HUTCHINSON BUILDERS
Established 1912

Construction Environmental Management Plan

SAMUEL GILBERT PUBLIC SCHOOL PROJECT

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Preface

Hutchinson Builders has developed this Construction Environmental Management Plan (CEMP) as the appointed Principal Contractor.

This plan provides specific information regarding the management of project-related works and will ensure that a uniform approach to environmental management is adopted.

A copy of the plan (CEMP) shall be referenced in Hutchinson Builders site specific induction and will be held on site by Hutchinson Builders so that all site employees, Client Reps, Subcontractors have access to the plan at all times. This plan is to be reviewed at 3 monthly intervals or amended where deficiencies are identified, or changes occur in Hutchinson Builders' Environmental Management System or project works change such that the information contained in the plan is no longer accurate or valid. If this CEMP is altered it will be the Team Leaders / Team HSE Managers responsibility to ensure that the revised CEMP is distributed to all Hutchinson Builders Site Management Staff, Client Representatives, Site Employees and Sub-contractors associated with the work.

Plan Review:

Name	Position	Signature
John Koumoukelis	Team Leader	
Michael Metherell	Site Manager	
Rob Fleming	Foreman	
Vitaly Kaakoush	Site Engineer	
Andy Smith	Project Manager	
Ben Mitchell	HSE Coordinator	

Plan Revision:

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1	20/09/2019	SM
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7	5/11/2020	BM
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9	07/04/2021	VK

Glossary

Term	Definition
C.A.R.	Corrective Action Report
Consequence	The outcome of an event expressed qualitatively or quantitatively, being a loss, injury, disadvantage or gain
Control Method	Method available to facilitate compliance with the performance criteria
Corrective Action	Action taken to eliminate the cause of a non-conformance, defect or short-coming
CEMP	Construction Environmental Management Plan
EMSM	Environmental Management Systems Manual
Environmental Aspects	Any element of an organisation's activities, products or services that can interact with the environment
Environmental Impact Environmental Issue	Any change in the environment whether adverse or beneficial, wholly or partially resulting from organisation activities, products or services A term used by the Company to address both environmental aspects and impacts.
EPA	Environment Protection Authority
ERP	Emergency Response Procedure
EWMS	Environmental Work Method Statement
HSE	Health Safety and Environment
Likelihood	A qualitative description of probability or frequency
NATA	National Association of Testing Authorities
PM	Hutchinson Builders Project Manager
PPE	Personal Protective Equipment
PRA	Project Risk Assessment
SDS	Safety Data Sheet
SM	Hutchinson Builders Site Manager
WHSMP	Work Health & Safety Management Plan

1. Environmental Policy Statement

Environmental Policy

HB-HSEQ-P-002

Hutchinson Builders operates within the construction industry and is committed to the delivery of construction activities through environmentally responsible practices from inception through to completion.

The leadership team recognises that the role in the protection of the environment to the extent to which we control is the cornerstone of our success.

The leadership team shall demonstrate this commitment by:

- Developing processes and procedures to identify, prevent and mitigate undesirable environmental impacts
- Establishing a framework for setting and monitoring environmental objectives
- Complying with all relevant statutory duties, regulations and codes of practice
- Championing the use of best practice environmental techniques and continuous improvement initiatives
- Implementing an effective monitoring and review process
- Conducting operations in accordance with approved environmental procedures
- Fostering a collaborative approach between senior management, workers and all external parties to achieve a responsible environmental outcome in all company activities

This Environmental Policy shall be communicated to all persons working on behalf of Hutchinson Builders to provide an understanding of the environmental objectives of the business.

Those persons involved with Hutchinson Builders operations shall be encouraged to exercise environmentally responsible practices into their everyday lives.

Greg Quinn
Managing Director

Date 2 March 2017
Version 5

ISO
14001:2004
ENVIRONMENTAL MANAGEMENT SYSTEM

2. Introduction

2.1 Purpose

This Construction Environmental Management Plan (CEMP) was developed by Hutchinson Builders to identify and provide management solutions for potential environmental impacts arising from the construction of the Samuel Gilbert Public School Project.

The aim of this CEMP is to provide the framework for environmental management of the construction phase of the project.

It is the responsibility of all project personnel, contractors and subcontractors to comply with the objectives and requirements of this CEMP and related documents.

Specifically this document:

- Sets the environmental objectives or standards to be achieved
- Identifies relevant legal requirements and conditions of approval
- Identifies environmental aspects of the construction activities and the potential environmental impacts which may result
- Details measures to mitigate potential environmental impacts and protect any special environmental characteristics of the site
- Identifies extraordinary factors (i.e. natural disasters, emergencies) that may cause environmental impacts and describes contingency plans to deal with these
- Describes strategies to ensure site personnel are aware of the environmental risks associated with the activity, and are trained in the measures and contingency plans to deal with them
- Details the monitoring and review program to evaluate environmental performance and ensure the effectiveness of environmental controls and contingency plans
- Describes the activities organisational structure and environmental responsibilities of site personnel including sub-contractors
- Outlines the mechanisms for communication of environmental information throughout the organisation and other stakeholders
- Describes the response and reporting procedure for complaints
- Details the requirements for record keeping
- Provides for continual improvement.

2.1.1 Environmental Commitment

Hutchinson Builders and their staff are committed to a ensuring a high standard of responsible environmental management during the Project.

Hutchinson Builders are committed to:

- Reducing the risk of adverse environmental impacts through an ongoing process of hazard identification, risk assessment, control implementation, monitoring and review;
- Minimising the potential for disturbance and disruption to surrounding stakeholders, including residents, businesses and the public;
- Striving for continuous improvement through ongoing environmental performance evaluation against Environmental Work Method Statements (EWMS), three monthly auditing, and ongoing update and review of this CEMP;
- Sustainable procurement; and
- Complying with all relevant regulatory, local laws and planning requirements.

2.1.2 Objectives of this Construction Environmental Management Plan

The objectives of this CEMP are to:

- Minimise the potential for adverse environmental impacts arising from construction activities;
- Outline the mitigation measures to ensure environmental risks are adequately managed during construction;
- Ensure all activities comply with relevant local and State regulatory requirements; and
- Ensure all activities comply with any environmental conditions of approval or permits.

The objectives will be achieved through the management commitment, strategies and monitoring programs outlined in this CEMP and related plans.

2.2 Project Scope and Description

Hutchinson Builders has been appointed to design & construct a $26 million upgrade to Samuel Gilbert Public School.

The project will deliver a three storey building which will include 25 new permanent learning spaces, a new library, a new hall (with separate access for community use) and new staff and administration facilities.

The project will also involve alterations to the existing administration building and existing library to convert them into six new learning spaces. In addition HB will also demolish four existing teaching spaces to create a new connection between the existing campus and existing school playing fields.

Additional information on the construction methodologies and controls are provided in the project specific WHS Risk Assessment located in Appendix 1 of the Samuel Gilbert WHS Management Plan.

The expected duration of construction activities has been outlined in Table 1.

TABLE 1

Construction time frames

Activity	Estimated Timeframe
Site Establishment	As per Construction Programme
Demolition	As per Construction Programme
Foundation and bulk earth work	As per Construction Programme
Structure	As per Construction Programme
Fit out and Finishes	As per Construction Programme
External works	As per Construction Programme

2.3 Structure of the Construction Environmental Management Plan

The CEMP consists of:

- This overarching Construction Environmental Management Plan which describes the environmental management system for the works in alignment with ISO 14001.
- Element based Environmental Work Method Statements (EWMS) which details the specific objectives / performance standards, control measures, monitoring and responsibility for the various environmental aspects associated with the works.
- Element based sub-plans for environmental aspects which carry a higher environmental risk.

The following supplementary documentation below in Table 2 may be required to be incorporated with the CEMP. These documents may be provided by an external agent.

TABLE 2

Supplementary Documentation – Appendix C

Reference Element	Elements(s)
EWMS-1	Erosion and Sediment Control (Stormwater Management)
EWMS-2	Waste Management

2.4 Related documents

The CEMP must be read in conjunction with the following documents:

- Environmental Management Systems Manual (EMSM)

- Work Health & Safety Management Plan (WHSMP)
- Emergency Management Plan (EMP)
- Quality Management Plan (QMP)

2.5 Hours of Work

As per the project DA, all works are to be carried out within the operating hours of:

Site Operation Hours:

Monday – Friday 7.00am to 6.00pm

Saturday 8.00am to 1.00pm

No works to be completed on Sundays or Public Holidays

2.6 24 Hour Contact Details

The 24 hour contact details for the Hutchinson Builders Site Manager are:

Michael Metherell

0428 366 022

michael.metherell@hutchinsonbuilders.au

3. Responsibilities

The project specific organisational structure is provided in the Work Health & Safety Management Plan (WHSMP). The general structure of authority and reporting flow paths is shown in the project **WHSMP Appendix 3 – Project Organisational Chart**.

3.1 On-site Environmental Responsibilities (EMSM Section 5)

The Site Manager is responsible for on-site activities and ensuring the management strategies outlined in this CEMP and related documents are implemented correctly, and monitoring performance indicators. The Site Manager is also responsible for ensuring all on-site activities comply with project permits, local government and regulatory requirements.

The environmental responsibilities of Hutchinson Builders workers on site are outlined in Table 3 as well as in the relevant **Responsibility Statements HB-HSEQ-F-007-A to HB-HSEQ-F-007-L** that are signed upon commencement on the project and retained in the site specific WHSMP.

TABLE 3

Project Team Environmental Responsibilities

Position Title	Responsibility
Project Manager Refer **HB-HSEQ-F-007-B**	Overall project environmental management and due diligence Allocation of resources Approval of CEMP and revisions Sustainable procurement Ensuring that all project management receive appropriate environmental inductions and additional training as required Promote environmental incident avoidance Respond to environmental incidents Corrective and preventative action Emergency preparedness and response Supporting the HSE Advisor in execution of their responsibilities and 'top-down' promotion of environmental best practice. Liaison with community and regulator
Site Manager Refer **HB-HSEQ-F-007-C**	Overall Project environmental management and due diligence Allocation of resources Ensuring that all site personnel receive appropriate environmental inductions and additional training as required Reporting on this CEMP Promote environmental incident avoidance Monitoring of performance of this CEMP Respond to environmental incidents Corrective and preventative action Emergency preparedness and response Approval of any chemicals entering the site Maintenance of up-to-date CEMP and documents at the site Emergency response manager Compliance with permits, local council guidelines and regulatory requirements. Monitoring of sub-contractor compliance with the CEMP
Site Foreman Refer **HB-HSEQ-F-007-D**	Direct activities in accordance with this CEMP and related documents Ensure that all site personnel are aware of any changes to this CEMP and related CEMPs Ensure that all personnel, including visitors are appropriately inducted Ensuring their individual areas of control and associated personnel comply with the requirements of this CEMP and related documents. Monitoring of sub-contractor compliance with the CEMP
HSE Advisor or Refer **HB-HSEQ-F-007-E** Project Environmental Representative Refer **HB-HSEQ-F-007-L**	Maintenance of Training Register and Community Complaints and Consultation Register Complete environmental checklists Maintain, assess, monitor and update the CEMP and other environmental documents Promote environmental incident avoidance Environmental performance in conjunction with project management Site inspection and monitoring Reporting to project/site manager on performance of the system and improvement opportunities Respond to environmental incidents Reporting any incidents, non-conformance or corrective actions.
Corporate Environmental Advisor	Provide environmental advice, support and management to the Project Manager and site personnel Consult with project management and relevant stakeholders regarding environmental issues Identify and prepare environmental toolbox and awareness training materials Conduct system environmental audits

3.2 Sub-contractor requirements

Contractors shall be required to comply with the specific performance objectives of the contract and participate in the implementation of the CEMP.

Key responsibilities of sub-contractors and their personnel in the field are to:

- Work with site supervisors to ensure their activities are undertaken in a manner which does not cause environmental harm;
- Rectify environmental controls removed or damaged by their activities and
- Report situations that have, or may result in environmental harm.

4. Relevant Legislation & Standards (EMSM 6.2.3)

Key legislation and policy directly relevant to the works are outlined in the **Environmental Legislation and Guidelines HB-HSEQ-F-005-A** (refer to **Appendix A**).

4.1 Licences, Permits and Consents

Certain project activities will need to comply with the relevant local council laws and state regulatory requirements. A review of relevant legislation and development approval conditions, and consultation with local regulatory bodies found the following statutory environmental permits and approvals where required:

Mark X if required	Required licences/ permits / consents required – if applicable
☒	Development approval
☒	Approval to enter the site (from NSW Government)
☐	Approval of the Erosion and Sediment Control Plan (ESCP)
☐	Local and/or State Government approval for any disturbance to protected vegetation
☐	Road authority approval for ancillary works within a road reserve
☐	State government approval (e.g. waterway licence) to disturb, clear, modify, bypass or temporarily dam a watercourse
☐	EPA licence to construct works within tidal areas or within a Marine National Park
☐	Regulated waste disposal

The requirement for any environmental permits and approvals will be reviewed with any significant change in scope of works or construction methodology. These approvals and any changes in current conditions of approval will be updated in this CEMP by the Site Manager or delegate and re-distributed to site contractors. Up to date permit and licence details will be maintained and available at the site office (see **Appendix B**)

4.2 Relevant Guidelines and Standards (EMSM Section 6.2.5)

The primary guidelines and standards applicable to the development and implementation of the CEMP can be located via **List of Relevant Australian Standards HB-HSEQ-F-004**. Unless mentioned elsewhere in the CEMP, the standards to be adopted for monitoring and assessment of environmental performance shall be the relevant Australian Standards.

4.3 Environmental Sampling and Laboratory Analysis

Where environmental sampling and analysis is required, methods and procedures used for sampling and analysis must be capable of withstanding rigorous scrutiny. The use of NATA registered laboratories or laboratories that perform to a recognised quality standard should be considered.

5. Environmental Aspects

5.1 Site Risk Assessment (EMSM 6.2.1)

Most, if not all, aspects of construction involve environmental risks of varying degrees. A break-down of construction activities and the associated risk levels (of an activity causing an adverse environmental impact) are provided in the **Samuel Gilbert Public School Site Specific Environmental Risk Assessment - Appendix L**. This document forms the primary risk management tool for the works and shall be reviewed as part of the CEMP review procedure discussed in **Section 10**.

An assessment of the projects location and scope of work was completed to identify potential environmental issues that may require consideration and/or management during construction (refer to **Samuel Gilbert Public School Site Specific Environmental Risk Assessment - Appendix L**).

Those aspects that were identified as having a moderate or greater risk of causing significant environmental impacts are as follows:

Aspect	Details
Proximity to sensitive receptors	**The proximity of the works to the nearest sensitive receptors:** • **Live operational school environment** • **Busy periods around school pick up & drop off** • **Residents located on neighbouring street to school**
Stormwater	Stormwater drains located on neighbouring streets
Waste management	All waste will be managed within the site boundary & disposed of as per the Project Waste Management Plan – Appendix H
Air quality	Managed as per the Samuel Gilbert Public School Site Specific Environmental Risk Assessment - Appendix L
Refer to PRA for all risks Moderate and greater	Samuel Gilbert Public School Site Specific Environmental Risk Assessment - Appendix L

Those environmental aspects that were assessed as a low to insignificant risk will be monitored as part of routine site inspection activities by the Site Manager or their delegate. If aspects initially assessed as low to insignificant risk, result in environmental harm, the risk assessment should be revised and this EMP updated. The Samuel Gilbert Public School Site Specific Environmental Risk Assessment will be reviewed 3 monthly and appropriate management measures will be developed and implemented within a practical time after their identification. Implementation of the controls is to occur by the Site Manager in consultation with the HSE Advisor.

5.1.1 Management of Dust & Odour

The management of dust and odour is to primarily protect the amenity of the neighbours and secondly to avoid environmental degradation around the site. It is the principal contractor's responsibility to set in place measures to minimise dust and odour generation during construction works.

Impacts to the surrounding neighbourhood associated with construction works are likely to be dust and odours as a result of earthworks and demolition work activities on site. These activities are generally undertaken by plant and equipment and occur during the disturbance of soils, groundwater, gases or unexpected finds etc.

The controls in the below table are required to be implemented and maintained on site to reduce the potential impact of dust & odour on neighbours and site personnel/workers.

Management of Potential Dust Impacts

Potential Source	Potential Impacts	Controls	Responsibility	Performance Measures
Excavation / Demolition	Neighbour complaints / workers exposure	Water suppression (hose / mist sprays) Shade cloth installed to site fencing	PC & Subcontractor	HB Daily Inspections & observations

Asbestos dust	Neighbour complaints / workers exposure	Water suppression (hose / mist sprays) Air monitoring set up in area during works	PC & Subcontractor	HB Daily Inspections & observations Compliance with AMP
Dirt stockpiles	Wind driven dust	Covering of stockpiles Water suppression Shade cloth installed to site fences	PC & Subcontractor	HB Daily Inspections & observations
Truck loads	Neighbour complaints / workers exposure	All trucks entering & leaving site must have loads covered	PC & Subcontractor	HB Daily Inspections & observations
Truck wheels	Neighbour complaints / workers exposure	Wheels wash / cattle grid at site exit Street sweeper when required	PC & Subcontractor	HB Daily Inspections & observations No complaints received relating to condition of street
Trenching - services	Neighbour complaints / workers exposure	Water suppression Cover stockpiles	PC & Subcontractor	HB Daily Inspections & observations

Management of Potential Odour Impacts

Potential Source	Potential Impacts	Controls	Responsibility	Performance Measures
Soils	Neighbour complaints / workers exposure / Odour	Cease works Water suppression (hose / mist sprays)	PC & Subcontractor	HB Daily Inspections & observations Monitor complaints
Groundwater	Neighbour complaints / workers exposure / Odour	Cease works & isolate area	PC & Subcontractor	HB Daily Inspections & observations Monitor complaints
Gases (unexpected finds)	Neighbour complaints / workers exposure / Odour	Cease works & isolate area	PC & Subcontractor	HB Daily Inspections & observations Monitor complaints
Vehicles	Neighbour complaints / workers exposure / Odour	Exhaust emissions	PC & Subcontractor	HB Daily Inspections & observations Monitor complaints

5.1.2 Stormwater Control & Discharge

This section identifies sediment control systems to be implemented on the project which will minimise erosion on-site and retain sediment eroded by water and wind. All sediment control will be installed as per the Samuel Gilbert PS Sediment & Erosion Control Plan which has been developed by Birzulis Associates.

The erosion & sediment control measures described in the below table will be installed and monitored on the project. Controls will initially be installed during site set up works and will be monitored and adjusted as per construction work activities.

Weather forecasts will be monitored and where significant inclement weather is identified, the site team will review the current sediment controls in place and will implement additional measures where required. Sediment control devices (silt fences) will be regularly monitored & cleaned/refreshed during daily HB site walks.

Management of Stormwater Impacts

Potential Source of stormwater	Potential Impacts	Controls	Responsibility	Performance Measures
Silt Fences	Neighbourhood impact	Cleaning of sediment controls	PC & Subcontractor	HB Daily Inspections & observations Monitor complaints
Vehicle Access	Neighbourhood impact, Road wash	Cleaning of cattle grid & maintenance of wheel wash system	PC & Subcontractor	HB Daily Inspections & observations
Stormwater Inlets	Neighbourhood impact, waterway contamination	Ensure placement of geo fabric & sandbags is as per Sediment Plan	PC & Subcontractor	HB Daily Inspections & observations
Stockpiles	Neighbourhood impact, waterway contamination	Cover stockpiles and position stockpile in a low risk location on site ie. away from drains	PC & Subcontractor	HB Daily Inspections & observations Monitor complaints
Construction activities (refuelling/concrete pumping)	Stormwater ecosystem impact	Hardstand areas on site / bunded areas / spill kits located on site	PC & Subcontractor	HB Daily Inspections & observations Monitor complaints

5.1.3 Sediment Control

Hutchinson Builders will set up controls on site to minimise the potential for sediment and other materials to be tracked onto surrounding roadways. All sediment control will be installed as per the Samuel Gilbert PS Sediment & Erosion Control Plan which has been developed by Birzulis Associates.

Work activities such as excavation/demolition works have the potential to create dust / dirt on roadways. The following table outlines controls which will be implemented by the site team to minimise the risk of these impacts affecting the local community.

Management of Roadway Impacts

Potential Source	Potential Impacts	Controls	Responsibility	Performance Measures
Silt Fences / Haybales	Sediment run-off, Neighbour complaints	Maintenance & cleaning of site silt fences	PC & Subcontractor	HB Daily Inspections & observations Monitor complaints
Stormwater Inlets	Sediment run-off, Neighbour complaints System surge	Install & maintenance of geofab	PC & Subcontractor	HB Daily Inspections & observations Monitor complaints
Driveways	Trucks tracking sediment onto roads Neighbour complaints	Install and maintenance of cattle grid	PC & Subcontractor	HB Daily Inspections & observations Monitor complaints

Stockpiles	Sediment run-off, Neighbour complaints	Install & maintenance of geofab & silt fences to stockpiles	PC & Subcontractor	HB Daily Inspections & observations Monitor complaints

5.1.4 Groundwater Management

Potential groundwater contamination will be monitored and controlled as per the following consultant reports which have been prepared for the Samuel Gilbert Project:

- Samuel Gilbert Construction Soil & Water Management Plan which has been developed by Birzulis Associates;
- JK Geotechnics Geotechnical Investigation Report;
- Preliminary Site Investigation Report (PSI) & Detailed Site Investigation by WSP.

In the unlikely event that groundwater is encountered on the project, HB will cease works & consult the relevant Consultants to assess and then implement required measures and controls.

Management of Groundwater Contamination

Potential Source	Potential Impacts	Controls	Responsibility	Performance Measures
Industrial	Groundwater contamination	Dilute any chemical with water washed into the soil, use on-site Spill Kits	PC & Subcontractor	HB Daily Inspections & observations

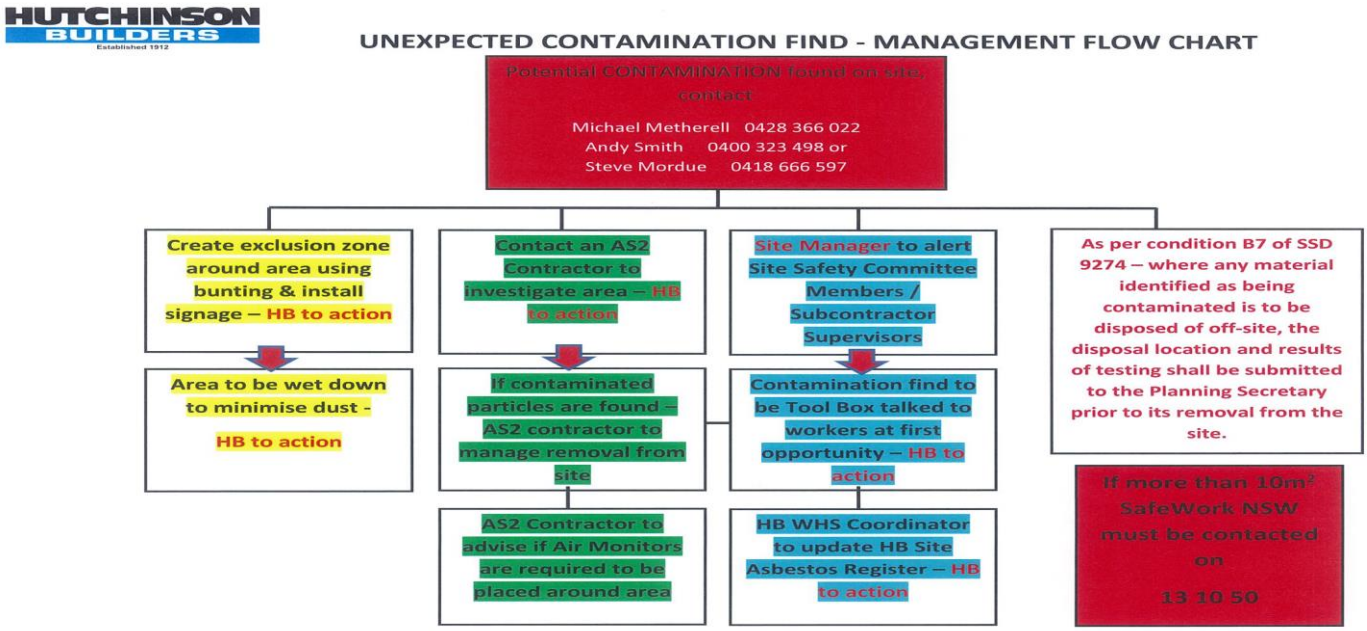
5.1.5 Management of External Lighting

Hutchinson Builders will ensure that external lighting to the Samuel Gilbert Public School project will comply with AS4282-2019 Control of the obtrusive effects of outdoor lighting.

The implementation of external lighting in line with the above standard will also be accompanied by the submission of a design compliance certificate complying with AS4282-2019 and submitted to the certifying authority for their information.

5.1.6 Unexpected Finds Protocol for Contamination

In the event of any unexpected contamination being encountered on site, all work will proceed in line with the below flowchart procedure.



5.1.7 Unexpected Finds Protocol for Aboriginal & Non-Aboriginal Heritage

In the event of any unexpected heritage related aboriginal or non-aboriginal items being encountered on site, HB will cease all works in the immediate area of the find. Once work has ceased HB will implement the following procedures:

- Area will be secured to prevent disturbance
- Pending the type of items found the following will occur on site:
    - Aboriginal heritage
        - An appropriately qualified archaeologist and the registered Aboriginal representative will be contacted to attend site to determine the significance of the finds
        - Consultation will occur between the archaeologist, Aboriginal representative and the Office of Environmental & Heritage (OEH) to develop and implement a management strategy
        - Written approval from OEH is to be received, once received works can recommence
    - Non-Aboriginal Heritage
        - An appropriately qualified archaeologist will be contacted to attend site to determine the significance of the finds
        - Consultation will occur between the archaeologist and the Office of Environmental & Heritage (OEH) to develop and implement a management strategy
        - Written approval from OEH is to be received, once received works can recommence

5.1.8 Waste Classification

Hutchinson Builders will ensure compliance with Condition B13(j) and will ensure waste classification (for materials to be removed) and validation (for materials to remain) is undertaken to confirm the contamination status in these areas of the site.

Please note however that the Greencap Report developed for the site advises that a Validation Report would only be required when the site requires remediation. The Report advises that for the Samuel Gilbert site, the Preliminary Site Investigation (PSI) & the Detailed Site Investigation (DSI) did not identify any issues with contamination and therefore implementing an Unexpected Finds Protocol Flowchart (see section 5.1.6) would be suitable for this site. Unless unexpected finds are encountered (based on site history the risk of this is low), the site will not require a Remediation Action Plan (RAP) or a Validation Report (VR).

5.2 Sub-contracted activities

The detachment of subcontractors from the main project delivery team can present an environmental risk to a project due to:

- Challenges in communicating environmental risks and controls to transient nature of sub-contractors and their employees
- Sub-contractors operating under a different management systems or standards.

Hutchinson Builders will ensure that the work of sub-contractors is monitored through daily surveillance whilst onsite; the site inspection and auditing processes are detailed in Section 8.

5.3 Sustainable Procurement

Sustainable procurement refers to the purchase of goods and services that have a lesser or reduced effect on the environment and human health (over the entire life cycle of the product i.e. production, distribution, usage and disposal), while maintaining value for money, when compared with other products or services that serve the same purpose.

Hutchinson Builders shall adopt a sustainable approach to procurement in the process of delivering the project.

5.4 Environmental Management Measures

Specific management measures for the various environmental aspects of the works are provided as Environmental Work Method Statements in **Appendix C**. The environmental management measures outlined aim to minimise or prevent the risk of adverse environmental impacts.

Waste generated though construction activities may be outsourced to a licenced third party. Disposal dockets shall be retained on the job file for future reference. Where the client specifies the use of a project specific Waste Management Plan a supplementary plan will be established and retained on site as per **Section 1.3**.

5.5 Emergency Planning and Response (Section 6.3.7)

Environmental management will include planning for potential emergencies at the site. The organisational structure, responsibilities and on-site contact details for all emergencies is specified **Emergency Response Plan** (**WHSMP – Appendix 7**). The relevant plan will be available in the site office. All emergency contacts will be recoded on the Emergency Contacts for site template (**WHSMP – Appendix 7 – Appendix A**) and be displayed on the site notice board.

The general procedure for managing environmental emergencies is provided in **Appendix F**.

Members of the Emergency Control Structure (ECS) will receive the relevant training to enable them to respond to identified environmental emergency situations in accordance with EMSM Section 6.3.2 Included in the site specific induction all workers will receive appropriate training in Emergency Response Procedures.

The ERP must be regularly tested and information revised regularly to ensure all details are current, including:

- The names of key response personnel
- Personnel responsibilities and contact details, including after-hours contact
- Contact details of emergency services
- The location of on-site information on hazardous materials, including SDSs and spill kits
- Information about minimising / controlling the emergency
- Procedures for notifying project management, regulators and public, if necessary.

6. Training, Awareness & Competency (EMSM Section 6.3.2)

6.1 Induction

Prior to working onsite all personnel and subcontractors will complete an environmental induction informing them of:

- Hutchinson Builders Environmental Policy;
- Legal requirements, including their duty of care under the State Environmental Protection Act;
- The purpose, objectives and key elements of the EMP ;
- Environmental responsibilities;
- Significant environmental issues relevant to the site;
- Key environmental control measures;
- Incident avoidance, management, emergency plans, and response;
- Reporting process for environmental harm/incidents; and
- Protection and maintenance of environmental controls.

A copy of the CEMP and related documents will be maintained on-site by the Site Manager/HSE Advisor and made accessible to personnel and subcontractors on the site. All subcontractors are responsible for ensuring personnel are aware of site environmental management measures and adequate materials are available to implement these.

6.2 Environmental training

Staff working onsite shall be provided with environmental training to achieve a level of awareness and competence appropriate to their assigned activities where required. Targeted environmental training will be provided to individuals or groups of workers with a specific authority or responsibility for environmental management or those undertaking an activity with a high risk of environmental impact. This training will be prepared and delivered by the HSE Advisor or Corporate Environmental Advisor in alignment with the specific **Site Training Register HB-HSEQ-F-031**.

The HSE Advisor will maintain an up to date register (Refer **WHSMP - Appendix 7 Site Training Register**) for the site.

Subcontractors should also maintain training details of any additional environmental awareness or competence training provided to personnel, and make records available to site management upon request.

6.3 Toolbox Training (EMSM 6.3.3)

Ongoing toolbox training using form **Toolbox Talk OHSE HB-HSEQ-F-055** shall be prepared and delivered by the HSE Advisor to ensure that relevant information is communicated to the workforce on an ongoing basis and that feedback can be provided on issues of interest or concern. For additional information relating to the use and implementation of Toolbox Talk refer to OHSMS procedure **PP:06 Communication on Site**.

7. Communication & Reporting (EMSM Section 6.3.3)

7.1 Internal communications and reporting pathways

The organisational structure described in Section 2 represents the general communication and reporting pathways for the contract.

Signage shall be erected displaying contact details for the Site Manager and persons responsible for responding to incidents and emergencies.

Hutchinson Builders will ensure consultation / cooperation and consultation occurs with duty holders & site personnel through the following consultative arrangements and in alignment with the EMSM, and internal OHSMS Procedure **PP:06 Communication on Site**:

- Weekly HB Site Meeting
- Weekly Subcontractor Meeting
- Weekly HSE Committee Meeting
- Toolbox and Prestart Meetings (refer **Section 6.3**)

7.2 External stakeholders

Hutchinson Builders are committed to working with other stakeholders to ensure an amicable approach is taken to the sharing of infrastructure and resources through specific and open lines of communication.

The Project Manager and Site Manager are responsible for consultation with external stakeholders. Sub-contractors are to notify the Site Manager of any issues or contact with stakeholders and refer all stakeholders to site management for further information. The Principal's Representative will be advised of all stakeholder consultation prior to it occurring and invited to attend meetings and/or discussions.

7.3 Routine reporting

General Progress Reports shall be prepared monthly using form **Project Performance HB-HSEQ-F-049** by the Site Manager or delegate and made available to the Principal. The report will, at a minimum, provide the following information summaries:

- Any EMP revisions
- Weekly **HSE Inspection BIG 8 HB-HSEQ-F-048**
- Environmental training
- Results of internal audits
- Non-conformances, incidents and/or proposed actions for rectification or improvement of management procedures, and
- The status of any open non-conformances
- Monitoring results, if requested.
- Project specific reporting requirements.

7.4 Internal reporting – hazards, non-conformance and corrective action

The Project Manager will be responsible for ensuring that all incidents are investigated and reported internally in accordance with the Hutchinson Builders procedure using form **Incident Report Form HB-HSEQ-F-027-B**.

Further to documenting a hazard or event, the type and extent of investigation will be determined by the Team HSE Manager. Management will review all information available and consider the risks associated with the hazard or incident. All events resulting in injury, disease or other harm will be investigated to determine the cause of the event. The result of the investigation will be reported to the Management Team. Where a systematic breach has been identified a corrective action will be raised in accordance with **Environmental Management Systems Manual** section 7.8.2

7.5 Incident and corrective action reporting to the Principal

The Principal shall be consulted on what environmental occurrences are considered to be incidents, prior to any works commencing. The Principal shall be notified of the occurrence of an environmental incident, or where there is any uncertainty about any incident.

7.6 Reporting incidents to regulatory authorities

The state regulatory body shall be notified in writing of any incident which has caused, or may cause serious or material environmental harm. The Project Manager is responsible for ensuring incidents are reported to regulatory authorities within the required time frames.

A written notice detailing the following information must be provided to the state regulatory body within 14 days only when the released contaminates exceed the allowable limit. The following are details that are required to be included on the notification:

- The name of the operator, including their registration certificate number
- The name and telephone number of a designated contact person
- Quantity and substance released
- Person(s) involved
- The location and time of the release
- The suspected cause of the release
- A description of the effects of the release
- The results of any monitoring performed in relation to the release
- Actions taken to mitigate any environmental harm caused by the release
- Proposed actions to prevent a recurrence of the release.

7.7 Complaints and complaints response

A **Community Complaints and Consultation Register HB-HSEQ-F-041** will be established for the project for the purpose of documenting impacts or complaints from neighbours or community. Incidents involving members of the community or complaints directly received may require an **Incident / Injury / Hazard Report Form HB-HSEQ-F-027-B** to be completed and retained on site for the duration of the project.

Sub-contractors will ensure that any complaints received by them during works are forwarded to site management immediately. Sub-contractors are not to initiate consultation or communication with community or stakeholders without site management approval.

Complaints shall be managed by the Project Manager, Site Manager or their delegate, in consultation with other relevant stakeholders so that a timely resolution is achieved. The resolution process shall involve a review of the effectiveness of control measures, which shall be modified where found to be deficient, and extended to other work areas or practices to avoid recurrence of the issue (refer Section 9)

8. Record Keeping & Document Control (EMSM Section 6.3.4)

The following records shall be accessible at the main site office:

- Current and superseded versions of the site specific CEMP (all versions)

- Regulatory licences and permits
- Pre-clearance survey (where applicable)
- Regulatory authority inspection reports
- Correspondence with regulatory authorities and other interested parties
- Employee training records
- **Register of Environmental Monitoring HB-HSEQ-042** and all relevant Environmental monitoring records
- Records of all environmental accidents/incidents/emergency (**Incident / Injury / Hazard Form HB-HSEQ-F-027-B**)
- **Corrective Action Report HB-HSEQ-F-029-A**
- **Site Weekly Date Collection Form HB-HSEQ-F-049-A**
- **Community Complaints and Consultation Register HB-HSEQ-F-041**
- **HSEQ Internal Audit Report HB-HSEQ-F-045-A**
- **HSEQ Monthly Review Agenda HB-HSEQ-F-057**
- **Weekly HSE Inspection BIG 8 HB-HSEQ-F-048**
- Records of the type, quantity and lawful disposal of regulated waste and recyclables removed from site
- Records of stormwater testing results and lawful discharge
- Calibration records for environmental monitoring equipment

Document control on the project is to occur in alignment with the EMSM **Section 6.3.5**. Further details on document control and management of project records is provided in the WHSMP.

9. Monitoring & Review Of Environmental Performance (EMSM Section 6.4.1)

9.1 Monitoring and Meetings

Environmental inspection of the site will be carried out by means of a routine monitoring program, which will identify non-conformances and areas for improvement. A formal audit program will also be implemented at the site.

Key aspects of the program include:

- Weekly site inspections will be undertaken by the HSE Advisor using the **Weekly HSE Inspection BIG 8 HB-HSEQ-F-048** to review performance against the key performance indicators outlined in **Appendix C**. Records of inspection findings, recommendations for improvement and non-conformances will be maintained in accordance with this EMP.
- On a regular basis, responsible personnel, including site supervisors, sub-contractor representatives and site management, will review site environmental performance, non-conformances and identify areas for improvement.
- All site personnel and sub-contractors will report non-conformances, identified as part of day to day works.
- Reporting to the Project Manager environmental management issues identified through Toolbox Talks
- Audit findings will be closed where practical within one month of audit.
- Monitoring and inspection shall be documented on **Weekly HSE Inspection BIG 8 HB-HSEQ-F-048**. All inspection, monitoring and non-conformance records are to be maintained for the purposes of audit and overall compliance monitoring for the life of the project.
- Any equipment required to satisfactorily complete environmental inspections must be recorded on the **Plant and Equipment Register HB-HSEQ-F-032** and include calibration records. Training records will also be maintained for measuring and monitoring equipment as required.

9.2 Environmental Work Method Statements (EMSM Section 6.2.1)

The EWMS provided in **Appendix C** detail the aspects that need to be monitored and controlled to reduce the potential environmental impacts at the site. Monitoring and inspection should assess activities against these EWMS to review overall environmental management performance at the site.

9.3 Internal Auditing (EMSM Section 6.4.4)

Construction activities and environmental procedures at the Project site will be audited for compliance with this CEMP. Audits will be conducted as per the **OHSMS Internal Audit Schedule HB-HSEQ-F-045**. The Environmental Auditor will be either an appointed independent consultant, HSE Manager, Site Manager, or delegate.

Audits may be conducted along with other required site audits, e.g., health and safety and quality audit. The scope of the audit will cover all construction activities on the site. It shall be the auditor's responsibility to:

- Provide an assessment of compliance with the environmental procedures and EWMS identified in this CEMP;
- Identify any other activities that have, or may cause an adverse impact to the environment, or non-conformance to regulation;
- Provide recommendations to the Project Manager and Site Manager regarding any practical measures that can be made to improve the effectiveness of environmental management at the Project site, and
- Complete and distribute and Audit Report within 1 week of the audit.

10. Non-Conformance & Preventive / Corrective Action (EMSM Section 6.4.2)

Negative findings arising from complaints, incidents, and routine inspection, monitoring and auditing shall be cause for corrective / preventive action. This shall include the completion of **Corrective Action Report HB-HSEQ-F-029-A** and the preparation of documented action plans consistent with the level of risk associated with the matter of concern.

In the event of a non-conformance:

- The nature of the event will be investigated
- Advice will be sought from a specialist where the matter is outside the expertise of project management
- Monitoring will be undertaken where required to properly investigate an incident, compliant or non-conformance
- An appropriate preventative and corrective action will be implemented
- The effectiveness or need for new/additional controls will be reviewed
- Strategies will be identified to prevent recurrence
- Environmental documentation will be reviewed and revised
- In certain situations work will be ceased until appropriate remedial actions are taken.
- Any non-conformance will be documented in the monthly **Project Performance HB-HSEQ-F-049** and forwarded to team HSE Manager for record and follow up. Corporate will be advised on monthly basis via Team C.A.R register.

The Site/Project Manager and HSE Advisor should be notified of any non-conformance within 24 hours of the incident occurring. However, if it appears that legislation has been breached or the events are of a major non-conformance the Corporate Environmental Advisor must be immediately notified.

Corrective action should be taken within a timely manner to ensure that the issue is addressed. A record of non-conformance for the event must be completed. Any issues for corrective or preventative action identified should be recorded, including responsibility for action and date for completion.

10.1 Close-out of Corrective Action Reports

The status of corrective actions shall be periodically reviewed by the HSE Advisor to ensure that all actions arising from inspections and audits are implemented in a timely manner, and verified and recorded as being satisfactorily completed.

Corrective action requests and observations of concern arising from external audits shall be addressed immediately following the site audit closing meeting using draft audit findings and resolved within two weeks of receiving the final audit report.

Corrective actions shall be included in the monthly **Project Performance HB-HSEQ-F-049**.

2. New South Wales

Issues	Applicable Legislation / Guidelines / Standards	Regulating Authority	Major Requirements Of Legislation
Office (including Site Offices)			
Energy Consumption			
Lighting	Department of Climate Change and Energy www.climatechange.gov.au	Department of Climate Change and Energy	• No specific legislation requirements.
Equipment Operation	Department of Climate Change and Energy www.climatechange.gov.au	Department of Climate Change and Energy	• No specific legislation requirements.
Air Conditioning / Heating	Department of Climate Change and Energy www.climatechange.gov.au	Department of Climate Change and Energy	• No specific legislation requirements.
Electricity	Department of Climate Change and Energy www.climatechange.gov.au	Department of Climate Change and Energy	• No specific legislation requirements.
Air Emissions			
Energy Use	Protection of the Environment Operations Act 1997	NSW EPA	• Monitor power usage and review opportunities for reduction. • Turn off appliances, including computers when not in use.
Vehicle use (exhaust emissions)	Department of Climate Change www.climatechange.gov.au	Department of Climate Change and Energy	• Ensure all vehicles are serviced in accordance with manufacturer's guidelines. • Consider alternate energy sources for vehicles, i.e. natural gas and hybrid types.
	Protection of the Environment Operations Act 1997	NSW EPA	• General Duty of care to prevent environmental harm through pollution
	Protection of the Environment Operations (Clean Air) Regulations 2010	NSW EPA	• No specific legislation requirements.
	Ozone Protection Act 1989	NSW EPA	• Ensure all vehicles are serviced in accordance with manufacturer's guidelines. • Consider alternate energy sources for vehicles, i.e. natural gas and hybrid types.

Issues	Applicable Legislation / Guidelines / Standards	Regulating Authority	Major Requirements Of Legislation
Waste Management			
Paper	Protection of the Environment Operations Act 1997	NSW EPA	• Undertake Paper Saving Initiatives. • When purchasing new printers consider printers which can print double sided. • Educate Staff on printer use and paper saving initiatives.
	Protection of the Environment Operations (Waste) Regulations 2005 [proposed 2014]	NSW EPA	• No specific requirements, however the Waste Management Hierarchy should be used Avoid/Reduce - Reuse - Recycle - Dispose • Minimisation of waste generated • Segregation of waste
Packaging	Protection of the Environment Operations Act 1997	NSW EPA	• Recycle and reuse
	Protection of the Environment Operations (Waste) Regulations 2005	NSW EPA	• No specific requirements, however the Waste Management Hierarchy should be used Avoid/Reduce - Reuse - Recycle - Dispose • Minimisation of waste generated • Segregation of waste
Equipment	Protection of the Environment Operations Act 1997	NSW EPA	• Recycle if possible. Otherwise comply with regulatory requirements for disposal. (For example, laser printer and ink cartridges, photocopier toner cartridges and CDs including cases).
	Protection of the Environment Operations (Waste) Regulations 2005	NSW EPA	• The Waste Management Hierarchy should be used Avoid/Reduce - Reuse - Recycle - Dispose • Minimisation of waste generated • Segregation of waste
Chemical storage (e.g. for cleaning)	Protection of the Environment Operations Act 1997	NSW EPA	• Audit storage 6 monthly. • Use biodegradable and non-toxic cleaning products where available. • Check SDS for storage and disposal recommendations
	Protection of the Environment Operations (Waste) Regulations 2005	NSW EPA	• Stipulates that the disposing of waste, or treating and disposing of waste, should occur in a way that causes the least harm to the environment. • The Waste Management Hierarchy should be used Avoid - Reduce - Reuse - Recycle - Dispose
	Work Health and Safety Act 2011; Work Health and Safety Regulation 2011	WorkCover NSW	• Stipulates requirement to minimise the risk of a dangerous event (e.g. fuel or chemical spill) occurring and controlling exposure. • Must obtain SDS on purchase from manufacturer. • Requirements for labelling of chemicals • Store in chemical cabinets or chemical stores as appropriate.

Issues	Applicable Legislation / Guidelines / Standards	Regulating Authority	Major Requirements Of Legislation
Chemical storage (e.g. for cleaning)	AS 1940 The Storage and Handling of Flammable and Combustible Liquids	WorkCover NSW NSW EPA	• Proper storage of hazardous substances and dangerous goods (toxic, flammable and combustible, corrosive) and implementation of all reasonable precautions and care to achieve an acceptable level of risk. • Stipulates emergency management and fire protection requirements.
	AS 1216 Classification, Hazard Identification and Information Systems for Dangerous Goods	WorkCover NSW NSW EPA	• Ensure different classes of chemical are appropriately segregated. • Store all chemicals in appropriate containers that are clearly marked. • Clearly label chemical storage areas. • Train personnel in safe chemical storage and handling.
Vehicle Use			
Project Trip Planning	Protection of the Environment Operations (Clean Air) Regulations 2010	NSW EPA	• Vehicle sharing, planning work to minimise site trips
Commuting to the Office	Protection of the Environment Operations (Clean Air) Regulations 2010	NSW EPA	• Encourage car-pooling / public transport / walking and cycling.
Vehicle Efficiency	Protection of the Environment Operations (Clean Air) Regulations 2010	NSW EPA	• Ensure all vehicles are serviced in accordance with manufacturer's guidelines.
Construction Site			
Air Emissions			
Fugitive Emissions - total volatile organic compounds (TVOCs) could be produced from contaminated soils.	Protection of the Environment Operations (Clean Air) Regulations 2010	NSW EPA	• Monitor emissions, where required. • Develop project specific Work Health & Safety Management Plan to limit exposure. • No unreasonable releases of contaminants to air resulting from activities on the site, including nuisance releases, unless authorised by EPA • No other air emissions, including odours, are detectable at the boundary of the site. • A management plan for the control of dust and air emissions is to be prepared and implemented where risk is moderate or higher
Dust and particulates from excavation and transport of material around and off site	Protection of the Environment Operations (Clean Air) Regulations 2010	NSW EPA	• Monitor dust emissions visually and apply water for dust suppression, if required. • No unreasonable releases of contaminants to air resulting from activities on the site, including nuisance releases, unless authorised by EPA • No other air emissions, including odours, are detectable at the boundary of the site.

Issues	Applicable Legislation / Guidelines / Standards	Regulating Authority	Major Requirements Of Legislation
Gaseous compounds (SO2, NO2) from equipment and vehicle use, exhaust emissions	Protection of the Environment Operations (Clean Air) Regulations 2010	NSW EPA	• Monitor emissions • Plan to limit exposure. • Ensure all vehicles are serviced in accordance with manufacturer's guidelines. • No unreasonable releases of contaminants to air resulting from activities on the site, including nuisance releases, unless authorised by an Environmental Authority Development approval • No other air emissions, including odours, are detectable at the boundary of the site.
Greenhouse gas emissions from vehicle and machinery use	Protection of the Environment Operations (Clean Air) Regulations 2010	NSW EPA	• No unreasonable releases of contaminants to air resulting from activities on the site, including nuisance releases, unless authorised by EPA • No other air emissions, including odours, are detectable at the boundary of the site. • Reduce use of greenhouse gas emitting vehicles and equipment where possible. • Monitor emissions where appropriate.
Fuel Storage and Handling	Protection of the Environment Operations Act 1997 Environmental Compliance Report Liquid Chemical Storage, Handling and Spill Management	NSW EPA	• General duty of care to prevent environmental harm through pollution • Must notify EPA when a pollution incident occurs that causes or threatens material harm to the environment
		NSW Department of Environment and Conservation	• Where possible have contractor's fuel equipment prior to commencing work at the site. • Where onsite refuelling is required, this should be conducted away from potentially sensitive receptors (e.g. waterways), preferably using a spill kit / tray and the contractor instructed to clean up any leaks or spills.
	Work Health and Safety Act 2011; Work Health and Safety Regulation 2011	WorkCover NSW	• Must obtain SDS on purchase from manufacturer. • Requirements for labelling of chemicals • Store in chemical cabinets or chemical stores as appropriate.
Chemical Storage	AS 4452:1997 "The Storage and Handling of Toxic Substances". AS 1940 (2004) "The Storage and Handling of flammable and combustible materials". AS 3780 (2008) "The storage and handling of corrosive substances"	Australia Standards	• Proper storage of hazardous substances and dangerous goods (toxic, flammable and combustible, corrosive) and implementation of all reasonable precautions and care to achieve an acceptable level of risk. • Stipulates emergency management and fire protection requirements. • Ensure different classes of chemical are appropriately segregated • Store all chemicals in appropriate containers that are clearly marked. • Clearly label chemical storage areas. • Train personnel in safe chemical storage and handling.

Issues	Applicable Legislation / Guidelines / Standards	Regulating Authority	Major Requirements Of Legislation
	Work Health and Safety Act 2011; Work Health and Safety Regulation 2011	WorkCover NSW	• Must obtain SDS on purchase from manufacturer. • Requirements for labelling of chemicals • Store in chemical cabinets or chemical stores as appropriate.
Transporting hazardous substances	Protection of the Environment Operations (Waste) Regulations 2005	NSW EPA	• Stipulates requirements for vehicle placarding, insurance, safety equipment and bulk transport of dangerous goods. • Stipulates safety obligations for employers, building occupiers and employees, as well as, notification or accidents or near misses. • Obtain SDS for each chemical / hazardous substance and transport in accordance with manufacturer's guidelines.
Equipment Decontamination	Protection of the Environment Operations Act 1997	NSW EPA	• General duty of care to prevent environmental harm through pollution. • Must notify EPA when a pollution incident occurs that causes or threatens material harm to the environment. • Use phosphate free detergent, dispose of waste water appropriately.
Emergency Management			
Fuel and Chemical Spills	Work Health and Safety Act 2011; Work Health and Safety Regulation 2011	WorkCover NSW	• Stipulates requirement to minimise the risk of a dangerous event (e.g. fuel or chemical spill) occurring.
	Protection of the Environment Operations Act 1997	NSW EPA	• General duty of care to prevent environmental harm through pollution. • Must notify EPA when a spill occurs that either causes or threatens material harm to the environment. • All staff and contractors involved in handling or use of fuels and chemicals (including hydraulic fluids) are to have spill kits available for use if required. • Project manager to contact EPA if significant spill / incident occurs.
Sewerage, Gas or Water release (caused by damage to underground services)	Protection of the Environment Operations Act 1997	NSW EPA	• General duty of care to prevent environmental harm through pollution. • Must notify EPA when pollution occurs that either causes or threatens material harm to the environment.
	Work Health and Safety Act 2011; Work Health and Safety Regulation 2011	WorkCover NSW	• Employee and employer obligations for the location of underground services detailed prior to excavation.
Emergency Response	Stage Emergency and Rescue Management Act 1989 NSW Work Health and Safety Act 2011 Work Health and Safety Regulation 2011	WorkCover NSW	• Stipulates requirements for evacuation plans and the provision of emergency escape routes.
Flora and Fauna			

Issues	Applicable Legislation / Guidelines / Standards	Regulating Authority	Major Requirements Of Legislation
Vegetation clearing or disturbance	Protection of the Environment Operations Act 1997 Native Vegetation Act 2003	NSW EPA	• General duty of care to prevent environmental harm through pollution. • Relevant approvals should have been obtained by any clients authorizing clearing. • Do not undertake any clearing without first obtaining permission from the site manager AND checking that the relevant approvals have been obtained. • If in doubt, obtain advice from relevant council about whether any clearing restrictions or approvals may apply. • Fencing may be required to protect vegetation. • Methods to reduce ground compaction, root damage or modification of the site conditions near vegetation may be required.
Native Fauna	Native Vegetation Act 2003	NSW EPA	• All fauna is protected under the Act (including common animals) • Do not injure or harm animals that may be in the way of works. • Ensure that measures to avoid injury to native wildlife have been considered if necessary. • During clearing of vegetation it may be necessary to have spotter-catchers on site to remove animals. • Hollow dwelling animals may be within tree trunks and logs. • Leave snakes alone unless they are an absolute threat to your safety.
Weed management	Noxious Weeds Act 1993	NSW EPA	• Pest management laws define different classes of declared weeds and required management strategies for each. It is illegal to introduce certain classes of declared plants (I.e. there is a legal obligation to prevent weed spread). • Must wash down vehicles to prevent the spread of weeds between areas • Ensure all vehicles/equipment are clean on arrival at the site. • If weeds are present, on leaving the site it will be necessary to wash down the vehicle to avoid spread of declared weeds to another site. • Follow Department of Natural Resources Management guidelines for vehicle wash down or visit an approved wash down centre.
Heritage Issues			
Protected Areas / Parks / Scientific Areas	National Parks & Wildlife Act 1974	NSW EPA	• Check with relevant authority for permit requirements prior to investigation works in World Heritage areas, National Heritage places and Wetlands of international importance

Issues	Applicable Legislation / Guidelines / Standards	Regulating Authority	Major Requirements Of Legislation
Cultural Heritage	Heritage Act 1977	NSW EPA	• The duty of care under the legislation protects not just registered cultural heritage sites but all sites • A Cultural Heritage survey may be required, and for some projects a Cultural Heritage Management Plan. An application for local government approval may also need to be lodged. • Where sites have areas containing native remnant vegetation or areas where no disturbance to the ground surface has occurred; cultural heritage (Heritage and cultural heritage) may be present. • If it is suspected that an area may be of cultural importance, request a search of the EPA Heritage Register(s) to see if the site is registered.
Discovery of Bones or Artefacts (Discovery of items of European or Indigenous Cultural Heritage Discovery of Bones or Artefacts)	Heritage Act 1977	NSW EPA	• The duty of care under the legislation protects not just registered cultural heritage sites but all sites • The discovery of bones or artefacts must be reported to the EPA and the artefacts must not be interfered with. • Any bones or artefacts found must be protected and conserved. • Aboriginal ownership of any items found must be recognised. • If items are uncovered that are suspected to be of cultural heritage significance, cease work immediately and notify the EPA. • Do not move or disturb items or artefacts. • The Project manager should contact the Police if bones are discovered.
Native Title	Native Title Act 1993 Commonwealth	NSW EPA	• Permission must be sought from Native Title holders for any work to be conducted on land to which Native Title applies. • The site may be operating under an Indigenous Land Use Agreement (ILUA).
Noise and Vibration			
Sensitive Receptors	Protection of the Environment Operations (Noise Control) Regulations 2008	NSW EPA	• Identify potential sensitive noise receptors prior to commencement of work. If present, consult with potential receptors and modify procedures or timing to reduce impact. • Reduce the noise source sound pressure level. • Select a suitable location for any noise source taking advantage of any attenuation provided by barrier structures or by providing a buffer.
	AS/NZ 2436:2010 "Guide to Noise Control on Construction, Maintenance and Demolition sites".	Australia Standards	• Methods for sound measurement and the control of noise are outlined • Guidelines provided for hearing protection
Soil Management			

Issues	Applicable Legislation / Guidelines / Standards	Regulating Authority	Major Requirements Of Legislation
Erosion and sediment control	Protection of the Environment Operations Act 1997 Best Practice Erosion & Sediment Control 2008	NSW EPA	• Must not deposit sand, soil, silt or mud— - in a roadside gutter, stormwater drain or a water; or - in a place where it could move or be washed into a roadside gutter, or stormwater drain • Local council can develop environmental plans to manage erosion and sediment erosion issues. Check with the appropriate local council for further details • Minimisation of erosion and control of sediment in all construction activities. • Use of erosion control matting to minimise soil erosion on steep slopes and for highly erosive soils. • Stabilised entry and exit points to minimise tracking of sediment offsite. • Sediment control for service trenches. • Preserve as much soil cover (grass, leaf litter, gravel and erosion control mats) as possible. • Maintain kerb vegetation where practicable to filter out sediment • Commence earthworks immediately prior to building. • Topsoil should be stockpiled (with cover) for later use. • Building materials should be located within the sediment control zone. • A perimeter bank may be required upslope of a stockpile.
Waste Management			
Disposal of waste from building sites	Protection of the Environment Operations (Waste) Regulations 2005	NSW EPA	• Outlines the requirements of a waste management program such as the activities that may generate waste
Management of Excavated Material	Protection of the Environment Operations (Waste) Regulations 2005	NSW EPA	• Minimisation of waste generated • Ensure the correct storage of waste and segregation of different waste materials. • A waste management program may be required as part of the development approval conditions. • Protect the environment through the minimising the amount of excavation required. • Use excavated material as backfill. • Where large excavation is required, stockpile topsoil and replace on completion of works. • A specific site rehabilitation program may need to be followed

Issues	Applicable Legislation / Guidelines / Standards	Regulating Authority	Major Requirements Of Legislation
Contaminated Soil	Protection of the Environment Operations Act 1997	NSW EPA	• Obtain permit from EPA if offsite transportation and/or disposal required. • Obtain permission from landfill operator for disposal. • All occupiers of land including subcontractors must be notified if a site is included on the contaminated land register or the environmental land register • Check with client whether contaminated soil has been documented on site and whether the appropriate permits have been obtained. • Check with Local council for any local codes or policies • The owner of the site should provide necessary notifications to occupiers if site is contaminated or included on the environmental land register
Water Management			
Water Use	Protection of the Environment Operations Act 1997 Water Management Act 2000 NSW	NSW EPA	• No releases of substances to surface waters, groundwater or stormwater e.g. cement, building waste, rubbish, hydrocarbons, etc. unless authorised by an EPA Approval • Minimise volumes of clean water used on site. • Ensure water valves/ taps can be turned off by using meters. • Minimise consumption of water for irrigation on site landscape.
Surface Water Discharge	Protection of the Environment Operations Act 1997 Best Practice Erosion & Sediment Control 2008	NSW EPA	• No releases of substances to surface waters, groundwater or stormwater e.g. cement, building waste, rubbish, hydrocarbons, etc. unless authorised by an EPA Approval. • No releases of stormwater off-site into a stormwater drain which results in the build-up of sand, silt or mud; or the deposition of sediments off site. • Identify potentially sensitive surface water drainage areas and, where possible move activities away from sensitive areas. • Use measures to minimise potential for surface water discharges.

APPENDIX B – LICENCES, PERMITS AND CONSENTS

Development Consent

Section 4.38 of the Environmental Planning and Assessment Act 1979

As the Minister for Planning and Public Spaces, I approve the Development Application referred to in Schedule 1, subject to the conditions specified in Schedule 2.

These conditions are required to:

- prevent, minimise, or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the development.

The Hon Robert Stokes MP
Minister for Planning and Public Spaces

Sydney 15th February 2020

SCHEDULE 1

Application Number:	SSD 9274
Applicant:	NSW Department of Education
Consent Authority:	Minister for Planning and Public Spaces
Site:	Lot 1 DP 719671, 20 Gilbert Road, Castle Hill Samuel Gilbert Public School
Development:	Redevelopment of Samuel Gilbert Public School comprising: • demolition of classroom spaces and removal of trees; • construction of a new three storey building along Ridgecrop Drive containing 23 new teaching spaces, new staff and administration offices, new library and school entry forecourt; • construction of a new school hall with a separate entrance for out of school hours and community use; • alterations and additions to the existing administration building and library building to convert these into six new home bases; • refurbishment of two toilet blocks; and

- associated works including construction of a new circulation axis, landscaping and signage.

DEFINITIONS

Aboriginal object	Has the same meaning as the definition of the term in section 5 of the *National Parks and Wildlife Act 1974*
Aboriginal place	Has the same meaning as the definition of the term in section 5 of the *National Parks and Wildlife Act 1974*
Advisory Notes	Advisory information relating to the consent but do not form a part of this consent
Applicant	NSW Department of Education or any other person carrying out any development to which this consent applies
Approved disturbance area	The area identified as such on the development layout
Archaeological Salvage	The collection and removal of archaeological data and materials from site
BCA	Building Code of Australia
BC Act	*Biodiversity Conservation Act 2016*
CEMP	Construction Environmental Management Plan
Certifying Authority	Professionals that are accredited by the Building Professionals Board to issue construction, occupation, subdivision, strata, compliance and complying development certificates under the EP&A Act, *Strata Schemes (Freehold Development) Act 1973* and *Strata Schemes (Leasehold Development) Act 1986* or in the case of Crown development, a person qualified to conduct a Certification of Crown Building works.
Conditions of this consent	The conditions contained in Schedule 2 of this document
Construction	All physical work to enable operation including but not limited to the demolition and removal of buildings, the carrying out of works for the purposes of the development, including bulk earthworks, and erection of buildings and other infrastructure permitted by this consent, but excluding the following: • building and road dilapidation surveys; • investigative drilling or investigative excavation; • Archaeological Salvage; • establishing temporary site offices (in locations identified by the conditions of this consent); • installation of environmental impact mitigation measures, fencing, enabling works; and • minor adjustments to services or utilities. However, where heritage items, or threatened species or threatened ecological communities (within the meaning of the *Biodiversity Conservation Act 2016 or Environment Protection and Biodiversity Conservation Act 1999*) are affected or potentially affected by any physical work, that work is construction, unless otherwise determined by the Planning Secretary in consultation with EES Group or DPIE Fisheries (in the case of impact upon fish, aquatic invertebrates or marine vegetation)
Council	The Hills Shire Council
Day	The period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays
Demolition	The deconstruction and removal of buildings, sheds and other structures on the site
Department	NSW Department of Planning, Industry and Environment
Development	The development described in the EIS and Response to Submissions, including the works and activities comprising demolition, construction and

	operation of Samuel Gilbert Public School, as limited by the conditions of this consent
Earthworks	Bulk earthworks, site levelling, import and compaction of fill material, excavation for installation of drainage and services
EES Group	Environment, Energy and Science Group of the Department of Planning, Industry and Environment (Former Office of Environment and Heritage)
EIS	The Environmental Impact Statement titled Proposed Expansion of Samuel Gilbert Public School, prepared by Minto Planning Services dated 14 November 2018, submitted with the application for consent for the development, including any additional information provided by the Applicant in support of the application
ENM	Excavated Natural Material
Environment	Includes all aspects of the surroundings of humans, whether affecting any human as an individual or in his or her social groupings
EPA	NSW Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPL	Environment Protection Licence under the POEO Act
Evening	The period from 6pm to 10pm.
Feasible	Means what is possible and practical in the circumstances
Heritage	Encompasses both Aboriginal and historic heritage including sites that predate European settlement, and a shared history since European settlement
Heritage NSW	Heritage, Community Engagement of the Department of Premier and Cabinet
Heritage Item	An item as defined under the *Heritage Act 1977,* and assessed as being of local, State and/ or National heritage significance*,* and/or an Aboriginal Object or Aboriginal Place as defined under the *National Parks and Wildlife Act 1974'*, the World Heritage List, or the National Heritage List or Commonwealth Heritage List under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth), or anything identified as a heritage item under the conditions of this consent
IBRA	Interim Biogeographic Regionalisation for Australia
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 *Note: "material harm" is defined in this consent*
Land	Has the same meaning as the definition of the term in section 1.4 of the EP&A Act
Management and mitigation measures	The management and mitigation measures set out in Section 7 of EIS and Section 5 of Response to Submission
Material harm	Is harm that: a) involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial; or b) 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)
Mitigation	Activities associated with reducing the impacts of the development prior to or during those impacts occurring

Monitoring	Any monitoring required under this consent must be undertaken in accordance with section 9.39 of the EP&A Act
Night	The period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays
Non-compliance	An occurrence, set of circumstances or development that is a breach of this consent
NSW RFS	New South Wales Rural Fire Service
OEMP	Operational Environmental Management Plan
Operation	The carrying out of the approved purpose of the development upon completion of construction.
Planning Secretary	Planning Secretary under the EP&A Act, or nominee
POEO Act	*Protection of the Environment Operations Act 1997*
Reasonable	Means applying judgement in arriving at a decision, taking into account: mitigation, benefits, costs of mitigation versus benefits provided, community views, and the nature and extent of potential improvements.
Registered Aboriginal Parties	Means the Aboriginal persons identified in accordance with the document entitled "*Aboriginal cultural heritage consultation requirements for proponents 2010*" (DECCW)
Rehabilitation	The restoration of land disturbed by the development to a good condition, to ensure it is safe, stable and non-polluting.
Response to submissions	The Applicant's response to issues raised in submissions received in relation to the application for consent for the development under the EP&A Act.
Sensitive receivers	A location where people are likely to work, occupy or reside, including a dwelling, school, hospital, office or public recreational area.
Site	The land defined in Schedule 1.
Site Auditor	As defined in section 4 of the *Contaminated Land Management Act 1997*
Site Audit Report	As defined in section 4 of the *Contaminated Land Management Act 1997*
Site Audit Statement	As defined in section 4 of the *Contaminated Land Management Act 1997*
STIF	Sydney Turpentine Ironbark Forest
TfNSW	Transport for New South Wales
TfNSW(RMS)	Transport for New South Wales (Roads and Maritime Services)
Upgrading	The carrying out of works (including replacing plant, equipment, or machinery or updating relevant technology) to improve the efficiency of the development or to enable or enhance its continued operation, and the carrying out of the maintenance works.
VENM	Virgin Excavated Natural Material
Waste	Has the same meaning as the definition of the term in the Dictionary to the POEO Act
Year	A period of 12 consecutive months

SCHEDULE 2

PART A ADMINISTRATIVE CONDITIONS

Obligation to Minimise Harm to the Environment

A1. In addition to meeting the specific performance measures and criteria in this consent, all reasonable and feasible measures must be implemented to prevent, and, if prevention is not reasonable and feasible, minimise any material harm to the environment that may result from the construction and operation of the development.

Terms of Consent

A2. The development may only be carried out:

(a) in compliance with the conditions of this consent;

(b) in accordance with all written directions of the Planning Secretary;

(c) generally in accordance with the EIS and Response to Submissions;

(d) in accordance with the approved plans in the table below:

Architectural Plans prepared by *Fulton Trotter*			
Dwg No.	**Rev**	**Name of Plan**	**Date**
AEX1002	P16	Site Demolition Plan	15/08/19
SD1001	P24	Proposed Site Plan	15/08/19
A-S-1400	01	Staging Plan	17/01/20
SD1603	P12	External Materials 1	7/05/19
SD1604	P12	External Materials 2	7/05/19
SD1605	P10	External Materials 3	7/05/19
SD1607	P10	Site Sections	7/05/19
SD1608	P10	Block N & P Street Elevation	7/05/19
SD1609	P14	Tree Plan	11/09/19
SD1610	P8	Proposed Signage	7/05/19
SD1611	P9	Construction Environmental Management Plan	7/05/19
SD1613	P3	Height Blanket Site Perspective & Section	7/05/19
SD1614	P2	End of Trip Facilities Plan	7/05/19
SD1615	P1	Kiss and Ride	7/05/19
SD-A-2001	P15	Building A – Ground Floor Plan	7/05/19
SD-A-2101	P7	Building A – Roof Plan	7/05/19
AEX-A-2001	P9	Building A – Demolition Floor Plan	7/05/19
AEX-E-2001	P9	Building E – Demolition Floor Plan	7/05/19
SD-E-2001	P16	Building E – Ground Floor Plan	7/05/19
SD-E-2101	P6	Building E – Roof Plan	7/05/19
AEX-F-2001	P3	Building D & F Demolition Floor Plans	7/05/19
SD-F-2101	P6	Building D & F Roof Plan	7/05/19
SD-F-3001	P3	Building D & F Elevations	7/05/19
SD-N-2002	P22	Building N – Ground Floor Plan	7/05/19

SD-N-2003	P21	Building N – Level 1 Floor Plan	7/05/19
SD-N-2004	P20	Building N – Level 2 Floor Plan	7/05/19
SD-N-2101	P15	Building N – Roof Plan	7/05/19
SD-N-3001	P18	Building N – North South Elevations	7/05/19
SD-N-3002	P18	Building N – East & West Elevations	7/05/19
SD-N-3101	P12	Building N – Sections N1, N2 & N3	7/05/19
SD-P-2002	P20	Building P – Ground Floor Plan	7/05/19
SD-P-2003	P19	Building P – Level 1 Floor Plan	7/05/19
SD-P-2004	P19	Building P – Level 2 Floor Plan	7/05/19
SD-P-2101	P15	Building P – Roof Plan	7/05/19
SD-P-3001	P18	Building P – North & South Elevations	7/05/19
SD-P-3002	P18	Building P – East & West Elevations	7/05/19
SD-P-3101	P12	Building P – Sections P1 & P3	7/05/19
SD-P-3102	P9	Building P – Section P4	7/05/19
SD-Q-2001	P19	Building Q – Ground Floor Plan	7/05/19
SD-Q-2101	P12	Building Q – Roof Plan	7/05/19
SD-Q-3001	P15	Building Q – North and East Elevations	7/05/19
SD-Q-3002	P17	Building Q – South and West Elevations	7/05/19
SD-Q-3101	P7	Building Q – Section Q1 & Q2	7/05/19
Landscape Plans prepared by *Ground Ink Landscape Architects*			
Dwg No.	**Rev**	**Name of Plan**	**Date**
LDA-05	-	Proposed External Works Plan	12/09/19
LDA-07	-	Landscape Masterplan	12/09/19
LDA-08	-	Materials Palette	12/09/19
LDA-09	-	Indicative Plant Palette	12/09/19
LDA-10	-	Central Plaza Landscape Plan	12/09/19
LDA-11	-	Central Plaza Section Elevation	12/09/19
LDA-12	-	Section Elevation	12/09/19
LDA-13	-	Ridgecrop Drive (Southern) Elevation	12/09/19
LDA-14	-	Proposed Tree Plan	12/09/19
Civil Plans prepared by *Henry & Hymas*			
Dwg No.	**Rev**	**Name of Plan**	**Date**
17787_DA_BE01	04	Bulk Earthworks Cut and Fill Plan	28/02/19
17787_DA_C100	09	General Arrangement Plan	28/02/19
17787_D1_BE01	01	Bulk Earthworks Cut and Fill Plan Staff Car Park	16/08/19
17787_D1_C000	01	Cover Sheet, Drawing Schedule Notes and Locality Sketch	16/08/19

17787_D1_C100	01	Staff Car Park – Detail Plan	16/08/19

A3. Consistent with the requirements in this consent, the Planning Secretary may make written directions to the Applicant in relation to:

(a) the content of any strategy, study, system, plan, program, review, audit, notification, report or correspondence submitted under or otherwise made in relation to this consent, including those that are required to be, and have been, approved by the Planning Secretary;

(b) any reports, reviews or audits commissioned by the Planning Secretary regarding compliance with this approval; and

(c) the implementation of any actions or measures contained in any such document referred to in (a) above.

A4. The conditions of this consent and directions of the Planning Secretary prevail to the extent of any inconsistency, ambiguity or conflict between them and a document listed in condition A2(c) or A2(d). In the event of an inconsistency, ambiguity or conflict between any of the documents listed in condition A2(c) and A2(d), the most recent document prevails to the extent of the inconsistency, ambiguity or conflict.

Limits of Consent

A5. This consent lapses five years after the date of consent unless work is physically commenced.

Prescribed Conditions

A6. The Applicant must comply with all relevant prescribed conditions of development consent under Part 6, Division 8A of the EP&A Regulation.

Planning Secretary as Moderator

A7. In the event of a dispute between the Applicant and a public authority, in relation to an applicable requirement in this approval or relevant matter relating to the Development, either party may refer the matter to the Planning Secretary for resolution. The Planning Secretary's resolution of the matter must be binding on the parties.

Evidence of Consultation

A8. Where conditions of this consent require consultation with an identified party, the Applicant must:

(a) consult with the relevant party prior to submitting the subject document for information or approval; and

(b) provide details of the consultation undertaken including:

(i) the outcome of that consultation, matters resolved and unresolved; and

(ii) details of any disagreement remaining between the party consulted and the Applicant and how the Applicant has addressed the matters not resolved.

Staging

A9. The project may be constructed and operated in stages. Where staged construction or operation is proposed, a Staging Report (for either or both construction and operation as the case may be) must be prepared and submitted for the approval of the Planning Secretary. The Staging Report must be submitted to the Planning Secretary no later than one month before the commencement of construction of the first of the proposed stages of construction (or if only staged operation is proposed, one month before the commencement of operation of the first of the proposed stages of operation).

A10. A Staging Report prepared in accordance with condition A9 must:

(a) if staged construction is proposed, set out how the construction of the whole of the project will be staged, including details of work and other activities to be carried out in each stage and the general timing of when construction of each stage will commence and finish;

(b) if staged operation is proposed, set out how the operation of the whole of the project will be staged, including details of work and other activities to be carried out in each stage

and the general timing of when operation of each stage will commence and finish (if relevant);

(c) specify how compliance with conditions will be achieved across and between each of the stages of the project; and

(d) set out mechanisms for managing any cumulative impacts arising from the proposed staging.

A11. Where staging is proposed, the project must be staged in accordance with the Staging Report, as approved by the Planning Secretary.

A12. Where staging is proposed, the terms of this approval that apply or are relevant to the works or activities to be carried out in a specific stage must be complied with at the relevant time for that stage.

Staging, Combining and Updating Strategies, Plans or Programs

A13. With the approval of the Planning Secretary, the Applicant may:

(a) prepare and submit any strategy, plan (including management plan, architectural or design plan) or program required by this consent on a staged basis (if a clear description is provided as to the specific stage and scope of the development to which the strategy, plan (including management plan, architectural or design plan) or program applies, the relationship of the stage to any future stages and the trigger for updating the strategy, plan (including management plan, architectural or design plan) or program);

(b) combine any strategy, plan (including management plan, architectural or design plan), or program required by this consent (if a clear relationship is demonstrated between the strategies, plans (including management plan, architectural or design plan) or programs that are proposed to be combined); and

(c) update any strategy, plan (including management plan, architectural or design plan), or program required by this consent (to ensure the strategies, plans (including management plan, architectural or design plan), or programs required under this consent are updated on a regular basis and incorporate additional measures or amendments to improve the environmental performance of the development).

A14. If the Planning Secretary agrees, a strategy, plan (including management plan, architectural or design plan), or program may be staged or updated without consultation being undertaken with all parties required to be consulted in the relevant condition in this consent.

A15. If approved by the Planning Secretary, updated strategies, plans (including management plan, architectural or design plan), or programs supersede the previous versions of them and must be implemented in accordance with the condition that requires the strategy, plan, program or drawing.

Structural Adequacy

A16. All new buildings and structures, and any alterations or additions to existing buildings and structures, that are part of the development, must be constructed in accordance with the relevant requirements of the BCA and any additional requirements of the Subsidence Advisory NSW where the building or structure is located on land within a declared Mine Subsidence District.

Notes:

- *Part 8 of the EP&A Regulation sets out the requirements for the certification of the development.*
- *Under section 21 of the Coal Mine Subsidence Compensation Act 2017, the Applicant is required to obtain the Chief Executive of Subsidence Advisory NSW's approval before carrying out certain development in a Mine Subsidence District.*

External Walls and Cladding

A17. The external walls of all buildings including additions to existing buildings must comply with the relevant requirements of the BCA.

Applicability of Guidelines

A18. References in the conditions of this consent to any guideline, protocol, Australian Standard or policy are to such guidelines, protocols, Standards or policies in the form they are in as at the date of this consent.

A19. Consistent with the conditions of this consent and without altering any limits or criteria in this consent, the Planning Secretary may, when issuing directions under this consent in respect of ongoing monitoring and management obligations, require compliance with an updated or revised version of such a guideline, protocol, Standard or policy, or a replacement of them.

Monitoring and Environmental Audits

A20. Any condition of this consent that requires the carrying out of monitoring or an environmental audit, whether directly or by way of a plan, strategy or program, is taken to be a condition requiring monitoring or an environmental audit under Division 9.4 of Part 9 of the EP&A Act. This includes conditions in respect of incident notification, reporting and response, non-compliance notification, Site audit report and independent auditing.

Note: *For the purposes of this condition, as set out in the EP&A Act, "monitoring" is monitoring of the development to provide data on compliance with the consent or on the environmental impact of the development, and an "environmental audit" is a periodic or particular documented evaluation of the development to provide information on compliance with the consent or the environmental management or impact of the development.*

Access to Information

A21. At least 48 hours before the commencement of construction until the completion of all works under this consent, or such other time as agreed by the Planning Secretary, the Applicant must:

(a) make the following information and documents (as they are obtained or approved) publicly available on its website:

(i) the documents referred to in condition A2 of this consent;

(ii) all current statutory approvals for the development;

(iii) all approved strategies, plans and programs required under the conditions of this consent;

(iv) regular reporting on the environmental performance of the development in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent;

(v) a comprehensive summary of the monitoring results of the development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs;

(vi) a summary of the current stage and progress of the development;

(vii) contact details to enquire about the development or to make a complaint;

(viii) a complaints register, updated monthly;

(ix) audit reports prepared as part of any independent audit of the development and the Applicant's response to the recommendations in any audit report;

(x) any other matter required by the Planning Secretary; and

(b) keep such information up to date, to the satisfaction of the Planning Secretary.

Compliance

A22. The Applicant must ensure that all of its employees, contractors (and their sub-contractors) are made aware of, and are instructed to comply with, the conditions of this consent relevant to activities they carry out in respect of the development.

Incident Notification, Reporting and Response

A23. The Planning Secretary must be notified in writing to compliance@planning.nsw.gov.au immediately after the Applicant becomes aware of an incident. The notification must identify the development (including the development application number and the name of the development if it has one), and set out the location and nature of the incident.

A24. Subsequent notification must be given and reports submitted in accordance with the requirements set out in **Appendix 1**.

Non-Compliance Notification

A25. The Planning Secretary must be notified in writing to compliance@planning.nsw.gov.au within seven days after the Applicant becomes aware of any non-compliance. The Certifying Authority must also notify the Planning Secretary in writing to compliance@planning.nsw.gov.au within seven days after they identify any non-compliance.

A26. The notification must identify the development and the application number for it, set out the condition of consent that the development is non-compliant with, the way in which it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.

A27. A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.

Revision of Strategies, Plans and Programs

A28. Within three months of:

(a) the submission of a compliance report under condition B33;

(b) the submission of an incident report under condition A23;

(c) the submission of an Independent Audit under condition C34;

(d) 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 Certifying Authority must be notified in writing that a review is being carried out.

A29. 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. Where revisions are required, the revised document must be submitted to the Planning Secretary for approval 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.

Design and Construction for Bush Fire

A30. Proposed Building N must comply with Sections 3 and 5 (BAL 12.5) Australian Standard AS3959-2009 Construction of buildings in bushfire-prone areas or NASH Standard (1.7.14 updated) National Standard Steel Framed Construction in Bushfire Areas – 2014 as appropriate and section A3.7 Addendum Appendix 3 of Planning for Bush Fire Protection 2006; and

A31. New works proposed to Building A must comply with Sections 3 and 5 (BAL 12.5) Australian Standard AS3959-2009 Construction of buildings in bushfire-prone areas or NASH Standard (1.7.14 updated) National Standard Steel Framed Construction in Bushfire Areas – 2014 as appropriate and section A3.7 Addendum Appendix 3 of Planning for Bush Fire Protection 2006.

PART B PRIOR TO COMMENCEMENT OF CONSTRUCTION

Notification of Commencement

B1. The Applicant must notify the Planning Secretary in writing of the dates of commencement of physical work and operation at least 48 hours before those dates.

B2. If the construction or operation of the development is to be staged, the Planning Secretary must be notified in writing at least 48 hours before the commencement of each stage, of the date of commencement and the development to be carried out in that stage.

Certified Drawings

B3. Prior to the commencement of construction, the Applicant must submit to the satisfaction of the Certifying Authority structural drawings prepared and signed by a suitably qualified practising Structural Engineer that demonstrates compliance with this development consent.

External Walls and Cladding

B4. Prior to the commencement of construction (excluding earthworks), the Applicant must provide the Certifying Authority with documented evidence that the products and systems proposed for use or used in the construction of external walls, including finishes and claddings such as synthetic or aluminium composite panels, comply with the requirements of the BCA. The Applicant must provide a copy of the documentation given to the Certifying Authority to the Planning Secretary within seven days after the Certifying Authority accepts it.

Protection of Public Infrastructure

B5. Prior to the commencement of construction, the Applicant must:

(a) consult with the relevant owner and provider of services that are likely to be affected by the development to make suitable arrangements for access to, diversion, protection and support of the affected infrastructure;

(b) prepare a dilapidation report identifying the condition of all public infrastructure in the vicinity of the site (including roads, gutters and footpaths); and

(c) submit a copy of the dilapidation report to the Planning Secretary, Certifying Authority and Council.

Pre-Construction Dilapidation Report

B6. Prior to the commencement of construction, the Applicant must submit a pre-commencement dilapidation report to Council and the Certifying Authority. The report must provide an accurate record of the existing condition of adjoining private properties and Council assets that are likely to be impacted by the proposed works.

Unexpected Contamination Procedure

B7. Prior to the commencement of earthworks, the Applicant must prepare an unexpected contamination procedure to ensure that potentially contaminated material is appropriately managed. The procedure must form part of the of the CEMP in accordance with condition B13 and where any material identified as contaminated is to be disposed off-site, the disposal location and results of testing submitted to the Planning Secretary prior to its removal from the site.

Community Communication Strategy

B8. No later than two weeks before the commencement of construction, a Community Communication Strategy must be submitted to the Planning Secretary for information. The Community Communication Strategy must provide mechanisms to facilitate communication between the Applicant, the relevant Council and the community (including adjoining affected landowners and businesses, and others directly impacted by the development), during the design and construction of the development and for a minimum of 12 months following the completion of construction.

The Community Communication Strategy must:

(a) identify people to be consulted during the design and construction phases;

(b) set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development;

(c) provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development;

(d) set out procedures and mechanisms:

(i) through which the community can discuss or provide feedback to the Applicant;

(ii) through which the Applicant will respond to enquiries or feedback from the community; and

(iii) to resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation.

Ecologically Sustainable Development

B9. Prior to the commencement of construction, unless otherwise agreed by the Planning Secretary, the Applicant must demonstrate that ESD is being achieved by either:

(a) registering for a minimum 4 star Green Star rating with the Green Building Council Australia and submit evidence of registration to the Certifying Authority; or

(b) seeking approval from the Planning Secretary for an alternative certification process.

Outdoor Lighting

B10. Prior to commencement of lighting installation, evidence must be submitted to the satisfaction of the Certifying Authority that all outdoor lighting within the site has been designed to comply with AS 1158.3.1:2005 Lighting for roads and public spaces – Pedestrian area (Category P) lighting – Performance and design requirements and AS 4282-2019 Control of the obtrusive effects of outdoor lighting.

Demolition

B11. Prior to the commencement of construction, demolition work plans required by *AS 2601-2001 The demolition of structures* (Standards Australia, 2001) must be accompanied by a written statement from a suitably qualified person that the proposals contained in the work plan comply with the safety requirements of the Standard. The work plans and the statement of compliance must be submitted to the Certifying Authority and Planning Secretary.

Environmental Management Plan Requirements

B12. Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:

(a) detailed baseline data;

(b) details of:

(i) the relevant statutory requirements (including any relevant approval, licence or lease conditions);

(ii) any relevant limits or performance measures and criteria; and

(iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;

(c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;

(d) a program to monitor and report on the:

(i) impacts and environmental performance of the development;

(ii) effectiveness of the management measures set out pursuant to paragraph (c) above;

(e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;

(f) a program to investigate and implement ways to improve the environmental performance of the development over time;

(g) a protocol for managing and reporting any:

(i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria);

(ii) complaint;

(iii) failure to comply with statutory requirements; and

(h) a protocol for periodic review / update of the plan and any updates in response to incidents or matters of non-compliance.

Note: *The Planning Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans*

Construction Environmental Management Plan

B13. Prior to the commencement of construction, the Applicant must submit a Construction Environmental Management Plan (CEMP) to the satisfaction of Certifying Authority and provide a copy to the Planning Secretary. 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) stormwater control and discharge;

(v) measures to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site;

(vi) groundwater management plan including measures to prevent groundwater contamination;

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

(viii) community consultation and complaints handling;

(b) Construction Traffic and Pedestrian Management Sub-Plan (see condition B14);

(c) Construction Noise and Vibration Management Sub-Plan (see condition B15);

(d) Construction Waste Management Sub-Plan (see condition B16);

(e) Construction Soil and Water Management Sub-Plan (see condition B17);

(f) Biodiversity Management Sub-Plan (see condition B18);

(g) Bush Fire Emergency Response Sub-Plan (see condition B19);

(h) an unexpected finds protocol for contamination and associated communications procedure;

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

(j) waste classification (for materials to be removed) and validation (for materials to remain) be undertaken to confirm the contamination status in these areas of the site; and

B14. The Construction Traffic and Pedestrian Management Sub-Plan (CTPMSP) must address, but not be limited to, the following:

(a) be prepared by a suitably qualified and experienced person(s);

(b) be prepared in consultation with Council and TfNSW;

(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) include a Driver Code of Conduct to:

(i) minimise the impacts of earthworks and construction on the local and regional road network;

(ii) minimise conflicts with other road users;

(iii) minimise road traffic noise; and

(iv) ensure truck drivers use specified routes;

(f) include a program to monitor the effectiveness of these measures; and

(g) if necessary, detail procedures for notifying residents and the community (including local schools), of any potential disruptions to routes.

B15. 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 B8(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 management measures in accordance with Condition B12(d).

B16. The Construction Waste Management Sub-Plan (CWMSP) must address, but not be limited to, the following:

(a) detail the quantities of each waste type generated during construction and the proposed reuse, recycling and disposal locations; and

(b) removal of hazardous materials, particularly the method of containment and control of emission of fibres to the air, and disposal at an approved waste disposal facility in accordance with the requirements of the relevant legislation, codes, standards and guidelines, prior to the commencement of any building works.

B17. The Applicant must prepare a Construction Soil and Water Management 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;

(b) describe all erosion and sediment controls to be implemented during construction;

(c) include an Acid Sulfate Soils Management Plan, if required, including measures for the management, handling, treatment and disposal of acid sulfate soils, including monitoring of water quality at acid sulfate soils treatment areas.

(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 1-year ARI, 1 in 5-year ARI and 1 in 100-year ARI.

B18. The Biodiversity Management Sub-Plan (BMSP) must address, but not be limited to, the following:

(a) should any injured fauna species be found during the construction period, construction must stop immediately so that the injured animal can be taken to a vet or wildlife carer. All handling of fauna species must be conducted by a qualified ecologist or wildlife carer;

(b) during vegetation clearing, animals that are injured or displaced are to be captured and relocated by a qualified ecologist or wildlife carer to nearby bushland (subject to landowner approval), or trees containing wildlife must be sectioned and dismantled before relocating the animals;

(c) nocturnal fauna species such as gliders and possums, if captured and rescued during vegetation clearing are to be secured in suitable enclosures and kept in a quiet, dark and cool environment until they can be released into suitable habitat after dark;

(d) include a Vegetation Management sub-plan (VMP) for the site during construction works.

(e) include measures to communicate to the construction workforce the biodiversity values that are to be retained and protected;

(f) any hollows removed be salvaged and replaced into trees within the vegetated areas to be retained or they be replaced with nest boxes in consultation with Council suitable to native fauna likely to use the site;

(g) include a Fauna Management Plan for the site including details of impacts and proposed mitigation measures due to impact on movement, construction traffic, proposed construction hours, details of any fencing, restricting developments in identified areas, light spill, construction noise and on-site crane movements; and

(h) include details to install and maintain exclusion fencing along and around any native vegetation not being removed as part of this development.

B19. The Bush Fire Emergency Response Sub-Plan (FERSP) must address, but not be limited to, the following:

(a) be prepared by a suitably qualified and experienced person(s);

(b) address the provisions of the Planning for Bush Fire Protection 2006;

(c) include details of:

(i) the bushfire emergency responses for both construction and operation phases of the development;

(ii) assembly points and evacuation routes;

(iii) evacuation and refuge protocols; and

(iv) awareness training for employees and contractors, and students.

Construction Worker Transportation Strategy

B20. Prior to the commencement of construction, the Applicant must submit a Construction Worker Transportation Strategy to the satisfaction of the Certifying Authority. The Strategy must detail the provision of sufficient parking facilities or other travel arrangements for construction workers in order to minimise demand for parking in nearby public and residential streets or public parking facilities.

Operational Noise – Design of Mechanical Plant and Equipment

B21. Prior to installation of mechanical plant and equipment, the Applicant must incorporate the noise mitigation recommendations in the Environmental Noise Assessment (6395-1R Rev A) report prepared by Day Design Pty Ltd dated 8 November 2018, into the detailed design drawings. The Certifying Authority must verify that all noise mitigation measures have been incorporated into the design to ensure the development will not exceed the recommended operational noise levels identified in the Environmental Noise Assessment report.

Pre clearing

B22. Prior to the commencement of construction and/or vegetation clearing (whichever occurs first), pre clearing surveys and inspections for fauna must be undertaken. The surveys and inspection, and any subsequent relocation of fauna, must be undertaken under the guidance of a suitably qualified ecologist and must be in accordance with the methodology incorporated in the Biodiversity Management Sub-Plan. Evidence of the pre clearing surveys and inspections for fauna and any relocation of fauna must be provided to the satisfaction of the Certifying Authority.

Biodiversity

B23. Prior to the commencement of vegetation clearing, the class and number of ecosystem credits in the table below must be retired to offset the residual biodiversity impacts of the development.

Impacted Plant Community Type (PCT)	Number of Credits	Containing hollow bearing trees	IBRA subregions	Plant community type(s) that can be used to offset the impacts from development
PCT 1081 – Bloodwood – Grey Gum woodland on edges of the Cumberland Plain, Sydney Basin Bioregion	13	Yes	Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo or any IBRA subregion that is within 100 Kilometers of the outer edge of the impacted site.	Sydney Hinterland Dry Sclerophyll Forests (including PCT's 612, 621, 624, 1080, 1081, 1086, 1159, 1246, 1255, 1327, 1328, 1614, 1622, 1628, 1631, 1634, 1640, 1664, 1666, 1667, 1789, 1790, 1912)
PCT 1281 – Turpentine – grey Ironbark open forest on shale in the lower Blue Mountains, Sydney basin Bioregion	1	No	Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo or any IBRA subregion that is within 100 Kilometers of the outer edge of the impacted site.	Sydney Turpentine-Ironbark Forest (including PTC's 1183, 1281, 1284)

B24. The requirement to retire credits in Condition B23 above may be satisfied by payment to the Biodiversity Conservation Fund of an amount equivalent to the class and number of ecosystem credits, as calculated by the Biodiversity Offsets Payment Calculator.

B25. Evidence of the retirement of credits or payment to the Biodiversity Conservation Fund in satisfaction of condition B24 must be submitted to the Planning Secretary prior to carrying out development that will impact on biodiversity values.

Landscaping

B26. Prior to the commencement of construction, the Applicant must prepare a revised Landscape Plan to manage the revegetation and landscaping works on-site, to the satisfaction of the Certifying Authority. The plan must:

(a) provide for the planting of 54 trees;

(b) provide for the planting of 50 shrubs and groundcover;

(c) detail the location, species, maturity and height at maturity of plants to be planted on-site;

(d) include species (trees, shrubs and groundcovers) indigenous to the local area;

(e) include the planting of trees with a pot container of 100 litres or greater, with a minimum height at maturity of 10m;

(f) include the provision of nest boxes suitable to native fauna likely to use the site;

(g) comply with the principles of Appendix 5 of *Planning for Bush Fire Protection 2006;*

(h) the revegetated area(s) of STIF must be contiguous with the areas of existing STIF and be fully structured with a diversity of local native tree, shrub and groundcover species;

(i) the existing STIF and revegetated areas of STIF must not be managed as an APZ under this consent;

(j) trees to be removed are salvaged and used in the remnant vegetation on site to enhance habitat including tree hollows and tree trunks (greater than 25-30cm in diameter and 3m in length).

Landscaping

B27. Prior to the commencement of construction, the existing STIF must be delineated and be protected by exclusion fencing on the ground.

Rainwater Harvesting

B28. Prior to the commencement of construction, the Applicant must ensure that a rainwater reuse/harvesting system for the development is developed for the site. A rainwater re-use plan must be prepared and certified by an experienced hydraulic engineer.

Roadworks and Access

B29. Prior to the commencement of construction, the Applicant must submit design plans to the satisfaction of the relevant roads authority which demonstrate that the proposed construction accesses to the development are designed to accommodate the turning path of a heavy ridged vehicles.

Car Parking and Service Vehicle Layout

B30. Prior to the commencement of construction, compliance with the following requirements must be submitted to the satisfaction of the Certifying Authority:

(a) all vehicles must enter and leave the Site in a forward direction;

(b) that the operational car parking layout provides a minimum of 38 on-site car parking spaces for use during operation of the development and new car parking spaces must be designed in accordance with the latest versions of AS 2890.1 and AS 2890.6;

(c) that the construction access and car parking arrangements provide 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, must be in accordance with the latest version of AS 2890.2; and

(d) the safety of vehicles and pedestrians accessing adjoining properties, where shared vehicle and pedestrian access occurs, is to be addressed.

Bicycle Parking and End-of-Trip Facilities

B31. Prior to the commencement of construction, evidence must be submitted to the satisfaction of the Certifying Authority with the following requirements for bicycle parking and end-of-trip facilities:

a) the provision of a minimum 60 bicycle parking spaces;

b) the layout, design and security of bicycle facilities must comply with the minimum requirements of the latest version of AS 2890.3:2015 *Parking facilities - Bicycle parking*, and be located in easy to access, well-lit areas that incorporate passive surveillance;

c) the provision of end-of-trip facilities for staff;

d) appropriate pedestrian and cyclist advisory signs are to be provided; and

e) all works/regulatory signposting associated with the proposed developments shall be at no cost to the relevant roads authority.

Public Domain Works

B32. Prior to the commencement of any footpath or public domain works, the Applicant must consult with Council and demonstrate to the Certifying Authority that the streetscape design and treatment meets the requirements of Council, including addressing pedestrian management. The Applicant must submit documentation of approval for each stage from Council to the Certifying Authority.

Compliance Reporting

B33. No later than two weeks before the date notified for the commencement of construction, a Compliance Monitoring and Reporting Program prepared in accordance with the Compliance Reporting Post Approval Requirements (Department 2018) must be submitted to the Planning Secretary and the Certifying Authority.

B34. The Applicant must make each Compliance Report publicly available 60 days after submitting it to the Planning Secretary and notify the Planning Secretary and the Certifying Authority in writing at least seven days before this is done.

B35. Notwithstanding the requirements of the Compliance Reporting Post Approval Requirements (Department 2018), the Planning Secretary may approve a request for ongoing annual operational compliance reports to be ceased, where it has been demonstrated to the Planning Secretary's satisfaction that an operational compliance report has demonstrated operational compliance.

PART C DURING CONSTRUCTION

Site Notice

C1. A site notice(s):

(a) must be prominently displayed at the boundaries of the site during construction for the purposes of informing the public of project details including, but not limited to the details of the Builder, Certifying Authority and Structural Engineer is to satisfy the following requirements;

(b) minimum dimensions of the notice must measure 841 mm x 594 mm (A1) with any text on the notice to be a minimum of 30-point type size;

(c) the notice is to be durable and weatherproof and is to be displayed throughout the works period;

(d) the approved hours of work, the name of the site/ project manager, the responsible managing company (if any), its address and 24-hour contact phone number for any inquiries, including construction/ noise complaint must be displayed on the site notice; and

(e) the notice(s) is to be mounted at eye level on the perimeter hoardings/fencing and is to state that unauthorised entry to the site is not permitted.

Operation of Plant and Equipment

C2. All construction plant and equipment used on site must be maintained in a proper and efficient condition and operated in a proper and efficient manner.

Demolition

C3. Demolition work must comply with the demolition work plans required by *Australian Standard AS 2601-2001 The demolition of structures* (Standards Australia, 2001) and endorsed by a suitably qualified person as required by Condition B11.

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 7:00am and 6:00pm, Mondays to Fridays inclusive; and

(b) between 8:00am and 1:00pm, Saturdays.

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

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

C6. Notification of such construction activities as referenced in Condition C5 must be given to affected residents before undertaking the activities or as soon as is practical afterwards.

C7. 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.

Implementation of Management Plans

C8. The Applicant must carry out the construction of the development in accordance with the most recent version of the approved CEMP (including Sub-Plans).

Construction Traffic

C9. All construction vehicles (excluding site personnel vehicles) are to be contained wholly within the site, except if located in an approved on-street work zone, and vehicles must enter the site before stopping.

Hoarding Requirements

C10. The following hoarding requirements must be complied with:

(a) no third-party advertising is permitted to be displayed on the subject hoarding/ fencing; and

(b) the construction site manager must be responsible for the removal of all graffiti from any construction hoardings or the like within the construction area within 48 hours of its application.

No Obstruction of Public Way

C11. The public way (outside of any approved construction works zone) must not be obstructed by any materials, vehicles, refuse, skips or the like, under any circumstances.

Construction Noise Limits

C12. 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.

C13. 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.

C14. 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.

Vibration Criteria

C15. 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).

C16. 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 C15.

C17. The limits in conditions C15 and C16 apply unless otherwise outlined in a Construction Noise and Vibration Management Plan, approved as part of the CEMP required by condition B13 of this consent.

Tree Protection

C18. For the duration of the construction works:

(a) street trees must not be trimmed or removed unless it forms a part of this development consent or prior written approval from Council is obtained or is required in an emergency to avoid the loss of life or damage to property;

(b) all street trees immediately adjacent to the approved disturbance area must be protected at all times during construction. Any tree on the footpath, which is damaged or removed during construction due to an emergency, must be replaced, to the satisfaction of Council;

(c) all trees on the site that are not approved for removal must be suitably protected during construction as per recommendations of the Arboricultural Impact Assessment report (5229/J1) prepared by TreeTalk Arboricultural consulting dated September 2019;

(d) if access to the area within any protective barrier is required during the works, it must be carried out under the supervision of a qualified arborist. Alternative tree protection measures must be installed, as required. The removal of tree protection measures, following completion of the works, must be carried out under the supervision of a qualified arborist and must avoid both direct mechanical injury to the structure of the tree and soil compaction within the canopy or the limit of the former protective fencing, whichever is the greater; and

(e) the area of fill/rubber built around trunks of trees in the STIF must be remediated and the fill/rubber removed as per the recommendations in Arboricultural Impact Assessment report (5229/J1) prepared by TreeTalk Arboricultural consulting dated September 2019.

Air Quality

C19. The Applicant must take all reasonable steps to minimise dust generated during all works authorised by this consent.

C20. During construction, the Applicant must ensure that:

(a) exposed surfaces and stockpiles are suppressed by regular watering;

(b) all trucks entering or leaving the site with loads have their loads covered;

(c) trucks associated with the development do not track dirt onto the public road network;

(d) public roads used by these trucks are kept clean; and

(e) land stabilisation works are carried out progressively on site to minimise exposed surfaces.

Erosion and Sediment Control

C21. All erosion and sediment control measures must be effectively implemented and maintained at or above design capacity for the duration of the construction works and until such time as all ground disturbed by the works have been stabilised and rehabilitated so that it no longer acts as a source of sediment. Erosion and sediment control techniques, as a minimum, are to be in accordance with the publication Managing Urban Stormwater: Soils & Construction (4th edition, Landcom, 2004) commonly referred to as the 'Blue Book'.

Imported Soil

C22. The Applicant must:

(a) ensure that only VENM, ENM, or other material approved in writing by EPA is brought onto the site;

(b) keep accurate records of the volume and type of fill to be used; and

(c) make these records available to the Certifying Authority upon request.

Disposal of Seepage and Stormwater

C23. Adequate provisions must be made to collect and discharge stormwater drainage during construction of the building to the satisfaction of the principal certifying authority. The prior written approval of Council must be obtained to connect or discharge site stormwater to Council's stormwater drainage system or street gutter.

Emergency Management

C24. The Applicant must prepare and implement awareness training for employees and contractors, including locations of the assembly points and evacuation routes, for the duration of construction

Stormwater Management System

C25. Within three months of the commencement of construction, the Applicant must design an operational stormwater management system for the development and submit it to the satisfaction of the Certifying Authority. The system must:

(a) be designed by a suitably qualified and experienced person(s);

(b) be generally in accordance with the conceptual design in the EIS;

(c) be in accordance with applicable Australian Standards; and

(d) ensure that the system capacity has been designed in accordance with *Australian Rainfall and Runoff* (Engineers Australia, 2016) and *Managing Urban Stormwater: Council Handbook* (EPA, 1997) guidelines.

Unexpected Finds Protocol – Aboriginal Heritage

C26. In the event that surface disturbance identifies a new Aboriginal object, all works must halt in the immediate area to prevent any further impacts to the object(s). A suitably qualified archaeologist and the registered Aboriginal representatives must be contacted to determine the significance of the objects. The site is to be registered in the Aboriginal Heritage Information Management System (AHIMS) which is managed by EES Group and the management outcome for the site included in the information provided to AHIMS. The Applicant must consult with the Aboriginal community representatives, the archaeologists and EES Group to develop and implement management strategies for all objects/sites. Works shall only recommence with the written approval of EES Group.

Unexpected Finds Protocol – Historic Heritage

C27. If any unexpected archaeological relics are uncovered during the work, then all works must cease immediately in that area and the Heritage NSW contacted. Depending on the possible significance of the relics, an archaeological assessment and management strategy may be required before further works can continue in that area. Works may only recommence with the written approval of the Heritage NSW.

Waste Storage and Processing

C28. All waste generated during construction must be secured and maintained within designated waste storage areas at all times and must not leave the site onto neighbouring public or private properties.

C29. All waste generated during construction must be assess, classified and managed in accordance with the Waste Classification Guidelines Part 1: Classifying Waste (EPA, 2014).

C30. The Applicant must ensure that concrete waste and rinse water are not disposed of on the site and are prevented from entering any natural or artificial watercourse.

C31. The Applicant must record the quantities of each waste type generated during construction and the proposed reuse, recycling and disposal locations for the duration of construction.

C32. The Applicant must ensure that the removal of hazardous materials, particularly the method of containment and control of emission of fibres to the air, and disposal at an approved waste disposal facility is in accordance with the requirements of the relevant legislation, codes, standards and guidelines.

Outdoor Lighting

C33. The Applicant must ensure that all external lighting is constructed and maintained in in accordance with AS 4282-2019 Control of the obtrusive effects of outdoor lighting.

Independent Environmental Audit

C34. Proposed independent auditors must be agreed to in writing by the Planning Secretary prior to the preparation of an Independent Audit Program or commencement of an Independent Audit.

C35. Prior to the commencement of construction, an Independent Audit Program prepared in accordance with the Independent Audit Post Approval Requirements (Department 2018) must be submitted to the Planning Secretary and the Certifying Authority.

C36. Table 1 of the Independent Audit Post Approval Requirements (Department 2018) is amended so that the frequency of audits required in the construction phase is:

(a) An initial construction Independent Audit must be undertaken within eight weeks of the notified commencement date of construction; and

(b) A subsequent Independent Audit of construction must be undertaken no later than six months from the date of the initial construction Independent Audit.

In all other respects Table 1 remains the same. The Planning Secretary may require the initial and subsequent Independent Audits to be undertaken at different times to those specified above, upon giving at least 4 weeks notice to the applicant of the date upon which the audit must be commenced.

C37. Independent Audits of the development must be carried out in accordance with:

(a) the Independent Audit Program submitted to the Planning Secretary and the Certifying Authority under condition C34 of this consent; and

(b) the requirements for an Independent Audit Methodology and Independent Audit Report in the Independent Audit Post Approval Requirements (Department 2018).

C38. In accordance with the specific requirements in the Independent Audit Post Approval Requirements (Department 2018), the Applicant must:

(a) review and respond to each Independent Audit Report prepared under condition C36 of this consent;

(b) submit the response to the Planning Secretary and the Certifying Authority; and

(c) make each Independent Audit Report and response to it publicly available within 60 days after submission to the Planning Secretary and notify the Planning Secretary and the Certifying Authority in writing at least seven days before this is done.

C39. Notwithstanding the requirements of the Independent Audit Post Approval Requirements (Department 2018), the Planning Secretary may approve a request for ongoing annual operational audits to be ceased, where it has been demonstrated to the Planning Secretary's satisfaction that an audit has demonstrated operational compliance.

Detailed Site Investigation

C40. Following the relocation or demolition of any existing structures, infrastructure and in ground utilities, the Applicant is to carry out further investigation of soil contamination (including within the footprint and immediate surrounds of those structures, infrastructures and utilities prior to undertaking any construction) to address any contamination with regard to the following:

(a) NSW EPA Sampling Design Guidelines;

(b) Guidelines for the NSW Site Auditor Scheme (3rd edition) 2017;

(c) Guidelines for Consultants Reporting on Contamination Sites, 2011; and

(d) The National Environment Protection (Assessment of Contamination) Measure.

PART D PRIOR TO COMMENCEMENT OF OPERATION

Notification of Occupation

D1. At least one month before commencement of operation, the date of commencement of the operation of the development must be notified to the Planning Secretary in writing. If the operation of the development is to be staged, the Planning Secretary must be notified in writing at least one month before the commencement of each stage, of the date of commencement and the development to be carried out in that stage.

External Walls and Cladding

D2. Prior to commencement of operation, the Applicant must provide the Certifying Authority with documented evidence that the products and systems used in the construction of external walls including finishes and claddings such as synthetic or aluminium composite panels comply with the requirements of the BCA.

D3. The Applicant must provide a copy of the documentation given to the Certifying Authority to the Planning Secretary within seven days after the Certifying Authority accepts it.

Post-construction Dilapidation Report

D4. Prior to commencement of operation, the Applicant must engage a suitably qualified person to prepare a post-construction dilapidation report at the completion of construction. This report is:
   a) to ascertain whether the construction created any structural damage to adjoining buildings or infrastructure;
   b) to be submitted to the Certifying Authority. In ascertaining whether adverse structural damage has occurred to adjoining buildings or infrastructure, the Certifying Authority must:
      i) compare the post-construction dilapidation report with the pre-construction dilapidation report required by these conditions; and
      ii) have written confirmation from the relevant authority that there is no adverse structural damage to their infrastructure and roads.
   c) to be forwarded to Council.

Protection of Public Infrastructure

D5. Unless the Applicant and the applicable authority agree otherwise, the Applicant must:
   (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by carrying out the development; and
   (b) relocate, or pay the full costs associated with relocating any infrastructure that needs to be relocated as a result of the development.

Protection of Property

D6. Unless the Applicant and the applicable owner agree otherwise, the Applicant must repair, or pay the full costs associated with repairing any property that is damaged by carrying out the development.

Utilities and Services

D7. Prior to commencement of operation, the Applicant must obtain a Compliance Certificate for water and sewerage infrastructure servicing of the site under section 73 of the *Sydney Water Act 1994*.

Pedestrian crossing

D8. Prior to the commencement of operation or other timeframe agreed in writing by the Planning Secretary, evidence must be submitted to the Planning Secretary that demonstrates that the Applicant has consulted with Council with respect to investigating the provision of formal pedestrian crossing within the refuge across Ridgecrop Drive. If a pedestrian crossing is required by Council, evidence of details of the pedestrian crossing in accordance with Council requirements must be provided to the satisfaction of the Certifying Authority.

Works as Executed Plans

D9. Prior to the commencement of operation, works-as-executed drawings signed by a registered surveyor demonstrating that the stormwater drainage and finished ground levels have been constructed as approved, must be submitted to the Certifying Authority.

Green Travel Plan

D10. Prior to the commencement of operation, a Green Travel Plan (GTP), must be submitted to the satisfaction of the Planning Secretary to promote the use of active and sustainable transport modes. The plan must:

(a) be prepared by a suitably qualified traffic consultant in consultation with The Hills Shire Council and (Sydney Coordination Office) Transport for NSW;

(b) include objectives and modes share targets (i.e. Site and land use specific, measurable and achievable and timeframes for implementation) to define the direction and purpose of the GTP;

(c) include specific tools and actions to help achieve the objectives and mode share targets;

(d) include measures to promote and support the implementation of the plan, including financial and human resource requirements, roles and responsibilities for relevant employees involved in the implementation of the GTP; and

(e) include details regarding the methodology and monitoring/review program to measure the effectiveness of the objectives and mode share targets of the GTP, including the frequency of monitoring and the requirement for travel surveys to identify travel behaviours of users of the development.

Operational Transport and Access Management Plan (OTAMP)

D11. Prior to the commencement of operation, an OTAMP is to be prepared by a suitably qualified person, in consultation with Council, Transport for NSW and TfNSW(RMS), and submitted to the satisfaction of the Certifying Authority and submitted to the Planning Secretary for information. The OTAMP must address the following:

(a) detailed pedestrian analysis including the identification of safe route options – to identify the need for management measures such as staggered school start and finish times to ensure students and staff are able to access and leave the Site in a safe and efficient manner during school start and finish;

(b) the location of all car parking spaces on the school campuses and their allocation (i.e. staff, visitor, accessible, emergency, etc.);

(c) the location and operational management procedures of the pick-up and drop-off parking located within Gilbert Road and Ridgecrop Drive, including staff management/traffic controller arrangements;

(d) the location and operational management procedures for the pick-up and drop-off of students by buses and coaches for excursions and sporting activities, including staff management/traffic controller arrangements;

(e) delivery and services vehicle and bus access and management arrangements;

(f) management of approved access arrangements;

(g) potential traffic impacts on surrounding road networks and mitigation measures to minimise impacts, including measures to mitigate queuing impacts associated with vehicles accessing pick-up and drop-off parking at Gilbert Road and Ridgecrop Drive;

(h) car parking arrangements and management associated with the proposed use of school facilities by community members; and

(i) a monitoring and review program.

Evacuation and Emergency Planning

D12. Prior to the commencement of operation, a Bush Fire Emergency Management and Evacuation Plan must be prepared consistent with *Development Planning – A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan* December 2014.

School Zones

D13. Prior to the commencement of operation, all required School Zone signage, speed management signage and associated pavement markings along Gilbert Road and Ridgecrop Drive must be installed, inspected by TfNSW(RMS) and handed over to TfNSW(RMS).

Note: Any required approvals for altering public road speed limits, design and signage are required to be obtained from the relevant consent authority.

D14. The Applicant must maintain records of all dates in relation to installing, altering and removing traffic control devices related to speed.

Mechanical Ventilation

D15. Prior to commencement of operation, the Applicant must provide evidence to the satisfaction of the Certifying Authority that the installation and performance of the mechanical ventilation systems complies with:

(a) *AS 1668.2-2012 The use of air-conditioning in buildings – Mechanical ventilation in buildings* and other relevant codes; and

(b) any dispensation granted by Fire and Rescue NSW.

Operational Noise – Design of Mechanical Plant and Equipment

D16. Prior to the commencement of operation, the Applicant must submit evidence to the Certifying Authority that the noise mitigation recommendations in the Environmental Noise Assessment report (6395-1.1R Rev A) dated 8 November 2018 and prepared by Day Design Pty Ltd have been incorporated into the design to ensure the development will not exceed the recommended operational noise levels identified in the Environmental Noise Assessment.

Car Parking Arrangements

D17. Prior to the commencement of operation or other timeframe agreed in writing by the Planning Secretary, evidence must be submitted to the Planning Secretary that demonstrates that:

(a) the Applicant has consulted with Council to form an agreement to use Council's carpark on Ridgecrop Drive as overflow staff carparking during school hours. If an agreement is formed, the agreement must to be submitted to the Planning Secretary for information.

(b) construction works associated with the proposed expansion of school, as proposed under SSD 9274, have been completed and that the expanded car parking facility is operational; and

(c) works associated with the reconfiguration of the existing on site car park to create for 4 additional car parking spaces have been completed.

Road Damage

D18. Prior to the commencement of operation, the cost of repairing any damage caused to Council or other Public Authority's assets in the vicinity of the Subject Site as a result of construction works associated with the approved development must be met in full by the Applicant.

Fire Safety Certification

D19. Prior to commencement of occupation, a Fire Safety Certificate must be obtained for all the Essential Fire or Other Safety Measures forming part of this consent. A copy of the Fire Safety Certificate must be submitted to the relevant authority and Council. The Fire Safety Certificate must be prominently displayed in the building.

Structural Inspection Certificate

D20. Prior to the commencement of occupation of the relevant parts of any new or refurbished buildings, a Structural Inspection Certificate or a Compliance Certificate must be submitted to the satisfaction of the Certifying Authority. A copy of the Certificate with an electronic set of final drawings (contact approval authority for specific electronic format) must be submitted to the approval authority and the Council after:

(a) the site has been periodically inspected and the Certifying Authority is satisfied that the structural works is deemed to comply with the final design drawings; and

(b) the drawings listed on the Inspection Certificate have been checked with those listed on the final Design Certificate/s.

Compliance with Food Code

D21. Prior to the commencement of operation, the Applicant is to obtain a certificate from a suitably qualified tradesperson, certifying that the kitchen, food storage and food preparation areas have been fitted in accordance with the AS 4674 *Design, construction and fit-out of food premises* and provide evidence of receipt of the certificate to the satisfaction of the Certifying Authority.

Stormwater Quality Management Plan

D22. Prior to the commencement of operation, an Operation and Maintenance Plan (OMP) is to be submitted to the satisfaction of the Certifying Authority along with evidence of compliance with the OMP. The OMP must ensure the proposed stormwater quality measures remain effective and contain the following:

(a) maintenance schedule of all stormwater quality treatment devices;

(b) record and reporting details;

(c) relevant contact information; and

(d) Work Health and Safety requirements.

Rainwater Harvesting

D23. Prior to the commencement of operation, signed works-as-executed Rainwater Re-use Plan must be provided to the Planning Secretary and Certifying Authority.

Warm Water Systems and Cooling Systems

D24. The installation of warm water systems and water cooling systems (as defined under the *Public Health Act 2010*) must comply with the *Public Health Act 2010*, Public Health Regulation 2012 and Part 1 (or Part 3 if a Performance-based water cooling system) of *AS/NZS 3666.2:2011 Air handling and water systems of buildings – Microbial control – Operation and maintenance* and the NSW Health Code of Practice for the Control of Legionnaires' Disease.

Outdoor Lighting

D25. Prior to the commencement of operation, the Applicant must submit evidence from a suitably qualified practitioner to the Certifying Authority that demonstrates that installed lighting associated with the development achieves the objective of minimising light spillage to any adjoining or adjacent sensitive receivers and:

(a) complies with the latest version of AS 4282-2019 - *Control of the obtrusive effects of outdoor lighting* (Standards Australia, 1997); and

(b) has been mounted, screened and directed in such a manner that it does not create a nuisance to surrounding properties or the public road network.

Signage

D26. Prior to the commencement of operation, way-finding signage and signage identifying the location of staff car parking must be installed.

D27. Prior to the commencement of operation, bicycle way-finding signage must be installed within the site to direct cyclists from footpaths to designated bicycle parking areas.

D28. Prior to the commencement of operation, 'Do not drink' signage on non-potable water used for toilet flushing and to new hose taps and irrigation systems for landscaped areas must be installed within the site.

D29. Prior to the commencement of operation, the approved illuminated signs must be installed with a timed intensity and illumination adjuster to the satisfaction of the Certifying Authority.

Operational Waste Management Plan

D30. Prior to the commencement of operation, the Applicant must prepare a Waste Management Plan for the development and submit it to the Certifying Authority. The Waste Management Plan must:

(a) detail the type and quantity of waste to be generated during operation of the development;

(b) describe the handling, storage and disposal of all waste streams generated on site, consistent with the *Protection of the Environment Operations Act 1997, Protection of the Environment Operations (Waste) Regulation 2014* and the *Waste Classification Guideline* (Department of Environment, Climate Change and Water, 2009);

(c) detail the materials to be reused or recycled, either on or off site; and

(d) include the Management and Mitigation Measures included in Section 7 of EIS, Section 5 of RtS and Appendix Z.

Landscaping

D31. Prior to the commencement of operation, the Applicant must prepare an Operational Landscape Management Plan to manage the revegetation and landscaping on-site, to the satisfaction of the Certifying Authority. The plan must:

(a) describe the ongoing monitoring and maintenance measures to manage revegetation and landscaping; and

(b) be consistent with the Applicant's Management and Mitigation Measures at Section 7 of EIS and Section 5 of RtS;

D32. The Applicant must not commence operation until the Operational Landscape Management Plan is submitted to the Certifying Authority.

Asset Protection Zones

D33. Asset protection Zones must be provided and maintained in accordance with the 'Bushfire hazard Analysis and Asset protection Zone', Figure 4, prepared by Peterson Bushfire Consulting, dated 1/08/2019. And managed as outlined within appendices 2 and 5 of planning for Bush Fire protection 2006 and the NSW Rural Fire Service's document Standards for asset protection zones.

Traffic and Parking Management Plan

D34. Prior to the commencement of operation, the Applicant must prepare a Traffic and Parking Management Plan to the satisfaction of the Planning Secretary, which details measures to safely manage the daily transport task to/from the school. Traffic management measures that need to be addressed include:

(a) kerbside vehicle pick-up/drop-off management and orderly vehicle queuing;

(b) maintaining bus accessibility and student waiting areas;

(c) safe parent and student behaviour during pick-up/drop-off; and

(d) safe pedestrian movements to the school entrances, minimising vehicle-pedestrian conflicts.

The plan must detail the responsibility of various personnel executing the plan and include measures to monitor, review the performance and make improvements to the plan.

Signage and Linemarking Plan

D35. Prior to the commencement of operation, the Applicant must prepare a detailed signage and linemarking plan to the satisfaction of Certifying Authority of the proposed changes to kerbside parking restrictions to accommodate the various vehicle movements to/from the development within the local road network. The preparation of the plan must be undertaken in consultation with Council.

D36. The detailed signage and linemarking plan must include 'no stopping' signpost along the proposed drop-off/pick-up arrangement.

D37. The approved kerbside parking restrictions must be implemented prior to the commencement of operation.

Road Safety Audit

D38. Prior to the commencement of operation, a Road Safety Audit (RSA) (refer Austroads Guide to Road Safety Part 6 and Part 6a) must be submitted to the satisfaction of the Certifying Authority. The RSA must consider all the proposed measures including any traffic management facilities, bus and private vehicle pick-up and drop-off arrangements, and signage and line-marking plan.

D39. The findings of the RSA must be incorporated into the proposed design in consultation with Council prior to commencement of operation to the satisfaction of the Certifying Authority.

Note: *the audit needs to be undertaken by an independent TfNSW accredited auditor.*

Validation Report

D40. The Applicant must prepare a Validation Report for the development. The Validation Report must:

(a) be prepared by an EPA accredited Site Auditor;

(b) be submitted to EPA, the Planning Secretary and the Certifying Authority for information one month after the completion of remediation works;

(c) be prepared in accordance with the RAP and the *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (OEH, 2011);

(d) include, but not be limited to:

(i) comment on the extent and nature of the remediation undertaken;

(ii) describe the location, nature and extent of any remaining contamination on site;

(iii) sampling and analysis plan and sampling methodology;

(iv) results of sampling of treated material, compared with the treatment criteria;

(v) details of the volume of treated material emplaced within the containment cell and its location;

(vi) results of any validation sampling, compared to relevant guidelines/criteria;

(vii) discussion of the suitability the remediated areas for the intended land use; and

(viii) any other requirement relevant to the project.

Site Audit Report and Site Audit Statement

D41. Prior to occupation of the building, the Applicant must obtain from an EPA accredited Site Auditor, a Site Audit Statement and a Site Audit Report which demonstrates that the site is suitable for its intended use(s).

D42. Within 3 months of submission of the Validation Report required by condition D40, the Applicant must demonstrate to the satisfaction of the Certifying Authority that the Site Auditor has submitted a Site Audit Report and Site Audit Statement to EPA in accordance with the requirements of EPA's *Guidelines for the NSW Site Auditor Scheme* (DEC, 2006).

Vegetation Management Plan

D43. Prior to the commencement of operation, a final Vegetation Management Plan must be prepared for the site and be submitted to the Certifying Authority.

D44. The Vegetation Management Plan must be developed to guide the management of retained native vegetation and adjoining Asset Protection Zones.

PART E POST OCCUPATION

Out of Hours Event Management Plan

E1. Prior to the commencement of the first out of hours events (school use) run by the school that involve 100 or more people, the Applicant is to prepare an Out of Hours Event Management Plan (School Use) and submit it to the Council and Planning Secretary in consultation with Council. The plan must include the following:

(a) the number of attendees, time and duration;

(b) arrival and departure times and modes of transport;

(c) where relevant, a schedule of all annual events;

(d) demonstrate measures to encourage non-vehicular travel to the school and promote and support the use of alternate travel modes (i.e. public transport);

(e) details of the use, where applicable, restricting use before 8am and after 10pm;

(f) measures to minimise localised traffic and parking impacts; and

(g) include measures to minimise CEMP impacts on any sensitive residential receivers, including the preparation of acoustic management plan.

E2. The Out of Hours Event Management Plan must be implemented by the Applicant for the duration of the identified events or use.

E3. Prior to the commencement of out of hours events (community use) run by the external parties that involve 100 or more people, the Applicant is to prepare an Out of Hours Event Management Plan (Community Use) in consultation with Council and submit it to the Council and Planning Secretary. The plan must include the following:

(a) the number of attendees, time and duration;

(b) arrival and departure times and modes of transport;

(c) where relevant, a schedule of all annual events;

(d) demonstrate measures to encourage non-vehicular travel to the school and promote and support the use of alternate travel modes (i.e. public transport);

(e) details of the use, where applicable, restricting use before 8am and after 10pm;

(f) measures to minimise localised traffic and parking impacts; and

(g) include measures to minimise noise impacts on any sensitive residential receivers, including the preparation of acoustic management plan.

E4. The Out of Hours Event Management Plan must be implemented by the Applicant for the duration of the identified community event or use.

Operation of Plant and Equipment

E5. All plant and equipment used on site must be maintained in a proper and efficient condition operated in a proper and efficient manner.

Warm Water Systems and Cooling Systems

E6. The operation and maintenance of warm water systems and water cooling systems (as defined under the Public Health Act 2010) must comply with the Public Health Act 2010, Public Health Regulation 2012 and Part 2 (or Part 3 if a Performance-based water cooling system) of AS/NZS 3666.2:2011 Air handling and water systems of buildings – Microbial control – Operation and maintenance and the NSW Health Code of Practice for the Control of Legionnaires' Disease.

Community Communication Strategy

E7. The Community Communication Strategy, as submitted to the Planning Secretary, must be implemented for a minimum of 12 months following the completion of construction.

Operational Transport and Access Management Plan (OTAMP)

E8. The OTAMP(s) approved under condition D11 (as revised from time to time) must be implemented by the Applicant for the life of the development.

Operational Noise Limits

E9. The Applicant must ensure that noise generated by operation of the development does not exceed the noise limits in Environmental Noise Assessment report (6395-1.1R Rev A) dated 8 November 2018 and prepared by Day Design Pty Ltd.

E10. The Applicant must undertake short term noise monitoring in accordance with the *Noise Policy for Industry* where valid data is collected following the commencement of use of each stage of the development. The monitoring program must be carried out by an appropriately qualified person and a monitoring report must be submitted to the Planning Secretary within two months of commencement use of each stage of the development to verify that operational noise levels do not exceed the recommended noise levels for mechanical plant identified in Environmental Noise Assessment report (6395-1.1R Rev A) dated 8 November 2018 and prepared by Day Design Pty Ltd. Should the noise monitoring program identify any exceedance of the recommended noise levels referred to above, the Applicant is required to implement appropriate noise attenuation measures so that operational noise levels do not exceed the recommended noise levels or provide attenuation measures at the affected noise sensitive receivers.

Unobstructed Driveways and Parking Areas

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.

Green Travel Plan

E12. The Green Travel Plan required by condition D10 of this consent must be updated annually and implemented unless otherwise agreed by the Planning Secretary.

Ecologically Sustainable Development

E13. Unless otherwise agreed by the Planning Secretary, within six months of commencement of operation, Green Star certification must be obtained demonstrating the development achieves a minimum 4 star Green Star Design & As Built rating. If required to be obtained, evidence of the certification must be provided to the Certifying Authority and the Planning Secretary. If an alternative certification process has been agreed to by the Planning Secretary under Condition B9, evidence of compliance of implementation must be provided to the Planning Secretary and Certifying Authority.

Outdoor Lighting

E14. Notwithstanding Condition D25, should outdoor lighting result in any residual impacts on the amenity of surrounding sensitive receivers, the Applicant must provide mitigation measures in consultation with affected landowners to reduce the impacts to an acceptable level.

Landscaping

E15. The Applicant must maintain the landscaping and vegetation on the site in accordance with the approved Landscape Management Plan required by condition D31 for the duration of occupation of the development.

Asset Protection Zones

E16. The asset protection zones required by condition D33 shall be maintained for the duration of occupation of the development.

Signage

E17. Signage approved for illumination under this consent must not be illuminated between the hours of 10pm and 7am seven days per week.

APPENDIX 1 ADVISORY NOTES

General

AN1. All licences, permits, approvals and consents as required by law must be obtained and maintained as required for the development. No condition of this consent removes any obligation to obtain, renew or comply with such licences, permits, approvals and consents.

Long Service Levy

AN2. For work costing $25,000 or more, a Long Service Levy must be paid. For further information please contact the Long Service Payments Corporation Helpline on 131 441.

Legal Notices

AN3. Any advice or notice to the consent authority must be served on the Planning Secretary.

Access for People with Disabilities

AN4. The works that are the subject of this application must be designed and constructed to provide access and facilities for people with a disability in accordance with the BCA. Prior to the commencement of construction, the Certifying Authority must ensure that evidence of compliance with this condition from an appropriately qualified person is provided and that the requirements are referenced on any certified plans.

AN5. Water, electricity and gas are to comply with sections 4.1.3 and 4.2.7 of Planning for Bush Fire Protection 2006.

Utilities and Services

AN6. Prior to the construction of any utility works associated with the development, the Applicant must obtain relevant approvals from service providers.

AN7. Prior to the commencement of above ground works written advice must be obtained from the electricity supply authority, an approved telecommunications carrier and an approved gas carrier (where relevant) stating that satisfactory arrangements have been made to ensure provisions of adequate services.

Road Design and Traffic Facilities

AN8. All roads and traffic facilities must be designed to meet the requirements of Council or TfNSW(RMS) (whichever is applicable). The necessary permits and approvals from the relevant road authority must be obtained prior to the commencement of road or pavement construction works.

Road Occupancy Licence

AN9. A Road Occupancy Licence must be obtained from the relevant road authority for any works that impact on traffic flows during construction activities.

SafeWork Requirements

AN10. To protect the safety of work personnel and the public, the work site must be adequately secured to prevent access by unauthorised personnel, and work must be conducted at all times in accordance with relevant SafeWork requirements.

Hoarding Requirements

AN11. The Applicant must submit a hoarding application to Council for the installation of any hoardings over Council footways or road reserve.

Handling of Asbestos

AN12. The Applicant must consult with SafeWork NSW concerning the handling of any asbestos waste that may be encountered during construction. The requirements of the Protection of the Environment Operations (Waste) Regulation 2014 with particular reference to Part 7 – 'Transportation and management of asbestos waste' must also be complied with.

Speed limit authorisation

AN13. At least eight weeks prior to the commencement of operation, the Applicant must submit the following details to TfNSW(RMS) and obtain authorisation to install School Zone signs and associated pavement markings, and / or removal / relocation of any existing Speed Limit signs:

(a) a copy of the Conditions of Consent;

(b) the proposed school commencement/opening date;

(c) two sets of detailed design plans showing the following:

(i) accurate Site boundaries;

(ii) details of all road reserves, adjacent to the Site boundaries;

(iii) all proposed access points from the Site to the public road network and any additional conditions imposed/proposed on their use;

(iv) all existing and proposed pedestrian crossing facilities on the adjacent road network;

(v) all existing and proposed traffic control devices and pavement markings on the adjacent road network (including School Zone signs and pavement markings); and

(vi) all existing and proposed street furniture and street trees.

Fire Safety Certificate

AN14. The owner must submit to Council an Annual Fire Safety Statement, each 12 months after the final Safety Certificate is issued. The certificate must be on, or to the effect of, Council's Fire Safety Statement.

APPENDIX 2 WRITTEN INCIDENT NOTIFICATION AND REPORTING REQUIREMENTS

Written Incident Notification Requirements

1. A written incident notification addressing the requirements set out below must be emailed to the Planning Secretary at the following address: compliance@planning.nsw.gov.au within seven days after the Applicant becomes aware of an incident. Notification is required to be given under this condition even if the Applicant fails to give the notification required under condition A23 or, having given such notification, subsequently forms the view that an incident has not occurred.
2. Written notification of an incident must:
   a. identify the development and application number;
   b. provide details of the incident (date, time, location, a brief description of what occurred and why it is classified as an incident);
   c. identify how the incident was detected;
   d. identify when the applicant became aware of the incident;
   e. identify any actual or potential non-compliance with conditions of consent;
   f. describe what immediate steps were taken in relation to the incident;
   g. identify further action(s) that will be taken in relation to the incident; and
   h. identify a project contact for further communication regarding the incident.
3. Within 30 days of the date on which the incident occurred or as otherwise agreed to by the Planning Secretary, the Applicant must provide the Planning Secretary and any relevant public authorities (as determined by the Planning Secretary) with a detailed report on the incident addressing all requirements below, and such further reports as may be requested.
4. The Incident Report must include:
   a. a summary of the incident;
   b. outcomes of an incident investigation, including identification of the cause of the incident;
   c. details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence; and
   d. details of any communication with other stakeholders regarding the incident.

APPENDIX C – ENVIRONMENTAL WORK METHOD STATEMENTS

EWSM- 1 EROSION AND SEDIMENT CONTROL (STORMWATER MANAGEMENT)

Hierarchy of Control (HOC): 1. Eliminate 2. Substitute 3. Isolate 4. Engineer 5. Admin 6. PPE

Environmental Aspects	Impacts	HOC	Controls / Work Methods	Responsible Person/s for Monitor & Review
Prior to site establishment, check for approved Erosion and Sediment Control (ESC) plan	Risk of environmental harm from sediment and sediment-laden water displaced from the site.	5	• Prior to commencement of works, a visual and desktop assessment of the site will be done to identify potential contamination. • The plan was developed by a suitably qualified person contracted by Hutchinson Builders and is in accordance with International Erosion Control Association Best Practice Guidelines 2008 • No clearing or soil disturbance is undertaken unless preceded or accompanied by installation of adequate drainage and sediment control measures.	Project Manager/ Environmental Consultant
	Erosion and sediment control plan does not work effectively	5	• Adjust to changing site conditions • Erosion and Sediment Control Plans are living documents that can and should be modified as site conditions change, or if the adopted measures fail to achieve the required treatment standard.	Project Manager Site Manager
Planning works	Mass soil loss during significant rain events	5	• Minimise the extent and duration of soil disturbance • Clearing work should be staged to minimise the duration for which soils are exposed to wind, rain and concentrated runoff. • In the northern (tropical) regions of Australia, the primary focus is on effective drainage control. Without effective drainage control, all erosion and sediment controls can be washed away! • In the southern (temperate) regions, the focus moves to erosion control, or possible sediment controls.	Project Manager Site Manager
	Excess sediment run-off site	5	• A sediment basin will usually be required if a disturbed area exceeds 2500m^2	Project Manager Consultant
	Sediment escape from entry point	5	• Site office and car parking areas identified and provided with adequate drainage, erosion and sediment controls. • Site access points limited to the minimum necessary, clearly identified on plans, and appropriate controls specified.	Site Manager
Monitoring weather	Unexpected weather event can effect construction activities	5	• Daily check and record weather event to avoid unexpected significant weather events (>25mm/ 24hours) • Ensure earthworks and grading activities are avoided during those periods of rainfall when stormwater runoff is either occurring or expected to occur	Site Manager

Hierarchy of Control (HOC): 1. Eliminate 2. Substitute 3. Isolate 4. Engineer 5. Admin 6. PPE

	Sediment controls are not in good order and working effectively	5	• All erosion and sediment control measures should be inspected: – At least daily when rain is occurring; – At least weekly (even if work is not occurring on-site) – Within 24 hours prior to expected rainfall; and – Within 18 hours of a rainfall event of sufficient intensity and duration to cause on-site runoff	
Control water movement through the site	Mass soil loss and significant sediment runoff site	5	• Divert clean stormwater (upslope water) runoff outside the site so that it does not flow through the site • Sediment traps must be installed and operated to both collect and retain sediment. • All erosion and sediment control measures, including drainage control measures, must be maintained in proper working order at all times during their operational lives.	Site Manager HSE Advisor
Material Stockpiles	Contaminated topsoil	5	• Topsoil stockpile needs to be separated to other materials and located at the undisturbed area • Topsoil is stockpiled at maximum 2m height • Long term spoil stockpiles (> 28 days) to be covered or stabilised.	Site Manager
	Cross-contaminated with topsoil Excess sediment runoff	5	• Sufficient land area must be provided for the short-term stockpiling of construction materials. • Ensure excavated material is not placed adjacent to protect vegetation, stream banks, or within locations where it may become an unacceptable source of sediment runoff. • These stockpiles should ideally be located within areas that would eventually need to be disturbed anyway. • Material stockpiles should be located away from overland flow paths and concentrated overland flow • Stockpiles of erodible materials (e.g. earth and sand) need to be located within the site's sediment control zone.	Site Manager
Stormwater kerb inlets in active construction areas as well as the basement level receiving deliveries areas are to be protected	Sediment socks fall into kerb inlet	5	• Daily check on sediment controls on council kerb inlets	Hutchinson Builders Foreman/ HSE Advisor
	Sediment deposition within creeks and wetlands can cause long-term changes to aquatic ecosystems and plant species (e.g. through weed infestation).	5	• Ensure all the sediment controls are installed as approved Erosion and Sediment Control plan and in good order	Hutchinson Builders Foreman Workers

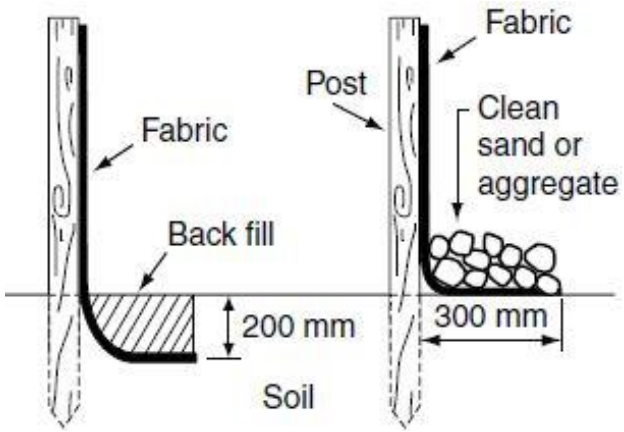
Hierarchy of Control (HOC): 1. Eliminate 2. Substitute 3. Isolate 4. Engineer 5. Admin 6. PPE

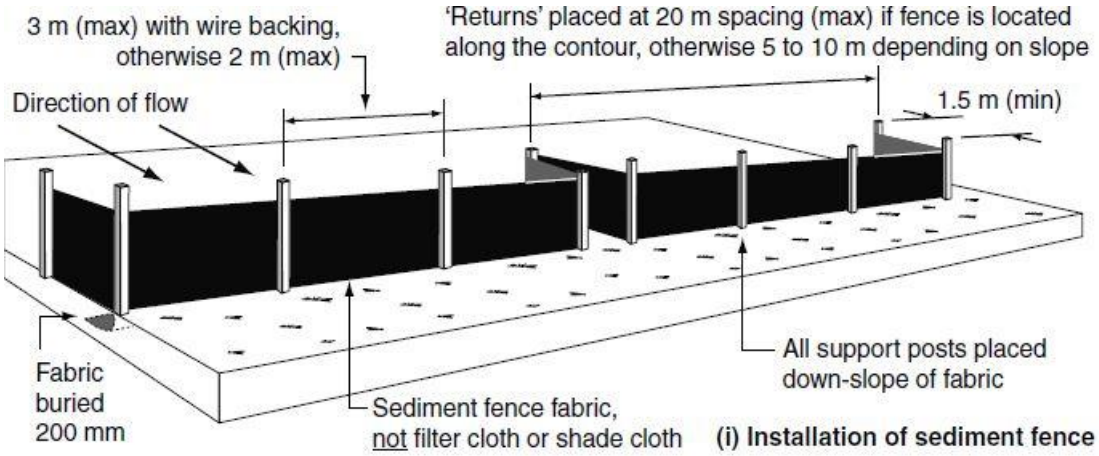
Work platforms connected to the stormwater system shall be maintained in good order and cleaned frequently of sediment/debris which may enter the system	Concentrated flow might cause erosion	5	• Roof water downpipes (temporary or permanent) should be connected to the stormwater drainage system immediately after the roof is laid.	Hutchinson Builders Foreman Workers
	Inappropriate and ineffective sediment control measures	5	• Sediment control devices must be de-silted and made fully operational as soon as reasonable and practicable after a sediment-producing event, whether natural or artificial, if the device's sediment retention capacity falls below 75% of its design retention capacity.	Hutchinson Builders Foreman Workers
	Inappropriate and ineffective sediment fence	5	• Sediment fence is buried in 200mm deep. Along the lower side of the trench, appropriately secure the stakes into the ground spaced no greater than 3m if supported by a top support wire or weir mesh backing, otherwise no greater than 2m • In areas where it is impractical to bury the lower edge of the sediment fence, the lower 200 mm (min) portion of the fabric should be placed on the ground up-slope of the fence and buried under a 100 mm (min) layer of coarse aggregate (20-40 mm) • Sediment fences should be located down-slope of the disturbance, and ideally along a line of constant land level to prevent the concentration of stormwater run-off. Where this cannot be achieved then sections of the sediment fence should have ‘returns’ directed up slope for 1-2 metres to control the concentration of stormwater run-off • Replace sediment fences if the fabric is ripped or otherwise damaged. The maintenance of sediment fences includes the removal of sediment deposited up-slope of the fence and, where necessary, re-trenching the fabric and ensuring posts are firmly secured in the ground • If excessive sediment build-up occurs, reapply crushed rock to the entry/exit pad. • Daily check on sediment fence	Hutchinson Builders Foreman Workers HSE Advisor
Trenching	Sediment-laden water ponding on site	5	• No more than 150m of a stormwater, sewer line or other service trench must to be open at any one time. • Where it is practical, trench needs to be backfilled when the significant event is forecasted	Site Manager

Hierarchy of Control (HOC): 1. Eliminate 2. Substitute 3. Isolate 4. Engineer 5. Admin 6. PPE

Maintain site entry point	Illegally discharge sediment to stormwater drainage	5	• Washing/flushing of sealed roadways must only occur where sweeping has failed to remove sufficient sediment and there is a compelling need to remove the remaining sediment (e.g. for safety reasons). In such circumstances, all reasonable and practicable sediment control measures must be used to prevent, or at least minimise, the release of sediment into receiving waters. Only those measures that will not cause safety and property flooding issues shall be employed. Sediment removed from roadways must be disposed of in a lawful manner that does not cause ongoing soil erosion or environmental harm	Site Manager
Discharge water after the rain event	Unauthorised sediment-laden water discharge resulting in impact to waterways and possible prosecution	5	• Stop all pumping in the vicinity and notify your supervisor • Contain discharge where possible • Only discharge if water has been tested and passed the criteria or it must be treated. **All water to be passed through Walan Siltbuster located in Building A excavation.**	Site Manager
	Water quality does not meet discharge criteria	5	• All water quality data, including dates of rainfall, dates of testing, testing results and dates of water release, must be kept in an on-site register. The register is to be maintained up to date for the duration of the approved works and be available on-site for inspection by company environmental representative or regulator on request. – pH is within 6.5-8.5 – Turbidity is <75NTU or TSS <50mg/L • Treat water with flocculating agents (e.g. Aluminium Sulfate, or Gypsum. Note that Aluminium Sulfate will greatly decrease pH level in the water. It must be used in the conjunction with Hydrated Lime to balance out the pH)	HSE Advisor
Maintain sediment basin/tank (if applicable)	Erosion and sediment control measures are not in good order and not ready for the significant rain events	5	• Clean out accumulated sediment when it reaches the marker board/post, and restore the original storage volume.	Site Manager
Rehabilitation	Environmental harm caused by erosion and soil loss	5	• Exposed soil surfaces need to be stabilised as soon as practicable to prevent, or at least minimise potential environmental harm. Once stabilised, these areas need to be revegetated or otherwise rehabilitated to ensure appropriate long-term erosion control.	Site Manager

Example of Erosion and Sediment Control Measures





Correct Sediment Fence Installation

Sediment released from stormwater pipe

Normal stormwater run-off

Contaminated stormwater run-off from construction site

Example of Erosion and Sediment Control Measures

Muddy site access track

Sediment Deposition on roadway

Site entry point not stabilised

Sediment fence requires maintenance

Sediment fence over flow

Inappropriate sediment control measure

Example of Erosion and Sediment Control Measures

Missing common sense here

Good set up. Require clean-up to work efficiently

Sand bags need to be replaced

Developed / approved and communicated to all relevant workers on site by:		
Name:	**Position:**	**Date:**
	Site Manager/ Foreman	
	Workers Representative	

EWSM- 2 WASTE MANAGEMENT

Hierarchy of Control (HOC): 1. Eliminate 2. Substitute 3. Isolate 4. Engineer 5. Admin 6. PPE

Environmental Aspects	Impacts	HOC	Controls / Work Methods	Responsible Person/s for Monitor & Review
Prior to site establishment	Unexpected cost for waste disposal	5	• Waste streams: identify which waste streams are likely to be generated and estimate the approximate amounts of material • Possible contamination by hazardous materials like asbestos or lead: these materials will limit reuse /recycling options and require special disposal • Focus on waste avoidance: instead of managing the waste once it has been generated, look at ways to avoid the generation of that waste in the first place • Services: select an appropriately qualified waste management contractor who will provide services for the waste streams generated and data on waste/recycling generation; • Check if washout bay (i.e. concrete, paint, plaster) is permitted on site. Where work site is close to natural watercourse, washout bay is unlikely acceptable. • Check if work site is on Fire Ant Restricted Areas • Check if work site is on Acid Sulfate Risk Areas • No burning off waste is permitted	Project Manager
Site establishment and management	Unsustainable practice Potential cause of pest outbreaks	5	• Where practical, waste should be segregated into recycling materials (steel, cardboards, timber, construction materials) • Bins must be clearly and correctly labelled • Vermin must be prevented from entering waste areas and containers. • Site will be maintained in a tidy state free of litter and rubbish	Project Manager Site Manager HSE Advisor
Site establishment	Inadequate liquid waste storage and contained causing significant environmental harm	1 5	• Liquid waste (effluent) will be stored in appropriate containers in bunded areas (or an equivalent purpose-built bunding device) until transported off-site. • Roof water is not connected to the effluent tank • The capacity of the spillage containment compound shall be at least 100% of the volume of the largest package plus 25% of the storage capacity up to 10,000 L, together with 10% of the storage capacity between 10,000 L and 100,000 L, and 5% above 100,000 L	Project Manager Site Manager

Hierarchy of Control (HOC): 1. Eliminate 2. Substitute 3. Isolate 4. Engineer 5. Admin 6. PPE

Environmental Aspects	Impacts	HOC	Controls / Work Methods	Responsible Person/s for Monitor & Review
			(AS1940:2004)	
Managing amenities	Potential of effluent spillage causing significant environmental harm	1 5	• Adequate amenity is provided • Sewage generated from site amenities to discharge direct to existing sewer main/ sewage tank. • Inspect effluent tank capacity or connection from toilet blocks to sewer main weekly or more regular if number of workers increase on-site	Site Manager HSE Advisor
	Potential of effluent spillage from portable toilets	1 5	• Maintain all portable toilets in good condition to prevent leaks or spills. • Damaged toilets must be repaired/ replaced immediately. • Portable toilets should be located away from high-traffic vehicular areas. • Portable toilets must not be located on top of stormwater drain inlets or on a street. • Portable toilets shall be placed on a level ground surface that provides unobstructed access to users and servicing pump trucks. • Portable toilets should wherever possible be located upon natural ground and not on or within 5 meters of a paved surface such as asphalt, concrete or similar. • If portable toilets must be placed on a paved surface exposed to rainwater or stormwater runoff, extra care must be taken during servicing to ensure any waste water spilled onto the paved surface is rinsed and adequately collected so as not to leave any residue. A wet shop vacuum or similar would provide for adequate collection. • As a minimum, portable toilets should not be located within 100 metres from any river, creek, channel (which can include a drain, gutter or pipe) or other watercourse (whether modified or not).	Site Manager HSE Advisor
Managing paint and plaster disposal	Chemicals like solvents, oils, paints, disinfectants, pesticides, household cleaning products and bleaches can kill the helpful bacteria in your septic system. This may 'kill' the system and stop it digesting effluent.	5 1	• Washout for paint and plaster will be separated from concrete wash bay or sediment water pit • Washout for paint and plaster will not be connected to sewage tank • No paint, and plaster residue wash down to stormwater drainage	Site Manager HSE Advisor

Hierarchy of Control (HOC): 1. Eliminate 2. Substitute 3. Isolate 4. Engineer 5. Admin 6. PPE

Environmental Aspects	Impacts	HOC	Controls / Work Methods	Responsible Person/s for Monitor & Review
Managing excess concrete & concrete wash water	Water that comes into contact with cement, uncured concrete, concrete dust, etc, quickly produces a strong alkaline solution that causes chemical burns to fish, insects and plants. If even a small volume of concrete wastewater is allowed to enter streams, lakes, wetlands or harbours through the stormwater system, it can cause immense damage to the environment.	5 1	• Excess concrete is dumped on an impervious surface (i.e. black plastic) and allowed to harden. Unused wet concrete should not be dumped on bare ground to harden because this can contribute to ground water and surface water contamination. • Only wash concrete, concrete tools, mixers, and wheelbarrows at designated location (concrete wash bay/ bunded area) • Concrete washout areas are to collect and retain all the concrete washout water and solids in leak proof containers/ bunded area, • Check concrete washout facilities daily to determine if they have been filled to 75% capacity, which is when materials need to be removed. • Spilt or surplus mortar or blockfill should be allowed to harden and removed from site as hardfill.	Site Manager HSE Advisor
	If the wash water is dumped on the ground it can run off site to adjoining roads and enter roadside storm drains, which discharge to surface waters such as rivers, lakes, or estuaries. Rainwater polluted with concrete wash water can percolate down through the soil and alter the soil chemistry, inhibit plant growth, and contaminate the groundwater. Its high pH can increase the toxicity of other substances in the surface waters and soils.		• Do not dilute the runoff and dispose of it to the stormwater system • DO NOT USE SEDIMENT FENCE AS BUNDING MATERIALS AROUND THE CONCRETE WASH AREA • Lay portable bund beneath concrete pump to collect concrete runoff water.	Site Manager HSE Advisor
Managing Acid Sulfate Soil	Contaminate stockpile and stormwater runoff	5 1	• See EWMS-5: Acid Sulfate Soil Management for details	Site Manager HSE Advisor
Manage and Record Waste transaction	Misleading documents to the department and for transporting a regulated waste	5 1	• All waste and recyclables shall be disposed of by a licensed contractor. • Complete **Waste Tracking Certificate** for TRACKABLE WASTE only: – Hutchinson Builders must give TRACKABLE WASTE (regulated waste) (e.g. Asbestos, Effluent, contaminated soil) to authorised	Site Manager HSE Advisor

Hierarchy of Control (HOC): 1. Eliminate 2. Substitute 3. Isolate 4. Engineer 5. Admin 6. PPE

Environmental Aspects	Impacts	HOC	Controls / Work Methods	Responsible Person/s for Monitor & Review
			waste transporters – Check the waste category to ensure all the waste trackable type is recorded – Record the prescribed information about the waste – Give the prescribed information to the waste transporter. – Give the prescribed information to the department *[within seven days (pink copy of the WTC with parts 1 and 2 completed)]* • Keep records of the waste transaction for five years	

Example of Concrete Wash Areas		
		Concrete washout pit with plastic liner
		The vinyl washout container is portable, reusable, and easier to install than a washout pit
		Metal washout container has ramp that allows concrete pump trucks to wash out their hoppers. **Utilise your skip bin with black plastic liner to ensure no leakage**

Example of Waste Management

Cement wash flowing to kerb

Cement wash-off from concreting works

Cement wash-off flowing to kerb

Insufficient concrete wash bay
Concrete residue is not retained within bunded area

Sufficient Concrete wash bay

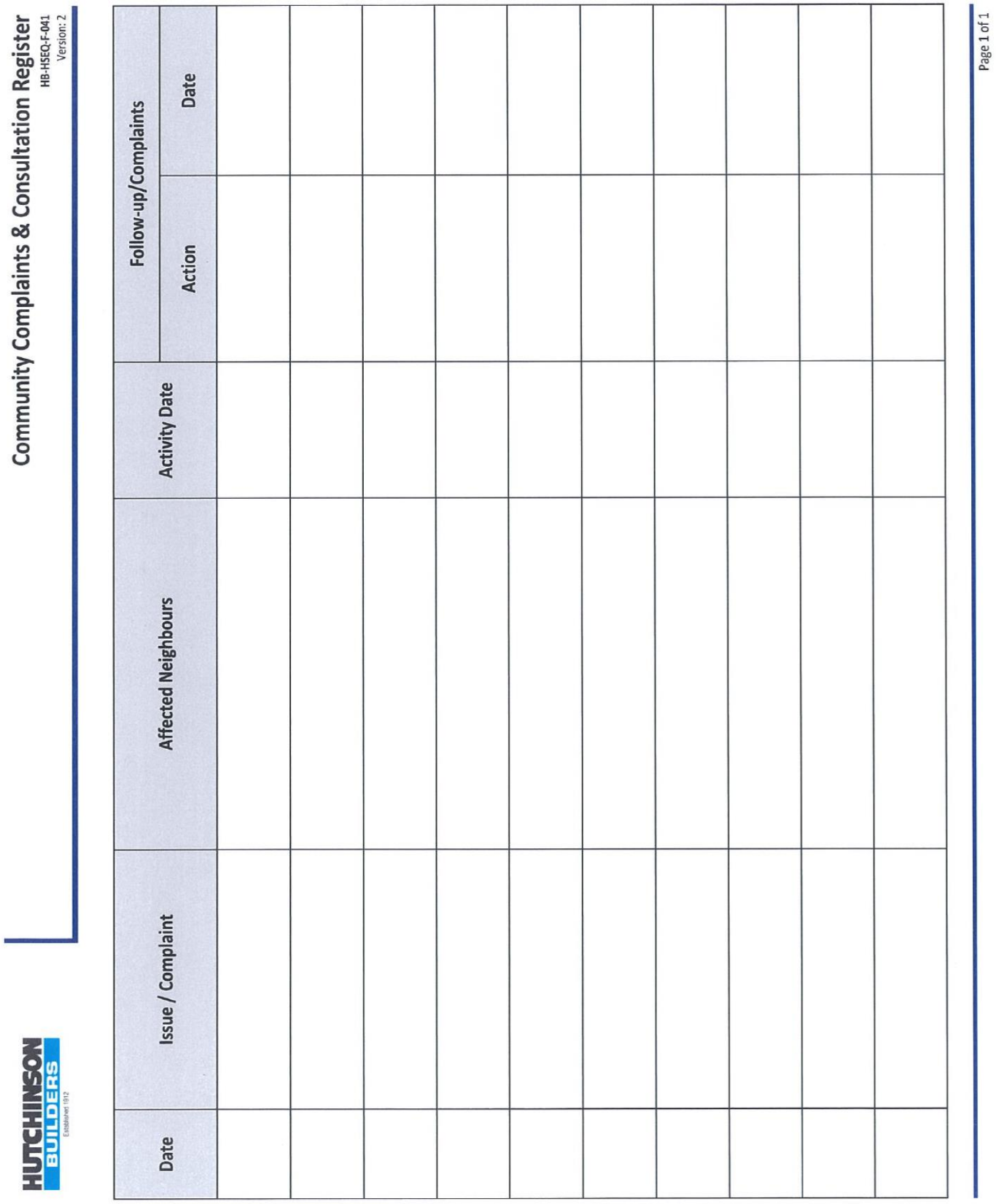
Bin is clearly labelled

Wash water being dumped on the ground

The red arrow points to a ready mixed truck chute that's being washed out into a roll-off bin, which isn't watertight. Leaking wash water, shown in the foreground, will likely follow similar paths to nearby surface waters.

Developed / approved and communicated to all relevant workers on site by:		
Name:	**Position:**	**Date:**
	Site Manager/ Foreman	
	Workers Representative	

APPENDIX D – COMMUNITY COMPLAINTS & CONSULTATION REGISTER



Community Complaints & Consultation Register
HB-HSEQ-F-041 Version: 2

HUTCHINSON BUILDERS Established 1912

Date	Issue / Complaint	Affected Neighbours	Activity Date	Follow-up/Complaints	
				Action	Date

Page 1 of 1

APPENDIX E – ENVIRONMENTAL MONITORING REPORTS/ EVIDENCE

HUTCHINSON BUILDERS
Established 1912

Register of Environmental Monitoring

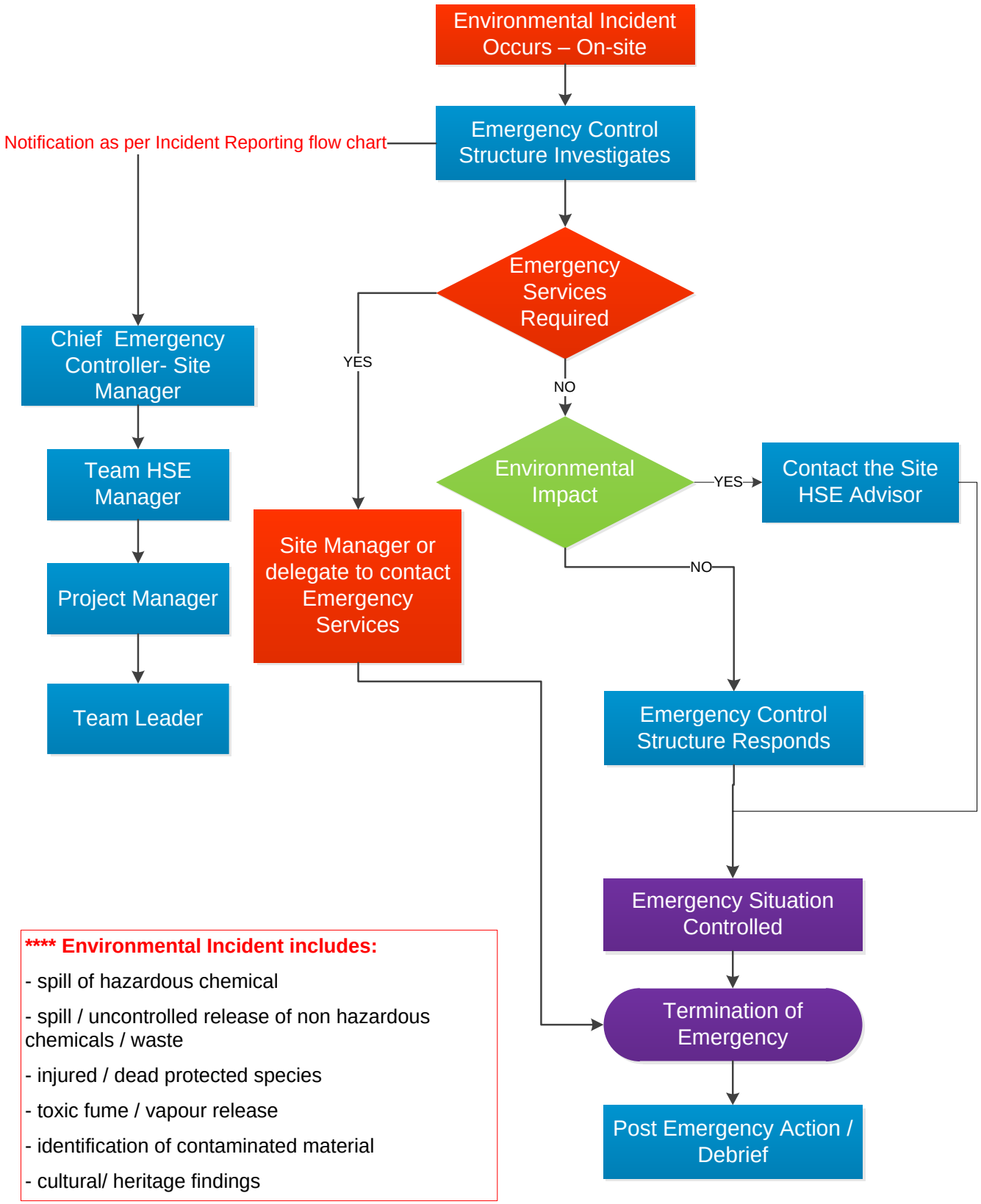
HB-HSEQ-F-042
Version: 9

Test Performed: _____

Date	Name of contractor performing tests	Report #	Outcome	Follow-up/Corrective Action		
				Action	Initial	Close out date

Page 1 of 1

APPENDIX F – EMERGENCY RESPONSE PROCEDURE (ENVIRONMENTAL)



****** Environmental Incident includes:**

- spill of hazardous chemical
- spill / uncontrolled release of non hazardous chemicals / waste
- injured / dead protected species
- toxic fume / vapour release
- identification of contaminated material
- cultural/ heritage findings

APPENDIX G – CONSTRUCTION TRAFFIC AND PEDESTRIAN MANAGEMENT SUB PLAN

As per Condition B13 (b)

TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994

Suite 502, Level 5, 282 Victoria Avenue
Chatswood NSW 2067
T (02) 9411 5660 | F (02) 9904 6822
E info@ttpa.com.au | ttpa.com.au

Samuel Gilbert Public School
20 Gilbert Road, Castle Hill
Proposed Alterations and Additions
Construction Pedestrian and Traffic Management Plan

Ref: 280/2019
Date: March 2021
Issue: I

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Appendix E Traffic Guidance Scheme
Appendix F Consultation with Council and TfNSW

1.0 Introduction

A Development Application (SSD 9274) has been approved by Minister for Planning and Public Spaces for the redevelopment of Samuel Gilbert Public School comprising of the demolition of existing classroom spaces, removal/relocation of demountable teaching spaces and removal of trees to construct a three-storey building and new school hall along Ridgecrop Drive, alterations and additions to the existing administration building and library building, refurbishment of two toilet blocks and associated works. The site is located on the corner of Gilbert Road and Ridgecrop Drive at 20 Gilbert Road, Castle Hill (Figure 1).

The proposed development involves alterations and additions to accommodate an increase in school population from 780 to 1,000 students between K – Year 6.

This report has been prepared in satisfaction of Consent Conditions № B14 for submission of a Construction Pedestrian and Traffic Management Sub-Plan as part of the Construction Certificate documentation for the proposed development as follows:

B14. The Construction Traffic and Pedestrian Management Sub-Plan (CTPMSP) must address, but not be limited to, the following:

(a) be prepared by a suitably qualified and experienced person(s);
(b) be prepared in consultation with Council and TfNSW;
(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) include a Driver Code of Conduct to:

> *(i) minimise the impacts of earthworks and construction on the local and regional road network;*
> *(ii) minimise conflicts with other road users;*

(iii) minimise road traffic noise; and

(iv) ensure truck drivers use specified routes;

(f) include a program to monitor the effectiveness of these measures; and

(g) if necessary, detail procedures for notifying residents and the community (including local schools), of any potential disruptions to routes.

All the contractors associated with this project will adhere to what is outlined in the CTMP. This will ensure that they will:

- not add excessively to the traffic congestion during peak hours and School's pick up and drop off times

- not have large truck deliveries or trucks laying over nearby on Gilbert Road and Ridgecrop Drive to wait for access to the site at these times

This CTMP has been prepared by an engineer who holds the Roads and Maritime Services Prepare a Work Zone Traffic Management Plan accreditation, detailed as follows:

Lachlan Ellson
Certificate No: 0052125163
Expiry Date: 28/08/2022

The CTMP has also been reviewed and checked by a suitably qualified and experienced civil (traffic) engineer, Meg Kong, with 13 years of professional experience. Meg has completed CTMP for more than 200 sites in Sydney including the Hills Shire Council area. See CV overleaf.

Established 1994 ttpa
TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Suite 502, Level 5, 282 Victoria Avenue, Chatswood NSW 2067
P (02) 9411 5660 **F** (02) 9904 6622 **W** ttpa.com.au **E** ross@ttpa.com.au

Meg Kong (Associate)

Meg is a civil engineer with higher academic credentials in transport planning, traffic engineering, transport economic, and transportation design. She has a combined 15 years of rich research and practical experience in the field of transport planning and traffic engineering in Australia, United States, Singapore and Malaysia. Meg has been involved in various traffic impact assessment, transport master planning studies, road feasibility studies, comprehensive urban and regional transportation studies, and traffic management plans. She has gained an insight into actual handling of tasks in various projects of varying scope and dimensions for both local and international clients in both the private and public sectors.

AITPM 99993784; EA ID: 7489101

Key Skill Areas

- Masterplanning
- Intersection Analysis
- Traffic Impact Assessments
- Parking Studies
- Construction traffic management plans
- Car park and bicycle parking design and certification
- Swept path assessment
- Driveway design and assessment
- Signage and line-marking plan
- Road safety assessment
- Compliance assessments
- Loading Dock Management Plan
- Green/Work Travel Plan
- Traffic control signal design (TCS)
- Car park operations review
- Car park upgrades
- Road network modelling
- Road Occupancy Licence (ROL)

Professional Experience

2016 - current	**Transport and Traffic Planning Associates** **Associate**	**Sydney**
2015 - 2016	**GTA Consultants** **Associate**	**Sydney**
2013 - 2015	**Gamuda Engineering** **Transport Planning Manager**	**Malaysia**
2013 - 2015	**Jacobs** **Senior Transport Planner**	**Malaysia**
2010 - 2013	**Atur Trafik** **Office Manager/Senior Consultant**	**Malaysia**
2009 – 2010	**Y&C Transportation Consultant** **Transport Engineer 3**	**USA**
2007 - 2008	**Kimley-Horn & Associates** **Transport and Traffic Analyst**	**USA**

Education Establishment Experience

- Killara High School
- Killara High School
- Lycée Condorcet the International French School of Sydney
- Samuel Gilbert Public School
- Medowie Christian School
- Monaro High School, Cooma
- Brookvale Public School
- Darcy Road Public School
- Kent Road Public School
- LaSalle College, Bankstown
- Al-Faisal College, Minto
- Australian Christian College, Riverstone
- 2 Percy Street, Auburn

Relevant Experience

- 24-26 Mile End Road, Rouse Hill
- 10-12 Lexington Drive, Bella Vista
- 47 Spurway Dr, Baulkham Hills - Phase 2
- 47 Spurway Drive, Baulkham Hills - Phase 1
- 47 Spurway Drive, Baulkham Hills - Phase 3
- 5-9 Castlefield Street, Bondi
- 87-99 Oxford Street, Bondi Junction
- 9-11 Bondi Road, Bondi
- 246-248 Campbell Parade, Bondi Beach
- 1a Epping Road, Lane Cove
- 1b Bridge Street, Lane Cove
- 23 Mindarie Street & 614-616 Mowbray Road, Lane Cove North
- 608 - 612 Mowbray Road, Lane Cove Nth
- 47 & 59 Mindarie Street, Lane Cove Nth
- 10-14 Gordon Street, Blacktown - Design
- 106-108 Liverpool Road, Ashfield
- 108-120 Station Street, Wentworthville
- 114-120 Old Pittwater Road, Brookvale
- 12 Primrose Avenue, Rosebery - Certification
- 12-14 Birnie Avenue (Carter Street Precinct), Lidcombe
- 12-22 And 24 Rothschild Avenue, Rosebery
- 12-22 Langston Place, Epping
- 13 Digitaria Drive, Gledswood Hills
- 1-3 Harrow Road, Bexley
- 137-139 Fairfield Street, Yennora-s96
- 6-8 Durbar Avenue Kirrawee
- 707-711 Elizabeth Street, Waterloo
- 71 Macquarie Street, Sydney
- 71 Raven Street, Kooragang
- 78 March Street, Richmond - Richmond Marketplace
- 79-81 Midson Road, Epping
- 82 Waterloo Road, Macquarie Park
- 822+828 Windsor Road, Rouse Hill
- 843 New Canterbury Road, Dulwich Hill
- 88 Walker Street, North Sydney
- 99 Hollinsworth Road, Marsden Park - S96
- Ambulance Stn Reviews - Bathurst, Cowra, Grenfels
- Anglicare, Bullecourt Avenue Milperra
- Aquatic Drive, Frenchs Forest - Additional Works
- Blacktown Hospital - Stage 2 Car Park
- Blue Mountains Rail Line Upgrade
- Burwood Uniting Church
- Carpet Court, Street George Priv.hosp.
- Central Park - Coach Access
- Central Park - Coach Access Design
- Central Park Tis - Bicycle Parking
- City West Link Lilyfield Outbound Rd Safety Check
- Coulson Street, Erskineville
- Edgecliff Commercial Centre Study
- Edmondson Park Frasers Town Tia Review
- Eve 2 And 3 Ctmp, Coulson Street, Erskineville
- Green Square Aquatic Centre - Cpb Construction
- Home Hq Artarmon Da
- Hume Highway, Bowning – Service Centre
- Hume Street Park Expansion, Crows Nest
- Kendall Bay Sediment Remediation Tia Update
- Kent Road, Public School
- Liverpool Plaza Additional Advice
- Lot 303 Diamond Drive, Thurgoona - Service Station
- Lot 303 Diamond Drive, Thurgoona - Service Station - Additional Tasks
- M4 Homebush And Victoria Rd West Ryde Road Safety Checks
- M5 Riverwood And Moorebank Post-installation Road Safety Checks

- 14-20 Connell Street, Towrsdgi
- 148-160 King Street, Sydney Cptmp Updates
- 15 Cross Street, Guildford
- 1-7 Crandon Road, Epping
- 17 Milson Road, Cremorne Point
- 170 South Terrace, Bankstown
- 18-20 Irving Street, Parramatta
- 1840 The Northern Road, Orchard Hills
- 187 Military Road, Guildford
- 1901 Botany Road, Matraville - Consultation
- 194-214 Oxford Street, Bondi Junction
- 199 George Street, Sydney Local Access Plan
- 199 Metford Road, Metford
- 1a - 17 Bowen Street, Chatswood
- 1a Coulson Street, Erskineville Design Review
- 2 Gatwood Close, Padstow
- 2 Gordon St+6rowley Street, Burwood
- 2 Mitchell Road, Alexandria - Cc
- 2 Percy Street, Auburn
- 20 Loombah Road, Dover Heights
- 204-208 Goulburn Street, Crookwell-service Station
- 206d & 208 Victoria Road, Bellevue Hill
- 21 Belgrave Street, Manly S96
- 2-10 Milner Street, Artarmon
- 22 Birdwood Avenue, Lane Cove Ctmp
- 22 Stuart Avenue Manly
- 2-22 Birdwood Ave & 11-15 Finlayson Street - S96
- 2-22 Birdwood Avenue, Lane Cove - Design Review
- 226 Mayne Street, Murrurundi
- 226 Mayne Street, Murrurundi - Consultation
- 23 Bennelong Parkway, Wentworth Point
- 232 New Line Road, Dural
- 238-240 Glenmore Road, Paddington
- 25 Illoura Avenue Wahroonga
- 2-6 Mentmore Avenue 2&2a Rothschild Ave - Rosebery
- 260 Liverpool Road, Ashfield Mall
- 275 George Street, Sydney Ctmp
- 280 George Street, Sydney - Cc2
- 283-285 Clarence Street, Sydney
- 29 Laycock Street, Penshurst
- 29-31 Dunning Avenue, Rosebery - Variation
- 29-33 Oxford Street And 6-14 Cambridge Street, Epping
- 3 Parramatta Square
- Burwood Grand
- Murugan Temple, Mays Hill
- Northmead High School
- Oaks Flats Library, Shellharbour
- Orchard Hills Rezoning Assessment
- Parkes Hospital, Forbes Road, Parkes
- Pyrmont Bridge Signage Safety Assessment
- Rhtc Tod Master Plan, Rouse Hill
- Richard Murden Reserve - Netball Courts Tia
- Richard Murden Reserve - Netball Courts Variation
- Rosenthal Avenue Car Park Redevelopment, Lane Cove
- Rosenthal Avenue Car Park, Lane Cove
- Rosenthal Avenue Pedestrian Bridge
- Rouse Hill Town Centre Retail Stage 2
- Rpah Car Park Post-occupation Conditions
- Shor, Street Leonards (Cpb)
- Sydney Rowing Club, Abbotsford
- Telstra - Sepp 64 Review
- Telstra Signage Safety Assessments
- The Crest, Lot 100 Meatworks Ave
- Toongabbie Sports Club
- Wagga Wagga Hospital Redevelopment Stage 3
- Waterfront Drive Sporting Ground Tia
- 47 Spurway Dr, Baulkham Hills - Masterplan Updates
- Majors Bay Rd Parking Study
- 517 Pacific Hwy, Artarmon
- 55 Market Street, Sydney
- 6 Prosperity Parade, Warriewood
- 60 & 62 Beaconsfield Street & Queens Pde
- 49a Forest Road, Frenchs Forest
- 5 Peppertree Drive, Erskine Park
- 55 Hannan Street, Maroubra
- 475-479 Honour Avenue, Corowa - Service Station
- 4-8 Hoxton Park Road, Liverpool
- 31-33 Albany Street, Crows Nest
- 317-331 Liverpool Road, Ashfield
- 32 Smith Street, Parramatta Design
- 339 Nelson Street, Annandale
- 339-345a Sussex Street, Sydney
- 36 Carrington Street - Design & Delivery Stage
- 377 Concord Road, Concord West - Lec
- 38-40 Orth Street, Kingswood
- 4&6 Parramatta Square – Construction Advice

2.0 Proposed Development

2.1 Site, Context, and Existing Use

The site (Figure 2) is Lot 1 DP 719671 within the Castle Hill LGA. The site forms an irregularly shaped parcel of land providing frontages to Ridgecrop Drive, Gilbert Road and Excalibur Avenue of approximately 303m, 133m and 109m respectively. The total site area is in the order of approximately 8.3ha.

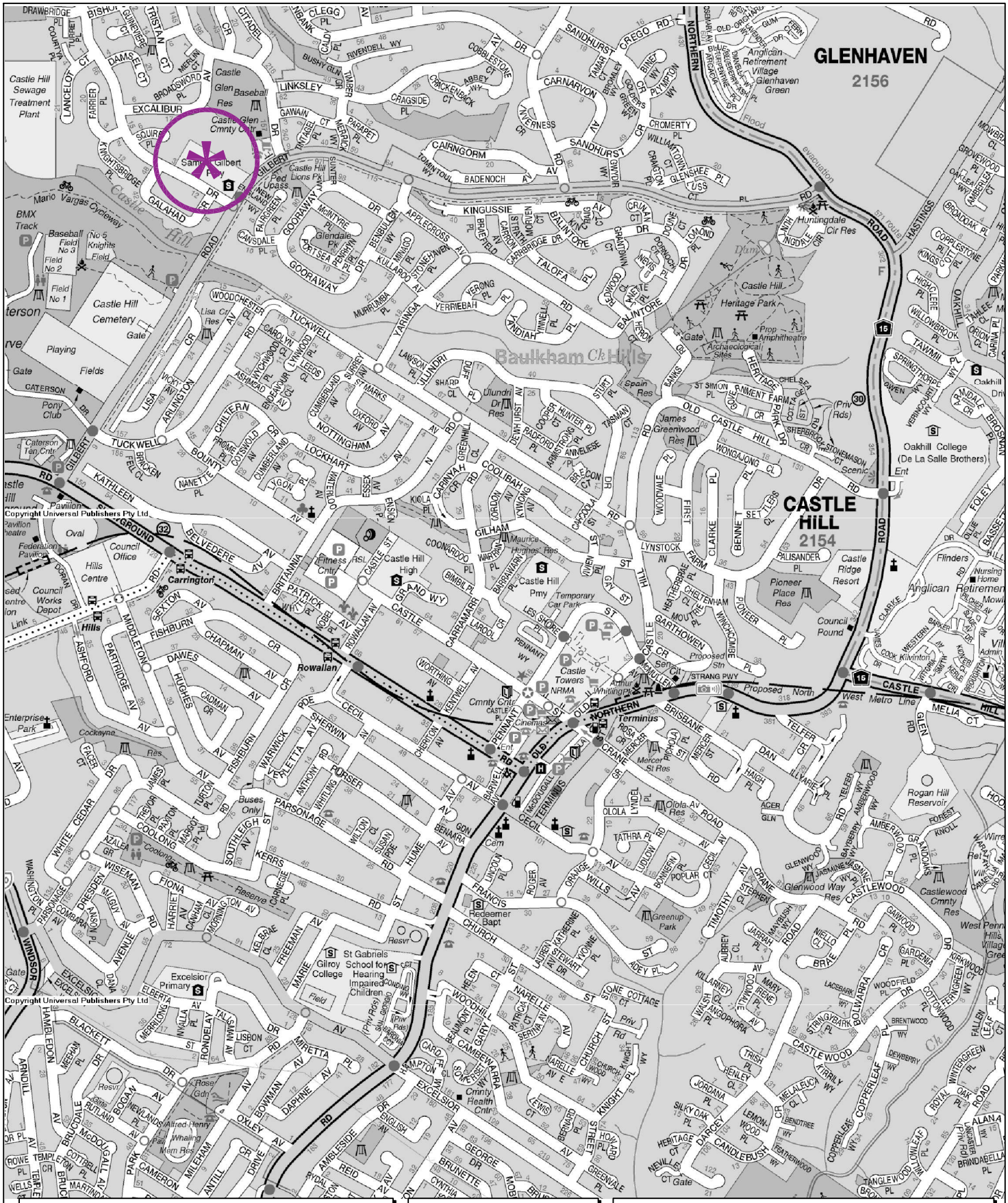
The site currently accommodates Samuel Gilbert Public School campus, a primary school catering to students from Kindergarten to Year 6. The current hours of operation of the primary School are between 8:30 am to 3:00 pm. The school campus currently accommodates a number of buildings, providing learning and administration facilities in conjunction with on-site student recreation, play and sporting areas.

The existing on-site development is serviced by an at-grade passenger vehicle parking area containing 26 staff spaces and a turnaround area for delivery vehicles. Vehicular connectivity between the on-site parking provision and the adjoining public road (Ridgecrop Drive) is facilitated by a combined entry/exit driveway at the centre of the south-western property boundary.

Our observations have indicated that parents/guardians use the public on-street parallel parking spaces within Ridgecrop Drive and Gilbert Road to pick-up/drop-off children. Further, the shopping centre car park to the east of the site and the public car park servicing the recreational sporting field to be north of the site has also been observed to accommodate the pick-up/drop-off children by parents/guardians. This car park has a pedestrian link to the subject site via the school oval.

The subject site is surrounded by the following mix of land-uses:

- Low-density residential development adjoins the site to the immediate west and south;
- Strip retail development (Knightsbridge Shopping Centre) and a childcare


GLENHAVEN
2156
CASTLE HILL
2154
Castle Hill Sewage Treatment Plant
Castle Glen Baseball Res
Castle Glen Cmnty Cntr
Castle Hill Cemetery
Castle Hill Heritage Park
Baulkham Hills
Oakhill College (De La Salle Brothers)
Castle Towers
Castle Hill Pmy
Castle Hill High
Hills Centre
Council Office
Council Works Depot
Oval
Federation Pavilion
Carrington
Rowallan
Terminus
Proposed North West Metro Line
Proposed Stn
Temporary Car Park
Castle Ridge Resort
Pioneer Place Res
Council Pound
Anglican Retirement Village Glenhaven Green
Rogan Hill Reservoir
Castlewood Cmnty Res
Glenwood Way Res
Greenup Park
Cockayne Res
James Greenwood Res
Maurice Hughes' Res
Mercer St Res
Olola Av Res
Spain Res
Ulundri Dr Res
Caterson Ten Cntr
Fitness Cntr
Cmnty Cntr
Cinemas
Redeemer Bapt
St Gabriels School for Hearing Impaired Children
Gilroy College
Excelsior Primary
Cmnty Health Cntr
Anglican Retiremen
Flood evacuation route
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),*

Hancey Farm Reserve
Ample Driving School
Castle Glen Reserve
Excalibur Ave
Linksley Ave
Castle Hill Art Society
Knightsbridge Pharmacy
Samuel Gilbert Public School
Tahitian Tan
Gilbert Rd
Calahad Cres
Ridgestrop Dr
Cansdale Pl
6 , 7 (

6, 7 (

), *

centre fronting Ridgecrop Drive is located to the immediate east of the subject site; and

- A recreational sports field adjoins the site to the immediate north.

The School is currently serviced by an off-street car park within the south-western corner of the site, which provides connectivity to Ridgecrop Drive via an existing 5m wide driveway, located to the immediate west of the wombat crossing within Ridgecrop Drive, approximately central to the southern site frontage.

It is also noted that emergency vehicles and service vehicles currently use the existing driveway mentioned above to access the site. It is understood that the site currently accommodates up to one (1) service vehicle a day, which generally occurs outside of the peak starting and finishing times of the School.

The existing vehicular driveway arrangements for passenger, service and emergency vehicles and the number of service vehicle movements to and from the site remain unaltered as part of the subject proposal.

The school campus is currently provided with the following formalised pedestrian access points as follows:

* A gated entrance providing a pedestrian link to the northern Ridgecrop Drive footpath, which is adjacent to a signposted indented student pick-up/drop-off bay; and

* Two separate pedestrian gates providing a pedestrian link to the eastern Gilbert Road footpath.

The existing off-street parking area, which remains unchanged, provides 26 formal passenger vehicle parking spaces, dedicated primarily to staff. Recent observations of this parking area have identified some informal parking within this area and some vacancies in the formal parking spaces. In any case, the number of parked vehicles within this off-street parking area was observed to be slightly higher than the formal

parking provision.

With regards to visitor parking, it is noted that the shopping centre car park and the public reserve car park to the north and east of the site respectively, is currently used by parents/guardians of children and general visitors associated with the School. It is understood following discussions with Council that the school sports oval and the recreational reserve, adjoining the site to the north are proposed to be provided with new off-street public parking areas in the future, which are available for use by parents/guardians to pick-up/drop-off their children to and from the School.

A survey plan of the site is shown overleaf.

2.2 Approved Development

The approved development comprises:

* Demolition of classroom spaces, removal/relocation of demountable teaching spaces and removal of trees

* Construction of a new three-storey building containing 23 new teaching spaces, new staff and administration offices, a new library and school entry forecourt

* Construction of a new school hall with a separate entrance for out of school hours and community use

* Alterations and additions to the existing administration building and library building to convert these into six new home bases

* Refurbishment of two toilet blocks

* Associated works including construction of a new circulation axis, landscaping and signage.

No modifications are proposed to the existing off-street parking provisions and

vehicular and pedestrian access arrangements.

The approved development is to accommodate an increase in the school population from 780 to 1000 students (between K – Year 6) and 45 to 58 staff.

Details of the approved development scheme are provided on the drawings prepared by Fulton Trotter Architects which accompany the Development Application are reproduced in part in Appendix A.

3.0 Existing Traffic Conditions

3.1 Road Network

The existing road network (Figure 3) serving the site comprises:

* *Gilbert Road* - a collector road which provides an east/west connection between the Showground Road in the east and Old Northern Road in the west. It intersects with Ridgecrop Drive adjacent to the southern corner of the site under a single-lane roundabout. An 8t load limit applies for Gilbert Road.

* *Ridgecrop Drive* - a local access road which forms a circulating loop, forming two T-junctions with Gilbert Road, adjacent to the corner of the school site and the corner of the adjoining shopping centre development.

* *Old Northern Road* – a State Road and arterial route connecting to Old Northern Road to the west and Cumberland Highway to the east

* *Castle Hill Road* – a State Road and arterial route connecting to Windsor Road to the south and Castle Hill Road to the east

* *Showground Road* – a State Road and sub arterial route connecting to Windsor Road to the west and Old Northern Road to the east

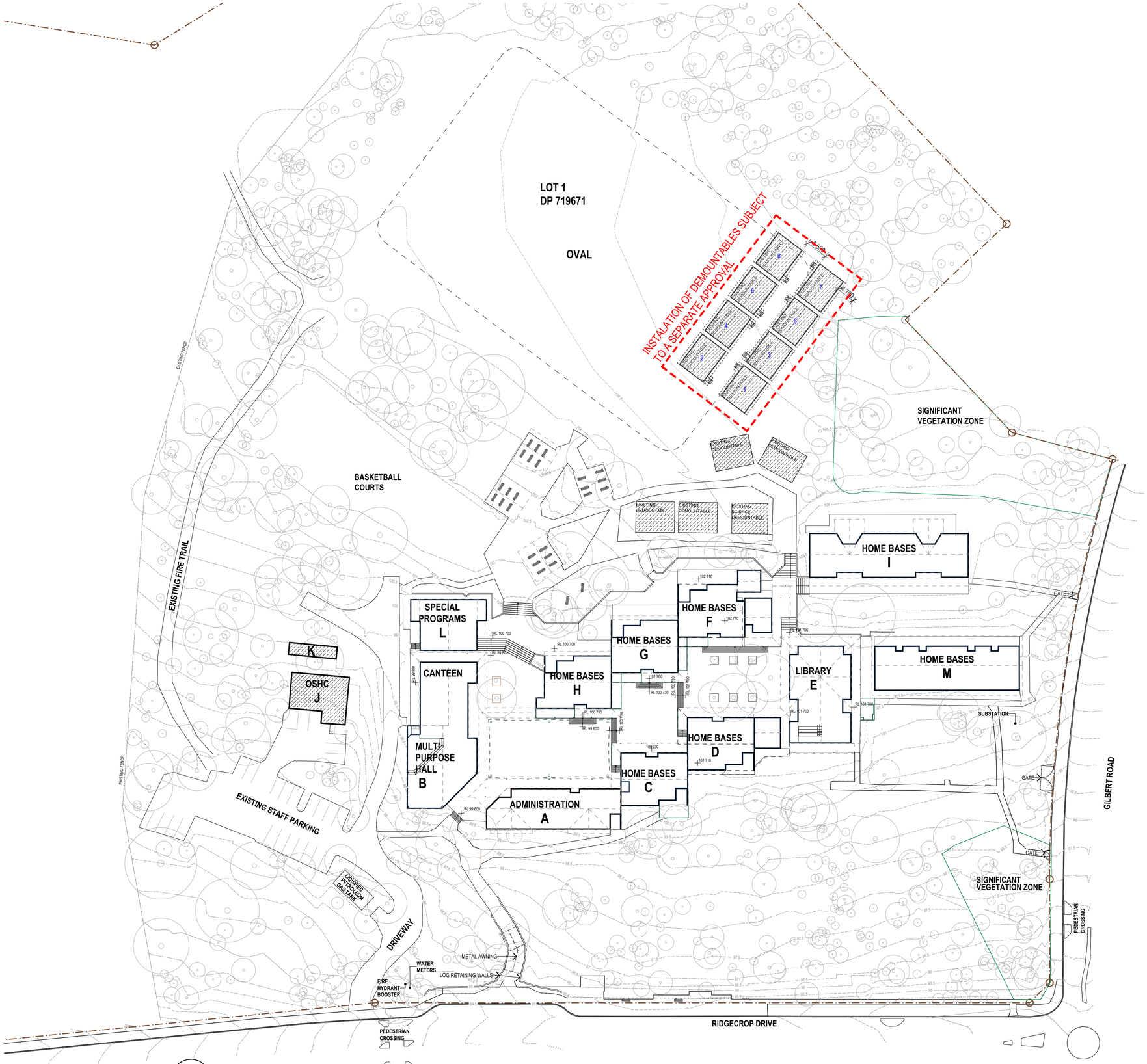
Gilbert Road and Ridgecrop Drive have 12m wide carriageways with one traffic lane in each direction with kerbside parking on both sides of the road.

3.2 Traffic Controls

The existing traffic controls which have been applied to the roads in the vicinity of the site (Figure 4) include:

* the traffic control signals at the intersections of:

- Gilbert Road / Showground Road
- Old Northern Road / Gilbert Road



1 PLAN
EXISTING SITE PLAN
SCALE: 1:500

50 100 150mm @ A1

plot date: Tuesday, 7 May 2019 file location: BIM Server: sydbimsyd 21 - BIM Server 21/7068 SGPS

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EXISTING SITE PLAN LEGEND

- EXISTING BUILDINGS
- EXISTING DEMOUNTABLE
- EXISTING TREES
- SITE BOUNDARY
- ROOF OVER
- CONTOURS
- FENCE: EXISTING
- NEW

P10	TSG final SD review	26/09/18	WG
P11	Issued for SDRP	03/10/18	AB
P12	SSDA Consultant Report Issue	05/10/18	AB
P1	SD / SSDA Client Review Issue	10/10/18	AB
P13	SSDA Draft Issue	05/11/18	AB
P14	SSDA Final Coordination Issue	07.11.18	AB
P15	SSDA Issue	12/11/18	AB
P16	SD ISSUE	19/11/18	AB
P17	SSDA Response to Submissions	07/05/19	AB
REV.	DESCRIPTION	DATE	INIT.

fulton trotter
ARCHITECTS

SYDNEY
Level 3, 35 Spring Street t. (02) 9369 5941
PO Box 1669 e. sydney@fultontrotter.com.au
Bondi Junction, NSW 2022

BRISBANE
SYDNEY

DIRECTORS
Greg Isaac raia NSW 6855 QLD 2920
Justine Elszery raia QLD 3313
John Ward raia VIC 18804 NSW 8371 QLD 3847
Katerina Dracopoulos raia QLD 4529
Mark Trotter fraia VIC 17691 NSW 4421 QLD 1870
Nathan Hildebrandt raia NSW 10256 QLD 4131
Paul Sekava raia NSW 7180 QLD 3108
Paul Trotter fraia NSW 7177 QLD 2646
Ryan Loveday raia QLD 4500
Robert Wesener fraia NSW 5802 QLD 2633

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PHASE **SCHEMATIC DESIGN**

CLIENT NSW Department of Education

PROJECT Samuel Gilbert Public School

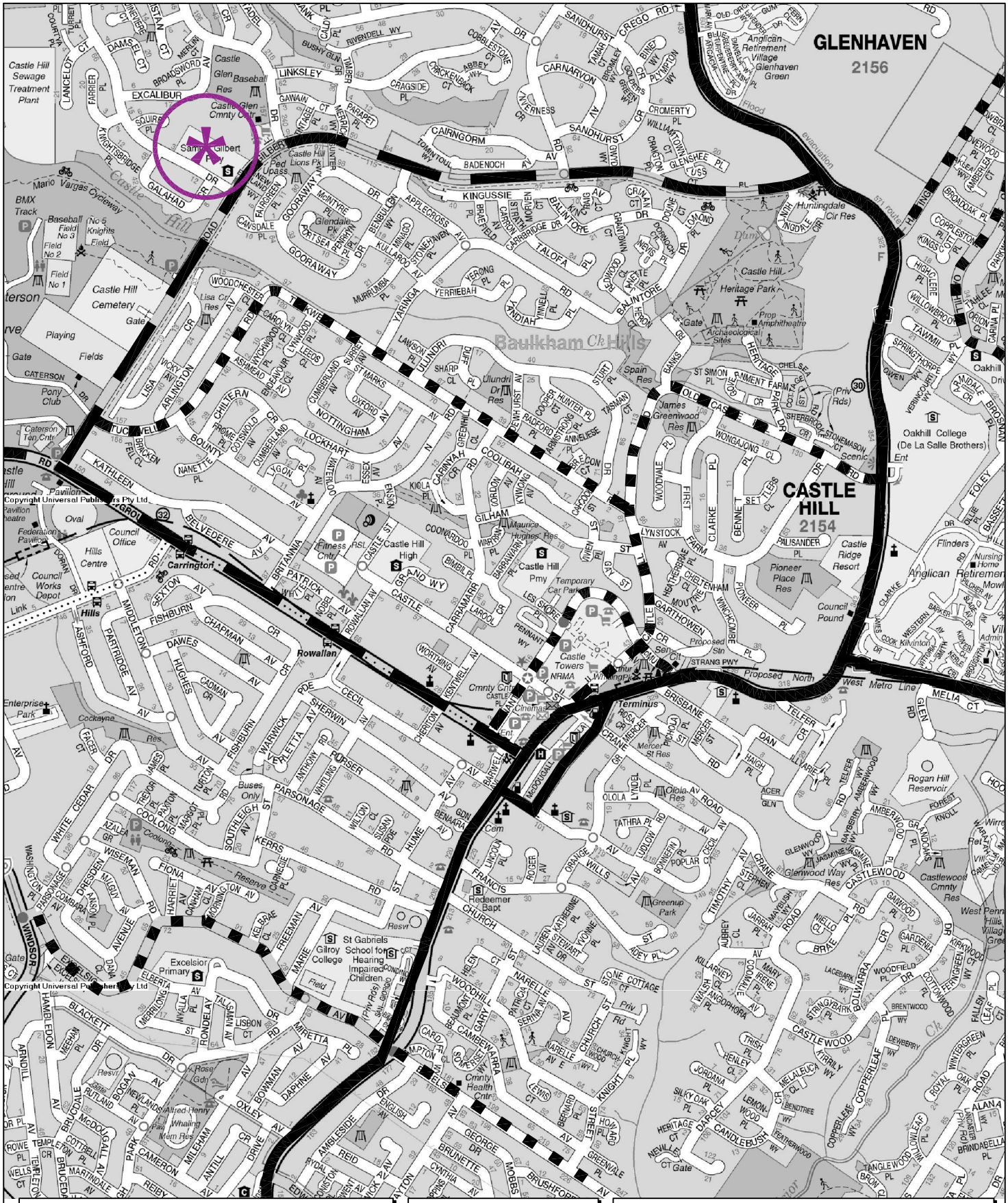
ADDRESS Ridgecrop Drive
Castle Hill, NSW

DRAWING **EXISTING SITE PLAN**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

PROJECT NUMBER	DIRECTOR	CHECKED
7068SG01	JW	AS

DRAWING NUMBER **AEX1001** REVISION **P17**


GLENHAVEN
2156
CASTLE HILL
2154
Castle Hill Sewage Treatment Plant
Castle Glen Baseball Res
Castle Glen Cmnty Ctr
EXCALIBUR
Sam Gilbert Ry
Castle Hill
Castle Hill Cemetery
Playing Fields
Baulkham Hills
Heritage Park
Castle Hill Heritage Park
Prop Amphitheatre
Archaeological Sites
Huntingdale Cir Res
Anglican Retirement Village Glenhaven Green
Oakhill College (De La Salle Brothers)
Castle Ridge Resort
Pioneer Place Res
Council Pound
Castle Towers
Proposed Stn
Proposed North West Metro Line
Terminus
Rogan Hill Reservoir
Castlewood Cmnty Res
Glenwood Way Res
Greenup Park
Redeemer Bapt Church
St Gabriels Gilroy College
School for Hearing Impaired Children
Excelsior Primary
Cmnty Health Cntr
Castle Hill High
Castle Hill Pmy
Temporary Car Park
Fitness Rst
Cmnty Cntr
Cinemas
Hills Centre
Council Office
Council Works Depot
Oval
Pavilion
Federation Pavilion
Caterson Tce Cntr
Pony Club
Baseball Field No 3
Field No 2
Field No 1
No 5 Knights Field
BMX Track
Mario Vargas Cycleway
Castle Hill Ped Pass
Castle Hill Lions Pk
Glendale Pk
Port Sea Pk
Lisa Ct Res
Spain Res
James Greenwood Res
Ulundri Dr Res
Maurice Hughes Res
Mercer St Res
Olola Av Res
Resvr
Rose Gdn
Alfred Henry Whaling Mem Res
Allambie
Arlington
Bountiful
Britannia
Carrington
Rowallan
Dawes
Chapman
Fishburn
Sexton
Middleton
Partridge
Ashford
Hughes
Cadman
Cecil
Sherwin
Fletta
Warwick
Parsonage
Wiseman
Fiona
Harriet
Dresden
Milgum
Kerrs
Southleigh
Cooloong
Azalea
White Cedar
Washington
Windsor
Blackett
Hambledon
Arndill
Rondelay
Lisbon
Miretta
Bowman
Daphne
Oxley
Cameron
Antill
Mileham
Reiby
Wells
Templeton
Rowe
Cottrell
McDougall
Brucedale
Martindale
Bogam
Rutland
Newlands
Brucedale
Merrilong
Nyalla
Elberta
Freeman
Kelbrae
Carnegie
Resvr
Lincoln
Roger
Orange
Wills
Francis
Church
Helen
Narelle
Woodhill
Benjamin
Gary
Cambewarra
Compton
Knight
Howard
Bernard
Lewis
Amesbury
Amesleside
Reid
Ryda
Brunette
Mobbs
Greenvale
Cynthia
Ayton
Edwin
Nick
Spring
Moore
Enterprise Park
Cockayne
Res
Buses Only
Cem
Priv Rds
Priv Rd
Ch
Oval
Hills
Link
Ent
Cnr
Gdn
Resvr
Res
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Wy
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Gate
Field
Park
Hill
Road
Drive
Lane
Creek
Bridge
Track
Cycleway
Cemetery
Fields
Centre
Depot
Pavilion
Oval
Club
Tce
Cntr
Pmy
Pk
Ent
Rds
Priv
Res
Gdn
Mem
Cem
Ch
Hts
Ave
Blvd
Cres
Ln
Pde
Sq
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Hwy
Fwy
Pkwy
Mwy
Tce
Cnr
Gr
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Pl
Av
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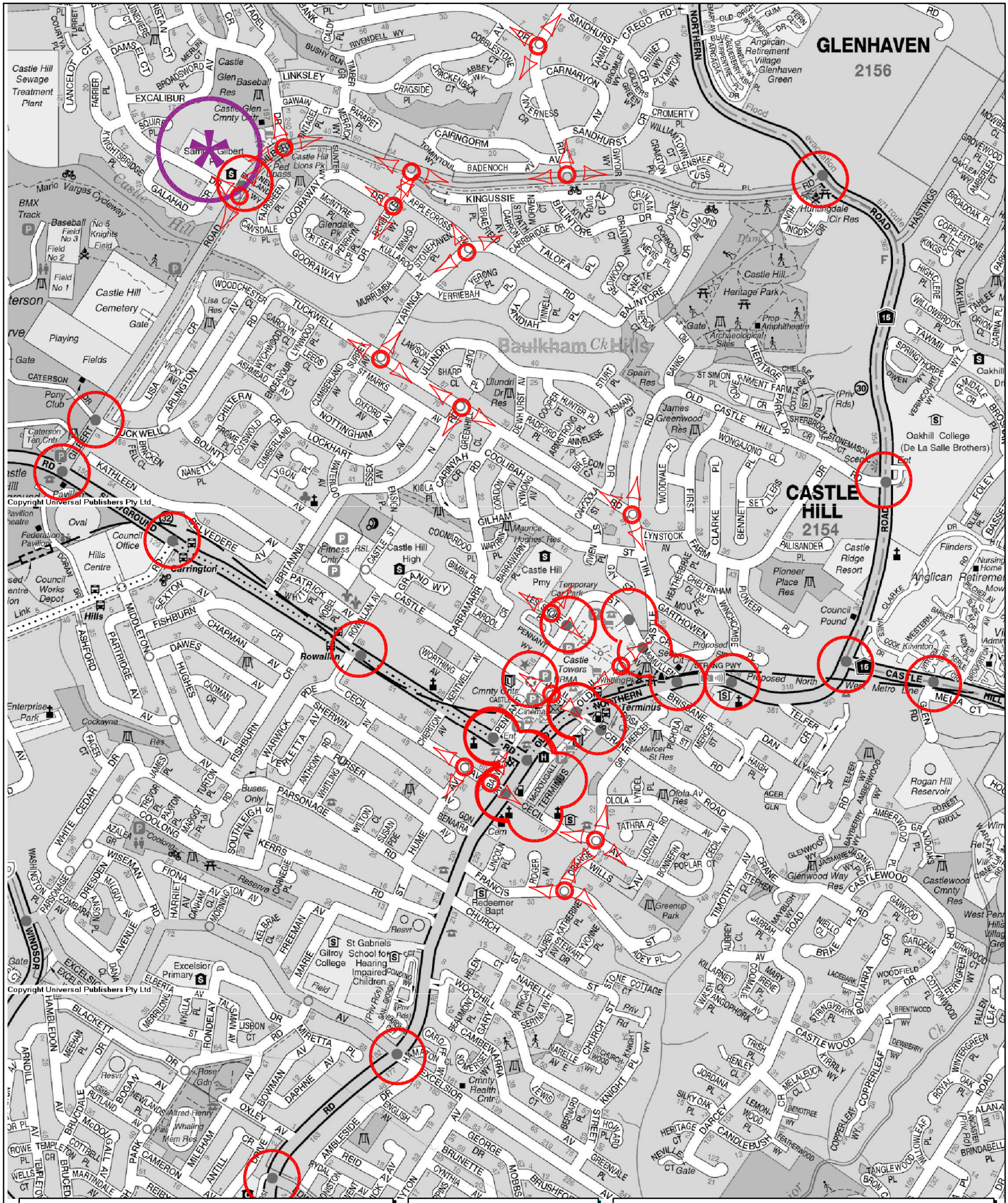
Dr
Ct



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75$)),&

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),*

- Old Northern Road / Showground Road
- Old Northern Road / Cecil Avenue
- De Clambe Drive / Showground Road
- Carrington Road / Showground Road
- Rowallan Avenue / Showground Road
- Old Northern Road / Cecil Avenue
- Crane Road/ Terminus Street
- Old Northern Road / Terminus Street
- Old Northern Road / McMullen Avenue

* the roundabout at the intersections of:

- Gilbert Road (north)/Ridgecrop Drive
- Gilbert Road (south)/Ridgecrop Drive
- Gilbert Road /Applecross Avenue
- Gilbert Road /Grange Road

* the 40kmph school zone speed restrictions between 8:00 am – 9:30 am and 2:30 pm – 4:00 pm during school days

* the 50kmph speed restriction on surrounding local roads

* An existing indented bus bay along Ridgecrop Drive with 'Bus-Zone'/'No-Stopping' parking restrictions applying along both sides of Ridgecrop Drive for the extent of the bus bay length.

3.3 Parking Controls

Unrestricted and restricted on-street parking spaces are available on-street along Gilbert Road and Ridgecrop Drive at the site frontage. A total of 9 spaces are signposted with the following restrictions:

* <u>Gilbert Road:</u>

- unrestricted parallel parking along the western side of the road adjacent to the

School

- unrestricted parallel parking along both sides of the road south of Ridgecrop Drive
- 'No-Stopping School Days' parking restrictions along the eastern side of the road between 8:00 am – 9:00 am and 2:30 pm – 3:30 pm

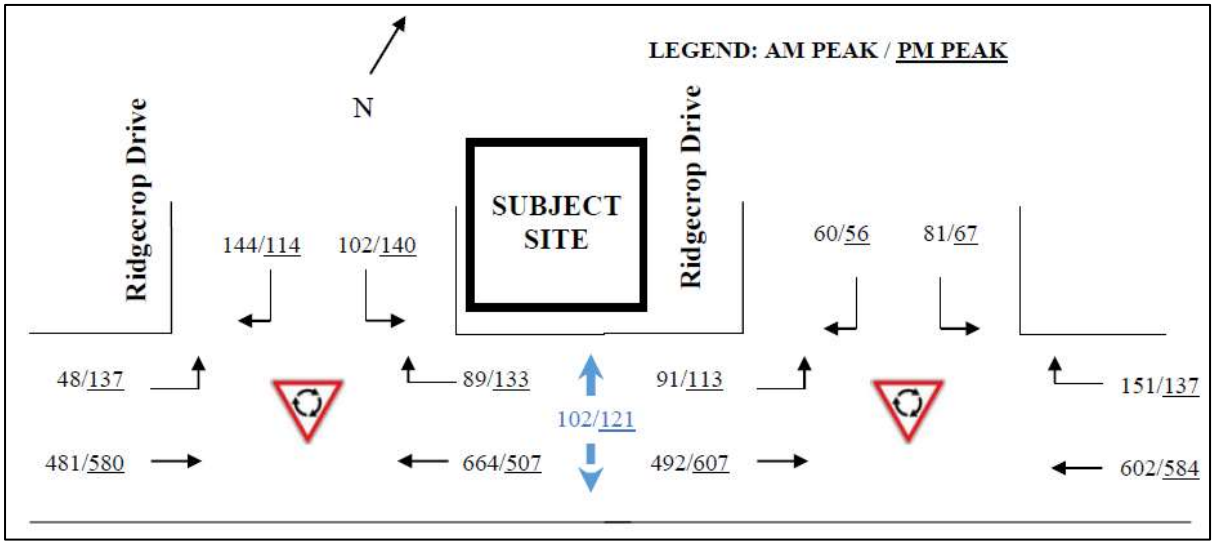
∗ Ridgecrop Drive

- Generally unrestricted parallel parking along both sides of the road
- Bus zone
- 'No-Stopping School Days' between 8:00 am – 9:00 am, along the northern side of the road adjacent to the southern site boundary within an indented 'Kiss and Ride' facility

3.4 Traffic Conditions

TSA carried out AM and PM peak period traffic movement surveys on a weekday on the 19th and 28th of May 2018 between 7:00 am – 9:00 am and 2:00 pm – 4:00 pm to coincide with the starting and finishing periods of the primary School. The surveys were undertaken at both the intersections of Ridgecrop Drive/Gilbert Road.

The outcomes of the surveys are summarised in the following figure:



The surveys indicate:

∗ two-way traffic flows of between 1,200 - 1,400 vehicles per hour during peak

periods on Gilbert Road

* two-way traffic flows of between 150 - 300 vehicles per hour during peak periods on Ridgecrop Drive

The operational performance of the intersections during the weekday AM and PM peak, have been assessed by TSA as part of the DA traffic report:

	Level of Service	
	AM Peak	**PM Peak**
Gilbert Road & Ridgecrop Drive (southernmost junction)	A	D
Gilbert Road & Ridgecrop Drive (northernmost junction)	A	A

The traffic modelling indicates the nearby intersections currently operate satisfactorily (level of service D or better) during the assessed peak hours. The vehicle arrival and departure associated with the School is concentrated over a 15 – 30-minute window. As such, any traffic impact and circumstances associated with the School's activity is temporary.

3.5 Existing Parking Demand

TSA also completed a survey of the existing on-street parking facilities within the surrounding road network in the immediate vicinity of the site (see the following figure) during the School's peak period on 7 March 2019 between 8:00 am – 9:00 am and 2:30 pm – 3:30 pm.

Legend	
Zone	**Description**
A	Public Car Park.
B	Western side of Gilbert Road between Ridgecrop Drive junctions.
C	Western side of Gilbert Road 100m south of Ridgecrop Drive (southernmost junction).
D	Northern side of Ridgecrop Drive between Gilbert Road and Galahad Crescent (westernmost junction).
E	Southern side of Ridgecrop Drive between Gilbert Road and Galahad Crescent (westernmost junction).
F	Both sides of Galahad Crescent for a length of 100m.
G	Western side of Ridgecrop Drive between Gilbert Road and Gawain Court.
H	Eastern side of Ridgecrop Drive between Gilbert Road and Gawain Court
I	Both sides of Galahad Crescent for a length of 100m.
J	Both sides of Gawain Court for a length of 100m.
K	Both sides of Fairgreen Place.

The outcomes of the surveys are summarised in the following figure:

TABLE 1
EXISTING (2019) PARKING DEMAND

Date/Time	Public Parking Areas (Total Spaces = 285)												
	Zone A (48 spaces)	Zone B (20 spaces)	Zone C (17 spaces)	Zone D (32 spaces)	Zone E (27 spaces)	Zone F (26 spaces)	Zone G (9 spaces)	Zone H (9 spaces)	Zone I (28 spaces)	Zone J (29 spaces)	Zone K (40 spaces)	Total Occupied Spaces	Total Unoccupied Spaces
THURSDAY, 7 MARCH 2019													
MORNING (AM)													
8.00am	1	18	0	4	3	2	6	4	1	2	9	50	235
8.15am	3	17	0	15	3	2	7	5	1	2	8	63	222
8.30am	5	16	1	22	8	6	5	7	1	3	15	89	196
8.45pm	5	17	3	10	3	4	7	7	1	3	16	76	209
9.00pm	3	14	3	7	3	4	4	6	1	3	10	58	227
AFTERNOON (PM)													
2.30am	2	17	1	21	12	2	5	5	4	0	15	84	201
2.45am	12	17	11	30	21	8	5	6	5	6	25	146	139
3.00pm	21	14	13	31	22	8	8	7	5	8	22	159	126
3.15pm	13	16	1	4	7	4	5	6	3	2	12	75	210
3.30pm	7	13	1	4	7	3	5	6	3	2	7	58	227

The survey indicates the following on-street parking demand:

- 285 spaces within the adjoining road network
- maximum parking demand was 89 vehicles during the AM peak period with a minimum of 196 unoccupied spaces
- maximum parking demand was 159 vehicles during the PM peak period with a minimum of 126 unoccupied spaces

3.6 Transport Services

Train

The closest railway station to the site is Hills Showground Metro Station, which is 1.7km south of the site. The station is serviced by the Tallawong Line service which operates every 4 minutes during the peak periods.

The closest CityRail station to the site is Parramatta Station and Pennant Hills which are within 8km from/to the site. The Parramatta Station is serviced by the T1 North Shore, Northern and Western, T2 Inner West & Leppington, T5 Cumberland, Blue Mountains and Western Lines. Services along the T1 line operate every 10 minutes, with express services to the Sydney CBD and T2 line operate every 14 minutes. Services on the T5 Line and the Blue Mountains Line operate every 30 minutes. The Pennant Hills Station is serviced by the T9 Northern line and operate every 15 minutes.

Bus

The closest bus stops are located along both sides of Ridgecrop Drive, just south of the site. Additional bus stops are also provided along both sides of Gilbert Road, some 50m to the northeast of the site, in the immediate vicinity of Knightsbridge Shopping Centre. These bus stops service the following public and school bus routes within close walking distance to the site:

Public Bus

Hillbus operates Route 603 between Rouse Hill Station and Parramatta via Glenhaven every 15 minutes (peak) and 30 minutes to hourly (off-peak).

School Bus

Hillbus operates Routes 603, 3062 and 3004 during the morning peak school start period (7.45 am – 8.45 am) and Routes 3610, 2550, 2578, 637 and 639 during the afternoon peak school finish period (3.00 pm – 4.00 pm), The bus services operate on 15 – 30-minute frequencies. The latest timetables obtained from Hillbus website are provided overleaf.

Details of the existing transport services are provided in Appendix B.

3.7 Walking Facilities

Pedestrians in the vicinity of the site are afforded excellent footpaths on both of the site frontages along Gilbert Road and Ridgecrop Drive. There is good pedestrian connectivity between the School and the surrounding residential developments and the adjacent Knightsbridge Shopping Centre. The existing pedestrian infrastructures in the vicinity of the School include:

* A midblock pedestrian crossing is provided within Gilbert Road approximately 20m to the north of its southernmost roundabout junction with Ridgecrop Drive

* A pedestrian refuge is provided within the splitter island of the western approach of the southernmost junction of Gilbert Road and Ridgecrop Drive

School Travel Advice

For trip planning visit www.transportnsw.info or call 131 500.
For current Hillsbus school and route services visit www.cdcbus.com.au or call 02 8889 7000.

Conditions of Carriage: Students must have a valid Opal card and must tap on and off every trip. Further details about the SSTS are available at: www.transportnsw.info

Key: L> Bus turns left; R> Bus turns right

SAMUEL GILBERT PS

Bell Times — Effective 18/11/2019
Morning: 08:50
Afternoon: 14:55

MORNING BUSES

Route	Time	Bus Route
603	07:40	**EX KELLYVILLE STATION** via Samantha Riley, Glenhaven, R>Mills, Carinda (08:24), L>Glenhaven, R>Old Glenhaven, L>Glenhaven, R>Evans, L>Grange, R>Greenbank Loop, R>Linksley, R>Ridgecrop Dr to school
3062	07:50	**EX ST ANGELA'S** Harrington St via Harrington, R>Wrights, R>Kings, Eric Cooper, L>Green, L>Showground, L>Britannia, L>Tuckwell, R>Gilbert, L>Ridgecrop Dr Nth, L>Bishopgate, L>Ridgecrop to school
3004	07:59	**EX OAKHILL COLLEGE** via Old Castle Hill Rd, R>Tuckwell, R>Gilbert, L>Ridgecrop Dr north- complete circuit to school

AFTERNOON BUSES

Route	Time	Bus Route
3610	15:05	**EX SAMUEL GILBERT TO GLENHAVEN & OLD NORTHERN RDS** via Ridgecrop, L>Gilbert, L>Ridgecrop, R>Linksley, L>Greenbank Loop, L>Greenbank Dr, L>Grange, R>Sandhurst, R>Grange, R>Evans, R>Glenhaven to Glenhaven & Old Northern (15:31). Transfer to Route 637 (due 15:46, see below)
2550	15:14	**TO CASTLE HILL** via R>Gilbert, L>Tuckwell, R>Old Castle Hill Rd, L>McMullen Rd, R>Old Northern, R>Castle Hill Interchange Stand C
2578	15:30	**TO KELLYVILLE** via R>Gilbert, R>Showground, R>Green, R>Eric Cooper, Kings, L>Wrights, R>Morris to William Clarke College
637	15:46	**EX OLD NORTHERN & GLENHAVEN** via Old Northern, Round Corner (15:50) Transfer to Route 639 (due 16:03, see below), Then via Old Northern, Dural P.O (16:02), Old Northern to Glenorie Shops.
639	16:03	**EX ROUND CORNER** via Old Northern, L>Kenthurst, L>Pitt Town to Maraylya

* A raised wombat pedestrian crossing is provided across Ridgecrop Drive, approximately 50m west of its easternmost junction with Galahad Crescent.

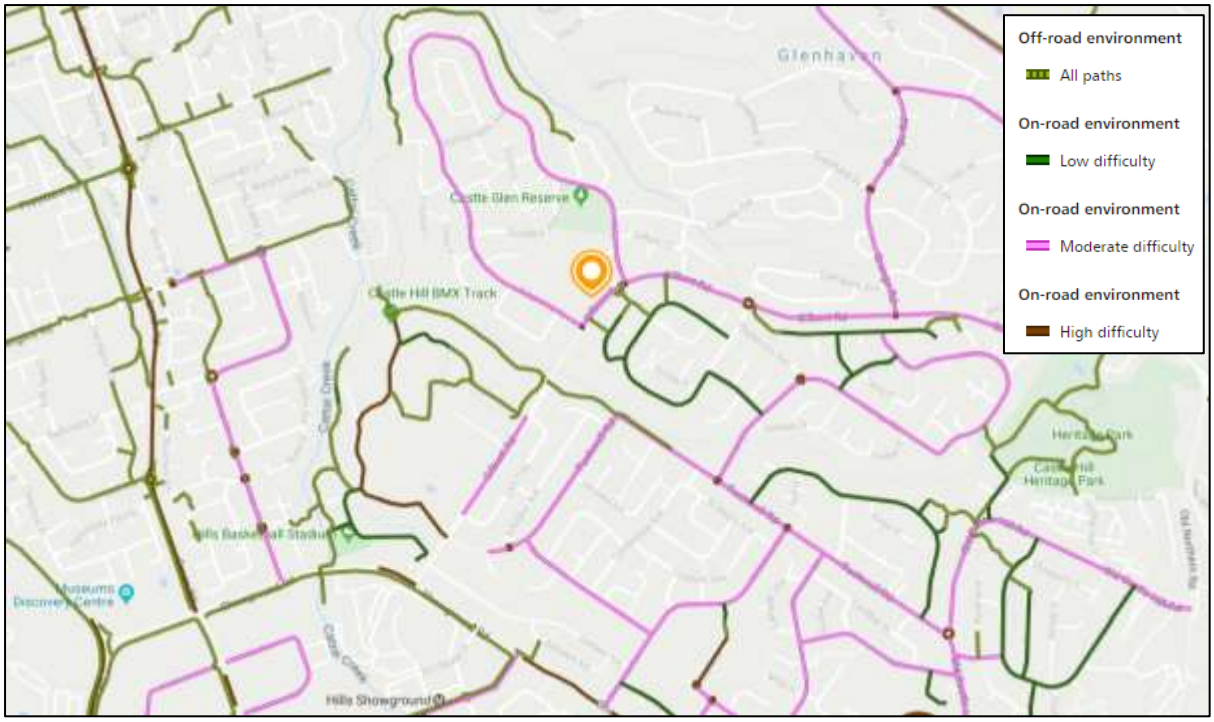
The abovementioned existing pedestrian infrastructure is shown in the following figure.

Pedestrian Infrastructures along Ridgecrop Drive

Pedestrian Infrastructures along Gilbert Road

3.8 Cycling Facilities

Council provides a number of on- and off-street bike paths through various parts of the LGA, which connect to the regional cycling network. There is currently on-road cycling infrastructure on Gilbert Road and Ridgecrop Drive in the immediate vicinity of the site. The cycling routes in the vicinity of the site is shown in the following figure.



Source: RMS Cycleway

4.0 Proposed Construction Scheme

4.1 Construction Program

This project is to be carried out in 3 stages, as shown on the Staging Plan overleaf. Stage 1 involving temporary school establishment works will be completed by others. Stages 2 and 3 will be completed over the course of 19 months between November 2019 and March 2021:

- Stage 2 – Early works, structure, façade & finishes (Buildings N, P and Q): 15 months
- Stage 3 – Early works, structure, façade & finishes (Buildings A, D, E and F): 4 months

The construction site plans for Stages 2 and 3 prepared by Hutchinson (Hutchinson Builders) are provided with following details:

- Stage 2 – Early works, structure, façade & finishes (Buildings N, P and Q)
- Stage 3 – Early works, structure, façade & finishes (Buildings A, D, E and F)

The site plans indicate:

- 1 vehicle access (1 ingress and 1 egress) along Gilbert Road frontage
- 1 worker access along Gilbert Road frontage
- 40m works zone on Gilbert Road
- Tower crane on the north-western corner of the site
- 3 unloading/cranage platforms (for Stage 2) and 2 platforms (for Stage 3)
- Hoarding barrier within the site
- Temporary chain wire fencing along Gilbert Road frontage
- Site amenities on the south-eastern corner of the site

Prior to Stage 2, temporary, preliminary site access will be provided on the site eastern frontages on Gilbert Road.

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LOT 1
DP 719671

OVAL

BASKETBALL COURTS

SIGNIFICANT VEGETATION ZONE

EXISTING FIRE TRAIL

EXISTING FENCE

NEW BARRIER FENCE 1.2M HIGH

SAT 1 ONLY 7:30-10:00

NEW BARRIER FENCE 1.2M HIGH

NEW BARRIER FENCE 1.2M HIGH

SPECIAL PROGRAMS L

K

OSHC J

CANTEEN

MULTI-PURPOSE HALL B

HOME BASES G

HOME BASES H

HOME BASES I

HOME BASES E

HOME BASES M

WC F

WC D

HOME BASES C

HOME BASES A

HALL Q

SUBSTATION

EXISTING STAFF PARKING

bollard

shared zone

NEW GATE

PROPOSED NEW PATH (1:5 WIDE)

RETAINING WALL

EXISTING GAS MAIN

ADMINISTRATION STAFF & HOME BASES N

LIBRARY & HOME BASES P

NEW BARRIER FENCE 1.2M HIGH

SIGNIFICANT VEGETATION ZONE

PEDESTRIAN CROSSING

DRIVEWAY

FIRE HYDRANT BOOSTER

WATER METERS

RECONFIGURE FENCE LINE AND PROVIDE NEW PEDESTRIAN ENTRY GATE WITH INTERCOM

PEDESTRIAN CROSSING

11,600 ADJUSTED N BLOCK SETBACK

BIKE RACKS (38 BIKES)

NEW FENCE

13 700 Q BLOCK SETBACK

GILBERT ROAD

GILBERT ROAD

RIDGECROP DRIVE

50,140 | 6,550 | 52,060 | 27 200 P BLOCK SETBACK

24,240 | 9,315 | 16,160 | 18,774

1 PLAN
STAGING PLAN
SCALE: 1:500

150mm @ A1 | 100 | 50

50 | 100 | 150mm @ A1

plot date: Wednesday, 19 August 2020 file location: BIM Server: sydbimsyd 21 - BIM Server 21/7096SG01 SGPS/7096SG01 SGPS - Site and External Works

STAGE 1 CONSTRUCT NEW MAIN HOMEBASES, LIBRARY, ADMINISTRATION, SLAB OF HALL AND COLA.

STAGE 1 & 2 COMPLETION OF NEW HALL AND COLA

STAGE 2 DEMOLISH/REFURBISH EXISTING BUILDINGS UPGRADE MAIN CONCOURSE

REV.	DESCRIPTION	DATE	INIT.
00	PRELIMINARY ISSUE	17/10/19	NE
01	CONSULTANT INFORMATION	17/01/20	AB
02	PROGRESS ISSUE	04/05/20	NE
03	EFSG DETAIL DESIGN REVIEW ISSUE	05/06/20	NE
04	CC ISSUE	07/08/20	NE
05	EFSG DETAIL DESIGN REVIEW ISSUE 02	19/08/20	NE

fulton trotter ARCHITECTS
SYDNEY
Level 3, 35 Spring Street
PO Box 1669
Bondi Junction, NSW 2022
t. (02) 9369 5941
e. sydney@fultontrotter.com.au
BRISBANE
SYDNEY

DIRECTORS
Greg Isaac raia — NSW 6855 — QLD 2920
Justine Ebzery raia — QLD 3313
John Ward raia — VIC 18804 — NSW 8371 — QLD 3847
Katerina Dracopoulos raia — QLD 4529
Mark Trotter fraia — VIC 17691 — NSW 4421 — QLD 1870
Paul Sekava raia — NSW 7180 — QLD 3108
Paul Trotter fraia — NSW 7177 — QLD 2646
Ryan Loveday raia — QLD 4500

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PHASE: **DD/DOCUMENTATION**

CLIENT: NSW Department of Education

PROJECT: Samuel Gilbert Public School

ADDRESS: Ridgecrop Drive
Castle Hill, NSW

DRAWING: **STAGING PLAN - Overall**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

PROJECT NUMBER	DIRECTOR	CHECKED
7096SG01	JW	AS

DRAWING NUMBER	REVISION
A-S-1401	05

4.2 Construction Workers

It is anticipated that there will be an average of 35-80 workers on-site during the various construction stages, with a maximum of 99 workers expected during the peak construction period, with the following breakdown:

Construction Stages	No. of Workers	
	Average	Peak
Stage 2 - Early works, structure, façade & finishes (Buildings N, P and Q)		
Early works	35	44
Structure	80	99
Façade & Finishes	75	99
Stage 3 - Early works, structure, façade & finishes (Buildings A, D, E and F)		
Early works	35	44
Structure	60	80
Façade & Finishes	75	92

4.3 Construction Hours

The approved hours of construction (excluding rock breaking, rock hammering, sheet piling, pile driving and similar activities) activity will be:

7.00 am – 6.00 pm	Monday to Friday
8.00 am – 1.00 pm	Saturday
No work	Sunday and public holidays

The approved hours for rock breaking, rock hammering, sheet piling, pile driving and similar activities are restricted will be:

9.00 am – 12.00 pm, 2.00 pm – 5.00 pm,	Monday to Friday
9.00 am – 12.00 pm	Saturday
No work	Sunday and public holidays

The principal contractor shall ensure that all sub-contractors are aware of the permitted hours of operation and shall ensure that all vehicle activity occurs strictly within the hours stipulated by the Conditions of Consent. Should any works be required to take place within public roads (in the vicinity of the site), outside these hours, this would be subject to prior approval from Council.

4.4 Site Access

Site access to the construction site is proposed via a combined 8m wide temporary crossover on the Gilbert Road frontage (ingress/egress).

The temporary crossovers will have 2m wings on either side. A footpath crossing (driveway) application will be submitted to the Council. Approval will be sought from Council prior to the construction of the temporary laybacks and crossovers.

The largest vehicle that will use the access point along Gilbert Road will be a 12.5m heavy rigid truck (HRV) and an 18m truck and dog trailer respectively while the largest vehicle to access the works zone on Gilbert Road will be a 19-metre semi.

During the earlier construction stages, a sufficient manoeuvring area will be provided on-site to ensure construction vehicles can exit in a forward direction. Swept path analysis was completed for the largest vehicle expected to access the site and works zone, which is provided in Appendix C of this report.

During the latter construction stages, the trucks (up to 12.5m heavy rigid vehicles) will reverse into the site on arrival and depart in a forward direction under the management of trained site personnel at the site access (for pedestrian safety) and accredited traffic controllers on Gilbert Road (for vehicle safety). Swept path analysis for HRV accessing the site is provided in Appendix C of this report.

4.5 On-Street Works Zone (If Required)

This works zone (if required) on Gilbert Road would accommodate trucks for the delivery of construction materials/ equipment, as well as any construction-related works that cannot be undertaken on-site and to accommodate the largest vehicles'

swept path clearances.

Based on the above, it is proposed to provide a 40m works zone on the western side of Gilbert Road along the site frontage. The works zone should not be used for private kerbside parking by builders, tradesmen and visitors associated with the site.

The works zone has been approved to be in operation during the following times:

- Monday to Friday: 9.30 am – 2.30 pm
- Saturday: 8.00 am – 1.00 pm.

The unrestricted parking would be maintained outside the works zone periods.

Gilbert Road has a minimum of the 12-metre wide carriageway, which would permit a 2.8-metre wide works zone on the western side of the road while maintaining the northbound traffic flows.

Separate applications will be made to the Council to organise appropriate approvals for any construction driveways, additional works zones, changes to any parking restrictions, temporary road occupancies or temporary road closures throughout the construction period.

4.6 Cranage and Materials Handling

A tower crane will be erected within the site, and specific areas will be available for loading/unloading, materials handling and storage, and worker sheds, etc. The tower crane will be utilised for materials handling within the works zone and the on-site unloading/cranage platforms. Light materials will be loaded/unloaded between the on-site unloading/cranage platforms using either forklifts or trolleys (for light materials).

As discussed, trucks will arrive via the southern gate (from the south) and depart via the only gate along Gilbert Road in a forward direction during the earlier construction stages and reverse in/forward out of the site from/to Gilbert Road

All trucks will enter the works zone from the south and exit towards the north in a forward direction.

5.0 Construction Traffic Management Planning

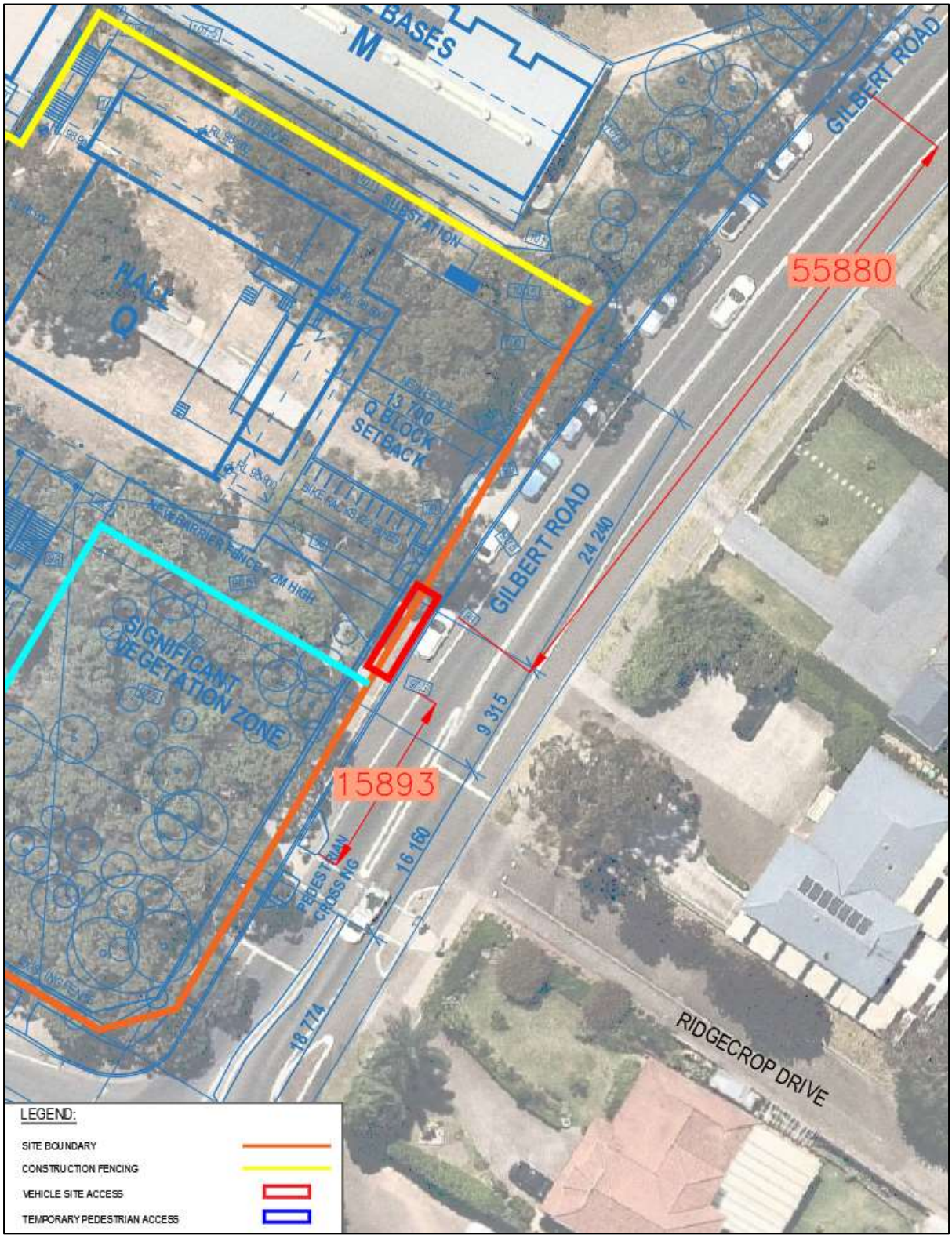
5.1 Site Access Locations and Internal Circulation

Construction access movements will be provided at the western edge of Gilbert Road. Access into the site will be left-in from Gilbert Road. Access out of the site will be right-out/left-out only along Gilbert Road.

Vehicles that will access the site during construction will likely mainly comprise of heavy vehicles including Articulated Vehicles (AV) such as curtain wall delivery trucks and heavy rigid vehicles (HRVs) such as concrete trucks are expected to access the site and works zone.

Appropriate and safe separations are provided between the School's pedestrian and vehicle accesses and the construction accesses.

The site access on Gilbert Road are a minimum of 15m and 55m from the signalised pedestrian crossing and pedestrian access respectively, as shown in the following figure.



The 15m separation is in accordance with the minimum distance required in Figure 8.4 of the Austroads Guide to Road Design Part 4: Intersections and Crossings – General.

5.2 Pedestrian Access

Access to the site will only be possible via security-controlled gates. All personnel entering the site will be required to undertake an induction program.

Pedestrian activities will be removed from the construction area by the erected site fencing which is comprised of A-Class hoarding within the site and chain fencing will be provided on the footpath along the western side of Gilbert Road, the northern side of Gilbert Road, to ensure safe pedestrian passage past the site.

An accredited traffic controller will be present at the site access/works zone to manage pedestrian movements and assist with vehicle's ingress and egress. Only one vehicle at a time will enter or exit the site at these accesses. Therefore, the provision of one traffic controller is considered appropriate to manage/monitor the construction and pedestrian traffic.

5.3 Construction Vehicles

It is anticipated that the construction works will involve the following heavy vehicle types:

Articulated vehicles	19m
Truck and Dog Trailer	18m
Heavy rigid vehicles (HRV)	12.5m
Medium rigid vehicles (HRV)	8.8m
Small rigid vehicles (SRV)	6.4m
Bin trucks	10.2m
Mobile cranes	18.5m
Concrete trucks	8m
Single bogie	10.5m
Concrete pump truck	8.8m
Small utility vehicle/Van	5.2m
Glass lifter (façade installation)	4.3m

Details of critical vehicles swept paths are provided in Appendix C.

5.4 Construction Traffic Haulage Route

Generally, construction vehicles will have origins and destinations from a wide variety of locations throughout Sydney. However, all construction vehicles will be restricted to the State and Regional road network.

Dedicated construction vehicle routes have been developed with the aim to provide the shortest distances to/from the arterial road network while minimising the impact of construction traffic on streets within the vicinity of the site. As such, the dedicated construction vehicle routes will use Gilbert Road, with access to/from Showground Road and Old Northern Road.

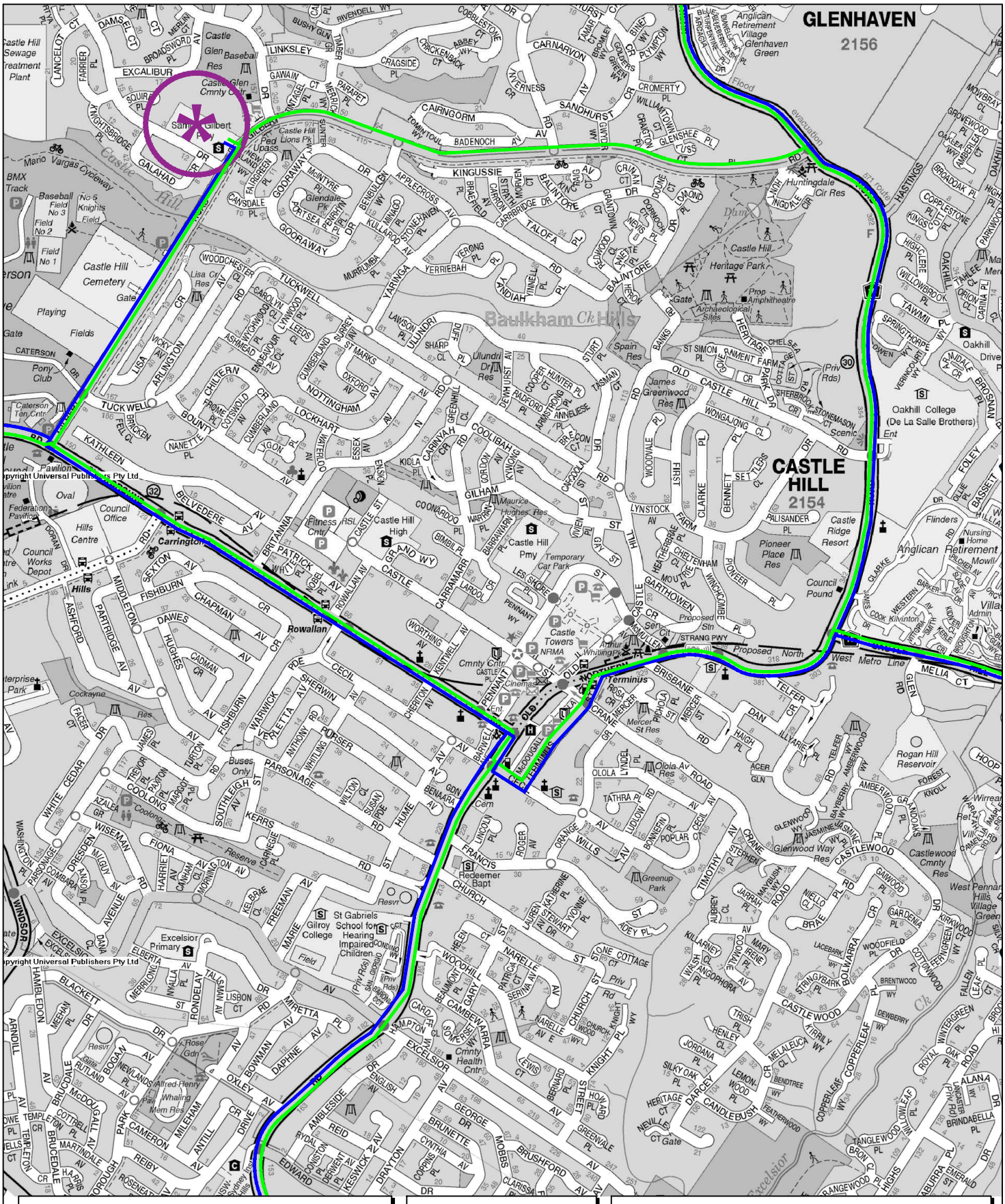
The construction program shall restrict deliveries and heavy vehicle traffic to occur during peak school traffic periods, i.e., 8 am to 9.30 am and from 2.30 to 4 pm.

Truck drivers will be advised of the designated truck routes to/ from the site. No queuing or marshalling of trucks will be permitted on public roads in the vicinity of the site.

Accredited traffic controllers will ensure they are in radio contact with truck drivers thus ensuring each vehicle's arrival is anticipated and planned. Such a process will be important in managing truck activity to ensure access to the construction site is available at all times and to remove any such likelihood of construction vehicles queuing and waiting along Gilbert Road to enter the site causing delays on surrounding roads. In addition, with only up to 15 truck visitations a day, it is very unlikely 2 trucks will arrive concurrently.

Construction activities at the site will generate vehicle trips primarily along Gilbert Road, Showground Road and Old Northern Road. These routes to/from Gilbert Road are shown in Figure 5.

The estimated number of construction vehicle movements per day throughout the construction stages are 6 (average) and 15 (maximum).


GLENHAVEN
2156
CASTLE HILL
2154
Castle Hill Heritage Park
Castle Hill Cemetery
Castle Hill Sewage Treatment Plant
Castle Hill Baseball Field No 1
Castle Hill Baseball Field No 2
Castle Hill Baseball Field No 3
Castle Hill Baseball No 5 Knights Field
Castle Hill Lions Pk
Castle Hill Pony Club
Castle Hill Caterson Ten Cntr
Castle Hill Fitness Cntr
Castle Hill High
Castle Hill Pmy
Castle Hill Pmy Temporary Car Park
Castle Hill Cmnty Cntr
Castle Hill Council Office
Castle Hill Council Works Depot
Castle Hill Hills Centre
Castle Hill Oval
Castle Hill Pavilion
Castle Hill Federation Pavilion
Castle Hill Gilbert Park
Castle Hill Glen Cmnty Cntr
Castle Hill Glen Baseball Res
Castle Hill Mario Vargas Cycleway
Castle Hill BMX Track
Castle Hill Playing Fields
Castle Hill Gate
Castle Hill Lisa Ct Res
Castle Hill Castle Glen Res
Castle Hill Castle Ridge Resort
Castle Hill Pioneer Place Res
Castle Hill Council Pound
Castle Hill Proposed Sen Stn
Castle Hill Proposed North West Metro Line
Castle Hill Prop Amphitheatre
Castle Hill Archaeological Sites
Castle Hill Castle Towers NFIMA
Castle Hill Arthur Whitling Pl
Castle Hill Maurice Hughes Res
Castle Hill Spain Res
Castle Hill James Greenwood Res
Castle Hill Ulundri Dr Res
Castle Hill Temporary Car Park
Castle Hill Cmnty Cntr Cinemas
Castle Hill Terminus
Castle Hill Oakhill College (De La Salle Brothers)
Castle Hill Oakhill Drive
Castle Hill Anglican Retirement Village Glenhaven Green
Castle Hill Anglican Retirement Village
Castle Hill Huntingdale Cir Res
Castle Hill Rogan Hill Reservoir
Castle Hill Castlewood Cmnty Res
Castle Hill Glenwood Way Res
Castle Hill Greenup Park
Castle Hill Olola Av Res
Castle Hill Mercer St Res
Castle Hill Cmnty Health Cntr
Castle Hill Redeemer Bapt Church
Castle Hill St Gabriels School for Hearing Impaired Children
Castle Hill Gilroy College
Castle Hill Excelsior Primary
Castle Hill Alfred Henry Whaling Mem Res
Castle Hill Rose Gdn
Castle Hill Resvr
Castle Hill Cockayne Res
Castle Hill Lisa Ct Res
Castle Hill Caterson Ten Cntr
Castle Hill Fiesta Reserve
Castle Hill Coolong Reserve
Castle Hill Cemetery
Castle Hill Gate
Castle Hill Playing Fields
Castle Hill Pony Club
Castle Hill Oval
Castle Hill Pavilion
Castle Hill Federation Pavilion
Castle Hill Hills Centre
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Castle Hill Cmnty Cntr
Castle Hill Glen Baseball Res
Castle Hill Glen Cmnty Cntr
Castle Hill Mario Vargas Cycleway
Castle Hill BMX Track
Castle Hill Playing Fields
Castle Hill Gate
Castle Hill Lisa Ct

5.5 Other General Requirements for Trucks

All drivers of vehicles transporting loose materials will be required to ensure the entire load is covered using a tarpaulin or similar impervious material. The vehicle driver will need to take all precautions to prevent any excess dust or dirt particles depositing onto the roadway during travel to and from the site. Truck shaker grids and wheel wash stations shall be positioned at all entry/exit points. The respective trades will be inducted by the head contractor into the above procedures and monitor all trucks entering and exiting the site to ensure the procedures are met.

The contractor will be required to monitor the roadways leading to and from the site on a daily basis and take all necessary steps to rectify any adversely impacted road deposits caused by site vehicles. The roads will also be cleaned on a regular basis to minimise dirt particles depositing externally from the site. Such cleaning will occur in the evenings outside of peak traffic period.

Vehicles traveling to, from and within the site shall not create unreasonable or unnecessary noise or vibration to minimise interference to adjoining building operations. No tracked vehicles will be permitted or required on any paved roads. Public roads and access points will not be obstructed by any materials, vehicles, refuse skips or the like, under any circumstances. All deliveries and works will be carried out within the site at the designated works zone and site. If there is a requirement to operate any material handling machinery on public access roads, the contractor will be required to seek separate Council/Police/RMS/ Buses approval prior to the works.

5.6 Occupational Health and Safety

Any workers required to undertake works or traffic control within the public domain shall be suitably trained and covered by adequate and appropriate insurances. All traffic control personnel will be required to hold RMS accreditation in accordance with Section 8 of Traffic Control at Worksites.

5.7 Emergency Vehicle Access

Access to the site and neighbouring sites by emergency vehicles would not be affected by the proposed construction zones within the bounds of the construction site and the works zone.

Emergency protocols on the site would indicate a requirement for the traffic controller to assist with emergency access from Gilbert Road. All truck movements to the site construction zone and the incident point would be suspended and cleared. Consequently, any potential impacts on emergency access would be effectively managed throughout the works.

The liaison would be maintained with the police and emergency services agencies throughout the construction period, and a 24-hour contact would be made available for 'out-of-hours' emergencies and access.

Thus, there would be no adverse impacts on the provision of existing emergency vehicle access to the site or other neighbouring properties as a result of the proposed construction activities.

5.8 Workers' Site Induction

All workers and sub-contractors employed on the site will be required to undertake a formal 'site induction' process prior to the undertaking of any task, and all the inductions will be performed specifically to each trade according to Workplace Health and Safety requirements.

During the conduct of this program, workers will be advised that parking will not be provided on-site. All vehicles associated with the development shall be parked wholly within the site. All site staff related to the works are to park in a designated off-street area or be encouraged to use public transport and not park on the public road.

The induction will also include the delivery of Truck Driver Code of Conduct (see Appendix D) to encourage compliance and acceptance by all heavy vehicle drivers servicing the site.

5.9 Traffic Guidance Scheme

The TGS presents the principles of traffic management, with the detailed information for worksite operations is contained in the Roads and Maritime Services Traffic Control at Work Sites Technical Manual Version 5.0 dated 27 July 2018. The control of traffic at work sites must be undertaken with reference to Workcover requirements and Hutchinson Workplace Health and Safety Manuals.

The TGS is prepared by a Certified Traffic Controller (under RMS regulations) in accordance with Australian Standards 1742.3. The TGS includes:

- The proposed works site and zones
- Trained site personnel at the site vehicle accesses
- Accredited Traffic controllers
- Truck (crossing and entering) and traffic controller signage

The TGSs for the construction processes are provided in Appendix E.

5.10 Road Condition

A dilapidation report will be produced prior to commencement of the works to identify impacts of heavy vehicles on Councils infrastructure, i.e. round-a-bout at Gilbert Road and Ridgecrop Drive. Hutchinson will be responsible for rectifying any damage to roadside infrastructure during construction.

5.11 Contact Details

The contact details for the day to day activities on the site will be the Hutchinson Project Manager:

Andy Smith
T 02 8344 2400
M 0400 323 498
E Andy.smith@hutchinsonbuilders.com.au

6.0 Construction Traffic Impact Assessment

6.1 Construction Traffic

As articulated in the preceding section, the construction works will involve a variety of construction vehicles ranging between a semi-trailer and a normal utility vehicle. The envisaged construction traffic movements vary from time to time, depending on a range of factors including:

- Processes
- Weather
- Time of day

Peak vehicle volumes would be in the order of 6 vehicles (12 movements) per day or a maximum of 15 vehicles (30 movements) per hour, which would occur outside of peak traffic periods wherever feasible to minimise traffic impacts and associated road network delays. Construction vehicle movements should also be managed to occur outside the peak pedestrian movements along Gilbert Road during the weekday.

Hutchinson should review and optimise the construction activities (e.g., store vehicles on-site if possible, load the vehicles in the morning peak period and depart during the off-peak period, and/or stockpile on-site and load-out during off-peak periods) to allow construction vehicle movements to occur outside the peak hours.

Construction truck drivers will be reminded that there should be no idling on and the use of Gilbert Road and Ridgecrop Drive as a marshalling area.

With the above measures, it is not expected that this level of traffic movement would create any adverse impact on the surrounding road network.

6.2 Impact on On-Street Parking

The 40m works zone on Gilbert Road would result in the temporary loss of 6 to 7 unrestricted on-street parking spaces would be occupied by the works zone. The temporary construction driveway would result in the temporary loss of unrestricted spaces outside of the set-down and pick-up hours. In summary, the construction processes will result in a temporary loss of 9 on-street parking spaces.

The temporary removal of these spaces is not anticipated to have an adverse impact on parking in the area, due to the availability of on-street parking

Based on the parking survey, at the busiest AM and PM peaks, there will be at least 196 and 126 spaces (of a total of 285 spaces) available in the surrounding streets respectively. The loss of 7 spaces represents remaining spare capacities of 187 and 117 on-street spaces during the AM and PM peaks, respectively.

Workers' Parking

No on-site car parking spaces will be provided. There will be 99 workers on-site during the peak period of the construction. While there is a minimum of 117 on-street spaces available in the surrounding streets during the School's busiest period to accommodate all workers should they choose to drive to/from the site, all workers will be encouraged to use public transport to access the site given the site's proximity to high-frequency public transport services or to carpool wherever possible to access the site.

The following measures will be incorporated to encourage more sustainable travel use:

- Provide an access pack to all workers and regular visitors including the transport access guide (TAG) and information on sustainable travel facilities including estimates of time taken to the bus stops, metro stations and other local destinations. This will be incorporated into the site induction program.
- Provide public transport information boards at the site office and meal rooms to make workers and regular visitors more aware of the alternative transport options

available. These will include all bus routes servicing the site and each corridor on the CityRail/Sydney Metro network.

- Provide a tool drop-off and storage facility within the site boundary near the site accesses along Gilbert Road. This would allow tradespeople to drop off and store their tools and machinery, allowing them to use public transport to travel to/ from the site on a daily basis.

Workers will be directed to park their vehicles further away from the School and not to use on-street parking along the immediate School's frontages on Ridegcrop Drive and Gilbert Road, noting the removal of some on-street parking spaces on Gilbert Road for the construction driveway. This will allow better access for parents/carers to park closer to the school entrances.

The workers will also be instructed to not use the off-street carpark within the School and Knightsbridge Shopping Centre compounds.

Hutchinson would take appropriate action if informed of this activity occurring.

6.3 Impact on Public Transport Services

As indicated in Figure 5, the heavy vehicle haulage routes will largely be limited on arterial and sub-arterial roads designed to accommodate heavy vehicle movements. As such, the impacts on public transport services will be minimal on the approach/departure routes.

6.4 Impact on Pedestrians and Cyclists

During construction, pedestrian and future cyclist movements along Gilbert Road and Ridgecrop Drive will be maintained at all times. Pedestrian safety is paramount at the site access and works zone locations on Gilbert Road with the School, childcare centre, shops, bus stops and pedestrian signals in this location to be carefully managed by traffic controllers.

A mix of A-Class hoarding and chain fencing would be erected around the perimeter of the site. A traffic controller would be present during construction hours to manage construction vehicle entry and exit and pedestrian movements at the site access/works zone, noting that pedestrian priority would be given. Outside of construction hours, gates would be installed to prevent pedestrians from entering the construction site. Notwithstanding, all construction-related traffic movements within the site will occur under the supervision of an accredited traffic controller, with trucks escorted between the access gate and the road. To minimise disruption to pedestrian and cycle movements, it is advised that truck movements are managed, wherever possible, to occur outside of peak commuting periods.

6.5 Traffic Movements in Adjoining Council Areas

No adverse effects are expected from the movement of heavy vehicles through adjacent council areas.

6.6 Consultation, Communication and Liaison

The management strategies were established firstly by identifying the relevant stakeholders and future coordination/liaison requirements with the following:

- The School
- The Hills Shire Council
- TfNSW
- Roads and Maritime Services
- Surrounding residential tenants/owners

Details of consultation with Council and TfNSW are provided in Appendix F.

Hutchinson shall maintain regular contact with the above stakeholders in relation to the construction works and timing thereof as well as of any potential disruptions to routes.

Works notification process

Works notifications are Hutchinson's prescribed notification requirement that provides

specific information about construction activities, such as what will be happening, when, and what the impacts will be.

They will be the primary mechanism to inform the community and key stakeholders about the impact of school construction on the local area and will provide advance warning of activities and planned disruptions, allowing stakeholders and community members to plan for the impacts and make alternative arrangements where required. Timeframes are highlighted in the table below.

Works notifications with be via locally based information booth, DoE approved site signage and will Hutchison builders with providing status information for the DoE's public communication department to issue to the community.

Works activity	Minimum community notification period*
Notification to communities following a major incident	Same day
Emergency works/unforeseen events	Same day
Upcoming works notification (minimum disruption)	5- 7 days
Invitation/notification of community event (e.g. info booth)	5 – 7 days
Notifications regarding traffic changes, parking impacts, road closures, major detours	10 – 14 days
Pedestrian route changes and other impacts	10 – 14 days
Notifications regarding operational changes for the school community (school drop-off points, entry and exit points)	10 - 14 days
Major construction impacts (out of hours/ significant noise/ demolition)	10 – 14 days
Pedestrian route changes and other impacts	10 – 14 days
Major impacts on the school community	6 months

It is noted that the consultation with the School and any affected residents regarding any proposed changes to parking or access around the School is ongoing as required.

6.7 Site Inspections and Record-Keeping

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

6.8 Monitoring, Reviews and Communication

Monitoring, Reviews and Communication will be as per the HB CEMP Section 7 (Communication & Reporting) and Section 9 (Monitoring & Reviewing of Environmental Performances) as well as the requirements within SSD 9274.

Appendix A

Revised Architectural Plans

1 PLAN
PROPOSED SITE PLAN
SCALE: 1:500

50 100 150mm @ A1

plot date: Tuesday, 7 May 2019 file location: BIM Server: sydbimsyd 21 - BIM Server 21/7068 SGPS

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PROPOSED SITE PLAN LEGEND

- EXISTING BUILDINGS TO BE RETAINED
- EXISTING BUILDINGS TO BE REFURBISHED
- PROPOSED BUILDINGS
- EXISTING TREES
- PROPOSED TREES
- SITE BOUNDARY
- ROOF OVER
- CONTOURS
- FENCE: EXISTING
- NEW

P15	SSDA Draft Issue	05/11/18	AB
P16	SSDA Final Coordination Issue	07.11.18	AB
P17	SSDA Final Coordination Issue REV A	08.11.18	AB
P18	SSDA Issue	12/11/18	AB
P19	SD ISSUE	19/11/18	AB
P20	SD Draft Amendments	05/02/18	WG
P21	Revised SSDA Issue	28/02/19	AB
P22	SSDA Response to Submissions	13/03/19	AB
P23	SSDA Response to Submissions	07/05/19	AB
REV.	DESCRIPTION	DATE	INIT.

fulton trotter
ARCHITECTS

SYDNEY
Level 3, 35 Spring Street t. (02) 9369 5941
PO Box 1669 e. sydney@fultontrotter.com.au
Bondi Junction, NSW 2022

BRISBANE
SYDNEY

DIRECTORS

Greg Isaac raia		NSW 6855	QLD 2920
Justine Elbzery raia			QLD 3313
John Ward raia	VIC 18804	NSW 8371	QLD 3847
Katerina Dracopoulos raia			QLD 4529
Mark Trotter fraia	VIC 17691	NSW 4421	QLD 1870
Nathan Hildebrandt raia		NSW 10256	QLD 4131
Paul Sekava raia		NSW 7180	QLD 3108
Paul Trotter fraia		NSW 7177	QLD 2646
Ryan Loveday raia			QLD 4500
Robert Wesener fraia		NSW 5802	QLD 2633

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PHASE **SCHEMATIC DESIGN**

CLIENT NSW Department of Education

PROJECT Samuel Gilbert Public School

ADDRESS Ridgecrop Drive
Castle Hill, NSW

DRAWING **PROPOSED SITE PLAN**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

PROJECT NUMBER	DIRECTOR	CHECKED
7068SG01	JW	AS

DRAWING NUMBER **SD1001**

REVISION **P23**

Appendix B

Public Transport Provision

Sydney rail network

NSW GOVERNMENT | Transport

M Metro T Trains

Sydney metro and train lines

M *Metro North West Line* — Chatswood, Tallawong

T1 *North Shore & Western Line* — North Shore, Western, Richmond

T2 *Inner West & Leppington Line* — Inner West, Leppington, City

T3 *Bankstown Line* — Liverpool, Lidcombe, City

T4 *Eastern Suburbs & Illawarra Line* — Eastern Suburbs, Illawarra, Cronulla

T5 *Cumberland Line* — Leppington, Richmond

T6 *Carlingford Line* — Carlingford, Clyde

T7 *Olympic Park Line* — Olympic Park, Lidcombe

T8 *Airport & South Line* — Airport, South, City

T9 *Northern Line* — Northern, Gordon

Stop · Interchange · Interchange · End of line

NORTH

Line under construction

Check timetables and trip planners for train services and connections

Visit **transportnsw.info**

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1812TMS-E-MWT-A4P

603 Rouse Hill Station to Parramatta via Glenhaven

B

How to use this timetable

This timetable provides a snapshot of service information in 24-hour time (e.g. 5am = 05:00, 5pm = 17:00). Information contained in this timetable is subject to change without notice. Please note that timetables do not include minor stops, additional trips for special events, short term changes, holiday timetable changes, real-time information or any disruption alerts.

For the most up-to-date times, use the Trip Planner or Departures on **transportnsw.info**

Real-time planning

You can plan your trip with real-time information using the Trip Planner or Departures on **transportnsw.info** or by downloading travel apps on your smartphone or tablet.

The Trip Planner, Departures and travel apps offer various features:

- favourite your regular trips
- see where your service is on the route
- get estimated pick up and arrival times
- receive service updates
- find nearby stations, stops, wharves and routes
- check accessibility information

Find the latest apps at **transportnsw.info/apps**

Accessible services

All new buses are wheelchair-accessible with low-level floors and space for wheelchairs, prams or strollers. Look for the ♿ symbol in this timetable. Some older buses may not have all the features you need. There will be more accessible services as older buses are replaced.

Who is providing my bus services?

The bus services shown in this timetable are run by Hillsbus.

Fares

In Sydney and surrounding regions, fares are based on:

- the distance you travel from tap on to tap off
- the mode of transport you choose
- whether you're eligible for a concession fare or free travel
- any Opal benefits such as discounts and capped fares that apply

You can use an Opal card or a contactless payment to pay for your travel.

Opal cards

An Opal card is a smartcard you keep and reuse. Add value before you travel and tap on and tap off to pay your fares throughout Sydney, the Blue Mountains, Central Coast, the Hunter and the Illawarra.

Which Opal card is right for you?

Adult - Customers 16 years and over who are not entitled to any concessions and normally pay full fare.

Child/Youth - For customers aged 4-15 (inclusive), or customers 16 years or older who hold a NSW/ACT Senior Secondary Student Concession Card.

Gold Senior/Pensioner - For eligible NSW and interstate seniors, pensioners, war widows/ers and asylum seekers.

Concession - For eligible tertiary students, job seekers, apprentices and trainees.

How to get an Opal card

You can get an Adult or Child/Youth Opal card over the counter at Opal retailers that display the Opal sign. To find your nearest retailer visit **transportnsw.info/opal**.

If you are eligible to travel with concession fares you can apply for a Gold Senior/Pensioner or Concession Opal card online. Visit **transportnsw.info/opal** for more information.

Contactless payments

If you have an American Express, Mastercard, Visa card or linked device, you can use it to pay for all public transport on the Opal network. Just make sure to tap on and tap off at Opal readers at the beginning and end of your trip.

Always separate your cards when you tap on and tap off so your preferred card is charged.

You will receive the same travel benefits of an Adult Opal card when you tap on and tap off consistently with the same credit card, debit card or linked device. This includes daily, weekly and Sunday travel caps, and a $2 transfer discount when you change between metro/train, ferry, bus or light rail services within 60 minutes. Adult Opal fare pricing applies.

Find out more at **transportnsw.info/contactless**

Explanation of definitions and symbols

♿	Wheelchair Accessible
B	Diverts via Greenbank Dr loop

NSW GOVERNMENT | Transport

603 Rouse Hill Station to Parramatta via Glenhaven

B

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Always separate your cards when you tap on and tap off so your preferred card is charged.

You will receive the same travel benefits of an Adult Opal card when you tap on and tap off consistently with the same credit card, debit card or linked device. This includes daily, weekly and Sunday travel caps, and a $2 transfer discount when you change between metro/train, ferry, bus or light rail services within 60 minutes. Adult Opal fare pricing applies.

Find out more at **transportnsw.info/contactless**

Explanation of definitions and symbols

♿	Wheelchair Accessible
B	Diverts via Greenbank Dr loop

NSW GOVERNMENT | Transport

603 Rouse Hill Station to Parramatta via Glenhaven

B

How to use this timetable

This timetable provides a snapshot of service information in 24-hour time (e.g. 5am = 05:00, 5pm = 17:00). Information contained in this timetable is subject to change without notice. Please note that timetables do not include minor stops, additional trips for special events, short term changes, holiday timetable changes, real-time information or any disruption alerts.

For the most up-to-date times, use the Trip Planner or Departures on **transportnsw.info**

Real-time planning

You can plan your trip with real-time information using the Trip Planner or Departures on **transportnsw.info** or by downloading travel apps on your smartphone or tablet.

The Trip Planner, Departures and travel apps offer various features:

- favourite your regular trips
- see where your service is on the route
- get estimated pick up and arrival times
- receive service updates
- find nearby stations, stops, wharves and routes
- check accessibility information

Find the latest apps at **transportnsw.info/apps**

Accessible services

All new buses are wheelchair-accessible with low-level floors and space for wheelchairs, prams or strollers. Look for the ♿ symbol in this timetable. Some older buses may not have all the features you need. There will be more accessible services as older buses are replaced.

Who is providing my bus services?

The bus services shown in this timetable are run by Hillsbus.

Fares

In Sydney and surrounding regions, fares are based on:

- the distance you travel from tap on to tap off
- the mode of transport you choose
- whether you're eligible for a concession fare or free travel
- any Opal benefits such as discounts and capped fares that apply

You can use an Opal card or a contactless payment to pay for your travel.

Opal cards

An Opal card is a smartcard you keep and reuse. Add value before you travel and tap on and tap off to pay your fares throughout Sydney, the Blue Mountains, Central Coast, the Hunter and the Illawarra.

Which Opal card is right for you?

Adult - Customers 16 years and over who are not entitled to any concessions and normally pay full fare.

Child/Youth - For customers aged 4-15 (inclusive), or customers 16 years or older who hold a NSW/ACT Senior Secondary Student Concession Card.

Gold Senior/Pensioner - For eligible NSW and interstate seniors, pensioners, war widows/ers and asylum seekers.

Concession - For eligible tertiary students, job seekers, apprentices and trainees.

How to get an Opal card

You can get an Adult or Child/Youth Opal card over the counter at Opal retailers that display the Opal sign. To find your nearest retailer visit **transportnsw.info/opal**.

If you are eligible to travel with concession fares you can apply for a Gold Senior/Pensioner or Concession Opal card online. Visit **transportnsw.info/opal** for more information.

Contactless payments

If you have an American Express, Mastercard, Visa card or linked device, you can use it to pay for all public transport on the Opal network. Just make sure to tap on and tap off at Opal readers at the beginning and end of your trip.

Always separate your cards when you tap on and tap off so your preferred card is charged.

You will receive the same travel benefits of an Adult Opal card when you tap on and tap off consistently with the same credit card, debit card or linked device. This includes daily, weekly and Sunday travel caps, and a $2 transfer discount when you change between metro/train, ferry, bus or light rail services within 60 minutes. Adult Opal fare pricing applies.

Find out more at **transportnsw.info/contactless**

Explanation of definitions and symbols

♿	Wheelchair Accessible
B	Diverts via Greenbank Dr loop

NSW GOVERNMENT | Transport

603 Parramatta to Rouse Hill Station via Glenhaven

B

Valid from: 17 Nov 2019

Creation date: 01 Nov 2019
NOTE: Information is correct on date of download.

Monday to Friday	♿	♿	♿	♿	♿	♿		♿	♿
Castle Hill Station	-	-	-	-	-	-	07:00	-	07:30
Old Northern Rd opp Oakhill College, Castle Hill	-	-	-	-	-	-	07:03	-	07:34
Ridgecrop Dr opp Samuel Gilbert Public School, Castle Hill	-	-	-	-	-	-	07:09	-	07:41
Greenbank Dr before Grange Rd, Glenhaven	-	-	-	-	-	-	07:15	-	07:47
Old Glenhaven Rd after Finley Pl, Glenhaven	-	-	-	-	-	-	07:20	-	07:52
Mills Rd before Glenhaven Rd, Glenhaven	-	-	-	-	-	-	07:24	-	07:56
Samantha Riley Dr opp Foxall Rd, North Kellyville	05:55	06:15	06:30	06:45	07:00	07:15	07:29	07:45	08:01
Kellyville Station	06:03	06:24	06:39	06:54	07:11	07:26	07:42	07:58	08:14
Merriville Rd at Vinegar Hill Rd, Kellyville Ridge	-	-	-	-	-	-	07:51	-	08:23
Rouse Hill Station	-	-	-	-	-	-	08:00	-	08:32

Monday to Friday	♿	♿		♿	♿	♿	♿	♿	♿
Parramatta Station	-	07:12	-	-	07:50	08:30	09:05	10:05	11:05
Church St opp St Patrick's Cemetery, North Parramatta	-	07:22	-	-	08:00	08:40	09:14	10:13	11:13
Windsor Rd after Churchill Dr, Winston Hills	-	07:34	-	-	08:15	08:54	09:23	10:19	11:19
Cross St after Baker Cres, Baulkham Hills	-	07:42	-	-	08:23	09:01	09:30	10:25	11:25
Old Northern Rd after Excelsior Ave, Castle Hill	-	07:49	-	-	08:30	09:07	09:36	10:30	11:30
Castle Hill Station	-	07:57	-	-	08:38	09:15	09:44	10:38	11:38
Old Northern Rd opp Oakhill College, Castle Hill	-	08:01	-	-	08:42	09:18	09:47	10:41	11:41
Ridgecrop Dr opp Samuel Gilbert Public School, Castle Hill	-	08:09	-	-	08:50	09:24	09:53	10:47	11:47
Greenbank Dr before Grange Rd, Glenhaven	-	08:15	-	-	08:56	09:30	09:59	10:53	11:53
Old Glenhaven Rd after Finley Pl, Glenhaven	-	08:20	-	-	09:01	09:34	10:03	10:57	11:57
Mills Rd before Glenhaven Rd, Glenhaven	-	08:24	-	-	09:05	09:38	10:07	11:01	12:01
Samantha Riley Dr opp Foxall Rd, North Kellyville	08:15	08:29	08:45	09:00	09:10	09:43	10:12	11:06	12:06
Kellyville Station	08:28	08:42	08:58	09:09	09:19	09:52	10:20	11:14	12:14
Merriville Rd at Vinegar Hill Rd, Kellyville Ridge	-	08:51	-	-	09:26	09:59	10:27	11:21	12:21
Rouse Hill Station	-	09:00	-	-	09:35	10:08	10:36	11:30	12:30

Monday to Friday	♿	♿	♿	♿	♿		♿	♿	♿
Parramatta Station	12:05	13:05	13:55	14:25	-	14:55	-	15:25	15:55
Church St opp St Patrick's Cemetery, North Parramatta	12:13	13:14	14:04	14:34	-	15:05	-	15:35	16:05
Windsor Rd after Churchill Dr, Winston Hills	12:19	13:21	14:12	14:42	-	15:13	-	15:43	16:14
Cross St after Baker Cres, Baulkham Hills	12:25	13:27	14:18	14:48	-	15:20	-	15:50	16:21
Old Northern Rd after Excelsior Ave, Castle Hill	12:30	13:32	14:24	14:54	-	15:26	-	15:56	16:27
Castle Hill Station	12:38	13:40	14:32	15:02	15:17	15:34	15:49	16:04	16:35
Old Northern Rd opp Oakhill College, Castle Hill	12:41	13:43	14:35	15:06	15:21	15:39	15:54	16:08	16:39
Ridgecrop Dr opp Samuel Gilbert Public School, Castle Hill	12:47	13:49	14:43	15:14	**B**15:29	**B**15:47	**B**16:02	**B**16:16	**B**16:47
Greenbank Dr opp Beacon Ave, Glenhaven	–	–	–	–	15:38	15:56	16:11	16:25	16:56
Greenbank Dr before Grange Rd, Glenhaven	12:53	13:55	14:49	15:20	15:40	15:58	16:13	16:27	16:58
Old Glenhaven Rd after Finley Pl, Glenhaven	12:57	13:59	14:55	15:26	15:45	16:03	16:18	16:32	17:03
Mills Rd before Glenhaven Rd, Glenhaven	13:01	14:03	14:59	15:30	15:49	16:07	16:22	16:36	17:07
Samantha Riley Dr opp Foxall Rd, North Kellyville	13:06	14:08	15:04	15:35	15:54	16:12	16:27	16:41	17:12
Kellyville Station	13:14	14:16	15:14	15:45	16:04	16:22	16:37	16:51	17:22
Merriville Rd at Vinegar Hill Rd, Kellyville Ridge	13:21	14:23	15:22	15:53	-	16:30	-	16:59	17:30
Rouse Hill Station	13:30	14:32	15:32	16:03	-	16:40	-	17:09	17:40

603 Parramatta to Rouse Hill Station via Glenhaven

B

Monday to Friday							
Parramatta Station	16:25	16:55	17:25	17:55	18:25	19:25	-
Church St opp St Patrick's Cemetery, North Parramatta	16:35	17:05	17:35	18:05	18:35	19:33	-
Windsor Rd after Churchill Dr, Winston Hills	16:44	17:15	17:45	18:13	18:42	19:39	-
Cross St after Baker Cres, Baulkham Hills	16:52	17:23	17:53	18:20	18:49	19:45	-
Old Northern Rd after Excelsior Ave, Castle Hill	16:59	17:30	18:00	18:26	18:55	19:51	-
Castle Hill Station	17:07	17:38	18:08	18:34	19:02	19:58	21:00
Old Northern Rd opp Oakhill College, Castle Hill	17:11	17:42	18:11	18:37	19:05	20:01	21:03
Ridgecrop Dr opp Samuel Gilbert Public School, Castle Hill	B17:19	B17:49	B18:18	B18:44	B19:11	20:07	21:09
Greenbank Dr opp Beacon Ave, Glenhaven	17:27	17:57	18:25	18:51	19:18	–	–
Greenbank Dr before Grange Rd, Glenhaven	17:29	17:59	18:27	18:53	19:20	20:13	21:15
Old Glenhaven Rd after Finley Pl, Glenhaven	17:34	18:03	18:31	18:57	19:24	20:17	21:19
Mills Rd before Glenhaven Rd, Glenhaven	17:38	18:07	18:35	19:01	19:28	20:21	21:23
Samantha Riley Dr opp Foxall Rd, North Kellyville	17:43	18:12	18:40	19:06	19:33	-	-
Kellyville Station	17:53	18:20	18:48	19:13	19:40	-	-
Merriville Rd at Vinegar Hill Rd, Kellyville Ridge	18:01	18:27	18:55	19:20	19:47	-	-
Rouse Hill Station	18:10	18:36	19:04	19:29	19:56	-	-

Saturday									
Parramatta Station	-	-	-	10:06	11:06	12:06	13:06	14:06	15:06
Church St opp St Patrick's Cemetery, North Parramatta	-	-	-	10:14	11:14	12:14	13:14	14:14	15:14
Windsor Rd after Churchill Dr, Winston Hills	-	-	-	10:20	11:20	12:21	13:21	14:21	15:21
Cross St after Baker Cres, Baulkham Hills	-	-	-	10:25	11:25	12:26	13:26	14:26	15:26
Old Northern Rd after Excelsior Ave, Castle Hill	-	-	-	10:31	11:31	12:32	13:32	14:32	15:32
Castle Hill Station	07:36	08:36	09:36	10:37	11:38	12:39	13:39	14:39	15:39
Old Northern Rd opp Oakhill College, Castle Hill	07:39	08:39	09:39	10:40	11:41	12:42	13:42	14:42	15:42
Ridgecrop Dr opp Samuel Gilbert Public School, Castle Hill	07:44	08:44	09:44	10:45	11:47	12:48	13:48	14:48	15:48
Greenbank Dr before Grange Rd, Glenhaven	07:50	08:50	09:50	10:51	11:53	12:54	13:54	14:54	15:54
Old Glenhaven Rd after Finley Pl, Glenhaven	07:54	08:54	09:54	10:55	11:57	12:58	13:58	14:58	15:58
Mills Rd before Glenhaven Rd, Glenhaven	07:58	08:58	09:58	10:59	12:01	13:02	14:02	15:02	16:02
Samantha Riley Dr opp Foxall Rd, North Kellyville	08:02	09:02	10:02	11:04	12:06	13:07	14:07	15:07	16:07
Kellyville Station	08:09	09:09	10:09	11:14	12:16	13:17	14:15	15:15	16:15
Merriville Rd at Vinegar Hill Rd, Kellyville Ridge	08:16	09:16	10:16	11:21	12:23	13:24	14:22	15:22	16:22
Rouse Hill Station	08:23	09:23	10:23	11:29	12:31	13:32	14:30	15:30	16:30

Saturday					
Parramatta Station	16:06	17:06	18:06	19:06	-
Church St opp St Patrick's Cemetery, North Parramatta	16:14	17:14	18:14	19:14	-
Windsor Rd after Churchill Dr, Winston Hills	16:21	17:21	18:20	19:19	-
Cross St after Baker Cres, Baulkham Hills	16:26	17:26	18:25	19:24	-
Old Northern Rd after Excelsior Ave, Castle Hill	16:32	17:32	18:30	19:29	-
Castle Hill Station	16:39	17:38	18:36	19:34	20:36
Old Northern Rd opp Oakhill College, Castle Hill	16:42	17:41	18:39	19:37	20:39
Ridgecrop Dr opp Samuel Gilbert Public School, Castle Hill	16:48	17:47	18:45	19:42	20:44
Greenbank Dr before Grange Rd, Glenhaven	16:54	17:53	18:51	19:48	20:50
Old Glenhaven Rd after Finley Pl, Glenhaven	16:58	17:57	18:55	19:52	20:54
Mills Rd before Glenhaven Rd, Glenhaven	17:02	18:01	18:59	19:56	20:58
Samantha Riley Dr opp Foxall Rd, North Kellyville	17:07	18:06	19:04	20:01	21:02
Kellyville Station	17:15	18:14	19:12	20:09	21:09
Merriville Rd at Vinegar Hill Rd, Kellyville Ridge	17:22	18:21	19:19	20:16	21:16
Rouse Hill Station	17:30	18:29	19:27	20:24	21:23

603 Parramatta to Rouse Hill Station via Glenhaven

B

Sunday & Public Holidays	♿	♿	♿	♿	♿	♿	♿	♿	♿
Castle Hill Station	08:25	09:25	10:25	11:25	12:25	13:25	14:25	15:25	16:25
Old Northern Rd opp Oakhill College, Castle Hill	08:28	09:28	10:28	11:28	12:28	13:28	14:28	15:28	16:28
Ridgecrop Dr opp Samuel Gilbert Public School, Castle Hill	08:33	09:33	10:33	11:33	12:33	13:33	14:33	15:33	16:33
Greenbank Dr before Grange Rd, Glenhaven	08:38	09:38	10:38	11:38	12:38	13:38	14:38	15:38	16:38
Old Glenhaven Rd after Finley Pl, Glenhaven	08:42	09:42	10:42	11:42	12:42	13:42	14:42	15:42	16:42
Mills Rd before Glenhaven Rd, Glenhaven	08:46	09:46	10:46	11:46	12:46	13:46	14:46	15:46	16:46
Samantha Riley Dr opp Foxall Rd, North Kellyville	08:50	09:50	10:50	11:50	12:50	13:50	14:50	15:50	16:50
Kellyville Station	08:56	09:56	10:56	11:57	12:57	13:57	14:57	15:57	16:57
Merriville Rd at Vinegar Hill Rd, Kellyville Ridge	09:03	10:03	11:03	12:04	13:04	14:04	15:04	16:04	17:04
Rouse Hill Station	09:10	10:10	11:11	12:12	13:12	14:12	15:12	16:12	17:12

Sunday & Public Holidays	♿	♿	♿
Castle Hill Station	17:25	18:25	19:25
Old Northern Rd opp Oakhill College, Castle Hill	17:28	18:28	19:28
Ridgecrop Dr opp Samuel Gilbert Public School, Castle Hill	17:33	18:33	19:33
Greenbank Dr before Grange Rd, Glenhaven	17:38	18:38	19:38
Old Glenhaven Rd after Finley Pl, Glenhaven	17:42	18:42	19:42
Mills Rd before Glenhaven Rd, Glenhaven	17:46	18:46	19:46
Samantha Riley Dr opp Foxall Rd, North Kellyville	17:50	18:50	19:50
Kellyville Station	17:57	18:57	19:57
Merriville Rd at Vinegar Hill Rd, Kellyville Ridge	18:04	19:04	20:04
Rouse Hill Station	18:12	19:12	20:12

603 Rouse Hill Station to Parramatta via Glenhaven

B

Monday to Friday	♿	♿	♿		♿	♿	♿	♿	♿
Rouse Hill Station	05:50	06:15	06:30	06:45	07:00	-	07:25	07:55	08:55
Merriville Rd at Perfection Ave, Kellyville Ridge	05:54	06:19	06:34	06:49	07:04	-	07:29	07:59	08:59
Kellyville Station	06:00	06:25	06:40	06:55	07:12	07:26	07:40	08:10	09:08
Samantha Riley Dr opp Foxall Rd, North Kellyville	06:06	06:31	06:46	07:01	07:18	07:33	07:48	08:20	09:14
Mills Rd after Glenhaven Rd, Glenhaven	06:11	06:36	06:51	07:06	07:23	07:38	07:56	08:28	09:19
Living Choice Glenhaven, Old Glenhaven Rd, Glenhaven	06:16	06:41	06:56	07:12	07:29	07:44	08:02	08:34	09:24
Greenbank Dr after Grange Rd, Glenhaven	06:21	B06:46	B07:01	B07:17	B07:35	B07:50	B08:08	08:40	09:29
Greenbank Dr opp Beacon Ave, Glenhaven	–	06:47	07:02	07:18	07:36	07:51	08:09	–	–
Samuel Gilbert Public School, Ridgecrop Dr, Castle Hill	06:28	06:55	07:10	07:26	07:44	07:59	08:17	08:48	09:35
Oakhill College, Old Northern Rd, Castle Hill	06:36	07:03	07:18	07:36	07:55	08:10	08:28	08:57	09:43
Castle Hill Station	06:42	07:10	07:25	07:44	08:03	08:18	08:35	09:04	09:50
Excelsior Ave after Old Northern Rd, Castle Hill	06:47	07:17	07:32	07:51	08:10	-	08:42	09:08	09:54
Cross St opp Baker Cres, Baulkham Hills	06:52	07:23	07:38	07:57	08:16	-	08:48	09:14	09:59
Windsor Rd after Mary St, Northmead	07:00	07:32	07:49	08:08	08:27	-	08:57	09:22	10:06
Church St before Fennell St, Parramatta	07:09	07:43	08:00	08:20	08:39	-	09:08	09:32	10:14
Parramatta Station	07:21	07:58	08:16	08:36	08:56	-	09:22	09:44	10:26

Monday to Friday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Rouse Hill Station	09:55	10:55	11:55	12:55	13:55	14:55	15:25	-	15:55
Merriville Rd at Perfection Ave, Kellyville Ridge	09:59	10:59	11:59	12:59	13:59	15:00	15:30	-	16:00
Kellyville Station	10:06	11:06	12:06	13:06	14:06	15:12	15:40	15:55	16:08
Samantha Riley Dr opp Foxall Rd, North Kellyville	10:12	11:12	12:12	13:12	14:12	15:22	15:48	16:03	16:16
Mills Rd after Glenhaven Rd, Glenhaven	10:17	11:17	12:17	13:17	14:17	15:27	15:53	-	16:21
Living Choice Glenhaven, Old Glenhaven Rd, Glenhaven	10:22	11:22	12:22	13:22	14:22	15:32	15:58	-	16:26
Greenbank Dr after Grange Rd, Glenhaven	10:27	11:27	12:27	13:27	14:27	15:37	16:03	-	16:31
Samuel Gilbert Public School, Ridgecrop Dr, Castle Hill	10:33	11:33	12:33	13:33	14:33	15:43	16:09	-	16:37
Oakhill College, Old Northern Rd, Castle Hill	10:41	11:41	12:41	13:41	14:41	15:51	16:17	-	16:45
Castle Hill Station	10:48	11:48	12:48	13:48	14:48	15:58	16:24	-	16:52
Excelsior Ave after Old Northern Rd, Castle Hill	10:52	11:52	12:52	13:52	14:54	16:04	16:30	-	16:58
Cross St opp Baker Cres, Baulkham Hills	10:57	11:57	12:57	13:57	14:59	16:09	16:35	-	17:03
Windsor Rd after Mary St, Northmead	11:04	12:04	13:04	14:04	15:07	16:17	16:43	-	17:11
Church St before Fennell St, Parramatta	11:12	12:12	13:12	14:12	15:16	16:28	16:54	-	17:21
Parramatta Station	11:24	12:24	13:24	14:24	15:29	16:43	17:09	-	17:36

Monday to Friday	♿	♿	♿		♿	♿		♿	
Rouse Hill Station	-	-	-	16:55	-	-	-	17:55	-
Merriville Rd at Perfection Ave, Kellyville Ridge	-	-	-	17:00	-	-	-	18:00	-
Kellyville Station	16:25	16:40	16:55	17:08	17:25	17:40	17:55	18:08	18:25
Samantha Riley Dr opp Foxall Rd, North Kellyville	16:33	16:48	17:03	17:16	17:33	17:48	18:03	18:15	18:32
Mills Rd after Glenhaven Rd, Glenhaven	-	-	-	17:21	-	-	-	18:20	-
Living Choice Glenhaven, Old Glenhaven Rd, Glenhaven	-	-	-	17:26	-	-	-	18:25	-
Greenbank Dr after Grange Rd, Glenhaven	-	-	-	17:30	-	-	-	18:29	-
Samuel Gilbert Public School, Ridgecrop Dr, Castle Hill	-	-	-	17:36	-	-	-	18:35	-
Oakhill College, Old Northern Rd, Castle Hill	-	-	-	17:43	-	-	-	18:42	-
Castle Hill Station	-	-	-	17:49	-	-	-	18:48	-
Excelsior Ave after Old Northern Rd, Castle Hill	-	-	-	17:53	-	-	-	18:52	-
Cross St opp Baker Cres, Baulkham Hills	-	-	-	17:58	-	-	-	18:56	-
Windsor Rd after Mary St, Northmead	-	-	-	18:06	-	-	-	19:03	-
Church St before Fennell St, Parramatta	-	-	-	18:15	-	-	-	19:11	-
Parramatta Station	-	-	-	18:30	-	-	-	19:23	-

603 Rouse Hill Station to Parramatta via Glenhaven

B

Monday to Friday			♿	♿	♿	♿	♿	♿	♿
Rouse Hill Station	-	-	18:57	-	-	-	-	-	-
Merriville Rd at Perfection Ave, Kellyville Ridge	-	-	19:01	-	-	-	-	-	-
Kellyville Station	18:40	18:55	19:08	19:25	19:40	20:00	20:30	21:00	21:30
Samantha Riley Dr opp Foxall Rd, North Kellyville	18:47	19:02	19:15	19:32	19:47	20:07	20:37	21:07	21:37
Mills Rd after Glenhaven Rd, Glenhaven	-	-	19:20	-	-	-	-	-	-
Living Choice Glenhaven, Old Glenhaven Rd, Glenhaven	-	-	19:25	-	-	-	-	-	-
Greenbank Dr after Grange Rd, Glenhaven	-	-	19:29	-	-	-	-	-	-
Samuel Gilbert Public School, Ridgecrop Dr, Castle Hill	-	-	19:35	-	-	-	-	-	-
Oakhill College, Old Northern Rd, Castle Hill	-	-	19:42	-	-	-	-	-	-
Castle Hill Station	-	-	19:47	-	-	-	-	-	-

Monday to Friday	♿
Kellyville Station	22:05
Samantha Riley Dr opp Foxall Rd, North Kellyville	22:12

Saturday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Rouse Hill Station	07:41	08:41	09:41	10:41	11:41	12:41	13:41	14:41	15:41
Merriville Rd at Perfection Ave, Kellyville Ridge	07:44	08:45	09:46	10:46	11:46	12:46	13:46	14:46	15:45
Kellyville Station	07:50	08:51	09:52	10:53	11:53	12:53	13:53	14:53	15:52
Samantha Riley Dr opp Foxall Rd, North Kellyville	07:56	08:57	09:59	11:00	12:00	13:00	14:00	15:00	15:59
Mills Rd after Glenhaven Rd, Glenhaven	08:00	09:01	10:03	11:04	12:04	13:04	14:04	15:04	16:03
Living Choice Glenhaven, Old Glenhaven Rd, Glenhaven	08:04	09:05	10:07	11:08	12:08	13:08	14:08	15:08	16:07
Greenbank Dr after Grange Rd, Glenhaven	08:08	09:10	10:12	11:13	12:12	13:12	14:12	15:12	16:11
Samuel Gilbert Public School, Ridgecrop Dr, Castle Hill	08:13	09:15	10:17	11:18	12:17	13:17	14:17	15:17	16:16
Oakhill College, Old Northern Rd, Castle Hill	08:19	09:22	10:25	11:26	12:23	13:23	14:23	15:23	16:22
Castle Hill Station	08:26	09:30	10:33	11:34	12:31	13:31	14:31	15:31	16:30
Excelsior Ave after Old Northern Rd, Castle Hill	08:31	09:35	10:38	11:39	12:36	13:36	14:36	15:36	16:35
Cross St opp Baker Cres, Baulkham Hills	08:35	09:40	10:43	11:44	12:41	13:41	14:41	15:41	16:40
Windsor Rd after Mary St, Northmead	08:41	09:46	10:49	11:50	12:47	13:47	14:47	15:47	16:46
Church St before Fennell St, Parramatta	08:48	09:54	10:57	11:58	12:54	13:54	14:54	15:54	16:53
Parramatta Station	09:02	10:08	11:11	12:12	13:08	14:08	15:08	16:08	17:07

Saturday	♿	♿	♿	♿
Rouse Hill Station	16:41	17:41	18:41	19:41
Merriville Rd at Perfection Ave, Kellyville Ridge	16:45	17:45	18:45	19:44
Kellyville Station	16:52	17:52	18:52	19:50
Samantha Riley Dr opp Foxall Rd, North Kellyville	16:59	17:59	18:58	19:56
Mills Rd after Glenhaven Rd, Glenhaven	17:03	18:03	19:02	20:00
Living Choice Glenhaven, Old Glenhaven Rd, Glenhaven	17:07	18:07	19:06	20:04
Greenbank Dr after Grange Rd, Glenhaven	17:11	18:11	19:10	20:08
Samuel Gilbert Public School, Ridgecrop Dr, Castle Hill	17:16	18:16	19:14	20:12
Oakhill College, Old Northern Rd, Castle Hill	17:22	18:22	19:20	20:18
Castle Hill Station	17:30	18:30	19:27	20:25
Excelsior Ave after Old Northern Rd, Castle Hill	17:35	18:35	-	-
Cross St opp Baker Cres, Baulkham Hills	17:40	18:39	-	-
Windsor Rd after Mary St, Northmead	17:46	18:45	-	-
Church St before Fennell St, Parramatta	17:53	18:52	-	-
Parramatta Station	18:07	19:04	-	-

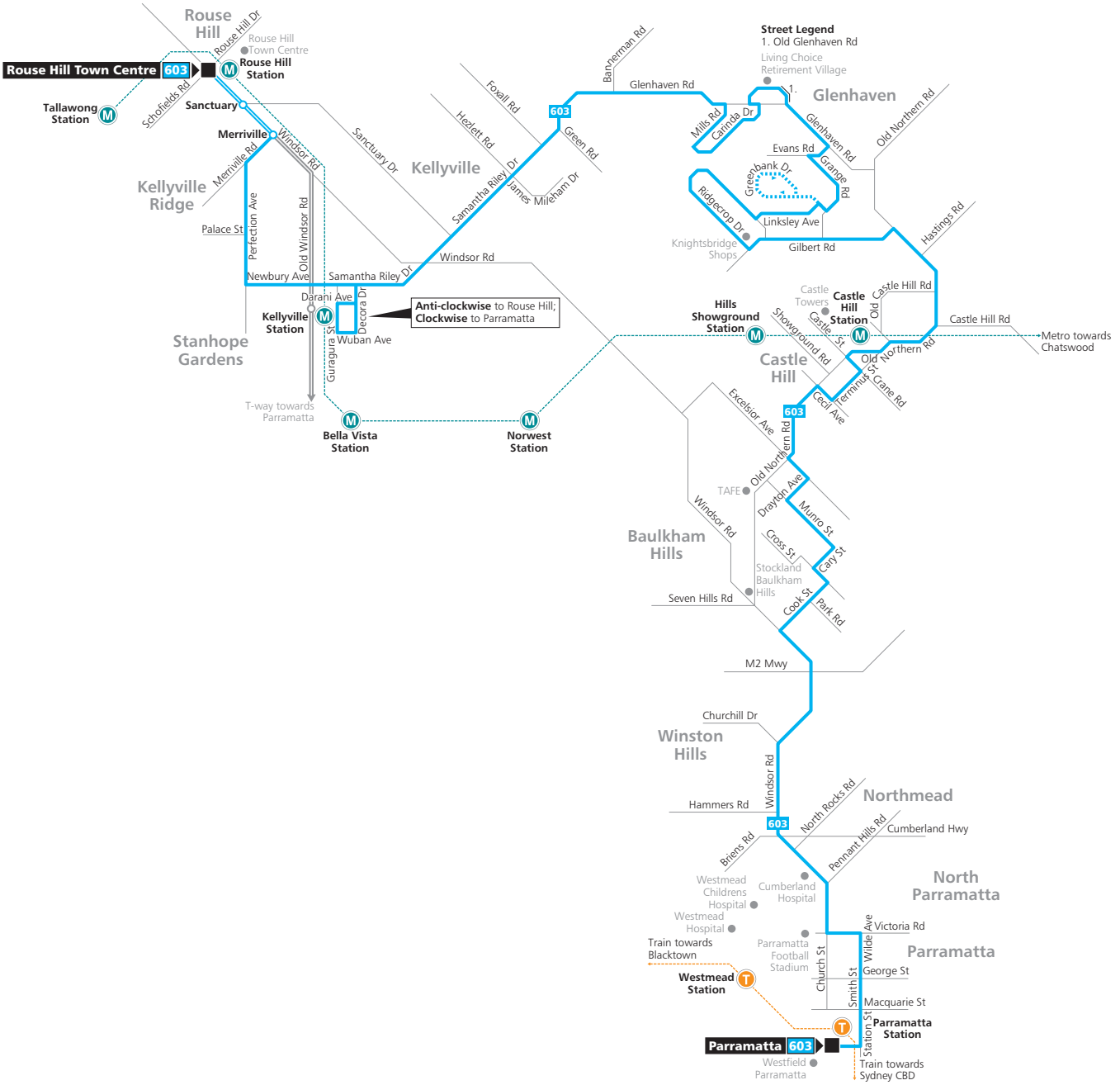
603 Rouse Hill Station to Parramatta via Glenhaven

B

Sunday & Public Holidays	♿	♿	♿	♿	♿	♿	♿	♿	♿
Rouse Hill Station	07:36	08:36	09:36	10:36	11:36	12:36	13:36	14:36	15:36
Merriville Rd at Perfection Ave, Kellyville Ridge	07:39	08:40	09:41	10:41	11:41	12:41	13:41	14:41	15:40
Kellyville Station	07:45	08:46	09:47	10:48	11:48	12:48	13:48	14:48	15:47
Samantha Riley Dr opp Foxall Rd, North Kellyville	07:51	08:52	09:54	10:55	11:55	12:55	13:55	14:55	15:54
Mills Rd after Glenhaven Rd, Glenhaven	07:55	08:56	09:58	10:59	11:59	12:59	13:59	14:59	15:58
Living Choice Glenhaven, Old Glenhaven Rd, Glenhaven	07:59	09:00	10:02	11:03	12:03	13:03	14:03	15:03	16:02
Greenbank Dr after Grange Rd, Glenhaven	08:03	09:05	10:07	11:08	12:07	13:07	14:07	15:07	16:06
Samuel Gilbert Public School, Ridgecrop Dr, Castle Hill	08:08	09:10	10:12	11:13	12:12	13:12	14:12	15:12	16:11
Oakhill College, Old Northern Rd, Castle Hill	08:14	09:17	10:20	11:21	12:18	13:18	14:18	15:18	16:17
Castle Hill Station	08:23	09:28	10:31	11:32	12:29	13:29	14:29	15:29	16:28

Sunday & Public Holidays	♿	♿	♿
Rouse Hill Station	16:36	17:36	18:36
Merriville Rd at Perfection Ave, Kellyville Ridge	16:40	17:40	18:40
Kellyville Station	16:47	17:47	18:47
Samantha Riley Dr opp Foxall Rd, North Kellyville	16:54	17:54	18:53
Mills Rd after Glenhaven Rd, Glenhaven	16:58	17:58	18:57
Living Choice Glenhaven, Old Glenhaven Rd, Glenhaven	17:02	18:02	19:01
Greenbank Dr after Grange Rd, Glenhaven	17:06	18:06	19:05
Samuel Gilbert Public School, Ridgecrop Dr, Castle Hill	17:11	18:11	19:09
Oakhill College, Old Northern Rd, Castle Hill	17:17	18:17	19:15
Castle Hill Station	17:28	18:28	19:24

Route 603



Legend

- Bus route
- 603 Bus route number
- Bus route start/finish
- Metro line/station
- Train line/station
- T-way/stop

North

Diagrammatic Map
Not to Scale

NSW GOVERNMENT Transport

transportnsw.info

Appendix C

Turning Path Assessment

LEGEND

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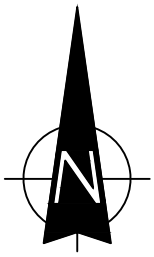
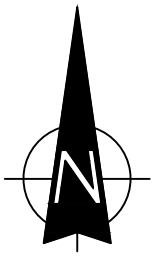


SWEPT PATH ANALYSIS OF A 12.5m HEAVY RIGID VEHICLE ENTERING □REVERSE IN □THE SITE VIA GILBERT ROAD

SP 1

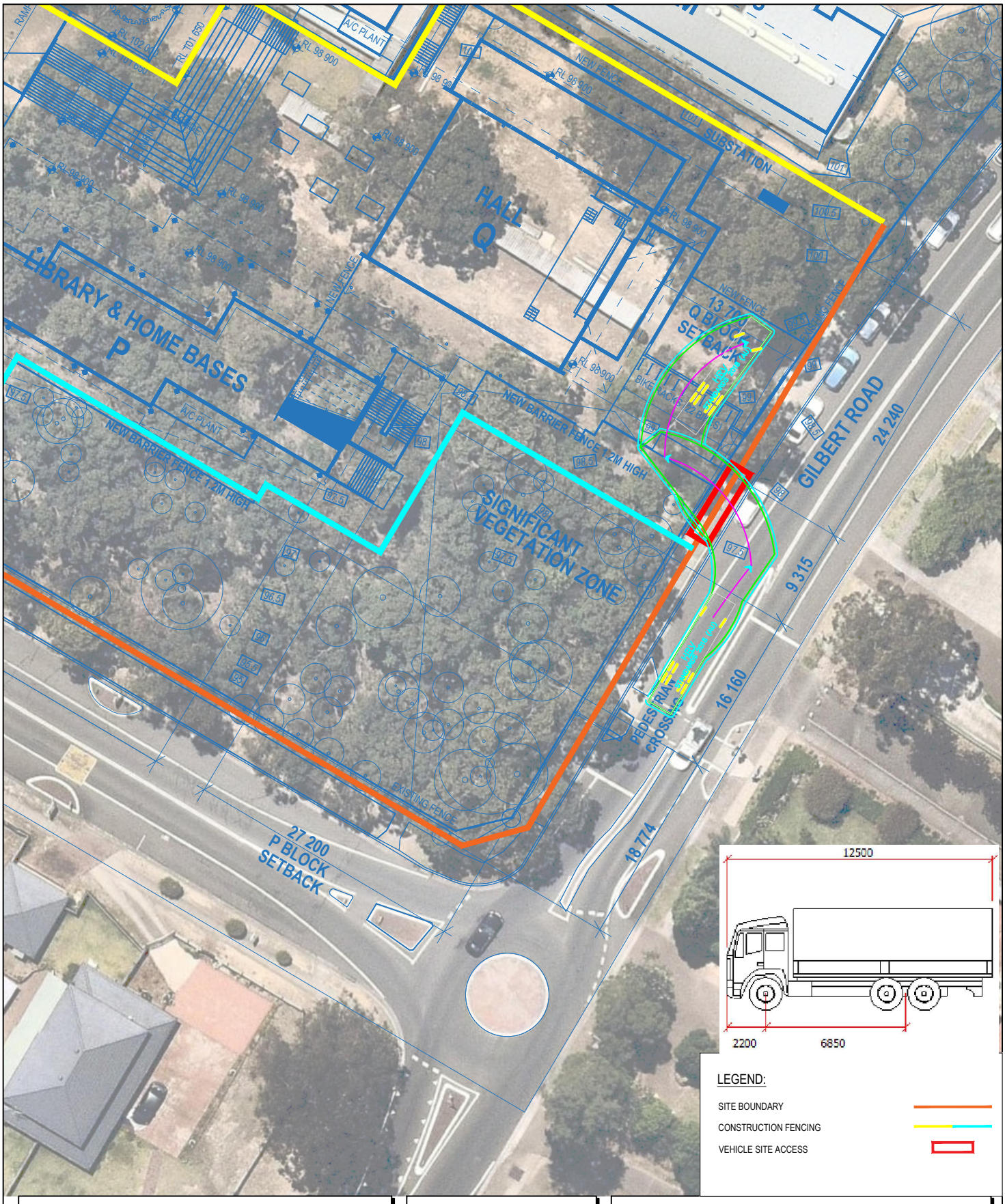
LEGEND

T□□ dr□□ □□□ □□□ □□□□ □r□□□r□d □□□□□ □□□□□□□□ m□d□□□□□ □□m□□□□r □□□□□ □r□ A□□□TURN PRO10 □□ □□□□□□□□□□□□ □ □□□ A□□□CAD □01□□ T□□ □□□□□□□□ □□□d □□ □□□□d □□□□□ □□□□□□□□ d□□□ □r□□d□d □□A□□□r□□d□ □□d □□□□r□□r□□□□ □ r□□□□□□□□□□ d□□r□□ □□□□□□□r□□□□□ H□□ □□□□r□□□□□ □□□□□□□□□□□□ □□ □□□□□□□□□□r □□□□□□□□□□ □□□□□□/□□□□r□□□□r□□□□□□ □□d/□r dr□□□r □□□□□□□□



SWEPT PATH ANALYSIS OF A 12.5m HEAVY RIGID VEHICLE EXITING □FORWARD O□T□THE SITE VIA GILBERT ROAD

SP 2



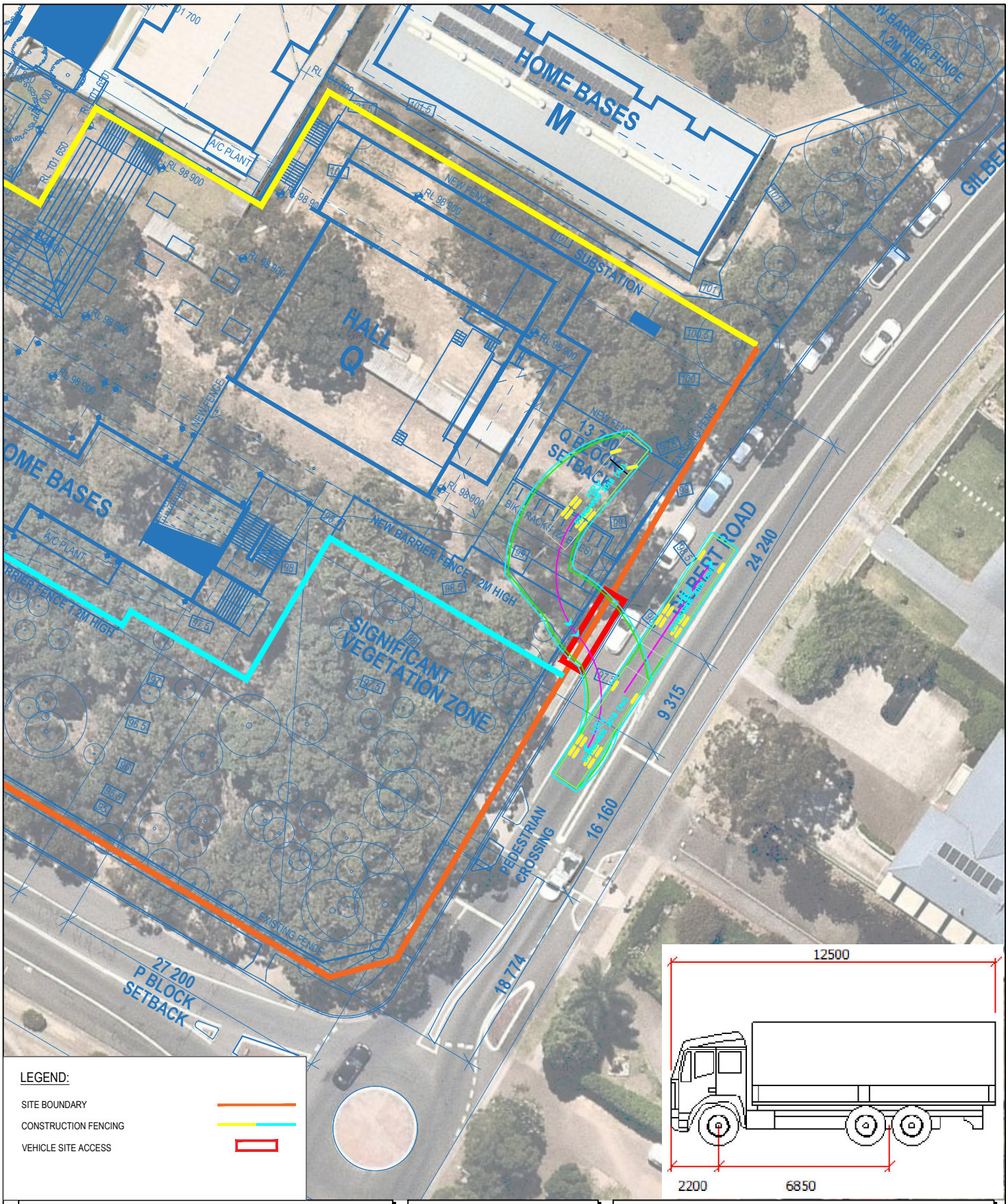
LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTURN PRO10 in conjunction with AutoCAD 2018. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.

N

SWEPT PATH ANALYSIS OF A 12.5m HEAVY RIGID VEHICLE ENTERING THE SITE VIA GILBERT ROAD

SP 1



LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTURN PRO10 in conjunction with AutoCAD 2018. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.

N

SWEPT PATH ANALYSIS OF A 12.5m HEAVY RIGID VEHICLE EXITING THE SITE VIA GILBERT ROAD

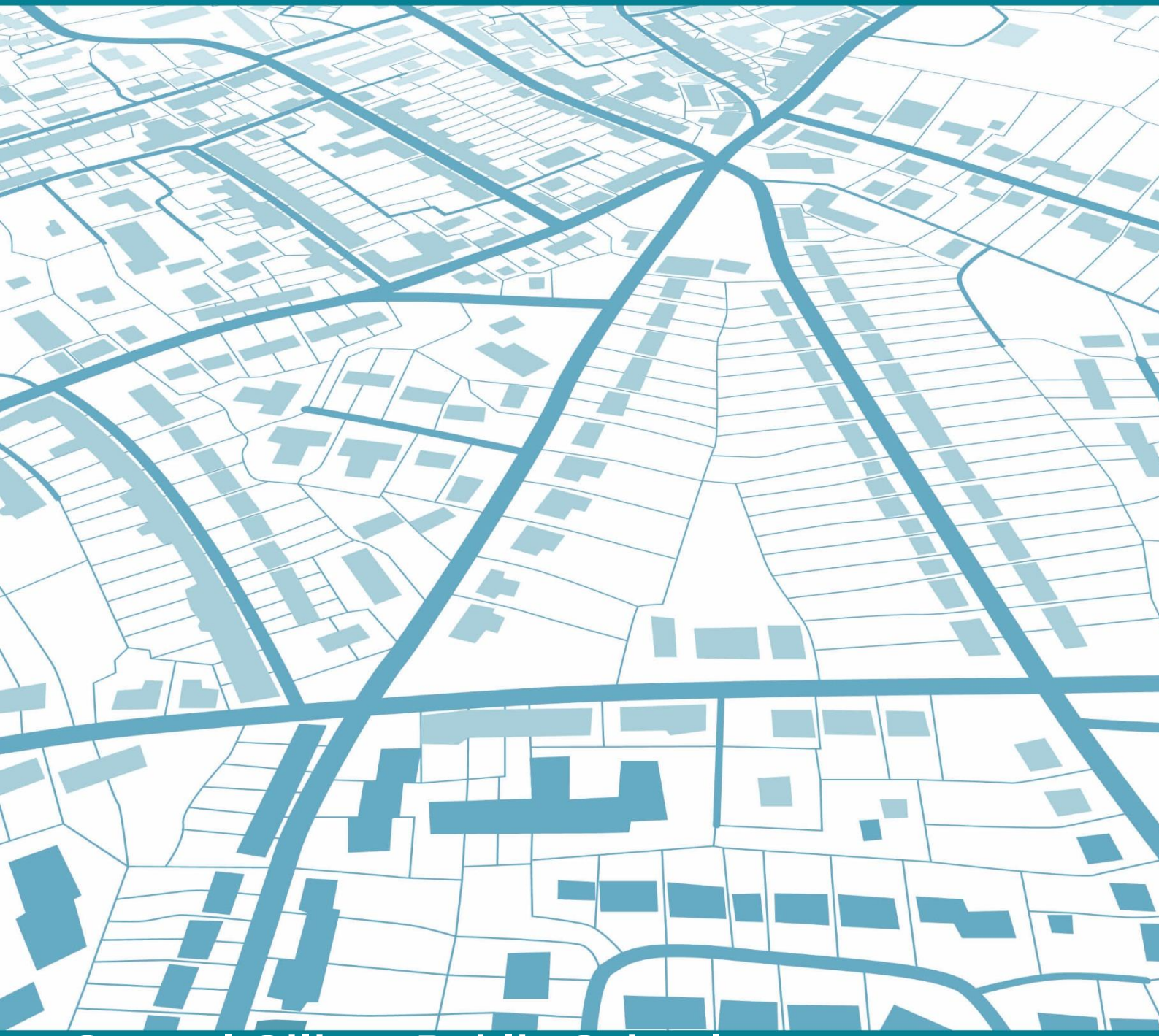
SP 2

Appendix D

Truck Driver's Code of Conduct

TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994

Suite 502, Level 5, 282 Victoria Avenue
Chatswood NSW 2067
T (02) 9411 5660 | F (02) 9904 6622
E info@ttpa.com.au | ttpa.com.au



Samuel Gilbert Public School
20 Gilbert Road, Castle Hill
Proposed Alterations and Additions

Driver Code of Conduct for Truck & Heavy Vehicle Operators

Ref: 280/2019
Date: October 2019
Issue: Draft

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Appendix A Truck Routes

1.0 Introduction

1.1 General

This driver code of conduct applies to all Hutchinson Builders personnel and any other person conducting business for the Hutchinson Builders works, or on any project associated with the Hutchinson Builders works, whether a direct employee of the Hutchinson Builders ('Company') or employed by some other organisation providing a service or product to the Company.

We are all members of the general community, so you are expected to comply with all the relevant legal requirements and accepted community standards whilst conducting your business. Your behaviour on the road reflects upon the community and in this regard your full compliance with this Driver Code of Conduct is required.

1.2 Penalties and Disciplinary Action

Failure to comply with this Driver Code of Conduct will lead to either the issue of a "warning notice" or "disciplinary action" if the offender is an employee of the Company. If the offending party represents another company then "disciplinary action" may be treated as suspension or cancellation of a service contract or arrangement with that company.

A warning notice may be issued for a number of reasons, which may include if, you:

- Drive at excessive speed;
- Abuse other road users;
- Do not carry out instructions as advised;
- Do not observe the site speed restrictions;
- Do not report incidents/accidents

Examples of behaviour that may result in disciplinary action are if you:

- Consume or are under the influence of alcohol or drugs whilst on duty;
- Fight or commit acts of violence towards any person whatsoever, whether employee of the Company or otherwise;
- Are charged and found guilty of a serious offence causing an accident.

1.3 Motor Traffic Act

As a driver you are required to know and comply with all road rules pertaining to your vehicle (whether standard passenger car, utility or heavy transport vehicle).

1.4 Driving License

You must hold a current and valid driving licence for the class of vehicle that you operate. Additionally, you must always carry your current driver's licence with you while you are on duty.

If your licence is cancelled or suspended, you must let your supervisor know immediately.

1.5 Vehicle Minimum Maintenance and Operating Condition

All vehicles must be maintained and operated in accordance with the vehicle manufacturers recommended standards (refer to vehicle manufacturer's handbook).

1.6 Occupational Health and Safety

The health and safety of all people employed by (or working for) the Company, and those visiting our sites, is of the utmost importance.

As an employee of the Company, or supplier or contractor to the Company, you are required to follow occupational health and safety legislation.

This means that you must:

- Carry out your duties in a way which does not adversely affect your own health and safety or that of others;

- Cooperate with measures introduced in the interest of workplace health and safety;
- Perform any OH&S training provided;
- Immediately report all matters which may affect workplace health & safety to your supervisor;
- Correctly use any information, training, personal protective equipment and safety devices provided;
- Not intentionally misuse or recklessly interfere with anything that has been provided for health and safety reasons;
- Only do tasks for which you have authorisation and/or the necessary training, and for which all necessary safety arrangements are in place.

1.7 Environment

The Company is committed to protecting the environment and preventing air, water and noise pollution. As the operator of your vehicle, you are subject to environmental regulations relating to vehicle emission and product spill and to minimise the impacts of earthworks and construction on the local and regional road network.

You must understand and appreciate the seriousness of polluting the environment and the consequences of this. If you are careless or neglect your responsibilities, you can cause personal injury, loss of life, property damage, substantial fines, and adverse publicity for the company.

1.8 Noise Control

Generating excessive noise is governed by legislation and is an offence. Heavy trucks generate a higher level of noise than light vehicles. The amenity of surrounding road users/residents is to be maintained as far as practical during the construction process.

You are required to adhere to the following during the course of your duty:

- If possible, you should minimise road traffic noise by not using engine brakes near residences and built up areas.
- All vehicles must be fitted with audible reversing alarms. These are essential

for the safety of all personnel. Reversing alarms are however the source of potential noise complaints from neighbouring residents so all drivers should be aware of this and try to minimise reversing when possible.

- Avoid loading and unloading of materials / deliveries outside of daytime hours.
- Compounds and work areas should be designed to as one-way to minimise the need for vehicles to reverse.
- Trucks should not idle near to residential receivers.
- Stationary sources of noise, such as generators, should be located away from sensitive receivers.
- Project personnel, including relevant sub-contractors, to acquaint themselves on noise and vibration requirements and the location of sensitive receivers during inductions and toolbox talks.
- Delivery vehicles should be fitted with straps rather than chains for unloading, wherever possible.
- Truck drivers should avoid compression braking as far as practicable.
- Where night-time works are required, trucks should use broadband reversing alarms.
- Use the minimum sized equipment necessary to complete the work and where possible, use alternative, low-impact construction techniques.
- Power tools should use mains power where possible rather than generators.
- Shut down machinery, including generators, when not in operation.
- Avoid dropping materials from a height and dampen or line metal trays, as necessary.
- Ensure equipment is operated in the correct manner.
- All equipment should be appropriately maintained and fitted with noise control

devices, where practicable, including acoustic lining of engine bays and air intake / discharge silencers, etc.

- Where possible, use dampened ‘city’ bits on jackhammers and rock breakers.

2.0 Safe Driving Practices

2.1 Highway Courtesy

The on-going reputation of the company depends very much on the way you drive your vehicle and courtesy that you extend to the community.

The road is there to share and therefore, it is a company requirement that you display courtesy and restraint towards other road users to minimise conflicts with other road users.

2.2 Speed Restriction

As a professional and competent driver, you must always adjust your driving to the existing conditions.

Studies have shown that many truck accidents are directly caused by excessive speed and/or poor road conditions such as surface condition, corner camber, "tightness" etc. Always follow posted signs as they provide vital clues to road conditions and characteristics. You should always apply the following rules:

- ✓ Always reduce your speed in wet conditions;
- ✓ Drive cautiously in fog or heavy rain;
- ✓ Descend hills at sign-posted truck speeds, or in the lowest gear to suit the conditions;
- ✓ Always observe the special limits that apply for road works etc;
- × **DO NOT** exceed the posted maximum speed;
- × **DO NOT** drive at speed past schools, school buses, parks, shopping areas etc.

2.3 Speed Restrictions

The site has a general speed limit of 10 km/h limit. This limit is to ensure the interaction between personnel and vehicles are managed to minimise the risk of injury to all personnel.

Drivers are required to observe the posted speed limits and other traffic signage at all times. All incidents where drivers do not observe speed limits and other traffic instructions will be logged and investigated and, where appropriate, disciplinary action will be taken.

2.4 Defensive Driving

You should always drive in a manner that will help you to avoid an accident, despite incorrect/inappropriate actions of others or poor driving conditions. Defensive driving requires a high degree of anticipation.

2.5 Preferred Routes

All trucks must enter and exit the works via the site gates or use the works zone.

The preferred routes for access to and from the site are listed below (refer to Route Map in Appendix A):

- Gilbert Road
- Showground Road
- Old Northern Road.

Where possible you should always:

- Use main roads;
- Use bypasses;
- Avoid communal areas, schools e.g. (particularly during school start and finish times), parks etc.

You must stick to the defined routes laid down unless there are exceptional circumstances. Such exceptional circumstances may be:

- Normal route blocked e.g. flooded;
- A revised route agreed in writing.

Trucks and heavy vehicles must not use local residential streets.

2.6 Vehicle Braking

One of the most important skills that a professional and competent driver possesses is bringing a loaded vehicle to a controlled stop in city and open road conditions.

You may need to brake heavily but you must also be aware of the possible consequences.

As a rule, you should always be aware of traffic conditions 1 to 2 km in front of you. In doing so, you are adjusting your own driving conditions to avoid the need for heavy braking.

Always brake with care, remembering that the truck will react differently according to the weight of the load, weight distribution of the load and road surface condition.

You should never, under any conditions, drive a vehicle with faulty or suspect brakes. You must always immediately report the fault to your supervisor to be fixed.

Engine brakes are auxiliary to the main service brakes. In general, the following should be observed regarding engine brakes:

- × **DO NOT** use the engine brake on slippery or wet surfaces, as a jack-knife may occur;
- × **DO NOT** use engine brakes in or near residences and built up areas, as this causes excessive noise and is a public disturbance.

2.7 Tailgating

By law you are required to maintain a gap between yourself and the vehicle directly in front of you, so that heavy braking will not be required. The gap is based on several factors including speed, vehicle weight, traffic congestion and road condition. During wet weather or other adverse conditions, the gap distance should be doubled.

The legal distance for heavy vehicles in areas without streetlights is 60 metres.

A gap of 60 metres is approximately the same as:

- The length of four (4) semi-trailer combinations;
- Twelve (12) car lengths;
- Four (4) seconds.

Always remember, appropriate gap distance between other road users is a key defensive driving tool.

2.8 Overtaking/Passing

You should always avoid overtaking in awkward, inappropriate situations or where there is unclear vision.

In general, you should **not** overtake/pass in the following situations:

- × Over continuous lane separation lines;
- × On narrow roads;
- × Near or on a curve or crest;
- × Near or on a bridge;
- × Near or on a railway crossing or tunnel;
- × When clear vision is restricted;
- × Through road work areas.

Do not indicate or signal to encourage other road users to overtake or pass. This action is against the law and may cause you to be responsible should an incident occur.

2.9 Road Hazards

During most journeys that you take, there will be hazards on and near roadways. Always be alert for these hazards and make your adjustments as necessary.

Examples of hazards are:

- × Rough/slippery surfaces;
- × Narrow or winding roads;
- × Low wires or awnings;

- × Low bridges, tunnels etc;
- × Crossings, rail/people;
- × Animals;
- × Underpasses and trees.

Be aware that your vehicle itself may become a road hazard when it is parked on a roadway, broken down or otherwise. In this circumstance, use portable warning signals, placing them 50-150 metres in front of and behind the vehicle, as well as at the side.

2.10 Parking

Construction Vehicles should always remain within the construction site. You must avoid parking on or within one metre of the roadway. If this is not possible, make sure that you use the portable warning signs referred to above.

Always park your vehicle in a safe position. Make sure it can be seen and that it is as far away from the moving traffic as possible. If in doubt leave your hazard lights on!

If you are transporting dangerous goods there are additional restrictions that affect you. Refer to the "Parking with Dangerous Goods" section of your manual.

2.11 Reversing

Try to avoid reversing whenever possible. If you cannot avoid it, use extreme caution.

If you need to reverse:

- ✓ Get out of your vehicle and check the rear surrounding area;
- ✓ Check clearances at sides, top and bottom;
- ✓ Constantly monitor mirrors for pedestrians or other traffic when reversing.

3.0 Materials Haulage

Drivers are responsible for ensuring that all tailgates are properly closed and that there is no excessive leakage of water from the vehicle to the road surface.

Drivers of trucks hauling raw materials to and from the works will ensure adequate separation between vehicles. No tailgating or formation of rolling convoys shall be permitted.

Drivers are responsible for ensuring that all loads are properly covered and that there is no spillage or leakage of the load from the vehicle to the road surface.

4.0 Time of Operation

This Driver Code of Conduct is applicable throughout the construction process.

5.0 Residents' Complaint Hotline

Drivers should be aware that a complaints telephone number is available to the public to lodge complaints against any driver contravening these guidelines. The contact details are displayed on the signs at the entrance to the site.

All complaints will be logged and investigated and, where appropriate, disciplinary action will be taken.

6.0 Public Notification

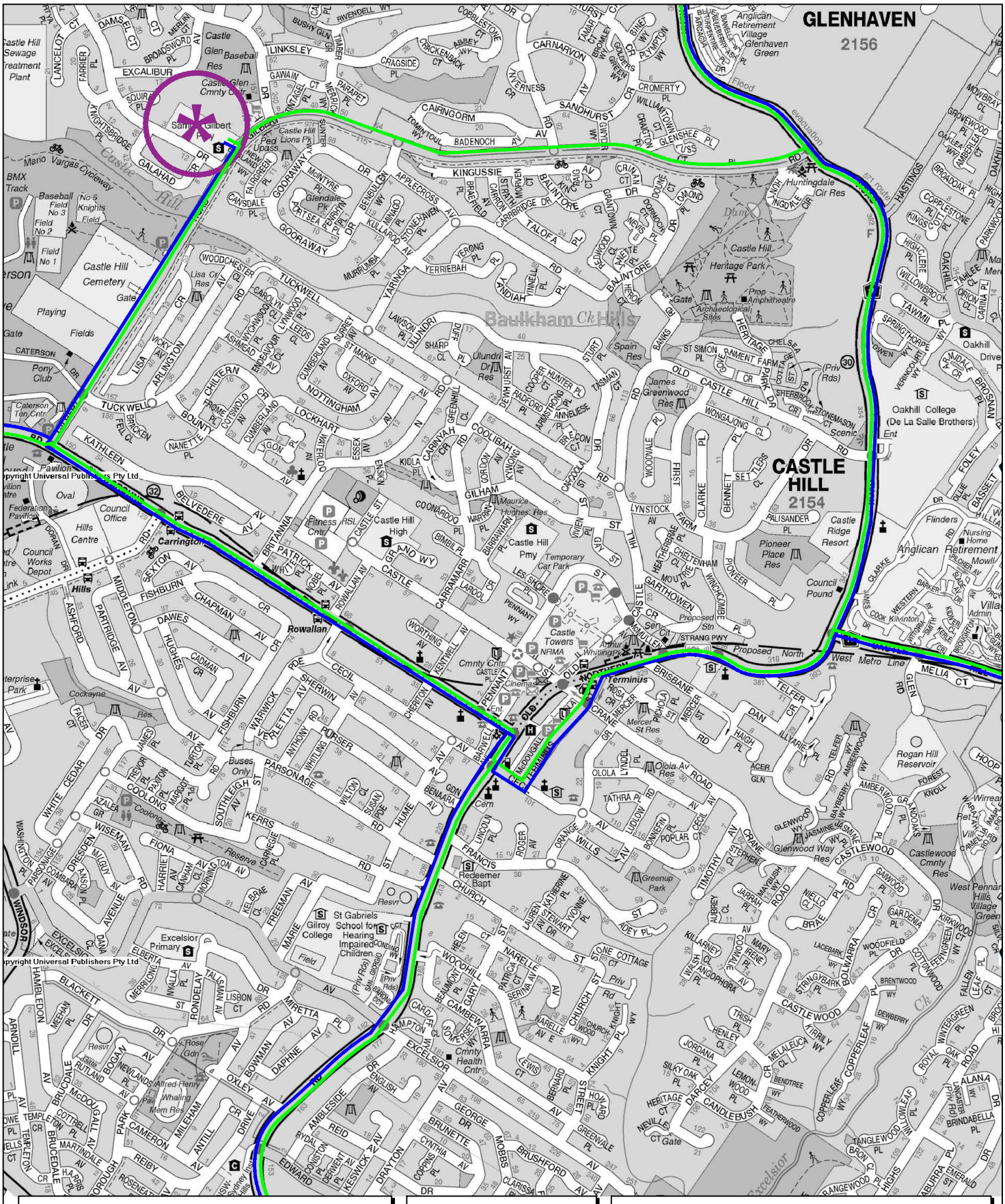
Hutchinson Builders would prepare notification letters, under the approval of Council, that would be delivered to nearby properties, to advise residents and the community (including local schools) of the construction works and timing thereof as well as of any potential disruptions to routes.

7.0 Monitoring Measures

Hutchinson Builders management will undertake formal observations / review of compliance at three monthly intervals and will document and undertake any remedial actions with employees or sub-contractors that may be necessary as a result of these observations. These formal observations / reviews maybe undertaken as part of an overall review of the safety management.

Appendix A

Route Map

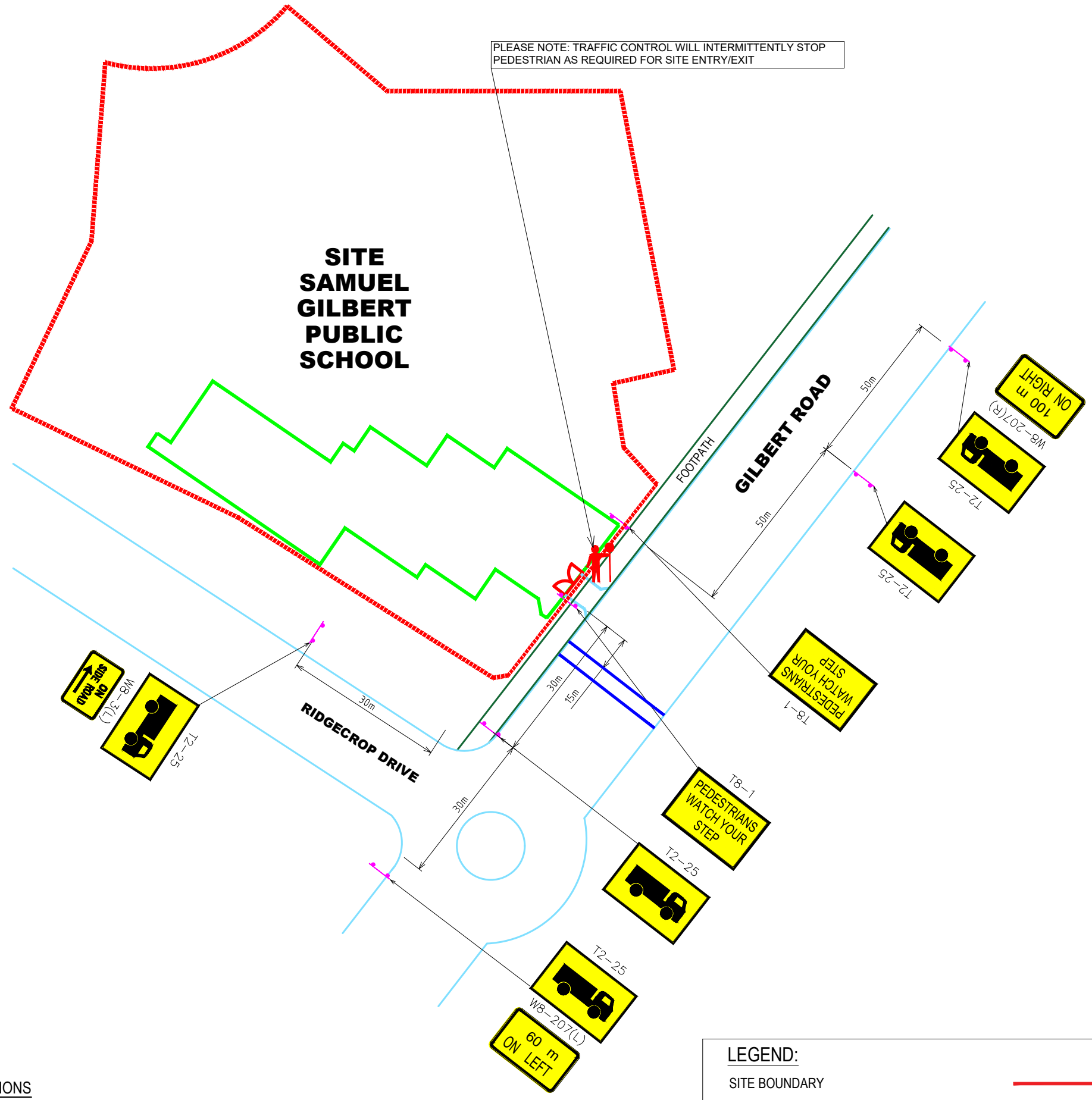

GLENHAVEN
2156
CASTLE HILL
2154
Castle Hill Heritage Park
Castle Hill Cemetery
Castle Hill Sewage Treatment Plant
Castle Hill Baseball Field No 1
Castle Hill Baseball Field No 2
Castle Hill Baseball Field No 3
Castle Hill Baseball No 5 Knights Field
Castle Hill Lions Pk
Castle Hill Pony Club
Castle Hill Caterson Ten Cntr
Castle Hill Fitness Cntr
Castle Hill High
Castle Hill Pmy
Castle Hill Pmy Temporary Car Park
Castle Hill Cmnty Cntr
Castle Hill Council Office
Castle Hill Council Works Depot
Castle Hill Hills Centre
Castle Hill Oval
Castle Hill Pavilion
Castle Hill Federation Pavilion
Castle Hill Gilbert Park
Castle Hill Glen Cmnty Cntr
Castle Hill Glen Baseball Res
Castle Hill Mario Vargas Cycleway
Castle Hill BMX Track
Castle Hill Playing Fields
Castle Hill Gate
Castle Hill Lisa Ct Res
Castle Hill Castle Glen Res
Castle Hill Castle Ridge Resort
Castle Hill Pioneer Place Res
Castle Hill Council Pound
Castle Hill Proposed Sen Stn
Castle Hill Proposed North West Metro Line
Castle Hill Prop Amphitheatre
Castle Hill Archaeological Sites
Castle Hill Castle Towers NFIMA
Castle Hill Arthur Whitling Pl
Castle Hill Maurice Hughes Res
Castle Hill Spain Res
Castle Hill James Greenwood Res
Castle Hill Ulundri Dr Res
Castle Hill Temporary Car Park
Castle Hill Cmnty Cntr Cinemas
Castle Hill Terminus
Castle Hill Oakhill College (De La Salle Brothers)
Castle Hill Oakhill Drive
Castle Hill Anglican Retirement Village Glenhaven Green
Castle Hill Anglican Retirement Village
Castle Hill Huntingdale Cir Res
Castle Hill Rogan Hill Reservoir
Castle Hill Castlewood Cmnty Res
Castle Hill Glenwood Way Res
Castle Hill Greenup Park
Castle Hill Olola Av Res
Castle Hill Mercer St Res
Castle Hill Cmnty Health Cntr
Castle Hill Redeemer Bapt Church
Castle Hill St Gabriels School for Hearing Impaired Children
Castle Hill Gilroy College
Castle Hill Excelsior Primary
Castle Hill Alfred Henry Whaling Mem Res
Castle Hill Rose Gdn
Castle Hill Resvr
Castle Hill Cockayne Res
Castle Hill Lisa Ct Res
Castle Hill Caterson Ten Cntr
Castle Hill Fiesta Reserve
Castle Hill Coolong Reserve
Castle Hill Cemetery
Castle Hill Gate
Castle Hill Playing Fields
Castle Hill Pony Club
Castle Hill Oval
Castle Hill Pavilion
Castle Hill Federation Pavilion
Castle Hill Hills Centre
Castle Hill Council Office
Castle Hill Council Works Depot
Castle Hill Fitness Cntr
Castle Hill High
Castle Hill Pmy
Castle Hill Cmnty Cntr
Castle Hill Glen Baseball Res
Castle Hill Glen Cmnty Cntr
Castle Hill Mario Vargas Cycleway
Castle Hill BMX Track
Castle Hill Playing Fields
Castle Hill Gate
Castle Hill Lisa Ct

Appendix E

Traffic Guidance Scheme

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.
   ALL TRAFFIC CONTROL PLANS ARE TO BE IMPLEMENTED IN ACCORDANCE WITH THE ROADS AND MARITIME SERVICES TRAFFIC CONTROL AT WORK SITES TECHNICAL MANUAL VERSION 5.0 DATED 27 JULY 2018 AND AUSTRALIAN STANDARDS AS1742.3:2009 MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, PART 3: TRAFFIC CONTROL DEVICES FOR WORKS ON ROADS.
5. THIS TRAFFIC CONTROL PLAN MUST BE SETUP BY A PERSON HOLDING AN "IMPLEMENT TRAFFIC CONTROL PLANS" (YELLOW) TICKET AND THE RMS TRAFFIC CONTROL AT WORK SITES CHECKLIST SHALL BE COMPLETED PRIOR TO IMPLEMENTATION.
6. THE ACCREDITTED PERSONNEL SHALL IMPLEMENT THE APPROVED TCP BEFORE ANY PHYSICAL WORK COMMENCES AND ENSURE A COPY OF THE TCP IS KEPT ON-SITE. THE ACCREDITTED PERSONNEL SHALL ALSO DRIVE THROUGH THE SITE BEFORE WORKS BEGIN TO ENSURE THAT THE TCP HAS BEEN IMPLEMENTED CORRECTLY AND THAT IT WILL WARN, INSTRUCT AND GUIDE ROAD USERS AS DESIGNED. ANY VARIATIONS MADE TO THE PLAN MUST BE MARKED ON THE PLAN AND INITIALLED BY THE ACCREDITTED PERSONNEL.
7. IT IS THE RESPONSIBILITY OF AN ACCREDITTED PERSONNEL WITH A 'PREPARE TRAFFIC MANAGEMENT PLAN' TICKET 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.
   - AT ALL TIMES AN UP-TO-DATE COPY OF "TRAFFIC CONTROL AT WORK SITES" SHOULD BE AVAILABLE FOR REFERENCE AND IMPLEMENTATION AS REQUIRED ON-SITE.
9. ALL WORKERS WILL BE CONFINED TO THE DEDICATED WORKS AREA SHOWN ON THE PLAN.
10. IF THE WORKSITE IS LEFT UNATTENDED IT IS THE CONTRACTOR'S DUTY TO ENSURE THAT THE APPROPRIATE MEASURES ARE TAKEN TO PROVIDE A SAFE ENVIRONMENT FOR VEHICLES AND PEDESTRIANS TO RELEVANT AUSTRALIAN STANDARDS. TRAFFIC CONTROLLERS ARE TO BE REQUIRED AT THE ACCESS FULL TIME AND THEY ARE TO BE SUITABLY ACCREDITED TO AUSTRALIAN STANDARDS AND RMS ACCREDITATION AS REQUIRED. WHEN REQUIRED T1-34 AND T1-10 SIGNS ARE TO BE SET UP IN ACCORDANCE TO AUSTRALIAN STANDARDS AND RMS REQUIREMENTS.
11. ALL SIGNAGE IS TO BE CLEAN, CLEARLY VISIBLE AND NOT OBSCURED.
12. ALL SIGNS TO BE COVERED OR REMOVED WHEN WORKERS ARE NOT ON SITE.
13. ALL NIGHT WORK OR DAY/NIGHT MUST USE RMS STANDARD NIGHT SIGNS AND DEVICES UNLESS OTHERWISE STATED.
14. ALL WORKERS MUST ADHERE TO THE APPLICABLE SAFE WORK DISTANCE AS DESCRIBED IN AS1742.3:2009.
15. ALL DISTANCES BETWEEN SIGNS ARE TO BE IN ACCORDANCE WITH SECTION 2.5.2 OF AS1742.3:2009. HOWEVER, MODIFICATIONS CAN BE MADE TO SUIT SITE CONDITIONS.



CERTIFICATIONS

THE UNDERSIGNED HAS COMPLETED AND OBTAINED "PREPARE A WORK ZONE TRAFFIC MANAGEMENT PLAN"

CERTIFICATE NO: 0052125163 (EXPIRY DATE: 28/08/2022)
PREPARE A WORK ZONE TMP CARD
LACHLAN ELLSON

LEGEND:

- SITE BOUNDARY
- WORK SITE
- WORK SITE ACCESS
- ACCREDITED RMS TRAFFIC CONTROLLER
- TRAFFIC SIGN
- PEDESTRIAN CROSSING

SAMUEL GILBERT PUBLIC SCHOOL
TRAFFIC GUIDANCE SCHEME

SITE ACCESS ON GILBERT ROAD

DRAWING REF NO. 280/2019-01-01 ISSUE A ISSUE DATE 16 MARCH 2021

DESIGNED BY L. ELLSON
APPROVED BY M.KONG

SCALE A3 8 4 0 4 8 NOT TO SCALE

FINAL PLAN
ANY CHANGES TO THE PLAN SHALL BE DONE WITHIN ALLOWANCE PROVIDED IN THE ROADS AND MARITIME SERVICES TRAFFIC CONTROL AT WORK SITES TECHNICAL MANUAL VERSION 5.0 DATED 27 JULY 2018

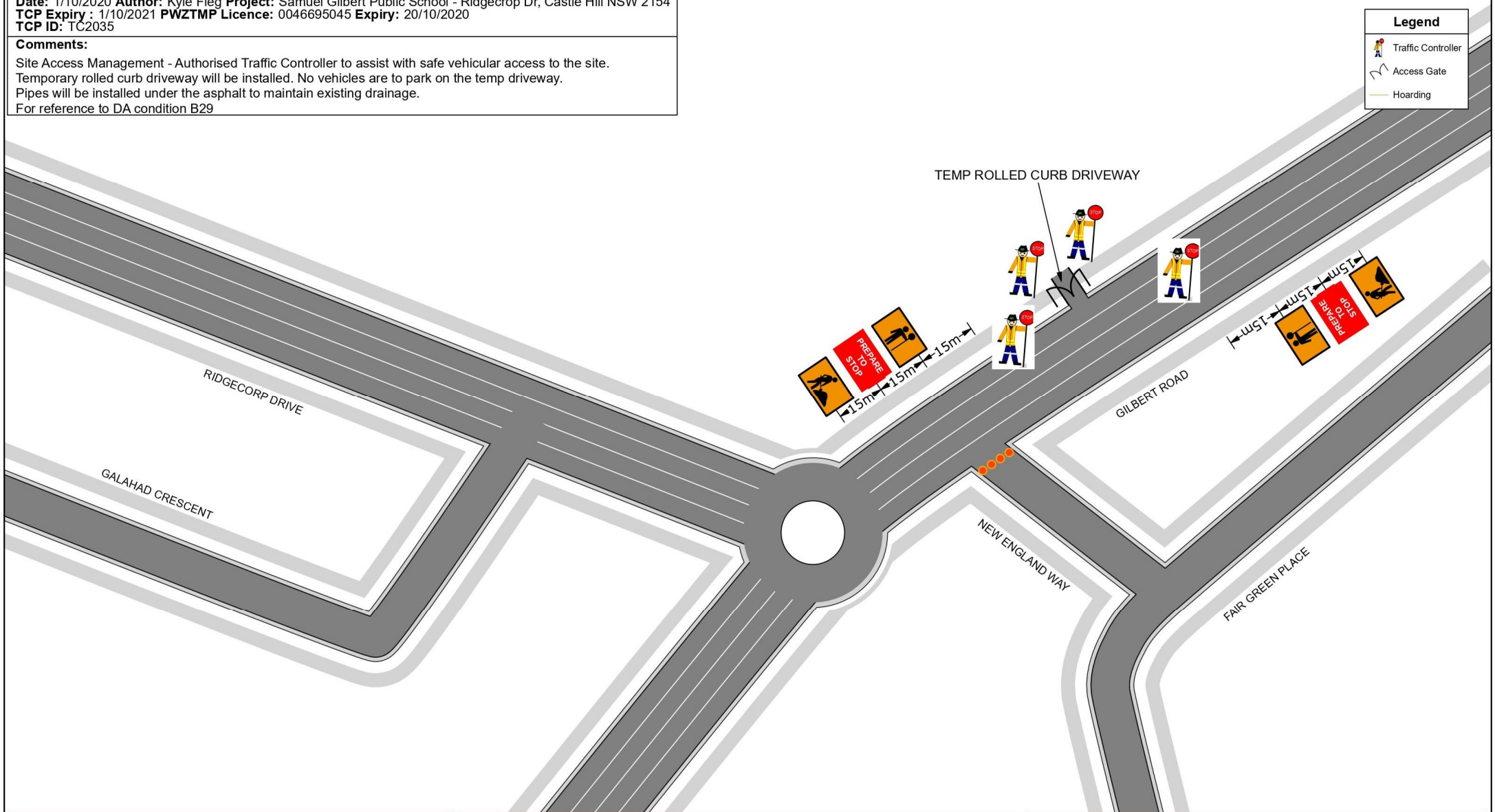
N

ttpa TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994
Address: Suite 502, Level 5, 282 Victoria Avenue, Chatswood NSW 2067
P: (02) 9411 5660 F: (02) 9904 6622 W: www.ttpa.com.au

Date: 1/10/2020 **Author:** Kyle Fieg **Project:** Samuel Gilbert Public School - Ridgecrop Dr, Castle Hill NSW 2154
TCP Expiry : 1/10/2021 **PWZTMP Licence:** 0046695045 **Expiry:** 20/10/2020
TCP ID: TC2035

Comments:

Site Access Management - Authorised Traffic Controller to assist with safe vehicular access to the site.
Temporary rolled curb driveway will be installed. No vehicles are to park on the temp driveway.
Pipes will be installed under the asphalt to maintain existing drainage.
For reference to DA condition B29



ETM TRAFFIC

Dm (Speed Limit)	Merge taper length	Lateral taper length	Buffer length
45 or less	15	15	30
46 to 55	30	15	30
56 to 65	60	30	30
66 to 75	115	70	30
76 to 85	130	80	40
86 to 95	145	90	40
96 to 105	160	100	50
Greater than 105	180	110	50

Based on AS 1742.3-2009

EXISTING POSTED SPEED LIMIT: 50

PLAN SCALE: NTS | SHEET SIZE: A3 | N

This document has been prepared solely as a guide only for traffic management purposes. The traffic planner (TTP) disclaims all responsibility & all liability (including without limitation, liability in negligence) for all expenses, losses, damages & costs. May incur as a result of the information being inaccurate or incomplete in any way, and for any reason. TTP does not accept any responsibility for compliance of this document if set up by others. Some distances not to code due to site constraints. The positions of the signs & equipment are only the suggested locations, as they may need to revised onsite to improve visibility and/or effectiveness. Figured distances shall take precedence to signage locations. Any changes onsite are to be noted on this document, recorded on the appropriate worksite paperwork and signed off by the site supervisor prior to implementation. All traffic control plans & traffic management plans are copyright and property of TTP & is not transferable unless authorised by TTP.

Prior to implantation of this traffic management plan, it is a requirement that all traffic control plans / traffic management plans conform to AS1742.3 2009 & Road Management Act 2004 & Code of Practice Traffic Management 2010.

This document is to be viewed in A3 colour.

All approvals/consent documents shall be on site at all times. Traffic controller to wear correctly fitted PPE (personal protective equipment) to AS/NZS 4602 as assess in the site safe work method statements (SWMS), hazard risk assessment. Location of signs shown may be varied slightly during implementation preventing a tripping hazard, improve visibility, effectiveness & not impact on pedestrian walkways (1.2m+ clearance, 1.5m+ curved footpath), cyclists, parking or deliveries unless footpath is closed. Signage is to be class 1 retroreflective signage as per AS/NZS 1742.3 2009. Note that additional traffic controllers/signage may be required.

Traffic controller instructions: all traffic management items must be in place prior to the commencement of the works. Onsite traffic management must have their traffic controller ticket RIIOHS205A (use the stop-slow bat to control traffic), RIIOHS302A (implement & monitor operational traffic management plans) as a minimum to implement this plan. Traffic controllers will assist local buses & emergency vehicles through the worksite where required. Traffic controllers to remain onsite at all times and ensure the pedestrian and the travelling public's safety at all times. If leaving the site for any reason, they must inform the site supervisor.

Pedestrians are to be physically separated from the worksite at all times with para-webbing or similar to ensure they do not walk into the work site, with 'pedestrians watch your step' signage placed on all approaches to work site. Where pedestrians are to come on/off the kerb a non-slip surface ramp per AS1428 be provided by the client. Minimum mounting height for all short term signage should be 200mm.

Appendix F

Consultation with Council and TfNSW

Meg Kong

From: Meg Kong
Sent: Wednesday, 24 February 2021 10:07 AM
To: Craig Hopfe
Cc: Vitaly Kaakoush (Vitaly.Kaakoush@hutchinsonbuilders.com.au); 'Andy Smith (Hutchinson Builders (Sydney))'; Angela Vernicos; Michael Lathlean; Rodney Pavitt
Subject: RE: SSD 9274 - Redevelopment of Samuel Gilbert Public School - Revised CTMP
Attachments: RE: SSD 9274 - Redevelopment of Samuel Gilbert Public School - Revised CTMP

Hi Craig

Thank you for your response. Based on the earlier response from TfNSW, the reversing is acceptable if Council is ok with the arrangement. See attached email.

As indicated by in the CTMP, we will complete the reversing under the management of traffic controllers.

Kind regards

Meg Kong | Associate

TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994
Suite 502, Level 5, 282 Victoria Avenue, Chatswood NSW 2067
P (02) 9411 5660 F (02) 9904 6622 W ttpa.com.au
ttpa

From: Craig Hopfe <chopfe@thehills.nsw.gov.au>
Sent: Wednesday, 24 February 2021 9:37 AM
To: Meg Kong <meg@ttpa.com.au>
Cc: Vitaly Kaakoush (Vitaly.Kaakoush@hutchinsonbuilders.com.au) <Vitaly.Kaakoush@hutchinsonbuilders.com.au>; 'Andy Smith (Hutchinson Builders (Sydney))' <Andy.Smith@hutchinsonbuilders.com.au>; Angela Vernicos <AVERNICOS@thehills.nsw.gov.au>; Michael Lathlean <mlathlean@thehills.nsw.gov.au>; Rodney Pavitt <rpavitt@thehills.nsw.gov.au>
Subject: RE: SSD 9274 - Redevelopment of Samuel Gilbert Public School - Revised CTMP

Hi Meg,

Apologies for delay in response.

Please be advised the Council is not the authority to approve your CTMP as per condition B14 of your State Significant Development Consent.

Noting this, if any reversing movements are proposed, these should only be completed under controlled environments, with a suitably approved TCP signed by a suitability accredited TfNSW Traffic control and implemented by accredited Traffic Controller to ensure traffic and pedestrian safety during these movements.

Kind Regards

Craig

From: Meg Kong [mailto:meg@ttpa.com.au]
Sent: Tuesday, 16 February 2021 10:38 AM
To: Craig Hopfe
Cc: Vitaly Kaakoush (Vitaly.Kaakoush@hutchinsonbuilders.com.au); 'Andy Smith (Hutchinson Builders (Sydney))'; Angela Vernicos; Michael Lathlean; Rodney Pavitt
Subject: RE: SSD 9274 - Redevelopment of Samuel Gilbert Public School - Revised CTMP

Hi Craig

We have gotten response from TfNSW early last week.

Can you advise timing on Council's comments?

Thank you in advance.

Kind regards

Meg Kong | Associate

TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994
Suite 502, Level 5, 282 Victoria Avenue, Chatswood NSW 2067
P (02) 9411 5660 F (02) 9904 6622 W ttpa.com.au
ttpa

From: Meg Kong
Sent: Wednesday, 10 February 2021 10:26 AM
To: 'Craig Hopfe' <chopfe@thehills.nsw.gov.au>
Cc: 'Vitaly Kaakoush (Vitaly.Kaakoush@hutchinsonbuilders.com.au)' <Vitaly.Kaakoush@hutchinsonbuilders.com.au>; 'Andy Smith (Hutchinson Builders (Sydney))' <Andy.Smith@hutchinsonbuilders.com.au>; 'Angela Vernicos' <AVERNICOS@thehills.nsw.gov.au>; 'Michael Lathlean' <mlathlean@thehills.nsw.gov.au>; 'Rodney Pavitt' <rpavitt@thehills.nsw.gov.au>
Subject: RE: SSD 9274 - Redevelopment of Samuel Gilbert Public School - Revised CTMP

Good morning Craig

Just following up if Council has any comments on the minor changes made to the revised CTMP.

Thank you.

Kind regards

Meg Kong | Associate

TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994
Suite 502, Level 5, 282 Victoria Avenue, Chatswood NSW 2067
P (02) 9411 5660 F (02) 9904 6622 W ttpa.com.au
ttpa

From: Meg Kong
Sent: Thursday, 4 February 2021 1:33 PM
To: 'Craig Hopfe' <chopfe@thehills.nsw.gov.au>
Cc: 'Vitaly Kaakoush (Vitaly.Kaakoush@hutchinsonbuilders.com.au)' <Vitaly.Kaakoush@hutchinsonbuilders.com.au>; 'Andy Smith (Hutchinson Builders (Sydney))' <Andy.Smith@hutchinsonbuilders.com.au>; 'Angela Vernicos' <AVERNICOS@thehills.nsw.gov.au>; 'Michael Lathlean' <mlathlean@thehills.nsw.gov.au>; 'Rodney Pavitt' <rpavitt@thehills.nsw.gov.au>
Subject: RE: SSD 9274 - Redevelopment of Samuel Gilbert Public School - Revised CTMP

Hi Craig

Hope you are well. Just following up if you have any comments on the updated CTMP.

Thank you in advance.

Kind regards

Meg Kong | Associate

TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994
Suite 502, Level 5, 282 Victoria Avenue, Chatswood NSW 2067
P (02) 9411 5660 F (02) 9904 6622 W ttpa.com.au
ttpa

From: Meg Kong
Sent: Thursday, 28 January 2021 3:25 PM
To: Rodney Pavitt <rpavitt@thehills.nsw.gov.au>; Craig Hopfe <chopfe@thehills.nsw.gov.au>
Cc: Vitaly Kaakoush (Vitaly.Kaakoush@hutchinsonbuilders.com.au) <Vitaly.Kaakoush@hutchinsonbuilders.com.au>; 'Andy Smith (Hutchinson Builders (Sydney))' <Andy.Smith@hutchinsonbuilders.com.au>; Angela Vernicos <AVERNICOS@thehills.nsw.gov.au>; Michael Lathlean <mlathlean@thehills.nsw.gov.au>
Subject: RE: SSD 9274 - Redevelopment of Samuel Gilbert Public School - Revised CTMP

Much appreciated, Rodney.

Kind regards

Meg Kong | Associate

TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994
Suite 502, Level 5, 282 Victoria Avenue, Chatswood NSW 2067
P (02) 9411 5660 F (02) 9904 6622 W ttpa.com.au
ttpa

From: Rodney Pavitt <rpavitt@thehills.nsw.gov.au>
Sent: Thursday, 28 January 2021 11:45 AM
To: Meg Kong <meg@ttpa.com.au>; Craig Hopfe <chopfe@thehills.nsw.gov.au>
Cc: Vitaly Kaakoush (Vitaly.Kaakoush@hutchinsonbuilders.com.au) <Vitaly.Kaakoush@hutchinsonbuilders.com.au>; 'Andy Smith (Hutchinson Builders (Sydney))' <Andy.Smith@hutchinsonbuilders.com.au>; Angela Vernicos

<AVERNICOS@thehills.nsw.gov.au>; Michael Lathlean <mlathlean@thehills.nsw.gov.au>
Subject: RE: SSD 9274 - Redevelopment of Samuel Gilbert Public School - Revised CTMP

Hi Meg,

Craig's Team assess and approve CTMP's, including those for State Significant Developments such as your site, and so I will leave it for Craig, or one of his Team to respond to you regarding your new CTMP.

Regards,

Rodney

From: Meg Kong [mailto:meg@ttpa.com.au]
Sent: Thursday, 28 January 2021 9:30 AM
To: Angela Vernicos; Craig Hopfe; Rodney Pavitt
Cc: Vitaly Kaakoush (Vitaly.Kaakoush@hutchinsonbuilders.com.au); 'Andy Smith (Hutchinson Builders (Sydney))'
Subject: SSD 9274 - Redevelopment of Samuel Gilbert Public School - Revised CTMP

Good morning Angela, Craig, Rodney

Hope you are well

Due to the site's constraint, the trucks (up to 12.5m heavy rigid vehicles) will now have to reverse into the site on arrival and depart in a forward direction. All movements in and out of the site will be completed under the management of trained site personnel at the site access (for pedestrian safety) and accredited traffic controllers on Gilbert Road (for vehicle safety). I have amended the CTMP on Sections 4.4, 4.6, Appendix C and E to reflect the new setup. Please download the revised CTMP from the link below:

https://www.dropbox.com/s/tnx0q3p42v2rqsb/SAMUEL%20GILBERT%20PUBLIC%20SCHOOL%2C%20RIDGECROP%20DRIVE%2C%20CASTLE%20HILL%20JAN%202021%20CTPMP%20REV%20G.pdf?dl=0

Appreciate Council's review and approval. Feel free to contact me if you have any questions.

Kind regards

Meg Kong | Associate

TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994
Suite 502, Level 5, 282 Victoria Avenue, Chatswood NSW 2067
P (02) 9411 5660 F (02) 9904 6622 W ttpa.com.au
ttpa

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Meg Kong

From: Meg Kong
Sent: Thursday, 11 February 2021 1:51 PM
To: Dina Hanna
Cc: Vitaly Kaakoush (Vitaly.Kaakoush@hutchinsonbuilders.com.au); 'Andy Smith (Hutchinson Builders (Sydney))'; Kevin Alawadhi
Subject: RE: SSD 9274 - Redevelopment of Samuel Gilbert Public School - Revised CTMP

Thanks, Dina.

Will check with Council.

Kind regards

Meg Kong | Associate

TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994
Suite 502, Level 5, 282 Victoria Avenue, Chatswood NSW 2067
P (02) 9411 5660 F (02) 9904 6622 W ttpa.com.au
ttpa

From: Dina Hanna <Dina.HANNA@transport.nsw.gov.au>
Sent: Thursday, 11 February 2021 1:32 PM
To: Meg Kong <meg@ttpa.com.au>
Cc: Vitaly Kaakoush (Vitaly.Kaakoush@hutchinsonbuilders.com.au) <Vitaly.Kaakoush@hutchinsonbuilders.com.au>; 'Andy Smith (Hutchinson Builders (Sydney))' <Andy.Smith@hutchinsonbuilders.com.au>; Kevin Alawadhi <Kevin.Alawadhi@transport.nsw.gov.au>
Subject: RE: SSD 9274 - Redevelopment of Samuel Gilbert Public School - Revised CTMP

Hi Meg

I had a discussion with Michael from Council and please note that Gilbert road is under the care and control of Council, TfNSW raise concerns with regards to the truck reverse manoeuvring onto the site and the tight swept path during the school peak hours due to the conflict with the school kids drop off and pick up times.

You would need to discuss this with council and confirm that Council is satisfied with swept path provided and also the operating hours of the construction activities.

I hope this helps!

Kind Regards
Dina Hanna
Senior Network & Safety Officer West
North West Precinct
Greater Sydney Division
Transport for NSW

M 0476 827 493

Level 5, 27 Argyle Street, Parramatta NSW 2150
www.Transport.nsw.gov.au
Transport for NSW
Every journey matters

From: Meg Kong [mailto:meg@ttpa.com.au]
Sent: Wednesday, 10 February 2021 10:27 AM
To: Dina Hanna <Dina.HANNA@transport.nsw.gov.au>
Cc: Vitaly Kaakoush (Vitaly.Kaakoush@hutchinsonbuilders.com.au) <Vitaly.Kaakoush@hutchinsonbuilders.com.au>; 'Andy Smith (Hutchinson Builders (Sydney))' <Andy.Smith@hutchinsonbuilders.com.au>; Kevin Alawadhi <Kevin.Alawadhi@transport.nsw.gov.au>
Subject: RE: SSD 9274 - Redevelopment of Samuel Gilbert Public School - Revised CTMP

Hi Dina

Hope you are well. Just following up on TfNSW input on the matter below.

Thank you in advance.

Kind regards

Meg Kong | Associate

TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994
Suite 502, Level 5, 282 Victoria Avenue, Chatswood NSW 2067
P (02) 9411 5660 F (02) 9904 6622 W ttpa.com.au
ttpa

From: Meg Kong
Sent: Thursday, 4 February 2021 1:14 PM
To: 'Dina Hanna' <Dina.HANNA@transport.nsw.gov.au>
Cc: Vitaly Kaakoush (Vitaly.Kaakoush@hutchinsonbuilders.com.au) <Vitaly.Kaakoush@hutchinsonbuilders.com.au>; 'Andy Smith (Hutchinson Builders (Sydney))' <Andy.Smith@hutchinsonbuilders.com.au>; Kevin Alawadhi <Kevin.Alawadhi@transport.nsw.gov.au>
Subject: RE: SSD 9274 - Redevelopment of Samuel Gilbert Public School - Revised CTMP

Hi Dina

Thanks for your comments. Please see below my response.

Given that the reversing truck will not impact the signalised crossing and that we will have trained staff/traffic to manage such movements, appreciate if TfNSW can reconsider this matter.

We look forward to getting a favourable response from your team.

Kind regards

Meg Kong | Associate

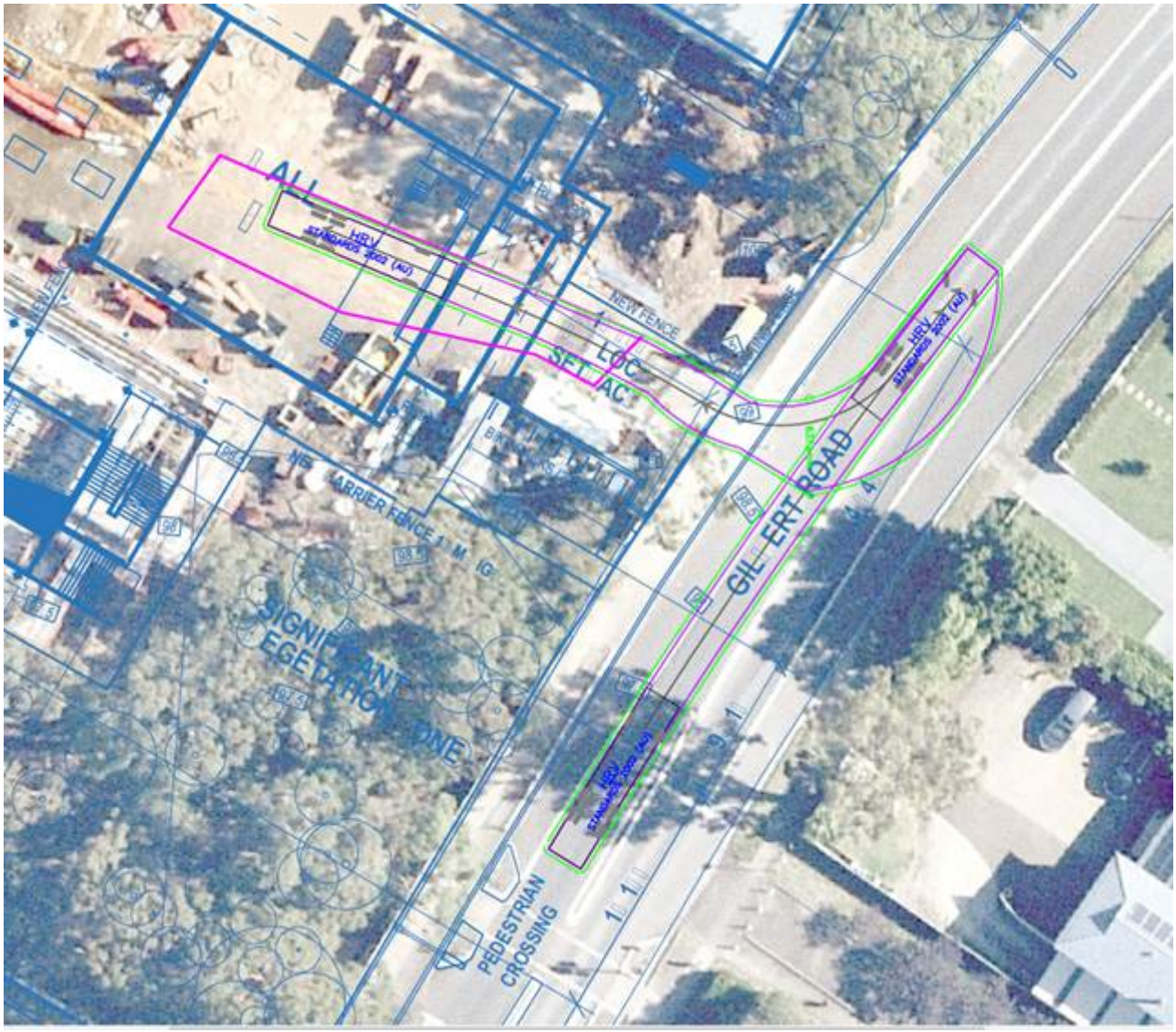
TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994
Suite 502, Level 5, 282 Victoria Avenue, Chatswood NSW 2067
P (02) 9411 5660 F (02) 9904 6622 W ttpa.com.au

From: Dina Hanna <Dina.HANNA@transport.nsw.gov.au>
Sent: Thursday, 4 February 2021 12:43 PM
To: Meg Kong <meg@ttpa.com.au>
Cc: Vitaly Kaakoush (Vitaly.Kaakoush@hutchinsonbuilders.com.au) <Vitaly.Kaakoush@hutchinsonbuilders.com.au>; 'Andy Smith (Hutchinson Builders (Sydney))' <Andy.Smith@hutchinsonbuilders.com.au>; Kevin Alawadhi <Kevin.Alawadhi@transport.nsw.gov.au>
Subject: RE: SSD 9274 - Redevelopment of Samuel Gilbert Public School - Revised CTMP

Hi Meg

Thank you for the CTMP at the above subject site, please see TfNSW below comments:

- Any Traffic Control Plans (TCP) prepared are to comply with A51742.3 and RMS's "Traffic Control at Worksites" manual (2018) and be signed by a person with RMS certification to prepare TCP's. **Yes, the certification has been included in all TCPs within Appendix E.**
- A copy of the TCP is to be held on site at all times by the responsible traffic controllers. **Noted and currently adhered.**
- No construction vehicle movements including material loading and unloading from construction vehicles are to occur during school drop-off (8.00am to 9.30am) and pick up (2.30pm to 4.00pm) times on school days to ensure the safety of school children in the vicinity of the school. **Noted on Sections 4.5 and 5.4**
- The proposed reverse-in manoeuvre for the 12.5 HRV from Gilbert Road is not supported as it is likely to impact on the safety and operation of the signalised pedestrian crossing immediately south of the construction access
  As shown on the swept path assessments in Appendix C (also below), the reversing of the truck into the site will not affect the signalised pedestrian crossing operation. As shown in Appendix E and Section 4.4, the reversing movements will be completed under the management of trained on-site personnel and traffic controllers.



- The proposed work zone on Gilbert Road is located within close proximity to the signalised pedestrian crossing and therefore, Road Occupancy Licences ROL are to be obtained from the Transport for NSW Transport Management Centre where necessary **Noted and currently adhered.**
- Barricades and signs to be provided in accordance with Australian Standards **Yes, this requirement is included in the general notes in all TCPs within Appendix E.**
- Appropriate advanced signage to warn drivers about changes in road conditions **Yes, this requirement is included in all TCPs within Appendix E.**
- Access be maintained for emergency vehicles at all times **Yes, see Section 5.7 of the CTMP**
- Access be maintained for all pedestrians and cyclists, ensuring their safety at all time **Yes, see Section 6.4 of the CTMP**
- All the existing 40km/h school zone infrastructure including signage and line marking should be maintained. Any damage to these infrastructure should be retained as per the exiting condition at no cost to Transport for NSW. **Yes, see Section 5.10 of the CTMP**
- The Council is to be satisfied with the provided turning paths as clearance and manoeuvrability is shown to be restrictive **Noted, we are waiting to hear back from Council**
- Any additional conditions that Council may require **Noted, we are waiting to hear back from Council**

Kind Regards
Dina Hanna
Senior Network & Safety Officer West
North West Precinct
Greater Sydney Division
Transport for NSW

M 0476 827 493
Level 5, 27 Argyle Street, Parramatta NSW 2150
www.Transport.nsw.gov.au
Transport for NSW
Every journey matters

From: Meg Kong [mailto:meg@ttpa.com.au]
Sent: Thursday, 28 January 2021 9:31 AM
To: Cameron Mcintyre <Cameron.MCINTYRE@transport.nsw.gov.au>
Cc: Vitaly Kaakoush (Vitaly.Kaakoush@hutchinsonbuilders.com.au) <Vitaly.Kaakoush@hutchinsonbuilders.com.au>; 'Andy Smith (Hutchinson Builders (Sydney))' <Andy.Smith@hutchinsonbuilders.com.au>; Dina Hanna <Dina.HANNA@transport.nsw.gov.au>
Subject: SSD 9274 - Redevelopment of Samuel Gilbert Public School - Revised CTMP

Good morning Cameron,

Hope you are well.

Due to the site's constraint, the trucks (up to 12.5m heavy rigid vehicles) will now have to reverse into the site on arrival and depart in a forward direction. All movements in and out of the site will be completed under the management of trained site personnel at the site access (for pedestrian safety) and accredited traffic controllers on Gilbert Road (for vehicle safety). I have amended the CTMP on Sections 4.4, 4.6, Appendix C and E to reflect the new setup. Please download the revised CTMP from the link below:

https://www.dropbox.com/s/tnx0q3p42v2rqsb/SAMUEL%20GILBERT%20PUBLIC%20SCHOOL%2C%20RIDGECROP%20DRIVE%2C%20CASTLE%20HILL%20JAN%202021%20CTPMP%20REV%20G.pdf?dl=0

Appreciate TfNSW's review and approval. Feel free to contact me if you have any questions.

Kind regards

Meg Kong | Associate

TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994
Suite 502, Level 5, 282 Victoria Avenue, Chatswood NSW 2067
P (02) 9411 5660 F (02) 9904 6622 W ttpa.com.au
ttpa

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Post Approval – Consultation

Consultation needs to be meaningful, done with courtesy and respect and be well documented. These are people/ organisations that we need to be building meaningful relationships with.

Conditions of all consent can require consultation with a range of stakeholders. Consultation in the post approval world needs to be well documented to satisfy the condition requirements.

Examples include Council, service providers (eg. Electricity gas etc.), consult with local bus provider and TfNSW.

Read each condition carefully, any reference to consult triggers consultation.

Typically on State Significant Development, there will be a specific consultation condition as to how this piece can be appropriately addressed.

Consultation is not:

- A token gesture
- Done at the end of the piece of work,
- An email to the relevant stakeholder with no response;
- A meeting with the stakeholder with no meeting minutes.

Consultation is:

- Meaningful
- Done prior to the requirement,
- Captures an outcome,
- Identifies matters resolved,
- Identifies matters unresolved,
- Any disagreements are disclosed; and
- How we are going to address unresolved matters?

How to capture all the relevant details on consultation requirements? Any consultation requirement in a condition is required to be accompanied with the following table:

Post Approval Consultation Record

Identified Party to Consult:	Hills Shire Council/Transport for NSW
Consultation type:	Email
When is consultation required?	Prior to Construction
Why	To meet Condition B30 (a)
When was consultation scheduled/held	4th February 2021, Email with TfNSW 11th February 2021, Email with TfNSW 28th of January 2021, Email with Council 24th of February 2021, Email with Council
When was consultation held	4th February 2021, Email with TfNSW 11th February 2021, Email with TfNSW 28th of January 2021, Email with Council 24th of February 2021, Email with Council
Identify persons and positions who were involved	- Meg Kong (TTPA) - Craig Hopfe (Council) - Rodney Pavitt (Council) - Dina Hanna (TfNSW)
Provide the details of the consultation	- Consultation with TfNSW and Council with regards to SSDA 9274 condition B30 (a).
What specific matters were discussed?	- Consultation complete to ensure all parties have no issues with vehicles reversing onto site.
What matters were resolved?	- No issues with reversing onto site if the TCP is adhered to.
What matters are unresolved?	- None
Any remaining points of disagreement?	- No
How will SINSW address matters not resolved?	- N/a

APPENDIX H – CONSTRUCTION NOISE AND VIBRATION MANAGEMENT SUB PLAN

As per Condition B13 (c)

DAY DESIGN PTY LTD
CONSULTING ACOUSTICAL ENGINEERS

SUITE 17, 808 FOREST ROAD, PEAKHURST 2210 ABN 73 107 291 494
P. 02 9046 3800 ACOUSTICS@DAYDESIGN.COM.AU WWW.DAYDESIGN.COM.AU

Construction Noise & Vibration Management Sub - Plan

Redevelopment of Samuel Gilbert Public School
Ridgecrop Drive, Castle Hill, NSW

REPORT No
6395-3.1R Rev B

DATE ISSUED
7 April 2020

Prepared For:
Samuel Gilbert Public School
C/- Hutchinson Builders
23 Dunning Avenue
Rosebery NSW 2018

Attention: Mr Vitaly Kaakoush

Revision History

Report	Date	Prepared	Checked	Comment
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Final	11/03/2020	Adam Shearer	Stephen Gauld	
Rev A	31/03/2020	Adam Shearer	Stephen Gauld	Appendix E
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Document R\6395-3.1R Rev B, 27 pages plus attachments

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1.0 EXECUTIVE SUMMARY

The Department of Education (DoE) has recently received approval (SSD 9274, 15 February 2020) to redevelop the existing Samuel Gilbert Public School at Ridgecrop Drive, Castle Hill, NSW.

The School is located on land zoned R2 – Low Density Residential under The Hills Local Environmental Plan (LEP) 2012. The School is bounded by Castle Glen Reserve to the north, commercial premises to the east (including a Child Care Centre), Gilbert Road to the south-east, Ridgecrop Drive to the south-west and residential premises to the west. Residential premises are also located on the opposite side of Gilbert Road to the south-east and Ridgecrop Drive to the south-west.

The approved proposal includes the removal of the demountables on the site to accommodate the redevelopment of the School and also the construction of 25 new permanent teaching spaces (home bases). The construction will include the removal of demountables, excavation of the site and the construction of the new Samuel Gilbert Public School buildings. The approved hours of construction are during standard working hours, as follows:

- 7.00 am to 6.00 pm Monday to Friday inclusive;
- 8.00 am to 1.00 pm Saturday; and
- No work on Sundays or public holidays.

The development is a State Significant Development (SSD) and as part of the Development Consent issued by the NSW Department of Planning and Environment, attached as Appendix C, an assessment against the NSW Environment Protection Authority's (EPA) *Interim Construction Noise Guideline 2009* is required.

This construction noise and vibration management sub-plan has been prepared in accordance with the Australian Standard AS2436:2010 *"Guide to noise and vibration control on construction, demolition and maintenance sites"*. Construction noise and vibration management levels have been derived from the Environment Protection Authority's *Interim Construction Noise Guideline 2009* and *Assessing Vibration: a technical guideline 2006* and are used for a quantitative assessment at the nearest affected residential and educational receiver locations.

The major noise sources associated with the project are mobile plant and machinery to be used during the excavation and bulk earth works including rock hammering (if required) and the transport of raw materials to and from site in trucks.

There is potential, at least on some occasions, for noise emission from construction works to exceed the noise management level at some residences during various stages of the works.

All feasible and reasonable methods to reduce noise emissions and minimise the noise impact on neighbouring properties have been provided in Section 6 of this report. These include, limiting construction activity to within the prescribed hours, selecting quiet equipment, incorporating periods of respite, maintaining community consultation relations, managing noise complaints and conducting ground-borne vibration monitoring (if necessary).

Provided the recommendations in Section 6 of this report are implemented and adhered to, the level of noise and vibration from the construction works will be minimised in accordance with Australian Standard AS2436:2010 and the NSW Environment Protection Authority's *Interim Construction Noise Guideline 2009* and *Assessing Vibration: a technical guideline 2006*.

2.0 CONSULTING BRIEF

Day Design Pty Ltd has been engaged by Hutchinson Builders on behalf of Samuel Gilbert Public School to assess the environmental noise impact of the construction of the proposed redevelopment of Samuel Gilbert Public School at Ridgecrop Drive, Castle Hill, NSW.

This commission involves the following:

Scope of Work:

- Inspect the site and environs
- Measure the background noise levels at critical locations and times
- Establish acceptable noise level criterion
- Quantify noise emissions from the demolition, excavation and construction works
- Calculate the level of noise emission, taking into account distance attenuation
- Prepare a site plan identifying the development and nearby noise sensitive locations
- Provide recommendations for noise control (if necessary)
- Prepare a Construction Noise and Vibration Management Sub-Plan.

3.0 PROJECT DESCRIPTION

3.1 Site Description

Samuel Gilbert Public School is located on land zoned R2 – Low Density Residential under The Hills Local Environmental Plan (LEP) 2012. The School is bounded by Castle Glen Reserve to the north, commercial premises to the east (including a Child Care Centre), Gilbert Road to the south-east, Ridgecrop Drive to the south-west and residential premises to the west. Residential premises are also located on the opposite side of Gilbert Road to the south-east and Ridgecrop Drive to the south-west, as shown on Figure 1.

The nearest noise sensitive receptors to the property, in various directions, are shown in Figure 1 and as follows in Table 1.

Table 1 Noise Sensitive Receptors

Receptor and Type	Address	Direction from site
R1 – Child Care Centre (Educational)	22 Gilbert Road	East
R2 – Residential	75 Gilbert Road	South-East
R3 – Residential	2 Galahad Crescent	South-West
R4 – Residential	9 Squire Place	West

3.2 Development Description

The development process is broken down into two phases:

- Phase 1 – Excavation and earth moving
    - Expected timeframe of 8 weeks
    - Activities include use of excavator and dump trucks, a pile bore and a rock breaker as required
- Phase 2 – Construction
    - Expected timeframe 40 weeks
    - Activities include use of cement trucks, cranes, gensets, and hand tools.

The approved hours of construction works, including delivery of materials to and from the site, are as follows:

- Monday to Friday: 7 am to 6 pm;
- Saturdays: 8 am to 1 pm; and
- Sundays and public holidays: No work.

The approved hours for rock breaking, rock hammering, sheet piling , pile driving and similar activities, are as follows:

- Monday to Friday: 9 am to 12 pm and 2 pm to 5 pm;
- Saturdays: 9 am to 12 pm; and
- Sundays and public holidays: No work.

Figure 1 - Location Plan, Ridgecrop Drive, Castle Hill, NSW.

4.0 NOISE CRITERIA

4.1 Measured Ambient 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 nearby residential dwellings and Child Care Centre. These locations are shown in the Site Plan on Figure 1 as 'R1' to 'R4'. The times of worst possible annoyance will be during the day when the construction is occurring.

Ambient noise levels were measured in two locations - the front yard of 73 Gilbert Road and the backyard of 9 Squire Place - shown as Logger Locations 'A' and 'B' on Figure 1, respectively, from Wednesday 13 December to Wednesday 20 December, 2017.

The day time ambient noise levels are presented in the attached Appendix B1 and B2 and also below in Table 2.

Table 2 Ambient Noise Levels

Noise Measurement Location	Time Period	L_{90} Rating Background Level	Existing L_{eq} Noise Level
Logger Location 'A' - Front yard – 73 Gilbert Road	Day (7 am to 6 pm)	**49 dBA**	**62 dBA**
Logger Location 'B' - Backyard – 9 Squire Place	Day (7 am to 6 pm)	**35 dBA**	**52 dBA**

Meteorological conditions during the testing typically consisted of clear skies and temperatures of 16 to 42°C. Atmospheric conditions were ideal for noise monitoring. Noise measurements were therefore considered reliable and typical for the receptor areas.

4.2 NSW Department of Planning & Environment

The NSW Department of Planning and Environment issued the Development Consent (*SSD 9274, 15 February 2020*) for the Samuel Gilbert Public School Redevelopment, Ridgecrop Drive, Castle Hill, NSW. As part of the Development Consent, the following Conditions relating to acoustics must be satisfied:

'Part B Prior to Commencement of Construction

B15. *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 B8(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 management measures in accordance with Condition B12(d).

Note on parts (d) and (e): Community consultation for DoE projects is not permitted by consultants or contractors unless explicitly instructed. Parts (d) and (e) of the Consent Condition B15 are to be completed by DoE representatives prior to the commencement of construction (*see "Community Relations" on page 23*). These parts of the Consent can only in part be satisfied by a consultant, prior to the actual community consultation by the DoE, through the implementation of strategies specific to the project, in line with the requirements of *Australian Standard AS2436* and the EPA's *Interim Construction Noise Guideline*.

During Construction

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 7 am and 6 pm, Mondays to Fridays inclusive; and

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

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

C5. *Activities may be undertaken outside of the hours in condition 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 approved for the works.

C6. *Notification of such activities must be given to affected residents before undertaking the activities or as soon as is practical afterwards.*

C7. *Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours:*

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

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

(c) 9 am to 12 pm, Saturday.

4.3 Australian Standard AS2436

The Australian Standard AS2436:2010 *"Guide to noise and vibration control on construction, demolition and maintenance sites"* provides guidance on noise control in respect to construction, demolition and maintenance sites. The Standard also provides guidance for the preparation of noise and vibration management plans.

Section 1.5 'Regulatory Requirements' of the Standard states:

"Legislation associated with the control of noise and vibration on and from construction, demolition and maintenance sites in Australia is generally the responsibility of the relevant State or Territory government, local council or a designated statutory authority."

Consequently the Standard does not provide specific noise criterion rather sets out practical methods for determining the potential for noise and vibration impact on the community from construction, demolition and maintenance sites.

A qualitative method is described in Section 3.3 of the standard, which is designed to avoid the need for complex noise predictions by following a series of questions relating to, for example, whether the noise is likely to be loud, have annoying characteristics or affect sleep.

In the event that any of these outcomes are likely, a more detailed and quantitative approach should be adopted.

In relation to carrying out detailed noise impact assessments, Section 4 'General' of the standard states:

"Regulatory authorities may have relevant polices and/or guidelines for the control of noise and vibration on construction sites. These should also be referred to when developing noise and vibration management plans for such projects."

In NSW this is the NSW Environment Protection Authority's *Interim Construction Noise Guideline 2009* as outlined in Section 4.4.

The Standard further states, in Section 4.6.1, that if noisy processes cannot be avoided, then the amount of noise reaching the receiver should be minimised and goes on to provide advice and recommendations to reduce noise and vibration impacts as far as reasonably practicable.

This report has been prepared in accordance with the guidance provided in AS2436:2010.

4.4 EPA Construction Noise Guideline

The NSW Environment Protection Authority published the *Interim Construction Noise Guideline* in July 2009. While some noise from construction sites is inevitable, the aim of the Guideline is to protect the majority of residences and other sensitive land uses from noise pollution most of the time.

The Guideline presents two ways of assessing construction noise impacts; the quantitative method and the qualitative method.

The quantitative method is generally suited to longer term construction projects and involves predicting noise levels from the construction phase and comparing them with noise management levels given in the guideline.

The qualitative method for assessing construction noise is a simplified way to identify the cause of potential noise impacts and may be used for short-term works, such as repair and maintenance projects of short duration.

In this instance, the quantitative method is the most appropriate and has been used in this assessment. Details of the quantitative method are given in Section 4 of the Guideline.

Normal construction hours are defined by the EPA as follows:

- 7.00 am to 6.00 pm Monday to Friday;
- 8.00 am to 1.00 pm Saturday; and
- No work on Sunday or Public Holiday.

Table 2 in Section 4 of the Guideline sets out noise management levels at affected residences and how they are to be applied during normal construction hours. The noise management level is derived from the rating background level (RBL) plus 10 dB in accordance with the Guideline. This level is considered to be the 'noise affected level' which represents the point above which there may be some community reaction to noise.

The 'highly noise affected' level of 75 dBA represents the point above which there may be strong community reaction to noise. This level is provided in the Guideline and is not based on the RBL. Restrictions to the hours of construction may apply to activities that generate noise at residences above the 'highly noise affected' noise management level.

Based on the RBLs at all sensitive residential receiver locations in the daytime, the recommended noise management level during all aspects of the construction program are summarised in Table 3.

Table 3 L_{eq} Noise Management Levels from Construction Activities

Receptor Location	Noise Management Level	How to Apply
'R2' & 'R3'	**59 dBA (49 + 10)**	The noise affected level represents the point above which there may be some community reaction to noise. ▪ Where the predicted or measured $L_{Aeq\ (15\ min)}$ noise level 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.
'R4'	**45 dBA (35 + 10)**	
All Residential Receptors	**Highly noise affected 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.

*Section 6, 'work practices' of The *Interim Construction Noise Guideline*, states: *"there are no prescribed noise controls for construction works. Instead, all feasible and reasonable work practices should be implemented to minimise noise impacts. This approach gives construction site managers and construction workers the greatest flexibility to manage noise"*.

Definitions of the terms feasible and reasonable are given in Section 1.4 of the Guideline.

Section 4.1.2 of the guideline sets out noise management levels at the nearby affected Child Care Centre. It states that *'internal noise levels are to be assessed at the centre of the occupied room'*, however, *'where internal noise levels cannot be measured, external noise levels may be used. A conservative estimate of the difference between internal and external noise levels is 10 dB for buildings other than residences'*, as follows:

- Classrooms at schools and other educational institutions: external $L_{Aeq,\ 15\ minute}$ (45 + 10 =) 55 dBA.

During construction, the proponent should regularly update the occupant of the Child Care Centre regarding noise levels and hours of work.

4.5 EPA Vibration Guideline

The NSW EPA published the *Assessing Vibration: a technical guideline* in February 2006. This guideline is based on the British Standard BS6472:1992 *"Evaluation of human exposure to vibration in buildings (1 Hz to 80 Hz)."*

The guideline presents preferred and maximum vibration values for use in assessing human responses to vibration and provides recommendations for measurement and evaluation techniques. The guideline considers vibration from construction activities as Intermittent Vibration. Table 2.4 of the guideline sets out limits for Vibration Dose Values to assess intermittent vibration and is replicated below in Table 4 for residential and educational receptor locations.

Table 4 Vibration Dose Values (VDV) from Construction Activities

Receptor Location	Daytime	
	Preferred value ($m/s^{1.75}$)	Maximum value ($m/s^{1.75}$)
All Residences	0.20	0.40
Schools, educational institutions	0.40	0.80

The British Standard BS7385-2:1993 *"Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration"* provides guide values for transient vibration relating to cosmetic damage, replicated below in Table 5 for residential and educational buildings.

Table 5 Transient Vibration Guide Values for Cosmetic Damage

Type of building	Peak component particle velocity in frequency range of predominant pulse	
	4 Hz to 15 Hz	15 Hz and above
Residential buildings and light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

In our opinion, an overall peak particle velocity of **15 mm/s** at the boundaries will comply with the recommended values in Table 5, and is an acceptable criterion for intermittent vibration to prevent cosmetic damage to the adjacent residential and educational buildings.

4.6 Project Specific Noise Criteria

In our opinion, the most relevant noise and vibration management levels for this development are those outlined in Sections 4.4 and 4.5 of this report, and summarised as follows:

- Noise management level of **55 dBA** ($L_{eq,\ 15\ minute}$) for educational receptor 'R1';
- Noise management level of **59 dBA** ($L_{eq,\ 15\ minute}$) for residential receptors 'R2' and 'R3';
- Noise management level of **45 dBA** ($L_{eq,\ 15\ minute}$) for residential receptor 'R4';
- A Vibration Dose Value (VDV) between **0.2 – 0.4 m/s$^{1.75}$** for human annoyance in residential buildings;
- A Vibration Dose Value (VDV) between **0.4 – 0.8 m/s$^{1.75}$** for human annoyance in schools or educational institutions; and
- A Peak Particle Velocity no greater than **15 mm/s** for cosmetic damage.

5.0 NOISE EMISSION

The main sources of noise on the site during the two phases of excavation and construction will be from heavy machinery such as excavators, dump trucks, cranes, cement mixers, rock breakers, etc.

Unless otherwise noted, the predicted noise levels in the following Sections assume that all equipment and plant listed are operating at the same time within the same general area along the nearest or furthest boundaries. This constitutes a worst-case scenario, however, due to the nature of the works, it is more likely that equipment will be dispersed over a wider area of the construction site and will not be continuously operating simultaneously. Typically, therefore, lower average levels can be expected.

A schedule of the sound power levels for the main demolition, excavation and construction equipment was extracted from the Day Design database of Sound Power Levels and the Australian Standard AS2436:1981 *"Guide to Noise Control on Construction, Maintenance and Demolition Sites".*

Knowing the sound power level of a noise source, the sound pressure level (as measured with a sound level meter) can be calculated at a remote location using suitable formulae to account for distance losses, barrier effects, etc.

Calculations consider distance attenuation only and the range of levels are based on the closest potential distance and furthest potential distance at which each item of plant may operate from each respective residential and educational location. The calculated noise levels at nearby residential receptors are presented in Tables 7, 9 and 10.

5.1 Phase 1 – Excavation and Bulk Earth Works

The removal of the demountables, excavation and bulk earth works is estimated to take 8 weeks and will involve the use of excavators, rock hammers / saws, pile bores and regular truck movements transporting waste materials from the site. The equipment likely to be used and their corresponding sound power levels are presented below in Table 6.

Table 6 Typical Excavation Works Equipment - Sound Power Levels

Description	Sound Power Level, dBA
Excavator – Hitachi 330	107
Truck	107
Compressor	101
Generator	99
Piling (Bored)	111
Hydraulic Rock Breaker	118

Note: (All sound power levels are based on previous noise measurements at various sites)

Given the intensity of work involved with rock breaking, it is unlikely that this activity will take place at the same time as any other activity. Therefore we have assessed the noise impact of rock breaking individually. The calculated noise levels at nearby residential and educational receptors are presented below in Table 7 as a worst case scenario.

Table 7 Calculated Receptor Sound Pressure Levels from Excavation Works

Receptor Location	Calculated Sound Pressure Levels (dBA)
R1 - 22 Gilbert Road	56 – 60
R2 - 75 Gilbert Road	57 – 70
R3 - 2 Galahad Crescent	62 – 72
R4 - 9 Squire Place	53 – 59
Rock Breaking	
R1 - 22 Gilbert Road	63 – 67
R2 - 75 Gilbert Road	65 – 77
R3 - 2 Galahad Crescent	69 – 79
R4 - 9 Squire Place	60 – 66

5.2 Phase 2 – Construction

The construction of the mixed use building is estimated to take 40 weeks and will involve the use of heavy vehicles, power tools and portable mechanical plant such as generators and compressors. The equipment likely to be used and their corresponding sound power levels are presented below in Table 8.

Table 8 Typical Construction Equipment - Sound Power Levels

Description	Sound Power Level, dBA
Cement Truck	109
Crane	104
Generator	99
Compressor	101
Power Saw	105
Nail Gun	95
Grinder	101
Bobcat	106

Note: (All sound power levels are based on previous noise measurements at various sites)

During the construction phase, work will be more dispersed across the site as the scale of work, compared to the previous phase, is less intensive. The calculated noise levels at nearby residential and educational are presented below in Table 9 as a worst case scenario.

Table 9 Calculated Receptor Sound Pressure Levels from Construction Works

Receptor Location	Calculated Sound Pressure Levels (dBA)
R1 - 22 Gilbert Road	59 – 62
R2 - 75 Gilbert Road	60 – 72
R3 - 2 Galahad Crescent	64 – 74
R4 - 9 Squire Place	56 – 62

5.3 Noise Emission Summary

From the calculated noise levels in Sections 5.1 to 5.2, the levels of exceedance are presented below in Table 10.

Table 10 Calculated $L_{eq\ 15\ minute}$ Noise Levels (Without Noise Controls)

Description	Calculated Noise Levels (dBA)			
	22 Gilbert Street	75 Gilbert Street	2 Galahad Crescent	9 Squire Place
Phase 1 – Excavation Works				
Excavation Works	56 – 60	57 – 70	62 – 72	53 – 59
Rock Hammering	63 – 67	65 – 77	69 – 79	60 – 66
Noise Management Level	55	59	59	45
Exceedance	**Up to 12 dB**	**Up to 18 dB**	**Up to 20 dB**	**Up to 21 dB**
Phase 2 – Construction				
Construction Works	59 – 62	60 – 72	64 – 74	56 – 62
Noise Management Level	55	59	59	45
Exceedance	**Up to 7 dB**	**Up to 13 dB**	**Up to 15 dB**	**Up to 17 dB**

It can be seen from Table 10 above, that the predicted levels of noise from construction activities will at times be in excess of the noise management levels of 53 dBA and 45 dBA, respectively, at residential receptor locations. There is also potential for the highly noise affected level of 75 dBA to be exceeded, if required, during any rock hammering.

To minimise the noise impact from the construction activities we recommend that the noise controls and the management sub-plan detailed in Section 6 of this report be implemented.

Rock hammering is not considered cumulatively as it is unknown at this stage whether it will be required, and if so where it may be required. To include it in the cumulative noise predictions would potentially over-state the predicted impact. However, as a precaution, it is recommended in the noise management controls (Section 6.2) that in the event that rock hammering is required near to residential receptors, it is conducted in the absence of any other plant operations to avoid a cumulative noise impact.

5.4 Vibration Emission

It is difficult to accurately predict levels of ground borne vibration at remote locations as there are many variables to consider including the surrounding terrain, strata, rock density, etc.

Previous measurements of ground borne vibration from rock hammering show that vibration levels can vary significantly at different distances and receptor locations. Given the distances from neighbouring developments to any potential rock hammering on site, we recommend that if warranted compliance monitoring of ground borne vibration is carried out at the nearest residences and Child Care Centre, wherever these activities are required.

Recommendations are made in Section 6.4 of this report should complaints arise from nearby residences regarding vibration from the site.

6.0 NOISE CONTROL RECOMMENDATIONS

The predicted level of noise emission from the excavation and construction activities at Samuel Gilbert Public School, Ridgecrop Drive, Castle Hill, NSW is in excess of the noise management levels established in Section 4.6 of this report.

In order to minimise the noise impact from all excavation and construction activities, we recommend the following engineering and management noise controls be implemented.

6.1 Engineering and Practical Noise Controls

Australian Standard AS2436:2010, Appendix C, Table C3 provides the relative effectiveness of various forms of noise control that may be applicable and implemented on various construction sites and projects. Table C3 is replicated below in Table 11.

Table 11 Relative Effectiveness of Various Forms of Noise Control

Control by	Nominal Noise Reduction Possible, dB
Distance	Approximately 6 dB for each doubling of distance
Enclosure	Normally 5 dB to 25 dB maximum 50 dB
Silencing	Normally 5 dB to 10 dB maximum 20 dB

Distance

Where applicable, we recommend locating mechanical plant near the centre of the site such that it is as far as practically possible from the residences to the east, south and west.

Enclosure

Constructing acoustical enclosures around items of mobile plant such as generators is recommended where extended use for long periods of time is expected.

Silencing

Consideration should be given to any mobile plant already acoustically treated when assessing tenders. All plant and machinery should be selected with consideration to low noise options where practicable and available.

Care should be taken to ensure that not more than one item of plant is operating simultaneously within close proximity of any given residence as far as reasonably practicable, to minimise cumulative noise impacts.

6.2 Noise Management Controls

The following noise management controls are derived from, or are in accordance with recommendations given in Australian Standard AS2436:2010 and the EPA's *Interim Construction Noise Guideline*.

Periods of Respite

We recommend that noisy construction activities such as rock hammering or the like only operate for 2 to 3 hours at a time.

Ensure activities in any one location are staggered, for instance, if rock hammering is occurring near to a residential receptor, all other construction activities will cease in the same location so as to minimise cumulative noise impacts.

Work Practices

We recommend that workers and contractors be trained in work practices to minimise noise emission such as the following:

- Avoid dropping materials from a height.
- Avoid shouting and talking loudly outdoors.
- Avoid the use of radios outdoors that can be heard at the boundary of residences.
- Turn off equipment when not being used.
- Carry out work only within the proposed hours of operation (see Section 3.2).

Heavy Vehicles and Staff Vehicles

- Keep truck drivers informed of designated vehicle routes, parking locations, acceptable delivery hours or other relevant practices (for example, minimising the use of engine brakes, and no extended periods of engine idling).
- Locate site vehicle entrances away from residences where practicable.
- Optimise the number of vehicle trips to and from the site – movements can be organised to amalgamate loads rather than using a number of vehicles with smaller loads.
- Staff parking areas should be located as far from residential receiver locations as practicable.
- No motor vehicles should access the site via, or park within residential areas prior to 7 am on any occasion, in order avoid sleep disturbance.

Community Relations

- A Community Liaison Officer (Project Manager or Site Manager) is to be appointed by the contractor prior to the commencement of any works.
- The Community Liaison Officer will approach all potentially affected residents prior to the commencement of any works as an initial introduction and provide his or her contact details.

- The Community Liaison Officer will explain the project, duration of works, potentially noisy periods as well as determine any particularly sensitive receivers or sensitive time periods and schedule works accordingly, as far as reasonably practical.
- A contact number will be provided for any residents to call with complaints or queries.

Once works commence, communication with the community should be maintained by the Community Liaison Officer. Communication should be maintained via a range of media including, for example, continued individual contact, letter box drops or a clearly visible notice board at the site office or on construction site boundaries.

Consultation and cooperation between the contractor and the neighbours and the removal of uncertainty and rumour can help to reduce adverse reaction to noise.

In addition –

- The DoE is to hold an Information Booth at the Samuel Gilbert Public School, adjacent to the site, to provide the community an opportunity to review the proposed construction activities. Residents in the vicinity are to be provided with 7 days notice. Comments will be captured per the NSW Department of Education Community Communication Strategy protocol. (See Appendix E)
- The NSW Department of Education Community Communication Strategy for complaints is to be implemented on this project. For the duration of the project a free call 1300 community information line is to be accessible and manned by Schools Infrastructure NSW.

Managing a Noise Complaint

The Community Liaison Officer should receive and manage noise complaints.

All complaints should be treated promptly and with courtesy.

Should a justified noise complaint not be resolved, noise monitoring may be carried out at the affected receptor location and appropriate measures be taken to reduce the noise emission as far as reasonably practicable.

Where it is not practicable to stop the noise, or reduce the noise, a full explanation of the event taking place, the reason for the noise and times when it will stop should be given to the complainant.

The following guidelines are recommended in Section 6 of the *Interim Construction Noise Guideline* to manage a noise complaint:

- Provide a readily accessible contact point.
- Give complaints a fair hearing.
- Have a documented complaints process, including an escalation procedure so that if a complainant is not satisfied there is a clear path to follow.

- Call back as soon as possible to keep people informed of action to be taken to address noise problems. Call back at night-time only if requested by the complainant to avoid further disturbance.
- Provide a quick response to complaints, with complaint handling staff having both a good knowledge of the project and ready access to information.
- Implement all feasible and reasonable measures to address the source of complaint.
- Keep a register of any complaints, including details of the complaint such as date, time, person receiving complaint, complainant's contact number, person referred to, description of the complaint, work area (for larger projects), time of verbal response and timeframe for written response where appropriate.

6.3 Noise Monitoring

We recommend that noise emissions from the development be measured during the construction periods in the event that complaints arise from nearby residences, regarding noise.

The noise measurements should be carried out using an attended noise monitor at the location (or as close as practically possible) of the noise complaint. Noise level measurements should be carried out by an appropriately qualified acoustical consultant / engineer, using Type 1 (see AS1259) noise measuring equipment.

The measured noise level are to be compared against the Project Specific Noise Criteria shown in Section 4.6 of this report. The outcomes of the noise monitoring should be submitted to the relevant authority for review.

6.4 Vibration Monitoring

We recommend that the level of vibration be measured during any rock hammering in the event complaints arise from any nearby residences regarding vibration.

The vibration measurements can be carried out using either an attended or an unattended vibration monitor. An unattended vibration monitor should be fitted with an alarm in the form of a strobe light or siren to make the plant operator aware immediately when the vibration limit is exceeded. The vibration monitor should be set to trigger the alarm when the overall Peak Particle Velocity (PPV) exceeds **15 mm/s** at the nearest residential building.

Dilapidation reports should be commissioned for potentially affected residential premises prior to any works being undertaken. This may be reassessed once the extent of required work is known.

In the event that levels of ground-borne vibration exceed the recommended acceptable levels for cosmetic damage, vibration causing works should cease immediately and alternative methods, such as rock sawing, be considered.

6.5 Construction Disclaimer

Recommendations made in this report are intended to resolve acoustical problems only. We make no claims of expertise in other areas of building construction and therefore the recommended noise controls should be implements into the building design in consultation with other specialists to ensure they meet the structural, fire, thermal or other aspects of building construction.

We encourage clients to check with us before using materials or equipment that are alternative to those specified in our Acoustical Report.

7.0 CONCLUSION

Day Design was engaged by Hutchinson Builders on behalf of Samuel Gilbert Public School to prepare a Construction Noise and Vibration Management Sub-Plan for the proposed redevelopment of Samuel Gilbert Public School at Ridgecrop Drive, Castle Hill, NSW.

Provided the recommendations in Section 6 of this report are implemented, the level of noise and vibration from the construction works at Samuel Gilbert Public School on Ridgecrop Drive, Castle Hill, NSW will be minimised as far as reasonably practical in accordance with the Australian Standard AS2436:2010 *"Guide to noise and vibration control on construction, demolition and maintenance sites"* and the EPA's *Interim Construction Noise Guideline 2009* and *Assessing Vibration: a technical guideline 2006*, as detailed in Section 4 of this report.

Adam Shearer, BCT (Audio), MDesSc (Audio and Acoustics), MAAS

Senior Acoustical Consultant

for and on behalf of Day Design Pty Ltd

AAAC MEMBERSHIP

Day Design Pty Ltd is a member company of the Association of Australasian Acoustical Consultants, and the work herein reported has been performed in accordance with the terms of membership.

APPENDICES

Appendix A – Instrumentation
Appendix B1 & B2 – Ambient Noise Survey
Appendix C – Development Consent **–** *SSD 9274, 15 February 2020*
Appendix D – Adam Shearer **–** *Curriculum Vitae*
Appendix E – Post Approval **–** SINSW Consultation Record
AC108-1 to 4 – Glossary of Acoustical Terms

NOISE SURVEY INSTRUMENTATION

Noise level measurements and analysis in this report were made with instrumentation as follows:

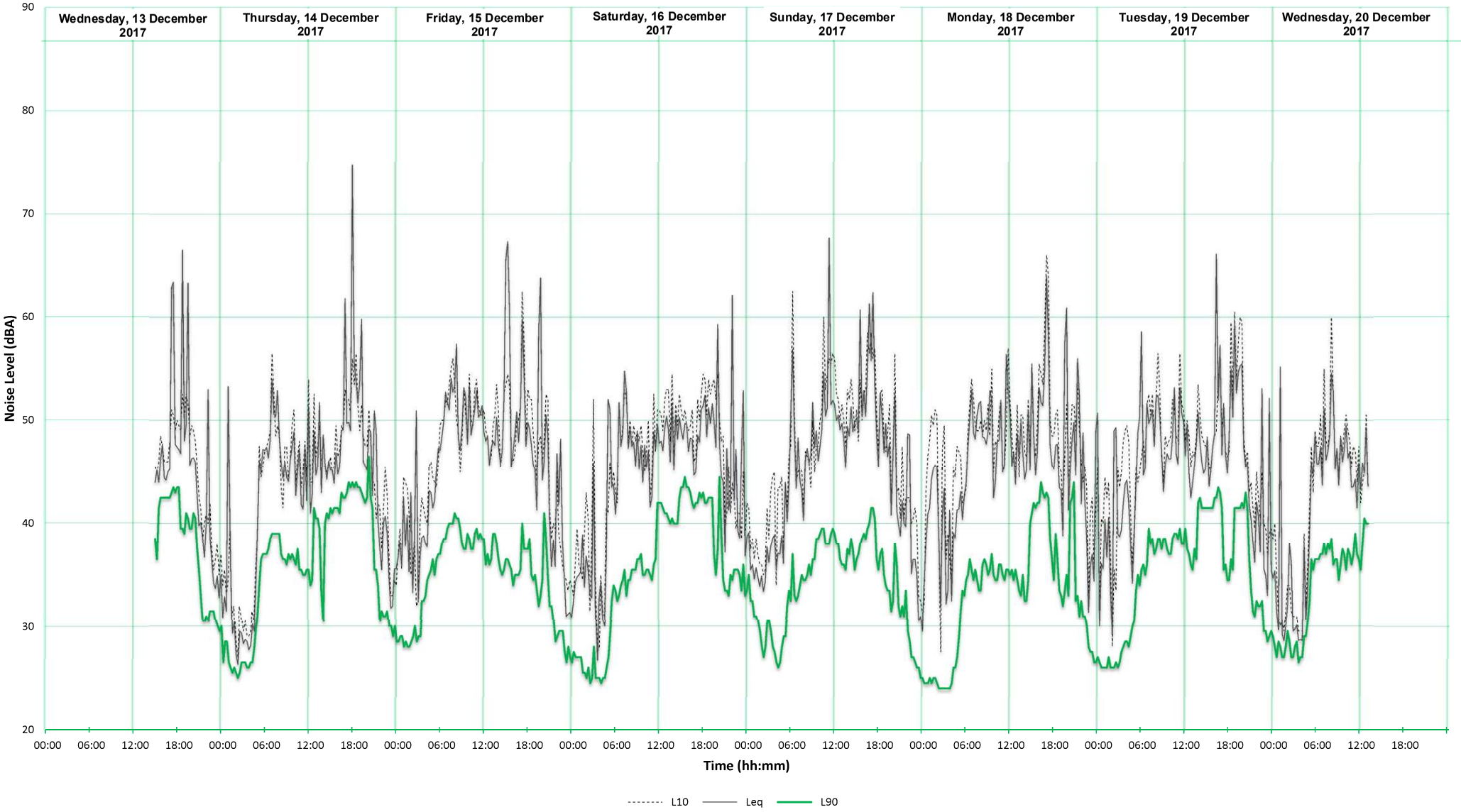
Table A1 Noise Survey Instrumentation

Description	Model No	Serial No
Infobyte Noise Logger (Type 1)	iM4	107
Condenser Microphone 0.5" diameter	MK 250	107
Infobyte Noise Logger (Type 2)	iM4	118
Condenser Microphone 0.5" diameter	MK 250	118

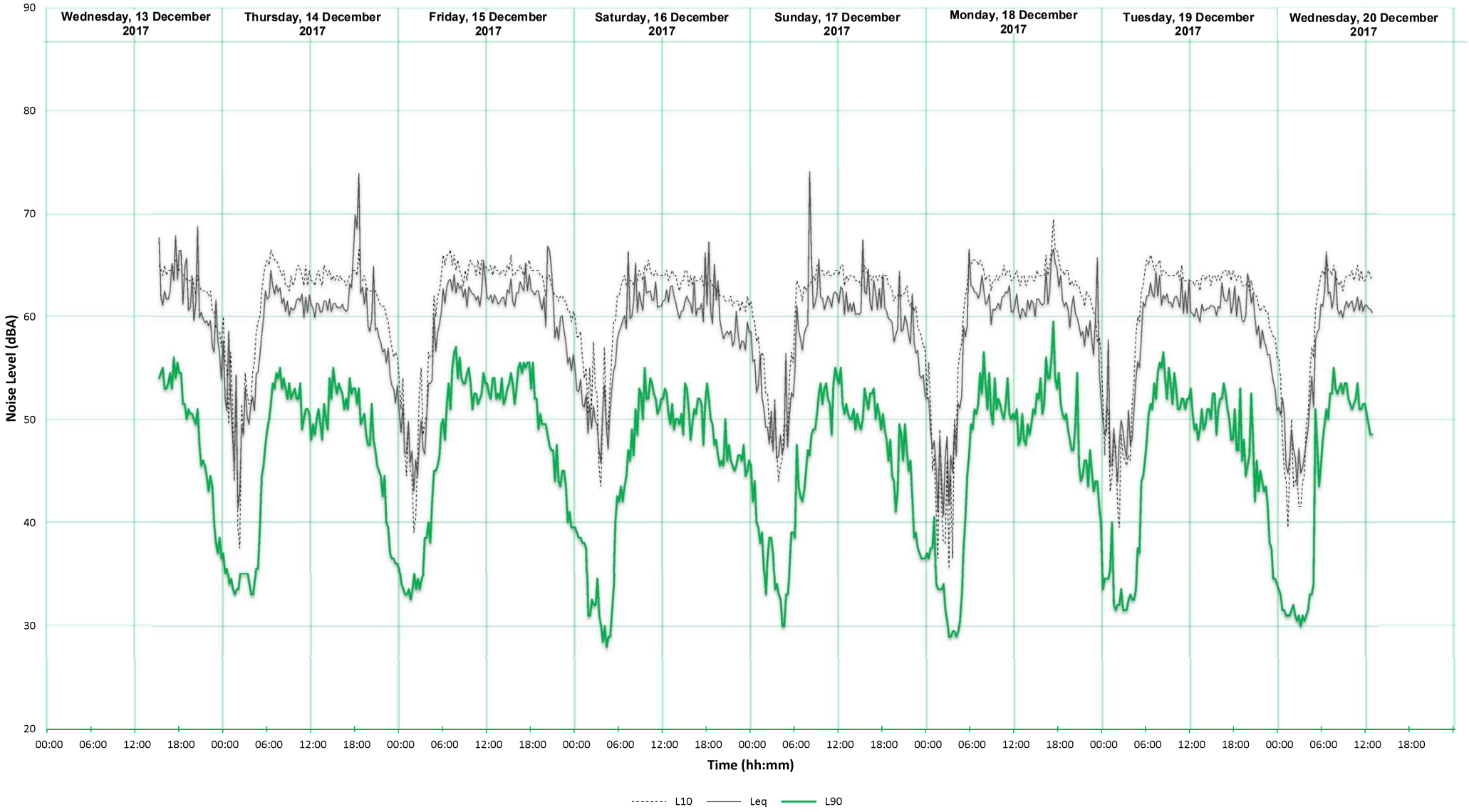
An environmental noise logger is used to continuously monitor ambient noise levels and provide information on the statistical distribution of noise during an extended period of time. The Infobyte Noise Monitor iM4s are Type 2 precision environmental noise monitor meeting all the applicable requirements of AS1259 for an integrating-averaging sound level meter.

All instrument systems had been laboratory calibrated using instrumentation traceable to Australian National Standards and certified within the last two years thus conforming to Australian Standards. The measurement system was also field calibrated prior to and after noise surveys. Calibration drift was found to be less than 1 dB during unattended measurements. No adjustments for instrument drift during the measurement period were warranted.

Located at 9 Squire Place, Castle Hill, NSW



Located at 73 Gilbert Road, Castle Hill, NSW



Development Consent

Section 4.38 of the Environmental Planning and Assessment Act 1979

As the Minister for Planning and Public Spaces, I approve the Development Application referred to in Schedule 1, subject to the conditions specified in Schedule 2.

These conditions are required to:

- prevent, minimise, or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the development.

The Hon Robert Stokes MP
Minister for Planning and Public Spaces

Sydney 15th February, 2020

SCHEDULE 1

Application Number:	SSD 9274
Applicant:	NSW Department of Education
Consent Authority:	Minister for Planning and Public Spaces
Site:	Lot 1 DP 719671, 20 Gilbert Road, Castle Hill Samuel Gilbert Public School
Development:	Redevelopment of Samuel Gilbert Public School comprising: • demolition of classroom spaces and removal of trees; • construction of a new three storey building along Ridgecrop Drive containing 23 new teaching spaces, new staff and administration offices, new library and school entry forecourt; • construction of a new school hall with a separate entrance for out of school hours and community use; • alterations and additions to the existing administration building and library building to convert these into six new home bases; • refurbishment of two toilet blocks; and

- associated works including construction of a new circulation axis, landscaping and signage.

DEFINITIONS

Aboriginal object	Has the same meaning as the definition of the term in section 5 of the *National Parks and Wildlife Act 1974*
Aboriginal place	Has the same meaning as the definition of the term in section 5 of the *National Parks and Wildlife Act 1974*
Advisory Notes	Advisory information relating to the consent but do not form a part of this consent
Applicant	NSW Department of Education or any other person carrying out any development to which this consent applies
Approved disturbance area	The area identified as such on the development layout
Archaeological Salvage	The collection and removal of archaeological data and materials from site
BCA	Building Code of Australia
BC Act	*Biodiversity Conservation Act 2016*
CEMP	Construction Environmental Management Plan
Certifying Authority	Professionals that are accredited by the Building Professionals Board to issue construction, occupation, subdivision, strata, compliance and complying development certificates under the EP&A Act, *Strata Schemes (Freehold Development) Act 1973* and *Strata Schemes (Leasehold Development) Act 1986* or in the case of Crown development, a person qualified to conduct a Certification of Crown Building works.
Conditions of this consent	The conditions contained in Schedule 2 of this document
Construction	All physical work to enable operation including but not limited to the demolition and removal of buildings, the carrying out of works for the purposes of the development, including bulk earthworks, and erection of buildings and other infrastructure permitted by this consent, but excluding the following: • building and road dilapidation surveys; • investigative drilling or investigative excavation; • Archaeological Salvage; • establishing temporary site offices (in locations identified by the conditions of this consent); • installation of environmental impact mitigation measures, fencing, enabling works; and • minor adjustments to services or utilities. However, where heritage items, or threatened species or threatened ecological communities (within the meaning of the *Biodiversity Conservation Act 2016 or Environment Protection and Biodiversity Conservation Act 1999*) are affected or potentially affected by any physical work, that work is construction, unless otherwise determined by the Planning Secretary in consultation with EES Group or DPIE Fisheries (in the case of impact upon fish, aquatic invertebrates or marine vegetation)
Council	The Hills Shire Council
Day	The period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays
Demolition	The deconstruction and removal of buildings, sheds and other structures on the site
Department	NSW Department of Planning, Industry and Environment
Development	The development described in the EIS and Response to Submissions, including the works and activities comprising demolition, construction and

	operation of Samuel Gilbert Public School, as limited by the conditions of this consent
Earthworks	Bulk earthworks, site levelling, import and compaction of fill material, excavation for installation of drainage and services
EES Group	Environment, Energy and Science Group of the Department of Planning, Industry and Environment (Former Office of Environment and Heritage)
EIS	The Environmental Impact Statement titled Proposed Expansion of Samuel Gilbert Public School, prepared by Minto Planning Services dated 14 November 2018, submitted with the application for consent for the development, including any additional information provided by the Applicant in support of the application
ENM	Excavated Natural Material
Environment	Includes all aspects of the surroundings of humans, whether affecting any human as an individual or in his or her social groupings
EPA	NSW Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPL	Environment Protection Licence under the POEO Act
Evening	The period from 6pm to 10pm.
Feasible	Means what is possible and practical in the circumstances
Heritage	Encompasses both Aboriginal and historic heritage including sites that predate European settlement, and a shared history since European settlement
Heritage NSW	Heritage, Community Engagement of the Department of Premier and Cabinet
Heritage Item	An item as defined under the *Heritage Act 1977,* and assessed as being of local, State and/ or National heritage significance*,* and/or an Aboriginal Object or Aboriginal Place as defined under the *National Parks and Wildlife Act 1974'*, the World Heritage List, or the National Heritage List or Commonwealth Heritage List under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth), or anything identified as a heritage item under the conditions of this consent
IBRA	Interim Biogeographic Regionalisation for Australia
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 *Note: "material harm" is defined in this consent*
Land	Has the same meaning as the definition of the term in section 1.4 of the EP&A Act
Management and mitigation measures	The management and mitigation measures set out in Section 7 of EIS and Section 5 of Response to Submission
Material harm	Is harm that: a) involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial; or b) 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)
Mitigation	Activities associated with reducing the impacts of the development prior to or during those impacts occurring

Monitoring	Any monitoring required under this consent must be undertaken in accordance with section 9.39 of the EP&A Act
Night	The period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays
Non-compliance	An occurrence, set of circumstances or development that is a breach of this consent
NSW RFS	New South Wales Rural Fire Service
OEMP	Operational Environmental Management Plan
Operation	The carrying out of the approved purpose of the development upon completion of construction.
Planning Secretary	Planning Secretary under the EP&A Act, or nominee
POEO Act	*Protection of the Environment Operations Act 1997*
Reasonable	Means applying judgement in arriving at a decision, taking into account: mitigation, benefits, costs of mitigation versus benefits provided, community views, and the nature and extent of potential improvements.
Registered Aboriginal Parties	Means the Aboriginal persons identified in accordance with the document entitled "*Aboriginal cultural heritage consultation requirements for proponents 2010*" (DECCW)
Rehabilitation	The restoration of land disturbed by the development to a good condition, to ensure it is safe, stable and non-polluting.
Response to submissions	The Applicant's response to issues raised in submissions received in relation to the application for consent for the development under the EP&A Act.
Sensitive receivers	A location where people are likely to work, occupy or reside, including a dwelling, school, hospital, office or public recreational area.
Site	The land defined in Schedule 1.
Site Auditor	As defined in section 4 of the *Contaminated Land Management Act 1997*
Site Audit Report	As defined in section 4 of the *Contaminated Land Management Act 1997*
Site Audit Statement	As defined in section 4 of the *Contaminated Land Management Act 1997*
STIF	Sydney Turpentine Ironbark Forest
TfNSW	Transport for New South Wales
TfNSW(RMS)	Transport for New South Wales (Roads and Maritime Services)
Upgrading	The carrying out of works (including replacing plant, equipment, or machinery or updating relevant technology) to improve the efficiency of the development or to enable or enhance its continued operation, and the carrying out of the maintenance works.
VENM	Virgin Excavated Natural Material
Waste	Has the same meaning as the definition of the term in the Dictionary to the POEO Act
Year	A period of 12 consecutive months

SCHEDULE 2

PART A ADMINISTRATIVE CONDITIONS

Obligation to Minimise Harm to the Environment

A1. In addition to meeting the specific performance measures and criteria in this consent, all reasonable and feasible measures must be implemented to prevent, and, if prevention is not reasonable and feasible, minimise any material harm to the environment that may result from the construction and operation of the development.

Terms of Consent

A2. The development may only be carried out:

(a) in compliance with the conditions of this consent;

(b) in accordance with all written directions of the Planning Secretary;

(c) generally in accordance with the EIS and Response to Submissions;

(d) in accordance with the approved plans in the table below:

Architectural Plans prepared by *Fulton Trotter*			
Dwg No.	**Rev**	**Name of Plan**	**Date**
AEX1002	P16	Site Demolition Plan	15/08/19
SD1001	P24	Proposed Site Plan	15/08/19
A-S-1400	01	Staging Plan	17/01/20
SD1603	P12	External Materials 1	7/05/19
SD1604	P12	External Materials 2	7/05/19
SD1605	P10	External Materials 3	7/05/19
SD1607	P10	Site Sections	7/05/19
SD1608	P10	Block N & P Street Elevation	7/05/19
SD1609	P14	Tree Plan	11/09/19
SD1610	P8	Proposed Signage	7/05/19
SD1611	P9	Construction Environmental Management Plan	7/05/19
SD1613	P3	Height Blanket Site Perspective & Section	7/05/19
SD1614	P2	End of Trip Facilities Plan	7/05/19
SD1615	P1	Kiss and Ride	7/05/19
SD-A-2001	P15	Building A – Ground Floor Plan	7/05/19
SD-A-2101	P7	Building A – Roof Plan	7/05/19
AEX-A-2001	P9	Building A – Demolition Floor Plan	7/05/19
AEX-E-2001	P9	Building E – Demolition Floor Plan	7/05/19
SD-E-2001	P16	Building E – Ground Floor Plan	7/05/19
SD-E-2101	P6	Building E – Roof Plan	7/05/19
AEX-F-2001	P3	Building D & F Demolition Floor Plans	7/05/19
SD-F-2101	P6	Building D & F Roof Plan	7/05/19
SD-F-3001	P3	Building D & F Elevations	7/05/19
SD-N-2002	P22	Building N – Ground Floor Plan	7/05/19

SD-N-2003	P21	Building N – Level 1 Floor Plan	7/05/19
SD-N-2004	P20	Building N – Level 2 Floor Plan	7/05/19
SD-N-2101	P15	Building N – Roof Plan	7/05/19
SD-N-3001	P18	Building N – North South Elevations	7/05/19
SD-N-3002	P18	Building N – East & West Elevations	7/05/19
SD-N-3101	P12	Building N – Sections N1, N2 & N3	7/05/19
SD-P-2002	P20	Building P – Ground Floor Plan	7/05/19
SD-P-2003	P19	Building P – Level 1 Floor Plan	7/05/19
SD-P-2004	P19	Building P – Level 2 Floor Plan	7/05/19
SD-P-2101	P15	Building P – Roof Plan	7/05/19
SD-P-3001	P18	Building P – North & South Elevations	7/05/19
SD-P-3002	P18	Building P – East & West Elevations	7/05/19
SD-P-3101	P12	Building P – Sections P1 & P3	7/05/19
SD-P-3102	P9	Building P – Section P4	7/05/19
SD-Q-2001	P19	Building Q – Ground Floor Plan	7/05/19
SD-Q-2101	P12	Building Q – Roof Plan	7/05/19
SD-Q-3001	P15	Building Q – North and East Elevations	7/05/19
SD-Q-3002	P17	Building Q – South and West Elevations	7/05/19
SD-Q-3101	P7	Building Q – Section Q1 & Q2	7/05/19
Landscape Plans prepared by *Ground Ink Landscape Architects*			
Dwg No.	**Rev**	**Name of Plan**	**Date**
LDA-05	-	Proposed External Works Plan	12/09/19
LDA-07	-	Landscape Masterplan	12/09/19
LDA-08	-	Materials Palette	12/09/19
LDA-09	-	Indicative Plant Palette	12/09/19
LDA-10	-	Central Plaza Landscape Plan	12/09/19
LDA-11	-	Central Plaza Section Elevation	12/09/19
LDA-12	-	Section Elevation	12/09/19
LDA-13	-	Ridgecrop Drive (Southern) Elevation	12/09/19
LDA-14	-	Proposed Tree Plan	12/09/19
Civil Plans prepared by *Henry & Hymas*			
Dwg No.	**Rev**	**Name of Plan**	**Date**
17787_DA_BE01	04	Bulk Earthworks Cut and Fill Plan	28/02/19
17787_DA_C100	09	General Arrangement Plan	28/02/19
17787_D1_BE01	01	Bulk Earthworks Cut and Fill Plan Staff Car Park	16/08/19
17787_D1_C000	01	Cover Sheet, Drawing Schedule Notes and Locality Sketch	16/08/19

17787_D1_C100	01	Staff Car Park – Detail Plan	16/08/19

A3. Consistent with the requirements in this consent, the Planning Secretary may make written directions to the Applicant in relation to:

(a) the content of any strategy, study, system, plan, program, review, audit, notification, report or correspondence submitted under or otherwise made in relation to this consent, including those that are required to be, and have been, approved by the Planning Secretary;

(b) any reports, reviews or audits commissioned by the Planning Secretary regarding compliance with this approval; and

(c) the implementation of any actions or measures contained in any such document referred to in (a) above.

A4. The conditions of this consent and directions of the Planning Secretary prevail to the extent of any inconsistency, ambiguity or conflict between them and a document listed in condition A2(c) or A2(d). In the event of an inconsistency, ambiguity or conflict between any of the documents listed in condition A2(c) and A2(d), the most recent document prevails to the extent of the inconsistency, ambiguity or conflict.

Limits of Consent

A5. This consent lapses five years after the date of consent unless work is physically commenced.

Prescribed Conditions

A6. The Applicant must comply with all relevant prescribed conditions of development consent under Part 6, Division 8A of the EP&A Regulation.

Planning Secretary as Moderator

A7. In the event of a dispute between the Applicant and a public authority, in relation to an applicable requirement in this approval or relevant matter relating to the Development, either party may refer the matter to the Planning Secretary for resolution. The Planning Secretary's resolution of the matter must be binding on the parties.

Evidence of Consultation

A8. Where conditions of this consent require consultation with an identified party, the Applicant must:

(a) consult with the relevant party prior to submitting the subject document for information or approval; and

(b) provide details of the consultation undertaken including:

(i) the outcome of that consultation, matters resolved and unresolved; and

(ii) details of any disagreement remaining between the party consulted and the Applicant and how the Applicant has addressed the matters not resolved.

Staging

A9. The project may be constructed and operated in stages. Where staged construction or operation is proposed, a Staging Report (for either or both construction and operation as the case may be) must be prepared and submitted for the approval of the Planning Secretary. The Staging Report must be submitted to the Planning Secretary no later than one month before the commencement of construction of the first of the proposed stages of construction (or if only staged operation is proposed, one month before the commencement of operation of the first of the proposed stages of operation).

A10. A Staging Report prepared in accordance with condition A9 must:

(a) if staged construction is proposed, set out how the construction of the whole of the project will be staged, including details of work and other activities to be carried out in each stage and the general timing of when construction of each stage will commence and finish;

(b) if staged operation is proposed, set out how the operation of the whole of the project will be staged, including details of work and other activities to be carried out in each stage

and the general timing of when operation of each stage will commence and finish (if relevant);

(c) specify how compliance with conditions will be achieved across and between each of the stages of the project; and

(d) set out mechanisms for managing any cumulative impacts arising from the proposed staging.

A11. Where staging is proposed, the project must be staged in accordance with the Staging Report, as approved by the Planning Secretary.

A12. Where staging is proposed, the terms of this approval that apply or are relevant to the works or activities to be carried out in a specific stage must be complied with at the relevant time for that stage.

Staging, Combining and Updating Strategies, Plans or Programs

A13. With the approval of the Planning Secretary, the Applicant may:

(a) prepare and submit any strategy, plan (including management plan, architectural or design plan) or program required by this consent on a staged basis (if a clear description is provided as to the specific stage and scope of the development to which the strategy, plan (including management plan, architectural or design plan) or program applies, the relationship of the stage to any future stages and the trigger for updating the strategy, plan (including management plan, architectural or design plan) or program);

(b) combine any strategy, plan (including management plan, architectural or design plan), or program required by this consent (if a clear relationship is demonstrated between the strategies, plans (including management plan, architectural or design plan) or programs that are proposed to be combined); and

(c) update any strategy, plan (including management plan, architectural or design plan), or program required by this consent (to ensure the strategies, plans (including management plan, architectural or design plan), or programs required under this consent are updated on a regular basis and incorporate additional measures or amendments to improve the environmental performance of the development).

A14. If the Planning Secretary agrees, a strategy, plan (including management plan, architectural or design plan), or program may be staged or updated without consultation being undertaken with all parties required to be consulted in the relevant condition in this consent.

A15. If approved by the Planning Secretary, updated strategies, plans (including management plan, architectural or design plan), or programs supersede the previous versions of them and must be implemented in accordance with the condition that requires the strategy, plan, program or drawing.

Structural Adequacy

A16. All new buildings and structures, and any alterations or additions to existing buildings and structures, that are part of the development, must be constructed in accordance with the relevant requirements of the BCA and any additional requirements of the Subsidence Advisory NSW where the building or structure is located on land within a declared Mine Subsidence District.

Notes:

- *Part 8 of the EP&A Regulation sets out the requirements for the certification of the development.*
- *Under section 21 of the Coal Mine Subsidence Compensation Act 2017, the Applicant is required to obtain the Chief Executive of Subsidence Advisory NSW's approval before carrying out certain development in a Mine Subsidence District.*

External Walls and Cladding

A17. The external walls of all buildings including additions to existing buildings must comply with the relevant requirements of the BCA.

Applicability of Guidelines

A18. References in the conditions of this consent to any guideline, protocol, Australian Standard or policy are to such guidelines, protocols, Standards or policies in the form they are in as at the date of this consent.

A19. Consistent with the conditions of this consent and without altering any limits or criteria in this consent, the Planning Secretary may, when issuing directions under this consent in respect of ongoing monitoring and management obligations, require compliance with an updated or revised version of such a guideline, protocol, Standard or policy, or a replacement of them.

Monitoring and Environmental Audits

A20. Any condition of this consent that requires the carrying out of monitoring or an environmental audit, whether directly or by way of a plan, strategy or program, is taken to be a condition requiring monitoring or an environmental audit under Division 9.4 of Part 9 of the EP&A Act. This includes conditions in respect of incident notification, reporting and response, non-compliance notification, Site audit report and independent auditing.

Note: *For the purposes of this condition, as set out in the EP&A Act, "monitoring" is monitoring of the development to provide data on compliance with the consent or on the environmental impact of the development, and an "environmental audit" is a periodic or particular documented evaluation of the development to provide information on compliance with the consent or the environmental management or impact of the development.*

Access to Information

A21. At least 48 hours before the commencement of construction until the completion of all works under this consent, or such other time as agreed by the Planning Secretary, the Applicant must:

(a) make the following information and documents (as they are obtained or approved) publicly available on its website:

(i) the documents referred to in condition A2 of this consent;

(ii) all current statutory approvals for the development;

(iii) all approved strategies, plans and programs required under the conditions of this consent;

(iv) regular reporting on the environmental performance of the development in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent;

(v) a comprehensive summary of the monitoring results of the development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs;

(vi) a summary of the current stage and progress of the development;

(vii) contact details to enquire about the development or to make a complaint;

(viii) a complaints register, updated monthly;

(ix) audit reports prepared as part of any independent audit of the development and the Applicant's response to the recommendations in any audit report;

(x) any other matter required by the Planning Secretary; and

(b) keep such information up to date, to the satisfaction of the Planning Secretary.

Compliance

A22. The Applicant must ensure that all of its employees, contractors (and their sub-contractors) are made aware of, and are instructed to comply with, the conditions of this consent relevant to activities they carry out in respect of the development.

Incident Notification, Reporting and Response

A23. The Planning Secretary must be notified in writing to compliance@planning.nsw.gov.au immediately after the Applicant becomes aware of an incident. The notification must identify the development (including the development application number and the name of the development if it has one), and set out the location and nature of the incident.

A24. Subsequent notification must be given and reports submitted in accordance with the requirements set out in **Appendix 1**.

Non-Compliance Notification

A25. The Planning Secretary must be notified in writing to compliance@planning.nsw.gov.au within seven days after the Applicant becomes aware of any non-compliance. The Certifying Authority must also notify the Planning Secretary in writing to compliance@planning.nsw.gov.au within seven days after they identify any non-compliance.

A26. The notification must identify the development and the application number for it, set out the condition of consent that the development is non-compliant with, the way in which it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.

A27. A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.

Revision of Strategies, Plans and Programs

A28. Within three months of:

(a) the submission of a compliance report under condition B33;

(b) the submission of an incident report under condition A23;

(c) the submission of an Independent Audit under condition C34;

(d) 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 Certifying Authority must be notified in writing that a review is being carried out.

A29. 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. Where revisions are required, the revised document must be submitted to the Planning Secretary for approval 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.

Design and Construction for Bush Fire

A30. Proposed Building N must comply with Sections 3 and 5 (BAL 12.5) Australian Standard AS3959-2009 Construction of buildings in bushfire-prone areas or NASH Standard (1.7.14 updated) National Standard Steel Framed Construction in Bushfire Areas – 2014 as appropriate and section A3.7 Addendum Appendix 3 of Planning for Bush Fire Protection 2006; and

A31. New works proposed to Building A must comply with Sections 3 and 5 (BAL 12.5) Australian Standard AS3959-2009 Construction of buildings in bushfire-prone areas or NASH Standard (1.7.14 updated) National Standard Steel Framed Construction in Bushfire Areas – 2014 as appropriate and section A3.7 Addendum Appendix 3 of Planning for Bush Fire Protection 2006.

PART B PRIOR TO COMMENCEMENT OF CONSTRUCTION

Notification of Commencement

B1. The Applicant must notify the Planning Secretary in writing of the dates of commencement of physical work and operation at least 48 hours before those dates.

B2. If the construction or operation of the development is to be staged, the Planning Secretary must be notified in writing at least 48 hours before the commencement of each stage, of the date of commencement and the development to be carried out in that stage.

Certified Drawings

B3. Prior to the commencement of construction, the Applicant must submit to the satisfaction of the Certifying Authority structural drawings prepared and signed by a suitably qualified practising Structural Engineer that demonstrates compliance with this development consent.

External Walls and Cladding

B4. Prior to the commencement of construction (excluding earthworks), the Applicant must provide the Certifying Authority with documented evidence that the products and systems proposed for use or used in the construction of external walls, including finishes and claddings such as synthetic or aluminium composite panels, comply with the requirements of the BCA. The Applicant must provide a copy of the documentation given to the Certifying Authority to the Planning Secretary within seven days after the Certifying Authority accepts it.

Protection of Public Infrastructure

B5. Prior to the commencement of construction, the Applicant must:

(a) consult with the relevant owner and provider of services that are likely to be affected by the development to make suitable arrangements for access to, diversion, protection and support of the affected infrastructure;

(b) prepare a dilapidation report identifying the condition of all public infrastructure in the vicinity of the site (including roads, gutters and footpaths); and

(c) submit a copy of the dilapidation report to the Planning Secretary, Certifying Authority and Council.

Pre-Construction Dilapidation Report

B6. Prior to the commencement of construction, the Applicant must submit a pre-commencement dilapidation report to Council and the Certifying Authority. The report must provide an accurate record of the existing condition of adjoining private properties and Council assets that are likely to be impacted by the proposed works.

Unexpected Contamination Procedure

B7. Prior to the commencement of earthworks, the Applicant must prepare an unexpected contamination procedure to ensure that potentially contaminated material is appropriately managed. The procedure must form part of the of the CEMP in accordance with condition B13 and where any material identified as contaminated is to be disposed off-site, the disposal location and results of testing submitted to the Planning Secretary prior to its removal from the site.

Community Communication Strategy

B8. No later than two weeks before the commencement of construction, a Community Communication Strategy must be submitted to the Planning Secretary for information. The Community Communication Strategy must provide mechanisms to facilitate communication between the Applicant, the relevant Council and the community (including adjoining affected landowners and businesses, and others directly impacted by the development), during the design and construction of the development and for a minimum of 12 months following the completion of construction.

The Community Communication Strategy must:

(a) identify people to be consulted during the design and construction phases;

(b) set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development;

(c) provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development;

(d) set out procedures and mechanisms:

(i) through which the community can discuss or provide feedback to the Applicant;

(ii) through which the Applicant will respond to enquiries or feedback from the community; and

(iii) to resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation.

Ecologically Sustainable Development

B9. Prior to the commencement of construction, unless otherwise agreed by the Planning Secretary, the Applicant must demonstrate that ESD is being achieved by either:

(a) registering for a minimum 4 star Green Star rating with the Green Building Council Australia and submit evidence of registration to the Certifying Authority; or

(b) seeking approval from the Planning Secretary for an alternative certification process.

Outdoor Lighting

B10. Prior to commencement of lighting installation, evidence must be submitted to the satisfaction of the Certifying Authority that all outdoor lighting within the site has been designed to comply with AS 1158.3.1:2005 Lighting for roads and public spaces – Pedestrian area (Category P) lighting – Performance and design requirements and AS 4282-2019 Control of the obtrusive effects of outdoor lighting.

Demolition

B11. Prior to the commencement of construction, demolition work plans required by *AS 2601-2001 The demolition of structures* (Standards Australia, 2001) must be accompanied by a written statement from a suitably qualified person that the proposals contained in the work plan comply with the safety requirements of the Standard. The work plans and the statement of compliance must be submitted to the Certifying Authority and Planning Secretary.

Environmental Management Plan Requirements

B12. Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:

(a) detailed baseline data;

(b) details of:

(i) the relevant statutory requirements (including any relevant approval, licence or lease conditions);

(ii) any relevant limits or performance measures and criteria; and

(iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;

(c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;

(d) a program to monitor and report on the:

(i) impacts and environmental performance of the development;

(ii) effectiveness of the management measures set out pursuant to paragraph (c) above;

(e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;

(f) a program to investigate and implement ways to improve the environmental performance of the development over time;

(g) a protocol for managing and reporting any:

(i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria);

(ii) complaint;

(iii) failure to comply with statutory requirements; and

(h) a protocol for periodic review / update of the plan and any updates in response to incidents or matters of non-compliance.

Note: *The Planning Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans*

Construction Environmental Management Plan

B13. Prior to the commencement of construction, the Applicant must submit a Construction Environmental Management Plan (CEMP) to the satisfaction of Certifying Authority and provide a copy to the Planning Secretary. 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) stormwater control and discharge;

(v) measures to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site;

(vi) groundwater management plan including measures to prevent groundwater contamination;

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

(viii) community consultation and complaints handling;

(b) Construction Traffic and Pedestrian Management Sub-Plan (see condition B14);

(c) Construction Noise and Vibration Management Sub-Plan (see condition B15);

(d) Construction Waste Management Sub-Plan (see condition B16);

(e) Construction Soil and Water Management Sub-Plan (see condition B17);

(f) Biodiversity Management Sub-Plan (see condition B18);

(g) Bush Fire Emergency Response Sub-Plan (see condition B19);

(h) an unexpected finds protocol for contamination and associated communications procedure;

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

(j) waste classification (for materials to be removed) and validation (for materials to remain) be undertaken to confirm the contamination status in these areas of the site; and

B14. The Construction Traffic and Pedestrian Management Sub-Plan (CTPMSP) must address, but not be limited to, the following:

(a) be prepared by a suitably qualified and experienced person(s);

(b) be prepared in consultation with Council and TfNSW;

(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) include a Driver Code of Conduct to:

(i) minimise the impacts of earthworks and construction on the local and regional road network;

(ii) minimise conflicts with other road users;

(iii) minimise road traffic noise; and

(iv) ensure truck drivers use specified routes;

(f) include a program to monitor the effectiveness of these measures; and

(g) if necessary, detail procedures for notifying residents and the community (including local schools), of any potential disruptions to routes.

B15. 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 B8(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 management measures in accordance with Condition B12(d).

B16. The Construction Waste Management Sub-Plan (CWMSP) must address, but not be limited to, the following:

(a) detail the quantities of each waste type generated during construction and the proposed reuse, recycling and disposal locations; and

(b) removal of hazardous materials, particularly the method of containment and control of emission of fibres to the air, and disposal at an approved waste disposal facility in accordance with the requirements of the relevant legislation, codes, standards and guidelines, prior to the commencement of any building works.

B17. The Applicant must prepare a Construction Soil and Water Management 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;

(b) describe all erosion and sediment controls to be implemented during construction;

(c) include an Acid Sulfate Soils Management Plan, if required, including measures for the management, handling, treatment and disposal of acid sulfate soils, including monitoring of water quality at acid sulfate soils treatment areas.

(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 1-year ARI, 1 in 5-year ARI and 1 in 100-year ARI.

B18. The Biodiversity Management Sub-Plan (BMSP) must address, but not be limited to, the following:

(a) should any injured fauna species be found during the construction period, construction must stop immediately so that the injured animal can be taken to a vet or wildlife carer. All handling of fauna species must be conducted by a qualified ecologist or wildlife carer;

(b) during vegetation clearing, animals that are injured or displaced are to be captured and relocated by a qualified ecologist or wildlife carer to nearby bushland (subject to landowner approval), or trees containing wildlife must be sectioned and dismantled before relocating the animals;

(c) nocturnal fauna species such as gliders and possums, if captured and rescued during vegetation clearing are to be secured in suitable enclosures and kept in a quiet, dark and cool environment until they can be released into suitable habitat after dark;

(d) include a Vegetation Management sub-plan (VMP) for the site during construction works.

(e) include measures to communicate to the construction workforce the biodiversity values that are to be retained and protected;

(f) any hollows removed be salvaged and replaced into trees within the vegetated areas to be retained or they be replaced with nest boxes in consultation with Council suitable to native fauna likely to use the site;

(g) include a Fauna Management Plan for the site including details of impacts and proposed mitigation measures due to impact on movement, construction traffic, proposed construction hours, details of any fencing, restricting developments in identified areas, light spill, construction noise and on-site crane movements; and

(h) include details to install and maintain exclusion fencing along and around any native vegetation not being removed as part of this development.

B19. The Bush Fire Emergency Response Sub-Plan (FERSP) must address, but not be limited to, the following:

(a) be prepared by a suitably qualified and experienced person(s);

(b) address the provisions of the Planning for Bush Fire Protection 2006;

(c) include details of:

(i) the bushfire emergency responses for both construction and operation phases of the development;

(ii) assembly points and evacuation routes;

(iii) evacuation and refuge protocols; and

(iv) awareness training for employees and contractors, and students.

Construction Worker Transportation Strategy

B20. Prior to the commencement of construction, the Applicant must submit a Construction Worker Transportation Strategy to the satisfaction of the Certifying Authority. The Strategy must detail the provision of sufficient parking facilities or other travel arrangements for construction workers in order to minimise demand for parking in nearby public and residential streets or public parking facilities.

Operational Noise – Design of Mechanical Plant and Equipment

B21. Prior to installation of mechanical plant and equipment, the Applicant must incorporate the noise mitigation recommendations in the Environmental Noise Assessment (6395-1R Rev A) report prepared by Day Design Pty Ltd dated 8 November 2018, into the detailed design drawings. The Certifying Authority must verify that all noise mitigation measures have been incorporated into the design to ensure the development will not exceed the recommended operational noise levels identified in the Environmental Noise Assessment report.

Pre clearing

B22. Prior to the commencement of construction and/or vegetation clearing (whichever occurs first), pre clearing surveys and inspections for fauna must be undertaken. The surveys and inspection, and any subsequent relocation of fauna, must be undertaken under the guidance of a suitably qualified ecologist and must be in accordance with the methodology incorporated in the Biodiversity Management Sub-Plan. Evidence of the pre clearing surveys and inspections for fauna and any relocation of fauna must be provided to the satisfaction of the Certifying Authority.

Biodiversity

B23. Prior to the commencement of vegetation clearing, the class and number of ecosystem credits in the table below must be retired to offset the residual biodiversity impacts of the development.

Impacted Plant Community Type (PCT)	Number of Credits	Containing hollow bearing trees	IBRA subregions	Plant community type(s) that can be used to offset the impacts from development
PCT 1081 – Bloodwood – Grey Gum woodland on edges of the Cumberland Plain, Sydney Basin Bioregion	13	Yes	Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo or any IBRA subregion that is within 100 Kilometers of the outer edge of the impacted site.	Sydney Hinterland Dry Sclerophyll Forests (including PCT's 612, 621, 624, 1080, 1081, 1086, 1159, 1246, 1255, 1327, 1328, 1614, 1622, 1628, 1631, 1634, 1640, 1664, 1666, 1667, 1789, 1790, 1912)
PCT 1281 – Turpentine – grey Ironbark open forest on shale in the lower Blue Mountains, Sydney basin Bioregion	1	No	Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo or any IBRA subregion that is within 100 Kilometers of the outer edge of the impacted site.	Sydney Turpentine-Ironbark Forest (including PTC's 1183, 1281, 1284)

B24. The requirement to retire credits in Condition B23 above may be satisfied by payment to the Biodiversity Conservation Fund of an amount equivalent to the class and number of ecosystem credits, as calculated by the Biodiversity Offsets Payment Calculator.

B25. Evidence of the retirement of credits or payment to the Biodiversity Conservation Fund in satisfaction of condition B24 must be submitted to the Planning Secretary prior to carrying out development that will impact on biodiversity values.

Landscaping

B26. Prior to the commencement of construction, the Applicant must prepare a revised Landscape Plan to manage the revegetation and landscaping works on-site, to the satisfaction of the Certifying Authority. The plan must:

(a) provide for the planting of 54 trees;

(b) provide for the planting of 50 shrubs and groundcover;

(c) detail the location, species, maturity and height at maturity of plants to be planted on-site;

(d) include species (trees, shrubs and groundcovers) indigenous to the local area;

(e) include the planting of trees with a pot container of 100 litres or greater, with a minimum height at maturity of 10m;

(f) include the provision of nest boxes suitable to native fauna likely to use the site;

(g) comply with the principles of Appendix 5 of *Planning for Bush Fire Protection 2006;*

(h) the revegetated area(s) of STIF must be contiguous with the areas of existing STIF and be fully structured with a diversity of local native tree, shrub and groundcover species;

(i) the existing STIF and revegetated areas of STIF must not be managed as an APZ under this consent;

(j) trees to be removed are salvaged and used in the remnant vegetation on site to enhance habitat including tree hollows and tree trunks (greater than 25-30cm in diameter and 3m in length).

Landscaping

B27. Prior to the commencement of construction, the existing STIF must be delineated and be protected by exclusion fencing on the ground.

Rainwater Harvesting

B28. Prior to the commencement of construction, the Applicant must ensure that a rainwater reuse/harvesting system for the development is developed for the site. A rainwater re-use plan must be prepared and certified by an experienced hydraulic engineer.

Roadworks and Access

B29. Prior to the commencement of construction, the Applicant must submit design plans to the satisfaction of the relevant roads authority which demonstrate that the proposed construction accesses to the development are designed to accommodate the turning path of a heavy ridged vehicles.

Car Parking and Service Vehicle Layout

B30. Prior to the commencement of construction, compliance with the following requirements must be submitted to the satisfaction of the Certifying Authority:

(a) all vehicles must enter and leave the Site in a forward direction;

(b) that the operational car parking layout provides a minimum of 38 on-site car parking spaces for use during operation of the development and new car parking spaces must be designed in accordance with the latest versions of AS 2890.1 and AS 2890.6;

(c) that the construction access and car parking arrangements provide 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, must be in accordance with the latest version of AS 2890.2; and

(d) the safety of vehicles and pedestrians accessing adjoining properties, where shared vehicle and pedestrian access occurs, is to be addressed.

Bicycle Parking and End-of-Trip Facilities

B31. Prior to the commencement of construction, evidence must be submitted to the satisfaction of the Certifying Authority with the following requirements for bicycle parking and end-of-trip facilities:

a) the provision of a minimum 60 bicycle parking spaces;

b) the layout, design and security of bicycle facilities must comply with the minimum requirements of the latest version of AS 2890.3:2015 *Parking facilities - Bicycle parking*, and be located in easy to access, well-lit areas that incorporate passive surveillance;

c) the provision of end-of-trip facilities for staff;

d) appropriate pedestrian and cyclist advisory signs are to be provided; and

e) all works/regulatory signposting associated with the proposed developments shall be at no cost to the relevant roads authority.

Public Domain Works

B32. Prior to the commencement of any footpath or public domain works, the Applicant must consult with Council and demonstrate to the Certifying Authority that the streetscape design and treatment meets the requirements of Council, including addressing pedestrian management. The Applicant must submit documentation of approval for each stage from Council to the Certifying Authority.

Compliance Reporting

B33. No later than two weeks before the date notified for the commencement of construction, a Compliance Monitoring and Reporting Program prepared in accordance with the Compliance Reporting Post Approval Requirements (Department 2018) must be submitted to the Planning Secretary and the Certifying Authority.

B34. The Applicant must make each Compliance Report publicly available 60 days after submitting it to the Planning Secretary and notify the Planning Secretary and the Certifying Authority in writing at least seven days before this is done.

B35. Notwithstanding the requirements of the Compliance Reporting Post Approval Requirements (Department 2018), the Planning Secretary may approve a request for ongoing annual operational compliance reports to be ceased, where it has been demonstrated to the Planning Secretary's satisfaction that an operational compliance report has demonstrated operational compliance.

PART C DURING CONSTRUCTION

Site Notice

C1. A site notice(s):

(a) must be prominently displayed at the boundaries of the site during construction for the purposes of informing the public of project details including, but not limited to the details of the Builder, Certifying Authority and Structural Engineer is to satisfy the following requirements;

(b) minimum dimensions of the notice must measure 841 mm x 594 mm (A1) with any text on the notice to be a minimum of 30-point type size;

(c) the notice is to be durable and weatherproof and is to be displayed throughout the works period;

(d) the approved hours of work, the name of the site/ project manager, the responsible managing company (if any), its address and 24-hour contact phone number for any inquiries, including construction/ noise complaint must be displayed on the site notice; and

(e) the notice(s) is to be mounted at eye level on the perimeter hoardings/fencing and is to state that unauthorised entry to the site is not permitted.

Operation of Plant and Equipment

C2. All construction plant and equipment used on site must be maintained in a proper and efficient condition and operated in a proper and efficient manner.

Demolition

C3. Demolition work must comply with the demolition work plans required by *Australian Standard AS 2601-2001 The demolition of structures* (Standards Australia, 2001) and endorsed by a suitably qualified person as required by Condition B11.

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 7:00am and 6:00pm, Mondays to Fridays inclusive; and

(b) between 8:00am and 1:00pm, Saturdays.

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

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

C6. Notification of such construction activities as referenced in Condition C5 must be given to affected residents before undertaking the activities or as soon as is practical afterwards.

C7. 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.

Implementation of Management Plans

C8. The Applicant must carry out the construction of the development in accordance with the most recent version of the approved CEMP (including Sub-Plans).

Construction Traffic

C9. All construction vehicles (excluding site personnel vehicles) are to be contained wholly within the site, except if located in an approved on-street work zone, and vehicles must enter the site before stopping.

Hoarding Requirements

C10. The following hoarding requirements must be complied with:

(a) no third-party advertising is permitted to be displayed on the subject hoarding/ fencing; and

(b) the construction site manager must be responsible for the removal of all graffiti from any construction hoardings or the like within the construction area within 48 hours of its application.

No Obstruction of Public Way

C11. The public way (outside of any approved construction works zone) must not be obstructed by any materials, vehicles, refuse, skips or the like, under any circumstances.

Construction Noise Limits

C12. 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.

C13. 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.

C14. 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.

Vibration Criteria

C15. 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).

C16. 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 C15.

C17. The limits in conditions C15 and C16 apply unless otherwise outlined in a Construction Noise and Vibration Management Plan, approved as part of the CEMP required by condition B13 of this consent.

Tree Protection

C18. For the duration of the construction works:

(a) street trees must not be trimmed or removed unless it forms a part of this development consent or prior written approval from Council is obtained or is required in an emergency to avoid the loss of life or damage to property;

(b) all street trees immediately adjacent to the approved disturbance area must be protected at all times during construction. Any tree on the footpath, which is damaged or removed during construction due to an emergency, must be replaced, to the satisfaction of Council;

(c) all trees on the site that are not approved for removal must be suitably protected during construction as per recommendations of the Arboricultural Impact Assessment report (5229/J1) prepared by TreeTalk Arboricultural consulting dated September 2019;

(d) if access to the area within any protective barrier is required during the works, it must be carried out under the supervision of a qualified arborist. Alternative tree protection measures must be installed, as required. The removal of tree protection measures, following completion of the works, must be carried out under the supervision of a qualified arborist and must avoid both direct mechanical injury to the structure of the tree and soil compaction within the canopy or the limit of the former protective fencing, whichever is the greater; and

(e) the area of fill/rubber built around trunks of trees in the STIF must be remediated and the fill/rubber removed as per the recommendations in Arboricultural Impact Assessment report (5229/J1) prepared by TreeTalk Arboricultural consulting dated September 2019.

Air Quality

C19. The Applicant must take all reasonable steps to minimise dust generated during all works authorised by this consent.

C20. During construction, the Applicant must ensure that:

(a) exposed surfaces and stockpiles are suppressed by regular watering;

(b) all trucks entering or leaving the site with loads have their loads covered;

(c) trucks associated with the development do not track dirt onto the public road network;

(d) public roads used by these trucks are kept clean; and

(e) land stabilisation works are carried out progressively on site to minimise exposed surfaces.

Erosion and Sediment Control

C21. All erosion and sediment control measures must be effectively implemented and maintained at or above design capacity for the duration of the construction works and until such time as all ground disturbed by the works have been stabilised and rehabilitated so that it no longer acts as a source of sediment. Erosion and sediment control techniques, as a minimum, are to be in accordance with the publication Managing Urban Stormwater: Soils & Construction (4th edition, Landcom, 2004) commonly referred to as the 'Blue Book'.

Imported Soil

C22. The Applicant must:

(a) ensure that only VENM, ENM, or other material approved in writing by EPA is brought onto the site;

(b) keep accurate records of the volume and type of fill to be used; and

(c) make these records available to the Certifying Authority upon request.

Disposal of Seepage and Stormwater

C23. Adequate provisions must be made to collect and discharge stormwater drainage during construction of the building to the satisfaction of the principal certifying authority. The prior written approval of Council must be obtained to connect or discharge site stormwater to Council's stormwater drainage system or street gutter.

Emergency Management

C24. The Applicant must prepare and implement awareness training for employees and contractors, including locations of the assembly points and evacuation routes, for the duration of construction

Stormwater Management System

C25. Within three months of the commencement of construction, the Applicant must design an operational stormwater management system for the development and submit it to the satisfaction of the Certifying Authority. The system must:

(a) be designed by a suitably qualified and experienced person(s);

(b) be generally in accordance with the conceptual design in the EIS;

(c) be in accordance with applicable Australian Standards; and

(d) ensure that the system capacity has been designed in accordance with *Australian Rainfall and Runoff* (Engineers Australia, 2016) and *Managing Urban Stormwater: Council Handbook* (EPA, 1997) guidelines.

Unexpected Finds Protocol – Aboriginal Heritage

C26. In the event that surface disturbance identifies a new Aboriginal object, all works must halt in the immediate area to prevent any further impacts to the object(s). A suitably qualified archaeologist and the registered Aboriginal representatives must be contacted to determine the significance of the objects. The site is to be registered in the Aboriginal Heritage Information Management System (AHIMS) which is managed by EES Group and the management outcome for the site included in the information provided to AHIMS. The Applicant must consult with the Aboriginal community representatives, the archaeologists and EES Group to develop and implement management strategies for all objects/sites. Works shall only recommence with the written approval of EES Group.

Unexpected Finds Protocol – Historic Heritage

C27. If any unexpected archaeological relics are uncovered during the work, then all works must cease immediately in that area and the Heritage NSW contacted. Depending on the possible significance of the relics, an archaeological assessment and management strategy may be required before further works can continue in that area. Works may only recommence with the written approval of the Heritage NSW.

Waste Storage and Processing

C28. All waste generated during construction must be secured and maintained within designated waste storage areas at all times and must not leave the site onto neighbouring public or private properties.

C29. All waste generated during construction must be assess, classified and managed in accordance with the Waste Classification Guidelines Part 1: Classifying Waste (EPA, 2014).

C30. The Applicant must ensure that concrete waste and rinse water are not disposed of on the site and are prevented from entering any natural or artificial watercourse.

C31. The Applicant must record the quantities of each waste type generated during construction and the proposed reuse, recycling and disposal locations for the duration of construction.

C32. The Applicant must ensure that the removal of hazardous materials, particularly the method of containment and control of emission of fibres to the air, and disposal at an approved waste disposal facility is in accordance with the requirements of the relevant legislation, codes, standards and guidelines.

Outdoor Lighting

C33. The Applicant must ensure that all external lighting is constructed and maintained in in accordance with AS 4282-2019 Control of the obtrusive effects of outdoor lighting.

Independent Environmental Audit

C34. Proposed independent auditors must be agreed to in writing by the Planning Secretary prior to the preparation of an Independent Audit Program or commencement of an Independent Audit.

C35. Prior to the commencement of construction, an Independent Audit Program prepared in accordance with the Independent Audit Post Approval Requirements (Department 2018) must be submitted to the Planning Secretary and the Certifying Authority.

C36. Table 1 of the Independent Audit Post Approval Requirements (Department 2018) is amended so that the frequency of audits required in the construction phase is:

(a) An initial construction Independent Audit must be undertaken within eight weeks of the notified commencement date of construction; and

(b) A subsequent Independent Audit of construction must be undertaken no later than six months from the date of the initial construction Independent Audit.

In all other respects Table 1 remains the same. The Planning Secretary may require the initial and subsequent Independent Audits to be undertaken at different times to those specified above, upon giving at least 4 weeks notice to the applicant of the date upon which the audit must be commenced.

C37. Independent Audits of the development must be carried out in accordance with:

(a) the Independent Audit Program submitted to the Planning Secretary and the Certifying Authority under condition C34 of this consent; and

(b) the requirements for an Independent Audit Methodology and Independent Audit Report in the Independent Audit Post Approval Requirements (Department 2018).

C38. In accordance with the specific requirements in the Independent Audit Post Approval Requirements (Department 2018), the Applicant must:

(a) review and respond to each Independent Audit Report prepared under condition C36 of this consent;

(b) submit the response to the Planning Secretary and the Certifying Authority; and

(c) make each Independent Audit Report and response to it publicly available within 60 days after submission to the Planning Secretary and notify the Planning Secretary and the Certifying Authority in writing at least seven days before this is done.

C39. Notwithstanding the requirements of the Independent Audit Post Approval Requirements (Department 2018), the Planning Secretary may approve a request for ongoing annual operational audits to be ceased, where it has been demonstrated to the Planning Secretary's satisfaction that an audit has demonstrated operational compliance.

Detailed Site Investigation

C40. Following the relocation or demolition of any existing structures, infrastructure and in ground utilities, the Applicant is to carry out further investigation of soil contamination (including within the footprint and immediate surrounds of those structures, infrastructures and utilities prior to undertaking any construction) to address any contamination with regard to the following:

(a) NSW EPA Sampling Design Guidelines;

(b) Guidelines for the NSW Site Auditor Scheme (3rd edition) 2017;

(c) Guidelines for Consultants Reporting on Contamination Sites, 2011; and

(d) The National Environment Protection (Assessment of Contamination) Measure.

PART D PRIOR TO COMMENCEMENT OF OPERATION

Notification of Occupation

D1. At least one month before commencement of operation, the date of commencement of the operation of the development must be notified to the Planning Secretary in writing. If the operation of the development is to be staged, the Planning Secretary must be notified in writing at least one month before the commencement of each stage, of the date of commencement and the development to be carried out in that stage.

External Walls and Cladding

D2. Prior to commencement of operation, the Applicant must provide the Certifying Authority with documented evidence that the products and systems used in the construction of external walls including finishes and claddings such as synthetic or aluminium composite panels comply with the requirements of the BCA.

D3. The Applicant must provide a copy of the documentation given to the Certifying Authority to the Planning Secretary within seven days after the Certifying Authority accepts it.

Post-construction Dilapidation Report

D4. Prior to commencement of operation, the Applicant must engage a suitably qualified person to prepare a post-construction dilapidation report at the completion of construction. This report is:

a) to ascertain whether the construction created any structural damage to adjoining buildings or infrastructure;

b) to be submitted to the Certifying Authority. In ascertaining whether adverse structural damage has occurred to adjoining buildings or infrastructure, the Certifying Authority must:

i) compare the post-construction dilapidation report with the pre-construction dilapidation report required by these conditions; and

ii) have written confirmation from the relevant authority that there is no adverse structural damage to their infrastructure and roads.

c) to be forwarded to Council.

Protection of Public Infrastructure

D5. Unless the Applicant and the applicable authority agree otherwise, the Applicant must:

(a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by carrying out the development; and

(b) relocate, or pay the full costs associated with relocating any infrastructure that needs to be relocated as a result of the development.

Protection of Property

D6. Unless the Applicant and the applicable owner agree otherwise, the Applicant must repair, or pay the full costs associated with repairing any property that is damaged by carrying out the development.

Utilities and Services

D7. Prior to commencement of operation, the Applicant must obtain a Compliance Certificate for water and sewerage infrastructure servicing of the site under section 73 of the *Sydney Water Act 1994*.

Pedestrian crossing

D8. Prior to the commencement of operation or other timeframe agreed in writing by the Planning Secretary, evidence must be submitted to the Planning Secretary that demonstrates that the Applicant has consulted with Council with respect to investigating the provision of formal pedestrian crossing within the refuge across Ridgecrop Drive. If a pedestrian crossing is required by Council, evidence of details of the pedestrian crossing in accordance with Council requirements must be provided to the satisfaction of the Certifying Authority.

Works as Executed Plans

D9. Prior to the commencement of operation, works-as-executed drawings signed by a registered surveyor demonstrating that the stormwater drainage and finished ground levels have been constructed as approved, must be submitted to the Certifying Authority.

Green Travel Plan

D10. Prior to the commencement of operation, a Green Travel Plan (GTP), must be submitted to the satisfaction of the Planning Secretary to promote the use of active and sustainable transport modes. The plan must:

(a) be prepared by a suitably qualified traffic consultant in consultation with The Hills Shire Council and (Sydney Coordination Office) Transport for NSW;

(b) include objectives and modes share targets (i.e. Site and land use specific, measurable and achievable and timeframes for implementation) to define the direction and purpose of the GTP;

(c) include specific tools and actions to help achieve the objectives and mode share targets;

(d) include measures to promote and support the implementation of the plan, including financial and human resource requirements, roles and responsibilities for relevant employees involved in the implementation of the GTP; and

(e) include details regarding the methodology and monitoring/review program to measure the effectiveness of the objectives and mode share targets of the GTP, including the frequency of monitoring and the requirement for travel surveys to identify travel behaviours of users of the development.

Operational Transport and Access Management Plan (OTAMP)

D11. Prior to the commencement of operation, an OTAMP is to be prepared by a suitably qualified person, in consultation with Council, Transport for NSW and TfNSW(RMS), and submitted to the satisfaction of the Certifying Authority and submitted to the Planning Secretary for information. The OTAMP must address the following:

(a) detailed pedestrian analysis including the identification of safe route options – to identify the need for management measures such as staggered school start and finish times to ensure students and staff are able to access and leave the Site in a safe and efficient manner during school start and finish;

(b) the location of all car parking spaces on the school campuses and their allocation (i.e. staff, visitor, accessible, emergency, etc.);

(c) the location and operational management procedures of the pick-up and drop-off parking located within Gilbert Road and Ridgecrop Drive, including staff management/traffic controller arrangements;

(d) the location and operational management procedures for the pick-up and drop-off of students by buses and coaches for excursions and sporting activities, including staff management/traffic controller arrangements;

(e) delivery and services vehicle and bus access and management arrangements;

(f) management of approved access arrangements;

(g) potential traffic impacts on surrounding road networks and mitigation measures to minimise impacts, including measures to mitigate queuing impacts associated with vehicles accessing pick-up and drop-off parking at Gilbert Road and Ridgecrop Drive;

(h) car parking arrangements and management associated with the proposed use of school facilities by community members; and

(i) a monitoring and review program.

Evacuation and Emergency Planning

D12. Prior to the commencement of operation, a Bush Fire Emergency Management and Evacuation Plan must be prepared consistent with *Development Planning – A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan* December 2014.

School Zones

D13. Prior to the commencement of operation, all required School Zone signage, speed management signage and associated pavement markings along Gilbert Road and Ridgecrop Drive must be installed, inspected by TfNSW(RMS) and handed over to TfNSW(RMS).

Note: Any required approvals for altering public road speed limits, design and signage are required to be obtained from the relevant consent authority.

D14. The Applicant must maintain records of all dates in relation to installing, altering and removing traffic control devices related to speed.

Mechanical Ventilation

D15. Prior to commencement of operation, the Applicant must provide evidence to the satisfaction of the Certifying Authority that the installation and performance of the mechanical ventilation systems complies with:

(a) *AS 1668.2-2012 The use of air-conditioning in buildings – Mechanical ventilation in buildings* and other relevant codes; and

(b) any dispensation granted by Fire and Rescue NSW.

Operational Noise – Design of Mechanical Plant and Equipment

D16. Prior to the commencement of operation, the Applicant must submit evidence to the Certifying Authority that the noise mitigation recommendations in the Environmental Noise Assessment report (6395-1.1R Rev A) dated 8 November 2018 and prepared by Day Design Pty Ltd have been incorporated into the design to ensure the development will not exceed the recommended operational noise levels identified in the Environmental Noise Assessment.

Car Parking Arrangements

D17. Prior to the commencement of operation or other timeframe agreed in writing by the Planning Secretary, evidence must be submitted to the Planning Secretary that demonstrates that:

(a) the Applicant has consulted with Council to form an agreement to use Council's carpark on Ridgecrop Drive as overflow staff carparking during school hours. If an agreement is formed, the agreement must to be submitted to the Planning Secretary for information.

(b) construction works associated with the proposed expansion of school, as proposed under SSD 9274, have been completed and that the expanded car parking facility is operational; and

(c) works associated with the reconfiguration of the existing on site car park to create for 4 additional car parking spaces have been completed.

Road Damage

D18. Prior to the commencement of operation, the cost of repairing any damage caused to Council or other Public Authority's assets in the vicinity of the Subject Site as a result of construction works associated with the approved development must be met in full by the Applicant.

Fire Safety Certification

D19. Prior to commencement of occupation, a Fire Safety Certificate must be obtained for all the Essential Fire or Other Safety Measures forming part of this consent. A copy of the Fire Safety Certificate must be submitted to the relevant authority and Council. The Fire Safety Certificate must be prominently displayed in the building.

Structural Inspection Certificate

D20. Prior to the commencement of occupation of the relevant parts of any new or refurbished buildings, a Structural Inspection Certificate or a Compliance Certificate must be submitted to the satisfaction of the Certifying Authority. A copy of the Certificate with an electronic set of final drawings (contact approval authority for specific electronic format) must be submitted to the approval authority and the Council after:

(a) the site has been periodically inspected and the Certifying Authority is satisfied that the structural works is deemed to comply with the final design drawings; and

(b) the drawings listed on the Inspection Certificate have been checked with those listed on the final Design Certificate/s.

Compliance with Food Code

D21. Prior to the commencement of operation, the Applicant is to obtain a certificate from a suitably qualified tradesperson, certifying that the kitchen, food storage and food preparation areas have been fitted in accordance with the AS 4674 *Design, construction and fit-out of food premises* and provide evidence of receipt of the certificate to the satisfaction of the Certifying Authority.

Stormwater Quality Management Plan

D22. Prior to the commencement of operation, an Operation and Maintenance Plan (OMP) is to be submitted to the satisfaction of the Certifying Authority along with evidence of compliance with the OMP. The OMP must ensure the proposed stormwater quality measures remain effective and contain the following:

(a) maintenance schedule of all stormwater quality treatment devices;

(b) record and reporting details;

(c) relevant contact information; and

(d) Work Health and Safety requirements.

Rainwater Harvesting

D23. Prior to the commencement of operation, signed works-as-executed Rainwater Re-use Plan must be provided to the Planning Secretary and Certifying Authority.

Warm Water Systems and Cooling Systems

D24. The installation of warm water systems and water cooling systems (as defined under the *Public Health Act 2010*) must comply with the *Public Health Act 2010*, Public Health Regulation 2012 and Part 1 (or Part 3 if a Performance-based water cooling system) of *AS/NZS 3666.2:2011 Air handling and water systems of buildings – Microbial control – Operation and maintenance* and the NSW Health Code of Practice for the Control of Legionnaires' Disease.

Outdoor Lighting

D25. Prior to the commencement of operation, the Applicant must submit evidence from a suitably qualified practitioner to the Certifying Authority that demonstrates that installed lighting associated with the development achieves the objective of minimising light spillage to any adjoining or adjacent sensitive receivers and:

(a) complies with the latest version of AS 4282-2019 - *Control of the obtrusive effects of outdoor lighting* (Standards Australia, 1997); and

(b) has been mounted, screened and directed in such a manner that it does not create a nuisance to surrounding properties or the public road network.

Signage

D26. Prior to the commencement of operation, way-finding signage and signage identifying the location of staff car parking must be installed.

D27. Prior to the commencement of operation, bicycle way-finding signage must be installed within the site to direct cyclists from footpaths to designated bicycle parking areas.

D28. Prior to the commencement of operation, 'Do not drink' signage on non-potable water used for toilet flushing and to new hose taps and irrigation systems for landscaped areas must be installed within the site.

D29. Prior to the commencement of operation, the approved illuminated signs must be installed with a timed intensity and illumination adjuster to the satisfaction of the Certifying Authority.

Operational Waste Management Plan

D30. Prior to the commencement of operation, the Applicant must prepare a Waste Management Plan for the development and submit it to the Certifying Authority. The Waste Management Plan must:

(a) detail the type and quantity of waste to be generated during operation of the development;

(b) describe the handling, storage and disposal of all waste streams generated on site, consistent with the *Protection of the Environment Operations Act 1997, Protection of the Environment Operations (Waste) Regulation 2014* and the *Waste Classification Guideline* (Department of Environment, Climate Change and Water, 2009);

(c) detail the materials to be reused or recycled, either on or off site; and

(d) include the Management and Mitigation Measures included in Section 7 of EIS, Section 5 of RtS and Appendix Z.

Landscaping

D31. Prior to the commencement of operation, the Applicant must prepare an Operational Landscape Management Plan to manage the revegetation and landscaping on-site, to the satisfaction of the Certifying Authority. The plan must:

(a) describe the ongoing monitoring and maintenance measures to manage revegetation and landscaping; and

(b) be consistent with the Applicant's Management and Mitigation Measures at Section 7 of EIS and Section 5 of RtS;

D32. The Applicant must not commence operation until the Operational Landscape Management Plan is submitted to the Certifying Authority.

Asset Protection Zones

D33. Asset protection Zones must be provided and maintained in accordance with the 'Bushfire hazard Analysis and Asset protection Zone', Figure 4, prepared by Peterson Bushfire Consulting, dated 1/08/2019. And managed as outlined within appendices 2 and 5 of planning for Bush Fire protection 2006 and the NSW Rural Fire Service's document Standards for asset protection zones.

Traffic and Parking Management Plan

D34. Prior to the commencement of operation, the Applicant must prepare a Traffic and Parking Management Plan to the satisfaction of the Planning Secretary, which details measures to safely manage the daily transport task to/from the school. Traffic management measures that need to be addressed include:

(a) kerbside vehicle pick-up/drop-off management and orderly vehicle queuing;

(b) maintaining bus accessibility and student waiting areas;

(c) safe parent and student behaviour during pick-up/drop-off; and

(d) safe pedestrian movements to the school entrances, minimising vehicle-pedestrian conflicts.

The plan must detail the responsibility of various personnel executing the plan and include measures to monitor, review the performance and make improvements to the plan.

Signage and Linemarking Plan

D35. Prior to the commencement of operation, the Applicant must prepare a detailed signage and linemarking plan to the satisfaction of Certifying Authority of the proposed changes to kerbside parking restrictions to accommodate the various vehicle movements to/from the development within the local road network. The preparation of the plan must be undertaken in consultation with Council.

D36. The detailed signage and linemarking plan must include 'no stopping' signpost along the proposed drop-off/pick-up arrangement.

D37. The approved kerbside parking restrictions must be implemented prior to the commencement of operation.

Road Safety Audit

D38. Prior to the commencement of operation, a Road Safety Audit (RSA) (refer Austroads Guide to Road Safety Part 6 and Part 6a) must be submitted to the satisfaction of the Certifying Authority. The RSA must consider all the proposed measures including any traffic management facilities, bus and private vehicle pick-up and drop-off arrangements, and signage and line-marking plan.

D39. The findings of the RSA must be incorporated into the proposed design in consultation with Council prior to commencement of operation to the satisfaction of the Certifying Authority.

Note: *the audit needs to be undertaken by an independent TfNSW accredited auditor.*

Validation Report

D40. The Applicant must prepare a Validation Report for the development. The Validation Report must:

(a) be prepared by an EPA accredited Site Auditor;

(b) be submitted to EPA, the Planning Secretary and the Certifying Authority for information one month after the completion of remediation works;

(c) be prepared in accordance with the RAP and the *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (OEH, 2011);

(d) include, but not be limited to:

(i) comment on the extent and nature of the remediation undertaken;

(ii) describe the location, nature and extent of any remaining contamination on site;

(iii) sampling and analysis plan and sampling methodology;

(iv) results of sampling of treated material, compared with the treatment criteria;

(v) details of the volume of treated material emplaced within the containment cell and its location;

(vi) results of any validation sampling, compared to relevant guidelines/criteria;

(vii) discussion of the suitability the remediated areas for the intended land use; and

(viii) any other requirement relevant to the project.

Site Audit Report and Site Audit Statement

D41. Prior to occupation of the building, the Applicant must obtain from an EPA accredited Site Auditor, a Site Audit Statement and a Site Audit Report which demonstrates that the site is suitable for its intended use(s).

D42. Within 3 months of submission of the Validation Report required by condition D40, the Applicant must demonstrate to the satisfaction of the Certifying Authority that the Site Auditor has submitted a Site Audit Report and Site Audit Statement to EPA in accordance with the requirements of EPA's *Guidelines for the NSW Site Auditor Scheme* (DEC, 2006).

Vegetation Management Plan

D43. Prior to the commencement of operation, a final Vegetation Management Plan must be prepared for the site and be submitted to the Certifying Authority.

D44. The Vegetation Management Plan must be developed to guide the management of retained native vegetation and adjoining Asset Protection Zones.

PART E POST OCCUPATION

Out of Hours Event Management Plan

E1. Prior to the commencement of the first out of hours events (school use) run by the school that involve 100 or more people, the Applicant is to prepare an Out of Hours Event Management Plan (School Use) and submit it to the Council and Planning Secretary in consultation with Council. The plan must include the following:

(a) the number of attendees, time and duration;

(b) arrival and departure times and modes of transport;

(c) where relevant, a schedule of all annual events;

(d) demonstrate measures to encourage non-vehicular travel to the school and promote and support the use of alternate travel modes (i.e. public transport);

(e) details of the use, where applicable, restricting use before 8am and after 10pm;

(f) measures to minimise localised traffic and parking impacts; and

(g) include measures to minimise CEMP impacts on any sensitive residential receivers, including the preparation of acoustic management plan.

E2. The Out of Hours Event Management Plan must be implemented by the Applicant for the duration of the identified events or use.

E3. Prior to the commencement of out of hours events (community use) run by the external parties that involve 100 or more people, the Applicant is to prepare an Out of Hours Event Management Plan (Community Use) in consultation with Council and submit it to the Council and Planning Secretary. The plan must include the following:

(a) the number of attendees, time and duration;

(b) arrival and departure times and modes of transport;

(c) where relevant, a schedule of all annual events;

(d) demonstrate measures to encourage non-vehicular travel to the school and promote and support the use of alternate travel modes (i.e. public transport);

(e) details of the use, where applicable, restricting use before 8am and after 10pm;

(f) measures to minimise localised traffic and parking impacts; and

(g) include measures to minimise noise impacts on any sensitive residential receivers, including the preparation of acoustic management plan.

E4. The Out of Hours Event Management Plan must be implemented by the Applicant for the duration of the identified community event or use.

Operation of Plant and Equipment

E5. All plant and equipment used on site must be maintained in a proper and efficient condition operated in a proper and efficient manner.

Warm Water Systems and Cooling Systems

E6. The operation and maintenance of warm water systems and water cooling systems (as defined under the Public Health Act 2010) must comply with the Public Health Act 2010, Public Health Regulation 2012 and Part 2 (or Part 3 if a Performance-based water cooling system) of AS/NZS 3666.2:2011 Air handling and water systems of buildings – Microbial control – Operation and maintenance and the NSW Health Code of Practice for the Control of Legionnaires' Disease.

Community Communication Strategy

E7. The Community Communication Strategy, as submitted to the Planning Secretary, must be implemented for a minimum of 12 months following the completion of construction.

Operational Transport and Access Management Plan (OTAMP)

E8. The OTAMP(s) approved under condition D11 (as revised from time to time) must be implemented by the Applicant for the life of the development.

Operational Noise Limits

E9. The Applicant must ensure that noise generated by operation of the development does not exceed the noise limits in Environmental Noise Assessment report (6395-1.1R Rev A) dated 8 November 2018 and prepared by Day Design Pty Ltd.

E10. The Applicant must undertake short term noise monitoring in accordance with the *Noise Policy for Industry* where valid data is collected following the commencement of use of each stage of the development. The monitoring program must be carried out by an appropriately qualified person and a monitoring report must be submitted to the Planning Secretary within two months of commencement use of each stage of the development to verify that operational noise levels do not exceed the recommended noise levels for mechanical plant identified in Environmental Noise Assessment report (6395-1.1R Rev A) dated 8 November 2018 and prepared by Day Design Pty Ltd. Should the noise monitoring program identify any exceedance of the recommended noise levels referred to above, the Applicant is required to implement appropriate noise attenuation measures so that operational noise levels do not exceed the recommended noise levels or provide attenuation measures at the affected noise sensitive receivers.

Unobstructed Driveways and Parking Areas

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.

Green Travel Plan

E12. The Green Travel Plan required by condition D10 of this consent must be updated annually and implemented unless otherwise agreed by the Planning Secretary.

Ecologically Sustainable Development

E13. Unless otherwise agreed by the Planning Secretary, within six months of commencement of operation, Green Star certification must be obtained demonstrating the development achieves a minimum 4 star Green Star Design & As Built rating. If required to be obtained, evidence of the certification must be provided to the Certifying Authority and the Planning Secretary. If an alternative certification process has been agreed to by the Planning Secretary under Condition B9, evidence of compliance of implementation must be provided to the Planning Secretary and Certifying Authority.

Outdoor Lighting

E14. Notwithstanding Condition D25, should outdoor lighting result in any residual impacts on the amenity of surrounding sensitive receivers, the Applicant must provide mitigation measures in consultation with affected landowners to reduce the impacts to an acceptable level.

Landscaping

E15. The Applicant must maintain the landscaping and vegetation on the site in accordance with the approved Landscape Management Plan required by condition D31 for the duration of occupation of the development.

Asset Protection Zones

E16. The asset protection zones required by condition D33 shall be maintained for the duration of occupation of the development.

Signage

E17. Signage approved for illumination under this consent must not be illuminated between the hours of 10pm and 7am seven days per week.

APPENDIX 1 ADVISORY NOTES

General

AN1. All licences, permits, approvals and consents as required by law must be obtained and maintained as required for the development. No condition of this consent removes any obligation to obtain, renew or comply with such licences, permits, approvals and consents.

Long Service Levy

AN2. For work costing $25,000 or more, a Long Service Levy must be paid. For further information please contact the Long Service Payments Corporation Helpline on 131 441.

Legal Notices

AN3. Any advice or notice to the consent authority must be served on the Planning Secretary.

Access for People with Disabilities

AN4. The works that are the subject of this application must be designed and constructed to provide access and facilities for people with a disability in accordance with the BCA. Prior to the commencement of construction, the Certifying Authority must ensure that evidence of compliance with this condition from an appropriately qualified person is provided and that the requirements are referenced on any certified plans.

AN5. Water, electricity and gas are to comply with sections 4.1.3 and 4.2.7 of Planning for Bush Fire Protection 2006.

Utilities and Services

AN6. Prior to the construction of any utility works associated with the development, the Applicant must obtain relevant approvals from service providers.

AN7. Prior to the commencement of above ground works written advice must be obtained from the electricity supply authority, an approved telecommunications carrier and an approved gas carrier (where relevant) stating that satisfactory arrangements have been made to ensure provisions of adequate services.

Road Design and Traffic Facilities

AN8. All roads and traffic facilities must be designed to meet the requirements of Council or TfNSW(RMS) (whichever is applicable). The necessary permits and approvals from the relevant road authority must be obtained prior to the commencement of road or pavement construction works.

Road Occupancy Licence

AN9. A Road Occupancy Licence must be obtained from the relevant road authority for any works that impact on traffic flows during construction activities.

SafeWork Requirements

AN10. To protect the safety of work personnel and the public, the work site must be adequately secured to prevent access by unauthorised personnel, and work must be conducted at all times in accordance with relevant SafeWork requirements.

Hoarding Requirements

AN11. The Applicant must submit a hoarding application to Council for the installation of any hoardings over Council footways or road reserve.

Handling of Asbestos

AN12. The Applicant must consult with SafeWork NSW concerning the handling of any asbestos waste that may be encountered during construction. The requirements of the Protection of the Environment Operations (Waste) Regulation 2014 with particular reference to Part 7 – 'Transportation and management of asbestos waste' must also be complied with.

Speed limit authorisation

AN13. At least eight weeks prior to the commencement of operation, the Applicant must submit the following details to TfNSW(RMS) and obtain authorisation to install School Zone signs and associated pavement markings, and / or removal / relocation of any existing Speed Limit signs:

(a) a copy of the Conditions of Consent;

(b) the proposed school commencement/opening date;

(c) two sets of detailed design plans showing the following:

(i) accurate Site boundaries;

(ii) details of all road reserves, adjacent to the Site boundaries;

(iii) all proposed access points from the Site to the public road network and any additional conditions imposed/proposed on their use;

(iv) all existing and proposed pedestrian crossing facilities on the adjacent road network;

(v) all existing and proposed traffic control devices and pavement markings on the adjacent road network (including School Zone signs and pavement markings); and

(vi) all existing and proposed street furniture and street trees.

Fire Safety Certificate

AN14. The owner must submit to Council an Annual Fire Safety Statement, each 12 months after the final Safety Certificate is issued. The certificate must be on, or to the effect of, Council's Fire Safety Statement.

APPENDIX 2 WRITTEN INCIDENT NOTIFICATION AND REPORTING REQUIREMENTS

Written Incident Notification Requirements

1. A written incident notification addressing the requirements set out below must be emailed to the Planning Secretary at the following address: compliance@planning.nsw.gov.au within seven days after the Applicant becomes aware of an incident. Notification is required to be given under this condition even if the Applicant fails to give the notification required under condition A23 or, having given such notification, subsequently forms the view that an incident has not occurred.
2. Written notification of an incident must:
   a. identify the development and application number;
   b. provide details of the incident (date, time, location, a brief description of what occurred and why it is classified as an incident);
   c. identify how the incident was detected;
   d. identify when the applicant became aware of the incident;
   e. identify any actual or potential non-compliance with conditions of consent;
   f. describe what immediate steps were taken in relation to the incident;
   g. identify further action(s) that will be taken in relation to the incident; and
   h. identify a project contact for further communication regarding the incident.
3. Within 30 days of the date on which the incident occurred or as otherwise agreed to by the Planning Secretary, the Applicant must provide the Planning Secretary and any relevant public authorities (as determined by the Planning Secretary) with a detailed report on the incident addressing all requirements below, and such further reports as may be requested.
4. The Incident Report must include:
   a. a summary of the incident;
   b. outcomes of an incident investigation, including identification of the cause of the incident;
   c. details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence; and
   d. details of any communication with other stakeholders regarding the incident.

DAY DESIGN PTY LTD
CONSULTING ACOUSTICAL ENGINEERS

SUITE 17, 808 FOREST ROAD, PEAKHURST 2210 ABN 73 107 291 494
P. 02 9046 3800 ACOUSTICS@DAYDESIGN.COM.AU WWW.DAYDESIGN.COM.AU

Curriculum Vitae

Adam Shearer

Adams Shearer is a Senior Acoustical Consultant at Day Design Pty Ltd. Adam has valuable knowledge and experience in the assessment of earthmoving machinery noise, environmental noise, architectural / building acoustics, mechanical services noise and transportation noise control.

Adam manages a wide variety of projects including the acoustical design of schools, child care centres, places of public worship, pubs and clubs, residential, commercial and industrial developments and mechanical services systems. He is competent in the measurement and assessment of noise, and in the design of noise control for such projects, which often require his reports to be submitted to regulatory authorities for approval. Adam also provides advice and evidence as an expert witness for matters listed in the NSW Land and Environment Court.

Adam regularly operates acoustical instrumentation including noise and vibration meters and analyses the data during the course of his work.

Qualifications:

Bachelor of Creative Technology (Audio),
JMC Academy;
Masters of Design Science (Audio & Acoustics),
University of Sydney (2009)

Membership:

Member – Australian Acoustical Society

Professional Experience:

August 2017 - Present
Senior Acoustical Consultant
Day Design Pty Ltd

December 2013 – August 2017
Acoustical Consultant
Day Design Pty Ltd

A short overview of the nature of **Mr Shearer's professional experience** is provided below:

Schools and Child Care Centres:	Schools located at East Leppington, Catherine Fields, Sydney CBD, Harrington Park, Armidale, Balmain, Lake Munmorah, Wahroonga, Ultimo, Castle Hill, Wentworthville, Drummoyne, Canada Bay, Point Claire, Dee Why, Woolwich, Tamworth and Merrylands. Child Care Centres located at Normanhurst, Olympic Park, Wahroonga, Eden, Kogarah, Lindfield, Glendenning, Killara, Middleton Grange, Schofields, Hornsby, Brighton Le Sands, Fairfield, St Leonards, Granville, Mudgee, Willoughby, Gymea, Bexley, Chatswood and Peakhurst.
Hotels/Clubs	Tapavino Restaurant Sydney, Cabra-vale Diggers, Harbord Diggers, St George Hotel, Toukley RSL, Willoughby Hotel, Doonside Hotel, Red Lantern Hotel Eastwood, Tathra Hotel, Woy Woy Bowling Club, Magpies Waitara, Gladesville RSL, Campsie RSL, Club Five Dock and Canterbury Hurlstone Park RSL.
Churches and Places of Worship:	Islamic Prayer Hall at Greenacre, Marsden Park Anglican Church, Eastwood Anglican Church, The Salvation Army at Rouse Hill, Saints in Sydney at Kellyville, St Aidan's Anglican Church at Hurstville Grove, Vine Church at Surry Hills and St Andrews Cathedral in Sydney CBD.
Environmental Noise	Malabar Waste Water Treatment Plant, Kurrajong Zone Substation, Munmorah Substation, Huntingwood Zone Substation, Mount Tomah Communications Facility, Shine Australia The Biggest Loser, Rossi Water Pumping Station, the Smeaton Grange Substation and resource recovery facilities in Kings Park, Somersby and Belmore. Animal facilities located at Kenthurst, North Richmond, Collaroy, Richmond Race Club, Colo Heights, Londonderry, Zetland and Fiddletown.
Mechanical:	New Acland Coal Mine – assessment of earthmoving machinery sound power levels. Residential and commercial mechanical services at Rose Bay, Potts Point, Canada Bay, Willoughby, Bellevue Hill, Bronte, Glebe, Singleton, Chatswood, Surry Hills, Ultimo, Convent Hills and Ryde.

Aircraft Noise:	Assessment of aircraft noise intrusion from Bankstown, Richmond and Sydney Airports. Design and compliance for residential developments in Botany, Mascot, Richmond, Windsor, Annandale, Revesby and Arncliffe.
Traffic Noise:	Design and compliance for residential and commercial developments at Lucas Gardens SSP, Iluka Residential Aged Care Facility, Kiah Residential Development, Fairlight, Pyrmont, West Wollongong, Eastern Creek, Schofields and Box Hill.
Train Noise	Design and compliance for residential and commercial developments at Kiama, Gosford, Revesby, Granville, Belmore, Haywards Bay, Miranda and Thirlmere.
Hearing Loss Assessments:	B&M Quality Meats at Umina, Wyong Rugby League Club at Kanwal, Belmont Golf Club at Marks Point, Hengl Transport at Beresfield, Hancock Sheetmetal at Lambton, Australian Timber Shutters at Berkeley Vale, Punchbowl Bus Co at Riverwood, MET Grono Transport at Ballina, Volvo Group Australia at Beresfield, Flamesafe Fire Protection at Rydalmere, Hunter Valley Buses at Hunter Valley and Integrated Steel Mill Services at Newcastle.
Occupational Noise	ARV Laundry at Glendenning, RBM Plastic Extrusions at Silverwater.
Legal Assignments	ArtMade Architectural Pty Ltd v Willoughby City Council, Child Care Centre. Seventh Street Ventures Pty Ltd v Willoughby City Council, Child Care Centre. Omid Mohebati-Arani v Ku-ring-gai Council, Child Care Centre. Antoniou v Bayside Council, Child Care Centre.

Education
School Infrastructure

Post Approval – Consultation

Consultation needs to be meaningful, done with courtesy and respect and be well documented. These are people/ organisations that we need to be building meaningful relationships with.

Conditions of all consent can require consultation with a range of stakeholders. Consultation in the post approval world needs to be well documented to satisfy the condition requirements.

Examples include Council, service providers (eg. Electricity gas etc.), consult with local bus provider and TfNSW.

Read each condition carefully, any reference to consult triggers consultation.

Typically on State Significant Development, there will be a specific consultation condition as to how this piece can be appropriately addressed.

Consultation is not:

- A token gesture
- Done at the end of the piece of work,
- An email to the relevant stakeholder with no response;
- A meeting with the stakeholder with no meeting minutes.

Consultation is:

- Meaningful
- Done prior to the requirement,
- Captures an outcome,
- Identifies matters resolved,
- Identifies matters unresolved,
- Any disagreements are disclosed; and
- How we are going to address unresolved matters?

How to capture all the relevant details on consultation requirements? Any consultation requirement in a condition is required to be accompanied with the following table:

NSW GOVERNMENT Education School Infrastructure

Post Approval Consultation Record

Identified Party to Consult:	Castle Hill Community
Consultation type:	Information Booth
When is consultation required?	Prior to Commencement
Why	B15 – Construction Noise and Vibration Management Sub-Plan The Construction Noise and Vibration Management Sub-Plan must address, but not be limited to, the following: (e) describe the community consultation undertaken to develop the strategies in condition B8;
When was consultation scheduled/held	19th March 2020
When was consultation held	19th March 2020
Identify persons and positions who were involved	Schools Infrastructure NSW: Project Director, Senior Manager Community Engagement and Community Engagement Manager, Hutchinson Builders Construction Team
Provide the details of the consultation	Consultation with the community regarding construction noise and vibration impacts. - Information display boards showing artist renders of the new school and the project scope - Project update flyer, with details of SSD process, construction milestones, minimising construction impacts and future communication - Contact cards including SINSW email address and phone number for queries - Flythrough and site plans shown digitally - Project page and SSD documents shown digitally
What specific matters were discussed?	Discussion: - Project scope and delivery timelines - Construction impacts including noise and traffic, and how these would be managed - How to contact SINSW with queries, concerns or complaints - Future communication, including door knocks, letterbox drops, information sessions Outcomes: - Approximately 40 residents attended - One resident asked about the kiss and drop during and after construction - One question about noise and visual impacts - Most attendees were more interested in school opening dates and parking impacts

What matters were resolved?	Not applicable – consultation only
What matters are unresolved?	Not applicable
Any remaining points of disagreement?	No
How will SINSW address matters not resolved?	Not applicable

ACOUSTICAL – Pertaining to the science of sound, including the generation, propagation, effects and control of both noise and vibration.

AMBIENT NOISE – The ambient noise level at a particular location is the overall environmental noise level caused by all noise sources in the area, both near and far, including road traffic, factories, wind in the trees, birds, insects, animals, etc.

AUDIBLE – means that a sound can be heard. However, there are a wide range of audibility grades, varying from "barely audible" to "just audible", "clearly audible" and "prominent". Chapter 83 of the NSW Environment Protection Authority – Environmental Noise Control Manual (1985) states:
"noise from a particular source might be offensive if it is clearly audible, distinct from the prevailing background noise and of a volume or character that a reasonable person would be conscious of the intrusion and find it annoying or disruptive".

It follows that the word "audible" in an environmental noise context means "clearly audible".

BACKGROUND NOISE LEVEL – Silence does not exist in the natural or the built-environment, only varying degrees of noise. The Background Noise Level is the average minimum dBA level of noise measured in the absence of the noise under investigation and any other short-term noises such as those caused by cicadas, lawnmowers, etc. It is quantified by the L_{A90} or the dBA noise level that is exceeded for 90 % of the measurement period (usually 15 minutes).

- **Assessment Background Level (ABL)** is the single figure background level representing each assessment period – day, evening and night (ie three assessment background levels are determined for each 24hr period of the monitoring period). Determination of the assessment background level is by calculating the tenth percentile (the lowest tenth percent value) of the background levels (L_{A90}) for each period (refer: NSW Industrial Noise Policy, 2000).
- **Rating Background Level (RBL)** as specified by the Environment Protection Authority is the overall single figure (L_{A90}) background noise level representing an assessment period (day, evening or night) over a monitoring period of (normally) three to seven days.

  The RBL for an assessment period is the median of the daily lowest tenth percentile of L_{90} background noise levels.

  If the measured background noise level is less than 30 dBA, then the Rating Background Level (RBL) is considered to be 30 dBA.

DECIBEL – The human ear has a vast sound-sensitivity range of over a thousand billion to one. The decibel is a logarithmic unit that allows this same range to be compressed into a somewhat more comprehensible range of 0 to 120 dB. The decibel is ten times the logarithm of the ratio of a sound level to a reference sound level. See also Sound Pressure Level and Sound Power Level.

Decibel noise levels cannot be added arithmetically since they are logarithmic numbers. If one machine is generating a noise level of 50 dBA, and another similar machine is placed beside it, the level will increase to 53 dBA, not 100 dBA. Ten similar machines placed side by side increase the sound level by 10 dBA, and one hundred machines increase the sound level by 20 dBA.

dBA – The human ear is less sensitive to low frequency sound than high frequency sound. We are most sensitive to high frequency sounds, such as a child's scream. Sound level meters have an inbuilt weighting network, termed the dBA scale, that approximates the human loudness response at quiet sound levels (roughly approximates the 40 phon equal loudness contour).

However, the dBA sound level provides a poor indication of loudness for sounds that are dominated by low frequency components (below 250 Hz). If the difference between the "C" weighted and the "A" weighted sound level is 15 dB or more, then the NSW Industrial Noise Policy recommends a 5 dBA penalty be applied to the measured dBA level.

dBC – The dBC scale of a sound level meter is similar to the dBA scale defined above, except that at high sound intensity levels, the human ear frequency response is more linear. The dBC scale approximates the 100 phon equal loudness contour.

EQUIVALENT CONTINUOUS NOISE LEVEL, L_{Aeq} – Many noises, such as road traffic or construction noise, vary continually in level over a period of time. More sophisticated sound level meters have an integrating electronic device inbuilt, which average the A weighted sound pressure levels over a period of time and then display the energy average or L_{Aeq} sound level. Because the decibel scale is a logarithmic ratio the higher noise levels have far more sound energy, and therefore the L_{Aeq} level tends to indicate an average which is strongly influenced by short term, high level noise events. Many studies show that human reaction to level-varying sounds tends to relate closely to the L_{Aeq} noise level.

FREE FIELD – This is a sound field not subject to significant reflection of acoustical energy. A free field over a reflecting plane is usually outdoors with the noise source resting on hard flat ground, and not closer than 6 metres to any large flat object such as a fence or wall; or inside an anechoic chamber.

FREQUENCY – The number of oscillations or cycles of a wave motion per unit time, the SI unit being the Hertz, or one cycle per second.

IMPACT ISOLATION CLASS (IIC) – The American Society for Testing and Materials (ASTM) has specified that the IIC of a floor/ceiling system shall be determined by operating an ISO 140 Standard Tapping Machine on the floor and measuring the noise generated in the room below. The IIC is a number found by fitting a reference curve to the measured octave band levels and then deducting the sound pressure level at 500 Hz from 110 decibels. Thus the higher the IIC, the better the impact sound isolation.

IMPACT SOUND INSULATION ($L_{nT,w}$) – Australian Standard AS ISO 717.2 – 2004 has specified that the Impact Sound Insulation of a floor/ceiling system be quantified by operating an ISO 140 Standard Tapping Machine on the floor and measuring the noise generated in the room below. The Weighted Standardised Impact Sound Pressure Level ($L_{nT,w}$) is the sound pressure level at 500 Hz for a reference curve fitted to the measured octave band levels. Thus the lower $L_{nT,w}$ the better the impact sound insulation.

IMPULSE NOISE – An impulse noise is typified by a sudden rise time and a rapid sound decay, such as a hammer blow, rifle shot or balloon burst.

INTRUSIVE NOISE LEVEL, L_{Aeq} – The level of noise from a factory, place of entertainment, etc. in NSW is assessed on the basis of the average maximum noise level, or the $L_{Aeq\ (15\ min)}$. This is the energy average A weighted noise level measured over any 15 minute period.

LOUDNESS – The degree to which a sound is audible to a listener is termed the loudness. The human ear perceives a 10 dBA noise level increase as a doubling of loudness and a 20 dBA noise increase as a quadrupling of the loudness.

MAXIMUM NOISE LEVEL, L_{Amax} – The rms maximum sound pressure level measured on the "A" scale of a sound level meter during a noise survey is the L_{Amax} noise level. It may be measured using either the Fast or Slow response time of the meter. This should be stated.

NOISE RATING NUMBERS – A set of empirically developed equal loudness curves has been adopted as Australian Standard AS1469-1983. These curves allow the loudness of a noise to be described with a single NR number. The Noise Rating number is that curve which touches the highest level on the measured spectrum of the subject noise. For broadband noise such as fans and engines, the NR number often equals the dBA level minus five.

NOISE – Noise is unwanted sound. Sound is wave motion within matter, be it gaseous, liquid or solid. "Noise includes sound and vibration".

NOISE REDUCTION COEFFICIENT – See: "Sound Absorption Coefficient".

OFFENSIVE NOISE - (Reference: Dictionary of the Protection of the Environment Operations Act 1997). *"Offensive Noise means noise:*

(a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:

(i) is harmful to (or likely to be harmful to) a person who is outside the premise from which it is emitted, or

(ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or

(b) that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances prescribed by the regulations."

PINK NOISE – Pink noise is a broadband noise with an equal amount of energy in each octave or third octave band width. Because of this, Pink Noise has more energy at the lower frequencies than White Noise and is used widely for Sound Transmission Loss testing.

REVERBERATION TIME, T_{60} – The time in seconds, after a sound signal has ceased, for the sound level inside a room to decay by 60 dB. The first 5 dB decay is often ignored, because of fluctuations that occur while reverberant sound conditions are being established in the room. The decay time for the next 30 dB is measured and the result doubled to determine the T_{60}. The Early Decay Time (EDT) is the slope of the decay curve in the first 10 dB normalised to 60 dB.

SOUND ABSORPTION COEFFICIENT, α – α Sound is absorbed in porous materials by the viscous conversion of sound energy to heat energy as the sound waves pass through it. Sound is similarly absorbed by the flexural bending of internally damped panels. The fraction of incident energy that is absorbed is termed the Sound Absorption Coefficient, α. An absorption coefficient of 0.9 indicates that 90 % of the incident sound energy is absorbed. The average α from 250 to 2000 Hz is termed the Noise Reduction Coefficient (NRC).

SOUND ATTENUATION – If an enclosure is placed around a machine, or a silencer is fitted to a duct, the noise emission is reduced or attenuated. An enclosure that attenuates the noise level by 30 dBA, reduces the sound energy by one thousand times.

SOUND EXPOSURE LEVEL (SEL) – The total sound energy of a single noise event condensed into a one second duration or in other words it is an L_{eq} (1 sec).

SOUND PRESSURE LEVEL, L_p – The level of sound measured on a sound level meter and expressed in decibels, dB, dBA, dBC, etc. $L_p = 20 \times \log (P/P_o)$ ... dB

where P is the rms sound pressure in Pascal and P_o is a reference sound pressure of 20 µPa. L_p varies with distance from a noise source.

SOUND POWER LEVEL, L_w – The Sound Power Level of a noise source is an absolute that does not vary with distance or with a different acoustic environment.

$L_w = L_p + 10 \log A$ ... dB, re: 1pW,
where A is the measurement noise-emission area in square metres in a free field.

SOUND TRANSMISSION CLASS (STC) – An internationally standardised method of rating the sound transmission loss of partition walls to indicate the decibels of noise reduction of a human voice from one side to the other. (Refer: Australian Standard AS1276 – 1979)

SOUND TRANSMISSION LOSS – The amount in decibels by which a random sound is reduced as it passes through a sound barrier. A method for the measurement of airborne Sound Transmission Loss of a building partition is given in Australian Standard AS1191 - 2002.

STATISTICAL EXCEEDENCE SOUND LEVELS, L_{A90}, L_{A10}, L_{A1}, etc – Noise which varies in level over a specific period of time (usually 15 minutes) may be quantified in terms of various statistical descriptors:

The L_{A90} is the dBA level exceeded for 90 % of the time. In NSW the L_{A90} is measured over periods of 15 minutes, and is used to describe the average minimum or background noise level.

The L_{A10} is the dBA level that is exceeded for 10 % of the time. In NSW the L_{A10} measured over a period of 10 to 15 minutes. It was until recently used to describe the average maximum noise level, but has largely been replaced by the L_{Aeq} for describing level-varying noise.

The L_{A1} is the dBA level that is exceeded for 1 % of the time. In NSW the L_{A1} may be used for describing short-term noise levels such as could cause sleep arousal during the night.

STEADY NOISE – Noise, which varies in level by 6 dBA or less, over the period of interest with the time-weighting set to "Fast", is considered to be "steady". (Refer AS 1055.1 1997)

WEIGHTED SOUND REDUCTION INDEX, R_w – This is a single number rating of the airborne sound insulation of a wall, partition or ceiling. The sound reduction is normally measured over a frequency range of 100 to 3,150 Hertz and averaged in accordance with ISO standard weighting curves (Refer AS/NZS 1276.1:1999).

Internal partition wall $R_w + C$ ratings are frequency weighted to simulate insulation from human voice noise. The $R_w + C$ is always similar in value to the STC rating value. External walls, doors and windows may be $R_w + C_{tr}$ rated to simulate insulation from road traffic noise. This is normally a lower number than the STC rating value.

WHITE NOISE – White noise is broadband random noise whose spectral density is constant across its entire frequency range. The sound power is the same for equal bandwidths from low to high frequencies. Because the higher frequency octave bands cover a wider spectrum, white noise has more energy at the higher frequencies and sounds like a hiss.

APPENDIX I – CONSTRUCTION WASTE MANAGEMENT SUB PLAN

As per Condition B13 (d)

Construction and Demolition Waste Management Plan

Proposed Samuel Gilbert Public School Redevelopment

At Ridgecrop Dr, Castle Hill

On behalf of Fulton Trotter Architects

About TTM

For 30 years, we've been at the centre of the Australian development and infrastructure industry. Our unique combination of acoustics, data, traffic and waste services is fundamental to the success of any architectural or development project.

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T: (02) 9418 3033
F: (02) 9418 3112
E: ttmnsw@ttmgroup.com.au

Revision Record

No.	Author	Reviewed/Approved	Description	Date
1.	A. Stamatiou	E. Atkins	Draft	07/09/2018
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5.				

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Level 5, Suite 501, 174 Pacific Highway. PO Box 5238 Greenwich NSW 2065

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1. Introduction

1.1. Background

TTM Consulting has been engaged by Fulton Trotter Architects to prepare a construction and demolition waste management plan for the existing school (Samuel Gilbert Public School) redevelopment at Ridgecrop Drive, Castle Hill. Significant waste volumes can be generated during the construction phase and as such, this plan will assist to guide in reducing wastage and reusing materials.

It should be noted that the site currently has 12 demountable buildings which will be removed from site. Being demountable buildings, minimal demolition waste will be generated from the removal of these buildings and has therefore not been addressed in this report.

Construction wastes can include excavated materials such as soil, rocks, vegetation, building materials such as bricks, concrete, timber, fittings, plasterboard and also contaminated or dangerous materials such as asbestos and contaminated soils. Some of these wastes have particular handling, transport and disposal requirements, and all wastes have been identified by the NSW State government as having significant potential to contribute to the circular economy – recovering and recycling materials and reducing the need for virgin materials. As such, best practice waste management is required to not only comply with laws and guidelines, but also to contribute to improved environmental performance and also to reduce waste disposal costs.

The Hills Shire Council Development Control Plan (DCP) also identifies the importance of minimising waste to landfill and maximising recovery of resources from wastes from construction activities. As such, it is a requirement of The Hills Shire to develop and submit a waste management plan that discusses waste minimisation, reuse, recycling and disposal options for all types of waste, and that the WMP must be implemented throughout the development process. During construction, the WMP and proof of lawful waste disposal/recycling, must be retained on site in a Waste Data File. Proof is to include a log book with associated receipts/invoices, waste classification and site validation certificates.

This construction waste management analysis of the project has been undertaken to meet the requirements of The Hills Shire DCP – Appendix A Waste Management Plan. The goal of this document is in line with the DCP as well as the waste hierarchy (avoid, reduce, reuse, recycle, recover (energy), treat and dispose), shown in Figure 1.1, and aims to:

- Minimise the amount of waste generated;
- Maximise the reuse, recycling and reprocessing of construction waste materials; and
- Minimise the volume of material disposed to landfill.

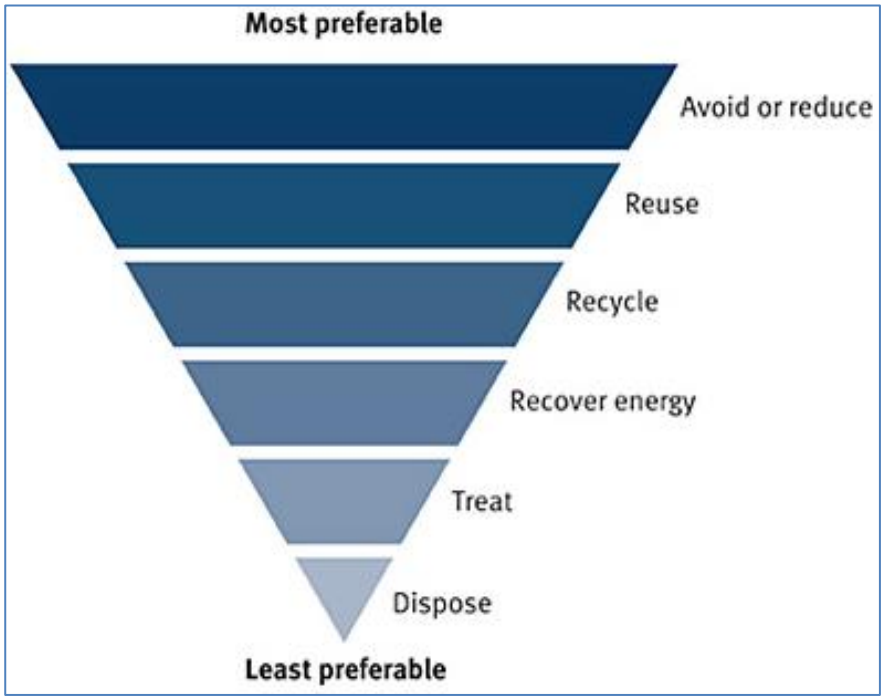

Figure 1.1 Waste Hierarchy

This report will provide guidance on activities and design before works on site commence, and will also outline the requirements to comply with Council and State legislation, and actions required during construction phases.

Information contained within the report is based on local government authority requirements related to The Hills Shire and the associated waste services department. The recommendations provided are designed to comply with:

- The Hills Shire DCP – Appendix A Waste Management Plan;
- NSW Waste Avoidance and Resource Recovery Act 2001 and Strategy 2014-2021.
- Any asbestos removal must be removed and disposed of in accordance with the requirements of Work Cover;
- All lead contaminated materials must be handled and disposed of in accordance with the NSW Environment Protection Authority's requirements.

This waste management plan relates to the construction phases only and does not include additional requirements during the operational phase of the development, which requires its own separate plan.

1.2. Site Location

The site is located on the corner of Ridgecrop Drive and Gilbert Road, as shown in Figure 1.2. The site has road frontages to Gilbert Road and Ridgecrop Drive, with the latter utilised for the service vehicle access. The site is currently operating as an educational facility.

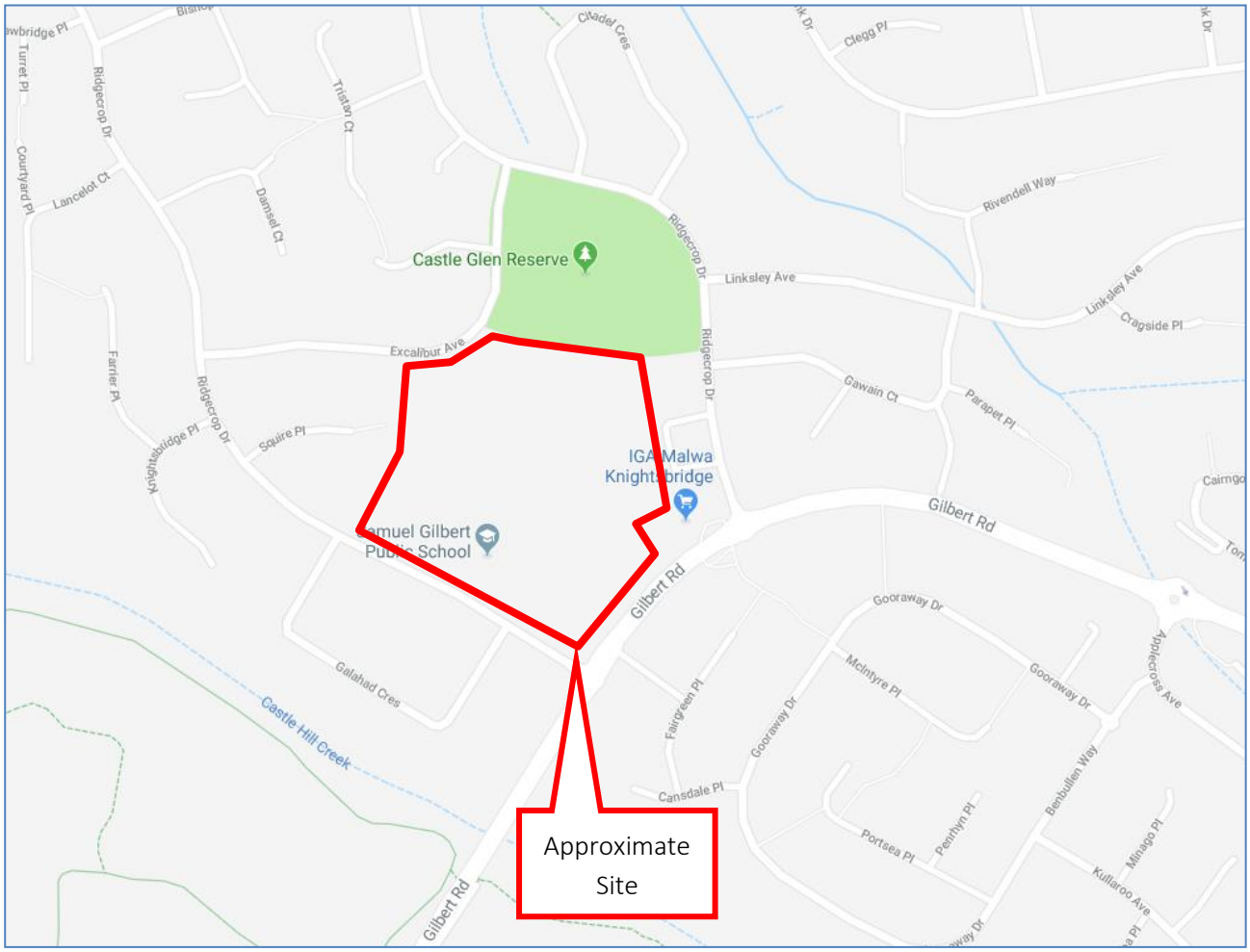

Figure 1.2: Site location

Figure 1.3: Site location

1.3. Development Summary

The development consists of an existing educational facility (school) including administration, classrooms, library and canteen areas.

The development proposal consists of removing 12 demountable buildings from an existing school, to provide 25 new teaching spaces totalling 43 permanent spaces, including a new hall, administration and home bases and cola catering for 1000 students.

The total GFA for the new buildings is 3974.2m^2 GFA, with 679.7m^2 GFA for the refurbishment buildings.

The construction of the new buildings mainly consists of glazing and metal deck roofing.

It is noted that all demountables will be removed at the completion of the project.

Note – the SSDA reports are based on the assumption that any new demountables required for construction would be on site and counted as existing for the purposes of the SSDA application.

2. Construction Waste Legislation

The transfer, transport and disposal of particular wastes have a range of legislative requirements that will need to be adhered to during the life of the project. This legislation has bearing on both the owner of the waste and the transporter.

2.1. General Requirements

Under Section 143 of the *Protection of the Environment Operations Act 1997*, waste can only be transported to a place that can lawfully accept it. If wastes are transported to a place that cannot lawfully accept the material, both the owner of the waste and the transporter can be held liable for clean up costs and for subsequent lawful disposal. Therefore, it is essential for the project managers/owners to ensure that due diligence is undertaken prior to transportation of waste materials. Additional measures owners of waste can protect themselves from fines and penalties are outlined at https://www.epa.nsw.gov.au/your-environment/waste/industrial-waste/construction-demolition.

- It is recommended that a copy of this WMP along with proof of lawful disposal for all waste that is disposed of, or otherwise recycled from the site, be retained on site. Proof of disposal/recycling should to include a log book with associated receipt/invoices, waste classification, and site validation certificates. All entries should include:
- Time and date;
- Description and size of waste;
- Waste facility used;
- Vehicle registration and company name.

Both the logbook and associated receipts should be made available for inspection by authorised Council Officers at any time during site works and at the conclusion of works should be retained by the person responsible and made available for inspection by authorised Council Officers.

2.2. Asbestos

Structures built or renovated in NSW prior to 1987 are likely to contain asbestos. Asbestos may be found in cement sheet walls and sheet roofing, backing to floor tiles, external cladding, switchboard backings and lagging insulation for water pipes. There are specific laws relating to working with or around asbestos (*Work Health and Safety Regulation 2017*). If building that are to be removed or demolished were built prior to 1987, an asbestos specialist should be engaged to identify if asbestos containing materials (ACM) are present and an appropriate removal process be undertaken. For more information, visit http://www.safework.nsw.gov.au/health-and-safety/safety-topics-a-z/asbestos/asbestos-at-work. As such, all removal and disposal of asbestos will be in accordance with all requirements of the relevant legislation, codes, standards and guidelines.

Details of removal procedures and risk management will be detailed in the Hazardous Building Materials Assessment Report. All works should be halted if unidentified materials are suspected. Additional sampling may be required to areas that were not accessible at the time the report was undertaken.

2.3. Contaminated Land

Any contaminated soil identified after demolition and excavation has commenced is to be remediated and disposed of to an approved contaminated/remediated soil facility as per the *Contaminated Land Management Act 1997* as required by NSW EPA. If during the course of demolition or excavation and activities lead to the contamination of land, or once a person becomes aware that there is evidence of previous contamination, there is a legal obligation to notify the EPA. Further information on requirements can be found at the following guideline https://www.epa.nsw.gov.au/-/media/09353B1ABE5C431BAE803A0BCE72510C.ashx?la=en.

3. Planning for Construction

In order to achieve effective waste reduction during the construction phase, there are a number of measures that should be undertaken by the project manager, construction contractors, and site staff. A commitment to reducing waste sent to landfill will need to be agreed by all stakeholders and actions coordinated early in the planning phases, in order to achieve best practice diversion rates. These measures are discussed in the following sections.

3.1. Contractor Selection

The projects site performance relies on the attitudes of the chosen contractors (and construction), which will ultimately have a significant impact on waste performance of the site. Contractor tendering should include a requirement for all contractors to identify their waste minimisation strategies and actions, and outline the materials that they are likely to reuse on site, recycle through the supply of bins, or recycle themselves through product stewardship arrangements for specialty wastes, and those items that they regularly dispose of to landfill.

Contractors supplying goods and equipment should also document within the tender submission the methods they undertake to reduce overordering, the anticipated/known wastage, and other waste minimisation actions. As a minimum, all contractors should follow the intent of this WMP, and where not achievable, discussions with the Site Manager/Foreman must be undertaken and recycling contractors engaged to provide consultation on alternative solutions.

3.1.1. Education

Site induction of all construction site staff and contractor will include education regarding the importance of recycling and reducing the amount of waste sent to landfill. Induction will also include a familiarisation of appropriate bins and stockpiles, and an introduction of the person responsible for managing the wastes. It is important to ensure people continue to use the facilities as originally intended.

3.2. Material Identification

It is recommended that construction contractors meet with site managers to identify those materials or items that are to be salvaged or reused during the construction stage. All other materials should then be categorised based on acceptance criteria for available recyclers (see Table 6.1 and Appendix B). This presents a clear idea of those materials that are to be excluded from being sent offsite for recycling/reprocessing or for disposal to landfill.

In the absence of readily available data on anticipated volumes of waste materials from the construction of commercial buildings, TTM have estimated volumes by extrapolating data available on the construction of houses (and assumed that the current buildings requiring construction equate to approximately 7 residential houses). The resulting quantities are a guide only to assist in planning appropriate management solutions (access, bin capacity, training) for each of the waste streams.

Without knowing quantities of materials that will be brought on to site, it is difficult to accurately estimate volumes of materials that will require recycling or landfilling. Therefore, without this information, TTM have provided industry knowledge on wastage percentages of materials ordered, of regularly used construction materials in the table below.

Table 3.1: Anticipated Construction Waste Volumes (% of total material)

Material	Waste as a percentage of the total amount of material ordered
Timber	5-7%
Plasterboard	5-20%
Concrete	3-5%
Bricks	5-10%
Cladding*	5-15%
Roofing*	1-5%

*Assumed based on timber and plasterboard percentages.

Source: http://www.wastenet.net.au/Profiles/wastenet/Assets/ClientData/Document-Centre/WAL2708_Construction_waste_A4_v2_singles.pdf

To convert volumes to tonnages for these materials, use the following table.

Table 3.2: Construction Waste Volumes (Tonnes/m^2)

Material	Tonnes/m^2
Timber	0.5
Plasterboard	2.4
Concrete	1.0
Bricks	0.75
Cladding**	2.4
Roof**	0.5

**Assumed based on timber and plasterboard densities.

Source: http://www.wastenet.net.au/Profiles/wastenet/Assets/ClientData/Document-Centre/WAL2708_Construction_waste_A4_v2_singles.pdf

As anticipated volumes are currently unknown, it is essential that the construction contractor complete the table in Appendix B as soon as known quantities of materials are calculated. An estimation of volumes has been provided below, but is indicative only.

Table 3.3: Anticipated Construction Waste Volumes

Material	Estimated Qty – to be updated by construction contractor
Timber	2t
Plasterboard	10m^3
Concrete	10m^3
Bricks	30m^3
Cladding	10m^3
Roofing	5m^3

4. Construction

4.1. Construction Objectives

The key objectives for reducing total waste to landfill during the construction phase should be to:

- Minimise the amount of waste generated for the project – this should be the primary focus "waste avoidance";
- Maximise the amount of materials reused/salvaged, sent for reuse or recycling; and
- Minimise the amount of waste sent to landfill.

These goals can be achieved with the right planning, commitment, infrastructure and site preparation. The site foreman, and contractor representatives should be engaged early and clear guidelines on the expectations to minimise waste to landfill communicated.

4.1.1. Waste Avoidance

- Plan to use building materials with low wastage rates such as prefabricated or modular materials;
- Design using standard material sizes, reducing off-cuts and time and labour saving;
- Store materials appropriately from weather, accidents, machinery and theft;
- Regularly undertake stocktake checks to ascertain available resources;
- Check all goods upon delivery for defects and return to supplier – do not accept oversupply as compensation;
- Purchase materials or request materials to have no packaging where appropriate; and
- Support the purchase of recycled content materials.

4.1.2. Reuse

- Reuse materials identified in the pre-planning consultation with the Site Foreman and construction contractor;
- Identify and source other salvaged materials from salvage yards or look for bespoke items on for sale websites/pages; and
- Stockpile materials that can be reused in future stages or projects.

4.1.3. Recycle

- Provide bins for each material stream based on acceptance criteria from recycling contractors/s;

- Some contractors will provide mixed bins and they will undertake the sorting process within their facility – this may be particularly useful where available space or access is limited; and
- Remember to provide a comingled (mixed) recycling bin for staff to dispose of recyclables from lunches and packaging.

4.1.4. Contaminated Items

- Must go to appropriately licensed facility, with appropriately licensed transporter.

4.1.5. Landfill

- This should be a last resort option for those items that cannot be readily reused, recycled or reprocessed.

5. Waste Bin Guidelines

All waste containers/skip bins are to be positioned within the property boundary. Bins outside of the property boundary such as the roadway or nature strip may require a permit application to Council. Storage of skip bins/containers should be placed in a suitable location as to not cause disturbance to normal stormwater flow. Under no circumstances should hazardous, flammable or explosive materials be disposed of within skip bins.

All bins and stockpiles will be appropriately labelled, clearly visible to and from the property, easily accessible and stored in a well-lit area. It is proposed that bins and stockpiles will be located in close proximity to the existing refuse bin area (refer Figure 5.1).

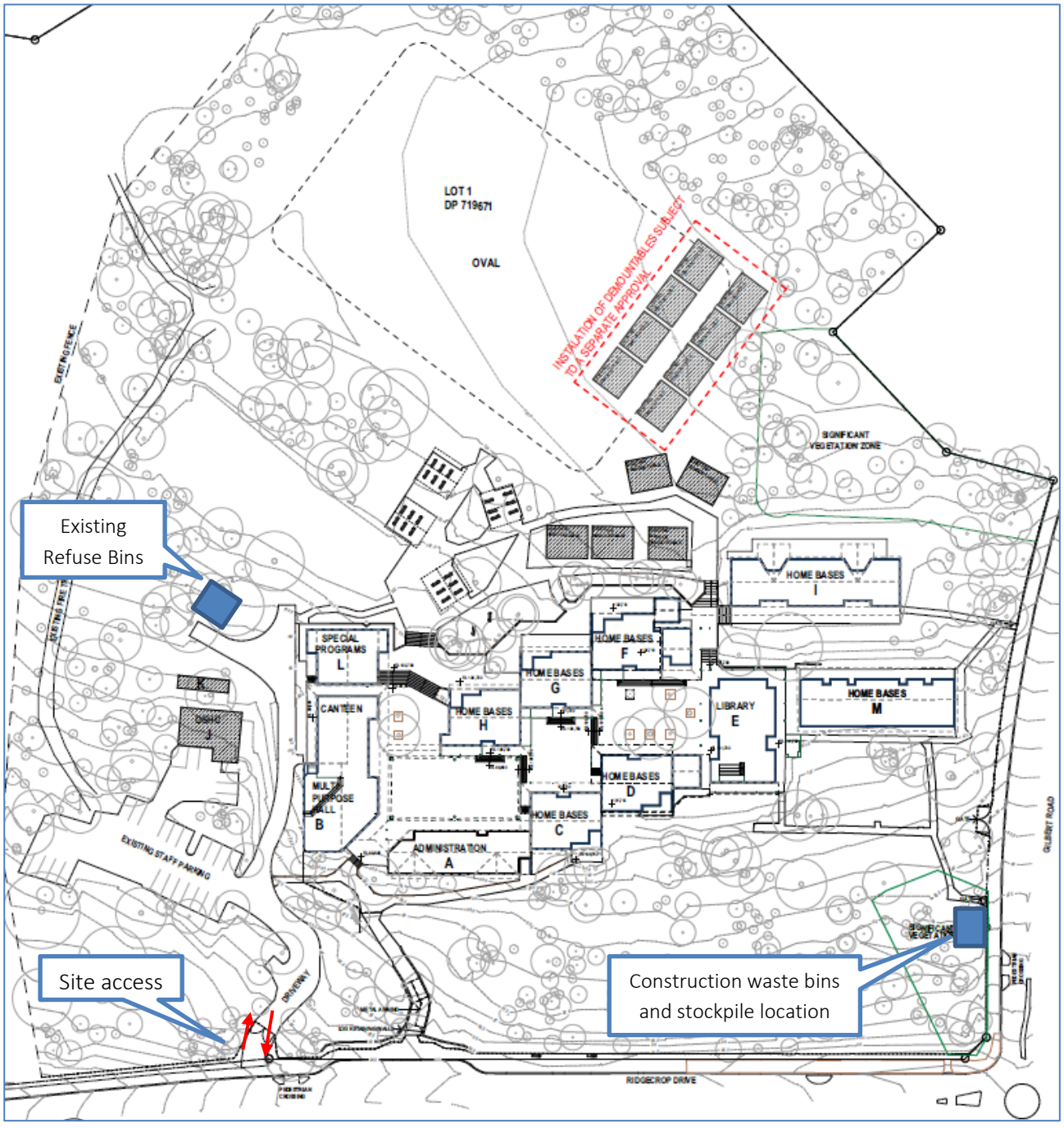

Figure 5.1 Proposed construction waste storage location and site access

Access to the construction area will be via Ridgecrop Drive. Each construction waste contractor has different collection methods, bins and vehicles and as such, the site foreman will be responsible for liaising directly with the contractors to ensure correct placement of bins/stockpiles to maximise safe access for both users and transporters.

6. Recycling Contractors

6.1. Recycling, Reuse and Recovery Guiding Principles

Reducing waste generation and keeping materials circulating within the economy are priorities for NSW. Through Waste Less, Recycle More funding, programs and services, the EPA is working hard to make it easier for businesses and communities to become better recyclers and reduce waste sent to landfill. On-site separation can reduce recycling costs and simplifies the sorting process.

6.2. Contractors and Services

The following is an indicative only list of Sydney based contractors that provide various services for handling the recycling, reuse and disposal of construction waste from the proposed project. This list has been assembled not in recommendation of any particular contractor but to demonstrate the general availability of recycling services around Sydney. The following larger waste transporters and operators are recommended:

Table 6.1: Recycling, Reuse and Recovery Services Contractors

Waste Material	Company	Description	Contact / Location Details
Concrete, blockwork, Bricks, Porcelain, Bitumen / Asphalt	Benedict Industries	Primarily a rubble recycling company but manages a wider range of waste streams as per below. Benedict will separate loads by hand or machine, screen some loads and crush masonry products. Non-recyclable elements will go to landfill. Materials accepted: • Clean concrete, blockwork, brick, mortar (masonry), porcelain; • Rubble+ soil; • Mixed load – concrete rubble and mixed in non-recyclables (incl mixed demolition waste, vegetation, timber, plastics); • Electrical cable; • Cardboard; • Clean timber; • Green waste; • Clean and laminated MDF, laminated timbers, stumps and plastics will generally go to landfill; • Steel loads – not mixed with other materials that requires sorting. Do not accept paints, liquids or food waste. Do not provide a bin collection service and are regularly serviced by bin suppliers and transporters such as: • Onesteel • Remondis • Reliance Skip Bins • Workhorse Waste and Recycling • Jims Skip bins • Vina Skip Bins • Brown Bros	A: Chipping Norton W: www.benedict.com.au Matthew Rooke E: matthew.rooke@benedict.com.au Ph. 02 9986 3500. M: 0431 737 444

	Bingo Industries	Primarily a rubble recycling service similar to Benedict however they also provide their own bins.	A: 305 Parramatta Rd, Auburn W: www.bingoindustries.com.au Ph: 02 9737 0351
	Boral Recycling	Provides concrete, asphalt, roof tiles, bricks and masonry blocks removal and disposal.	A: Wetherill Park W: https://www.boral.com.au/locations/boral-recycling-wetherill-park Ph. (02) 9604 9101
	Concrete Recyclers	Provides concrete, brick, asphalt waste removal.	A: 14 Thackeray St, Camellia W: www.concreterecyclers.com.au Ph: (02) 8832 7400
	Dial a Dump	Provides waste removal, waste management and waste transfer service.	A: 84-88 Burrows Rd, Alexandria W: http://www.dadi.com.au/recycling-landfill/genesis-eastern-creek
	Hi Quality	Resource recovery and recycling facility licensed to accept: • VENM; • Blast furnace slag; • Building and demolition wastes; and • Soils (CT1 thresholds); and • Organic wastes (mill wastes, green waste and wood waste).	A: Elizabeth Dr & Mamre Road, Kemps Creek W: http://www.hiquality.com.au Ph: 02 9826 1666
	Kimbriki Resource Recovery Centre	• Concrete; • Brick; • Asphalt; • Roof tiles Disposal facility only – requires use of transporter.	A: Kimbriki Rd, Ingleside/Terrey Hills W: Kimbriki.com.au Ph: 02 9486 3512
	M&K Demolition Group	Demolition, asbestos removal, strip outs and any other earthmoving service.	W: http://www.mkdemogroup.com.au/ Ph: Karl: 0404 429 995 Michael: 0404 222 995
Plasterboard / Gypsum	Bin only company	Rubbish removal (waste and recycling) from residential and commercial buildings, construction sites and deceased and hoarding affected estates.	W: www.1300rubbish.com.au Ph: 1300 78 22 47
	Gyprock	Only new, clean Gyprock product plasterboard waste is accepted. They do not provide bins.	A: Wetherill Park W: www.gyprock.com.au Ph. 131744
	ReGyp	Regyp provide and collect their own bins for new and old plasterboard per below: • Plasterboard and cornice off-cuts • Plasterboard with paint or wallpaper • Non-laminated plasterboard tiles • Gypsum blocks, gypsum prefab wall panels eg RFC rapid wall • Chemical precipitate gypsum (eg FGD) • Suitable industrial gypsum waste	A: Kurnell W: http://www.regyp.com.au/ Ph: 1300 473 497

	Remondis	Accepted materials: • Chemical & FGD gypsum • Scrap metal, • Organic waste, • Paper • Glass • Plastics	A: 32-36 Christie Street, St. Marys W:remondis.com.au Ph: +61 2 96234733 E: info@remondis.com.au
	Sydney Rubbish Services	Collection and removal of plasterboard and gyprock for delivery to recycling centre.	W: http://sydneyrubbishservices.com.au Ph: 02 9785 5526
Paints	paintback	Taking unwanted paint and packaging for innovative reuse and responsible disposal. Further information regarding acceptable paints can be found on the website.	W: www.paintback.com.au P: 1300 390 380
Metal - Metal recycling generally falls into ferrous and non-ferrous metal categories numerous recyclers exist to handle both types in mixed and separated loads	Benedict Industries	As above.	As above.
	Liverpool Scrap Metal – Mooreban k	Removal and disposal of scrap metal.	W: http://www.liverpoolscrapmetal.com.a u Ph. (02) 9602 4330
	Kimbriki Resource Recovery Centre	Scrap metal accepted	As above
	North Shore Metal Recyclers	Wire, copper pipe, plumbing fixtures, steel	A: Artarmon W: www.nsmr.com.au Ph. 02 9436 3000
	Onesteel Recycling	Mixed metals recycling, full site clean-up and bin services	A: Chipping North, Wetherill Park W: www.onesteel.com
	Remondis	As above.	As above.
	Veolia	All waste metal in large volumes.	W: https://www.veolia.com/anz/our-services/our-services/recycling-waste-services/construction-demolition-waste Ph. 132 955
Timber	Benedict Industries	As above.	As above.
	Kimbriki Resource Recovery Centre	Untreated unpainted timber	As above
Cardboard + Polystyrene	Brandown	Privately owned and operated Resource Recovery Centre, General Solid Waste (Non-Putrescible) Landfill and Quarry	A: Lot 90 Elizabeth Drive, Kemps Creek W: http://www.brandown.com.au/ Ph. - General Enquiries - 02 9826 1256
	Cleanaway	Sustainability for recycling, reuse, repurposing, treating or shredding across the following areas: • General Waste • Recycling • Hazardous Chemical Waste Disposal Services	A: Multiple Locations throughout Australia W: https://www.cleanaway.com.au/our-services/building-construction-scrap-

		• Used Oil and Oily Water • Construction and Demolition Waste	metal-and-timber-waste/ Ph. - General Customer Enquiries - 13 13 39
	Liverpool City Council	As above.	As above.
	Kimbriki Resource Recovery Centre	Cardboard and paper	As above
	Remondis	As above.	As above.
Soft plastics from packaging	Cleanaway	As above.	As above.
	Remondis	As above.	As above.
	Suez	Sustainability across the following areas: • Commercial Waste Management • Waste Removal & Disposal • General Waste Management • Commercial Waste Recycling • Advanced Resource Recovery Technology • Diversion Solutions • Households & Small Business • Collection & Disposal • General Waste Management • Skip Bins	W: http://www.sita.com.au/commercial-solutions/resource-recovery-recycling/construction-demolition/

Appendix A Construction Checklist

Waste and/or Recyclable Materials		Destination		
		Reuse and Recycling		Disposal
Possible Materials Generated	Estimated volume (m^3) or area (m^2) or weight (t) (Contractor to confirm)	On-site (How will materials be reused and/or recycled on-site?)	Off-site (Specify the contractor and recycling facility)	Specify the contractor and/or landfill site/transfer station
	Construction			
Timber				
Plasterboard				
Concrete				
Bricks				
Tiles				
Fittings				
Green Waste				
Asbestos (if any)				
Other (specify)				

How and where will materials be stored on-site for reuse and recycling? e.g. in skip bins located near entry.

How will site operations be managed to ensure minimal waste creation and maximum reuse and recycling? e.g. staff training, feedback from waste management service provider, on-going checks by site managers, separate area set aside for sorted wastes, clear signage for waste areas etc.

How will this plan be evaluated, and who is responsible for the evaluation? e.g. feedback from staff collected by the site manager.

Appendix B Action and Responsibilities During Construction Stages

Stage	Action	Responsibility	Checklist
Construction	Sourcing of recycling agents/contractors and transportation – gain an understanding of site access requirements and bin choices.	Project / Site manager	
	Installation of any barrier fencing to protect pedestrian safety, access pathways, and stockpiles to be protected/retained.	Project manager, site manager and construction contractor	
	Identification of best bin storage areas for the number of material streams and collection vehicle access, ensuring unimpeded access for users and waste collection contractors.	Project / Site manager	
	Installation of recycling bins.	Project / Site manager	
	Preparation of access points and installation of safety and educational signage at waste storage areas.	Project / Site manager	
	Site induction for all staff to include discussion on commitment to waste minimisation, reuse and recycling, available stockpiles of salvaged materials, how to use bins appropriately, and who to contact for any issues.	Site manager	
	Regular checks on bin capacity and scheduling of removal contractors.	Site manager	
	Waste information maintained and updated with each collection.	Site manager and construction contractor	

SAMUEL GILBERT PUBLIC SCHOOL

RIDGECROP DRIVE, CASTLE HILL NSW 2154

NON-DESTRUCTIVE HAZARDOUS BUILDING MATERIALS SURVEY

JULY 2018

wsp

SAMUEL GILBERT PUBLIC SCHOOL

RIDGECROP DRIVE, CASTLE HILL NSW 2154

NON-DESTRUCTIVE HAZARDOUS BUILDING MATERIALS SURVEY

WSP
LEVEL 27, 680 GEORGE STREET
SYDNEY NSW 2000
GPO BOX 5394
SYDNEY NSW 2001

TEL: +61 2 9272 5100
FAX: +61 2 9272 5101
WSP.COM

REV	DATE	DETAILS
A	06/08/2018	First issue

	NAME	DATE	SIGNATURE
Prepared by:	Daniel Sharkey	06/08/2018	
Reviewed by:	Thomas Wear	14/08/2018	
Approved by:	Prasanna Pichai	14/08/2018	

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OUR REF: PS110440_Fulton_&_Trotter JULY 2018

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GLOSSARY

ACRONYM	DEFINITION
A	Amosite Asbestos (Brown Asbestos)
AC	Asbestos cement (Asbestos-containing fibrous cement material)
ACM	Asbestos containing material
AS 1216	Standards Association of Australia, Classification and Class Labels for Dangerous Goods
AS 1319	Standards Association of Australia, Rules for the Design and Use of Safety Signs for the Occupational Environment
AS 1715	Standards Association of Australia, Selection, Use and Maintenance of Respiratory Protective Devices
AS 1716	Standards Association of Australia, Respiratory Protective Devices
ASCC	Australian Safety & Compensation Council
C	Crocidolite Asbestos (Blue Asbestos)
CH	Chrysotile Asbestos (White Asbestos)
DECC	Department of Environment and Climate Change (now NSW EPA)
EPA	Environment Protection Authority
Fibres/mL	Countable fibres per millilitre of air sampled
FC	Fibre cement (usually sheeting)
L/min	Litres per minute of air
NAD	No Asbestos Detected
NATA	National Association of Testing Authorities, Australia
NOHSC	National Occupational Health and Safety Commission
ODS	Ozone Depleting Substance
PAM	Presumed Asbestos Material
PCB	Polychlorinated Biphenyls
PPE	Personal protective equipment
RPE	Respiratory protective equipment
SMF	Synthetic Mineral Fibre
WH&S	Workplace health and safety

EXECUTIVE SUMMARY

On 11th July 2018, WSP Australia Pty Ltd conducted a Non-Destructive Hazardous Building Materials Survey of Samuel Gilbert Public School at Ridgecrop Dr, Castle Hill NSW 2154. The survey was undertaken on behalf of Fulton Trotter Architects.

The scope of services for this inspection comprised a detailed visual inspection of all accessible areas on the site. Representative samples were collected from materials suspected of containing Asbestos and paint systems suspected of containing Lead and all items suspected of containing Synthetic Mineral Fibres (SMF) were conducted via a visual inspection only. All data generated from the survey was used to create a hazardous building materials register (Appendix B). A summary of the hazardous building materials inspection findings is shown in **Table E.1** and a summary of inaccessible areas is shown in **Table E.2.**

Table E.1 Summary of hazardous materials identified at the time of inspection

HAZARDOUS MATERIAL	FOUND
Friable asbestos containing materials (ACM)	No
Non-friable ACM	No
Synthetic mineral fibre (SMF)	Yes
Lead-based paints	No
Capacitors with polychlorinated biphenyls (PCBs)	No

Table E.2 Summary of inaccessible areas at time of inspection

INACCESSIBLE AREAS	DETAILS
Ceiling Space	Building Block A & Block B have suspended ceilings. A visual assessment was made via the ceiling access point
Subfloors	Building Block L, limited access to all areas of subfloor
Electrical Distribution Cupboards	Building Block A, Block B, Block E& Block L – Locked Door - Electric Distribution Board - Live
Areas at heights	Height above 3 meter and not fully accessed in line with company OHS policies

Details of all hazardous building materials identified are presented within the register in Appendix B.

To assist in the management of possible hazardous building materials being identified on site and to ensure compliance with relevant regulations, it is recommended that a separate Hazardous Building Materials Management Plan be prepared, which should include information regarding:

- Roles and responsibilities
- Training
- Prohibitions
- Management plan and register reviews
- Labelling
- Demolition and refurbishment works
- Asbestos removal works
- Lead paint removal works
- Incidents and emergencies
- Record keepings

1 INTRODUCTION

WSP Australia was commissioned by Fulton Trotter Architects to undertake Non-destructive Hazardous Building Materials inspection and risk assessment of Samuel Gilbert Public School located at Ridgecrop Dr, Castle Hill NSW 2154.

This report presents the findings of the inspection conducted on 11th July 2018.

The term hazardous building materials for the purpose of this report refers to the following:

- Asbestos containing materials (ACM);
- Lead based paints;
- Synthetic Mineral Fibre (SMF) materials; &
- Light fittings and accessible electrics that may contain polychlorinated biphenyls (PCB) capacitors

A complete list of the in-situ and suspected hazardous materials identified during the inspection, including details about the condition and the risk posed by each situation and a risk matrix, has been provided in the hazardous building materials register including photographs and certificates of analysis that form the deliverable component of the project. These are attached as Appendices A to D.

No one section or part of a section of this report should be taken as giving an overall idea of this report. Each section must be read in conjunction with the whole of this report, including the asbestos materials register and sample results.

1.1 LEGISLATIVE REQUIREMENTS

The pre-demolition hazardous materials survey works and production of this report have been undertaken in accordance with the requirements of the following documents:

- Work Health and Safety Act 2011 (Commonwealth)
- Work Health and Safety Act 2011 (NSW)
- Work Health and Safety Regulation 2017 (NSW)
- SafeWork NSW: How to Manage and Control Asbestos in the Workplace: Code of Practice 2016.
- SafeWork NSW: How to Safely Remove Asbestos: Code of Practice 2016.
- Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres. 2nd Edition [NOHSC:3003(2005)]
- ANZECC (1997) Identification of PCB-containing Capacitors: An information booklet for Electricians and Electrical Contractors.
- AS 1319, Standards Association of Australia, Rules for the Design and Use of Safety Signs for the Occupational Environment
- AS 1715, Standards Association of Australia, Selection, Use and Maintenance of Respiratory Protective Devices
- AS 1716, Standards Association of Australia, Respiratory Protective Devices
- AS 2601 Demolition of Structures
- AS 4361.1 Guide to Lead Paint Management, Part 1: Industrial Application 1995
- AS 4361.2 Guide to Lead Paint Management, Part 2: Residential and Commercial Buildings 2017
- National Code of Practice for the Control and Safe Use of Inorganic Lead at Work [NOHSC:2015 (1994)].
- AIOH positional paper: Synthetic Mineral Fibres and Occupational Health Issues 2011
- NOHSC (1989b). Guidance Note on the Membrane Filter Method for the Estimation of Airborne Synthetic Mineral Fibres. [NOHSC:3006 (1989)] June 1989
- National Standard for Synthetic Mineral Fibres [NOSHC:1004 (1990)].
- National Code of Practice for the Safe Use of Synthetic Mineral Fibres [NOSHC:2006 (1990)].
- AS 3640 Workplace atmospheres - Methods for sampling and gravimetric determination of inhalable dust 2009
- NSW Protection of the Environment Operations Act 1997.

1.2 SCOPE OF SERVICES

The objectives of the hazardous building material inspection were to:

- Conduct a Non – Destructive Inspection at to identify hazardous building materials;
- Confirm the type, location, friability, disturbance potential and labelling status of hazardous building materials identified;
- Sampling of representative materials suspected of containing asbestos or lead;
- Suspected ACM and Lead containing samples collected during the re-inspection were sent to NATA accredited laboratories for analysis;
- Prepare a Hazardous Building Materials Register, including asbestos containing materials;
- Provide a semi-quantitative risk assessment of the hazardous building materials identified and;
- Provide recommendations on the control measure strategies in the event of any refurbishment or demolition works.

2 SURVEY METHODOLOGY

2.1 SITE INSPECTION

The identification of hazardous building materials involves a combination of visual inspection of the accessible areas of the building/structure and the collection of representative samples of the suspect materials for the purpose of analytical confirmation. Where identical suspect materials are detected at different locations, visual confirmation only may have been made rather than additional sample collection.

Access was made only where safe access by solid floors, decking, walkways, protected catwalks or ladders was available. Minimal to no disturbance of any equipment was undertaken as part of the survey as all plant, electrical installations, pipe-work and associated equipment were considered live at the time of the survey.

Access through the building and structures on the site was made by systematic walkthrough, with the order of the items listed in the Asbestos Register reflective of the order of the inspection. This inspection was semi-destructive in nature and could not be a fully destructive survey as services were still connected to the building.

2.2 IDENTIFICATION OF MATERIAL

2.2.1 ASBESTOS CONTAINING MATERIALS (ACM)

Representative samples of materials suspected to contain asbestos were collected and analysed at WSP Australia's NATA Accredited. The identification of asbestos fibres is based on using Polarised Light Microscopy supplemented with Dispersion Staining techniques. This is detailed in Australian Standard 4964-2004 '*Method for the qualitative identification of asbestos in bulk samples*'. Asbestos samples were only collected for analysis where the safety of personnel would not be compromised. Sampling was conducted in accordance with the WSP Australia's in house survey guide, SafeWork Australia's Code of Practice, '*How to Manage and Control Asbestos in the Workplace*' and the United Kingdom Health & Safety Executive publication, '*HSG 264: Asbestos: The survey guide*'.

2.2.2 LEAD-BASED PAINTS

Representative samples of paint suspected to be lead based were collected and analysed at Envirolab Services NATA Accredited Laboratory. Laboratory analysis of lead based paints is used to achieve a reportable weight by weight percentage of lead throughout the paint layers and is reported against AS 4361.-2017 *Guide to lead Paint Management, Part 2: Commercial and Residential Buildings* lead containing paint system level of 0.1 per cent (w/w) of the dried film.

The analysis of the physical samples is achieved by digestion of the sample for determination of lead content by one of two methods, atomic absorption spectroscopy (AAS) or inductively coupled plasma emission spectrometry (ICP-AES). Collection of lead based paint samples was only conducted where the safety of personnel would not be compromised. Sampling was conducted in accordance with the WSP Australia's in house survey guide and AS 4361.2-2017 *Guide to lead Paint Management, Part 2: Commercial and Residential Buildings*.

Sampling methodology will consider the various paint coats and record these layers accordingly, these observations will be referred to alongside the analytical sample results to acknowledge that lead paint layers of varying lead content will affect the analytically observed lead weight concentration recorded from the sample. To this end, where multiple lead paint layers have been visually recorded but analytically determined lead percentage of the collective paint layers is below actionable limits, the paint undercoats may still be determined as hazardous due to its dilution in the sample by the non-lead topcoats. Sampling methodology may also consist of the use of a lead paint chemical colorimetric test reagent that can provide an instantaneous result of lead presence within specific layers. This testing will however be used in conjunction with a physical sample to determine the lead concentration as above.

2.2.3 SYNTHETIC MINERAL FIBRES (SMF)

If representative samples of materials suspected to contain asbestos were collected and analysed at WSP Australia's in-house NATA Accredited Laboratory, SMF can also be identified. The identification of SMF fibres is based on using Polarised Light Microscopy supplemented with Dispersion Staining techniques. Alternatively, our experienced surveyor visually identified and recorded the presence of synthetic mineral fibre products onsite.

2.2.4 POLYCHLORINATED BIPHENYLS (PCBS)

Where access was available and power was isolated representative examples of each major type of fluorescent light fittings were examined to determine, which lights were fitted with PCB containing ballast capacitors. The details of the brand, model of each capacitor and capacity were recorded and checked against with the ANZECC database of known PCB capacitors and PCB free capacitors.

The Australian and New Zealand Environment Conservation Council 'Polychlorinated Biphenyls Management Plan, November 1996' outlines the National Strategy for the management of PCBs.

The document defines PCB materials and wastes as follows:

Table 2.1 PCB Concentration Classification

PCB CONCENTRATION	WASTE CLASSIFACTION
<2 mg/kg	PCB free
2 mg/kg to <50 mg/kg	Non-scheduled PCB material or waste
>50 mg/kg	Scheduled PCB material or waste
>100,000 (10%)	Concentrated PCB material

3 SITE DESCRIPTION

3.1 SITE LOCATION

Site is located at 3-7 McPherson Street, Banksmeadow, NSW 2019

3.2 SITE DESCRIPTION

The survey was limited to specified buildings selected by Fulton Trotter Architects. Details of the buildings are presented below:

Table 3.1 Building Description

BUILDING	BUILDING DESCRIPTION
Block A (Administration)	Single storey building constructed in 1984. The building is made of brick walls, concrete floor slab. There is SMF ceiling batts, the ceiling is suspended and the roof is corrugated iron.
Block B (Communal Facilities/ Pupil Facilities	Single storey building constructed in 1984. The building is made of brick / Besser block walls, with a concrete floor slab. There are tall ceilings within the Hall, suspended ceilings are gyprock material. There are SMF ceiling batts within the ceiling space and the roof is corrugated iron.
Block E (Library/ Tiered Learning)	Single storey building constructed in 1984. The building is made of brick walls, concrete floor slab. There is SMF ceiling batts, and the roof is corrugated iron.
Block L (General Learning/ Music)	Single storey building constructed in 2002. The building is made of brick veneer walls, concrete floor slab. Ceiling lining is plaster gyprock, there is SMF ceiling batts, as well as SMF A/C ducting and the roof is corrugated iron

3.3 SURVEY RESTRICTIONS

No access was possible to areas above 3 meters in height and confined spaces due to not being fully accessed in line with the companies OHS policies. Certain areas of the sub-floor void could not be accessed due to the space of the void not being tall enough for human occupancy. Refer to Table E.2 for a detailed list of no-access areas.

4 HAZARDOUS MATERIALS RISK ASSESSMENT

To assess the health risk posed by the presence of ACMs, SMF, lead based paint and PCBs; the following factors must be considered:

4.1 ACM & SMF RISK ASSESSMENT FACTORS

These factors include:

- Condition of the material. This is described as either good (not been damaged or have not deteriorated), medium (minor deterioration or damage) or poor (materials which have been extensively damaged or their condition has deteriorated over time);
- Proximity of air plenums and direct air stream;
- Friability of the material (ease with which the material can be crumbled) listed as either friable or non-friable;
- Requirement for access for building or maintenance operations and accessibility (low, medium or high);
- Likelihood of disturbance of the material;
- Exposed surface areas and;
- Environmental conditions.

These aspects are in turn judged upon; (i) potential for fibre generation; and, (ii) the potential for exposure. When these factors have indicated that there is a possibility of exposure to airborne fibres, appropriate recommendations for repair, maintenance or abatement of the asbestos containing materials are made.

4.2 LEAD BASED PAINT RISK ASSESSMENT FACTORS

Risk assessment factors include:

- Concentration of lead in paint;
- Condition of the paint.
- Deterioration/damage (peeling, flaking);
- Proximity of air plenums, direct air stream and sensitive receptors such as foodstuffs;
- Ease with which the paint can be disturbed/removed;
- Requirement for access for building or maintenance operations and accessibility (low, medium or high) and;
- Magnitude of exposed surface areas.

These aspects are in turn judged upon the potential for exposure. When these factors have indicated that there is a possibility of exposure to lead-based paint appropriate recommendations for the repair, maintenance, abatement and removal of the paint are made.

4.3 POLYCHLORINATED BIPHENYLS (PCBS) RISK ASSESSMENT FACTORS

Risk assessment factors include:

- The manufacture age and location of the capacitor;
- The condition of the capacitor (visible leaks/spills of fluid);
- Potential of exposure to the PCBs from contact with capacitors;
- Ease with which the capacitors can be accessed and;
- The requirement for access to light fittings for building or maintenance operations and accessibility (low, medium or high).

As above, these aspects are in turn judged upon the potential for exposure. When risk factors have indicated a possibility of exposure to PCBs, appropriate recommendations for the removal and disposal of the capacitors are made.

5 FINDINGS AND RECOMMENDATIONS

5.1 ASBESTOS CONTAINING MATERIALS

At the time of the inspection, Asbestos containing material was presumed in the following location:

Table 5.1 Presumed Asbestos containing materials

BUILDING	LOCATION	MATERIAL
Block A - Administration	R0013 - Distribution Board	Backing board
Block B - Communal Facilities/ Pupil Facilities	R0015 - Distribution Board	Backing board
Block E - Library/ Tiered Learning	R0004 - Main Switch Board	Backing board
Block L - General Learning/ Music	R0002 - Main Switch Board Cupboard	Backing board

It is recommended that the materials above be tested and if confirmed to contain asbestos be removed by appropriately licensed contractors prior to demolition/refurbishment works. Any work conducted on material should be under controlled conditions to reduce the amount of airborne fibres. Appropriate PPE and RPE should be worn.

5.2 SMF CONTAINING MATERIALS

At the time of the inspection, SMF containing materials were identified in the following locations:

Table 5.2 Identified SMF containing materials

BUILDING	LOCATION	MATERIAL
Block A - Administration	Ceiling Space (suspended ceilings)	Ducting to ceiling
Block A - Administration	Ceiling Space (suspended ceilings)	Ceiling Batts
Block B - Communal Facilities/ Pupil Facilities	Ceiling Space (suspended ceilings)	Ducting to ceiling
Block B - Communal Facilities/ Pupil Facilities	Ceiling Space (suspended ceilings)	Ceiling Batts
Block E - Library/ Tiered Learning	Ceiling Space	Ducting to ceiling
Block E - Library/ Tiered Learning	Ceiling Space	Ceiling Batts
Block L - General Learning/ Music	Ceiling Space	Ducting to ceiling
Block L - General Learning/ Music	Ceiling Space	Ceiling Batts

It is recommended that any work conducted on material should be under controlled conditions to reduce the amount of airborne fibres. Appropriate PPE and RPE should be worn.

5.3 LEAD BASED PAINTS

Table 5.3 Identified Lead containing materials

BUILDING	LOCATION	MATERIAL
NA	NA	NA

It is recommended that the material above be removed by appropriately licensed contractors prior to demolition/refurbishment works. Any work conducted on material should be under controlled conditions to reduce the amount of airborne lead content. Appropriate PPE and RPE should be worn.

6 STATEMENT OF LIMITATIONS

This report has been prepared for the benefit of the client and no other party. WSP assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of WSP or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

In accordance with the scope of services, WSP has relied upon the data and has conducted field monitoring and/or testing in the preparation of the report. The nature and extent of monitoring and/or testing conducted is described in the report. On all sites, varying degrees of non-uniformity of conditions are encountered. Hence no monitoring, common testing or sampling technique can eliminate the possibility that monitoring or testing results/samples are not totally representative of actual situations. The conclusions are based upon the data and the field monitoring and/or testing and are therefore merely indicative of the conditions of the site at the time of preparing the report.

It should also be recognised that site conditions, including the extent and concentration of contaminants, can change with time.

Within the limitations imposed by the scope of services, the monitoring, testing, sampling and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable Occupational Hygiene consultants under similar circumstances. No other warranty, expressed or implied, is made.

APPENDIX A

RISK MATRIX

Table 1 Definitions

CODE	ITEM	DEFINITION
U	Unknown	No access to assess friability or condition
N/A	Not Applicable / Practicable	Not Applicable / Practicable
FRIABILITY (ASBESTOS AND SMF)		
F	Friable	Material that; (A) is in a powder form or that can be crumbled, pulverised or reduced to powder by hand pressure when dry, and (B) contains asbestos.
NF	Non-friable	Material containing asbestos that is not friable asbestos, including material containing asbestos fibres reinforced with a bonding compound.

Note: Friability only applies to asbestos and SMF

Table 2 Condition and Disturbance Assessment

CONDITION		
1	Unknown	No access to assess condition
2	Poor	Obvious damage or deterioration, extensive dust and contamination
3	Moderate	Major damage throughout, no debris or dust, not sealed or encapsulated
4	Fair	Minor damage or deterioration, not sealed or encapsulated
5	Good	No obvious damage or deterioration, secured in place, sealed and encapsulated
DISTURBANCE POTENTIAL		
A	Public	Public access areas
B	Certain	Disturbance very likely to occur during typical occupancy of the building and during maintenance works
C	High	Disturbance may occur during typical occupancy of the building and is likely during maintenance works
D	Medium	Disturbance unlikely during typical occupancy of the building however may occur during maintenance works
E	Low	Disturbance unlikely during typical occupation of the building

Table 3 Risk Assessment Chart

MATERIAL CONDITION		PROBABILITY OF DISTURBANCE				
		Public	Certain	Likely	Possible	Unlikely
		A	B	C	D	E
Unknown	1	1	2	4	7	11
Poor	2	3	5	8	12	16
Moderate	3	6	9	13	17	20
Fair	4	10	14	18	21	23
Good	5	15	19	22	24	25

LEGEND: 1-6 HIGH RISK 7-15 MEDIUM RISK 16-25 LOW RISK

APPENDIX B

HAZARDOUS BUILDING MATERIALS REGISTER

Address: Samuel Gilbert Public School, Ridgecrop Drive, Castle Hill 2154
Consultant Names: Daniel Sharkey
Survey Date: 12/7/18

Hazard	Sample No	Result	Photo ID	Description of Hazardous Material	Location of Hazardous Material	Quantity	Friability (F, NF)	Condition (Good, Fair,Poor)	Risk Rating (L, M, H)	Consultant Comments
Block A - Administration - 1984 - Brick Veneer Structure										
B00A - External Movement										
Asbestos	WSP-050267	NAD		Ceiling linings	Covered Walkway Throughout	>150m2	NA	NA	NA	No Further action required
B00A - R0001 Movement										
No Asbestos identified at time of inspection										
B00A- R0002 Entry Vestible										
No Asbestos identified at time of inspection										
B00A-R0003 - Clerical Office										
No Asbestos identified at time of inspection										
B00A-R0004 - Principal										
No Asbestos identified at time of inspection										
B00A-R0005 - Deputy Principal										
No Asbestos identified at time of inspection										
B00A-R0006 - Deputy Principal										
No Asbestos identified at time of inspection										
B00A-R007 - Movement										
No Asbestos identified at time of inspection										
B00A-R0008 - Staff Room										
No Asbestos identified at time of inspection										
B00A-R0009 - Movement										
No Asbestos identified at time of inspection										
B00A-R0010 - Staff Room Annexe										
No Asbestos identified at time of inspection										
B00A-R0011 - Staff Toilet										
No Asbestos identified at time of inspection										
B00A-R0012 - Staff Toilet										
No Asbestos identified at time of inspection										
B00A-R0013 - Distribution Board										
No Access at time of inspection										
B00A-R0014 - Security Store										
No Asbestos identified at time of inspection										

Address: Samuel Gilbert Public School, Ridgecrop Drive, Castle Hill 2154
Consultant Names: Daniel Sharkey
Survey Date: 12/7/18

Hazard	Sample No	Result	Photo ID	Description of Hazardous Material	Location of Hazardous Material	Quantity	Friability (F, NF)	Condition (Good, Fair,Poor)	Risk Rating (L, M, H)	Consultant Comments
B00A-R0015 - Security Store										
Asbestos	WSP-050268	NAD	2	Blue Vinyl	Floor throughout	16m2	NA	Good	NA	No Further action required
Asbestos		NAD		Adhesive beneath Blue Vinyl	Floor throughout	16m2	NA	Good	NA	No Further action required
B00A-R0016 - Sick Bay										
No Asbestos identified at time of inspection										
B00A-R0017 - Duplicating Workroom										
No Asbestos identified at time of inspection										
B00A-R0018 - Interview										
No Asbestos identified at time of inspection										
B00B-R0010 - Movement										
No Asbestos identified at time of inspection										
B00A - Ceiling Space (suspended ceilings)										
SMF	Visual	SMF	1	Insulation	Ducting to ceiling	50lm	NF	Good	L	WSP 2018: Handle in accordance with the Code of Practice for the Safe Use of Synthetic Mineral Fibres [NOHSC: 2006 (1990)].
B00A - Ceiling Space (suspended ceilings)										
SMF	Visual	SMF	3	Insulation	Ceiling Batts	>150m2	F	Good	L	WSP 2018: Handle in accordance with the Code of Practice for the Safe Use of Synthetic Mineral Fibres [NOHSC: 2006 (1990)].
Block B - Communal Facilities/ Pupil Facilities - 1984 - Brick/Besser Block Structure										
B00B-R0001 - Movement										
No Asbestos identified at time of inspection										
B00B-R0002 - Toilet Boys										
No Asbestos identified at time of inspection										
B00B-R0003 - Toilet Girls										
No Asbestos identified at time of inspection										
B00B-R0004 - Cleaning Distributed Store										
No Asbestos identified at time of inspection										
B00B-R0005 - Disabled Toilet										
No Asbestos identified at time of inspection										
B00B-R0006 - Cleaning Supplies										
No Asbestos identified at time of inspection										
B00B-R0007 - Canteen Office/Store										
No Asbestos identified at time of inspection										
B00B-R0008 - Canteen Office/ Store										

Address: Samuel Gilbert Public School, Ridgecrop Drive, Castle Hill 2154
Consultant Names: Daniel Sharkey
Survey Date: 12/7/18

Hazard	Sample No	Result	Photo ID	Description of Hazardous Material	Location of Hazardous Material	Quantity	Friability (F, NF)	Condition (Good, Fair,Poor)	Risk Rating (L, M, H)	Consultant Comments
No Asbestos identified at time of inspection										
B00B-R0009 - Canteen										
Asbestos	WSP - 050265	NAD		Red Vinyl	Floor throughout	40m2	NA	Good	NA	No Further action required
B00B-R0010 - Movement										
No Asbestos identified at time of inspection										
B00B-R0011 - Hall Chair Store										
No Asbestos identified at time of inspection										
B00B-R0012 - P.E Store										
Asbestos	WSP - 050266	NAD	5	Green Vinyl	Floor throughout	25m2	NA	Good	NA	No Further action required
B00B-R0013 - Cleaning Supplies										
No Asbestos identified at time of inspection										
B00B-R0014 - Plant										
No Asbestos identified at time of inspection										
B00B-R0015 - Distribution Board										
No Access at Time of Inspection										
B00B-R0016 - Movement										
No Asbestos identified at time of inspection										
B00B-R0017 - Raised Platform										
No Asbestos identified at time of inspection										
B00B-R0018 - Communal Space/Hall										
No Asbestos identified at time of inspection										
No inspection to ceiling space within Hall as limited by heigth restriction										
B00B-R0019 - General Assistant/ Bulk Store										
No Asbestos identified at time of inspection										
B00B-R0020 - Uniform Shop										
No Asbestos identified at time of inspection										
B00B-R0021 - Garden Store										
No Asbestos identified at time of inspection										
B00B-R0022 - General Storeroom										
No Asbestos identified at time of inspection										
B00B - Ceiling space (suspended ceiling)										

Address: Samuel Gilbert Public School, Ridgecrop Drive, Castle Hill 2154
Consultant Names: Daniel Sharkey
Survey Date: 12/7/18

Hazard	Sample No	Result	Photo ID	Description of Hazardous Material	Location of Hazardous Material	Quantity	Friability (F, NF)	Condition (Good, Fair,Poor)	Risk Rating (L, M, H)	Consultant Comments
SMF	Visual	SMF		Insulation	Ducting to ceiling	90lm	NF	Good	L	WSP 2018: Handle in accordance with the Code of Practice for the Safe Use of Synthetic Mineral Fibres [NOHSC: 2006 (1990)].
B00B - Ceiling space to (suspended ceiling)										
SMF	Visual	SMF	4	Insulation	Ceiling Batts	>200m2	F	Good	L	WSP 2018: Handle in accordance with the Code of Practice for the Safe Use of Synthetic Mineral Fibres [NOHSC: 2006 (1990)].
Block E - Library/ Tiered Learning - 1984 - Brick/Veneer Structure										
B00E-R0001- Movement										
No Asbestos identified at time of inspection										
B00E-R0002 - Reading Area										
No Asbestos identified at time of inspection										
No inspection to ceiling space within reading area as limited by heigth restriction										
B00E-R0003 - K.L.A. Store										
No Asbestos identified at time of inspection										
B00E-R0004 - Main Switch Board										
No Access at Time of Inspection										
B00E-R0005 - Library Office/Work Room										
Asbestos	WSP - 050262	NAD	7	Membrane Beneath Sink	Floor throughout	<1m2	NA	NA	NA	No Further action required
Asbestos	WSP - 050263	NAD	6	Green Vinyl	Floor throughout	12m2	NA	NA	NA	No Further action required
B00E - R0006 - Special Programs Store										
No Asbestos identified at time of inspection										
B00E - R0007 - Plant										
No Asbestos identified at time of inspection										
B00E - R0008 - Special Programs Store										
No Asbestos identified at time of inspection										
B00E - Ceiling Space										
SMF	Visual	SMF		Insulation	Ducting to ceiling	50lm	NF	Good	L	WSP 2018: Handle in accordance with the Code of Practice for the Safe Use of Synthetic Mineral Fibres [NOHSC: 2006 (1990)].
B00E - Ceiling Space										
SMF	Visual	SMF		Insulation	Ceiling Batts	>100m2	F	Good	L	WSP 2018: Handle in accordance with the Code of Practice for the Safe Use of Synthetic Mineral Fibres [NOHSC: 2006 (1990)].
Block L - General Learning/ Music - 2002 - Brick/Veneer Structure										
B00L - R0001 - General Store										
No Asbestos identified at time of inspection										
B00L - R0002 - Main Switch Board Cupboard										
No Access at Time of Inspection										

Address: Samuel Gilbert Public School, Ridgecrop Drive, Castle Hill 2154
Consultant Names: Daniel Sharkey
Survey Date: 12/7/18

Hazard	Sample No	Result	Photo ID	Description of Hazardous Material	Location of Hazardous Material	Quantity	Friability (F, NF)	Condition (Good, Fair,Poor)	Risk Rating (L, M, H)	Consultant Comments
B00L - R0003 - External Movement										
No Asbestos identified at time of inspection										
B00L - R0004 - Interview										
No Asbestos identified at time of inspection										
B00L - R0005 - Withdrawal Space - 1hb										
No Asbestos identified at time of inspection										
B00L - R0006 - Special Programs Room										
No Asbestos identified at time of inspection										
B00L - R0007 - Withdrawal Space - 1hb										
No Asbestos identified at time of inspection										
B00L - R0008 - Special Programs Room										
No Asbestos identified at time of inspection										
B00L - R0009 - General Store										
No Asbestos identified at time of inspection										
B00L - R0009 - External Movement										
No Asbestos identified at time of inspection										
B00L - Subfloor										
Asbestos	WSP - 050264	NAD	9	Compressed flooring	Floor throughout	>100m2	NA	NA	NA	No Further action required
B00L -Ceiling Space										
SMF	Visual	SMF	8	Insulation	Ducting to ceiling	45lm	NF	Good	L	WSP 2018: Handle in accordance with the Code of Practice for the Safe Use of Synthetic Mineral Fibres [NOHSC: 2006 (1990)].
B00L - Ceiling Space										
SMF	Visual	SMF	8	Insulation	Ceiling Batts	>100m2	F	Good	L	WSP 2018: Handle in accordance with the Code of Practice for the Safe Use of Synthetic Mineral Fibres [NOHSC: 2006 (1990)].

APPENDIX C

CERTIFICATES OF ANALYSIS

WSP Australia Pty Limited

Level 27 Ernst & Young Centre 680 George Street
PO Box 20967 World Square
Telephone +61 2 9272 1407
Facsimile +61 2 9272 5101
Email ANZLab@pbworld.com

ABN 80 078 004 798

NCSI Certified Quality System ISO 9001

Certificate of Analysis

LOCATION:	**Samuel Gilbert Public School**	**CERTIFICATE NO:**	**SYD-PS110440-0001-98761**
CLIENT:	Fulton Trotter Architects	DATE\S SAMPLED:	11/07/2018
CLIENT ADDRESS:	PO BOX 1669, Bondi NSW 1355	DATE RECEIVED:	11/07/2018
TELEPHONE:	02 8383 5151	DATE ANALYSED:	13/07/2018
EMAIL:	johnw@fultontrotter.com.au	ORDER NUMBER:	N/A
CONTACT:	John Ward	SAMPLED BY:	Dan Sharkey

TEST METHOD: Qualitative identification of Asbestos fibre in bulk and soil samples at WSP Corporate Laboratories, by polarised light microscopy, including dispersion staining techniques using AS4964 (2004) and supplementary in house laboratory procedure (LP3 - Identification of Asbestos Fibres). This document is issued in accordance with NATA's requirements under NATA accreditation No. 17199, accredited for compliance with ISO/IEC: 17025 - Testing. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standard.

Lab No	Sample ID	Location	Sample Description	Sample Dimensions	Identification Type
001	WSP-050262	Block E - Library Office - Beneath sink - Membrane	Bituminous Membrane	3 gm	OF, NAD
002	WSP-050263	Block E - Library Office - Green Floor Covering	Vinyl	2 gm	NAD
002A			Adhesive		OF, NAD
003	WSP-050264	Block L - Subfloor South Elevation - Compressed Sheeting	Fibre Cement Sheet	3 gm	OF, NAD
004	WSP-050265	Block B - Canteen - Red Floor Covering	Vinyl	6 gm	NAD
004A			Adhesive		OF, NAD
005	WSP-050266	Block B - Store Room in Hall - Green Floor Covering	Vinyl	4 gm	NAD
005A			Adhesive		OF, NAD
006	WSP-050267	Block A - Awning Lining to Movement	Fibre Cement Sheet	2 gm	OF, NAD
007	WSP-050268	Block A- Store - Blue Vinyl Floor Covering	Vinyl Sheeting	2 gm	NAD
007A			Adhesive		OF, NAD

LEGEND:

NAD	-	No Asbestos Detected
CH	-	Chrysotile Asbestos Detected
A	-	Amosite Asbestos Detected
C	-	Crocidolite Asbestos Detected
UMF	-	Unknown Mineral Fibres Detected
SMF	-	Synthetic Mineral Fibres Detected
OF	-	Organic Fibres Detected

Hand picked refers to small discrete amounts of asbestos distributed unevenly in a large body of non asbestos material.

NATA
ACCREDITED FOR
TECHNICAL
COMPETENCE

Approved Identifier

Name: Melanie Reed

Approved Signatory

Name: Clare Brockbank

AUTHORISATION DATE

Friday, 13 July 2018

Notes:
If no asbestos is detected in vinyl tiles, mastics, sealants, epoxy resins and ore samples then confirmation by another independent analytical technique is advised due to the nature of the samples.
The results contained within this report relate only to the sample(s) submitted for testing. WSP accepts no responsibility for the initial collection, packaging or transportation of samples submitted by external persons. NATA does not accredit the sampling process, therefore sampling is not covered by the scope of accreditation. This document may not be reproduced except in full.

WSP Australia Pty Limited

Level 27 Ernst & Young Centre 680 George Street
PO Box 20967 World Square
Telephone +61 2 9272 1407
Facsimile +61 2 9272 5101
Email ANZLab@pbworld.com

ABN 80 078 004 798

NCSI Certified Quality System ISO 9001

Certificate of Analysis

LOCATION: **Samuel Gilbert Public School**

CERTIFICATE NO: **SYD-PS110440-0001-98761**

LEGEND:

NAD	-	No Asbestos Detected
CH	-	Chrysotile Asbestos Detected
A	-	Amosite Asbestos Detected
C	-	Crocidolite Asbestos Detected
UMF	-	Unknown Mineral Fibres Detected
SMF	-	Synthetic Mineral Fibres Detected
OF	-	Organic Fibres Detected

Hand picked refers to small discrete amounts of asbestos distributed unevenly in a large body of non asbestos material.

NATA
ACCREDITED FOR
TECHNICAL
COMPETENCE

Approved Identifier

Name: Melanie Reed

Approved Signatory

Name: Clare Brockbank

AUTHORISATION DATE

Friday, 13 July 2018

Notes:
If no asbestos is detected in vinyl tiles, mastics, sealants, epoxy resins and ore samples then confirmation by another independent analytical technique is advised due to the nature of the samples.
The results contained within this report relate only to the sample(s) submitted for testing. WSP accepts no responsibility for the initial collection, packaging or transportation of samples submitted by external persons. NATA does not accredit the sampling process, therefore sampling is not covered by the scope of accreditation. This document may not be reproduced except in full.

APPENDIX D

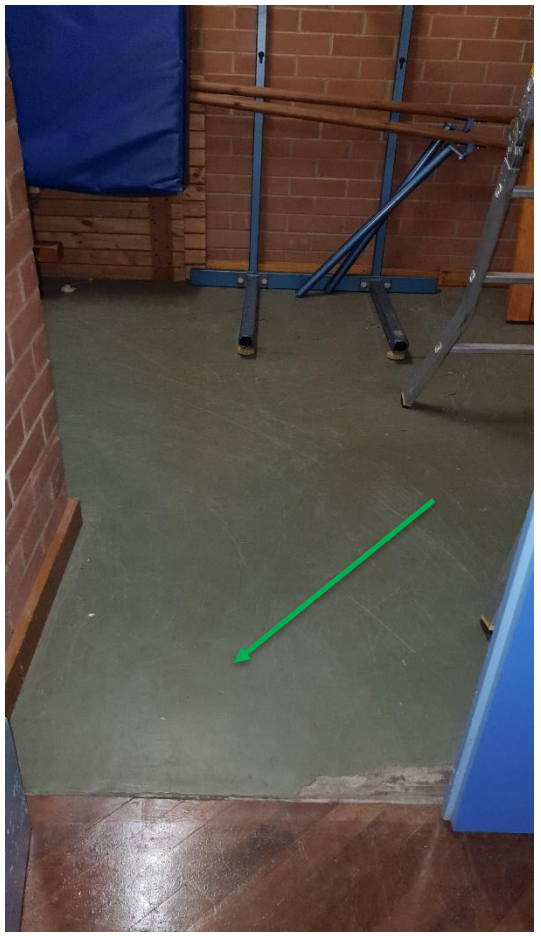
PHOTOGRAPHS

Photograph 1: B00A - Ceiling space – SMF ceiling batts

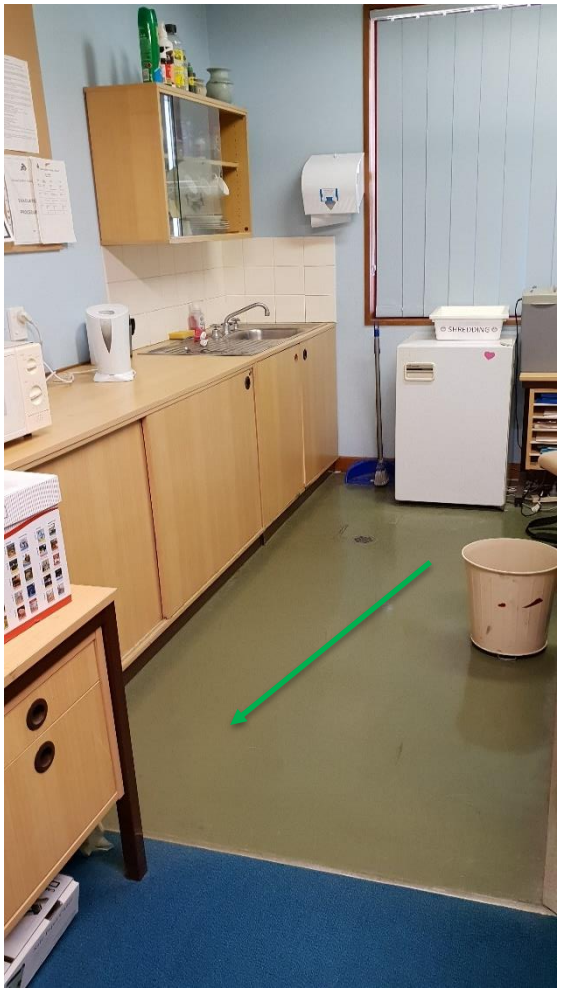
Photograph 3: B00A - Ceiling space – SMF ceiling batts

Photograph 2: B00A R00015 - Blue vinyl floor lining – No Asbestos detected **(WSP-050268)**

Photograph 4: B00B - Ceiling space – SMF ceiling batts



Photograph 5: B00B R0012 - Green vinyl floor lining – No Asbestos detected **(WSP-050266)**



Photograph 6: B00E R0005 - Green vinyl floor lining – No Asbestos detected **(WSP-050263)**

Photograph 7: B00E R0005 – Membrane beneath sink – No Asbestos detected **(WSP-050262)**

Photograph 8: B00L Ceiling Space– SMF ceiling batts as well as A/C ducting

Photograph 9: B00L Subfloor – Compressed fibre cement sheeting – No Asbestos detected **(WSP-050264)**

APPENDIX E

SITE MAP

4574 - Samuel Gilbert Public School

Administration (B00A) - Ground Floor (Room Function)

1:172

Printed: 01-Apr-2015

4574 - Samuel Gilbert Public School

Communal Facilities/Pupil Facilities (B00B) - Ground Floor (Room Function)

0 3 6 9

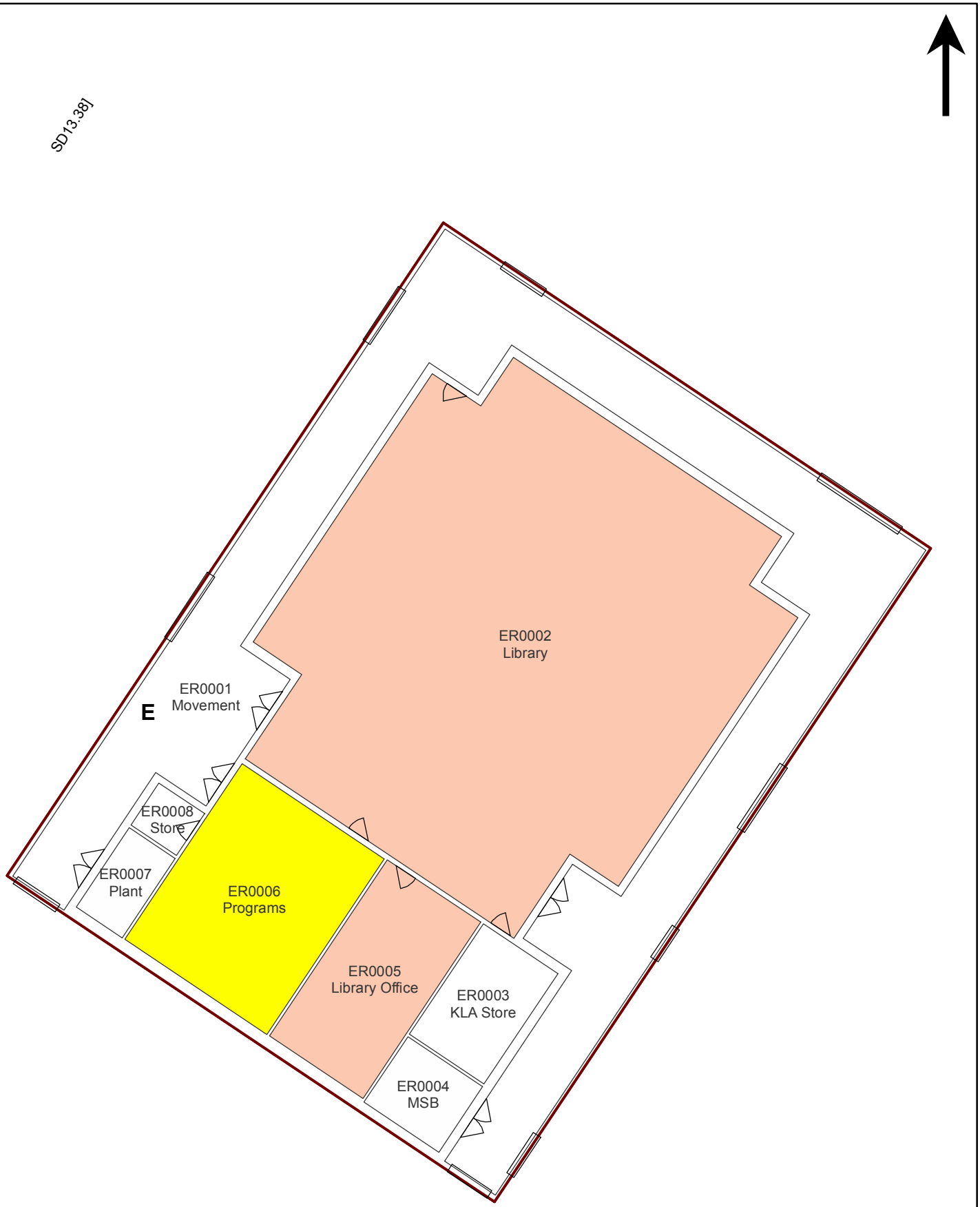
Meters

1:218

Printed: 01-Apr-2015

4574 - Samuel Gilbert Public School

Library/Tiered Learning (B00E) - Ground Floor (Room Function)



0 2.5 5 7.5

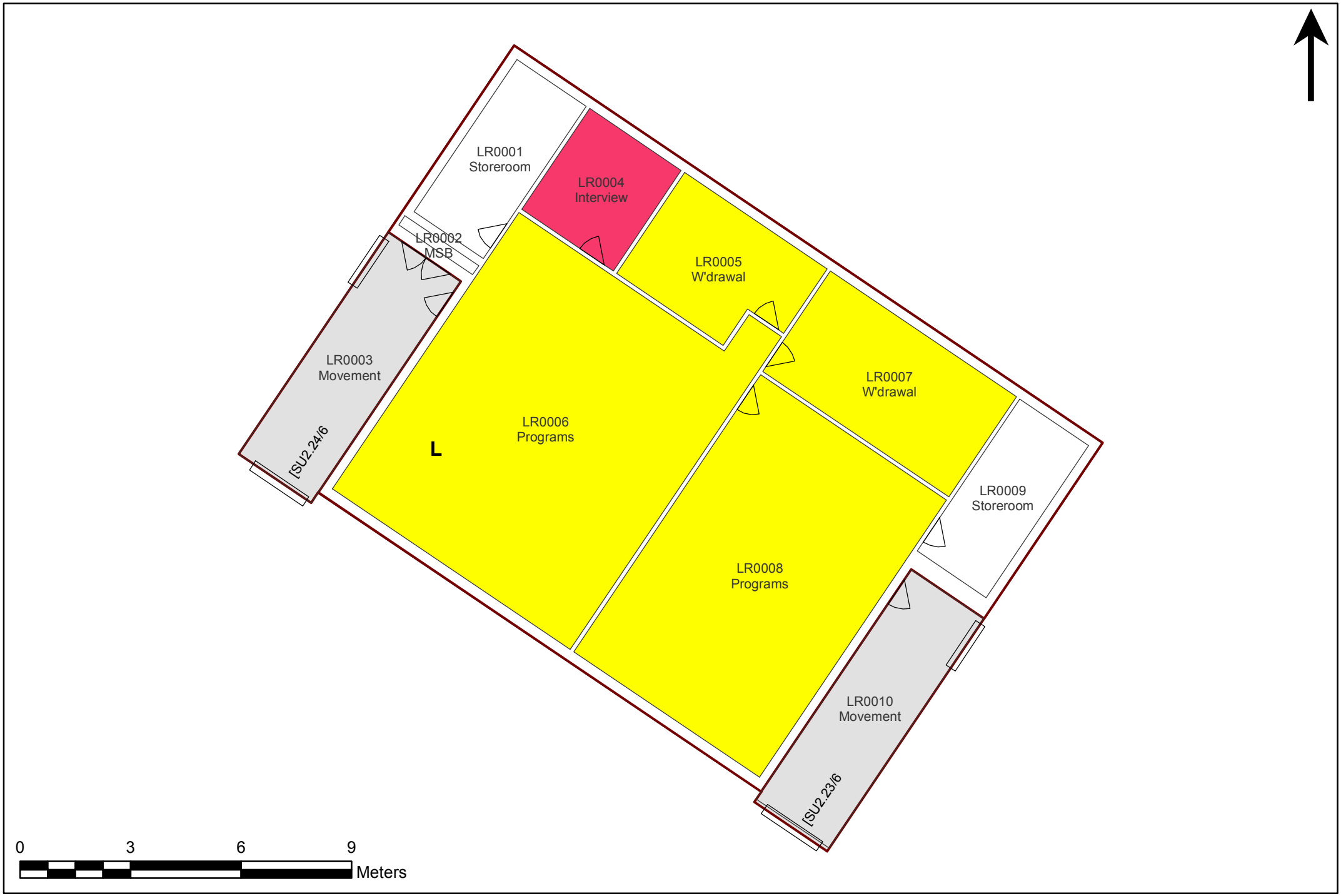
Meters

1:178

Printed: 01-Apr-2015

4574 - Samuel Gilbert Public School

General Learning/Music (B00L) - Ground Floor (Room Function)



1:128

Printed: 01-Apr-2015

- Excavation
- Demolition
- Contract Hire
- Underpinning
- Shoring Systems

NMK Group Pty Ltd

6 Shortland Ave Strathfield NSW 2135

ABN 58 152 310 784

Samuel Gilbert Public School

Ridgecrop Drive, Castle Hill, NSW

Demolition Plan – In Accordance with AS 2601-2001

March 2020

NMK Group Pty Ltd ABN 58 152 310 784
PO Box 4444, Homebush South NSW 2140
Ph. 02 9763 7715 **Fax.** 02 9763 7714 **Email.** info@nmkgroup.com.au

Table of Contents

Demolition License no: .....
Location .....
Structure Description: .....
Building Type: .....
Start Date: .....
Finished Date: .....
Sequence of Demolition .....
Hazardous Material Management: .....
Site Accessibility: .....
Plant and Equipment .....
Hours of Work: .....
Boundaries and signage locations: .....
Emergencies: .....
Emergency Plan: .....

- Excavation
- Demolition
- Contract Hire
- Underpinning
- Shoring Systems

Demolition Plan

Demolition License no: AD212768

Location: Ridgecrop Drive, Castle Hill NSW

Demolition Structure Description: Single Story Buildings, Basket Ball Court and Refurbishment of 2 Buildings

Building Type: Two Single Story Building Demolition of Brick and Iron Roofs, Two Buildings Refurbishment Removal of Ceilings, Doors, Windows, Floors and Finishes

Start Date: TBA

Finished Date: TBA

NMK Group Pty Ltd ABN 58 152 310 784
PO Box 4444, Homebush South NSW 2140
Ph. 02 9763 7715 **Fax.** 02 9763 7714 **Email.** info@nmkgroup.com.au

Sequence of Demolition

1. Site Establishment, Install Cattle Grates, Install Tree Protection, Install Silt Fencing and Sediment as per Sediment Control Plan
2. Hazardous Material – Synthetic Mineral Fibres is present in Block A and E, this will be low impact removal, no air monitors required
3. Crew will come onto site to start internal strip out in building A and E,
4. All Windows, Doors and Ceilings will be removed manually using hand tools and reciprocating Saws
5. Material will exit through front of Building, directly into trucks, all vehicles will exit via Ridgecorp Drive as shown on Access drawings
6. Structural Demolition will then start on Blocks D and F, using excavators with grab attachments
7. All material will be loaded into trucks and transported to appropriate licensed waste facilities
8. Excavators will then remove Slabs on D and F Buildings, Foundations, Basket Ball Courts and any other items, small landscaping items, in order to clear area for new building works
9. All material will be taken to licensed land fill facility

Hazardous Material Management

PROCEDURE

NMK Group Pty Ltd is devoted to eliminating or minimising any risk of exposure to asbestos or any relevant contamination in the Samuel Gilbert School. All NMK Group Pty Ltd personnel must follow this policy as the minimum requirements for all the Samuel Gilbert School project and adhere to other requirements of Hutchinson Builders.

NMK Group Pty Ltd shall benefit from the professional external safety hygienist (WPS Report dated 6/8/18) to ensure the proper execution of this policy. The framework mentioned in NMK policy is the minimum safety management operation requirement and will be updated based on the nature of works.

NMK Group Pty Ltd shall follow the hierarchy of controls triangle for asbestos management; proceeding from the minimum to maximum risk using the following control methods: *PPE, Administrative Controls, Engineering Controls, Isolation, Substitution,* and *Elimination*.

NMK Group Pty Ltd considers the following as the minimum requirements to be undertaken by the internal experts of the company:

- Critical controls checklist and preparation of SWMS compatible with the minimum requirements of Hutchinson Builders

- Internal inspection forms and any other forms requested by Hutchinson Builders

- All legislations, regulations, standards and acts up to date regarding Asbestos Management including:

  - Work Health and Safety Act 2011 (NSW)
  - Work Health and Safety Regulation 2017 (NSW)
  - Australian Standard 4964 *Method for the qualititative identification of asbestos in bulk samples*

- Notes and procedures advised by the Manufacturer of the original equipments.

- Any other advices received by the third-party expert (WPS and Greencap)

INVESTIGATION RESULTS

ASBESTOS CONTAINING MATERIALS (ACM)

Representative samples of materials suspected to contain asbestos were collected and analysed at WSP Australia's NATA Accredited. The identification of asbestos fibres is based on using Polarised Light Microscopy supplemented with Dispersion Staining techniques. This is detailed in Australian Standard 4964-2004 '*Method for the qualitative identification of asbestos in bulk samples*'. Asbestos samples were only collected for analysis where the safety of personnel would not be compromised. Sampling was conducted in accordance with the WSP Australia's in house survey guide, SafeWork Australia's Code of Practice, '*How to Manage and Control Asbestos in the Workplace*' and the United Kingdom Health & Safety Executive publication, '*HSG 264: Asbestos: The survey guide*'.

LEAD-BASED PAINTS

Representative samples of paint suspected to be lead based were collected and analysed at Envirolab Services NATA Accredited Laboratory. Laboratory analysis of lead based paints is used to achieve a reportable weight by weight percentage of lead throughout the paint layers and is reported against AS 4361.-2017 *Guide to lead Paint Management, Part 2: Commercial and Residential Buildings* lead containing paint system level of 0.1 per cent (w/w) of the dried film.

The analysis of the physical samples is achieved by digestion of the sample for determination of lead content by one of two methods, atomic absorption spectroscopy (AAS) or inductively coupled plasma emission spectrometry (ICP-AES). Collection of lead based paint samples was only conducted where the safety of personnel would not be compromised. Sampling was conducted in accordance with the WSP Australia's in house survey guide and AS 4361.2-2017 *Guide to lead Paint Management, Part 2: Commercial and Residential Buildings.*

Sampling methodology will consider the various paint coats and record these layers accordingly, these observations will be referred to alongside the analytical sample results to acknowledge that lead paint

layers of varying lead content will affect the analytically observed lead weight concentration recorded from the sample. To this end, where multiple lead paint layers have been visually recorded but analytically determined lead percentage of the collective paint layers is below actionable limits, the paint undercoats may still be determined as hazardous due to its dilution in the sample by the non-lead topcoats. Sampling methodology may also consist of the use of a lead paint chemical colorimetric test reagent that can provide an instantaneous result of lead presence within specific layers. This testing will however be used in conjunction with a physical sample to determine the lead concentration as above.

SYNTHETIC MINERAL FIBRES (SMF)

If representative samples of materials suspected to contain asbestos were collected and analysed at WSP Australia's in- house NATA Accredited Laboratory, SMF can also be identified. The identification of SMF fibres is based on using Polarised Light Microscopy supplemented with Dispersion Staining techniques. Alternatively, our experienced surveyor visually identified and recorded the presence of synthetic mineral fibre products onsite.

POLYCHLORINATED BIPHENYLS (PCBS)

Where access was available and power was isolated representative examples of each major type of fluorescent light fittings were examined to determine, which lights were fitted with PCB containing ballast capacitors. The details of the brand, model of each capacitor and capacity were recorded and checked against with the ANZECC database of known PCB capacitors and PCB free capacitors.

The Australian and New Zealand Environment Conservation Council 'Polychlorinated Biphenyls Management Plan, November 1996' outlines the National Strategy for the management of PCBs.

The document defines PCB materials and wastes as follows:

Table 2.1 PCB Concentration Classification

PCB CONCENTRATION	WASTE CLASSIFACTION
<2 mg/kg	PCB free
2 mg/kg to <50 mg/kg	Non-scheduled PCB material or waste
>50 mg/kg	Scheduled PCB material or waste
>100,000 (10%)	Concentrated PCB material

A very detailed survey was conducted by WPS dated 6/8/18 which the results are reflected in their official report.

APPROACH & METHODOLOGY

Isolation of Contaminated Area

Any of the work zones mentioned in the investigation results will be isolated with an exclusion zone of 10 meters minimum distance away from the contaminations. Physical barriers and signages will be installed to define the limitations.

Setting Up Air Monitors

NMK Group Pty Ltd will install air monitoring devices in all surrounding of the work zones and ACM risk areas to ensure the safety of the works and all time monitoring of the level of the ACM dusts. There will not be any appliance of negative air pressure in the operations, therefore, the risk of sudden attraction of ACM dusts towards the work zones is eliminated. A safe limit of 0.1 fibres per millilitre will be enforced and monitored. Should it exceed the maximum of tolerance the area will be promptly evacuated, and level of ACM dust will be monitored until it is back to the safe operational level.

Personal Protective Equipment:

NMK Group Pty Ltd will provide all workers with PPE that is suitable for asbestos removal work. Workers must also use the PPE given to them. PPE will always be worn during the work in the asbestos removal area.

Specific PPE requirements, as outlined in the *SafeWork NSW Code of Practice: How to Safely Remove Asbestos,* include the following items:

- Disposable coveralls rated type 5, category 3 (prEN ISO 13982–1) or equivalent; hood fitted with cuffs ensuring they are sealed with tape or tucked in
- Single use disposable gloves
- Safety goggles
- Safety footwear including steel-capped work shoes/boots
- Respiratory Protective Equipment (RPE) including P2 face mask/respirators for majority of asbestos removal works. For handling of extensive friable asbestos including removal works of gaskets and insulation, P3 type RPE will be used.

Should further PPE be required, a risk assessment shall be conducted by NMK supervisors and the control measures be implemented accordingly.

All equipment used for the removal of asbestos should be inspected before the commencement of the asbestos removal work, after any repairs and at least once every seven days when it is continually

being used. A register with the details of these inspections, the state of the equipment and any repair details will be maintained.

At the end of the asbestos removal work and upon leaving the asbestos removal work area, all PPE will be disposed of as asbestos waste or decontaminated and stored in sealed double bags before being removed from the site and disposed.

Progression of Works:

Any materials deemed to be consistent with those detailed in the Hazardous Materials Register that have not been previously identified should be presumed to have the same content and be treated accordingly.

Should any additional suspected hazardous materials be observed during or prior to demolition works, works should cease until a suitably qualified consultant can assess the suspected hazardous material and provide appropriate recommendations for management and/or removal.

Unexpected Findings Above Ground Level:

NMK Group Pty Ltd will apply all the above-mentioned methods in all other Buildings that are Identified to be Hazardous but not on the report.

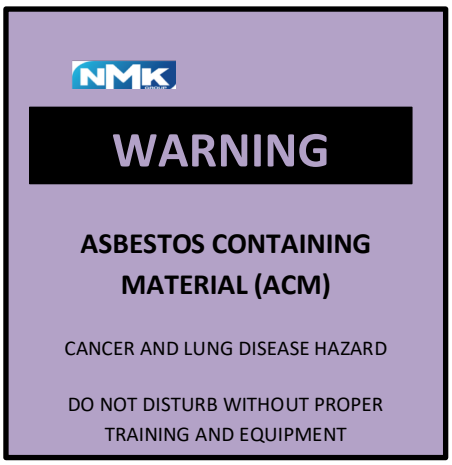
CRITICAL CONTROLS

Primary Inspection and Identification of Asbestos:

Prior to any commencement of works asbestos must be identified by qualified third party (WPS dated 6/8/19 and Greencap). Following the reported results, NMK has updated the asbestos management plan and asbestos register will be revised and updated accordingly (WPS dated 6/8/19 and Greencap).. This update must be controlled and reviewed. The asbestos register must identify the following as the minimum based on the date of identification: *Type of asbestos containing material (ACM), Specific Location, Accessibility of the ACM, Source of the unfixed or uninstalled asbestos, Friability, Sustainability, Likelihood of disturbance of the ACM and related activities*

Labelling of ACM:

Each source of asbestos must be labelled and treated as ACM until proven otherwise by NATA certified test results. The labelling must come in yellow warning signage mentioning the asbestos containing material and relative possible hazards including cancer and lung diseases. It must also warn personnel about minimising the disturbance near the sources of ACM and to consult an asbestos register before commencement of works.



Demolition:

NMK Group Pty Ltd will assign the third-party external experts (WPS /Greencap) to ensure and manage the following prior to the commencement of works:

- Identification any hazardous materials including asbestos and lead
- Notification of asbestos removal work to the relevant regulatory authority

All this information shall be documented both as a hard copy on site and in NMK central office and an electronic version will be uploaded to Acconex.

Hutchinson Builders is responsible for the provision of the risk management plan and NMK and its sub-contractors shall fully comply with the provisions outlined by Hutchinson Builders. NMK considers the conditions of High-Risk work applying to any operation involved with asbestos contamination. Emergency procedures for asbestos-related incidents are included in the NMK SWMS.

Elimination and Removal:

In case of discovery of confirmed ACM in poor condition, it must be promptly removed from the site by **NMK Approved Personnel** to comply with the *NSW Code of Practice: How to Safely Remove Asbestos*. Following the removal of ACM, the clearance certificate must be issued by the above-mentioned expert prior to continuation of works.

In case of discovery of ACM in a damaged condition, the area shall be isolated, encapsulated, or by any other means kept out of access by non-certified personnel until the third-party professional mentioned above removes the ACM from the site.

In case of discovering ACM in good condition, they will be identified with proper asbestos warning labels described in *Labelling of the ACM* section.

Monitoring:

Monitoring of air quality on the site will be done by NMK upon any asbestos handling work is conducted as per the Australian Standard.

Work Health and Safety Act 2011 (NSW): Health Monitoring applies to all personnel exposed or potentially to be exposed to ACM. Furthermore, a frequent Occupational Health Physician must be assigned to monitor personnel health as per physician's decision. The current assigned frequency of health check is every six months after the commencement of asbestos works.

Following removal works, a clearance inspection shall be completed by a hygienist to ensure that asbestos materials have been removed to a satisfactory standard. Following the completion of the clearance inspection, a clearance certificate shall be issued by the hygienist to confirm that the ACMs have been satisfactorily removed.

INTERNAL INSPECTION FORMS

NMK Group Pty Ltd has developed a series of internal inspection forms to make sure of full compliance of the operations and procedures with the above-mentioned policy.

IMPLEMENTATION AND RESPONSIBILITES

NMK Group Pty Ltd will assign site managers and safety supervisors to each work zone to ensure that all workers are aware of the risks and required responses to hazardous materials. This is already described in section 5: Roles and Responsibilites. Proper training shall be provided by the NMK and any updated training will be outsources. The trainings could include but not limited to be based on the scope of works the following subjects: *Asbestos Removal, Asbestos Assessment, Occupational Exposure Training*.

Nick Kollias 24/3/20

.....

DIRECTOR'S NAME **SIGNATURE** **DATE**

Site Accessibility: Vehicular access: Will be via Ridgecorp Drive

Plant and Equipment

Consideration has been given to the types of plant and equipment that are likely to be used during the whole demolition works.

Table 1: Plant Equipment during demolition works

Plant and Equipment
Excavators
Trucks
Air Monitors – If Required
Compressors
Generator
Concrete Splitters and Saws
EWPs
Floodlights
Cutters, Drills and Small Tools

Hours of Work:

Hours of working are subject to site requirements. Hours are between Monday and Friday 7.30 am to 5.30 pm, Saturdays 7.30 am to 3.30 pm. Excluding Public Holidays and Shut Down weekends.

Boundaries and signage locations: Demolition signage will be on fencing and around the boundary. All entrances will be locked to prevent unauthorized access. Demolition warning signs present on all main entrances. Nick Kollias will remain in the demolition removal site to ensure no unauthorized access.

Emergencies: In case of emergencies, clear access to the emergency location point will always be maintained, all personnel will assemble at designated meeting point as discussed in inductions prior to commencing work.

Emergency Plan:

Front Emergency Assembly point as per induction

Call 000 for all emergencies

First Aid Officer: Nick Kollias

First Aid Kit located in site office

Fire Extinguisher

Emergency plan as per induction

Monitoring, Reviews and Communication: will be as per the HB CEMP Section 7 (Communication and Reporting) and Section 9 (Monitoring and Reviewing of Environmental Performances) as well as the requirements within SSD 9274.

APPENDIX J – CONSTRUCTION SOIL AND WATER MANAGEMENT SUB PLAN

As per Condition B13 (e)

BIRZULIS ASSOCIATES Pty Ltd
Consulting Structural + Civil Engineers
ACN 003 797 911 ABN 99 003 797 911

Sydney Office
583 Darling Street, Rozelle NSW 2039
Telephone: 9555 7230
Email: office@birzulisassociates.com
Newcastle Office
105 Merewether Street, Merewether NSW 2291
Telephone: 4049 4855
Email: office@birzulisassociates.com

CONSTRUCTION SOIL AND WATER MANAGEMENT REPORT

SAMUEL GILBERT PRIMARY SCHOOL CASTLE HILL NSW

Prepared For:
Hutchinson Builders
23 Dunning Avenue,
ROSEBERRY NSW 2018

Prepared by:
Birzulis Associates Pty Ltd
583 Darling Street
ROZELLE NSW 2039

***Rev*: G**

DIRECTORS
B Fimmano B.E. (Hons), M.I.E. Aust., C.P.Eng.
M A Grogan B.E., M.Eng., M.I.E. Aust., C.P.Eng.
ASSOCIATE DIRECTOR
P W Grogan B.E. (Hons), M.E.(Struct), M.I.E. Aust., C.P.Eng.
CONSULTANT
A J Birzulis OAM, B.E., M.Eng. Sc., F.I.E. Aust., C.P.Eng.

DOCUMENT VERIFICATION

Project Title	Construction Soil & Water Management Report
Project No.	7738
Client Contact	Hutchinson Builders

	Name	**Signature**
Amended by	Cameron Amri	
Checked by	Michael Grogan	
Issued by	Michael Grogan	

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Appendix C – Council Consultation
Appendix D – Site Shutdown and Storm Preparation Checklist
Appendix E – Construction Soil and Water Management (Site Map – Site Arrangement)
Appendix F – NSW Planning Industry & Environment (Acid Sulphate Soils Risk Map)

1 INTRODUCTION

Birzulis Associates Pty Ltd has been commissioned by Hutchinson Builders Pty Ltd on behalf of NSW Department of Education to prepare this Construction Soil and Water Management Report in support of a proposed development for the site.

The site is located on the northern intersection of Ridgecrop Drive and Gilbert Road, Castle Hill NSW. The proposed additions are for an existing co-educational public primary school consisting of numerous multi storey classroom buildings, office facilities and a multipurpose hall.

This report also provides a summary of the stormwater management design principles and planning objectives for the management of stormwater quality and quantity. The objectives for the development are to provide an appropriate and economical stormwater management system which incorporates best practice in water sensitive urban design consistent with the requirements of The Hills Shire Council's water quality objectives.

A set of drawings have been prepared to show that the proposed stormwater quantity and quality requirements for the development can be met. These drawings cover stormwater management elements which cover surface levels and drainage layouts.

At this stage, the engineering and stormwater management policy requirements of The Hills Shire Council has been considered in the concept design. The stormwater management design will incorporate the use of rainwater tanks for water re-use and in conjunction with the use of an on-site detention tank to maintain the permissible site stormwater discharge in accordance with The Hills Shire Council's stormwater management policy.

This report will also provide a plan of how all construction works will be managed in wet-weather events and details of all off-site flows from the site. The measures that are to be implemented to manage stormwater and flood flows for small and large sized events will be discussed.

1.1 PLANNING RELEVANCE, LEGISLATION & ACT

The following legislation and regulatory framework relating to construction soil and water management are outlined below.
Immediate SSD Planning Requirement to be satisfied:

- As stipulated in the State Significant Development Conditions of Consent.

Environmental Planning and Assessment Act 1979 & Environmental Planning & Assessment Regulation 2000.

This Act and regulation establishes a system of environmental planning and assessment of development proposals for the State. This project has been assessed and approved under Section 89E of the Environmental Planning and Assessment Act 1979.

Project Relevance; Approval process for a legal Consent to develop and considerations for such.

Protection of the Environment Operations Act 1997

This Act includes all the controls necessary to regulate pollution and reduce degradation of the environment, provides for licensing of scheduled development work, scheduled activities and for offences and prosecution under this Act.

Project Relevance; This Act is of high relevance to the Project as it provides for the issuing of environmental protection notices to control work and activities not covered by licences. Section 148 of the Act requires a pollution incident-causing or threatening material harm to the environment to be notified to the EPA and other authorities immediately.

Contaminated Land Management Act 1997

This Act provides for a process to investigate and remediate land that has been contaminated and presents a significant risk of harm to human health. Section 60 of the Act is a “Duty to Report Contamination”. This duty applied to owners of land and persons who become aware that their activities have contaminated the land.

Project Relevance; The relevance of this Act will be in the event that suspected or potentially contaminated ground is found during construction activities.

Commonwealth Environment Protection and Biodeversity Act 1999

The main purpose of this Act is to provide for the protection of the environment especially those aspects that are of national environmental importance and to promote ecological sustainable development. The Act binds the Crown. Do not take, use, keep or interfere with “nationally significant” cultural and natural resources, protected wildlife and protected plants without approval.

Project Relevance; This Act is of little relevance to this project as it has been determined not to trigger the provisions of the act.

Soil Conservation Act 1938

This Act makes for the provision for the conservation of soil resources, farm water resources and the mitigation of erosion. The Act is binding on the Crown; however, the Crown is not liable for prosecution. The Act provides for notification in the government gazette catchments where erosion is liable to cause degradation of rivers and lakes (i.e. protected land).

Project Relevance; This Act has low relevance as the site is not located within "protected land". Further, such notification has not been given to the owner of the land.

Water Management Act 2000 & Water Management (General) Regulation 2004

This Act and Regulation provide for the protection, conservation and ecologically sustainable development of water sources of the State and in particular to protect, enhance and restore water sources and their associated ecosystems.

Project Relevance; This Act has no direct relevance at this time to the construction work under this contract. The project approval does not trigger the provisions of this Act

Water Act 1912

This Act provides for licences to extract water for construction purposes either from surface or artesian sources. Should construction water be extracted from surface (other than sedimentation ponds) or artesian sources, a licence will be required.

Project Relevance; This Act has no relevance as it is not proposed that construction water will be obtained from surface (for example, creeks, lakes) or artesian sources.

Rivers and Forseshores Improvement Act, 1948

The Rivers and Foreshores Improvement Act, 1948, is administered by DIPNR for regulating operations involving excavation and fill within the immediate vicinity of coastal rivers, lakes and estuaries. Under this Act, a Part 3A Permit is required for the undertaking of works within 40 metres of the bed and banks of a watercourse. By late 2003, the Water Management Act 2000 (WMA) will have repealed the Rivers and Foreshores Improvement Act, 1948 (RFIA). When this occurs, activities that require a Permit under Part 3A Approvals under the RFIA will require Controlled Activity Approvals under the WMA

Project Relevance; Nil as not within 40m of the bed and banks of a watercourse.

National Parks and Wildlife Act, 1974

(1) The objects of this Act are as follows:

(a) the conservation of nature, including, but not limited to, the conservation of:

(i) habitat, ecosystems and ecosystem processes, and

(ii) biological diversity at the community, species and genetic levels, and

(iii) landforms of significance, including geological features and processes, and

(iv) landscapes and natural features of significance including wilderness and wild rivers,

(b) the conservation of objects, places or features (including biological diversity) of cultural value within the landscape, including, but not limited to:

(i) places, objects and features of significance to Aboriginal people, and

(ii) places of social value to the people of New South Wales, and

(iii) places of historic, architectural or scientific significance,

(c) fostering public appreciation, understanding and enjoyment of nature and cultural heritage and their conservation,

(d) providing for the management of land reserved under this Act in accordance with the management principles applicable for each type of reservation

Project Relevance; nil.

2 SITE CHARACTERISTICS

2.1 Site Description

The proposed development is located in the suburb of Castle Hill on Ridgecrop Drive as shown in **Figure 1.**

The site is bounded by Ridgecrop Drive on the south-western boundary, Gilbert Road on the south-eastern boundary and high-density vegetation land on the northern boundary.

Figure 1. Locality Plan

2.2 Proposed Development

The proposed development is for a co-educational public primary school consisting of numerous multi storey classroom buildings, office facilities and a multipurpose hall.

An indicative layout of the development has been produced by Fulton Trotter Architects and can be seen in **Figure 2**.

The proposed development will include the following engineering components:

- Earthworks to provide foundation support for the classroom buildings including the excavation for an underground on-site detention tank;
- Maintaining the natural gradient of the site and overland flow path through the development site;
- Stormwater drainage system based on a major/ minor design philosophy;
- Management of stormwater quality using a treatment train approach to pollutant loads on a developed catchment in accordance with The Hills Shire Council's recommendations;
- Management of stormwater quantity by reducing post developed flow to

pre-developed over the range of storms between the 1 in 5 year Average Recurrence Interval (ARI) to the 1 in 100 year ARI as per council policy and recommendations; and

- Further measures to manage stormwater and flood flows for 1 in 5 year ARI and 1 in 100 year ARI during construction.

BIRZULIS ASSOCIATES Pty Ltd
Consulting Structural + Civil Engineers
ACN 003 797 911 ABN 99 003 797 911

Sydney Office
583 Darling Street, Rozelle NSW 2039
Telephone: 9555 7230
Email: office@birzulisassociates.com
Newcastle Office
105 Merewether Street, Merewether NSW 2291
Telephone: 4049 4855

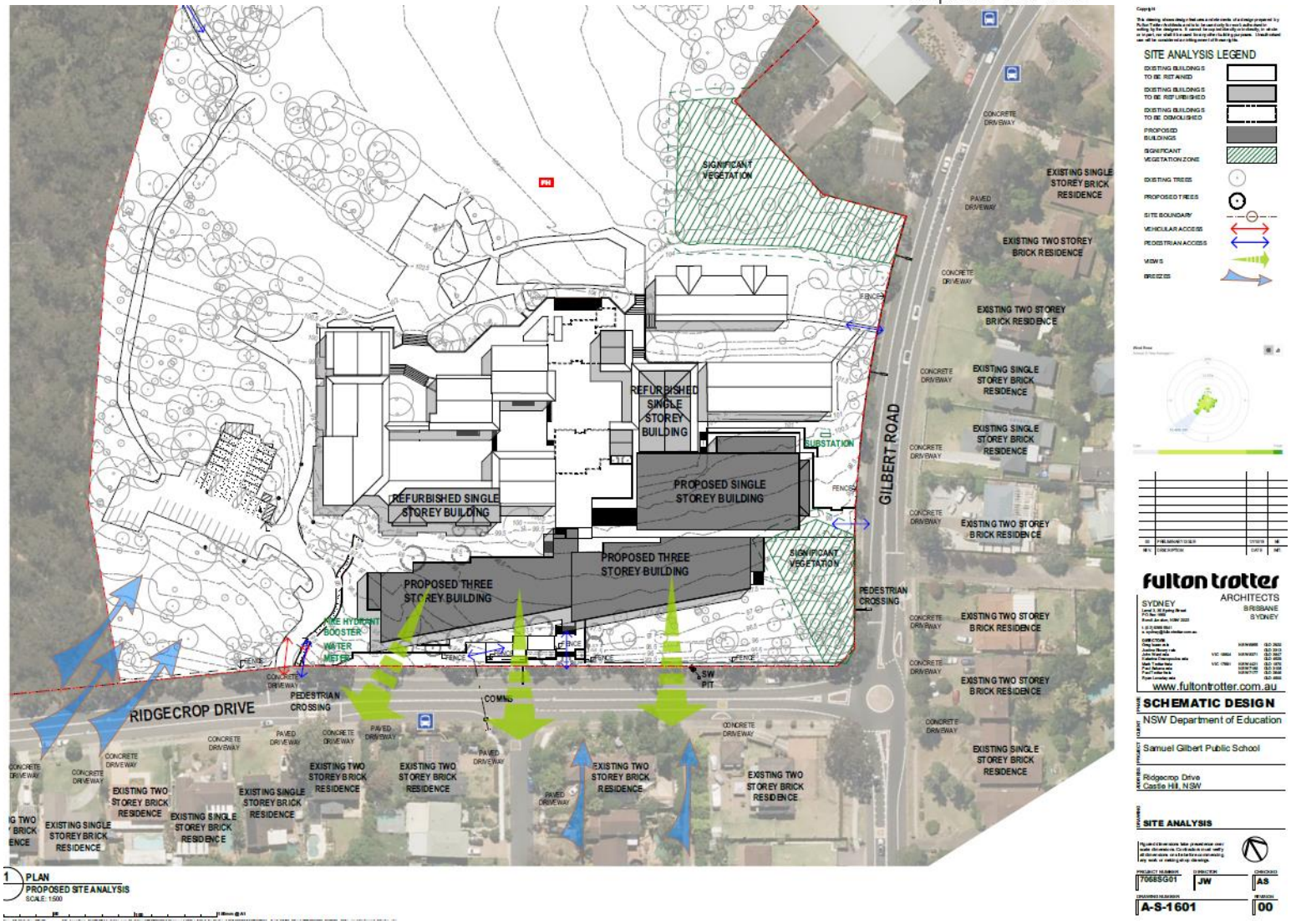


Figure 2. Architectural Plan

2.3 Acid Sulfate Soils

Acid sulfate soil planning maps are indicative and on-site observations and testing should also be used to identify acid sulfate soils. The below shall be used to use visual guidance for more specific onsite assessment.

Potential acid sulfate soil indicators:

- Presence of mangroves, reeds, rushes, salt marsh or swamp vegetation etc
- Sulfurous (rotten egg gas) smell after rain, following a dry spell or when the soils are disturbed • Marine or estuarine sediments
- Soils can be described as unripe muds/sediments (soft, buttery, blue grey or dark greenish grey) which can include sands and gravels
- Milky blue/green water
- Shell fragments in the soil • Waterlogged, scalded or back swamp areas
- Land below 5m AHD elevation

Actual acid sulfate soil indicators:

- Any jarosite (a pale yellow mineral deposit) or iron oxide (rusty) colouring
- Extensive iron stains on any drain surfaces, or iron stained drain water and ochre deposits
- Corrosion of concrete and/or steel structures
- Surface or ground water on or draining from the site with a pH < 5.5, or of an unusually clear or milky green
- Sulfurous (rotten egg gas) smell when soils are disturbed

2.4 Ground Water Protection

Generally possible sources of ground water contamination can be linked to:

- Industrial effluent and manufacturing wastes
- Leaking underground storage tanks and pipelines (not stormwater/rainwater)
- Landfill stockpiles or contaminated soil producing leachate ‘
- Intensive agricultural fertiliser and pesticide use or waste generation
- Contamination from septic tanks and from sewerage and wastewater lagoons
- Mining industry processes and wastes
- Contamination from wells
- Urban stormwater
- Atmospheric fallout
- Inter-aquifer contamination by alteration of flow
- Chemical storage

Dewatering is considered in the EP Act as the process of removal of any water that accumulates in earthwork excavations or below ground structures at or below the existing water table as a result of intersecting aquifers, seepage of soil water/groundwater or storm events

As there is no below ground excavation planned and the noted level of the water table, the anticipated dewatering would be in draining footings and construction areas after rain events.

3 STORMWATER DRAINAGE

3.1 Site Drainage

3.1.1 Existing Site Drainage

The property is currently developed as public primary school with numerous stormwater pits located around the school site. All current overland flows travel towards the south-eastern part of the site via an overland flow route. There are numerous stormwater discharge locations to the kerb and gutter on Ridgecrop Drive and a kerb inlet pit connection on Gilbert Road.

3.1.2 Proposed Site Drainage

The proposed system to be completed generally in accordance with the following general engineering practice, the guidelines of The Hills Shire Council and the following regime:

- The proposed stormwater drainage system for the development will comprise a minor and major system to safely and efficiently convey collected stormwater run-off from the development to the legal point of discharge

- The minor system is to consist of a piped drainage system which has been designed to accommodate the 1 in 5-year ARI to 1-in-20 year ARI storm event. This results in the piped system being able to convey all stormwater runoff up to and including the Q20 event. This meets the requirements of The Hills Shire Council's stormwater criteria.

- The major system will be designed to cater for storms up to and including the 1 in 100-year ARI storm event. The major system will employ the use of defined overland flow paths, such as roads and open channels, to safely convey excess run-off from the site.

- The design of the stormwater system for this site will be based on relevant national design guidelines, Australian Standard Codes of Practice, the standards of The Hills Shire Council and accepted engineering practice. Runoff from buildings will generally be designed in accordance with AS 3500.3 National Plumbing and Drainage Code Part 3 – Stormwater Drainage. Overall site runoff and stormwater management will generally be designed in accordance with the Institution of

Engineers, Australia publication "Australian Rainfall and Runoff" (2019 Edition), Volumes 1 and 2 (AR&R).

4 IMPACT ASSESSMENT

4.1 Construction

Construction activities such as excavation, other earthworks and the use of water for construction activities may cause runoff, sedimentation and erosion impacts to the local waterways if not appropriately managed.

Potential adverse impacts would include:

- Inadequate containment of spills or leaks of fuels and/or oils from construction plant and equipment and/or from vehicle/trucks that may result in pollutants entering the local waterway;
- Excavation, vegetation clearing and grading that may cause increased sediment and pollutant load in runoff;
- Stockpiling of spoil and construction materials may lead to polluted water runoff and sedimentation of waterways;
- Uncontrolled water use for construction activities resulting in pollutants entering the receiving waterway and potential increased scour and erosion effects;
- Litter from construction activities entering waterways; and
- Exposure of soils containing acid sulphides to oxygen resulting in the production of sulfuric acid, which may negatively affect the environment and waterways.

4.2 Mitigation

Erosion and sediment control measures will be provided in accordance with the "Blue Book" – Managing Urban Stormwater – Soils and Construction (Landcom, 2004) and the The Hills Shire Council's Engineering Guide to mitigate potential impacts to the downstream water quality from construction activities.

Controls would include:

- Sediment management devices, such as fencing, hay bales and sandbags;
- Measures to divert or capture and filter water prior to discharge, such as drainage channels and first flush and sediment basins;
- Installation of measures at work entry and exit points to minimise movement of material onto adjoining roads, such as rumble grids or wheel wash bays;
- Appropriate location and storage of construction materials, fuels and chemicals, including bunding where appropriate;
- All refuelling of vehicles and equipment on site would be undertaken a minimum of 50 metres away from water bodies and surface drains, where possible and;
- Any fuel, oil or other liquids stored onsite would be stored in an appropriately

sized impervious bunded area.
- Measures to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site.

An erosion and sediment control plan has been prepared as part of the Construction Environmental Management Plan – refer to Appendix 'A'. Implementation of these measures would mitigate off-site impacts to the downstream water quality of the site during construction of the school.

4.3 Wet Weather Management

Prior to a wet weather event and in conjunction with the '*Site Shut Down and Storm Preparation* Checklist', refer to Appendix 'D', all tools and materials will be stored in designated worker areas such as designated containers, sheds etc. During the groundworks stage a Geotechnical Engineer will be on-site regularly and will review all batters and ground conditions to confirm stability.

After periods of wet weather, authorised representatives of the project leadership team and the relevant subcontractors shall inspect all workplaces to determine what, if any, actions are required to declare the site open for regular activity. Situations can present whereby parts of the site remain closed pending further action (dewatering, clean-up etc.) with the rest of the project returning to normal activities. The status of work areas shall be clearly communicated to all project workers at site meeting/s.

In-house and subcontract workers may be required to undertake dewatering and clean-up activities in order that the site be reopened. In these situations appropriate risk assessments shall be undertaken prior to the commencement of clean-up works and appropriate PPE and other equipment shall be issued by the Site Manager.

In the event of inclement weather sites are to refer to the Bureau of Meteorology and/or relevant government website in conjunction with the '*Site Shut Down and Storm Preparation Checklist'.*

During construction, wet weather events will be managed via the use of silt sediment fences, mesh and gravel filters, haybale filters and a sediment basin. The proposed soil and erosion control plan indicate that a sediment control fence is to be installed around the lower side boundary of the site to minimize off-site stormwater runoff from the construction site. A catchment diversion drain will be constructed to divert site runoff towards the proposed sediment basin. Refer to the sediment and erosion control plan for further information. Refer to figure Appendix 'E' for a site plan of the construction site. Appendix 'E' shows the arrangement of the sediment control fences with additional information on how the site will be managed during a storm event.

General Management

- forecast for heavy rain and make decisions on the following accordingly.
- storage of hazardous materials and equipment away from flow paths and known drainage channel
- layout of site compound facilities to take into consideration of the flow paths which are shown on the sediment and erosion control plans and the civil drawings.
- ensure evacuation routes are kept clear during high risk periods based on weather and storm forecasts.
- ensure loose materials, fuel, chemicals and equipment can either be secured or removed during a flood event if required
- equipment shall be covered as required if runoff from equipment can be hazardous or create sediment or oil displacement.
- No greater than 2500m² or soil should be being disturbed at any one time. Ground should be stabalised/sealed prior to disturbing soil greater than 2500m².
- Allow for vehicle washdown during wet weather to ensure sediment is not tracked on roadways leaving when leaving the site. This will be achieved by a hose connection where the vehicle exists are from the site. Surround this and or other wash down areas with sediment fence or bunding and maintain as required. Shaker grates should be located where and vehicles (which have been driving on soil) leave the site.

1-year ARI

- Brief personnel at prestart
- Review of all current ERSED controls and ensure ESCP is still current
- Stormwater would be managed using the following controls
    - o Sediment fencing
    - o Diversion bunds / swales
    - o Coir logs/ sandbags/ silt socks

• Upstream stormwater runoff is expected to bypass the site using the swale system proposed. Other runoff will be minimum given the moderate infiltration rate and be handled by the ESCP.

• High risk soil and erosion activities such as earthworks will not be undertaken immediately before high rainfall.

5 Year ARI

• Implement as above for the 1-year ARI event

• Ensure all plant and equipment are removed from areas of concentrated flow

• Sedimentation basins maximum capacities will be maintained where practically possible

100 Year ARI

• Implement as above for the 1-year ARI event

• Remove all plant and equipment from site areas where there is potential for inundation

• Perimeter controls are not expected to be breached.

• Flow will be directed to the street for the existing buildings in place prior to commencement of the stage 2 works. There will always be a site connection to the street

for site water to be drained based on the stage 1 system or the existing system which is to remain prior to commencement of stage 2 works.

4.3.1 Pre Wet-Weather

The site manager is to carry out a thorough walkthrough of the site to ensure the following control measures are set in place;

- All sediment and erosion controls have been correctly installed and do not need any maintenance works;
- All loose materials/items to be tied down including signage; and
- Where possible machinery and equipment to be placed under cover.

4.3.2 Post Wet-Weather

The site manager is to carry out a thorough walkthrough of the site to ensure the following;

- The sediment and erosion controls have not been damaged. If so, damage is to be rectified immediately;
- Excavated areas to be inspected by authorised person for destabilization;
- Access roads and paths to be cleaned and made good;
- Inspect sediment basin and clean/pump out if required; and
- Inspect all areas to ensure there has been no damage/hazards created by the weather.

5 STATE SIGNIFICANT DEVELOPMENT APPLICATION - CONSENT CONDITIONS

B12.
(b)(iii) *the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;*
(d) *a program to monitor and report on the:*

> ***(i)*** *impacts and environmental performance of the development;*
> ***(ii)*** *effectiveness of the management measures set out pursuant to paragraph (c) above (a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria)*

(f) *a program to investigate and implement ways to improve the environmental performance of the development over time;*
(g) *a protocol for managing and reporting any:*

> ***(i)*** *incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria);*
> ***(ii)*** *complaint;*
> ***(iii)*** *failure to comply with statutory requirements.*

Birzulis Associates offer the following comments in regard to the above conditions:

(b)(iii) Performance indicators will be carried out in accordance with Hutchinson Builder's CEMP report, Section 9.1 'Monitoring and Reviewing of Environmental Performances' and the requirements within the SSD 9274. The construction soil and water management control shall be carried out in accordance with the 'Blue Book – Landcom, Section 8.2 'Maintenance Program'.

(d)(i) & (ii) A program to monitor and report on the environmental impacts and performance of the development, effectiveness of the management measures will be carried out in accordance with Hutchinson Builder's CEMP report, Section 9.1 'Monitoring and Reviewing of Environmental Performances' and the requirements within the SSD 9274. The construction soil and water management control shall be carried out in accordance with the 'Blue Book – Landcom, Section 8.2 'Maintenance Program'.

(f) A program to investigate and implement methods to improve environmental impact for the development over time will be carried out in accordance with Hutchinson Builder's CEMP report, Section 9.1 'Monitoring and Reviewing of Environmental Performances' and the requirements within the SSD 9274.

(g)(i), (ii) & (iii) Protocols for managing incidence, non-compliance, complaints and failure to comply with statutory requirements will be carried out in accordance with Hutchinson Builder's CEMP report, Section 7 'Communication & Reporting' and the requirements within the SSD 9274.

B17. *The Applicant must prepare a Construction Soil and Water Management 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;*
(b) *describe all erosion and sediment controls to be implemented during construction;*
(c) *include an Acid Sulfate Soils Management Plan, if required, including measures for the management, handling, treatment and disposal of acid sulfate soils, including monitoring of water quality at acid sulfate soils treatment areas.*
(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 1-year ARI, 1 in 5-year ARI and 1 in 100-year ARI.*

Birzulis Associates offer the following comments in regard to the above conditions:

a) This Construction Soil and Water Management Plan has been prepared by Steven Luu, a civil engineer for Birzulis Associates with over 7 years of experience in the industry. The plan has been reviewed and approved by Michael Grogan, Director of Structural and Civil department with Birzulis Associates (refer to CV included in Appendix 'B'. The sediment and erosion control plan and strategy has been prepared in accordance with Council's recommendations and requirements.

b) All sediment and erosion controls have been described within this report and additional within the sediment and erosion control plans included within Appendix 'A'.

c) The NSW Planning Industry and Environment 'Acid Sulphate Soils Risk Map' indicates that the proposed development site is not affected by acid sulphate soils – refer to Appendix 'F'.

d) Refer to the section 4.3, Wet Weather Management, for details summarizing the action required to be taken immediately before, during and after wet weather events.

e) Refer to the sediment and erosion control drawings included within Appendix 'A' of this report for flow path and discharge point details.

f) During storms up to the 1 in 10yr ARI event (which includes the 1 in 1yr ARI and 1 in 5yr ARI event), flows will be directed to the sediment basins via catch drains or through stormwater pits and pipes that have been constructed. Stormwater that is to be discharged from the basin is to be re-flocculated prior to discharge into Council's stormwater system.

In storms greater than the 1 in 10yr ARI event, flows will similarly discharge to the sediment basin via catch drains and stormwater pits and pipes that have been constructed. Due to natural and unexpected blockages in the stormwater system, it is expected that, in a 1 in 100yr event, the stormwater flows will overtop pits and be conveyed through site overland flows. The sediment basins have not been designed to cater for the 1 in 100yr flows, thus it is likely that flows will discharge overland to Council's stormwater system on Ridgecrop Drive and Gilbert Road. Sediment fences and haybale filters are still expected to perform adequately in larger storm events and contain sediments within the site.

6 CONSTRUCTION IMPACTS

EROSION CONTROL

Erosion control is primary to an erosion and sediment control strategy. This can be achieved through:

- Limiting the area of disturbance and only disturbing what is required. Also limiting the time period of disturbance.
- Integrating elements that reduce or control the volume of water moving over surfaces. This includes, diversion through swales and table drains, and piped or lined channels to stabilised outlets.
- Measures the slow the velocity of water over exposed surfaces within the construction area such as hay bail barriers, introducing roughness, flow check measures, textiles, binding compounds or exposed surface protections. Binding products and surface protection can be spray on stabilisers, mulches, blankets, temporary vegetation and permanent progressive landscape construction.

The above is achieved using the correct implementation of the Erosion and Sediment Control Plan shown on the engineering drawings and any other recommendations in this report.
To achieve the requirements of not concentrating water flows which can lead to transportation of sediment off site it is recommended the swales on the stormwater design drawings be constructed as soon as practicable to divert upstream water around the site.

SEDIMENT MANAGEMENT

This is secondary to erosion control in minimising water pollution as a result of construction. Where required sediment basins are generally located at the low points of site discharges. Requirements for sediment control basins are in accordance with Section 6.3.2.d of the Managing Urban Stormwater: Soils and Construction (the Blue Book). The soil loss from the catchment is led than that required for a sediment basin and as such one is not required.

STOCKPILE STABILISATION

As there is significant volumes of fill being proposed for the site it is foreseeable that material stockpiles will be required. Stockpiles within the site which will be in effect for more than 10 days should be stabalised. As per the Erosion and Sediment Control Plan all stockpiles are to have sediment fences on the downstream slopes and generally should be located a minimum of 5m from overland flow swales. If unused for 10 days then stockpiles shall also be stabalised in accordance with the below relative to the relevant material in the stockpile:

- Coarse grained stockpiles
    - Downstream perimeter rock armouring.
- Less coarse grained stockpiles
    - Polymer binder application

- Application of hydro-seed or hydromulch.

HAZARDOUS MATERIALS

Hazardous material will be addressed in accordance with the Construction Waste Management Sub-Plan (CWMSP) prepared by others.
Reference should be made to the HAZMAT survey relevant for this site to locate any existing hazardous materials.

7 CONCLUSION

This construction soil and water management report has been prepared to support the application for a proposed development at Samuel Gilbert Primary School, Castle Hill NSW.

A stormwater management strategy for the site has been developed which provides a best practice solution within the constraints of the existing landform and proposed development layout. The strategy for stormwater quantity and quality management has been developed to reduce both peak flows and pollutant loads in stormwater leaving this site. The stormwater management for the development has been designed in accordance with the development consent.

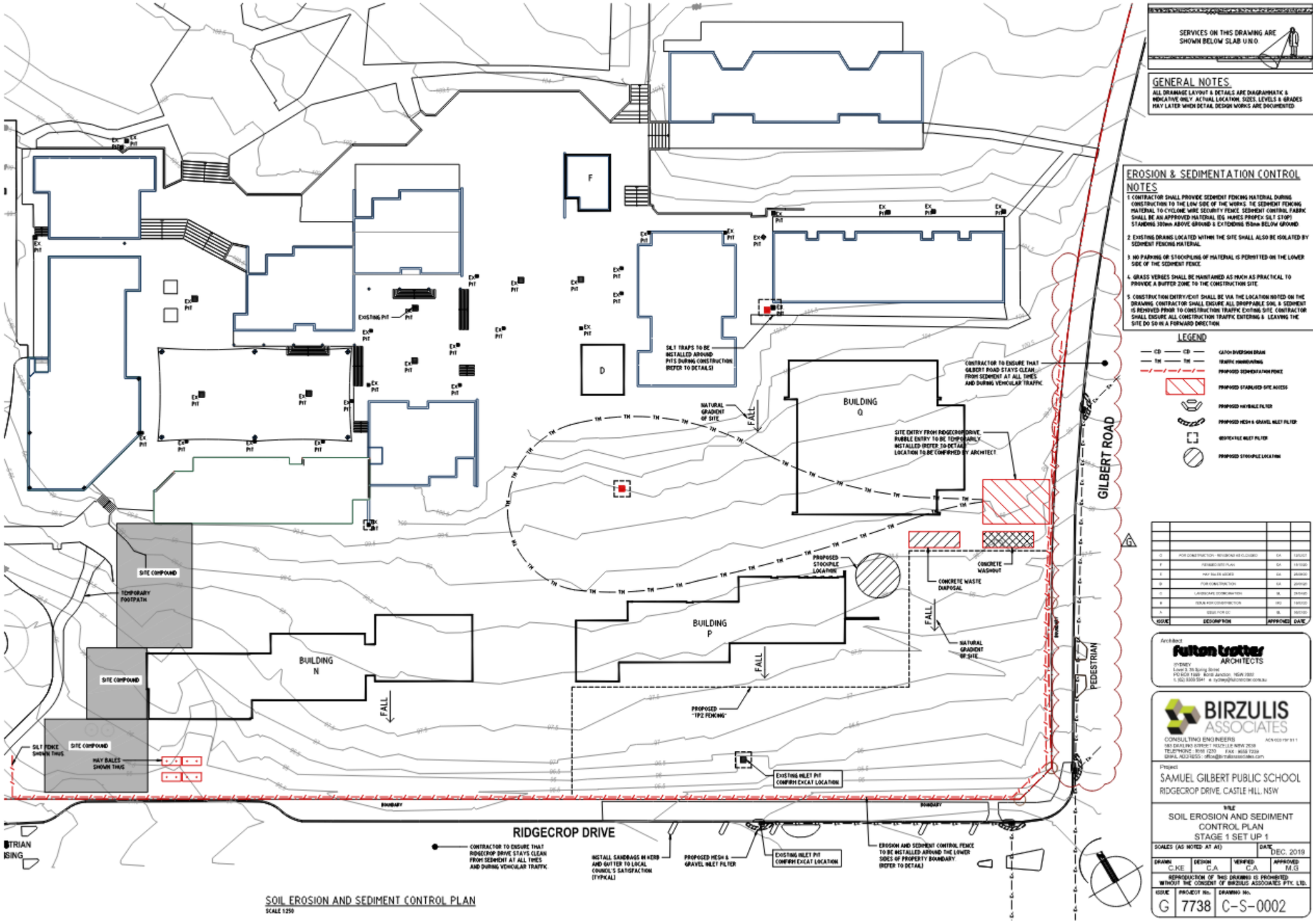
The stormwater layout for the development maintains the existing catchment breakdown and proposed stormwater connection to the existing kerb inlet pit on Ridgecrop Drive. A hydrological assessment has been undertaken which confirms local post development flows from the site will be less than pre-development flows and demonstrates that the site discharge would not adversely affect any land, drainage system or watercourse as a result of the development. A stormwater detention system comprising an active storage of 245m^3 is proposed to attenuate developed stormwater flows to pre-developed flows. This will be provided by an underground detention tank.

During the construction phase, an erosion and sediment control plan will be in place to ensure the downstream drainage system and receiving waters are protected from sediment laden runoff. Best management practices have been applied to the development to ensure that the quality of stormwater runoff is not detrimental to the receiving environment.

It is recommended the management strategies in this report be approved and incorporated into the construction phase.

APPENDIX A

EROSION & SEDIMENT CONTROL PLAN & DETAILS



SOIL EROSION AND SEDIMENT CONTROL PLAN
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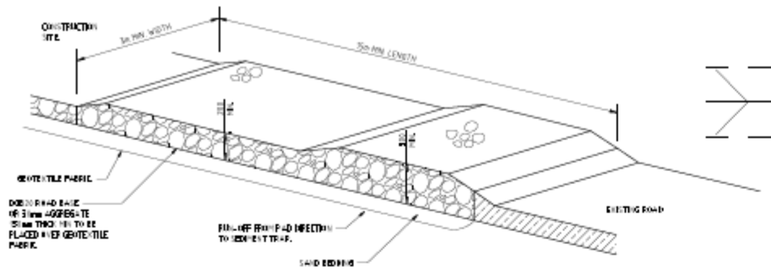

TEMPORARY CONSTRUCTION EXIT
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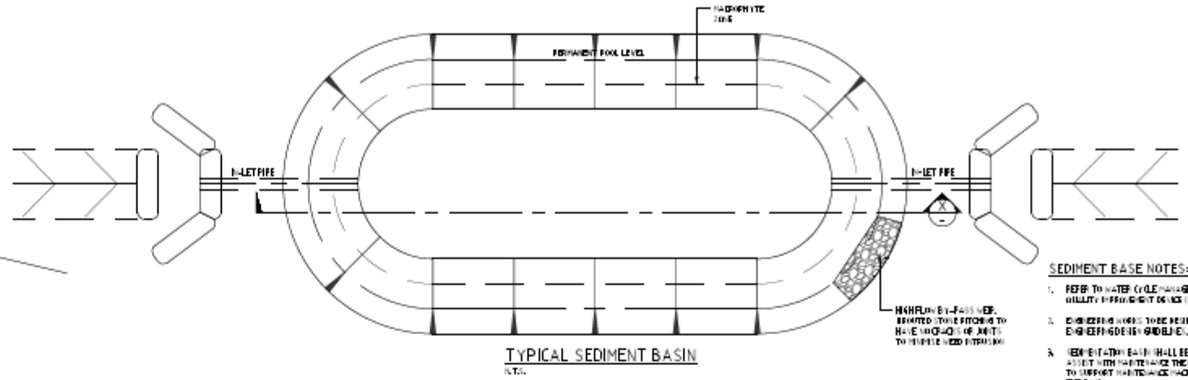
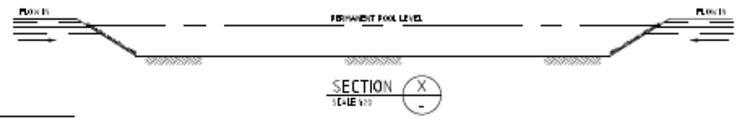
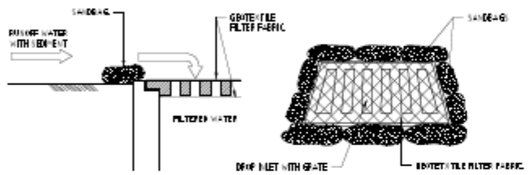


TYPICAL SEDIMENT BASIN
N.T.S.

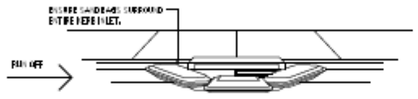


SEDIMENT BASE NOTES:

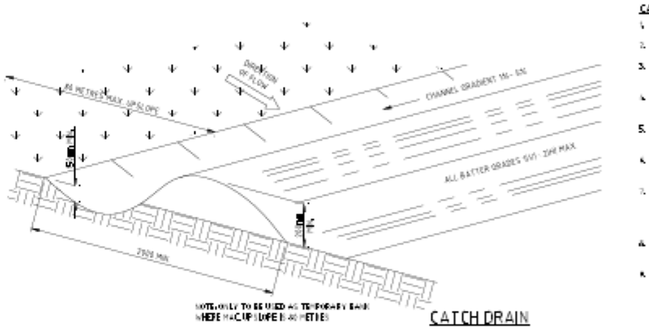
1. REFER TO WATER CYCLE MANAGEMENT GUIDELINES AND STORMWATER UTILITY STRATEGY FOR DESIGN STANDARDS.
2. ENGINEERING WORKS TO BE DESIGNED IN ACCORDANCE WITH COUNCIL'S ENGINEERING DESIGN GUIDELINES.
3. SEDIMENTATION BASIN SHALL BE CONSTRUCTED WITH A HARD BASE TO ASSIST WITH MAINTENANCE THE BASE MUST HAVE A BEARING CAPACITY TO SUPPORT MAINTENANCE MACHINERY WHEN ACCESS IS REQUIRED TO THE BASIN.
4. REFER TO DARNELL'S LANDSCAPE DESIGN GUIDELINES FOR THE MULCH AND PLANTING SPECIFICATIONS.
5. AQUATIC VEGETATION IS REQUIRED IN THE MACROPHYTE ZONE TO PROVIDE ALGAL BLOOMS AND EUTROPHICATION.



GEOTEXTILE FILTER FABRIC
DROP INLET SEDIMENT TRAP
NOT TO SCALE



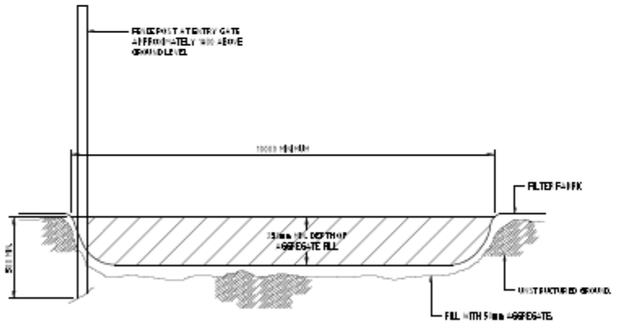
SANDBAG KERB INLET SEDIMENT TRAP
NOT TO SCALE



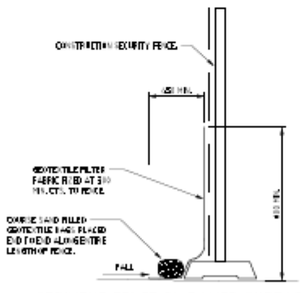
CATCH DRAIN
NOT TO SCALE

CATCH DRAIN CONSTRUCTION NOTES:

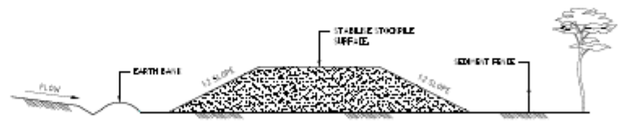
1. CONSTRUCT AT LONGGRADIENT AS SPECIFIED.
2. MAXIMUM SPACING BETWEEN BANKS SHALL BE AS METRES.
3. DRAINS TO BE OF PARABOLIC OR TRAPEZOIDAL CROSS SECTION NOT V-SHAPED.
4. EARTH BANKS TO BE ADEQUATELY COMPACTED IN ORDER TO PREVENT FAILURE.
5. CONSTRUCTION OF A TEMPORARY NATURE AND SHALL BE COMPACTED AT THE END OF DAYS WORK OR IMMEDIATELY AFTER RAIN.
6. ALL OUTLETS FROM DISTURBED LANDS ARE TO FEED INTO SEDIMENT BASIN OR SIMILAR.
7. DISCHARGE RUNOFF COLLECTED FROM UNDISTURBED LANDS ONTO EITHER A STABILISED OR UNDISTURBED DISPOSAL SITE WITHIN THE SAME CATCHMENT AREA FROM WHICH THE WATER ORIGINATED.
8. COMPACT WITH A SUITABLE IMPLEMENT IN STRATHMS WHERE THEY ARE REQUIRED FOR FUNCTION FOR MORE THAN 5 DAYS.
9. EARTH BANKS TO BE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT WILL IMPEDE NORMAL FLOW.



CROSS-SECTION OF CONSTRUCTION ENTRY/EXIT DETAIL
NOT TO SCALE



SEDIMENT FENCE ON PAVED SURFAC E
NOT TO SCALE



STOCKPILES DETAIL
NOT TO SCALE

ISSUE	REVISION	APPROVED	DATE
B	ISSUED FOR CONSTRUCTION	MG	19/06/20
A	ISSUED FOR DA	AL	19/06/20

Architect
Fulton trotter ARCHITECTS
Sydney
Level 2, 35 Spring Street
PO BOX 1898 Bondi Junction NSW 2022
t. (02) 9365 9441 e. sydney@fultontrotter.com.au

BIRZULIS ASSOCIATES
CONSULTING ENGINEERS ACN 003 787 911
583 DARLING STREET ROZELLE NSW 2039
TELEPHONE: 9555 7200 FAX: 9555 7299
EMAIL ADDRESS: office@birzulisassociates.com

Project
SAMUEL GILBERT PUBLIC SCHOOL
RIDGECROP DRIVE, CASTLE HILL, NSW

TITLE
SOIL EROSION AND SEDIMENT DETAILS

SCALES (AS NOTED AT A1)			DATE: DEC. 2019
DRAWN: C.KE	DESIGN: S.L	CHECKED: S.L	APPROVED: M.G

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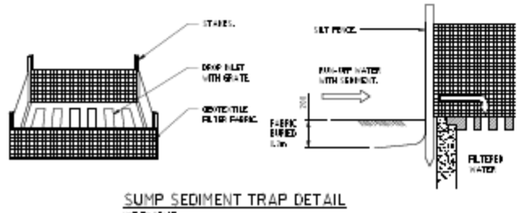
ISSUE	PROJECT No.	DRAWING No.
B	7738	C-S-0003



SUMP SEDIMENT TRAP DETAIL
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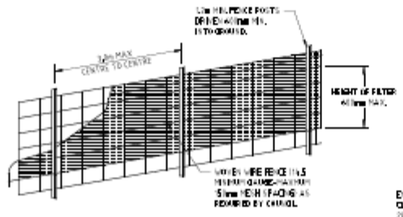
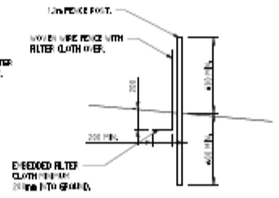


DIAGRAMMATIC VIEW



TYPICAL SECTION

SEDIMENT FENCE DETAIL
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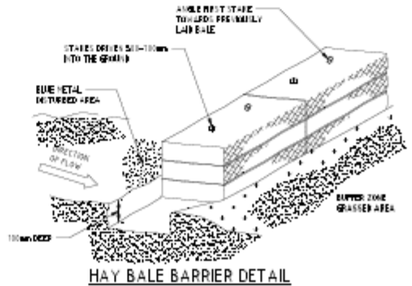

HAY BALE BARRIER DETAIL
NOT TO SCALE

APPENDIX B - CURRICULUM VITAE

MICHAEL GROGAN Born 2.2.1978

Bachelor of Engineering in Civil Engineering
University of Newcastle

Masters of Engineering (Structural)
University of Technology, Sydney

Member of the Institution of Engineers, Australia
Chartered Professional Engineer
Registered with National Professional Engineers Register
Registered Professional Engineer of Queensland
Registered Building Practitioner with Building Commission Victoria

Since completing his degree in 1999, Michael has worked as a structural engineer for Birzulis Associates Pty Ltd and in 2004 Michael was appointed as an Associate Director of Birzulis Associates Pty Ltd. In 2012 Michael was appointed a Director of Birzulis Associates Pty Ltd.

Michael has had exposure to the design of reinforced and post-tensioned concrete, structural steelwork, glass, brickwork, timber and foundation design along with site supervision through involvement with numerous projects including the following projects:-

- National Gallery of Australia, Canberra
- Ian Thorpe Aquatic Centre, Ultimo
- Hillsong Christian Church with 3500 seat auditorium and chapel
- Presbyterian Ladies College – performing arts centre and indoor swimming complex
- Ocean Breeze Apartments
- Energy Australia Substation, Campbell Street
- Nareen Gardens Retirement Village
- Millers Self Storage, Thornleigh, Rozelle and Auburn Storage Warehouses
- Delany College, Granville
- Penrith Anglican College
- Hamilton Island Apartments
- Kia Ora Stud luxury residence, Scone
- Tara Anglican College – numerous buildings
- Hoxton Park Anglican College – numerous buildings
- Griffith TAFE – nursing and children's services
- Numerous luxury domestic buildings

APPENDIX C
COUNCIL CONSULTATION

Post Approval – Consultation

Consultation needs to be meaningful, done with courtesy and respect and be well documented. These are people/ organisations that we need to be building meaningful relationships with.
Conditions of all consent can require consultation with a range of stakeholders. Consultation in the post approval world needs to be well documented to satisfy the condition requirements.
Examples include Council, service providers (eg. Electricity gas etc.), consult with local bus provider and TfNSW.
Read each condition carefully, any reference to consult triggers consultation. Typically on State Significant Development, there will be a specific consultation condition as to how this piece can be appropriately addressed.

Consultation is not:

- A token gesture
- Done at the end of the piece of work,
- An email to the relevant stakeholder with no response;
- A meeting with the stakeholder with no meeting minutes.

Consultation is:

- Meaningful
- Done prior to the requirement,
- Captures an outcome,
- Identifies matters resolved,
- Identifies matters unresolved,
- Any disagreements are disclosed; and
- How we are going to address unresolved matters?

How to capture all the relevant details on consultation requirements? Any consultation requirement in a condition is required to be accompanied with the following table:

Post Approval Consultation Record

Identified Party to Consult:	The Hills Shire Council
Consultation type:	Teleconference
When is consultation required?	Prior to commencement of construction
Why	To meet condition B17
When was consultation scheduled/held	Consultation scheduled for the 24/02/2020
When was consultation held	Consultation undertaken on the 24/02/2020
Identify persons and positions who were involved	Craig – Subdivision Department The Hills Shire Council Steven Luu – Civil Engineer Birzulis Associates
Provide the details of the consultation	• Consultation undertake via teleconference; • Introductions made; • Description of the site/development ; • Review of relevant SSDA conditions of consent; and • Outline of council policies and councils requests were made.
What specific matters were discussed?	• Discussion regarding location of the site within Council LGA; • Council advise to refer to Landcom (blue book) for specific sediment and erosion control requirements – silt fences, basin design etc; and • Sediment and erosion control measures clarified.
What matters were resolved?	All matters resolved
What matters are unresolved?	None
Any remaining points of disagreement?	No
How will SINSW address matters not resolved?	None

APPENDIX D
SITE SHUTDOWN AND
STORM PREPARATION CHECKLIST

Site Shut Down & Storm Preparation Checklist

HB-HSEQ-F-084

Project Name: Job Number: Date:

Inspected by:

SITE SHUT DOWN OR BUREAU OF METEOROLOGY(BOM) / OFFICIAL GOVERNMENT WARNING RECIEVED			
ITEM	**YES**	**NO**	**N/A**
HOUSEKEEPING			
Ensure loose materials and objects including signage are secured and cannot blow away (check all levels, including formwork deck and roof). This is particularly important where the structure is not enclosed.			
All stored materials (e.g. ply, roofing) have been tied down/strapped.			
For holiday shutdown period – ensure excess waste has been removed from site.			
SECURITY			
Ensure boundary fencing, hoarding and barricading is secured with adequate bracing / counterweights and cannot be blown over.			
Ensure site office is locked and laptops, cameras etc. are taken home to prevent unauthorised access and theft.			
Securely lock all site containers, site sheds and buildings.			
For holiday shutdown period – Site contacts sign is secured and legible, with contact phone numbers displayed.			
For holiday shutdown period - routine security patrols arranged where appropriate.			
For holiday shutdown period - arm security system, as appropriate. Advise monitoring company of any changes to contact phone numbers during shutdown period.			
For holiday shutdown period – advise Client regarding shutdown period and emergency contact phone numbers.			
PUBLIC SAFETY			
For holiday shutdown period - pedestrians have safe passage around/adjacent to project.			
For holiday shutdown period – gantry lighting operational and sharp edges protected (e.g. pvc pipe).			
For holiday shutdown period – traffic control measures would either be removed or covered where not required to be displayed over shutdown (e.g. 'worker ahead' signage).			
EXCAVATION & CONFINED SPACES			
For holiday shutdown period – ensure excavations have been filled, barricaded or covered (load bearing) to prevent persons falling into them.			
For holiday shutdown period – confined spaces signed and locked if possible.			

HUTCHINSON BUILDERS

Site Shut Down & Storm Preparation Checklist

HB-HSEQ-F-084

SCAFFOLD			
Ensure scaffold ties are in place and check scaffold couplers that link scaffold components together.			
Check shade cloth / mesh and planks are securely fixed.			
Check scaffold baseplates and ensure potential water runoff is diverted (so they cannot be undermined).			
If scaffold is incomplete, ensure access is restricted (e.g. minimum prominent incomplete scaffold signs and hazard tape).			
Ensure scaffold is free from excess materials and no loose materials.			
STRUCTURE			
Where required incomplete structures are braced to prevent collapse.			
Review all pre-cast panel braces and ensure they are secured and locked.			
Ensure all block & brick walls are supported / braced and/or core filled.			
Finished/sensitive work protected from weather ingress.			
For holiday shutdown period – ensure penetrations in concrete slabs have penetration covers affixed.			
PLANT			
Ensure tower crane warning lights operational.			
Ensure tower crane barricading secured/ lifting hooks and chains removed/ crane in slew mode and crane cabin locked.			
All plant parked in designated area with attachments lowered.			
All plant locked, with keys removed and isolated if possible.			
HAZARDOUS CHEMICALS/MATERIALS			
Dangerous goods and hazardous substances should be correctly disposed of or secured in a location that is unlikely to flood.			
Bunds empty and clean.			
Asbestos removal enclosures sealed and secured, following advice from licenced removalist.			
SERVICES & AMENITIES			
For holiday shutdown period – where required gas, electrical and water supplies / mains have been isolated. This includes isolating temporary boards at the main switchboard, isolating water to site sheds and turning off all lighting and air conditioners inside sheds.			
For holiday shutdown period - all extension leads and power tools removed from site and secured.			
For holiday shutdown period – fridges emptied and cleaned.			
For holiday shutdown period – chemical toilets emptied and cleaned.			
ENVIRONMENTAL			
Erosion and sediment controls in place (and in a clean condition).			

Stockpiles covered if required by site plan; covers sufficiently weighed down.			
For holiday shutdown period – road leaving site is clean.			
For holiday shutdown period – dust control arranged if required.			
IF SITE BEING SHUT DUE TO WEATHER EVENT			
Evacuate the site where it is identified that serious and damaging weather is coming and it is safe for workers to travel from site to home			

POST SITE SHUT DOWN OR WEATHER EVENT			
ITEM	**YES**	**NO**	**N/A**
POST SITE SHUTDOWN			
Restore services to site.			
Complete BIG10 inspection, including:			
No evidence of intruders.			
Scaffold inspection, including footings not undermined.			
Condition of erosion and sediment controls.			
Plant operators to conduct a thorough prestart check prior to equipment use.			
POST STORM EVENT			
Electricity – Prior to use ensure there has been a clearance to use live electrical sources by an electrician			
Identify any materials likely to contain asbestos containing material and isolate.			
Check drinking water and hand wash facilities are available			
Check that workers have access to working amenities			
Assess what clean-up work needs to be done			
Plan the clean-up to ensure additional risks / hazards are not introduced			
Determine which tools & equipment will be needed to safely do the work			
Check that the people required to operate the machinery have the right skill and competencies and ensure less skilled workers are supervised			
Be aware of worker fatigue and toolbox all workers on the signs and symptoms of fatigue			
Ensure all correct PPE for the task is being correctly used by all workers			
Ensure all first aid stock and rooms are suitable for treating any injuries			
Complete a monthly scaffold inspection checking: - there has not been soil erosion occur from underneath the sole boards - that the scaffold base jacks are centred on the sole boards			

APPENDIX E

CONSTRUCTION SOIL AND WATER MANAGEMENT
SITE ARRANGEMENT

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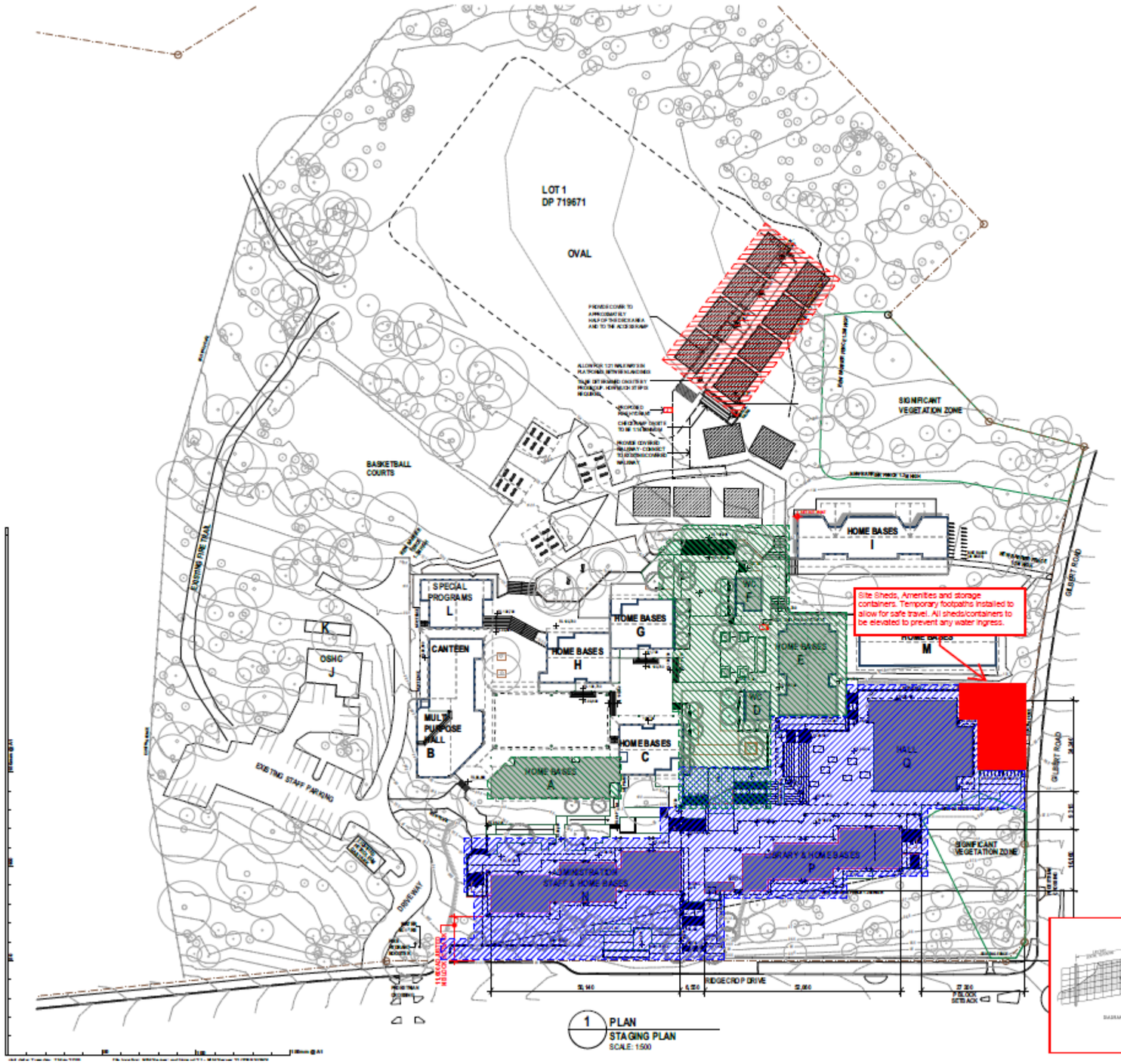

1 PLAN
STAGING PLAN
SCALE: 1:500

STAGE 1 TEMPORARY SCHOOL ESTABLISHMENT WORKS

STAGE 2 CONSTRUCT NEW MAIN HOMEBASES, LIBRARY, ADMINISTRATION, HALL AND COLA

STAGE 3 DEMOLISH/REFURBISH EXISTING BUILDINGS UPGRADE MAIN CONCOURSE

P2	S.DEP. Consultant Report Issue	09/10/19	AS
P3	S.DEP. Client Review Issue	15/10/19	AS
P4	S.DEP. Draft Issue	04/11/19	AS
P5	S.DEP. Final Coordination Issue	07/11/19	AS
P7	S.DEP. Issue	12/11/19	AS
P8	S.DEP.UD	19/11/19	AS
P9	Finalised S.DEP. Issue	29/02/20	AS
P10	S.DEP. Response to Submissions	13/03/20	AS
P11	S.DEP. Response to Submissions	01/05/20	AS
REV	DESCRIPTION	DATE	INIT

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SCHEMATIC DESIGN

NSW Department of Education

Samuel Gilbert Public School

Ridgecrop Drive
Castle Hill, NSW

STAGING SITE PLAN

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

PROJECT NUMBER	DIRECTOR	CHECKED
7068SG01	JW	AS

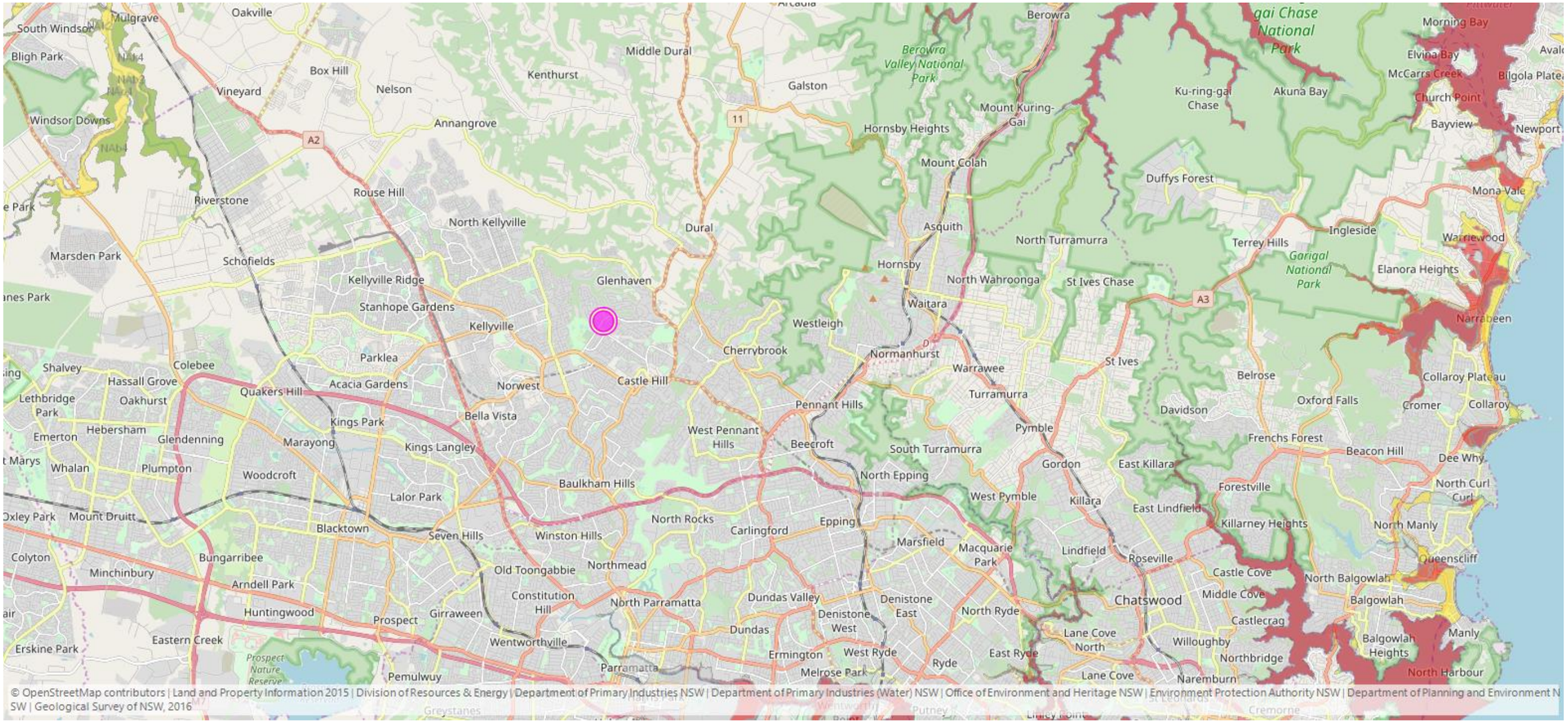
DRAWING NUMBER	REVISION
SD1401	P11

APPENDIX F

NSW PLANNING INDUSTRY & ENVIRONMENT

-

ACID SULPHATE SOILS RISK MAP


Oakville
Mulgrave
South Windsor
Bligh Park
Box Hill
Vineyard
Nelson
Middle Dural
Kenthurst
Galston
Berowra
Berowra Valley National Park
Morning Bay
Elvina Bay
McCarrs Creek
Church Point
Bilgola Plateau
Ku-ring-gai Chase National Park
Akuna Bay
Mount Kuring-Gai
Hornsby Heights
Bayview
Newport
Windsor Downs
Annangrove
Mount Colah
Duffys Forest
Mona Vale
Riverstone
Rouse Hill
North Kellyville
Dural
Asquith
North Turramurra
Terrey Hills
Ingleside
Warriewood
Marsden Park
Schofields
Kellyville Ridge
Glenhaven
Hornsby
North Wahroonga
St Ives Chase
Garigal National Park
Elanora Heights
Stanhope Gardens
Kellyville
Waitara
Westleigh
Narrabeen
Parklea
Cherrybrook
Normanhurst
Warrawee
St Ives
Shalvey
Colebee
Hassall Grove
Acacia Gardens
Norwest
Castle Hill
Belrose
Collaroy Plateau
Lethbridge Park
Oakhurst
Quakers Hill
Turramurra
Oxford Falls
Cromer
Collaroy
Pennant Hills
Davidson
Kings Park
Bella Vista
Pymble
Emerton
Hebersham
Glendenning
West Pennant Hills
Beecroft
Frenchs Forest
Beacon Hill
Marayong
Kings Langley
South Turramurra
Dee Why
Whalan
Plumpton
Gordon
East Killara
Woodcroft
Baulkham Hills
North Epping
Forestville
North Curl Curl
Lalor Park
West Pymble
Killara
East Lindfield
Killarney Heights
Oxley Park
Mount Druitt
North Rocks
Carlingford
Epping
North Manly
Blacktown
Seven Hills
Winston Hills
Marsfield
Macquarie Park
Lindfield
Roseville
Queenscliff
Colyton
Bungarribee
Minchinbury
Old Toongabbie
Northmead
Castle Cove
North Balgowlah
Arndell Park
Constitution Hill
North Parramatta
Dundas Valley
Chatswood
Middle Cove
Balgowlah
Huntingwood
Prospect
Girraween
Denistone East
North Ryde
Castlecrag
Dundas
Denistone West
Lane Cove North
Willoughby
Balgowlah Heights
Manly
Eastern Creek
Wentworthville
Erskine Park
Ermington
West Ryde
Ryde
East Ryde
Northbridge
Prospect Nature Reserve
Parramatta
Melrose Park
Lane Cove
Naremburn
North Harbour
Pemulwuy
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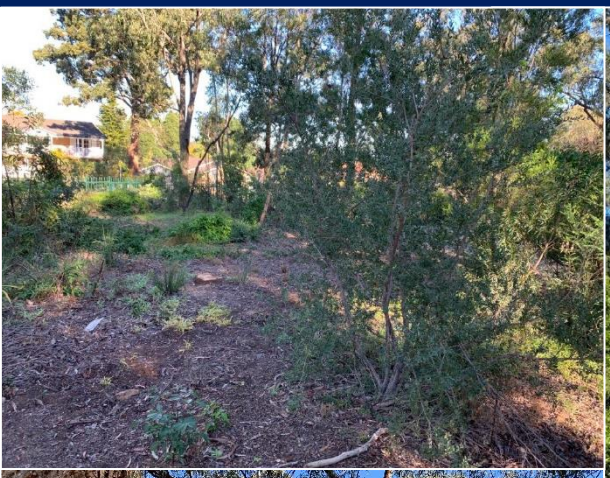
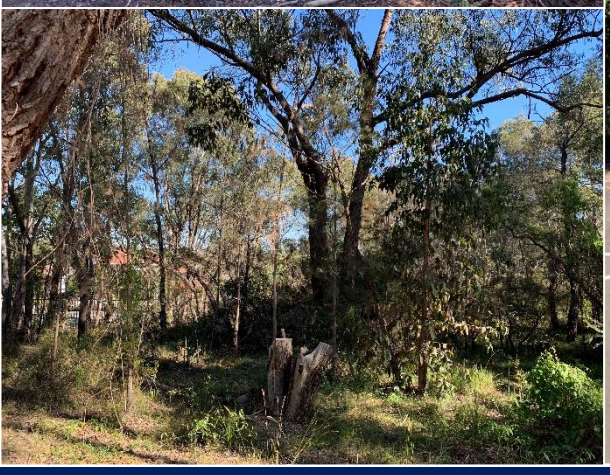
APPENDIX K – BIODIVERSITY MANAGEMENT SUB PLAN

As per Condition B13 (f)

ecoplanning
ecology | planning | offsets

Biodiversity Management Sub-plan

Samuel Gilbert Public School (Lot 1 // DP 719671)

Proposed temporary demountable classrooms

Prepared for: Hutchinson Builders

14 April 2020 Version: 1.2 – Final

PROJECT NUMBER	2020-017			
PROJECT NAME	Biodiversity Management Sub-plan			
PROJECT ADDRESS	Samuel Gilbert Public School (Lot 1 // DP 719671)			
PREPARED FOR	Hutchinson Builders			
AUTHOR/S	Stephanie Cerato			
REVIEW	**Technical**	**QA**	**Version**	**Date to client**
	Bruce Mullins		1.0 - Draft	20 February 2020
			1.1 - Final	10 March 2020
			1.2 – Final	23 March 2020
			1.3 – Finale	14 April 2020

This report should be cited as: 'Ecoplanning (2020). Biodiversity Management Sub-plan– Samuel Gilbert Public School (Lot 1 // DP 719671). Prepared for Hutchinson Builders.'

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ECOPLANNING PTY LTD | 74 HUTTON AVENUE BULLI NSW 2516 | P: (02) 4244 2736

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Table 1.1: Link to where consent conditions are addressed in the report 1

Glossary and abbreviations

Acronym	Description
BDAR	Biodiversity Development Assessment Report
BC Act	*Biodiversity Conservation Act 2016*
CEEC	Critically Endangered Ecological Community
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
FMSP	Fauna Management Sub-Plan
HBT	Hollow Bearing Tree
THLEP	The Hills Local Environmental Plan 2012
LGA	Local Government Area
SSD	State Significant Development
STIF	Sydney Turpentine-Ironbark Forest
TEC	Threatened Ecological Community
WONS	Weeds of National Significance
VMP	Vegetation Management Plan
VMSP	Vegetation Management Sub-Plan
*	Denotes exotic species

1 Introduction

1.1 Description of project and purpose of the Biodiversity Management Sub-Plan

Ecoplanning were commissioned by Hutchinson Builders to prepare a Biodiversity Management Sub-Plan (BMSP) relating to the development at Lot 1 // DP 719671, Samuel Gilbert Public School, Castle Hill. For the purposes of this report, Lot 1 // DP 719671 is referred to as the 'study area' and the area for the works is referred to as the 'subject site' (**Figure 1.1**). The development is a State Significant Development (SSD) involving the demolition of classrooms and tree removal.

The study area currently contains the existing school grounds including built areas (e.g. classrooms), stands of native bushland and open space areas. A small amount of Sydney Turpentine-Ironbark Forest (STIF) is present in the south eastern part of the site. This community is equivalent to '*Turpentine-Ironbark Forest of the Sydney Basin Bioregion*', a Critically Endangered Ecological Community (CEEC) listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the NSW *Biodiversity Conservation Act 2016* (BC Act).

This BMSP has been prepared in accordance with the SSD (application number SSD 9274) and fulfils the following consent conditions:

- B18 – Biodiversity Management Sub-Plan (BMSP) that includes a Vegetation Management Sub-plan (VMSP) and Fauna Management Sub-plan (FMSP), and
- B22 – A pre-clearing survey and inspection.

Monitoring, Reviews and Communication will be as per the HB CEMP Section 7 (Communication & Reporting) and Section 9 (Monitoring & Reviewing of Environmental Performances) as well as the requirements within SSD 9274.

Table 1.1 shows the sections of this report that address the matters described in consent conditions B18 and B22.

Table 1.1: Link to where consent conditions are addressed in the report

Consent Conditions		Section of the report
Condition B18		
a)	should any injured fauna species be found during the construction period, construction must stop immediately so that the injured animal can be taken to a vet or wildlife carer. All handling of fauna species must be conducted by a qualified ecologist or wildlife carer	Section 3.2.1 p12 - 13
b)	during vegetation clearing, animals that are injured or displaced are to be captured and relocated by a qualified ecologist or wildlife carer to nearby bushland (subject to landowner approval), or trees containing wildlife must be sectioned and dismantled before relocating the animals;	Section 3.2.1 p12 - 13

Consent Conditions		Section of the report
Condition B18		
c)	nocturnal fauna species such as gliders and possums, if captured and rescued during vegetation clearing are to be secured in suitable enclosures and kept in a quiet, dark and cool environment until they can be released into suitable habitat after dark;	Section 3.2.1 p12 - 13
d)	include a Vegetation Management sub-plan (VMP) for the site during construction works.	Section 2 p8 – 11
e)	include measures to communicate to the construction workforce the biodiversity values that are to be retained and protected;	Section 2.2.1 p9
f)	any hollows removed be salvaged and replaced into trees within the vegetated areas to be retained or they be replaced with nest boxes in consultation with Council suitable to native fauna likely to use the site;	Section 2.2.2 p9 – 10
g)	include a Fauna Management Plan for the site including details of impacts and proposed mitigation measures due to impact on movement, construction traffic, proposed construction hours, details of any fencing, restricting developments in identified areas, light spill, construction noise and on-site crane movements; and	Section 3 p12 – 16 Appendix A p18 – 20
h)	include details to install and maintain exclusion fencing along and around any native vegetation not being removed as part of this development.	Section 2.1.1 p8
Condition B22		
a)	Prior to the commencement of construction and/or vegetation clearing (whichever occurs first), pre-clearing surveys and inspections for fauna must be undertaken. The surveys and inspection, and any subsequent relocation of fauna, must be undertaken under the guidance of a suitably qualified ecologist and must be in accordance with the methodology incorporated in the Biodiversity Management Sub-Plan. Evidence of the pre-clearing surveys and inspections for fauna and any relocation of fauna must be provided to the satisfaction of the Certifying Authority.	Section 3.1 p12

Figure 1.1: Study area and subject site.

1.2 Site description

The study area is located on the corner of Ridgecrop Drive and Gilbert Road, Castle Hill in The Hills Shire Local Government Area (LGA).

The study area consists of a combination of native bushland, planted gardens and mown open space amongst the schools build environment. The main area of interest for this BMSP includes two native vegetation communities located in the subject site; namely, *Red Bloodwood - Grey Gum woodland on the edges of the Cumberland Plain, Sydney Basin Bioregion* (PCT 1081) and *Turpentine - Grey Ironbark open forest on shale in the lower Blue Mountains, Sydney Basin Bioregion* (PCT 1281) (**Figure 1.2**). PCT 1281 forms part of the Critically Endangered Ecological Community (CEEC) Sydney Turpentine – Ironbark Forest (STIF) in the Sydney Basin Bioregion under the BC Act and the EPBC Act.

The development involves the demolition of classrooms and tree removal, construction of a new three storey building, construction of a new school hall, alterations and additions to two existing buildings and refurbishment of two toilet blocks. Trees within the construction footprint (including a 3 m setback beyond the construction area) are required for removal (**Figure 1.3** and **Figure 1.4**).

A site-specific survey was undertaken by Travers bushfire & ecology (2018) and Ecoplanning Pty Ltd (2019). For the full description of plant community types and weed management identified within the study area please refer to '*Travers bushfire & ecology (2018). Biodiversity Development Assessment Report (State Significant Development Assessment) Lots 1 & 2 DP 719671 and Lots 551 & 552 DP 734350, Ridgecrop Drive, Castle Hill'* and '*Ecoplanning (2019). Vegetation Management Plan– Samuel Gilbert Public School (Lot 1 // DP 719671). Prepared for Alphitonia.*'

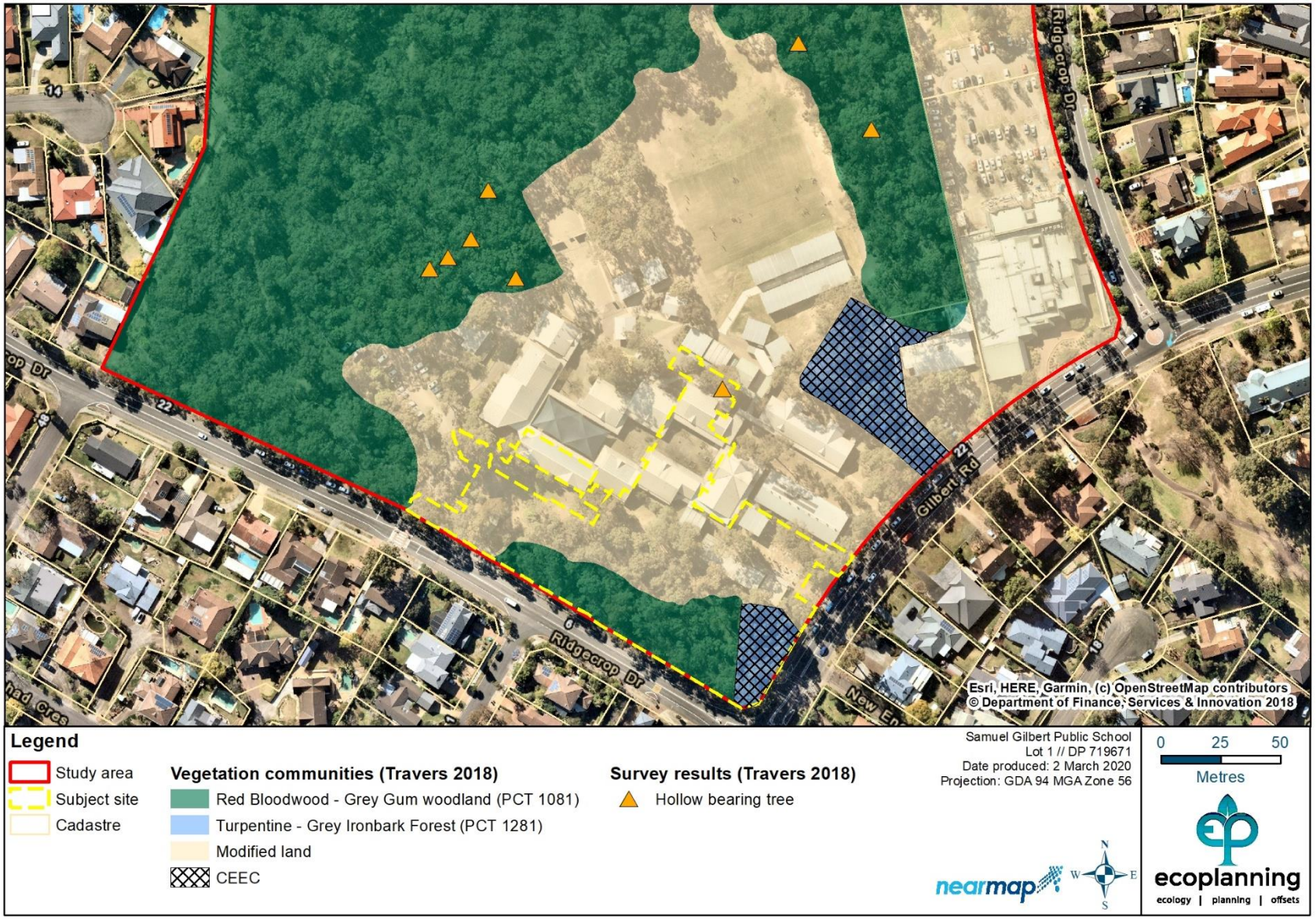

Figure 1.2: Vegetation mapping of the study area, including hollow bearing trees (Travers bushfire and ecology 2018).

Figure 1.3: Development footprint, including construction setback.

Figure 1.4: Tree removal and retention plan (issued by client 11/02/2020).

2 Vegetation Management Sub-plan

The VMSP outlines potential impacts of the process to clear and protect native vegetation prior to and during construction, as required under Consent Condition B18.

2.1 Prior to construction

2.1.1 Fencing

- Exclusion fencing will be erected prior to commencement of demolition, vegetation clearing work or construction to protect the retained vegetation, particularly vegetation adjacent or in proximity to construction,
- sedimentation fencing will be installed at the interface between the works and the retained vegetation to prevent the translocated soil to wash off into the retained vegetation,
- the perimeter of the development should be fenced with post and cable fencing to prevent vehicular access and discourage access by the general public.

Exclusion fencing to be erected prior to commencement of works is provided in **Figure 2.1**.

2.1.2 Signage

- Signs will be installed on fences protecting retained vegetation as “no go” areas and “protected native vegetation”,
- signage around the perimeter of the works will displayed that informs workers, staff and students of the environmental value of the retained vegetation and advise of the need to report sightings of fauna within the construction area.

2.1.3 Vegetation for removal

- All plant, equipment, hand tools and work boots must be cleaned prior to delivery onsite to ensure that they are free of soil or vegetation material,
- priority and Weeds of National Environmental Significance (as identified in school wide VMP (Ecoplanning 2019)) within the construction footprint will be subject to primary and secondary treatment, and disposed of in accordance with Ecoplanning (2019),
- all canopy trees proposed to be removed will be clearly marked prior to construction works, with hollow bearing trees and habitat trees marked individually,
- the boundary of the clearing zone must be clearly delineated,
- all personnel involved in vegetation clearing must be trained in this vegetation clearance procedure and of the significance of the vegetation to be retained,
- access to the study area will be limited to the subject site and no additional trails or tracks to access this area will be established.

2.2 During construction

2.2.1 General

- Plant, equipment and stockpiles must not be stored in retained vegetation,
- all construction workers will be informed about the ecological significance of the retained vegetation and procedures should native fauna be encountered in the construction area,
- weed monitoring and control must occur during construction. The school wide VMP (Ecoplanning 2019) is the point of reference for weed control and revegetation of the site,
- exclusion fencing must be periodically inspected to ensure that it is functioning as intended in the BMSP, and that any breaches in this BMSP have not occurred.

2.2.2 Vegetation clearing

Vegetation clearing should follow the following procedure, in the order outlined:

- the midstorey, ground layer and woody debris will be cleared leaving canopy trees. Canopy trees will be left standing overnight following complete removal of the midstorey, ground layer and woody debris from the construction area,
- canopy trees that are not HBTs or habitat trees (i.e. trees that contain nests) can be cleared in the construction area. These trees must be felled with caution to avoid impact to HBTs and habitat trees. HBTs and habitat trees must be left overnight following complete removal of other canopy trees,
- HBTs and habitat trees must be cleared carefully. It is preferred that each tree is lopped with a chainsaw commencing with the non-hollow bearing portions of the tree, or sections of the tree containing the habitat element. Hollow bearing portions must be lopped in manageable sections so that they can be gradually lowered to the ground to injury to resident fauna,
- if a heavy machinery is used to remove HBTs and habitat trees, then the following procedure should be followed:
    - prior to felling HBTs and habitat trees, the trees will be nudged or shaken by tree felling equipment to create enough disturbance and encourage any fauna to voluntarily vacate the tree
    - if no animals emerge from the hollows after shaking or nudging, then the tree will be ‘slow-dropped’ in a controlled manner, which gentle lowers the tree to the ground,
    - once the tree has been felled, a search will be made of the branches around the tree for any fauna and hollows should be inspected with a torch for the presence of any animals.
- the ecologist will salvage tree hollows suitable for re-use in retained vegetation and set aside. If suitable, the hollows will be erected in retained vegetation or replaced with nest boxes of equivalent size and function. The location for hollows and/or nest boxes will be selected by a qualified ecologist,
- the ecologist will record the number of HBTs and habitat trees removed, the number of fauna identified and/or captured and relocated while removing HBTs and habitat trees.

General principles for tree felling include:

- where possible, chainsaws will be used for clearing of vegetation to reduce impacts of heavy machinery on surrounding vegetation and soil disturbance,
- where possible, the trees proposed for removal will be felled at an angle so that they fall within the development footprint area. This will prevent surrounding vegetation from being crushed and damaged during the tree removal process,
- work will cease when native fauna are detected in the vegetation clearing area and a suitably qualified ecologist called to site to capture and assessment the animal,
- a suitably qualified ecologist will be on site when HBTs and habitat trees are removed. Refer to **Section 3** for more information.

2.2.3 Soil disturbance

- Soil disturbance will be limited to the digging required to install required foundations,
- excess soil generated from construction will be removed from the site and not stored within the retained vegetation,
- implement sediment and erosion control plans to limit mobilisation of exposed soils.

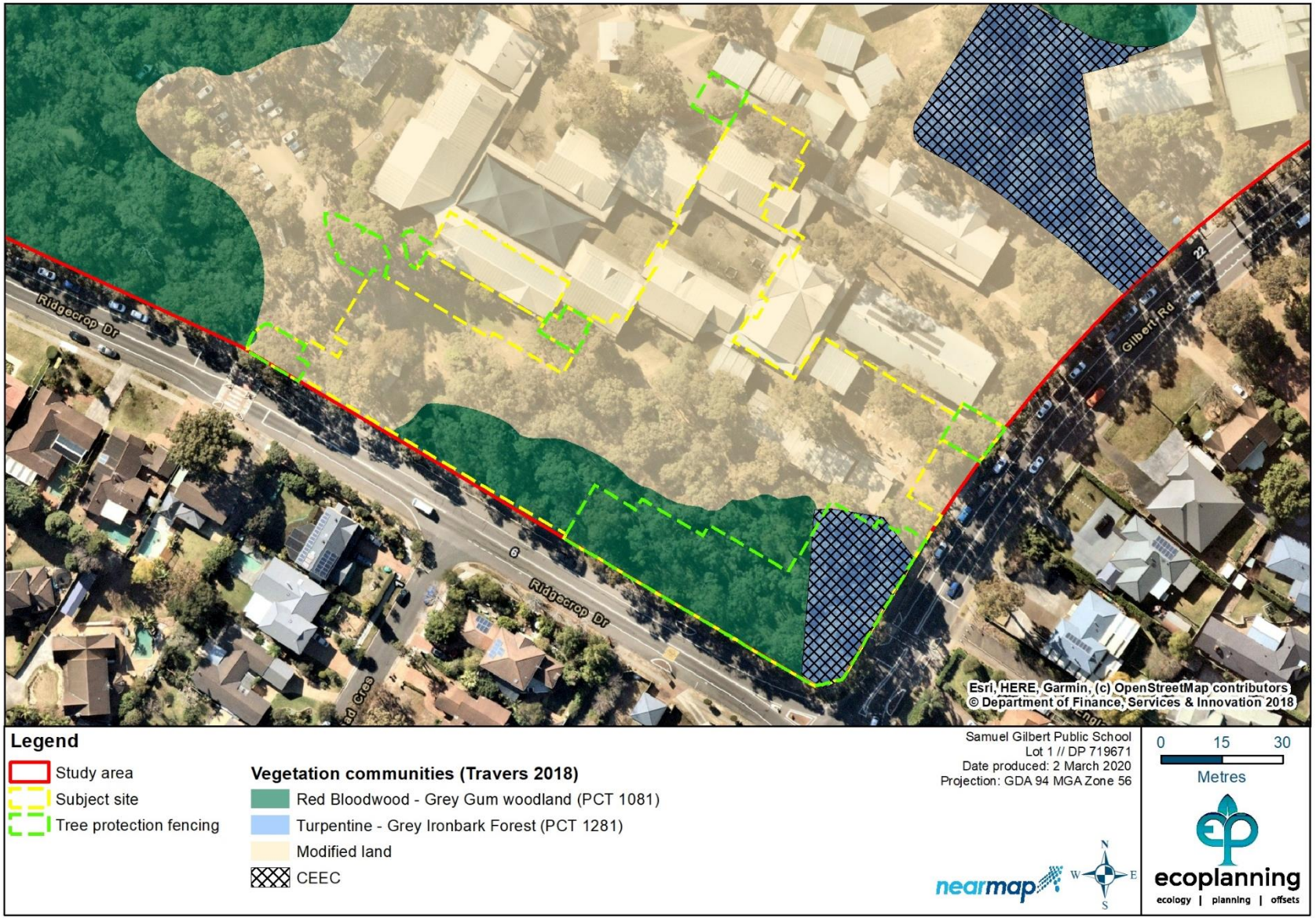

Figure 2.1: Indicative exclusion fencing for vegetation within the subject site.

3 Fauna Management Sub-plan

The development will impact native vegetation, threatened species and their habitat, and has the potential to increase edge effects on retained vegetation and reduce the function of native vegetation for native fauna (Travers bushfire & ecology 2018).

This section outlines actions to reduce the potential impact of the construction phase of the development on native fauna, in accordance with Consent Conditions B18 and B22. The FMSP should be read in concert with the VMSP.

3.1 Pre-clearance protocols

- Prior to the commencement of any construction or vegetation clearing, all habitat trees and HBTs proposed for removal must be clearly marked,
- an appropriate release location for any rescued fauna identified during construction will be identified by the suitably qualified ecologist, but this is preferably in retained vegetation on or adjacent to the school ground on property owned by the Department of Education,
- pre-clearing surveys and inspections for fauna must be undertaken under the guidance of a suitably qualified ecologist, and must include:
    - a review of the BDAR (Travers bushfire & ecology 2019) to identify threatened species that have the potential to occur in the construction area,
    - pre-clearing surveys no more than 5 days prior to the commencement of construction and or vegetation clearing (whichever comes first),
    - a survey of the construction area that includes stag watches and spotlight survey of HBTs and habitat trees, and general spotlight survey of the native vegetation,
    - any fauna captured during the survey will be relocated.
- a brief letter report will be prepared describing the methods and outcomes of the pre-clearing survey and fauna species relocated as evidence the pre-clearing survey has been conducted.

3.2 During construction

- Construction hours should take place during daylight hours only to reduce noise disturbance,
- any lighting must not be directed towards retained native vegetation. In addition, shade cloth or similar material could be hung from the fence around the construction area to reduce light spill into retained vegetation,
- fences must be erected around retained vegetation, as described in **Section 2**. Retained vegetation will be a ‘no-go” area for vehicular and pedestrian traffic. Plant, equipment and stockpiles must not be stored in retained vegetation,
- all construction workers must be inducted during which the significance of the native vegetation will be addressed and “no-go” areas clearly identified.

3.2.1 Fauna management during vegetation clearing

The vegetation clearing procedure describe in **Section 2** must be followed:

- vegetation clearing will be supervised by a qualified ecologist or wildlife carer,
- if fauna are detected during vegetation clearing, work will cease, and the qualified ecologist or wildlife carer contacted immediately. The qualified ecologist or wildlife carer will capture and assess the health of the animal and determine if veterinary assistance is required. If veterinary assistance is not required, the animal will be released at the agreed relocation point,
- should any injured fauna species be found during the tree felling, work must stop immediately and the injured fauna species be taken to a vet or wildlife carer by the supervising ecologist or wildlife carer,
- the qualified ecologist or wildlife carer supervise the removal of HBTs and habitat trees. Any fauna displaced during vegetation clearing will be captured by the ecologist or wildlife carer, subject to a health assessment and either released at the agreed relocation point or, if injured, taken to a vet or other wildlife carer for treatment,
- nocturnal fauna captured during vegetation clearing will be secured in a clean, dry calico bag and kept in a dark, cool and dry environment during the day, the released at the agreed relocation point after dark,
- HBTs must should be sectionally dismantled for relocation and all hollows must be inspected for occupation, signs of previous activity and potential for reuse,
- once felled, HBTs and habitat trees should be left overnight lying on the ground to allow animals to self-relocate.

3.2.2 Fauna handling and rescue procedure

- Relocation of any fauna must be undertaken under the guidance of a suitably qualified ecologist or wildlife carer and taken to an agreed location. It is advised that fauna be relocated to native vegetation retained within the school property (**Figure 3.1**),
- if an animal emerges from a hollow following shaking or nudging of the tree, then at least 30 minutes will be allowed for the animal to leave the tree. If the animal comes to the ground, or when it is on the lower trunk, attempts will be made to capture the animal using a net,
- captured animals will be immediately transferred to a suitably sized cotton bag and checked for obvious injury during the transfer process,
- captured animals will be placed in individual bags unless they are a family group to which separation would risk the survival of the young (i.e. lactating female with young),
- animals that are uninjured will be released by the ecologist or wildlife carer to nearby retained native vegetation (ideally within the school property) as soon as practicable,
- if a fauna species is found inside a felled tree, the animal should be extracted by hand and/or the tree must be sectioned and dismantled before relocating the animal,
- if extraction is impossible, then the hollow section must be left lying on the ground and reinspected the following day by the qualified ecologist or wildlife carer,
- if an animal flees from an already felled tree, attempts will be made to capture the fleeing fauna with a net.

A list of previously identified fauna within the study area is provided in **Appendix A** (Travers bushfire & ecology 2018). A search of the Atlas of NSW Wildlife (OEH 2020) was performed to identify threatened fauna recorded within 1 km of the study area (**Figure 3.2**).

Figure 3.1: Fauna relocation area within school property.

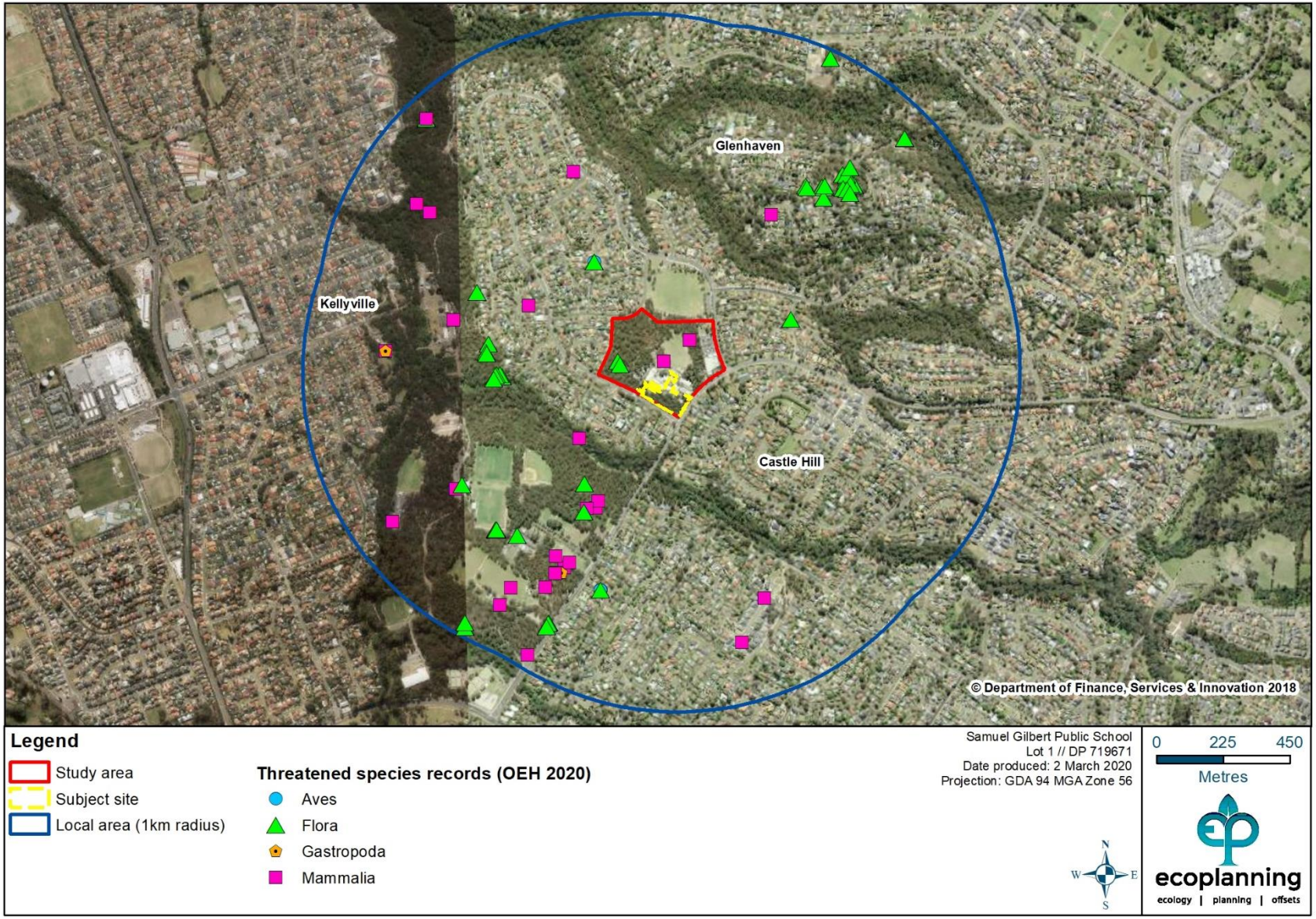

Figure 3.2: Threatened species in the local area (OEH 2020).

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Appendix A Fauna species previously identified (Travers bushfire & ecology 2018)

Class	Family	Scientific name	Common name	Native/Exotic	Method Observed	
					Dec-17	Sep-18
Aves	Accipitridae	*Lophoictinia isura*	Square-tailed Kite	Native	O	
Aves	Alcedinidae	*Dacelo novaeguineae*	Laughing Kookaburra	Native	OW	OW
Aves	Artamidae	*Cracticus tibicen*	Australian Magpie	Native	O	O
Aves	Artamidae	*Cracticus torquatus*	Grey Butcherbird	Native	W	W
Aves	Cacatuidae	*Calyptorhynchus lathami*	Glossy Black-Cockatoo	Native		G
Aves	Cacatuidae	*Cacatua tenuirostris*	Long-billed Corella	Native		O
Aves	Cacatuidae	*Cacatua galerita*	Sulphur-crested Cockatoo	Native	OW	W
Aves	Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike	Native	W	
Aves	Columbidae	*Phaps chalcoptera*	Common Bronzewing	Native	O	O
Aves	Columbidae	*Ocyphaps lophotes*	Crested Pigeon	Native		O
Aves	Corvidae	*Corvus coronoides*	Australian Raven	Native	W	OW
Aves	Hirundinidae	*Hirundo neoxena*	Welcome Swallow	Native		O
Aves	Meliphagidae	*Manorina melanocephala*	Noisy Miner	Native	OW	OW

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Class	Family	Scientific name	Common name	Native/Exotic	Method Observed	
					Dec-17	Sep-18
Aves	Psittacidae	*Platycercus eximius*	Eastern Rosella	Native	O	W
Aves	Psittacidae	*Glossopsitta concinna*	Musk Lorikeet	Native	W	OW
Aves	Psittacidae	*Trichoglossus haematodus*	Rainbow Lorikeet	Native	OW	OW
Mammalia	Miniopteridae	*Miniopterus orianae oceanensis*	Large Bent-winged Bat	Native	U	
Mammalia	Molossidae	*Mormopterus ridei*	Eastern Free-tailed Bat	Native	U	
Mammalia	Molossidae	*Austronomus australis*	White-striped Freetail-bat	Native	U	
Mammalia	Petauridae	*Petaurus breviceps*	Sugar Glider	Native	F	F
Mammalia	Pseudocheiridae	*Pseudocheirus peregrinus*	Common Ringtail Possum	Native	O	EP
Mammalia	Pteropodidae	*Pteropus poliocephalus*	Grey-headed Flying-fox	Native	OW	
Mammalia	Vespertilionidae	*Falsistrellus tasmaniensis*	Eastern False Pipistrelle	Native	U	
Mammalia	Vespertilionidae	*Chalinolobus gouldii*	Gould's Wattled Bat	Native	U	U
Mammalia	Vespertilionidae	*Scoteanax rueppellii*	Greater Broad-nosed Bat	Native	U	
Mammalia	Vespertilionidae	*Vespadelus vulturnus*	Little Forest Bat	Native	U	U
Mammalia	Vespertilionidae	*Nyctophilus* sp.	long-eared bat	Native		U

DRAFT

Class	Family	Scientific name	Common name	Native/Exotic	Method Observed	
					Dec-17	Sep-18
Reptilia	Scincidae	*Eulamprus quoyii*	Eastern Water-skink	Native	O	
Reptilia	Scincidae	*Lampropholis delicata*	Dark-flecked Garden Sunskink	Native	O	O
Reptilia	Scincidae	*Lampropholis guichenoti*	Pale-flecked Garden Sunskink	Native	O	

E – Nest/roost, F – Tracks/scratchings, G = crushed cones, O = observed, W – heard, OW – observed & heard, P – scat, EP – nest & scat, U – ultrasound

DRAFT

APPENDIX L – BUSH FIRE EMERGENCY RESPONSE SUB PLAN

As per Condition B13 (g)

peterson bushfire.

expert consulting services

Bushfire Emergency Response Sub-Plan

Samuel Gilbert Public School, Ridgecrop Drive, Castle Hill

5 March 2020

(Ref: 17037)

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report by
david peterson

0455 024 480
david@petersonbushfire.com.au
po box 391 terrigal nsw 2260
petersonbushfire.com.au

FPA AUSTRALIA (NO.BPAD18882)
BPAD LEVEL 3 ACCREDITED PRACTITIONER
ABN 28 607 444 833

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Review of emergency procedures contained in this plan

Australian Standard *AS 3745-2010 Planning for emergencies in facilities* requires that the Emergency Planning Committee (EPC) ensure the emergency procedures remain viable and effective by review and monitoring at periods not exceeding 12 months. In addition, the EPC shall ensure that the procedures are reviewed after an emergency event, a training exercise or any changes that might affect this Plan.

Amendments are to be recorded in the following table and inserted into the body of the document.

Date of review	Reviewed by	Pages amended

1 Introduction

1.1 Purpose

This is the Bushfire Emergency Response Sub-Plan (the 'Plan') for Samuel Gilbert Public School (the 'School') located at Ridgecrop Drive, Castle Hill in Sydney's Hills district. This Plan aims to increase the preparedness of the School community, including contractors, to ensure a rapid and safe shelter within the School or evacuation from the School prior to bushfire impact.

This Plan provides a set of procedures to manage an emergency response based on the nature of the School, the bushfire threat and an analysis of the issues that may be encountered during a bushfire emergency. A key component of the Plan is ensuring that employees, contractors and students have a clear understanding of their roles and responsibilities, and they understand when to act. The communication of emergency response arrangements to employees, contractors and students is critical to safe and coordinated bushfire response and evacuation.

This Plan satisfies Condition B.19 and D.12 of the State Significant Development (SSD 9274) development consent (dated 15th February 2020) which requires the preparation of such a plan prior to construction of the approved development at the School (refer to Section 1.3 below).

This Plan forms a sub-plan of the Construction Environmental Management Plan and acts as a standalone plan to address a bushfire emergency. This Plan provides a procedure that outlines what action people are required to undertake to take shelter on site or initiate evacuation off site, as well as the return of those people to the School property when the bushfire threat has passed.

1.2 How to read this report in an emergency

The Plan provides for planned and orderly shelter on site or evacuation off site of employees, contractors and students. The Plan will be activated and implemented by the Emergency Control Organisation (ECO) (Section 4) or senior officers of emergency services (NSW Police and Fire and Rescue NSW).

An important element of this Plan is that it provides for shelter on site for certain situations where procedural arrangements enable the School community to seek refuge within an appropriate location within the School property. The decision-making process for selecting either shelter on site or evacuation off site and circumstances under which each will be implemented are outlined in Section 2 of this Plan.

1.3 The School and approved development

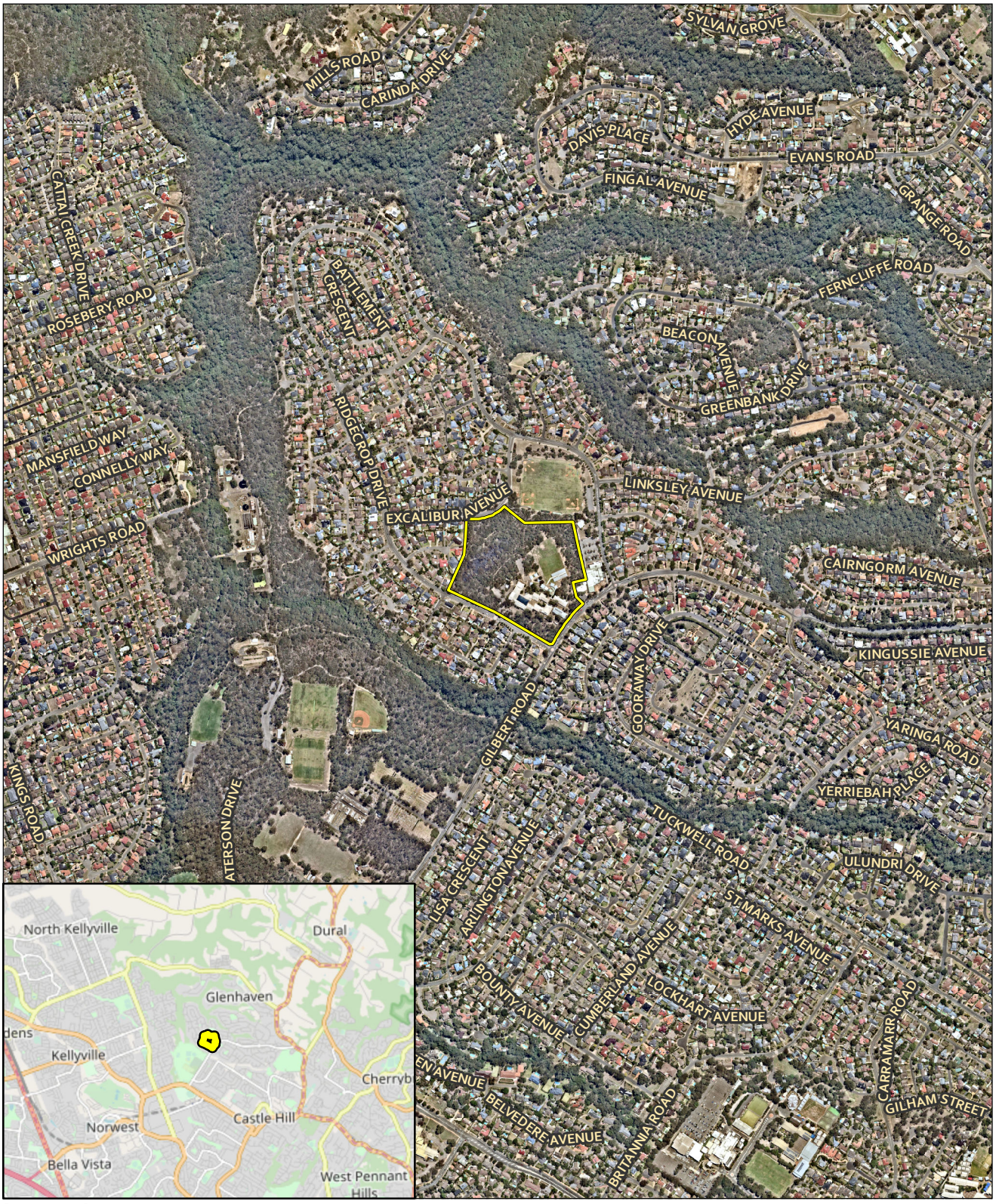
The School is located at the corner of Ridgecrop Drive and Gilbert Road, Castle Hill (Lot 1 DP 719671). Figure 1 shows the location of the School and its context with the bushfire hazard (detailed further at Section 1.4). The School buildings are clustered in the south-eastern portion of the School property, with the remainder of the property consisting of playing fields and forest vegetation.

A redevelopment of the School has been approved, consisting of the following:

- Construction of a new three storey building fronting Ridgecrop Drive to the south containing 23 new teaching spaces, new staff and administion offices and a new library;
- Construction of a new hall fronting Gilbert Road to the east;

- Refurbishment of the existing administration and library buildings to create six new home bases; and
- Refurbishment of two toilet blocks.

This Plan addresses the emergency management arrangements during and after construction of the above new components.



Legend

Subject Land

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DKGIS

Date: 26/02/2020

0 125 250 500

Metres

Figure 1: The Location of the Subject Land

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

peterson bushfire
expert consulting services

david peterson
0455 024 480 • david@petersonbushfire.com.au
po box 391 terrigal nsw 2260 • petersonbushfire.com.au

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1.4 Bushfire hazard

The bushfire hazard was described in the Bushfire Assessment Report prepared by Peterson Bushfire (28th February 2019) to accompany the Environmental Impact Statement (EIS) for the SSD application. To summarise, the hazard consists of approximately 4.5 hectares of dry sclerophyll forest located predominantly within the School property as shown on Figure 2. The forest is situated on a gradient within the slope class of 'downslope 0-5 degrees'.

There are two fire scenarios that could impact the School:

1. A fire burning within the Castle Hill Creek system (to the south) and/or Cattai Creek system (to the west and north-west) located 140-180 m away could spot into the school property during adverse fire weather (strong winds from the western sector during spring and summer). A spot fire could develop within the School property and spread uphill towards the buildings.

2. Ignition within the School property and fire development and spread confined to the immediate area of hazard. Ignition would occur by point source ignition from such causes as lightning strike, accidental ignition or arson.

Both fire scenarios are based on point source ignition and not a landscape-wide fire front. The length of fire run ranges between 90 and 180 m.

1.5 Bushfire protection attributes of the School

The School benefits from a relatively high level of bushfire protection due to the outcomes of the redevelopment and location within a highly urbanised area. The following bushfire protection attributes are available at the school:

- The School is to have an Asset Protection Zone (APZ) established prior to commencement of construction. The APZ works are detailed on Figure 2 and show improvement to the standard of vegetation management amongst the existing built form, such as adjacent Ridgecrop Drive, and new APZ establishment to the west. The APZ will ensure that the redevelopment will not be exposed to a bushfire radiant heat flux greater than 10 kW/m^2 (based on the accepted design fire scenario – refer to the Peterson Bushfire report). The APZ will greatly assist in the protection of the School from the impact of bushfire and is compliant with NSW Rural Fire Service standards.

- When completed, the new buildings will comply with Australian Standard 'AS 3959 Construction of buildings in bushfire-prone areas' Bushfire Attack Level BAL-12.5. Existing Building M (homebase building adjacent Gilbert Road) also complies with BAL-12.5.

- The school benefits from two road frontages with hydrants as well as additional hydrants located throughout the school property (refer to Figure 2 for hydrant locations).

- Access and egress are very good with the adjoining roads providing direct access through the immediate suburban area away from bushfire prone areas.

Legend

- Hydrant
- Subject Land
- Proposed Building
- Fence
- Fire Trail
- Contour - 1m
- Sydney Turpentine Ironbark Forest
- Change from OPA to IPA

Vegetation Formations

- Forest
- Garden Bed

Approved BER Asset Protection Zone

- OPA - Outer Protection Area
- IPA - Inner Protection Area

Asset Protection Zone - Exisiting BPED

- Asset Protection Zone - 18m
- Asset Protection Zone - 23m

Asset Protection Zone - 60m

- Inner Protection Area - 40m
- Outer Protection Area - 20m

Asset Protection Zone - 70m

- Inner Protection Area - 50m
- Outer Protection Area - 20m

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DKGIS

Date: 4/03/2020

0 12.5 25 50

Metres

Figure 2: Bushfire Hazard Analysis and Asset Protection Zone

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

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david peterson
0455 024 480 • david@petersonbushfire.com.au
po box 391 terrigal nsw 2260 • petersonbushfire.com.au

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2 Decision to shelter or evacuate

Care is required to avoid confusion between shelter on site related to bushfire attack and the evacuation of the School for other purposes. The latter requires the School to be cleared of people whereas with shelter on site it is important that people stay inside a building within the School to avoid exposure to the impacts of bushfire, such as radiant heat, ember attack and smoke. The emergency procedures of the School Emergency Management Plans should be consulted for threats other than bushfire.

2.1 Evacuation decision matrix

The decision to shelter on site or evacuate off site should be reached following the evacuation decision matrix at Table 1 (following Figures 3 and 4). The matrix has been formulated based on the vulnerability of the School (building protection and occupants) and known bushfire risk.

The **refuge building for taking shelter on site** depends on whether construction of the new hall is completed:

- Prior to completion of New Hall (Building Q) – the refuge building to shelter on site will be Buildings E and M.
- Once New Hall (Building Q) is completed – the refuge building to shelter on site will be the New Hall (Building Q).

The location of both refuge scenarios is identified on Figure 3. The New Hall (Building Q) will offer the best level of protection as it will be located furthest from the hazard, have direct access onto Gilbert Road and will have the ability to accommodate the entire School community. Prior to the construction of the New Hall being completed, Buildings E and M will be able to accommodate the School community across the two buildings with a level of hazard separation similar to the New Hall. Building M is also compliant with BAL-12.5. The existing hall (Building B) is located on the hazard side of the school and therefore does not offer a safe level of refuge.

Off-site evacuation for the School community will be Castle Hill Public School (5 Les Shore Place, Castle Hill - refer to Figure 4).

Given the relatively small area of bushland adjacent the school buildings, and the large distance between the school and the surrounding gully systems, it is envisaged that on site shelter in place would be a suitable option. Otherwise it is expected that the School be closed prior to the start of the school day if significant fire activity was reported within the surrounding gully systems. Off site evacuation may occur if a significant fire started within a gully system during the school day and spread towards the site impacting the School with smoke and embers. It is important to recognise that the NSW Police are responsible for protection of life and any lawful request of Police must be followed. The decision to evacuate should be guided by NSW Police or Senior Officers of Fire and Rescue NSW.

Legend

- Subject Land
- Proposed Building
- New Hall Building Q - refuge building post construction

On Site Refuge

- Buildings E and M - refuge building prior to completion of Building Q

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Date: 4/03/2020

0 12.5 25 50

Metres

Figure 3: On Site Refuge Buildings (Shelter in Place)

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

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david peterson
0455 024 480 • david@petersonbushfire.com.au
po box 391 terrigal nsw 2260 • petersonbushfire.com.au

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Legend

- Evacuation Route A
- Evacuation Route B
- Subject Land
- Off Site Evacuation Point - Castle Hill Public School

N

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Date: 26/02/2020

0 125 250 500

Metres

Figure 4: Off Site Evacuation Point

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

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david peterson
0455 024 480 • david@petersonbushfire.com.au
po box 391 terrigal nsw 2260 • petersonbushfire.com.au

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If a bushfire is spotted near the School, the Chief Warden or Deputy Warden is to telephone NSW Rural Fire Service, The Hills Fire Control Centre (see Appendix B) to clarify the location of the fire and seek advice on the next point of contact if more information is required. Alternatively, any member of the ECO may contact '000' by following these steps:

1. Ring '000' and you will be asked 'Would you like Police, Fire or Ambulance'.
    a. Respond 'Fire' and advise Emergency Services of:
    b. The exact location of the incident;
    c. The nature of the incident;
    d. Any persons trapped or injured or likely to be injured;
    e. A contact number;
    f. A contact name;
    g. Any requirement for further assistance (e.g. an Ambulance if anyone is injured).

Table 1: Evacuation Decision Matrix

THREAT	FDR – FIRE DANGER RATING*1					
	LOW/MOD	HIGH	VERY HIGH	SEVERE	EXTREME	CATASTROPHIC
Fire predicted to impact site	Option to shelter on site	Option to shelter on site	Evacuate off-site if safe to do so*2	Evacuate off-site if safe to do so*2	Evacuate off-site if safe to do so*2	Evacuate off-site for forecast period if safe to do so*2
Time to fire impact is less than time required to relocate*3	Last resort. Shelter on site	Last resort. Shelter on site	Last resort. Shelter on site	Last resort. Shelter on site	Last resort. Shelter on site	Last resort. Shelter on site
Fires exist in region but no risk to site*4	Monitor situation	Monitor situation	Monitor situation	Prepare for evacuate off site	Prepare for evacuate off site	Consider evacuate off site
No fires	No action	No action	No action	No action	No action	Prepare for evacuate off site

*1 FDR can be sourced from NSW Rural Fire Service website for the current day or in the afternoon of the day before (http://www.rfs.nsw.gov.au/dsp_content.cfm?cat_id=1109). Fire weather information is also available from the Bureau of Meteorology (BoM) website (www.bom.gov.au). The BoM is able to distribute a daily information update regarding the weather forecasts and Fire Danger Rating should this be required by the ECO.

*2 Evacuate ONLY if safe to do so. Shelter on site if unsafe.

*3 Time to evacuate is the estimated time for all employees, students and contractors to be transported off School grounds and onto the road towards the off-site evacuation point. This may take more than an hour depending on the availability of transport.

*4 Fires may be located many kilometres away and therefore may only pose a negligible risk. However, under higher FDR precautionary evacuation may be wise because of depleted local fire-fighting resources and the unpredictability of fires at higher FDR.

2.2 Shelter on site procedures

1. Chief Warden to advise School community, including contractors, of the decision to shelter on site.
2. Chief Warden to activate fire siren.
3. Upon being alerted by fire siren, Area Wardens are to visit each classroom/building within their area advising all people to move to the on site shelter (refer to Figure 3 for location of refuge building).
4. Students/contractors are to leave school bags and possessions within the classroom/building.
5. All employees, students and contractors are to be registered (refer to Appendix E for example form).
6. The Chief Warden or Deputy Chief Warden is the 'Incident Controller' until relieved by arriving authorities e.g. Fire & Rescue NSW or Police.
7. The Chief Warden or Deputy Chief Wardens will ensure that a person able to further advise people of their welfare on an ongoing basis occupies the on site shelter.
8. The ECO will ensure that additional drinking water is available in the on site shelter.
9. If staff availability and time permit, personnel delegated by the ECO may be required to assist emergency services personnel to secure the School buildings by ensuring all windows and external doors are closed.
10. When in the on-site shelter building close all windows and doors.
11. Ensure the welfare of all evacuees through advice and first aid where required.
12. Watch for sparks and embers entering the on site refuge building and extinguish.
13. Upon finalisation of the shelter in place, the Chief Warden/Deputy Chief Warden will ensure that the incident is declared over, and when it is appropriate to do so, a debriefing of the incident will occur for all involved staff and Emergency Services representatives.

2.3 Evacuate off site procedures

Safe off-site evacuation of the School may take more than an hour to complete, depending on the availability of transport. Wherever possible, off-site evacuation should commence at least 2-3 hours ahead of the anticipated arrival of a bushfire.

The following procedures are to be followed when NSW Police or Fire and Rescue NSW initiate an off-site evacuation of the School.

1. Chief Warden to advise School community, including contractors, of the decision to evacuate off site.
2. Chief Warden to activate fire siren.
3. Upon being alerted by fire siren, Area Wardens are to visit each classroom/building within their area advising all people to move to the on site refuge building (refer to Figure 3 for location of

refuge building) to assembly ready for evacuation off site.

4. Students/contractors are to leave school bags and possessions within the classroom/building.

5. All employees, students and contractors are to be registered (refer to Appendix E for example form).

6. The Chief Warden or Deputy Chief Warden is the 'Incident Controller' until relieved by arriving authorities e.g. Fire & Rescue NSW or Police.

7. If staff availability and time permit, personnel delegated by the ECO may be required to assist emergency services personnel to secure the School buildings by ensuring all windows and external doors are closed.

8. A briefing on arrangements for transporting people to an off-site evacuation location will be provided by the Chief Warden/Deputy Chief Warden. At the briefing the School community are to be advised of the potential duration of the off-site evacuation.

9. The location of the selected off-site evacuation point will be made by NSW Police or Fire and Rescue NSW - this may or may not be the Castle Hill Public School (location shown on Figure 4). Authorities may instruct evacuation to an alternate location dependent upon the nature of the bushfire and its existing and predicted effects. Should time allow and safety permit, evacuation may consist of students being picked up by parents and contractors leaving site.

10. Once the evacuation procedure has been instigated, delegated School staff members are to close and secure the School to prevent unauthorised people entering the School grounds.

11. Employees, students and contractors should be checked off the personnel list when they reach the off-site evacuation centre.

12. The Chief Warden/Deputy Chief Warden or local authority will notify the School community of the ability to leave the off site evacuation centre. All employees, students and contractors are to be checked off prior to departing (refer to Appendix E for example form).

3 Preparedness for shelter on site

3.1 Bushfire protection provisions

Regular bushfire protection audits of the buildings and adjacent APZs are recommended and should consider:

- The maintenance of APZs in relation to designated area and fuel management standards (refer to Peterson Bushfire Bushfire Assessment Report).
- The provision of appropriate access/egress to the property so occupants leaving, and firefighters/rescuers accessing the property can do so in relative safety.
- Checks and maintenance of the water supply (e.g. ensure hydrants and extinguishers) prior to the declaration of the bushfire danger period each year.
- Site familiarity e.g. employees are familiar with fire detection systems such as alarms etc., evacuation procedures and the operation of any fire suppression equipment.

The above provisions are essential for adequate protection for sheltering on site.

The ECO shall arrange for the audit prior to the Bush Fire Danger Period each year which normally starts on 1st October but can occasionally start earlier depending on seasonal conditions. If the start and/or end date of the annual Bush Fire Danger Period is altered, changes will be notified on the NSW Rural Fire Service website.

3.2 Signage

The shelter on-site building is to be marked with a sign affixed to the wall near the main doors with the wording 'Bushfire Shelter On-site Refuge Building'. An updated list of Chief Warden and Deputy Chief Warden (along with first aid officers) is to be prominently displayed here and at other locations.

3.3 First aid equipment

The School is to provide basic first aid equipment to staff that may be involved in evacuation operations.

3.4 Bushfire information

Contact details for NSW Rural Fire Service are detailed in Appendix B.

Fire weather information is available from the Bureau of Meteorology (BoM) and the NSW Rural Fire Service (www.rfs.nsw.gov.au). Region specific information is available from the BoM website (www.bom.gov.au). The BoM are able to distribute a daily information update regarding the weather forecasts and Fire Danger Index should this be required by the ECO.

4 Emergency Control Organisation (ECO)

In accordance with *AS 3745-2010 Planning for emergencies in facilities*, an Emergency Control Organisation (ECO) is to be established for the School. The ECO has overall responsibility for the planning, preparation and implementation of the emergency procedures.

The ECO should consist of a Chief Warden, Deputy Chief Warden and Area Wardens. The ECO will also perform the duties of the Emergency Planning Committee (EPC) (Standards Australia 2010).

The ECO does not have a 'statutory standing'. It must follow instructions and advice from Emergency Service personnel related to the preparedness for and response to an evacuation. The managers of the School will ensure that instructions given by employees identified within the ECO overrule the normal management structure during emergency events/training when operating under this Plan.

Persons appointed to the ECO are to:

- Be physically capable of performing the duties required;
- Have strong leadership qualities;
- Have maturity of judgement, good decision-making skills and be capable of remaining calm under pressure;
- Have a comprehensive knowledge of the local area;
- Generally be on site during the Bush Fire Danger Period; and
- Be able to complete the required training (Section 6).

The person selected for Chief Fire Warden, in addition to the above, is to have a good knowledge of the layout of the School and the location of all fire protection equipment. The appointment of the Deputy is to ensure continuity of the Chief Warden's functions during absences.

It is essential that the persons appointed as Area Wardens have the qualities needed to enable them to perform duties required in emergencies. Area Wardens will be delegated by the Chief Warden or Deputy Chief Warden from suitable people who meet the requirements listed below:

- Availability;
- Ability to organise others in an emergency; and
- Reliability.

The School is to ensure that the ECO are indemnified against civil liability resulting from practice or emergency evacuations, where the personnel act in good faith and in the course of the duties as defined by this Plan

5 Responsibility of ECO, Chief Warden and Area Wardens

The Chief Warden and Deputy Chief Warden will coordinate the activities of staff during a bushfire event and ensure emergency responsibilities and duties are carried out. The primary role of members of the ECO is to ensure that protection of life, health and welfare of School community, including contractors, takes precedence over asset protection.

Each officer in the ECO shall have clearly defined duties and responsibilities.

5.1 Emergency Control Organisation (ECO)

The following is a list of the responsibilities of the ECO:

- Annual update of the Plan.
- Annual testing of the Plan.
- Reviewing and correcting any deficiencies in the Plan identified during annual testing or actual events.
- Distributing a current Plan in August each year to the Local Emergency Management Committee (LEMC) and other appropriate authorities. (e.g. NSW Rural Fire Service, Fire and Rescue NSW) – see Appendix D for document distribution details.
- Issue, to all staff with any responsibility for evacuation or firefighting, a copy of those components of the Plan necessary for their efficient and effective involvement.
- Display the emergency procedures and assembly area maps and to ensure that all signage is affixed in appropriate locations within the School as specified in Appendix A.
- During the Bush Fire Danger Period, a brief outline of the emergency procedures (Section 2 and Figures 2 and 3) is to periodically be included with all written handout material provided to staff.
- Maintain a Chief Warden and Warden roster.
- Provide safety equipment for the Chief Warden, Deputy Chief Warden and Wardens as outlined in Appendix C (i.e. safety vest, helmet, torch, mobile phone, portable radio, loud hailer) and any additional equipment determined appropriate by the ECO.
- Invite representatives of the Local Emergency Management Committee (LEMC) to participate in a review of evacuation exercises.

5.2 Chief Warden and Deputy Chief Warden

The Chief Warden and/or Deputy Chief Warden are responsible for the following:

- Monitoring fire risk (e.g. weather patterns) during the Bush Fire Danger Period (Section 3.4).
- Monitoring through contact with NSW Rural Fire Service, the progress and situation of bushfires in the local region (Section 2).
- Supervision of the ECO.
- Ensuring the ECO achieves its responsibilities (see Section 4).
- Preparation, management and activation of the Plan (in conjunction with the ECO).
- Liaising with Emergency Services and maintaining the Emergency Service contact lists (Appendix B).
- Maintaining and displaying a current list of internal contact telephone numbers in prominent positions (Appendix B).
- Movement of transport during evacuation until this function is undertaken by emergency service personnel.
- Setting up the evacuee registration system to check people into and out of the off site evacuation centre (see Appendix E).
- Arrange for the bushfire audit prior to the bushfire season each year.
- Implement annual evacuation exercises prior to the bushfire season to ensure that the School community know what to do and where to assemble in the event of a bushfire emergency.
- On becoming aware of a bushfire emergency or potential emergency:
  - Ascertain the nature of the emergency and determine appropriate response in accordance with the Plan.
  - Ensure that the appropriate Emergency Services are notified.
  - Ensure the suitability of the shelter on site building.
  - Instigate the operation of an evacuee registration system to check people into and out of the shelter on site building or off-site evacuation location.
  - Ensure the School community, including contractors, are notified that an orderly shelter on site or evacuation off site has been initiated.
  - Monitor the progress of the fire and notify fire authorities on their arrival and whenever else required.
  - Supervise the shelter or evacuation unless relieved of this responsibility by the attending

commanding officer of Emergency Services.

- Brief and co-operate with the Emergency Services personnel upon their arrival.

- Undertake a debrief with the School and, if appropriate, the local emergency services within one month of the conclusion of the emergency.

5.3 Area Wardens

Area Wardens are responsible for the following:

- Assisting with the notification and implementation of the shelter/evacuation.
- Assisting the Emergency Service personnel on their arrival, unless otherwise directed.
- Keeping the Chief Warden and/or Deputy Chief Warden regularly informed of the status of the emergency, and their current activities and location by telephone.

Area Wardens will also be responsible for assistance with setting up the evacuee registration system to check people into and out of the shelter on site building or off-site evacuation location.

6 ECO training and education

All members of the ECO are to be trained in evacuation procedures. Guidance should be sought from the LEMC concerning the format and content of evacuation training exercises where no such material is available.

The Chief, Deputy Chief and Area Wardens are to receive training/awareness in the following:

- The layout of the School, including evacuation routes, shelter building and evacuation centre.
- The operation of communication equipment (if specialist equipment is supplied).
- The operation of a registration system for the shelter on-site building or off-site evacuation centre (see example in Appendix E).
- The operation of the Plan.
- The staging of annual evacuation exercises.
- Bushfire awareness training.

7 Plan awareness

The Emergency Procedures of the Plan are to be displayed as specified in Appendix A. During the Bush Fire Danger Period, information from Appendix A is to be periodically distributed to residents and staff.

Staff and contractors are to be provided with an updated summary version of the entire Plan in September each year.

8 Debriefing

A debriefing, to be held within one month of each practice (or actual) evacuation and emergency, is essential to identify shortcomings in the procedures and Plan.

A representative of the Local Emergency Management Committee (LEMC) is to be invited to attend any debrief where emergency personnel have had an involvement in the exercise or actual emergency.

Minutes of the debriefing are to be recorded and distributed to all relevant agencies and personnel. Amendments are to be recorded within this document. Annual dissemination of the plan is to include these amendments.

Appendix A – Procedures display

The following evacuation procedures are to be displayed in conjunction with the on site refuge and off site evacuation figures (Figure 2 and Figure 3).

PLEASE READ THIS

WHAT TO DO IN A BUSHFIRE EMERGENCY REQUIRING EVACUATION

1. **DO NOT PANIC. Do not leave the School grounds under any circumstances until directed by emergency services or the Chief Warden unless there is imminent danger and to delay departure would jeopardise life.**

2. On hearing the fire siren or being alerted of an evacuation, all employees, students and contractors are to make their way to the shelter on site refuge building (Figure 2). The Fire Wardens wearing white, yellow or red helmet and/or a vest marked 'Warden' will assist in the evacuation. Please take directions from these persons.

3. Wherever possible, in a bushfire evacuation, avoid walking in areas with direct exposure to bushland areas or visible fire, and attempt to remain shielded from these hazard areas by a building. Generally, if a bushfire's flames are visible you should be within the shelter on-site building or making your way to it by a route as far away from the flames as possible.

4. Remain in the shelter on site building until further instruction – which may involve evacuating off site. Directions and procedures will be provided to execute off-site evacuation if required.

Appendix B – Contact lists

Internal contacts:

Position	Name	Telephone number
Chief Warden		M:
Deputy Chief Warden		M:
Area Warden		M:
Area Warden		M:

External contacts:

Emergency Services (**EMERGENCY**) police, ambulance, fire	**000**
NSW Rural Fire Services, The Hills Fire Control Centre	(02) 9654 1244
NSW Rural Fire Service information line	1800 679 737
NSW Rural Fire Service - Website	www.rfs.nsw.gov.au
Bureau of Meteorology - Website	www.bom.gov.au
Fire & Rescue NSW (Castle Hill Fire Station)	(02) 9680 1282
NSW Police (Castle Hill Police Station)	(02) 9680 5399
Blacktown Hospital	(02) 9105 5000
Westmead Hospital	(02) 8890 5555
Ryde Hospital	(02) 9858 7888
(SES) State Emergency Services	(02) 132 500

Appendix C – Equipment for Wardens

The following is a list of tools and safety equipment to be provided to the Wardens for use in bushfire emergencies and evacuations:

- Drinking water containers;
- Torch with spare batteries;
- A copy of the emergency procedures (Section 2).

Warden Identification:

Chief Warden and Deputy Chief Warden – White helmet, cap or hat and vest with the marking 'Chief Warden'.

Area Warden – Yellow helmet, cap or hat and vest with the marking 'Warden'.

Appendix D – Plan distribution

A copy of the plan is to be located in a prominent position in the shelter on-site building. All members of the Emergency Control Organisation (ECO) are to have a personal copy.

Copies are also to be sent to, and held by the following authorities:

- Castle Hill Police Station;
- Castle Hill Fire & Rescue NSW;
- Local Emergency Management Committee (c/- The Hills Shire Council)

Amendments made after annual reviews are also to be disseminated to the aforementioned organisations

Appendix E – Example check in/out form

Name	Staff, student or contractor	Time in	Medical requirements	Time out	Proposed destination after emergency

peterson bushfire
expert consulting services

david peterson
0455 024 480 • david@petersonbushfire.com.au
po box 391 terrigal nsw 2260 • petersonbushfire.com.au
FPA AUSTRALIA (NO.BPAD18882) BPAD LEVEL 3 ACCREDITED PRACTITIONER • ABN 28 607 444 833

peterson bushfire.
expert consulting services

david peterson
0455 024 480 • david@petersonbushfire.com.au
po box 391 terrigal nsw 2260 • **petersonbushfire.com.au**

FPA AUSTRALIA (NO.BPAD18882) BPAD LEVEL 3 ACCREDITED PRACTITIONER • ABN 28 607 444 833

David Peterson

David is a business owner specialising in bushfire protection consulting, planning and design. He has over 20 years' experience in managing environmental projects of a variety of backgrounds including over 17 years dedicated to bushfire protection planning within both the public and private sectors. David has been consulting at a senior level for over 16 years.

An accredited practitioner at the highest level, he is an expert in bringing solutions to challenging projects where environmental, engineering or planning constraints need consideration amongst bushfire planning requirements.

Operating since August 2015, Peterson Bushfire provides advice to clients from the development industry and government, Australia-wide.

Qualifications

- Accredited bushfire consultant (Level 3 – Alternate Solutions); Fire Protection Association of Australia BPAD scheme (2008).
- Graduate Diploma in Design for Bushfire Prone Areas; University of Western Sydney (2008).
- Bachelor of Environmental Science, Land Resources, First Class Honours; University of Wollongong (2002).

Previous positions held

- Principal Bushfire Consultant, Manager Central Coast; Eco Logical Australia (June 2010 – July 2015).
- Principal Bushfire Consultant; Eco Logical Australia (November 2008 – June 2010).
- Senior Bushfire Consultant; Bushfire and Environmental Services (January 2003 – November 2008).
- Conservation and Natural Resources Cadet; Wollongong City Council (January 1996 – January 2003).

david peterson
0455 024 480 • david@petersonbushfire.com.au
po box 391 terrigal nsw 2260 • petersonbushfire.com.au
FPA AUSTRALIA (NO.BPAD18882)
BPAD LEVEL 3 ACCREDITED PRACTITIONER
ABN 28 607 444 833

Examples of recent project experience, clientele and location

- Preparation of Bushfire Assessment reports for various subdivision applications in the Rouse Hill precinct (Castle Group, February 2017 – present).
- Preparation of Bushfire Assessment Reports for various subdivisions at Calderwood Valley and Jordan Springs East (Lendlease, January 2016 – present).
- Preparation of Bushfire Assessment reports for various subdivision stages at Huntley, Avondale (Visionary Investment Group, January 2016 – present).
- Preparation of Bushfire Attack Level (BAL) assessments for properties damaged during the Wye River and Separation Creek bushfire event, Victoria (Suncorp, January 2016).
- Preparation of Bushfire Assessment report for the Mooney Mooney and Peat Island Planning Proposal (NSW Government Property, August 2016).
- Preparation of Bushfire Fuel Load Monitoring Assessments for the M7 road corridor (M7 Westlink Services, June 2016 – present).

APPENDIX M – SITE LOCATION PLAN

Copyright

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PROPOSED SITE PLAN LEGEND

- EXISTING BUILDINGS TO BE RETAINED
- EXISTING BUILDINGS TO BE REFURBISHED
- PROPOSED BUILDINGS
- EXISTING TREES
- PROPOSED TREES
- SITE BOUNDARY
- ROOF OVER
- CONTOURS
- FENCE: EXISTING / NEW

08

CHANGES NOT CLOUDED:
- SOME LABELS THAT SHOULD NOT BE ON THIS DRAWING HAVE BEEN REMOVED.

00	PROGRESS ISSUE	13/03/20	NE
01	CONSULTANT INFORMATION	18/03/20	AB
02	PROGRESS ISSUE	04/05/20	NE
03	EFSG DETAIL DESIGN REVIEW ISSUE	05/06/20	NE
04	CC ISSUE	07/08/20	NE
05	EFSG DETAIL DESIGN REVIEW ISSUE 02	19/08/20	NE
06	CONSULTANT COORDINATION	14/10/20	NE
07	FOR CONSTRUCTION	17/02/21	JH
08	FOR CONSTRUCTION	01/03/21	JH
REV.	DESCRIPTION	DATE	INIT.

fulton trotter ARCHITECTS
SYDNEY
Level 3, 35 Spring Street
PO Box 1669
Bondi Junction, NSW 2022
t. (02) 9369 5941
e. sydney@fultontrotter.com.au
BRISBANE
SYDNEY

DIRECTORS
Greg Isaac raia — NSW 6855 — QLD 2920
Justine Ebzery raia — QLD 3313
John Ward raia — VIC 18804 — NSW 8371 — QLD 3847
Katerina Dracopoulos raia — QLD 4529
Mark Trotter fraia — VIC 17691 — NSW 4421 — QLD 1870
Paul Sekava raia — NSW 7180 — QLD 3108
Paul Trotter fraia — NSW 7177 — QLD 2646
Ryan Loveday raia — QLD 4500

www.fultontrotter.com.au

PHASE: **DD/DOCUMENTATION**

CLIENT: NSW Department of Education

PROJECT: Samuel Gilbert Public School

ADDRESS: Ridgecrop Drive
Castle Hill, NSW

DRAWING: **PROPOSED SITE PLAN**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

PROJECT NUMBER	DIRECTOR	CHECKED
7096SG01	JW	GI

DRAWING NUMBER: **A-S-1101** REVISION: **08**

1 PLAN
PROPOSED SITE PLAN
SCALE: 1:500

50 100 150mm @ A1

plot date: Monday, 1 March 2021 file location: BIM Server: sydbimsyd 21 - BIM Server 21/7096SG01 SGPS/7096SG01 SGPS - Site and External Works

APPENDIX N – TREE PLAN & ARBORICULTURAL REPORT

TREETALK
ARBORICULTURAL CONSULTING

ABN 36 323 568 677

Arboricultural Impact Assessment

Samuel Gilbert Public School
Ridgecrop Street Cnr Gilbert Road
Castle Hill

Project No 5229/J1

September 2019

Prepared for

Fulton Trotter Architects
Level 3, 35 Spring Street
Bondi Junction

Alison Sheil
Architectural Project Manager
alisons@fultontrotter.com.au
johnw@fultontrotter.com.au

By Consulting Arborist

Sue Wylie *AQF Level 5*

Sue Wylie *AAust. AAUK ISA*
TreeTalk Arboricultural Consulting
46 Beaconsfield Pde Lindfield 2070
reports@treetalk.com.au
P 02 9416 6607 M 0417 022 692

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1.0 Summary

Trees at Samuel Gilbert Public School (SGPS) have been considered in relation to extensive works proposed within the school grounds. New and extended buildings are proposed on the site. This report provides an assessment of the larger site trees, and then considers tree protection and management measures required during the planned works processes.

Over 600 trees or tree groups were considered. The trees are discussed in terms of their location in relation to works and their future longevity and beneficial outcome. Many trees are located within the works areas and will require removal.

The trees beyond works can be managed by isolating them from damage by all works processes. Those trees closest to works will require that specific on-site management be undertaken with the project arborist present to advise on intrusions and protection of roots and canopy during early processes.

General tree protection measures are provided within the report. This includes protection by isolation of tree groups and limiting works processes within the TPZ.

Image 1: Tall healthy trees providing shade and natural environment for school children

Specific tree protection measures are discussed in Sections 7 of the report, and general protection measures given in Sections 8 of the report.

2.0 Background

TreeTalk Arboricultural Consulting has been engaged by the project architects Fulton Trotter, to assess trees likely to be impacted upon by works proposed. The school is to be extensively enlarged to accommodate a greater number of children. New buildings are proposed in the south-eastern section of the site forward of, and linking to existing buildings. This area is currently naturally vegetated bushland with locally endemic trees and understorey.

Demountable buildings will be replaced with new buildings, and some are to be temporarily relocated in the eastern section of the oval at the rear of the site. A plan of the proposed building footprint is copied into Appendix A2.

The aims of this report are:
To satisfy the requirements of the consenting authority, by providing arboricultural data on the trees including their species, dimensions, health, structural condition and viability.

To provide arboricultural information, to the property owners, architects and other consultants, on the constraints presented by the trees, to assist in the design process.

Also, to provide information, during site works, for trees being retained, and necessary management measures required.

To advise the project manager, site managers and contractors on setbacks and tree protection measures, and necessary management measures required to retain each tree in a healthy and viable condition.

3.0 Method

Consulting arborist Sue Wylie, and assistants, visited the site on several occasions between April and July 2018, to assess the site and trees, and consider the likely impact by the works proposed.

Tree Assessment

The trees were assessed by the Visual Tree Assessment (VTA) method as described in Mattheck & Breloer (1994)[1], using non-invasive tools such as binoculars and acoustic mallet.

The VTA was performed from the ground considering overall *health* and vitality, including percentage of canopy, epicormic growth, deadwood, predation by pests and diseases, and *Structural condition*. Consideration was given to faults such as *Bark Inclusion*, poor branch attachment and mechanical or biological damage and, in some cases, Useful Life Expectancy (ULE). Neither internal probing of living tree tissue nor aerial inspection by climbing was undertaken.

Health and condition was rated as *Good, Fair* or *Poor* (see Glossary), based on assessment at the time of inspection. Notes are recorded on any tree concerns or matters found to be outside normal tree development.
Tree height was estimated, and where relevant the orientation of the canopy is given. The trunk diameter was estimated at breast height 1.4 metres (DBH) and/or above root buttress (arb.).

Tree Protection Measures

The Tree Protection Zone (TPZ)[2] and Structural Root Zone (SRZ)[3] has been arrived at using widely recognised methods as detailed in *Australian Standard AS 4970–2009* (Appendix B2).

Tree Numbering Anomality

Each line in the *Tree Data Table* - Appendix F, has been assessed as one tree. This may be because it represents a group of trees that either functions as a whole, or are dependent on each other for survival where removal of any one tree, may impact on the whole group. (i.e. trees that have develop as a group (possibly sharing canopy or roots), or the less successful ones may be suppressed and become insignificant).

Some survey points had no tree/s present, and we became aware that some trees were removed between site visits due to bush fire control measures.

1 Mattheck, Claus; Breloer, Helge (1994) *The Body Language of Trees: A Handbook for Failure Analysis - Research for Amenity Trees No 4*, Pub. Forestry Commission, London.
2 Tree Protection Zone: TPZ = an area around a tree with radius of 12 x DBH.
3 Structural Root Zone: SRZ = $64(D \times 50)^{0.42}$. As per Australian Standard AS 4970 – 2009, *Protection of Trees on Development Sites*.

4.0 The Site and Tree Location

The site comprises an extensive area of land rising from south to the north. The site is bounded by streets to the south and south-east. Remnant bushland is present to the west and north, between residential areas to the west, and a public oval to the north. Also, a preschool and shopping centre to the north-east (See Image 2).

The western and north western area of bushland is to be addressed in a separate report.

Existing structures include the main permanent buildings to the south with demountables nearby to the east and the north.

Vegetation is dominant throughout the site with mostly mature trees in *Good* to Fair health and condition.

There are no trees on adjacent land likely to be impacted upon by works proposed.

Note: The north-eastern boundary near the shops is fenced, however, not on the boundary.

Image 2: Aerial view of school from Google maps
Inset School symbol with tall trees from school web site

4.0 The Site and Tree Location

Trees in Ecologically Significant Areas

The building designs have been planned to avoid works in the ecologically important (Sydney Turpentine-Ironbark Forest (STIF) areas (see blue areas on Image 3),

The Southern corner STIF area is near extensive works and works processes.

The north-eastern STIF area is outside the area of works.

Trees South of Works

The densely vegetated area of tall trees along Ridgecrop Street and south of the existing buildings, will require removal of many trees to perform the works proposed.

Trees near Oval Area

Tree near the oval and those east beyond are outside the area of works with the exception of those west of the STIF area. These may be impacted upon by the temporary relocation of demountables.

Image 3: Aerial view of school & vegetation groups discussed in report from Travers s report

4.0 The Site and Tree Location

Trees East of Buildings

The trees east of the buildings are near the main pedestrian entrance from Gilbert Street. This area is near proposed works and may be impacted upon by work processes, particularly the excavation of the existing paths. There are few trees of significance in this location.

Trees West of Oval

Trees west of the oval provide an exemplary example of tall trees and sensitively installed play areas. Works will not impact on these trees.

Trees West of Buildings (OOSH)

This area to the west of buildings in the south-west of site, is utilised by the OOSH group. Works will impact on three trees in this area.

Trees near Car Park and Trees to South of Car Park

The south-western area of site, along Ridgecrop Street, and west of car entrance is beyond most of the works.

Image: 4 Trees near buildings with limited soil available

5.0 Findings

Larger trees on the site have been assessed individually, or in groups and the results are listed in Appendix F - T*ree Data Schedule.*

The history of impact on the trees is evident near the buildings and expansions to the west and north. The installation of demountables does not appear to have significantly impacted on trees to the south.

There was very little, large deadwood present, and this appears to have been successfully managed during annual tree inspections.

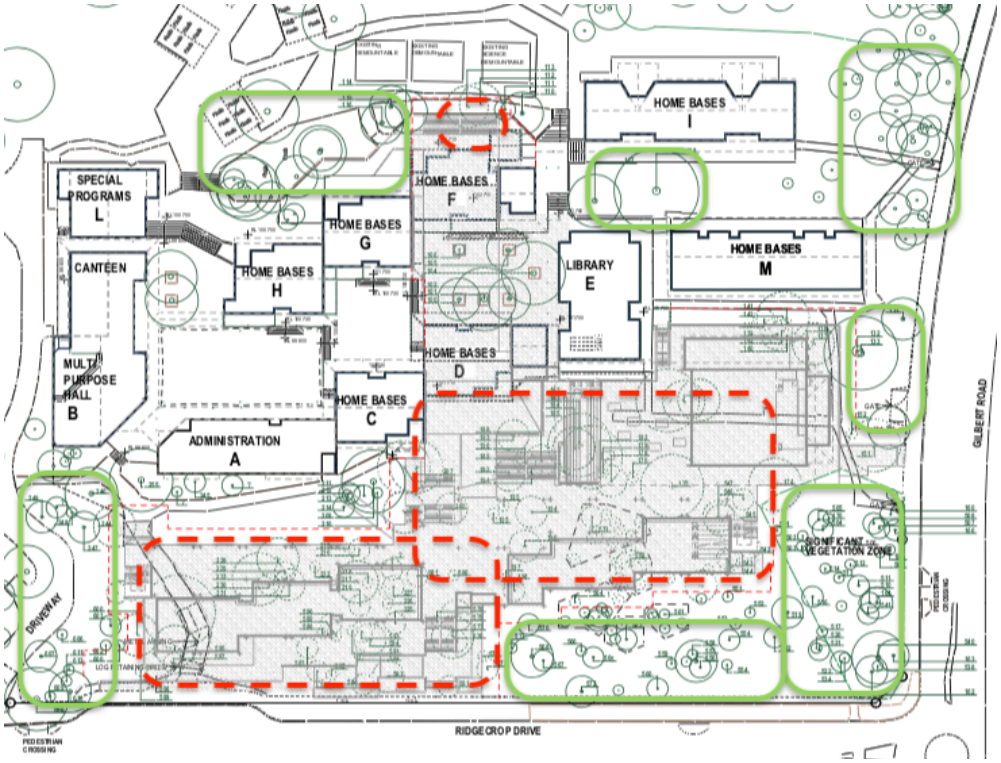
Summary of Findings

A definitive number of trees requiring removal is difficult to determine at this stage. All trees within the building platform will require removal, i.e. all trees within the red dashed areas. (See plan below).

Trees within three (3) metres of the building platform will require removal to facilitate the works processes.

Trees beyond three metres of works will require that careful management of most of their Tree Protection Zone (i.e.10 x trunk diameter) must be undertaken.

This information is summarized in Sections 8 : *Tree Protection Measures*, of this report.



Plan: Aerial view of tree management. See Appendix A4 for larger plan

5.0 Findings (continued)

The total number of removals has been determined on the site plan (Appendix A2) which reflect the building platform. An allowance of three (3) metres has been made beyond the building platform. All trees within works area are to be removed and nearby trees can then be considered for future potential at the completion of works.

Trees Proposed for Removal:

- Trees within the building platform – Removal of all trees within the building platform is proposed. See Appendix F for colour coding (Red) and Appendix E3.

Trees Requiring Protection and further consideration:

Trees three metres from building platform, can be isolated from works with fencing.
Colour coded Green.

- Trees with canopies overhanging the building envelope will require pruning (Appendix E1) Colour coded Blue.

This is detailed on plan Appendix A4. Distance of TPZ and SRZ are provided in Appendix E1.
Some trees where encroachment into TPZ is greater than 10% will require further consideration.

Reasons for further consideration include:

- Mature trees of significance with a short Useful Life Expectancy, or structural or health concerns.
- Understorey protection and soil management.

On-site Management

Arboricultural management of works near trees must be undertaken, and this should be established when trees are isolated with fencing from works processes. This will include trees with limited futures, trees requiring formative pruning and trees unsuitable as an *edge tree*.

Pruning

Clearance pruning will be required to perform some works (scaffolding or building process) near trees. Works must be performed to AS4373 (Appendix D). Pruning requirements for trees near works i.e. branches that may conflict with building processes or are likely to become long lever arms (this can be managed in annual tree assessment).

5.1 Discussion by Area

Ecologically Significant Areas

Areas of ecological significance have been identified in the Travers Ecological report, one in the south-eastern corner and one in the north-eastern section of the site.

These areas are shown in blue on the map (see Image 3) including areas Q4 and Q5 and have been identified as STIF (Sydney Turpentine-Ironbark Forest community) an endangered ecological community, listed by the NSW Scientific Committee.

STIF Area South

Trees in the south-eastern corner of the site have works proposed up-hill, and nearby. These must be carefully protected and isolated from the works processes. Trees in this area with unusual growth or damage, appear to be those where mechanical damage has occurred (possibly from mechanical clearing or tree removal). In most cases these tree have managed to maintain their structural strength by compartmentalisation (CODIT).

STIF Area North

Trees in the north-eastern corner (Lilli Pilli [sic] Grove) (see Image 5 below), are outside most works proposed. They impact upon these trees can be avoided by managing the relocation of demountables nearby Upon close inspection, most trees in this area are in *Fair to Poor* health and structural condition, many with signs of stresses that require remediation of the soil area.

This area does not have the benefits of the understorey of the lower area south of the buildings.

Image 5: Lilli Pilli Grove – STIF north
Fill under trees causing decline

The reasons for the poor growing conditions are not clear, however, it appeared to be due to human elements rather than natural occurrences.

There is fill and rubble in this area and this has built up around the trunks of trees. If this area is to survive in the longer term, this fill and rubble should be removed to clear the tree trunks.

5.1 Discussion by Area (continued)

Oval Area

The area north of the buildings comprised the school oval. The contrast between the dry open oval and the healthy tree canopy in sandpit area are an excellent example of the benefits of trees.

The area east of oval is relatively undisturbed natural bushland. Several dead trees were noted; however, we were advised that this is an 'out of bounds area' where children are not allowed to play, and therefore maintenance has been limited.

Images 6- 8:
Oval area and compacted soil

5.1 Discussion by Area (continued)

West of Oval

Trees in this area are very tall and heathy, with the under area modified to provide active play. The soil in this area was not compacted and not as dry as was the area around oval. The trees in this area are an exemplary example of the possibilities for interaction between children and trees (see Images 9-11 below).

Images 9 - 11: West of Oval natural area of tall trees with sensitive understorey additions

5.1 Discussion by Area (continued)

South of Works

Trees in the area south of the works are similar to the STIF community in the south-eastern corner of the site. This is the area where most building works are proposed and many of the trees close to the buildings will require removal. With the exception of one Turpentine (Tree 174), no one tree is significantly more beneficial than any other. Rather the whole area is made up of relatively healthy trees with an understorey of smaller remanet, and endemic, trees and shrubs.

Bush fire mitigation measures appear to be having an adverse impact on tree health and longevity, also on the understorey. The long-term outcome, if this method of management is continued, will be the loss of a unique and exceptionally beneficial environment. (See notes on bushfire mitigation in Appendix B4) of trees in the south and south-east of the site.

Careful and specific management will be required to limit the impact on retained trees.

East of Buildings

The area east of buildings, near the main pedestrian entrance from Gilbert Street has some revegetation. Also, near this and the entrance from Ridgecrop Street, appears to have been revegetated. Trees are mostly planted mid-storey and understorey native species (non endemic), in generally *Fair* health and condition. Works are proposed in this location and none of the trees are individually significant.

West of Buildings (OOSH)

The area to the west of buildings in the south-west of the site is utilised by the OOSH group. There are many examples of creative play and enjoyment evident with the children using the natural materials such as sticks, bark and gum nuts. This area appears to be used for both active and passive activities. Car parking will impact on three trees in this area.

Image 12: Tree #13 near car park with damage under main leader

Car Park and Trees to South.

This area south-west along Ridgecrop Street, is west of car entrance to site and below the carpark. One tree (Tree 13) on the corner of the carpark entrance presents a high risk and should be assessed further and will most likely require removal (see Image 12). This area is beyond most works.

6.0 Discussion of Assessment

Background in Assessment

Trees can be assessed in two separate ways which can potentially appear contradictory. These are listed as tree *Heath* and tree *Condition*, and are an important summary of the tree assessment. These are recorded in the relevant columns in the *Tree Schedule* Appendix F,

Tree Health

A tree's *health* (and vitality) depends upon its growing conditions, and limiting factors such as access to water and air - particularly in their root systems. Prolonged stress in the form of limited water availability, or lack of air from soil compaction or fill over roots, will severely impact on a tree's Health. The tree will be stressed while using stored sugars, and can become vulnerable to damage and diseases that it would normally be manage by the tree using its defence mechanisms of Compartmentalisation Of Decay (or damage) In Trees (CODIT).

A tree can be resilient, and overcome periods of decline in the short-term. Where adverse conditions are eliminated or are remediated, a tree can re-establish and improve in health and vigour as smaller roots are regenerated. This is apparent in the north-eastern corner (Lilli Pilli Grove) area, where most trees are in only *Fair* health and condition. It appears likely that this is due to fill or building rubble – which limits air to smaller roots, and has adverse impacts on the root crown (flare at the base of trunk) in many trees.

Tree Condition

A tree's *Condition* (and structural stability) is important in its ability to stay upright, and be of sound structural condition. This is important both above and below-ground and particularly to the root crown (base of trunk see note above about Lilli Pilli Grove).

Above-ground structural *Condition* can often be managed by removing or managing weak attachments e.g. formative pruning, removing '*included bark'* and managing crossed or poorly formed branches. Also, to allow good leading branches in semi-mature or supressed trees by removing overhanging branches of a dominant tree (as in the area south of the buildings).

6.0 Discussion of Assessment (continued)

Below-ground condition of a tree is less accessible for assessment and consideration of the sites history is one of the only guides.

This is the primary reason for *setting back* works near a tree. (i.e. outside SRZ). Where concern such as this arise, root mapping can be undertaken to better understand the tree's below-ground conditions and root strength.

Further assessment of canopies after removals is recommended for the trees at the edge of retained group.

Crowded Tree Canopies

The structural condition of trees to being retained in the area south of the buildings are of concern where competition for light and space limits the growth of adjacent younger – (future canopy) trees.

While this is of little concern in natural areas, where this occurs (as in the area south of proposed works), changes such as those proposed, will require assessment to ensure that the tree is able to develop in a structurally sound way (see Image 13).

This can be managed with formative pruning such as removing overhanging branches of an adjacent tree to allow a good strong leader in the supressed tree.

Image 13: Crowded and competing canopies

7.0 Discussion of Tree Groups

Canopy Trees - Eucalypts

The canopy trees are mostly those of the Sydney *Turpentine Ironbark Forest community* (STIF) and the *Sandstone Ridgetop Woodland*. This wide variety of these trees and tree species provided an excellent environment for the school and wider area. This island of tall trees has many benefits and can continue to provide these into the future if appropriately managed.

This vegetation also providing an appreciation of tall trees as a positive experience for the students, and an awareness and understanding of native species and natural bushland, often lacking in many schools.

Understorey Species

Trees as identified in the Tree Data schedule and the understorey as identified in the Travers report are suitable for replacement planting. The under and mid-storey vegetation are important in attracting birds and other fauna.

Weedy Species

There are a few weedy species present on the site. One area requiring management is the area south of the carpark. This is to be expected as this is the lowest point in the land and run-off from the hard surfaces of the bitumen surfaces, concentrates weeds and allows germination.

Solutions to managing weeds are as follows:

Ensure that the understorey is maintained in a natural state (e.g. bush regeneration techniques), and allow endemic seed sources to succeed. Limit weed seeds entering or germinating in this area by e.g. diverting run-off from parking area/hard surfaces into drains or away from natural areas. Plant endemic species on higher land. Finally, avoid exotics that readily self-seed e.g. *Koelreuteria species* –Rain Tree.

7.0 Discussion of Tree Groups (continued)

Future Planting

Where tree planting is desired, initial species considerations should be those of the Cumberland Plain selection, and planted in appropriate soil in areas of as defined in *Travers maps.* These trees include Turpentine-Ironbark Forest and Sandstone Ridgetop Woodland. Also, a selection of rainforest trees that may have been present in the past, is another good option.

Locally Endemic Shrubs, grasses and ground covers

An understorey is beneficial to whole tree health and survival, as well as protection of the soil area for healthy tree growth and protecting fauna.

Exotic Trees

Exotic trees, where required, must be considered for their future weed potential. It is noted that the *Koelreuteria species* - Rain Tree appears to be becoming of greater weed potential in the Sydney region (It is noted as a weed in dryer locations and it is becoming (anecdotally) apparent, that this species is now self-seeding in areas not previously considered a problem. This is possibly due to 'climate change/warming' creating more suitable growing conditions).

Maintenance Pruning Works

Maintenance works, as performed in the areas near buildings, have been managed well. The changes of site usage will require that new areas of impact are closely considered in annual reviews of the trees, e.g. management of deadwood. All deadwood (3cm∅ at branch junction) should be removed in *high target* areas.

Consideration should also be given to conflicting branches that could weaken a tree, as well as branches that could limit growth of a beneficial and supressed tree (See image 13).

7.1 Discussion of Tree Removal / Retention

Tree Removal for works proposed

All trees within the building platform will require removal Appendix E3. An additional distance to allow for the building process will also be required. Three (3) metres will accommodate most works processes. Trees beyond the additional three metres will require assessment of their suitability for retention.

Note: It has been requested by the ecologist that dead trees be retained for habitat. Where these dead trees are outside the proposed works, these have been noted for retention.

Table 1: Tree Removals or Consideration

Species	Location	Reason / Works Required
Various Trees mainly Eucalypts	South of existing buildings	Removal of trees within building platform
Various Trees mainly Eucalypts	South of existing buildings Building envelope – 3m around areas of works	Removal of trees 3m from building platform Soil surface protection required.
Various Trees mainly Eucalypts	South of existing buildings Trees beyond 3m works process allowance	Isolation and protection of trees. Reassessment manage trees E.g. unsuitable for *edge* location.
Weedy species	As required	Weedy species
Various	demountable class rooms relocation process	Route taken may impact on existing trees
Single Eucalypt	Tree 13 - near car parking access	High risk tree – assess further

Tree Protection

As all works are to be above existing grade, the impact on trees is limited to footings, which must be by pier or beam construction (not strip footings).

Landscaping: Ideally any new paths can be designed to be *entirely* above, existing grade. Features such as paving or paths should be designed to be entirely above existing grade within the Tree Protection Zone (TPZ) of retained trees.

The process of removing and relocating demountable class rooms to the oval area can be managed to limit impacting on retained trees in the moving process. The route taken by the buildings and the equipment used must be carefully considered to limit damage to trees (including the soil beneath these trees) proposed for retention.

7.2 General Summary of Discussion

There are no individual trees that are more prominent others. Rather the groups of trees present extensive canopies providing many amenity and environmental benefits.

Most trees are growing and surviving as expected. Taller canopy trees (mostly locally endemic Eucalypts and Allocasuarina) are growing well in natural areas and are growing less vigorously with limited growth in impacted areas of compacted soil and planter beds.

Shorter lived and understorey species such as wattles and hakeas are in various degrees of ageing and becoming over-mature.

Regeneration of this important understorey and mid-storey layers are being adversely impacted upon by bushfire mitigation measures (see Appendix B3).

As currently practiced this is likely to lead to gradual tree decline of the overall area. It is recommended that this be managed to halt a decline of the beneficial elements and ensure the survival of this unique area.

The exception to tree health is the fallen tree in the south-western section of the site and this appears to be due to changes/failure to soil strength and cohesion and increase water into the area. The drainage along the southern area has mounding present, apparently in relation to surface water management. It is possible that this, followed by extreme weather conditions, is the reason for the fallen tree.

Trees further east, along this drainage areas do not appear to have been adversely affected.

One tree that requires further consideration if it is to be retained, is the tree near the corner of the car park. This tree (see Image 12) has significant faults under the main branches and is in a high target area of frequent usage by people and cars.

Image 12: Tree near car park with damage under main leader

8.0 Tree Protection Measures and Likely Impact on Retained Trees

Site Preparation

The site preparation process is the initial time that trees are likely to be adversely impacted upon. Protection fencing, soil surface protection and run-off management must be in place before any other works occur (Appendix A4 and C1).

Care must be taken to isolate the trunks of any trees where works are proposed within the SRZ (Appendix C2). This will be defined when closer inspection of trees near works is undertaken.

General Tree Protection measures are provided in the following section Sections 9.0, 9.1 and 9.2. Any level changes will adversely impact on retained trees as their roots are mostly in the top 20cm of soil.

Work Between Buildings and Trees

All works between buildings and the TPZ of trees must be managed. Installation of, or changes to drainage must be addressed as this is likely to impact on adjacent trees. Landscaping features, such as soil surfacing, walkways or paving must be above existing ground level (and including and accommodating all base works; not just FFL's).

Key to Tree Outcome (including Ecological and landscaping considerations)

The outcome of trees in the area of works are colour coded in Appendix F and individually provided in Tables E.

Key to Tree outcome	Colour code in Appendix F
Trees proposed for retention and protection	# Retain & Protect within 3m of works # Retain & Protect
Trees proposed for removal	# Remove
Other uncoloured tree #'s	Beyond works areas

8.1 Trees

Areas of Semi-Mature Trees – Trees with Long-term Potential

Semi mature or supressed trees are an opportunity to consider the future canopy growth. The southern boundary along the fence line is an area where semi-mature trees are growing. Individual inspection of these trees was not undertaken as they can be isolated beyond other trees being protected. Also, they are not indicated on the survey.

Mature Trees

Mature trees are at their best both aesthetically and environmentally with large canopies, large amounts of stored carbon and expansive canopies of photosynthesising leaves. Mature trees also require management. This is not difficult, rather it requires considered assessment in managing risk.

Exotic Trees

Some exotic trees have been planted around and between the buildings providing a contrast with most being deciduous

Weeds

The area south of the car park, is weedy compared with other areas on the site. Run-off from the car park area has introduced competition in the form of weed establishment.

8.2 General Protection for Retained Trees

Tree protection measures for tree/s being retained will include isolating each to the extent of TPZ/works **before any other works begin**. And maintaining the soil area in its existing condition until the landscaping phase (see Appendices A4 and C1).

Both above and below-ground sections of each tree require protection. Fence (See Appendix C1) each tree or group of trees to TPZ. Where this is not possible or where works or access are required near the tree/s, wrap trunk and install mulch and rumble boards (See Appendix C2) and isolate root zone as diagrammatically represented on plans in Appendix A4.

TPZ

To protect soil from compaction or contamination storage of material must be outside the TPZ.
Where access is required within the TPZ the area should be mulched and rumble boards added (as per Appendix C2). Where there are difficulties isolating tree and tree root zones from works processes, please discuss this further with your project arborist.

Engineering works must be considered by your project arborist and be outside SRZ and most of TPZ.

Surfacing and all associated works must be above existing grade, and performed with consideration of tree roots below. Do Not mechanically scour under tree/s being retained as this will detrimentally impact on roots which are near the surface.

There must not be any level changes with TPZ by an area greater than 15% unless specific arboricultural consideration is given to the works proposed.

SRZ

Any works within SRZ requires that specific and detailed arboricultural assessment be undertaken.
Where access is required within the SRZ the trunk must be isolated/wrapped, the area mulched and rumble boards added as per Appendix C2.
Footings for works or boundary fencing within SRZ - must be of pier and beam construction and NOT strip footings.

8.3 General Tree Protection at Work Phases

Site Preparation

To ensure that adequate tree protection is in place, it is important that protection measures are the first works on site. Fence tree/s to the extent of the TPZ or to specific distances given in the report (see Table 1).

Where access is required within the TPZ, wrap trunk and protect soil within TPZ with geotextile fabric, mulch and rumble boards where fencing is not possible (this must be specifically discussed).

- Consider branches that may interfere with works process and manage or prune (See Appendix D).
- Consider where materials are to be stored and keep this outside tree protection zones.
- Protect tree from run-off from works processes, particularly materials that can change soil chemistry, as this is detrimental to trees, particularly native species.
- DO NOT CHANGE SOIL LEVELS within TPZ without arboricultural advice (Tree roots are usually located in the top 30cm of soil and reductions in soil level can remove most of a tree's roots. Additionally, and increases in soil levels or fill can reduce available air to roots and cause them to die).

Table 2: Tree Protection at Stages of Works

Works Phase	Protection Required	Solution
Site Preparation	Protect Tree canopy, trunk and roots with clear separation from work processes.	Install tree isolation fencing as per distances given in Table 2. (Protect soil where staged works are proposed within the SRZ). Install soil surface and run-off protection for TPZ.
Site Works	Protect tree canopy, trunk and roots. Maintain soil in current condition. Protect soil and roots run off.	Maintain soil surface protection and retain fencing. Contractors should be made aware of the importance of retaining tree protection measures and avoiding damage to vegetation being retained.
Services	Maintain soil in current condition.	Install all services outside tree protection area. No excavation below existing grade without specific arboricultural advice being provided.
Landscaping	Soil and tree roots zone. Cut and Fill.	No significant level changes (no reduction in soil level unless specified. No fill over 10cm unless it is with **structural soils**).

Do not perform works within SRZ without your arborist on site & specific information provided.

9.0 Summary of Assessment

Most trees at Samuel Gilbert School (SGPS) are relatively healthy and in mostly *Good – Fair* condition. This is particularly the case in the areas of dense vegetation. Understorey retention (even with clearing for fire management) has retained a natural level of soil protection by vegetation at ground level. Canopy competition and suppression are the main causes of limitations on future canopy trees.

Factors affecting some trees are compaction near the heavily used areas e.g. around the oval. Trees in the north-eastern ecological area are in decline due to damage to their growing conditions and fill around the base of many trees. It is possible that this was caused during much earlier works on the site, with fill dumped in this area. Remediation of this area is recommended to remove fill from the base of trees and see if this tree decline can halted.

The Tree Data Schedule (Appendix F), provides the initial assessment of tree *Health and Condition*. The trees have then been considered regarding the impact of works proposed. Methods to minimise the impact of works on retained trees is discussed in Sections 6 and 7 of the report.

Tree Protection measures are provided in Sections 8.0 8.1, 8.2, and 8.3 of this report. *A diagrammatic representation of tree protection fencing is provide in Appendix A4 and specific distances of fencing given in Appendix E2.* An intrusion of 10% of TPZ *area* is acceptable (as per AS4970) and possibly a greater area if arboriculturally managed. Intrusion into the Structural Root Zone (SRZ), is likely to affect tree stability and therefore increasing risk to nearby property and people.

Specific Calculations of tree protection distances, for *set-backs* for works from trees are provided (see Appendix E). On-site tree management advice prior to site works, in a discussion between the site manager and the project arborist is recommended.

Important factors to consider during works will be that:

- Soil areas around retained trees, must be kept un-compacted and free of fill or building rubble. Fill and building rubble must not be discarded within the TPZ of retained trees.
- Run-off from works processes must be diverted to ensure that it does not enter TPZ of retained trees. Ideally run off can be diverted into drains or away from vegetated areas.
- To prevent tearing by works processes, ensure adequate clearance from canopy. Pruning must be performed before works (See Appendix E1 and Appendix D).

10.0 Conclusion

Over 600 trees and tree groups have been considered. The location of the new buildings has been determined by many factors beyond individual trees and tree health and tree structural condition. Some ecologically sensitive areas of the STIF endangered community have been defined in the Travers ecological report and this has been a critical factor in their retention, protection and management. On-ground assessment of these areas defined two areas of concern beyond the scope of this report and these should be considered for future site management (see Management of soil in north-eastern area, and management of fire mitigation in other areas).

Many large trees will be removed, however, with the exception of the Turpentine's (of which there are few remaining on the site, (and after which the Sydney Turpentine STIF community is named) other trees are generally similar with none being more individually significant than another. The trees have been considered by area of different growing conditions. While understorey trees were not individually assessed, it is important to note that they are important in the overall health of the larger trees.

As all building work, with the exception of footings, are to be above ground, management of works near a large tree, can be managed by isolating them as groups. Discussion of findings is provided in Sections 6 and 7.

Necessary protection measures, set-backs, and constraints required to adequately manage all trees being retained, are provided in this report. See Sections 8 and diagrams in Appendices A4, C1, C3 and E1.

11.0 Recommendations

To minimise the impact on the trees being retained, works must be performed as discussed in Sections 8.0, 8.1, 8.2 and 8.3 of this report.

The site manager and contractors must be advised of Tree Protection requirements, and a copy of this report should be available on-site at all times.

The most relevant sections of the report are *Appendix A4 – Indicative Tree Protection Diagrams*, Sections 8.0 and Appendices C1 and C2.

Please contact me directly on 0417 022 692, if any sections of this report require clarification.

Sue Wylie
Principal Arboriculturist
TreeTalk Arboricultural Consulting
Diploma of Horticulture (Arboriculture)
Australian Qualification Framework (AQF5)

Age of Tree:

Young: Less than 1/3 life expectancy
Semi-mature: 1/3 to 2/3 life expectancy
Mature: Older than 2/3 life expectancy
Over-Mature /Senescent: Older than 2/3 life expectancy and showing signs of irreversible decline

Condition of Tree:

Good: Tree is generally healthy and free from and obvious signs of structural weakness or significant adverse effects of pests and diseases or infection.

Fair: Tree is generally vigorous although has some indication of being adversely affected by the early effects of disease or infection or environmental or mechanical damage. Appropriate tree maintenance can usually improve trees overall health and halt decline.

Poor: Tree in decline and is not likely to improve with reasonable maintenance practices or has a structural fault such as bark *inclusion*.

Dead: Tree no longer capable of sustained growth

Compartmentalisation: CODIT – Compartmentalisation of Decay or Damage in Tree

Diameter at breast height (DBH): The nominal trunk diameter at 1.4 m above ground level

D = Ø arb = Trunk diameter, in m, measured above the root buttress

Dead Wood: Noted in tree data table **D/w**. All deadwood will eventually fall and should be removed in high target/high usage areas, as per AS4373 (Appendix D).

Development Works: Includes any physical activity in relation to land that is specified by the determining authority.

Edge Effect: Tree/s where changes/sudden exposure of its growing conditions, may affect canopy growth or structural condition.

Included Bark: Patterns of development at branch junctions where bark is turned inwards rather than pushed out. – A potentially weak attachment.

Project Arborist: The person responsible for carrying out the tree assessment, report preparation, consultation with designers, specifying tree protection measures, monitoring and certification. The project arborist will be suitably experienced and competent in arboriculture, having acquired through training, qualification (minimum Australian Qualification Framework (AQF) Level 5, Diploma of Horticulture (Arboriculture)) and/or equivalent experience, the knowledge and skills enabling that person to perform the tasks required by this Standard.

Structural root zone (SRZ): The area around the base of a tree required for the tree's stability in the ground. The woody root growth and soil cohesion in this area are necessary to hold the tree upright. The SRZ is nominally circular with the trunk at its centre and is expressed by its radius in metres. This zone considers a tree's structural stability only, not the root zone required for a tree's vigour and long-term viability, which will usually be a much larger area.

Tree: Long-lived woody perennial plant greater than (or usually greater than) 3 m in height with one or relatively few main stems or trunks (or as defined by the determining authority).

Tree Protection Zone (TPZ): A specified area above and below ground and at a given distance from the trunk set aside for the protection of a tree's roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development.

TMO/TPO Tree Management Order/ Tree Preservation Order – Legislation (usually part of Local Environment Plan (LEP) directing management of trees and vegetation).

ULE: Useful Life Expectancy (after Barrell) A modified version of this ULE has been used to include only Long/Medium/Short ULE (see Table in Appendix B5).

Vigour: Ability of a tree to sustain its life processes. The term 'vigour' in this document is synonymous with commonly used terms such as 'health' and 'vitality'.

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Site Specific
www.samuelgilbert.nsw.edu.au/our-school.html

Trees are dynamic living structures, growing and adapting to conditions around them. A Tree's condition will change and vary over time depending on weather, environmental factors and mechanical or human interaction.
Assessment is limited to the conditions at the time of the inspection and only trees discussed in the report have been assessed. Plans used to assess likely impact are those appended (Appendix A).

Ongoing monitoring of all nearby trees is advised and where significant changes are observed, further advice should be requested. Unusual developments or sudden changes in a tree's condition should be addressed immediately.

There should be **NO changes within the Structural Root Zone** (SRZ) of a tree without specific arboricultural advice and supervision being provided from an experienced AQF Level 5 arborist.
This also applies to underground utilities and services such as plumbing/gas/drainage and can also apply to landscaping works such as paving below existing grade and fill greater than 10cm above grade.

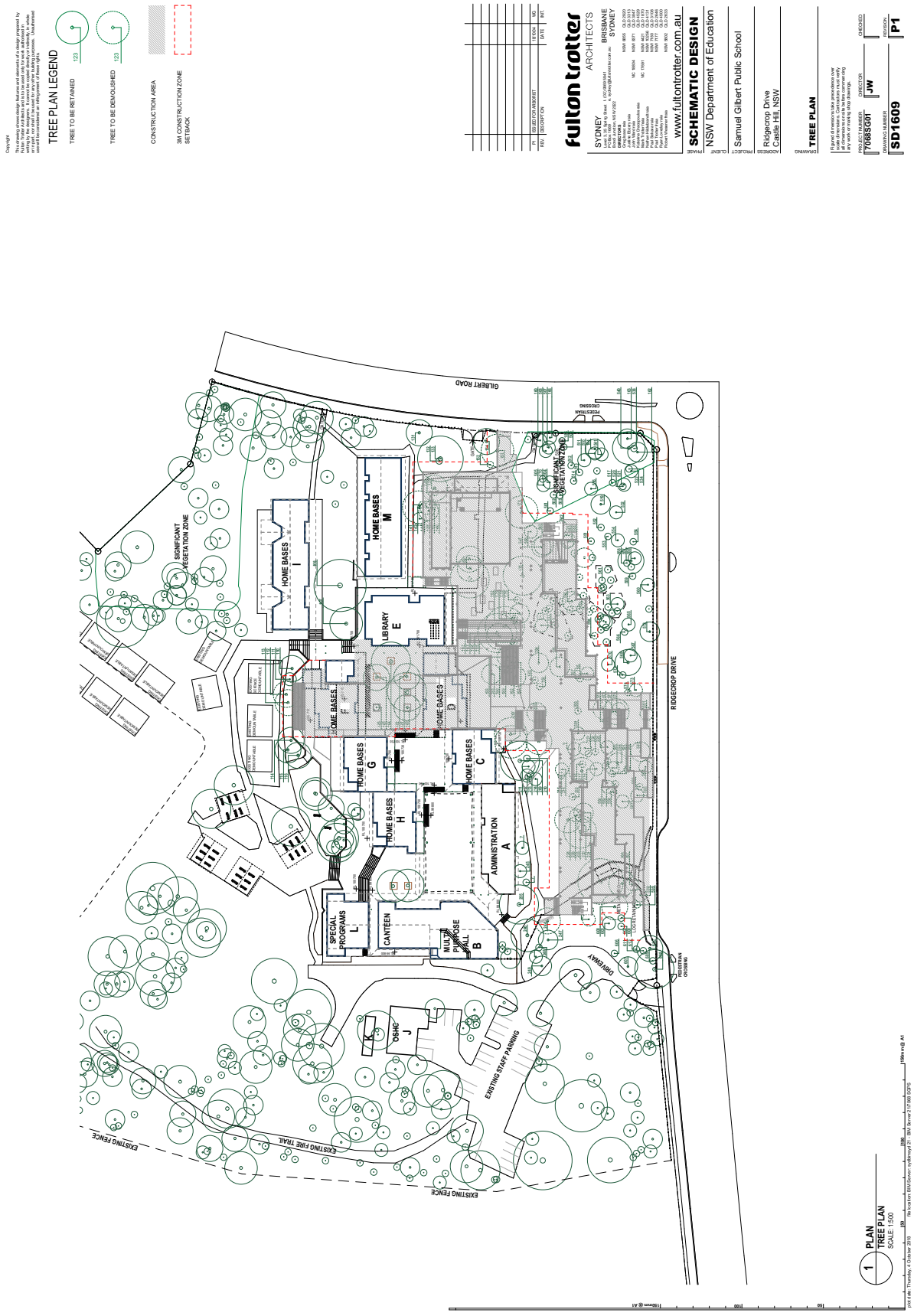
Photographs are inserted as a guide to matters discussed however these could be misleading and may exaggerate or minimise the elements under discussion. The text should be the main guide to the importance of images and diagrammatic representation on plans.

This report is primarily about tree protection measures as they relate to the works proposed (as given in the attached plans) and does not necessarily address tree maintenance or tree management works required.

The report is to be considered in its entirety and where unclear clarification should be sought.

Tree Numbers added to Site survey by LandPartners Limited, Drawing No. SY074362-SV1, Dated 06/12/2017
*see larger format plan and latest modifications sent separately

Tree Plan by Fulton Trotter Architects, Project No:7068SG01, Dwg No: SD1609/Rev P1, Dated 18/10/18
*see larger format plan and latest modifications sent separately



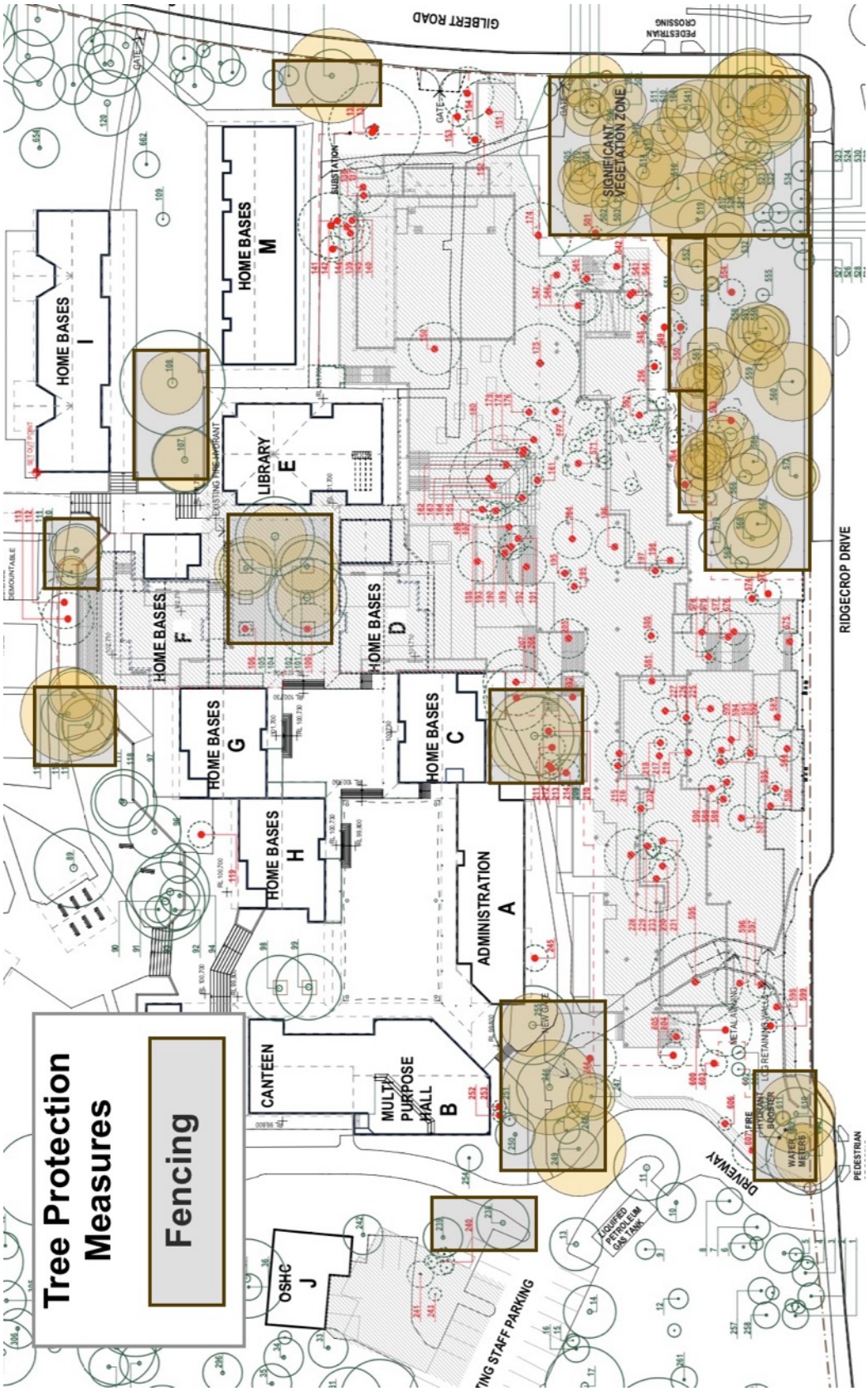
TREE PLAN LEGEND
TREE TO BE RETAINED
TREE TO BE REMOVED
TREE PROTECTION ZONE (TPZ)
CONSTRUCTION AREA
3M CONSTRUCTION ZONE SETBACK
PROPOSED BUILDING WORKS
fulton trotter ARCHITECTS
SYDNEY
BRISBANE
SCHEMATIC DESIGN
NSW Department of Education
Samuel Gilbert Public School
Ridgecrop Drive
Castle Hill, NSW
TREE PLAN
SD1609
P14
LOT 1 DP 719671
OVAL
SIGNIFICANT VEGETATION ZONE
HOME BASES
LIBRARY
ADMINISTRATION
SPECIAL PROGRAMS
CANTEEN
MULTI PURPOSE HALL
OSHC
BASKETBALL COURTS
EXISTING STAFF PARKING
EXISTING FIRE TRAIL
GILBERT ROAD
RIDGECROP DRIVE
PEDESTRIAN CROSSING
1 TREE PLAN
SCALE: 1:500

Appendix A4 Indicative[4] Fencing and Soil Management

Tree protection over enlarged Plan by Fulton Trotter, Project No:7068SG01, Tree Plan Dwg No: SD1609/Rev P14, Dated 15/08/19

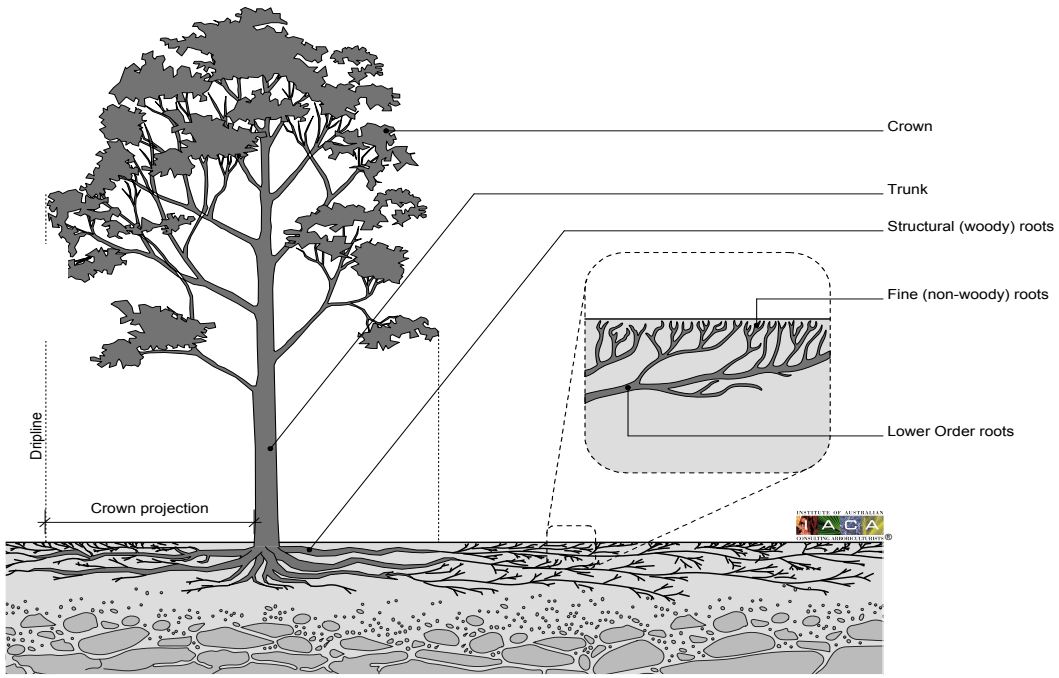
This plan is representative of the location of Tree Protection Fencing and soil management as required and explained in Appendix C1). Actual set-backs can be found in Appendix E1 & E2.

*see larger format plan and latest modifications sent separately



[4] This plan is representative of the location of Tree Protection Fencing and soil management as required and explained in Appendix C1). Actual set-backs can be found in Appendix E1 & E2.

Based on IACA Members licence of AS4970-2009



Structure of a Tree in a Typical Growing Environment — Scale 1:200 @ A4

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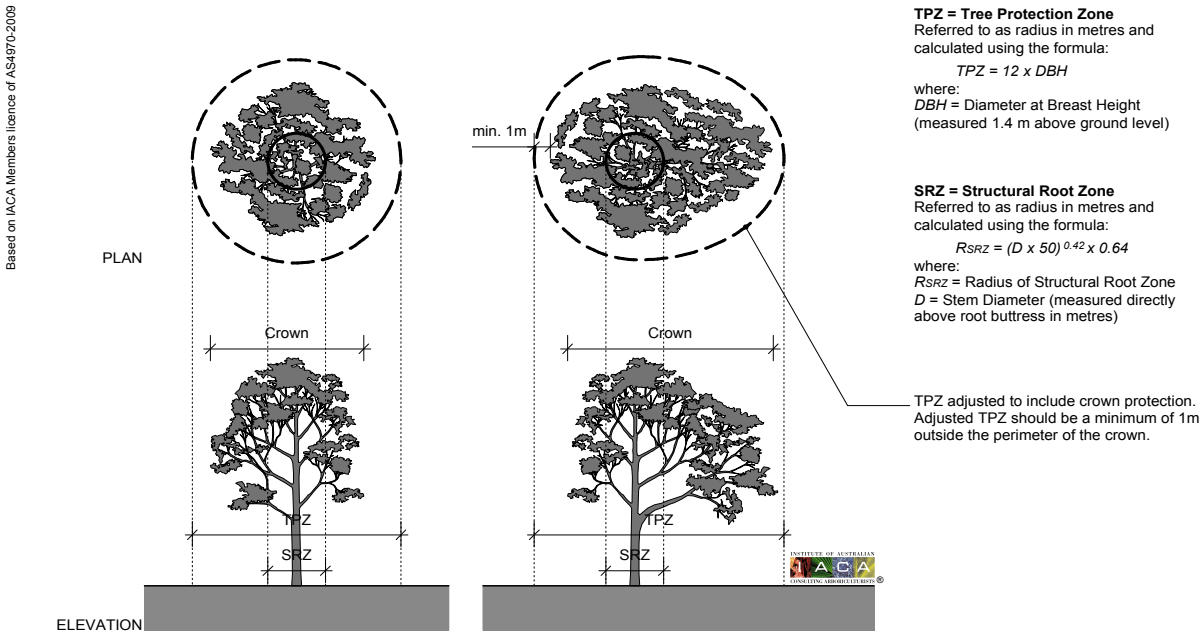
Most tree roots are in the top 30cm of soil and are easily damaged by compaction and the loss of air spaces necessary for healthy survival. Soil compaction is a common cause of tree decline on development sites.

- Protection of tree roots requires that all activity be managed (and preferably eliminated within the Tree Protection Zone) with fencing (i.e. 12 times trunk diameter or as otherwise specified in the report).
- Roots fall into two main categories:
  - **Structural woody/Critical roots (SRZ):** These roots are instrumental in tree anchorage and structural support, nutrient storage and nutrient transport.
  - **The** fine/smaller **non-woody roots (TPZ)** are important in water and nutrient absorption as well as other functions important to tree health and survival.
- During site works demolition teams, builders and other workers on site will gravitate towards these green shady “different” areas, unaware of the damage they can cause, by compacting or contaminating the soil.
- Damaged trees are a liability and ongoing expense.
- Existing vegetation, particularly trees, are valuable assets that can continue to contribute to the property value long after new works have been completed.
- If well managed and protected trees provide an amenity to the immediate area and an environmental benefit to the wider community.



Indicative Tree Protection Zone (TPZ) Scale 1:500 @ A4

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The theoretical Tree Protection Zones (TPZ) of trees being retained, are given in the appended Tree Protection Calculations section of the report (Appendix E).

Works within the area of small roots Tree Protection Zone (TPZ)

- Minimising soil compaction, by isolating most of the TPZ from works is important in the early stages of site works. Heavy equipment (such as those used in the demolition and the site preparation process) passing over the roots (or materials stockpiling) is detrimental to both the tree as well as the soil proposed for future plant growth (later landscaping).

- If works are proposed within the TPZ by and area of greater than 10%,

Works within Structural Root Zone SRZ

- Where works are required near large roots i.e. those within the SRZ, it is essential to avoid damaging these roots that are providing tree anchorage. Failure to do so is likely to create a dangerous tree that could fall.
- All works within SRZ should be above ground and to specific arboricultural specifications (provided by your AQF Level 5 arborist and preferably with them on site).
- Consideration may be required such as root mapping (careful exploratory digging using hand tools) to locate any large roots - 3cm or greater in diameter) and to find suitable locations. Piers for pier and beam construction are the only work possible.
- Piers must avoid roots with 20 – 30mm plus diameters.

"*The Tree Protection Zone is the area around the tree or group of trees in which no grading or construction activity may occur. This area should be large enough to retain sufficient root or crown area to maintain tree health and stability. "* [5]

[5] Harris, Clark Matheny (2004)

Fire mitigation measures are having an adverse impact on the future integrity of some tree groups. It appears that many trees with lengthy beneficial futures are being lost. Removals appeared ad hoc. Many fire mitigation requirements can be achieved with selective pruning and overall tree assessment. Additionally, the remains of cut trees above ground level has created trip hazards (see images below).

Many trees have been removed and others marked with various coloured paint. The environmental benefits of the tree groups is gradually being eroded away with the loss of understorey vegetation regeneration, soil compaction and the spread of weedy species encouraged.

: Understorey vegetation, trip hazard stumps and drainage channel south of buildings

Meeting fire mitigation requirements while limiting the loss of beneficial trees and understorey is recommended. Decisions regarding which trees are removed requires greater consideration, preferably with thoughtful arboricultural input (minimum AQF5) and discussion between specialists. Understorey vegetation can be vigorous and therefore green with less likelihood of flammability.

A final site evaluation was performed after the most recent school holidays and it became apparent that several large trees had been removed. Also, soil compacting, tyre tracks were present through the southern section of the site.

Cooperation between specialists can arrive at a better outcome in each area of long-term tree survival and appropriate fire mitigation. It is too easy to remove a tree with great value in maturity and they deserve acknowledgment of their longevity and future benefit.

Tree Numbering

Many tree numbers, as identified on the survey plan, have since been removed. Also, some trees on the plan and in the schedule are now gone. These are identified in the Tree Data Table as 'No Tree'. Additionally, it appears that some trees have been removed since the initial TreeTalk assessments.

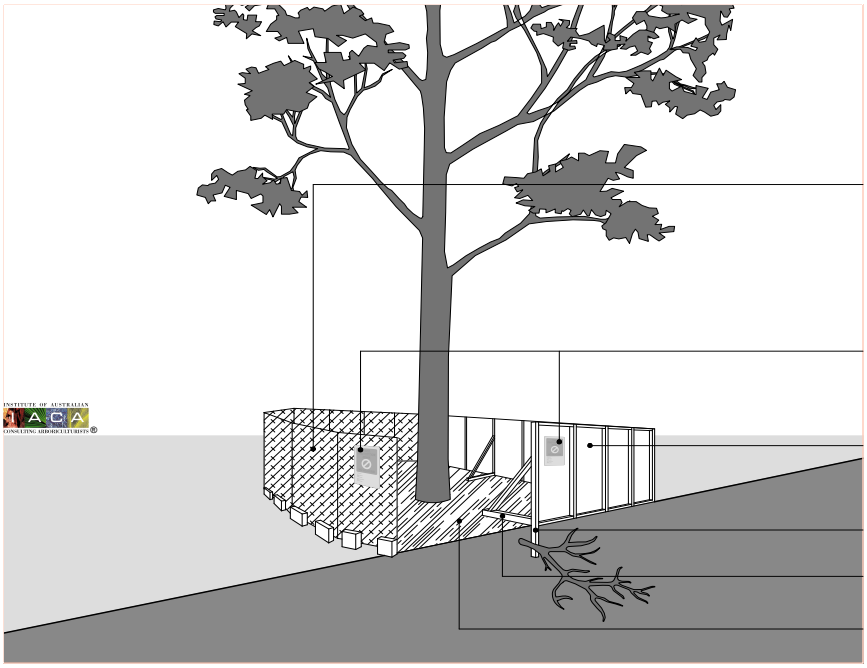
Initially, identification numbering was arrived at by follow numbers as on reflected the tagged trees (from annual tree inspections). The sequencing became difficult when tags were unreadable and some trees were no longer present.

Due to the density of trees and closeness of trees and lack of reference points, tree location was difficult, particularly when reassessing or trying to later locate a tree. The TreeTalk method of identifying trees in dense areas was to use temporary ties on trees for ease of locating trees.

Tree tagging was not part of the project; however, it is recommended that this be undertaken in the future (with imprinted metal tags) for ease of tree location, data collection and subsequent referencing.

	1 Long ULE	2 Medium ULE	3 Short ULE	4 Remove	5 Small Young or Regularly clipped
	Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 15 - 40 years with an acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 5 - 15 years with an acceptable level of risk.	Trees that should be removed within the next 5 years	Trees that can be reliably moved or replaced.
A	Structurally sound trees located in positions that can accommodate future growth.	Trees that may only live between 15 and 40 years.	Trees that may only live between 5 and 15 more years.	Dead, dying, suppressed or declining trees because of disease or inhospitable conditions.	Small trees less than 5m high.
B	Trees that could be made suitable for long-term retention by remedial tree care.	Trees that could live for more than 40 years but may be removed for safety or nuisance reasons.	Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.	Dangerous trees because of instability or recent loss of adjacent trees.	Young trees less than 15 years old but over 5m in high.
C	Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long-term retention.	Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide space for new plantings.	Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide space for new plantings.	Damaged trees because of structural defects including cavities, decay, included bark, wounds or poor form.	Formal hedges and trees intended for regular pruning to artificially control growth.
D		Trees that could be made suitable for retention in the medium term by remedial tree care.	Trees that require substantial remedial tree care and are only suitable for retention in the short term.	Damaged trees that are clearly not safe to retain.	
E				Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new plantings.	
F				Trees that are damaging or may cause damage to existing structures within 5 years.	

(after Barrell SULE**)



Tree Protection Fencing — Not to Scale

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Tree Protection should be the first works on site: Protecting trees and vegetation being retained by isolating it with fencing is easier and far less expensive than later replacement or re-establishment.

Exclusion of Activity Inside the TPZ

- Each tree to be retained should be fenced off to the extent of the Tree Protection Zone excluding all activity unless otherwise indicated in the report. The fencing is to exclude storage of materials, site sheds, machinery, run off (e.g. concrete, or chemical treatments), the movement of pedestrian or vehicular traffic, the temporary, location of services, e.g. trenches, pits or canals.

- No works should be performed within the fenced area without specific consideration given. This includes mechanical scouring of existing vegetation and changes of soil levels (either the addition or removal).

- Where access is required adjacent to a tree e.g. along a driveway trunks and branches will require protection (see Appendix C2).

FENCING

- **For large significant trees** fencing should be 1.8m in height of cyclone chainmesh Hire from - temporary fencing companies or similar. Other vegetation can be isolated using star pickets and orange parra-webbing. Available at local hardware outlets

Site Signage on the fencing reminds workers of specific reasons for the fencing – for example:

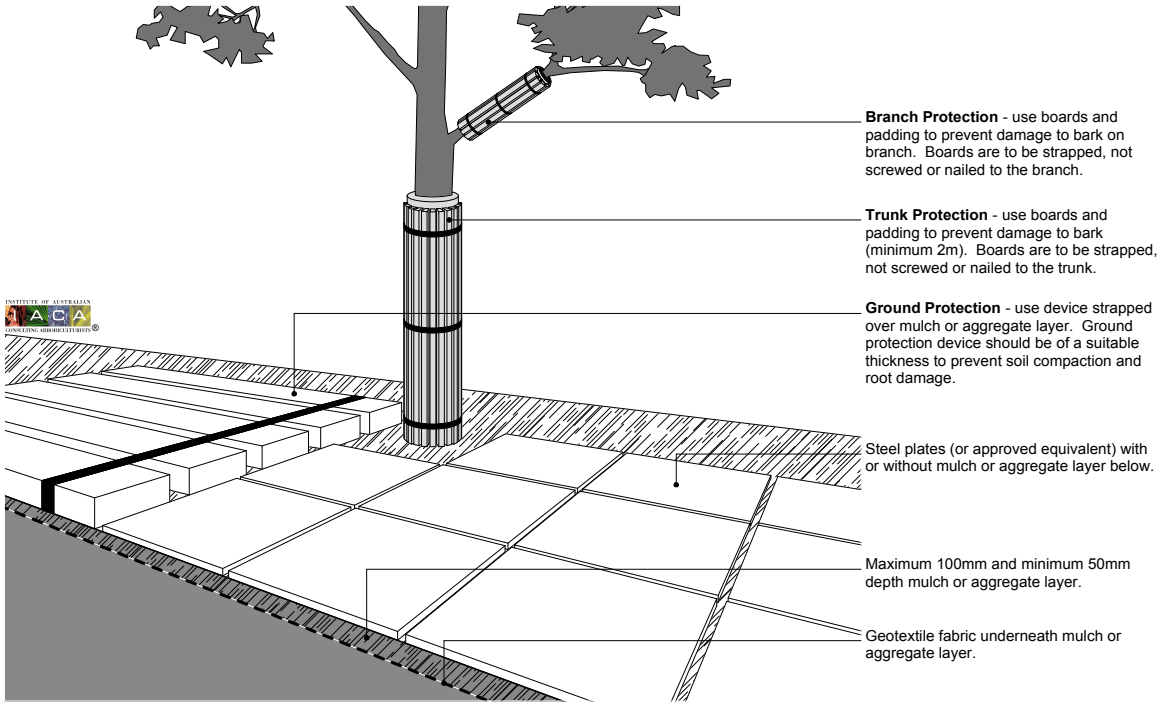
'This fencing is not to be moved'.

'This Tree Protection Zone is to isolate vegetation from the building process'.

No equipment or materials are to enter or be stored within the fenced area and no chemicals or run off enter this protected zone.

Should fencing need to be moved for any reason first contact …Site Manager on 9999 9999 or Arborist on 0417 022 692'.

Based on IACA Members licence of AS4970-2009



Examples of Branch, Trunk and Ground Protection — WORKS Not to Scale

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CLOSE TO A TREE

Trunk Protection

Where a tree trunk is likely to be knocked (e.g. site access along a driveway) it must be protected from possible damage.

Protection material may be hessian, carpet, underfelt (or similar breathable material) with timber planks attached with wire or rope, encircling the materials (not into trunk).

Protection material should cover from the base of the tree to 2m (or to a level that is likely to be damaged by passing equipment) branch protection may be required.

Where access or works within TPZ are required soil surface protection must be installed i.e. a platform (constructed of steel material or timber/rumble boards capable of supporting and distributing the weight over a layer of mulch) and geotextile fabric (see diagram above).

Branch & Foliage Protection

To accommodate works some pruning might be required.

All pruning should be performed by a Qualified Tree Surgeon to ensure pruning is to AS 4373- 1996 'Australian Standards for Pruning Amenity Trees, see Appendix D). (If greater than 10% council approval may be necessary).

MULCH

Mulch is a blanket of insulating material that helps maintain soil moisture reduces the effects of temperature fluctuation and assists in weed reduction. Organic mulch is preferable as it also improves soil condition. Mulch such as Eucalyptus Wood mulch is ideal for use on development sites and should be placed to a depth of 70-100mm within the Tree Protection Zone or drip zone. The area immediately around the trunk should be kept clear of mulch to ensure no moisture builds up at the base of the trunk. It is also a barrier used in exceptional circumstances to assist with reducing soil compaction with vehicular access.

As poor pruning practices can create dangerous trees, introduce disease and cause trees to decline in health, all tree works recommended in this report should comply with the **Australian Standard for Pruning of Amenity Trees AS4373-2007**, and be performed by a suitably qualified and experienced tree surgeon, preferably with membership of a recognised organisation e.g. Arboriculture Australia (AA), Tree Contractors Association (TCA).

Tree works by unqualified, inexperienced or well-meaning cutters who do not perform works to AS 4373 can lead to many long-term and detrimental effects on the tree.

Tree Safety concerns include:

- Topping, lopping and structural root removals (roots >3cm in diameter) are inappropriate tree works, likely to create hazardous trees.
- Excessive pruning can lead to inappropriate growth such as the development of epicormic shoots. Epicormic shoots are emergency growth to provide short-term nutrient supply and are rarely strongly attached to branches or trunks. These branches are likely to fall as they become heavier.
- Removal of deadwood in Urban Trees is necessary in high traffic areas as part of the maintenance regime. Excessive deadwood production needs investigation.

Tree Health concerns include:

- Disease can be introduced onto a site or be transferred between trees by unclean equipment. **All equipment used should be cleaned before use and between trees with either 10% bleach 90% water or 70 % Metho 30% water.**
- Where a tree is suspected of being diseases the wood should be disposed of with care and not used for mulch.
- Poorly maintained equipment such as unsharpened blades, promotes jagged or poor cuts, leading to unnecessary stress and greater chance of disease entry and insect attack.
- Cutting to inappropriate points along a branch (known as lopping) encourages weakly attached regrowth that is likely to fail.
- The trees' natural defence and protection systems can be weakened by inappropriate cutting.

Considerations Before Pruning

Trees do not in themselves require pruning. A tree will naturally optimize its use of light (foliage) and space (particularly roots). When we interfere with this process by removing live foliage we interrupt or reduce the trees ability to photosynthesise and produce the sugars required for health and vigour. Where we cut branches, the tree must use stored sugars to manage the cut surface with defences to insect and disease.

Trees in the urban area require management to fit in with our requirements. Removal of deadwood as well as diseased and damaged wood are normal maintenance procedures to limit the impact on us. Removal of live wood (stored sugars) and foliage must be kept to a minimum.

From AS4373 - *The tree should not be adversely affected by pruning.*

> *Prior to pruning being prescribed or undertaken a thorough inspection of the tree should be carried out by a person competent in arboricultural assessment (minimum AQF Level 3). This should include an assessment of the trees health, growth habit, structure, stability and growing environment. The need for pruning should be determined. If pruning is required, then the current and subsequent pruning requirements should be specified. Clause 7 covers types of pruning.*

Good tree management: Pruning is creating minimal adverse effects on the tree.

Pruning is defined as considered cutting to branch collars (the location of many tree defences) without damaging the collar (e.g. flush cutting).

Poor Inappropriate Tree works include: Indiscriminate cutting often leading to poorly attached re-growth that is likely to fail.
E.g. **Lopping –** Random cutting at a point between branch unions (i.e. not to branch collars). This practice usually damages a tree reducing strength condition and vigour and promoting premature decline and exposure to pests and diseases.
Topping - Height reduction**,** Removal of the upper part of a tree reducing its height by Lopping and **Flush cutting –** removal of or damage to branch collar.

For your protection **Choose a Professional Tree surgeon who**:

- Conducts their business according to The Code of Practice for The Amenity Tree Industry.
- Performs works to Australian Standard for Pruning of Amenity Trees, 4373–1996
- Carries CURRENT Public Liability Insurance – Check currency certificate.
- Is a member of a recognised, professional organisation such as: Tree Contractors Association (TCA) or Arboriculture Australia (AA). Membership of these organisations requires that works be performed to appropriate standards. These members are monitored for compliance.

About the **Code of Practice for the Amenity Tree Industry** 1998

> '*This code has been developed as TREE WORK IS HAZARDOUS. The industry is full of hazards ranging from the tree itself, to the weather, the terrain and difficult sites in which tree work is carried out. Each year, many people in the tree industry are killed or injured. Apart from the enormous impact of injury on individuals and their families, accidents cost the community a significant amount of money. The relatively high incidence of injuries is reflected in the high rates for workers' compensation insurance premiums. When injuries are analysed, the overwhelming majority could have been prevented by following the simple safety procedures outlined in this Code of Practice'.* (Quote from the code)

This code provides practical guidance on safety requirements for the amenity tree industry. It is intended as a guide to the public and private sectors in meeting their requirements under the Occupational Health and Safety Act 1983. This code applies to the amenity tree industry for pruning, trimming, repairing, maintaining, transplanting and removing trees and for wood chipping, stump grinding and for equipment used in such operations.

About the Australian Standard: Pruning of Amenity[6] Trees 4373–2007

This document outlines 'best practice' methods of tree work, written for compliance by arborists. Your chosen tree contractor must be familiar with and perform all works according to the standard.

[6] The AS4373 is for Amenity trees and does not relate to trees in Commercial production.

Appendix E — Summary of Tree Outcome

Summary of findings and outcomes	Total number of Trees 678 (including no tree) Trees requiring specific Protection = 58 (Table E2) (678 Trees or tree spaces – 153 removals)
Trees to be Retained & Protected near works Trees near works requiring specific Protection = 58 *See Table Appendix E2*	# Retain & Protect beyond works # Retain & Protect near works
Trees within 3m of works *See Table Appendix E1*	# Retain & Protect Assessment for pruning may be required.
Trees to be Removed Total tree numbers proposed for removal =111 Total number of trees/[plants for removal =153 *See Table Appendix E3*	# Remove
Dead Trees	Retain Dead trees for habitat except for 4 trees within building platform
No Trees existing at survey mark	46
Total retentions - including dead trees	518

Appendix E1

(Trees within 3m of Works) **SGPS Tree Protection Calculations as per AS 4970 - 2009**

Tree No.	Species	DBH cm	Tree Protection Area (m^2)	SRZ Radius	Intrusion into SRZ	TPZ Radius	Intrusion into TPZ Area	Works nearby/Tree Protection Measures
110	*Corymbia (Euc) maculata* Spotted Gum	35cm	41m^2	2.3m		3.6m		Canopy overhanging works zone
111	*Syzygium paniculatum* (Brush Cherry)	20cm	18m^2	1.7m		2.4m		
114	*Eucalyptus haemastoma* Scribbly Gum	2 x 12-25cm	72m^2	2.3m		4.8m		Canopy overhanging works zone
115	*Eucalyptus sp (Gum)*	2 x 25-30cm	163m^2	2.7m		7.2m		Canopy overhanging works zone
209	*Angophora costata* (Sydney Red Gum)	60cm	163m^2	2.7m		7.2m		Canopy overhanging works zone
246	*Eucalyptus paniculata* (Grey Ironbark)	60cm	163m^2	2.7m		7.2m		Canopy overhanging works zone
255	*Eucalyptus haemastoma* (Scribbly Gum)	40cm	72m^2	2.3m		4.8m		Canopy overhanging works zone
551	*Eucalyptus resinifera* (Red Mahogany)	25cm	28m^2	1.85m		3.0m		Canopy overhanging works zone
569	*Angophora costata* (Sydney Red Gum)	25+20cm (32cm)	45m^2	2.3m		3.8m		
570	Corymbia (Euc) gummifera (Red Bloodwood)	30cm	41m^2	2.00m		3.6m		
610	*Eucalyptus paniculata* Grey Ironbark	45cm	91m^2	2.37m		5.4m		

Appendix E2 (Trees to be Retained & Protected Near Works) **SGPS Tree Protection Calculations as per AS 4970 - 2009**

Tree No.	Species	DBH cm	Tree Protection Area (m^2)	SRZ Radius	Intrusion into SRZ	TPZ Radius	Intrusion into TPZ Area	Works nearby/Tree Protection Measures
101	*Koelreuteria paniculata* (Golden Rain Tree)	25cm	41m^2	2.0m		3.6m		
102	*Koelreuteria paniculata* (Golden Rain Tree)	20cm	18m^2	1.7m		2.4m		
104	*Koelreuteria paniculata* (Golden Rain Tree)	25cm	41m^2	2.0m		3.6m		
105	*Liriodendron tulipiferum* (Tulip Tree)	20cm	18m^2	1.7m		2.4m		
107	*Eucalyptus haemastoma* Scribbly Gum	40cm	72m^2	2.3m		4.8m		
108	*Eucalyptus haemastoma* (Scribbly Gum)	40cm	72m^2	2.3m		4.8m		
114	*Eucalyptus haemastoma* Scribbly Gum	2 x 12-25cm	36m^2	2.0m		3.4m		
116	*Acacia sp* (Wattle)	4 x20cm	72m^2	3.0m		4.8m		
131	*Eucalyptus resinifera* (Red Mahogany)	40 + 40cm	163m^2	2.7m		7.2m		
160	*Corymbia (Euc) gummifera* (Red Bloodwood)	16cm	18m^2	1.7m		2.4m		
162	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm + 25cm + 20cm +	72m^2	2.3m		4.8m		
163	*Acacia sp* (Wattle)	50cm	113m^2	2.5m		6.0m		
164	*Angophora costata* (Sydney Red Gum)	29 + 17cm	41m^2	2.0m		3.6m		

Appendix E2 (Trees to be Retained & Protected Near Works) **SGPS Tree Protection Calculations as per AS 4970 - 2009**

Tree No.	*Species*	DBH cm	Tree Protection Area (m2)	SRZ Radius	Intrusion into SRZ	TPZ Radius	Intrusion into TPZ Area	Works nearby/Tree Protection Measures
166	*Angophora costata* (Sydney Red Gum)	25cm + 36cm	72m^2	2.3m		4.8m		
170	*Angophora costata* (Sydney Red Gum)	18cm	18m^2	1.7m		2.4m		
247	*Eucalyptus paniculata* (Grey Ironbark)	25cm	41m^2	2.0m		3.6m		
248	*Eucalyptus paniculata* (Grey Ironbark)	30cm	41m^2	2.0m		3.6m		
249	*Eucalyptus paniculata* (Grey Ironbark)	50 +40cm	163m^2	2.7m		7.2m		
502	*Angophora costata* (Sydney Red Gum)	50+ 10cm	113m^2	2.5m		6.0m		
503	*Syncarpia glomulifera* (Turpentine)	3x 10-20	41m^2	2.0m		3.6m		
504	*Syncarpia glomulifera* (Turpentine)	20+23+ 26cm	72m^2	2.3m		4.8m		
505	*Angophora costata* (Sydney Red Gum)	23cm + 26cm	41m^2	2.5m		3.6m		
506	*Syncarpia glomulifera* (Turpentine)	25cm	41m^2	2.0m		3.6m		
507	*3 x Allocasuarina torulosa* (Forest Oak)	15cm	4.6m^2	1.5m		1.2m		
508	*Syncarpia glomulifera* (Turpentine)	25cm	41m^2	2.0m		3.6m		

Appendix E2 (Trees to be Retained & Protected Near Works) **SGPS Tree Protection Calculations as per AS 4970 - 2009**

Tree No.	*Species*	DBH cm	Tree Protection Area (m2)	SRZ Radius	Intrusion into SRZ	TPZ Radius	Intrusion into TPZ Area	Works nearby/Tree Protection Measures
509	*Syncarpia glomulifera* (Turpentine)	23cm + 22cm	41m^2	2.0m		3.6m		
510	*Syncarpia glomulifera* (Turpentine)	22cm + 22cm	41m^2	2.0m		3.6m		
511	*Syncarpia glomulifera* (Turpentine)	20 +20 + 20cm	41m^2	2.0m		3.6m		
512	*Syncarpia glomulifera* (Turpentine)	20 + 10cm	18m^2	1.7m		2.4m		
513	*Angophora costata* (Sydney Red Gum)	40cm	72m^2	2.3m		4.8m		
514	*Angophora costata* (Sydney Red Gum)	23 +25 +15cm	72m^2	2.3m		4.8m		
516	*Angophora costata* (Sydney Red Gum)	40 +20 + 32cm	113m^2	2.5m		6.0m		
517	*Syncarpia glomulifera* (Turpentine)	26cm	41m^2	2.0m		3.6m		
519	*Syncarpia glomulifera* (Turpentine)	55cm (at 1m)	163m^2	2.6m		7.2m		
520	*Corymbia (Euc) gummifera* (Red Bloodwood)	25 + 25cm	72m^2	2.3m		4.8m		
521	*Angophora costata* (Sydney Red Gum)	32cm	41m^2	2.3m		3.6m		
532	*Angophora costata* (Sydney Red Gum)	30cm	41m^2	2.3m		3.6m		

Appendix E2 (Trees to be Retained & Protected Near Works) **SGPS Tree Protection Calculations as per AS 4970 - 2009**

Tree No.	*Species*	DBH cm	Tree Protection Area (m2)	SRZ Radius	Intrusion into SRZ	TPZ Radius	Intrusion into TPZ Area	Works nearby/Tree Protection Measures
534	*Angophora costata* (Sydney Red Gum)	35cm	41m^2	2.3m		3.6m		
538	*Syncarpia glomulifera x 3* (Turpentine)	15 +20+ 20cm	41m^2	2.3m		3.6m		
540	*Angophora costata* (Sydney Red Gum)	35 +40+ 40cm	222m^2	2.9m		8.4m		
541	*Eucalyptus resinifera* (Red Mahogany)	50cm	113m^2	2.5m		6.0m		
552	*Angophora costata* (Sydney Red Gum)	25cm	41m^2	2.0m		3.6m		
553	*Angophora costata* (Sydney Red Gum)	10cm	4.5m^2	1.7m		1.2m		
555	*Corymbia (Euc) gummifera* Red Bloodwood)	23+ 25cm	72m^2	2.3m		4.8m		
556	*Eucalyptus resinifera* Red Mahogany	32cm	41m^2	2.3m		3.6m		
557	*Eucalyptus haemastoma* Scribbly Gum	40cm at 1m	72m^2	2.3m		4.8m		
558	*Corymbia (Euc) gummifera* Red Bloodwood	25cm	41m^2	2.3m		3.6m		
559	*Corymbia (Euc) gummifera* Red Bloodwood	30cm	41m^2	2.3m		3.6m		
560	*Eucalyptus species* Ironbark	50cm	113m^2	2.0m		6.0m		

Appendix E2 (Trees to be Retained & Protected Near Works) **SGPS Tree Protection Calculations as per AS 4970 - 2009**

Tree No.	*Species*	DBH cm	Tree Protection Area (m2)	SRZ Radius	Intrusion into SRZ	TPZ Radius	Intrusion into TPZ Area	Works nearby/Tree Protection Measures
561	4 x *Corymbia (Euc) gummifera* (Red Bloodwood) 1 x *Angophora costata* (Sydney Red Gum)	30cm	41m^2	2.3m		3.6m		
565	*Eucalyptus resinifera* (Red Mahogany)	30cm	41m^2	2.3m		3.6m		
566	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	41m^2	2.3m		3.6m		
567	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	41m^2	2.3m		3.6m		
568	*Eucalyptus haemastoma* (Scribbly Gum)	50cm	113m^2	2.5m		6.0m		
572	3 x *Eucalyptus sp. Gums*	30-10cm	41m^2	2.3m		3.6m		
608	*Eucalyptus paniculata* Grey Ironbark	40cm	72m^2	2.3m		4.8m		
609	*Eucalyptus sp.* (Gum tree)	20cm	18m^2	1.7m		2.4m		
610	*Eucalyptus paniculata* Grey Ironbark	45cm	113m^2	2.5m		6.0m		
611	*Eucalyptus sp.* (Gum tree)	>10cm	4.5m^2	1.7m		1.2m		

Appendix E3

SGPS: Trees to be Removed

Tree No.	Species	Tree Group of #	Works [7]Intrusion into SRZ	Works Intrusion into TPZ Area	ULE	Reason for Proposed Removal	Remove tree with care Do not to impact on retained trees nearby
100	*Koelreuteria paniculata* (Golden Rain Tree/Pride of India)	1	Landscaping	Landscaping	Long	Undesirable species	Remove tree with care. Do not to impact on retained trees nearby
106	*Eucalyptus haemastoma* Scribbly Gum	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
112	*Eucalyptus haemastoma* Scribbly Gum	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
113	*Eucalyptus haemastoma* Scribbly Gum	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
119	*Melaleuca sp.* (Paperbark)	1	Hard Landscaping	Hard Landscaping	Long	To allow for disabled accessible path from the concourse to the existing buildings – to be added in future works outside of this approval	Remove tree with care. Do not to impact on retained trees nearby
132	*Angophora costata* (Sydney Red Gum)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
133	*Eucalyptus punctata* (Grey Gum)	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
137	*Angophora costata* (Sydney Red Gum)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
138	*Allocasuarina torulosa* (Forest Oak)	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
139	2 x *Eucalyptus resinifera* (Red Mahogany)	2	Yes	Yes	Short	Works processes	Remove tree with care. Do not to impact on retained trees nearby
140	*Angophora costata* (Sydney Red Gum)	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
141	2 x *Allocasuarina torulosa* (Forest Oak)	2	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
142	*Angophora costata* (Sydney Red Gum)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
143	*Angophora costata* (Sydney Red Gum)	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
144	*Angophora costata* (Sydney Red Gum)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
150	*Angophora costata* (Sydney Red Gum)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby

[7] Note: Any works that impact on the soil creating a level change will adversely impact upon tree stability.

Tree No.	Species	Tree Group of #	Works [7]Intrusion into SRZ	Works Intrusion into TPZ Area	ULE	Reason for Proposed Removal	Remove tree with care Do not to impact on retained trees nearby
151	*Eucalyptus punctata* Grey Gum	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
152	*Eucalyptus sp* (Gum tree)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
153	*Eucalyptus resinifera* (Red Mahogany)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
154	*Eucalyptus haemastoma* Scribbly Gum	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
174	*Eucalyptus resinifera* (Red Mahogany)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
175	*Eucalyptus haemastoma* (Scribbly Gum)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
177	*Angophora costata* (Sydney Red Gum)	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
178	*Eucalyptus resinifera* (Red Mahogany)	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
179	*Angophora costata* (Sydney Red Gum)	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
180	*Corymbia (Euc) gummifera (Red Bloodwood)*	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
181	*Eucalyptus resinifera* (Red Mahogany)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
182	*Eucalyptus resinifera* (Red Mahogany)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
183	*Angophora costata* (Sydney Red Gum)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
184	*Eucalyptus resinifera* (Red Mahogany)	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
187	*Corymbia (Euc) gummifera (Red Bloodwood)*	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
188	*Corymbia (Euc) gummifera (Red Bloodwood)*	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
193	*Acacia implexa* Hickory Wattle/ Weetjellan (D'harawal)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby

Tree No.	Species	Tree Group of #	Works [7]Intrusion into SRZ	Works Intrusion into TPZ Area	ULE	Reason for Proposed Removal	Remove tree with care Do not to impact on retained trees nearby
194	*Acacia implexa* Hickory Wattle/ Weetjellan (D'harawal)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
196	*E Angophora costata* (Sydney Red Gum)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
197	*Corymbia (Euc) gummifera (Red Bloodwood)*	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
198	*Angophora costata* (Sydney Red Gum)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
205	*Allocasuarina torulosa* (Forest Oak)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
206	*Angophora costata* (Sydney Red Gum)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
207	*Angophora costata* (Sydney Red Gum)	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
208	*3 x Eucalyptus paniculata* (Grey Ironbark)	3	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
210	*Corymbia (Euc) gummifera* (Red Bloodwood	1	Hard Landscaping	Hard Landscaping	Long	Conflicts with proposed entrance pathways and landscaping works	Remove tree with care. Do not to impact on retained trees nearby
211	*Corymbia (Euc) gummifera* (Red Bloodwood)	1	Hard Landscaping	Hard Landscaping	Long	Conflicts with proposed entrance pathways and landscaping works	Remove tree with care. Do not to impact on retained trees nearby
212	*Corymbia (Euc) gummifera* (Red Bloodwood)	1	Hard Landscaping	Hard Landscaping	Long	Conflicts with proposed entrance pathways and landscaping works	Remove tree with care. Do not to impact on retained trees nearby
213	*Corymbia (Euc) gummifera* (Red Bloodwood)	1	Hard Landscaping	Hard Landscaping	Long	Conflicts with proposed entrance pathways and landscaping works	Remove tree with care. Do not to impact on retained trees nearby
214	*Corymbia (Euc) gummifera* (Red Bloodwood)	1	Hard Landscaping	Hard Landscaping	Long	Conflicts with proposed entrance pathways and landscaping works	Remove tree with care. Do not to impact on retained trees nearby
215	*Allocasuarina torulosa* (Forest Oak)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
216	*Corymbia (Euc) gummifera* (Red Bloodwood)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
217	*Angophora costata* (Sydney Red Gum)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
218	*Eucalyptus resinifera* (Red Mahogany)	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
219	*2 x Corymbia (Euc) gummifera* (Red Bloodwood)	2	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby

Tree No.	Species	Tree Group of #	Works [7]Intrusion into SRZ	Works Intrusion into TPZ Area	ULE	Reason for Proposed Removal	Remove tree with care Do not to impact on retained trees nearby
225	*Corymbia (Euc) gummifera* (Red Bloodwood)	1	Hard Landscaping	Hard Landscaping	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
226	*Corymbia (Euc) gummifera* (Red Bloodwood)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
227	*Eucalyptus resinifera* (Red Mahogany)	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
228	*Corymbia (Euc) gummifera* (Red Bloodwood)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
229	*Corymbia (Euc) gummifera* (Red Bloodwood)	1	Yes	Yes	Dead	Works processes	Remove tree with care. Do not to impact on retained trees nearby
230	*Corymbia (Euc) gummifera* (Red Bloodwood)	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
231	*Corymbia (Euc) gummifera* (Red Bloodwood)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
232	*Corymbia (Euc) gummifera* (Red Bloodwood)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
233	*Pittosporum undulatum* Native Daphne	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
240	Eucalyptus paniculata (Grey Ironbark)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
241	*Eucalyptus acmenoides* White mahogany	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
244	*Eucalyptus microcorys* (Tallowwood)	1	Hard Landscaping	Hard Landscaping	Medium	Conflicts with proposed new access path and sits in close proximity to the proposed Building N – sits partially within the 3m exclusion zone around the building.	Remove tree with care. Do not to impact on retained trees nearby
245	*Grevillea* Grevillea Hybrid	1	Yes	Landscaping	Medium	Impacted by the proposed landscaping works adjacent to Building A	Remove tree with care. Do not to impact on retained trees nearby
252	*Grevillea* Grevillea Hybrid/CV	1	Landscaping	Landscaping	Short	Located too close to the existing Building B and is considered to be in Fair/Poor condition with a limited future.	Remove tree with care. Do not to impact on retained trees nearby
253	Grevillea Hybrid *Melaleuca bracteata*	1	Landscaping	Landscaping	Short	Located too close to the existing Building B and is removed in association with tree number 252.	Remove tree with care. Do not to impact on retained trees nearby

Tree No.	Species	Tree Group of #	Works [7]Intrusion into SRZ	Works Intrusion into TPZ Area	ULE	Reason for Proposed Removal	Remove tree with care Do not to impact on retained trees nearby
501	*Eucalyptus haemastoma* (Scribbly Gum) Euc pilularis	1	Yes	Yes	Long	Located in close proximity to the works of Proposed Building P – sits partially within the 3m exclusion zone around the building.	Remove tree with care. Do not to impact on retained trees nearby
542	*Syncarpia glomulifera* Turpentine	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
543	*Eucalyptus haemastoma* (Scribbly Gum)	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
544	*Eucalyptus resinifera* (Red Mahogany)	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
545	*Syncarpia glomulifera* Turpentine	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
546	*Corymbia (Euc) gummifera* (Red Bloodwood)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
547	*2 x Syncarpia glomulifera* Turpentine	2	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
548	*Angophora costata* (Sydney Red Gum)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
549	*Angophora costata* (Sydney Red Gum)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
550	*Eucalyptus resinifera* (Red Mahogany)	1	Yes	Yes	Medium	Considered to be located too close to the works of proposed Building P and is removed in association with Tree Number 549.	Remove tree with care. Do not to impact on retained trees nearby
554	*Corymbia (Euc) gummifera* (Red Bloodwood	1	APZ	APZ	Short	Recommended by the Ecologist (Travers) for removal to form canopy break in relation the APZ.	Remove tree with care. Do not to impact on retained trees nearby
562	4 x *Corymbia (Euc) gummifera* (Red Bloodwood) 1 x *Angophora costata* (Sydney Red Gum)	5	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
563	4 x *Corymbia (Euc) gummifera* (Red Bloodwood)	4	APZ	APZ	Long	Recommended by the Ecologist (Travers) for removal to form canopy break in relation the APZ.	Remove tree with care. Do not to impact on retained trees nearby
564	10 x *Corymbia (Euc) gummifera* (Red Bloodwood)	10	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
571	*14 x Corymbia (Euc) gummifera* (Red Bloodwood)	14	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
573	*Corymbia (Euc) gummifera* (Red Bloodwood)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby

Tree No.	Species	Tree Group of #	Works [7]Intrusion into SRZ	Works Intrusion into TPZ Area	ULE	Reason for Proposed Removal	Remove tree with care Do not to impact on retained trees nearby
574	*Angophora costata* (Sydney Red Gum)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
575	2 wattle 4 x *Eucalyptus sp.*	6	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
576	*Corymbia (Euc) gummifera* (Red Bloodwood)	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
577	*Corymbia (Euc) gummifera* (Red Bloodwood)	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
578	*Corymbia (Euc) gummifera* (Red Bloodwood)	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
579	*Dead Tree*	1	Yes	Yes	Dead	Works processes	Remove tree.
580	*Corymbia (Euc) gummifera* (Red Bloodwood)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
581	*Corymbia (Euc) gummifera* (Red Bloodwood)	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
582	*Angophora costata* (Sydney Red Gum)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
583	Acacia sp. Wattle	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
584	*Eucalyptus sp* (Gum)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
585	*Eucalyptus sp* (Gum)	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
586	*Dead Tree*	1	Yes	Yes	Dead	Works processes	Remove tree.
587	*Corymbia (Euc) gummifera* (Red Bloodwood)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
588	*Corymbia (Euc) gummifera* (Red Bloodwood)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
589	Dead & *bit of gummifera* (Red Bloodwood)	1	Yes	Yes	Short	Works processes	Remove tree with care. Do not to impact on retained trees nearby
590	*Angophora costata* (Sydney Red Gum)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
591	*Angophora costata* (Sydney Red Gum)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby

Tree No.	Species	Tree Group of #	Works [7]Intrusion into SRZ	Works Intrusion into TPZ Area	ULE	Reason for Proposed Removal	Remove tree with care Do not to impact on retained trees nearby
595	*Eucalyptus scoparia* (Wallangarra White Gum)	1	Hard Landscaping	Hard Landscaping	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
596	*Eucalyptus punctata* (Grey Gum)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
597	2 x *Eucalyptus punctata* (Grey Gum)	2	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
598	*Eucalyptus punctata* (Grey Gum)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
599	*Eucalyptus punctata* (Grey Gum)	1	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
600	*Eucalyptus resinifera* Red Mahogany	1	Yes	Yes	Medium	Works processes	Remove tree with care. Do not to impact on retained trees nearby
603	*Dead Tree*	1	Yes	Yes	Dead	Works processes	Remove tree.
604	*2 x Angophora costata* (Sydney Red Gum)	2	Yes	Yes	Long	Works processes	Remove tree with care. Do not to impact on retained trees nearby
605	*Dead Tree*	1	Yes	Yes	Dead	Works processes	Remove tree.
606	*Eucalyptus paniculata* Grey Ironbark	1	Hard Landscaping	Hard Landscaping	Long	Conflicts with proposed entrance pathways and landscaping works	Remove tree with care. Do not to impact on retained trees nearby
607	*Eucalyptus paniculata* Grey Ironbark	1	Hard Landscaping	Hard Landscaping	Medium	Conflicts with proposed entrance pathways and landscaping works	Remove tree with care. Do not to impact on retained trees nearby
Tree #111	Total	153 Trees					

Appendix F

Samuel Gilbert PS **Tree Data Schedule** [8]

Tree #		DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Check
1	*Eucalyptus paniculata* (Grey Ironbark)	14cm	12 x 4m	Good	Good	*Pittosporum undulatum* Sweet Pittosporum	
2	*Eucalyptus paniculata* (Grey Ironbark)	18cm	13 x 5m	Fair	Good	Near entrance	
3	*Eucalyptus haemastoma* (Scribbly Gum)	20cm	6 x5m	Good	Good		
4	*Eucalyptus paniculata* (Grey Ironbark)	12cm	9 x 3m	Good	Fair		
5	*Eucalyptus haemastoma* (Scribbly Gum)	30cm 38cm	13x2 2m	Fair-Poor	Fair		
6	*Eucalyptus haemastoma* (Scribbly Gum)	12cm	7 x 5m	Fair	Good		
7	*2 x Eucalyptus paniculata* (Grey Ironbark)	25cm	5 x 4m 5 x 3m	Fair	Good	Near gate	
8	*Eucalyptus paniculata* (Grey Ironbark)	25cm	10m	Fair	Fair	Co-dom from 2m. Near driveway	
9	*Corymbia (Euc) gummifera* (Red Bloodwood)	35cm	12m	Good	Good	D/w to 5cm∅	
10	*Eucalyptus paniculata* (Grey Ironbark)	25cm	12m	Good	Good	Vine over. Car parking area	

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk:** **Failure:** **Imminent** / **Probable** (Possible Improbable) Target: **High / Medium** (Low/Very Low) Consequences **of Failure:** **Severe/ Significant** (Minor/ Negligible)

[8] Each line in the table has been assessed as one tree. This may be because it represents a group of trees that either functions as a whole, or are dependent on each other for survival. They will, if retained, develop as a group (possibly sharing canopy), or the less successful ones will be suppressed and become insignificant. Removal of any one may impact on the whole group.

Appendix F

Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
11	*Eucalyptus paniculata* (Grey Ironbark)	40cm	15m	Good	Good	Co-dom from 1.5m	
12	*Eucalyptus resinifera* (Red Mahogany)	40c+25+ 30cm	13m	Good	Good-Fair	Co-dom x 3. Good understorey.	
13	*Eucalyptus punctata* (Grey Gum)	55cm	20m	Good	Fair-Poor	Failure evident. Co-dom. Large D/w. Consider removal.	
14	*Eucalyptus punctata* (Grey Gum)	50+50cm	20m	Good	Fair	Co-dom from base. Sewer nearby	
15	*Eucalyptus punctata* (Grey Gum)	40cm	16m	Good	Good	Understorey Melaleucas.	
16	*Callistemon salignus* Willow Bottlebrush	15cm	8m	Good	Good		
17	*Cupressus sp* (Cypress Pine)	50@0.5m	15m	Good	Good	Suckers x 3. Vines over.	
18	*Eucalyptus resinifera* (Red Mahogany)	20cm	10m	Good	Good	Semi- mature	
19	3 x *Eucalyptus resinifera* (Red Mahogany)	Various	8m	Good	Good	Semi- mature	
20	*Eucalyptus resinifera* (Red Mahogany)	40cm	12m	Fair	Good-Fair	Co-dom x 3, Below-ground.	
20a	*Eucalyptus resinifera* (Red Mahogany)	20+30cm	12m	Fair	Fair	Regenerated.	

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk:** **Failure:** **Imminent** / **Probable** (Possible Improbable) Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

Appendix F

Samuel Gilbert PS Tree Data Schedule

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
21	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	12m	Good	Good	Minor d/w	-
22	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	12m	Good	Good	1x trunk beside has previously been removed	-
23	*Corymbia (Euc) gummifera* (Red Bloodwood)	5 trunks 25-35cm	16m	Fair	Good	Borer activity	
24	*Eucalyptus acmenoides* (White Mahogany)	40cm	17m	Fair	Good	Minor d/w	
25	*Corymbia (Euc) gummifera* (Red Bloodwood)	4 trunks 5-25cm	15m	Fair	Fair	Epicormics along trunk	
26	*Corymbia (Euc) gummifera* (Red Bloodwood)	4 trunks 10-20cm	12m	Fair	Fair	Epicormics	
27	*Corymbia (Euc) gummifera* (Red Bloodwood)	3 trunks 20-35 cm	17m	Good	Good	D/w + Epicormics Co-dom from base	D/w required over carpark
28	*Eucalyptus resinifera* (White Mahogany)	30cm	17m	Fair	Fair	Epicormics along trunk + branches Large amounts of mulch around base. Built up - Remove	
~~**29**~~	No tree	-	-	-	-	-	-
30	*Corymbia (Euc) gummifera* (Red Bloodwood)	35cm	17m	Good	Good	Feeding scars sugar gliders D/w to 10cm diameter	

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS Tree Data Schedule

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
31	*Eucalyptus resinifera* (Red Bloodwood)	30cm	17m	Fair	Fair		
32	Eucalyptus haemastoma Scribbly Gum	55cm	18m	Good	Good		
33	*Corymbia (Euc) gummifera* (Red Bloodwood)	25cm	14m	Good	Good		
34	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	10m	Good	Good		
35	*Eucalyptus resinifera (Red Mahogany)*	40cm	17m	Good	Good	Minor d/w	
36	*Corymbia (Euc) gummifera* (Red Bloodwood)	2 x 25+30cm	15m	Good	Good	Heavily suppressed by T37	
37	*Eucalyptus resinifera (Red Mahogany)*	50cm	18m	Good	Good	Codom from 3m in height. Small d/w	
38	No tree	-	-	-	-	-	
39	No tree	-	-	-	-	-	
40	*Angophora costata (Sydney Red Gum)*	55cm	17m	Good	Fair-Poor	Extensive decay. Epicormic growth. Needs further inspection.	

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS Tree Data Schedule

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
41	*Angophora costata (Sydney Red Gum)*	20cm	10m	Good	Good	Suppressed. D/w	
42	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	13m	Good	Good	Intermediate. D/w	
43	*Eucalyptus haemastoma* Scribbly Gum	20cm	12m	Fair	Fair	Needs formative pruning, crossing/rubbish branches co-dom from 6m.	
44	*Eucalyptus haemastoma* Scribbly Gum	60cm	17m	Good	Fair	Unbalanced canopy. D/w to 8cm	
45	*Acacia decurrens* (Sydney green wattle, Boo'kerrikin (D'harawal))	Multi	6m	Good	Good		
46	*Eucalyptus resinifera (Red Mahogany)*	25cm	16m	Fair	Fair	Consider removal declining rapidly. D/w Epis.	
47	*Eucalyptus haemastoma* Scribbly Gum	40cm	16m	Good	Good/Fair	D/w large open decay on E and W. Monitor further assessment	
~~48~~	No tree	-	-	-	-	-	
49	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	14m	Fair	Fair	Hangs over BB court Suppressed, growing to N.	
50	*Eucalyptus resinifera (Red Mahogany)*	40cm	16m	Fair	Good	Epis, lots of small D/w	

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS Tree Data Schedule

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
51	*Corymbia (Euc) gummifera* (Red Bloodwood)	20+20cm	14m	Good	Good		
52	*Eucalyptus resinifera* (Red Mahogany)	30cm	14m	Fair	Good	D/w	
53	*Eucalyptus punctata* Grey Gum	25cm	11m	Good	Fair	Soil built up around root zone. Lean to east. Suppressed.	
54	*Angophora costata* (Sydney Red Gum)	40cm	14m	Good	Good		
~~55~~	No tree	-	-	-	-	-	-
56	*Eucalyptus resinifera* (Red Mahogany)	30cm	14m	Good	Good	Exposed roof crown from kids Root damage - D/w needed;	
57	*Angophora costata (Sydney Red Gum)*	4 (8-15cm)	9m	Good	Good	Multi trunks	
58	*Eucalyptus haemastoma* (Scribbly Gum)	35cm	16m	Good	Good	Minor D/w. Surround by sand (pit)	
59	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	13m	Good	Fair	Heavily suppressed and growing to N. D/w needed	
60	*Eucalyptus resinifera* (Red Mahogany)	30cm	12m	Good	Good	Previous large branch flush cut!	

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS Tree Data Schedule

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
61	*Corymbia (Euc) gummifera* (Red Bloodwood)	35cm	16m	Good	Good	Very poor previous pruning. Ripped collar pruning.	
62	*Corymbia (Euc) gummifera* (Red Bloodwood)	50cm	16m	Good	Good	Heavy kino production. Beside sandpit. D/w to 15 cm over sandpit (urgent)	
63	*Angophora costata* (Sydney Red Gum)	40 + 25 +28cm	16m	Good	Good	Co-dom from 0D.5m. D/w to 5cm	
64	*Corymbia (Euc) gummifera* (Red Bloodwood)	38cm	14m	Good	Good	Epicormics over most branches. Soil/mulch built up	
65	*Corymbia (Euc) gummifera* (Red Bloodwood)	25 + 40cm	14m	Good	Good	Co-dom from base.	
66	*Corymbia (Euc) gummifera* (Red Bloodwood)	40cm	13m	Fair	Good		
67	*Eucalyptus resinifera* (Red Mahogany)	30cm	14m	Good-Fair	Good		
68	*Eucalyptus resinifera* (Red Mahogany)	30cm	15m	Fair	Good		
69	*Eucalyptus resinifera* (Red Mahogany)	30cm	17m	Good	Good		
70	*Allocasuarina torulosa* (Forest Oak)	10cm	5m	Poor	Poor	Poor senescing	

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure: Imminent / Probable** (Possible Improbable)
Target: High / Medium (Low/Very Low) **Consequences of Failure: Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS Tree Data Schedule

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
71	*Eucalyptus haemastoma* *Scribbly Gum*	40cm	15m	Good	Good		
72	*Angophora costata* (Sydney Red Gum)	50+ 50cms	17m	Good	Good	Codom from base	
73	*Corymbia (Euc) gummifera* (Red Bloodwood)	25cm	12m	Good	Fair	Epis/suppressed by T72	
74	*Eucalyptus haemastoma* Scribbly Gum	65cm	15m	Good	Good	Vertical fissures down trunk.	
75	*Eucalyptus haemastoma* Scribbly Gum	25+25cm	16m	Good	Fair	Co-dom from 1.5 m Kissing trucks @ 8m. Leaning	
76	*Eucalyptus haemastoma* Scribbly Gum	55cm	16m	Good	Fair	Corner, Compacted, Branch removed a@4m.	
77	*Eucalyptus sp* Gum	35cm	14m	Good	Good	Intermediate tree.	
78	*Angophora costata* (Sydney Red Gum)	45cm	15m	Good	Good	Heavy kino production from co-dom union @ 5m. Exposed roots. Kino.	
79	*Corymbia (Euc) gummifera* (Red Bloodwood)	N/a	N/a	Dead	Dead	Remove	
80	*Eucalyptus haemastoma* Scribbly Gum	30cm	14m	Fair	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure: Imminent / Probable** (Possible Improbable)
Target: High / Medium (Low/Very Low) **Consequences of Failure: Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS Tree Data Schedule

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
81	*Angophora costata (Sydney Red Gum)*	25cm	9m	Good	Good		
82	No tree	-	-	-	-		
83	*Corymbia (Euc) gummifera (Red Bloodwood)*	15cm	7m	Good	Good		
84	*Corymbia (Euc) gummifera (Red Bloodwood)*	38cm	14m	Good	Good		-
85	*Allocasuarina torulosa* (Forest Oak)	10cm	5m	Good	Good		
86	*Angophora costata* (Sydney Red Gum)	35cm	17m	Good	Good	Play area	
87	*Eucalyptus microcorys* (Tallowwood)	25cm	9m	Good	Good		
88	*Eucalyptus microcorys* (Tallowwood)	25cm	9m	Good	Fair	Compacted ground Heavy fruit production. Monitor	
89	*Angophora costata* (Sydney Red Gum)	35cm	14m	Good	Good	Minor D/w over path	
90	*Corymbia (Euc) gummifera* (Red Bloodwood)	2x 20cm	9m	Good	Good	Supressed	

Health/Structure: Good Fair poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS Tree Data Schedule

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
91	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm 25cm	8m	Good	Fair	Near step. Supressed.	
92	*Eucalyptus haemastoma* Scribbly Gum	50cm	17m	Good	Good		
93	*Angophora costata* (Sydney Red Gum)	45cm	17m	Good	Fair		
94	*Allocasuarina torulosa* (Forest Oak)	20cm	8m	Good	Good		
95	*Allocasuarina torulosa* (Forest Oak)	20cm	8m	Good	Good		
96	*Corymbia (Euc) gummifera* Red Bloodwood	20cm	7m	Good	Good		
97	*Casuarina cunninghamiana* (River She-oak)	30cm	11m	Good	Good		
98	*Koelreuteria paniculata* (Golden Rain Tree/Pride of India)	30cm	9m	Good	Fair	Deciduous	
99	*Koelreuteria paniculata* (Golden Rain Tree/Pride of India)	25cm	9m	Good	Fair	Deciduous	
100	*Koelreuteria paniculata* (Golden Rain Tree/Pride of India)	25cm	6m	Good	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure: Imminent / Probable** (Possible Improbable)
Target: High / Medium (Low/Very Low) **Consequences of Failure: Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS Tree Data Schedule

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
101	*Koelreuteria paniculata* (Golden Rain Tree/Pride of India)	25cm	6m	Fair	Fair		
102	*Koelreuteria paniculata* (Golden Rain Tree/Pride of India)	20cm	5m	Fair	Fair		
~~103~~	No tree	-	-	-	-		
104	*Koelreuteria paniculata* (Golden Rain Tree/Pride of India)	25cm	6m	Fair	Fair		
105	*Liriodendron tulipiferum* (Tulip Tree)	20cm	4m	Fair	Fair		
106	*Eucalyptus haemastoma* Scribbly Gum	18cm	6m	Fair	Fair		
107	*Eucalyptus haemastoma* (Scribbly Gum)	40cm	14m	Fair	Fair		
108	*Corymbia (Eucalyptus) citriodora* Lemon-scented Gum	40cm	16m	Good	Good		
109	*3 x Eucalyptus species* (Gum)	40cm	15m	Fair	Good		
109b	*Acacia sp* (Wattle)	Multi	7m	Fair	Fair		
110	*Corymbia (Euc) maculata* Spotted Gum	35cm	14m	Fair	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS Tree Data Schedule

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
111	*Syzygium paniculatum* (Brush Cherry)	20cm	8m	Good	Good		
112	*Eucalyptus haemastoma* Scribbly Gum	55cm	10m	Good	Good	Pushing up concrete paths. Make note that no root disturbance when paths are redone. Consider rubbery pathway	
113	*Eucalyptus haemastoma* Scribbly Gum	40cm	15m	Good	Good		
114	*Eucalyptus haemastoma* Scribbly Gum	2 x 12-25cm	7m	Good	Good		
115	*Eucalyptus sp (Gum)*	2 x 25-30cm	8m	Good	Good		
116	*Acacia sp* (Wattle)	4 x20cm	7m	Good	Poor	Needs to be removed – about to fall – included stems!	
117	*Eucalyptus resinifera (Red Mahogany)*	25cm	9m	Good	Fair	D/w	
118	*Casuarina cunninghamiana* (River She-oak)	30cm	13m	Good	Good		
119	*Melaleuca sp.* (Paperbark)	20cm	7m	Good	Good		
120	*Eucalyptus microcorys* (Tallowwood)	35 + 35 cm	14m	Good	Good-Fair	Co-dom from 0.5m - monitor. D/w 10cm	

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS Tree Data Schedule

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
121	*Eucalyptus resinifera* (Red Mahogany)	35cm	15m	Good	Good-Fair	Clay at base. Manage if retained.	
122	*Callitris rhomboidea* (Port Jackson Pine)	15cm	4m	Fair	Good	Galls.	
123	*Eucalyptus resinifera* (Red Mahogany)	25cm	9m	Fair-Good	Fair		
~~**124**~~	-	-	-	-	-	-	
125	*Eucalyptus resinifera* (Red Mahogany)	35cm	15m	Good	Good-Fair	Dead central leader. Horizontal. Branching queries at height.	
126	*Angophora costata* (Sydney Red Gum)	25cm	8m	Good	Fair	Bark damage. Canopy over street.	
127	*Syncarpia glomulifera* Turpentine	30 + 25cm	15m	Good	Good	Fill at base	
128	*Eucalyptus punctata* (Grey Gum)	25 cm	8m	Good	Poor		
129	*Allocasuarina torulosa* (Forest Oak)	20cm	7m	Good	Good		
130	*Angophora costata* (Sydney Red Gum)	40 + 15 cm	15m	Good	Fair	[Some trunk damage and Kino. Lopping. Reassess if retained.	

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS Tree Data Schedule

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
131	*Eucalyptus resinifera* (Red Mahogany)	40 + 40cm	18m	Good	Good-Fair	Co-dom from 1m. Low angle of attachment. Minor bulging.	
132	*Angophora costata* (Sydney Red Gum)	18 +10 cm	6m	Good	Good	Near fence. Co-dom base	
133	*Eucalyptus punctata* (Grey Gum)	50 + 45 + 40cm	>22m	Good	Fair-Poor	Multi and suckering. Monitor if retained.	
~~**134**~~	-		-	-	-	-	
~~**135**~~	-		-	-	-	-	
~~**136**~~	-	-	-	-	-	-	
137	*Angophora costata* (Sydney Red Gum)	55cm	>20m	Good	Good-Fair	Co-dom from 6m.	
138	*Allocasuarina torulosa* (Forest Oak)	18cm	5m	Fair	Fair		
139	2 x *Eucalyptus resinifera* (Red Mahogany)	20+25cm	14m	Good	Fair	Epicormic high. Supressed and shared canopy.	
140	*Angophora costata* (Sydney Red Gum)	35cm	22m	Good	Fair	Shared canopy with 145.	

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
141	2 x *Allocasuarina torulosa* (Forest Oak)	15cm + 20cm	12m	Good	Good	Supressed	
142	*Angophora costata* (Sydney Red Gum)	35cm + 40cm	20m	Good	Fair	Co-dom for 2m. Trunk bulging.	
143	*Angophora costata* (Sydney Red Gum)	35cm	22m	Good	Fair	Canopy shared and conflicting.	
144	*Angophora costata* (Sydney Red Gum)	20cm + 20cm	12m	Good	Good	Shared canopy. Slightly supressed.	
~~**145**~~	-	-	-	-	-	-	
~~**146**~~	-	-	-	-	-	-	
~~**147**~~	-	-	-	-	-	-	
148	*Syncarpia glomulifera* Turpentine	30cm	14 x 12m	Fair	Good		
149	*Angophora costata* (Sydney Red Gum)	35cm	14 x 14m	Fair	Good		
150	*Angophora costata* (Sydney Red Gum)	40cm	20m	Good	Good	Minor D/w	
150a	*Corymbia (Euc) gummifera* (Red Bloodwood)	40cm	20m	Good	Good		
150b	*Syncarpia glomulifera* Turpentine	20+20 +25 cm	18m	Good	Good	Codom from ½ m	
150c	*Eucalyptus haemastoma* Scribbly Gum	45c + 55cm	18m	Good	Good	Near fence, Co-dom from 0.5m	

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk:** **Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
151	*Eucalyptus punctata* Grey Gum	3 x 35cm	8m	Good	Good	Central leader lost	
152	*Eucalyptus paniculata* (Gum tree)	10cm	8m	Good	Good	Slightly supresses	
153	*Eucalyptus resinifera* (Red Mahogany)	30cm	13m	Good	Good	Adjacent to fence	
154	*Eucalyptus haemastoma* Scribbly Gum	20 + 25cm	6m	Good	Good	Near fence	
155	*Eucalyptus haemastoma* Scribbly Gum	60 + 45cm	20m	Good	Good	Co-dom. from base or two trees adjacent. D/w 5cm. Fill over roots	
156	*Angophora costata* (Sydney Red Gum)		20m	Good	Good	Minor D/w	
157	*Syncarpia glomulifera (*Turpentine)	3 (25 – 30cm)	14m	Good	Good	Raised soil at base, shared and competing canopy	
158	*Acacia sp.* (Wattle)	17cm	6m	Poor	Poor	Limited future Near corner demountable	
~~**159**~~	-	-	-	-	-	-	
160	*Corymbia (Euc) gummifera* (Red Bloodwood)	16cm		Good	Good	Semi-mature (near gate) Termite mound at base	

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
161	*Acacia sp* (Wattle)	Multi	6m	Good	Fair		
162	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm + 25cm + 20cm + 15cm	9 x 8m	Good	Fair	Co-dom from base x 4 Corner of site	
163	*Acacia sp* (Wattle)	50cm	6 x 8m	Fair	Fair	Leaning over public path/small leaf	
164	*Angophora costata* (Sydney Red Gum)	29 + 17cm	9 x 7m	Fair	Good	*Eucalyptus punctata (*Grey Gum) nearby Co-dom from 1m. Canopy towards the road	
165	*Angophora costata* (Sydney Red Gum)	25cm + 36cm	13 x 6m	Good	Good	Co-dom from base x 2 Damaged leader at height. Remove deadwood. Monitor.	
166	*Angophora costata* (Sydney Red Gum)	18cm	5 x 2m	Fair	Fair	Splits in trunk Edge tree	
167	*Angophora costata* (Sydney Red Gum)	Multi	16m	Good	Fair		
168	*Angophora costata* (Sydney Red Gum)	Multi	16m	Good	Fair	Co-dom from base x 4 Reason unclear	
169	*Acacia sp* (Wattle)	10cm + 12cm	6m	Fair	Poor	Suppressed Co-dom from base x 2 10% foliage cover	
170	*Angophora costata* (Sydney Red Gum)	37cm	6 x 3m	Good	Good	Leaning away from adjacent tree	

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
171	*Angophora costata* (Sydney Red Gum)	Multi	16m	Good	Fair		
~~**172**~~	No tree	-	-	-	-		
~~**173**~~	No tree	-	-	-	-		
174	*Eucalyptus resinifera* (Red Mahogany)	55cm + 45cm	18m	Good	Fair	Co'dom from base	
175	*Eucalyptus haemastoma (*Scribbly Gum)	45cm + 45cm	25m	Good	Fair	Co'dom from 1m	
~~**176**~~	No tree	-	-	-	-	Juveniles tree nearby	
177	*Angophora costata* (Sydney Red Gum)	25cm	16m	Good	Fair		
178	*Eucalyptus resinifera* (Red Mahogany)	30cm	18m	Fair	Good	Small adjacent tree nearby (same species)	
179	*Angophora costata* (Sydney Red Gum)	25cm	12m	Good	Fair	Suppressed	
180	*Corymbia (Euc) gummifera (Red Bloodwood)*	25cm	18m	Good	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
181	*Eucalyptus resinifera* (Red Mahogany)	25cm	20m	Good	Fair	Partially suppressed	
182	*Eucalyptus resinifera* (Red Mahogany)	35cm	20m	Good	Good		
183	*Angophora costata* (Sydney Red Gum)	40+45cm	20m	Good	Good	Co-dom from base	
184	*Eucalyptus resinifera* (Red Mahogany)	35cm	20m	Good	Fair		
~~**185**~~	No tree	-	-	-	-		
~~**186**~~	No tree	-	-	-	-		
187	*Corymbia (Euc) gummifera (Red Bloodwood)*	40cm	18m	Good	Fair		
188	*Corymbia (Euc) gummifera (Red Bloodwood)*	38cm	18m	Good	Fair		
~~**189**~~	No tree	-	-	-	-		
~~**190**~~	No tree	-	-	-	-		

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk:** **Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

Appendix F

Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	Works required
~~**191**~~	No tree	-	-	-	-	-	
~~**192**~~	~~No tree~~	-	-	-	-	-	
193	*Acacia implexa* Hickory Wattle/ Weetjellan (D'harawal)	50cm	16m	Good	Good		
194	*Acacia implexa* Hickory Wattle/ Weetjellan (D'harawal)	10cm	6m	Good	Good	Similar trees under storey nearby	
~~**195**~~	-	-	-	-	-	-	
196	*Angophora costata* (Sydney Red Gum)	40cm	18m	Good	Good	Intermediate adjacent trees	
197	*Corymbia (Euc) gummifera (Red Bloodwood)*	35cm	18m	Good	Good	Intermediate tree. Sydney Red Gum's adjacent.	
198	*Angophora costata* (Sydney Red Gum)	30cm	18m	Good	Good	Vine over	
~~**199**~~	-	-	-	-	-	-	
200	*Eucalyptus resinifera* (Red Mahogany)	30cm	18m	Fair	Fair		

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	Works required
201	*Angophora costata* (Sydney Red Gum)	40cm	10 -16m	Good	Good	201-206 Group of Angophora, Acacia sp and Forest Oaks 10 – 40cm	
202	*Acacia sp* (Wattle)	10– 20cm	6-10m	Good - Fair	Good - Fair	0201-206 Group of Angophora, Acacia sp and Forest Oaks 10 – 40cm	
203	*Allocasuarina torulosa* (Forest Oak)	10– 20cm	6-10m	Good - Fair	Good - Fair	201-206 Group of Angophora, Acacia sp and Forest Oaks 10 – 40cm	
204	*Acacia sp* (Wattle)	10– 20cm	6-10m	Good	Good	201-206 Group of Angophora, Acacia sp and Forest Oaks 10 – 40cm	
205	*Allocasuarina torulosa* (Forest Oak)	10– 20cm	6-10m	Good	Good	201-206 Group of Angophora, Acacia sp and Forest Oaks 10 – 40cm	
206	*Allocasuarina torulosa* (Forest Oak)	10– 20cm	6-10m	Good	Good	201-206 Group of Angophora, Acacia sp and Forest Oaks 10 – 40cm	
207	*Angophora costata* (Sydney Red Gum)	40cm	9m	Good - Fair	Good - Fair		
208	*3 x Eucalyptus paniculata* (Grey Ironbark)	25 +28 +10cm	16m	Good	Good	Lomandra under	
209	*Angophora costata* (Sydney Red Gum)	60cm	16m	Good	Good		
210	*Corymbia (Euc) gummifera* (Red Bloodwood)	10 – 25cm	14m	Good	Good	210 – 214 comprise a Group of trees. Lomandra under	

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure: Imminent / Probable** (Possible Improbable)
Target: High / Medium (Low/Very Low) **Consequences of Failure: Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	Works required
211	*Corymbia (Euc) gummifera* (Red Bloodwood)	10 – 25cm	14m	Good	Good	210 – 214 comprise a Group of trees	
212	*Corymbia (Euc) gummifera* (Red Bloodwood)	10 – 25cm	14m	Good	Good	210 – 214 comprise a Group of trees	
213	*Corymbia (Euc) gummifera* (Red Bloodwood)	10 – 25cm	14m	Good	Good	210 – 214 comprise a Group of trees	
214	*Corymbia (Euc) gummifera* (Red Bloodwood)	10 – 25cm	14m	Good	Good	210 – 214 comprise a Group of trees	
215	*Allocasuarina torulosa* (Forest Oak)	20cm	7m	Good	Good		
216	*Corymbia (Euc) gummifera* (Red Bloodwood)	25 +30cm	13m	Good	Good	Shared canopy	
217	*Angophora costata* (Sydney Red Gum)	40cm	16m	Good	Good	Intermediate tree	
218	*Eucalyptus resinifera* (Red Mahogany)	35cm	16m	Fair	Fair		
219	*2 x Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	10m	Good	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk:** **Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	Works required
~~220~~	No tree	-	-	-	-	-	
~~221~~	No tree	-	-	-	-	-	
~~222~~	No tree	-	-	-	-	-	
~~223~~	No tree	-	-	-	-	-	
~~224~~	No tree	-	-	-	-	-	
225	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	14m	Good	Good	Dead and senescing She Oaks & wattles nearby	
226	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	15m	Good	Fair	D/w10cm	
227	*Eucalyptus resinifera* (Red Mahogany)	30cm	16m	Fair	Good		
228	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	10m	Good	Good		
229	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	10m	Dead	Dead	Dead	

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS Tree Data Schedule

Tree #	Species	DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	Works required
230	*Corymbia (Euc) gummifera* (Red Bloodwood)	25cm	9m	Fair	Fair	Minor D/w	
231	*Corymbia (Euc) gummifera* (Red Bloodwood)	25cm	9m	Good	Good	Understorey of She Oaks, Hakeas, Persooonia.	
232	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	10m	Good	Good	Understorey of She Oaks, Hakeas, Persooonia	
233	*Pittosporum undulatum* Native Daphne	12cm	4m	Good	Good		
234	Various Semi-Mature trees	10 - 25cm	6-10m	Fair	Fair	234-237 Mix of semi mature trees 10 – 25cm diameters, Angophora and Eucalyptus sp. In Fair health and condition.	
235	Various Semi-Mature trees	10 - 25cm	6-10m	Fair	Fair		
236	Various Semi-Mature trees	10 - 25cm	6-10m	Fair	Fair		
237	Various Semi-Mature trees	10 - 25cm	6-10m	Fair	Fair		
238	Eucalyptus paniculata (Grey Ironbark)	40cm	6m	Good	Good		
239	Eucalyptus paniculata (Grey Ironbark)	25cm + 26cm 5cm	18m	Good	Good	Co-dom x 3	
240	Eucalyptus paniculata (Grey Ironbark)	40cm	16m	Good	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk:** **Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS Tree Data Schedule

Tree #	Species	DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	Works required
241	*Eucalyptus acmenoides* White mahogany	45cm	10m	Good	Good		
242	*Eucalyptus resinifera* (Red Mahogany)	45cm	12m	Good	Good		
~~**243**~~	No tree	-	-	-	-		
244	*Eucalyptus microcorys* (Tallowwood)	25cm	8m	Good	Good-Fair	Top damaged	
245	*Grevillea* Grevillea Hybrid	20cm	5m	Good	Fair		
246	*Eucalyptus paniculata* (Grey Ironbark)	60cm	10m	Good	Good-Fair	Co-dom from base, D/w 5cm	
247	*Eucalyptus paniculata* (Grey Ironbark)	25cm	10m	Good	Good		
248	*Eucalyptus paniculata* (Grey Ironbark)	30cm	16m	Good	Good	D/w 8cm	
249	*Eucalyptus paniculata* (Grey Ironbark)	50 +40cm	16m	Good	Fair-Poor	Co-dom from base, frass. Near post	
250	*Callistemon citrinus* Crimson Bottlebrush	7cm	10m	Good	Good	Near building. Multi from base. M-OM	

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
251	*Melaleuca sp.* Paperbark	7cm	8m	Good	Good	Near building.	
252	*Grevillea* Grevillea Hybrid/CV	10<cm	6m	Fair	Fair-Poor	Limited future	
253	*Melaleuca bracteata* Black Tea-tree	<10cm	6m	Fair	Fair		
254	*Macadamia integrifolia* Macadamia	20cm	5m	Good	Good	Near building, Codom from 1m	
255	*Eucalyptus racemosa* Narrow-leaved Scribbly Gum / Snappy Gum	40cm	13m	Good	Good	Near flag pole	
~~**256**~~	No tree	-	-	-	-	-	
257	*Corymbia (Euc) gummifera?* (Red Bloodwood)	3 x 20cm	7m	Fair	Fair	Codom. High% D/w. *Callitris* sp nearby.	
258	*Eucalyptus resinifera* (Red Mahogany)	20cm	7m	Good	Good	Other Semi- Mature *Eucalyptus resinifera, and Allocasuarina* sp close to parking area	
~~**259**~~	Dead	-	-	-	-	-	
260	*Eucalyptus resinifera* (Red Mahogany)	25cm	9m	Good	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
261	*5 x Eucalyptus resinifera* (Red Mahogany)	11cm-12cm	10m 30m	Good Good	Good Fair	And one *Allocasuarina* sp.	
262	*Eucalyptus resinifera* (Red Mahogany)	55cm	13+10m	Good-Fair	Good	Dominant tree. Termite mound nearby. D/w 10cm. Dodder and Olives nearby.	
263	*Eucalyptus resinifera* (Red Mahogany)	22cm	10m	Good	Good	Co-dom from 4m	
264	*Eucalyptus resinifera* (Red Mahogany)	25cm	10m	Good	Good	Two Semi- mature intermediate trees nearby	
265	*Eucalyptus resinifera* (Red Mahogany)	40cm	10m	Fair-Poor	Fair		
266	*Eucalyptus resinifera* (Red Mahogany)	30cm	10m	Good	Good	Co-dom. from 1m. Mounding nearby	
267	*13 x Eucalyptus resinifera* (Red Mahogany)	10-12cm	9m	Good - Fair	Good - Fair	Manage 266 – 268 as a group	
268	Fallen tree	-	-	-	-	*Eucalyptus resinifera*	
269	*Corymbia (Euc) gummifera* (Red Bloodwood)	10-20cm	10m			Group of small *Corymbia gummifera* nearby	
270	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	12m	Good	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk:** **Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
271	*Corymbia (Euc) gummifera (Red Bloodwood)*	30cm	12m	Good	Good		
272	*Corymbia (Euc) gummifera (Red Bloodwood)*	25cm	14m	Good	Good		
273	*Corymbia (Euc) gummifera (Red Bloodwood)*	20cm	11m	Good	Good		
274	*Corymbia (Euc) gummifera (Red Bloodwood)*	30cm	13m	Good	Good		
275	*Corymbia (Euc) gummifera (Red Bloodwood)*	15cm	11m	Good	Good		
276	*Eucalyptus resinifera* (Red Mahogany)	15cm	9m	Good	Good		
277	*Corymbia (Euc) gummifera (Red Bloodwood)*	25cm	13m	Good	Fair	Wound on West side of trunk from 0-1m height	
278	*Eucalyptus haemastoma* (Scribbly Gum)	40cm	15m	Good	Fair	Multiple open [?] trunk	
279	*Eucalyptus haemastoma* (Scribbly Gum) *Angophora costata* (Sydney Red Gum)					Also 20 Small trees	
280	*Corymbia (Euc) gummifera (Red Bloodwood)*	20cm	12m	Good	Good	Epis	

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
281	*Acacia sp.* (Wattle)	20cm	7m	Fair	Fair	Senescing	
282	*Corymbia (Euc) gummifera (Red Bloodwood)*	20-30cm	14m	Good	Good		
283	*Corymbia (Euc) gummifera* (Red Bloodwood)	40cm	18m	Good	Good	Feeding scars…sugar gliders	
284	*Corymbia (Euc) gummifera (Red Bloodwood)*	15cm	11m	Good	Good		
285	*Eucalyptus haemastoma* (Scribbly Gum)	40cm	16m	Good	Good		
286	*Angophora costata* (Sydney Red Gum)	55cm	16m	Good	Good	Very recently pruned	
287	*Corymbia (Euc) gummifera (Red Bloodwood)*	20cm	12m	Good	Good		
288	*Corymbia (Euc) gummifera (Red Bloodwood)*	20cm	9m	Good	Fair		
289	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	11m	Good	Good		
290	*Corymbia (Euc) gummifera (Red Bloodwood)*	30cm	13m	Good	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk:** **Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
291	*Eucalyptus resinifera* (Red Mahogany)	20cm	9m	Good	Good		
292	*Eucalyptus haemastoma* (Scribbly Gum)	45cm	17m	Good	Good		
293	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	12m	Good	Good		
294	*Corymbia (Euc) gummifera (Red Bloodwood)*	55cm	16m	Fair	Fair	Multiple hollows found	
295	*Eucalyptus haemastoma* (Scribbly Gum)	35cm	13m	Good	Fair	Large wound on south side of trunk	
296	*Angophora costata* (Sydney Red Gum)	35cm	13m	Good	Good		
297	*Corymbia (Euc) gummifera* (Red Bloodwood)	25cm	15m	Good	Good		
298	*Angophora costata* (Sydney Red Gum)	50cm	16m	Good	Good	-	
299	*Eucalyptus resinifera* (Red Mahogany)	20cm	8m	Fair	Fair	Epicormics all over Dead wood	Remove
300	*Eucalyptus haemastoma* (Scribbly Gum)	40cm	15m	Good	Good	Co-dom from 5m. Behind container	

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk:** **Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
301	*Angophora costata* (Sydney Red Gum)	20cm	12m	Good	Good		
302	*Eucalyptus haemastoma* (Scribbly Gum)	35cm	16m	Good	Good	2 x D/w 10 cm diameter to south	
303	*Eucalyptus resinifera* (Red Mahogany)	2 x 25cm	14m	Good	Good		
304	Dead	-	-	-	-	Dead leaning tree – Remove ASAP	
305	*Angophora costata* (Sydney Red Gum)	35cm	14m	Good	Good		
306	*Eucalyptus haemastoma* (Scribbly Gum)	35cm	13m	Good	Good		
307	*Eucalyptus haemastoma* (Scribbly Gum)	40cm	15m	Good	Good		
308	*Eucalyptus haemastoma* (Scribbly Gum)	30cm	14m	Good	Fair	Large open would to S @ 0-2m	
309	*Corymbia (Euc) gummifera (Red Bloodwood)*	Multiple 10-30cm	12-16m	Fair/Good	Fair/Good		
310	*Corymbia (Euc) gummifera (Red Bloodwood)* as above	20+25cm	12m	Good	Good	-	

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk:** **Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
311	*Corymbia (Euc) gummifera (Red Bloodwood)*	25cm	12m	Good	Good		
312	*Corymbia (Euc) gummifera (Red Bloodwood)*	25cm	12m	Good	Good		
313	*Eucalyptus resinifera* (Red Mahogany)	25cm	14m	Good	Good		
314	*Eucalyptus resinifera* (Red Mahogany)	30+10 cm	14m	Good	Good		
315	*Corymbia (Euc) gummifera* (Red Bloodwood)	15cm	9m	Good	Good		
316	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	12m	Good	Good		
317	*Eucalyptus resinifera* (Red Mahogany)	2 x 25cm	14m	Fair	Fair		
318	*Eucalyptus haemastoma* (Scribbly Gum)	40cm	15m	Good	Good		
319	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	12m	Good	Good		
320	*Eucalyptus haemastoma* (Scribbly Gum)	35cm	14m	Good	Good	D/w to 10 cm diameter	

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure: Imminent / Probable** (Possible Improbable)
Target: High / Medium (Low/Very Low) **Consequences of Failure: Severe/ Significant** (Minor/ Negligible)

321	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	9m	Good	Good		
322	*Corymbia (Euc) gummifera* (Red Bloodwood)	10+20+ 25cm	14m	Good	Good		
323	*Eucalyptus resinifera* (Red Mahogany)	20+30cm	13m	Fair	Fair		
324	*Angophora costata* (Sydney Red Gum)	50cm	16m	Good	Good	Lean to N.	
325	Group of *Angophora costata* (Sydney Red Gum) / *Corymbia (Euc) gummifera* Red Bloodwood	10-20cm	9m	Good	Good		
326	*Eucalyptus resinifera* (Red Mahogany)	40cm	15m	Fair	Good	Lean to N. Compacted roots from fire trail	
327	*Eucalyptus resinifera* (Red Mahogany)	30cm	15m	Fair	Good		
328	*Corymbia (Euc) gummifera (Red Bloodwood)*	2 x 20cm	14m	Good	Good		
329	*Eucalyptus paniculata* Grey Ironbark	3 x20cm	12m	Fair	Poor	2 x dead stems	
330	*Corymbia (Euc) gummifera (Red Bloodwood)*	25cm	14m	Fair	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk:** **Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
331	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	10m	Fair	Fair		
332	*Eucalyptus resinifera* (Red Mahogany)	30cm	12m	Fair	Good		
333	*Corymbia (Euc) gummifera (Red Bloodwood)*	3 x 20-25cm	13m	Good	Good	Minor d/w	
334	*Corymbia (Euc) gummifera (Red Bloodwood)*	2x20cm	9m	Good-Fair	Good		
335	*Eucalyptus resinifera* (Red Mahogany)	30cm	15m	Good	Good	Minor d/w	
335a	*Eucalyptus punctata* (Grey Gum)	30cm	16m	Good	Fair	Large wound a 1-5m H.	
336	*Corymbia (Euc) gummifera (Red Bloodwood)*	30cm	16m	Good	Good	Fill in root zone	
337	*Eucalyptus resinifera* (Red Mahogany)	30cm	14m	Fair	Good	Fill in root zone	
338	*Angophora costata* (Sydney Red Gum)	20+25cm	12m	Good	Good		
339	*Corymbia (Euc) gummifera (Red Bloodwood)*	25cm	14m	Good	Good		
340	*Corymbia (Euc) gummifera (Red Bloodwood)*	25cm	15m	Good	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
341	*Corymbia (Euc) gummifera (Red Bloodwood)*	20cm	12m	Good	Good		
342	*Eucalyptus punctata* (Grey Gum)	20cm	9m	Good	Good		
343	*Eucalyptus resinifera* (Red Mahogany)	20+ 25cm	10m	Fair	Good	Co-dom from 0.5m. Compacted roots from cars	
344	*Eucalyptus haemastoma* (Scribbly Gum)	40cm	17m	Good	Good-Fair	Large wound on 5 trunks	
345	*Corymbia (Euc) gummifera (Red Bloodwood)*	20cm	15m	Good	Good	Fill around trunk	
346	*Corymbia (Euc) gummifera (Red Bloodwood)*	Multi 25cm	13m	Good	Good	Fill around trunk	
347	*Corymbia (Euc) gummifera (Red Bloodwood)*	25cm	14m	Fair	Fair	Fill around trunk	
348	*Corymbia (Euc) gummifera (Red Bloodwood)*	20cm	12m	Fair	Fair	Fill around trunk	
349	*Eucalyptus haemastoma* (Scribbly Gum)	35cm	14m	Good	Fair	High epicormic, wound wood/kino	
350	*Eucalyptus haemastoma* (Scribbly Gum)	40cm	14m	Good	Good	Trunk discolouration	

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
351	*Corymbia (Euc) gummifera (Red Bloodwood)*	30cm	14m	Good	Good		
352	*Corymbia (Euc) gummifera (Red Bloodwood)*	20cm	13m	Good	Good		
353	*Corymbia (Euc) gummifera (Red Bloodwood)*	15cm	12m	Good	Good		
354	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	14m	Good	Good		
355	*Eucalyptus haemastoma* (Scribbly Gum)	40cm	14m	Good	Good	Fill around base	
356	*Corymbia (Euc) gummifera (Red Bloodwood)*	20cm	12m	Good	Good		
357	*Eucalyptus resinifera* (Red Mahogany)	35cm	16m	Fair	Good	Fill around base	
358	*Corymbia (Euc) gummifera* (Red Bloodwood)	4 x 10-20cm	12m	Good	Good		
359	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	12m	Good	Good		
360	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	9m	Good	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure: Imminent / Probable** (Possible Improbable)
Target: High / Medium (Low/Very Low) **Consequences of Failure: Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
361	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	11m	Good	Good	Fill around base	
362	*Eucalyptus resinifera* (Red Mahogany)	20+ 25cm	11m	Good	Good	Fill around base	
363	*Corymbia (Euc) gummifera* (Red Bloodwood)	20+25cm	9m	Good	Poor	Included from base	Remove
364	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	12m	Good	Good		
365	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	14m	Good	Good	-	
366	*Eucalyptus resinifera* (Red Mahogany)	20cm	9m	Good	Good		
367	*Eucalyptus resinifera* (Red Mahogany)	35cm	16m	Good	Good		
368	*Corymbia (Euc) gummifera* (Red Bloodwood)	10-30cm	8-12m	Good	Good		
369	*Corymbia (Euc) gummifera* (Red Bloodwood)	10-30cm	8-12m	Good	Good		
370	*Corymbia (Euc) gummifera* (Red Bloodwood)	10-30cm	8-12m	Good	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
371	*Corymbia (Euc) gummifera* (Red Bloodwood)	10-30cm	8-12m	Good	Good		
372	*Corymbia (Euc) gummifera* (Red Bloodwood)	10-30cm	8-12m	Good	Good		
373	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	12m	Good	Good		
374	*Corymbia (Euc) gummifera* (Red Bloodwood)	25cm	12m	Good	Good	-	
375	*Corymbia (Euc) gummifera* (Red Bloodwood)	25cm	12m	Good	Good		
376	*Corymbia (Euc) gummifera* (Red Bloodwood)	35 + 20cm	15m	Good	Good		
377	*Eucalyptus resinifera* (Red Mahogany)	35cm	9m	Good	Poor	Top has died - back end been pruned out	
378	*Corymbia (Euc) gummifera* (Red Bloodwood)	30 cm	13m	Good	Good		
379	*Corymbia (Euc) gummifera* (Red Bloodwood)	15cm	9m	Good	Good		
380	*Corymbia (Euc) gummifera* (Red Bloodwood)	20 +25cm	11m	Good	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
381	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	12m	Good	Good		
382	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	12m	Good	Good	*Eucalyptus haemastoma* (Scribbly Gum)	
383	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	12m	Good	Good		
384	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	12m	Good	Good		
385	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	14m	Good	Good		
386	*Corymbia (Euc) gummifera* (Red Bloodwood)	15cm	12m	Good	Good		
387	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	14m	Good	Good		
388	*Corymbia (Euc) gummifera* (Red Bloodwood) + *Angophora costata* (Sydney Red Gum)	20 and 25cm	13m	Good	Good	One is co'dom – further inspection required	
389	*Corymbia (Euc) gummifera* (Red Bloodwood)	20-30cm	13m	Good	Good		
390	*Eucalyptus haemastoma* (Scribbly Gum)	40cm	15m	Good	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
391	Group *Corymbia (Euc) gummifera* Red Bloodwood & *Eucalyptus punctata* (Grey Gum)	20/25 cm	12m	Good	Good		
392	*Eucalyptus haemastoma* (Scribbly Gum)	40cm	15m	Good	Good	Has wound in trunk – S - machinery	
393	*Corymbia (Euc) gummifera* Red Bloodwood	20cm	12m	Good	Good		
394	*Eucalyptus haemastoma* (Scribbly Gum)	30 + 30cm	16m	Good	Fair	Codom from base. Kids vandalising tree	
395	*Eucalyptus punctata* (Grey Gum)	30cm	15m	Good	Good	D/w required	
396	*Eucalyptus punctata* (Grey Gum)	20cm	7m	Good	Fair	Tree is alive!	
397	*Angophora costata* (Sydney Red Gum)	25cm	12m	Good	Good	D/w to 50mm	
398	*Corymbia (Euc) gummifera* (Red Bloodwood)	20-30 cm	12m	Good	Good		
399	*Eucalyptus haemastoma* (Scribbly Gum)	40cm	17m	Good	Good		
400	*Eucalyptus haemastoma* (Scribbly Gum)	40cm	17m	Good	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk:** **Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
401	*Angophora costata* (Sydney Red Gum)	20 +20cm	8m	Good	Good	Prune dead stub @0.5m height dangerous for kids	
402	2 *Corymbia (Euc) gummifera* Red Bloodwood	20 +20cm	9m	Good	Good		
403	*Eucalyptus haemastoma* (Scribbly Gum)	40cm	15m	Good	Good	Has nest box wired onto trunk	
404	*Corymbia (Euc) gummifera* Red Bloodwood	20cm	10m	Good	Good	-	
405	*Eucalyptus resinifera* (Red Mahogany)	25+ 25cm	10m	Fair	Fair	Codom trunks. Epicormics, D/w Good climbing tree	
406	*Eucalyptus haemastoma* (Scribbly Gum)	25cm	10m	Good	Fair	Supressed – growing to S, with lean	
407	*Eucalyptus punctata* (Grey Gum)	40cm	18m	Good	Fair	Co'dom with included bark from 4m. D/w needed. Hanger to be removed!	
408	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	9m	Good	Good	-	
409	*Eucalyptus haemastoma* (Scribbly Gum)	35cm	15m	Fair	Good	Share canopy	
410	*Eucalyptus punctata* (Grey Gum)	25cm	10m	Fair	Fair	Large deadwood	

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
411	*Eucalyptus punctata* (Grey Gum)	15cm	10m	Good	Fair		
412	*Eucalyptus resinifera* (Red Mahogany)	20cm	12m	Good	Good		
413	*Corymbia (Euc) gummifera* (Red Bloodwood)	15cm	10m	Good	Good	Remove first Northwest branch 25cm Ø at 1.5m	
414	*Eucalyptus punctata* (Grey Gum)	25cm	14m	Good	Good		
415	*Corymbia (Euc) gummifera* (Red Bloodwood)	25cm	14m	Fair	Good		
416	*Angophora costata* (Sydney Red Gum)	30cm	14m	Good	Good		
417	*Eucalyptus punctata* (Grey Gum)	25cm	12m	Good	Good		
418	*Eucalyptus punctata* (Grey Gum) + *Eucalyptus haemastoma* (Scribbly Gum)	25cm	13m	Good	Good	A wound on Scribbly at 1m	
419	*Eucalyptus haemastoma* (Scribbly Gum)	15cm +30cm	12m	Good	Good		
420	*Eucalyptus haemastoma* (Scribbly Gum)	2 x 25cm	12m	Good	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure: Imminent / Probable** (Possible Improbable)
Target: High / Medium (Low/Very Low) **Consequences of Failure: Severe/ Significant** (Minor/ Negligible)

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
421	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	11m	Good	Good		
422	*Corymbia (Euc) gummifera* (Red Bloodwood)	25cm	11m	Good	Good		
423	*Eucalyptus resinifera* (Red Mahogany)	30cm	13m	Good	Good		
424	Dead *Corymbia (Euc) gummifera* Red Bloodwood	25cm	14m	Dead	Dead		
425	*Corymbia (Euc) gummifera* (Red Bloodwood)	15cm	9m	Good	Good		
426	*Corymbia (Euc) gummifera* (Red Bloodwood)	15cm	9m	Good	Good		
427	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	12m	Good	Good		
428	*Corymbia (Euc) gummifera* (Red Bloodwood)	2 x 15-20cm	13m	Good	Good		
429	*Angophora costata* (Sydney Red Gum)	4 x 10-25cm	14m	Good	Good	D/w	
430	*Eucalyptus resinifera* (Red Mahogany)	35cm	14m	Good	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk:** **Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
431	*Eucalyptus haemastoma* (Scribbly Gum)	35cm	15m	Fair	Good		
432	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	9m	Good	Fair	Dead leader	
433	*Angophora costata* (Sydney Red Gum)	55cm	17x12m	Good	Good-Fair	High Kino - Detailed inspection required. Further inspection if retained.	
434	Group of *trees*	10-20cm	9m	Good	Good	*Eucalyptus resinifera* (Red Mahogany), *Corymbia (Euc) gummifera* Red Bloodwood, *Angophora costata* (Sydney Red Gum)	
435	*Angophora costata* (Sydney Red Gum)	20-25cm	10m	Good	Good		
436	*Angophora costata* (Sydney Red Gum)	25cm	11m	Good	Good		
437	*Eucalyptus haemastoma* (Scribbly Gum)	20cm	11m	Good	Good		
438	*Eucalyptus haemastoma* (Scribbly Gum)	45cm	14m	Good	Good		
439	*Corymbia (Euc) gummifera* (Red Bloodwood)	25cm	10m	Good	Good		
440	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	13m	Good	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
441	*Angophora costata* (Sydney Red Gum)	30+25cm	16m	Good	Fair	Included from 1m	
442	*Eucalyptus haemastoma* (Scribbly Gum)	35cm	14m	Good	Good		
443	*Corymbia (Euc) gummifera* (Red Bloodwood)	25cm	8m	Good	Good		
444	*Angophora costata* (Sydney Red Gum)	20+25cm	9m	Good	Good		
445	*Corymbia (Euc) gummifera* (Red Bloodwood)	25cm	9m	Good	Good		
446	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	11m	Good	Good	Growing to west.	
447	*Corymbia (Euc) gummifera* (Red Bloodwood)	15cm	9m	Good	Good		
448	*Angophora costata* (Sydney Red Gum)	25cm	14m	Good	Good		
449	*Angophora costata* (Sydney Red Gum)	50cm	17m	Good	Good		
450	*Eucalyptus haemastoma* (Scribbly Gum)	25cm	12m	Good	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
451	*Angophora costata* (Sydney Red Gum)	25cm	12m	Good	Good		
452	*Angophora costata* (Sydney Red Gum)	30cm	4m	Fair	Poor		
453	*Eucalyptus haemastoma* (Scribbly Gum)	30cm	12m	Good	Good		
454	*Eucalyptus resinifera* (Red Mahogany)	30cm	12m	Good	Good		
455	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	8m	Good	Good		
456	*Eucalyptus resinifera* (Red Mahogany)	30cm	16m	Fair	Poor		
457	*Eucalyptus resinifera* (Red Mahogany)	25cm + 25cm	16m	Good	Fair		
458	*Corymbia (Euc) gummifera* (Red Bloodwood)	25cm	14m	Good	Good		
459	*Eucalyptus haemastoma* (Scribbly Gum)	60cm	16m	Fair	Good	-	
460	*Angophora costata* (Sydney Red Gum)	30cm	15m	Good	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk:** **Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
461	*Angophora costata* (Sydney Red Gum)	25cm	9m	Good	Good		
462	*Eucalyptus resinifera* (Red Mahogany)	30cm	12m	Good	Good	D/w	
463	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	13m	Good	Good		
464	*Corymbia (Euc) gummifera* (Red Bloodwood)	25cm	14m	Good	Good		
465	*Angophora costata* (Sydney Red Gum)	20cm	12m	Good	Good		
466	*Syncarpia glomulifera* Turpentine	35cm	14m	Good	Good	Deadwooding required	
466a	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	14m	Fair	Good		
467	*Corymbia (Euc) gummifera* (Red Bloodwood)	2 x 15 +25cm	9m	Good	Good		
468	*Eucalyptus haemastoma* (Scribbly Gum)	35cm	12m	Fair	Fair	Dead leader	
469	*Eucalyptus haemastoma* (Scribbly Gum)	35cm	14m	Good	Good	D/w	
470	*Eucalyptus haemastoma* (Scribbly Gum)	30cm	14m	Good	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
471	*Eucalyptus haemastoma* (Scribbly Gum)	25cm	14m	Good	Good		
472	*Eucalyptus haemastoma* (Scribbly Gum)	35cm	16m	Good	Good		
473	*Eucalyptus haemastoma* (Scribbly Gum)	25cm	14m	Good	Good		
474	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	15m	Good	Good	-	
475	*Eucalyptus resinifera* (Red Mahogany)	35cm	13m	Good	Good		
476	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	10m	Good	Good	Surrounded by dead *Corymbia (Euc) gummifera*	
477	*Eucalyptus haemastoma* (Scribbly Gum)	20cm	13m	Good	Good		
478	*Eucalyptus haemastoma* (Scribbly Gum)	20cm	12m	Good	Good	-	
479	*Angophora costata* (Sydney Red Gum)	3 x 20cm	14m	Good	Good		
480	*Eucalyptus resinifera* (Red Mahogany)	25cm	13m	Good	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure: Imminent / Probable** (Possible Improbable)
Target: High / Medium (Low/Very Low) **Consequences of Failure: Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
481	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	9m	Good	Good		
482	*Eucalyptus haemastoma* (Scribbly Gum)	25cm	12m	Good	Good		
483	*Syncarpia glomulifera* Turpentine	5 x (10-20) cm	9m	Good	Good	Clump	
484	*Eucalyptus haemastoma* (Scribbly Gum)	25cm	12m	Good	Good		
485	*Angophora costata* (Sydney Red Gum)	30cm	14m	Good	Good		
486	*Corymbia (Euc) gummifera* (Red Bloodwood)	2 x 20cm	12m	Good	Good		
487	*Eucalyptus haemastoma* (Scribbly Gum)	2 x 25cm	12m	Good	Fair	Decay pockets on trunk	
488	*Angophora costata* (Sydney Red Gum)	2 x 30cm	14m	Good	Good	D/w	
489	*Eucalyptus haemastoma* (Scribbly Gum)	35cm	14m	Good	Good	D/w	
490	*Eucalyptus resinifera* (Red Mahogany)	15+ 20cm	10m	Good	Good		

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk:** **Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
491	*Angophora costata* (Sydney Red Gum)	55cm	14m	Good	Good		
492	*Eucalyptus haemastoma* (Scribbly Gum)	55cm	12m	Good	Good	with fissures up trunk	
493	*Eucalyptus haemastoma* (Scribbly Gum)	55cm	12m	Good	Good		
494	*Corymbia (Euc) gummifera* (Red Bloodwood)	55cm	12m	Good	Good	-	
495	*Eucalyptus haemastoma* (Scribbly Gum)	55cm	10m	Good	Good		
496	*Angophora costata* (Sydney Red Gum)	55cm	12m	Good	Good		
497	*Eucalyptus haemastoma* (Scribbly Gum)	55cm	12m	Fair	Fair		
498	*Eucalyptus haemastoma* (Scribbly Gum)	55cm	12m	Good	Good		
499	*Acacia sp.* Wattle	55cm	12m	Fair	Fair		
500	*Angophora costata* (Sydney Red Gum)	3 x10-25cm	13m	Good	Good	Co-dom from base x 2, Vine growing over Frass evident at base	

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
501	*Eucalyptus haemastoma* (Scribbly Gum)	15 + 20cm	12 x 3m	Good	Good		
502	*Angophora costata* (Sydney Red Gum)	50+ 10cm	16 x9m	Good	Good	Stump removed	
503	*Syncarpia glomulifera* (Turpentine)	3x 10-20	12 x 5m	Good	Good		
504	*Syncarpia glomulifera* (Turpentine)	2+23+ 26cm	12x 6m	Good	Good	Co-dom from base x 3	
505	*Angophora costata* (Sydney Red Gum)	23cm + 26cm	14 x 9m	Good	Good	Co-dom x 2 Intermediate tree Slightly affected by tree 504	
506	*Syncarpia glomulifera* (Turpentine)	25cm	8 x 4m	Good	Good		
507	*3 x Allocasuarina torulosa* (Forest Oak)	15cm	8 x 6m	Good	Good		
508	*Syncarpia glomulifera* (Turpentine)	25cm	7 x 3m	Good	Good		
509	*Syncarpia glomulifera* (Turpentine)	23cm + 22cm	6 x 2m	Good	Good	Co-dom from base x 2	
510	*Syncarpia glomulifera* (Turpentine)	22cm + 22cm	9 x 7m	Good	Good	2 x trees slightly suppressed	

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
511	*Syncarpia glomulifera* (Turpentine)	20 +20 + 20cm	6m x 4m	Good	Good	3 x suckers from old stump	
512	*Syncarpia glomulifera* (Turpentine)	20 + 10cm	17 x 10m	Good	Good	Co-dom from base x 2	
513	*Angophora costata* (Sydney Red Gum)	40cm	13 x 7m	Good	Good		
514	*Angophora costata* (Sydney Red Gum)	23 +25 +15cm	10 x 7m	Good	Good	Co-dom from base x 3 Minor mechanical damage Deadwood to 5cm Intermediate	
515	*Syncarpia glomulifera* (Turpentine)	15cm + 18cm	7m x 3m	Good	Fair	Co-dom from base x2 Suppressed	
516	*Angophora costata* (Sydney Red Gum)	40 +20 + 32cm	15 x 9m	Good	Good	Co-dom from base x3 Caused by clearing	
517	*Syncarpia glomulifera* (Turpentine)	26cm	7m x 4m	Good	Fair	Canopy suppressed	
518	*Allocasuarina torulosa* (Forest Oak)	15cm	8m x 5m	Good	Fair		
519	*Syncarpia glomulifera* (Turpentine)	55cm (at 1m)	13m x 8m	Good	Fair	Low angle of attachment 1.5m	
520	*Corymbia (Euc) gummifera* (Red Bloodwood)	25 + 25cm	15m	Good	Good	Co-dom from base x2 Intermediate with adjacent tree	

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

Appendix F

Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
521	*Angophora costata* (Sydney Red Gum)	32cm	15m	Good	Good	Folding under leader, correcting at 5m	
522	*Angophora costata* (Sydney Red Gum)	10-15cm	8m	Good	Good	Co-dom from base x3	
523	*Eucalyptus haemastoma* (Scribbly Gum)	20 +10cm	7m	Good	Fair	Co-dom from base x2 Minor bark damage from fence	
524	*Eucalyptus haemastoma* (Scribbly Gum)	20cm	6m	Good	Fair	Damage in trunk. Manage	
525	*Angophora costata* (Sydney Red Gum)	20cm	8m	Good	Good		
526	*Eucalyptus haemastoma* (Scribbly Gum)	15cm	8m	Good	Good		
527	*Eucalyptus haemastoma* (Scribbly Gum)	15cm	8m	Good	Good		
528	*Eucalyptus resinifera* (Red Mahogany)	30cm	10m	Fair	Good		
529	*Eucalyptus resinifera* (Red Mahogany)	15cm	8m	Good	Fair-Poor		
530	*Eucalyptus resinifera* (Red Mahogany)	20cm	8m	Fair	Fair		

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

Appendix F

Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
531	*Eucalyptus resinifera* (Red Mahogany)	16cm	8m	Good	Fair		
532	*Angophora costata* (Sydney Red Gum)	30cm	10m	Fair	Fair	Deadwood at 8cm *Allocasuarina* to east (small)	
533	*Corymbia (Euc) gummifera* (Red Bloodwood)	25cm	16m	Good	Good	Forest form No canopy up to 14m	
534	*Angophora costata* (Sydney Red Gum)	35cm	20m	Good	Good		
535	*Corymbia (Euc) gummifera* (Red Bloodwood)	35cm	20m			Shared canopy with 534	
536	*Angophora costata* (Sydney Red Gum)	15cm	16m	Good	Good	Suppressed by adjacent trees	
537	*Syncarpia glomulifera* (Turpentine)	25cm	16m	Good	Good		
538	*Syncarpia glomulifera x 3* (Turpentine)	15 +20+ 20cm	16m	Good	Good		
539	*Syncarpia glomulifera* (Turpentine)		15m	Good	Good	Co-dom from base x 2	
540	*Angophora costata* (Sydney Red Gum)	35 +40+ 40cm	16m	Good	Good	Dominant tree in corner, Co-dom from base x 3, Old stump removed, Vertical trunks, Crossed branches, Deadwood to 10cm diameters.	

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

Appendix F

Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
541	*Eucalyptus resinifera* (Red Mahogany)	50cm	17 X 10m	Good	Good	Basal sucker	
542	*Syncarpia glomulifera* Turpentine	35+10cm	15m	Good	Good		
543	*Eucalyptus haemastoma* (Scribbly Gum)	55cm	18m	Fair	Fair		
544	*Eucalyptus resinifera* (Red Mahogany)	40cm	15m	Fair	Fair		
545	*Syncarpia glomulifera* Turpentine	25cm	14m	Good	Good		
546	*Corymbia (Euc) gummifera* (Red Bloodwood)	25cm	16m	Good	Good-Fair		
547	*2 x Syncarpia glomulifera* Turpentine	38cm & 32cm	16m	Good	Good-Fair	Shared canopy	
548	*Angophora costata* (Sydney Red Gum)	25cm	14m	Good	Good	Re-growth from stump	
549	*Angophora costata* (Sydney Red Gum)	20-35cm	16m	Good	Good	Coppiced x 5 trunks	
550	*Eucalyptus resinifera* (Red Mahogany)	25cm	17m	Fair	Good	Mostly epicormic	

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure: Imminent / Probable** (Possible Improbable)
Target: High / Medium (Low/Very Low) **Consequences of Failure: Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
551	*Eucalyptus resinifera* (Red Mahogany)	25cm	14m	Good	Good	-	
552	*Angophora costata* (Sydney Red Gum)	25cm	16m	Good	Fair	High epicormic growth Deadwood at 6cm?	
553	*Angophora costata* (Sydney Red Gum)	10cm	10m	Good	?		
554	*Corymbia (Euc) gummifera* (Red Bloodwood	40cm	17m	Fair-Poor	Fair		Remove
555	*Corymbia (Euc) gummifera* Red Bloodwood	23+ 25cm	16m	Good	Fair	Co-dom from base x 2)	
556	*Eucalyptus resinifera* Red Mahogany	32cm	18m	Good	Good-Fair		
557	*Eucalyptus haemastoma* Scribbly Gum	40cm at 1m	12m	Fair	Fair		
558	*Corymbia (Euc) gummifera* Red Bloodwood	25cm	14m	Fair	Fair		
559	*Corymbia (Euc) gummifera* Red Bloodwood	30cm	17m	Fair	Fair		Keep
560	*Eucalyptus species* Ironbark	45+25cm	10m	Good			

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
561	4 x *Corymbia (Euc) gummifera* (Red Bloodwood) 1 x *Angophora costata* (Sydney Red Gum)	10-25cm	15m	Good	Fair		
562	4 x *Corymbia (Euc) gummifera* (Red Bloodwood) 1 x *Angophora costata* (Sydney Red Gum)	10-25cm	15m	Good	Fair		
563	4 x *Corymbia (Euc) gummifera* (Red Bloodwood)	15-30cm	8-17m	Good	Good		
564	10 x *Corymbia (Euc) gummifera* (Red Bloodwood)	15-30cm	9-16m	Good	Good-Fair	*Eucalyptus punctata* (Grey Gum)	
565	*Eucalyptus resinifera* (Red Mahogany)	30cm	15m	Fair	Good	Remove deadwood. Monitor.	
566	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	15m	Fair	Good		
567	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	15m	Fair	Good		
568	*Eucalyptus haemastoma (*Scribbly Gum)	50cm	18m	Good	Fair		
569	*Angophora costata* (Sydney Red Gum)	25+20cm	10m	Good	Fair	*Acacia implexa* (Hickory Wattle) Maintenance prune.	
570	Corymbia (Euc) gummifera (Red Bloodwood)	30cm	16m	Good	Fair		

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure: Imminent / Probable** (Possible Improbable)
Target: High / Medium (Low/Very Low) **Consequences of Failure: Severe/ Significant** (Minor/ Negligible)

Appendix F

Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
571	*14 x Corymbia (Euc) gummifera* (Red Bloodwood)	10-30cm	8-12m	Good	Good		
572	3 x *Eucalyptus sp. Gums*	30-10cm	8-9m	Good	Good		
573	*Corymbia (Euc) gummifera* (Red Bloodwood)	25cm	10m	Good	Good		
574	*Angophora costata* (Sydney Red Gum)	25cm	14m	Good	Good		
575	2 wattle 4 x *Eucalyptus sp.*	15-25cm	7-9m	Good	Good		
576	*Corymbia (Euc) gummifera* (Red Bloodwood)	20cm	14m	Good	Fair		
577	*Corymbia (Euc) gummifera* (Red Bloodwood)	30+35cm	14m	Good	Fair		
578	*Corymbia (Euc) gummifera* (Red Bloodwood)	25cm	10m	Good	Fair		
579	Dead *Eucalypt.*	-	-	-	-	Within building envelope	
580	*Corymbia (Euc) gummifera* (Red Bloodwood)	35cm	10m	Good	Good	Monitor	

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
581	*Corymbia (Euc) gummifera* (Red Bloodwood)	20+ 20cm	8m	Fair	Fair		
582	*Angophora costata* (Sydney Red Gum)	40cm	20m	Good	Good		
583	Acacia sp. Wattle	40cm	9m	Good	Good		
584	*Eucalyptus sp* (Gum)	20+10cm	7m	Good	Good	*Leptospermum petersonii* (Lemon-scented Tea Tree)	
585	*Eucalyptus sp* (Gum)	20cm			-		
586	*Eucalyptus sp* (Gum)	Dead	-	-	-	Within building envelope	
587	*Corymbia (Euc) gummifera* (Red Bloodwood)	3 x20 cm	13m	Good	Good		
588	*Corymbia (Euc) gummifera* (Red Bloodwood)	30cm	13m	Good	Good		
589	Dead *& bit of gummifera* (Red Bloodwood)	20cm	N/a	Poor	Poor	Near shed. Possum/bird box. Chest table under.	
590	*Angophora costata* (Sydney Red Gum)	23cm	11m	Good	Good	*Syncarpia glomulifera* (Turpentine) nearby	

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
591	*Angophora costata* (Sydney Red Gum)	38cm		Good	Good		
~~**592**~~	-	-	-	-			
~~**593**~~	-	-	-	-			
~~**594**~~	No tree	-	-	-	-	-	
595	*Eucalyptus scoparia* (Wallangarra White Gum)	35cm	12m	Good	Good-Fair		
596	*Eucalyptus punctata* (Grey Gum)	30cm	15m	Good	Good		
597	2 x *Eucalyptus punctata* (Grey Gum)	2 (18) cm	13m	Good Good	Good Poor		
598	*Eucalyptus punctata* (Grey Gum)	40cm	15m	Good	Good	-	
599	*Eucalyptus punctata* (Grey Gum)	15cm	8m	Good	Good	*Eucalyptus sideroxylon* (Mugga Ironbark) x 3	
600	*Eucalyptus resinifera* Red Mahogany	50cm	13m			-	

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

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Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
601	Dead	-	-	-	-	*Allocasuarina torulosa* Forest Oak	-
602	Dead	-	-	-	-	*Allocasuarina torulosa* Forest Oak	-
603	Dead	-	-	-	-	Within building envelope	-
604	*2 x Angophora costata* (Sydney Red Gum)	12+12cm	13m	Good	Good-Fair		
605	Dead	-	-	-	-	Within building envelope	-
606	*Eucalyptus paniculata* Grey Ironbark	25cm	12m	Good	Good		
607	*Eucalyptus paniculata* Grey Ironbark	35cm	13m	Fair	Fair		
608	*Eucalyptus paniculata* Grey Ironbark	40cm	12m	Good	Fair		
609	*Eucalyptus sp.* (Gum tree)	20cm	6m	Good	Fair	*Eucalyptus sideroxylon* (Mugga Ironbark) x 3	
610	*Eucalyptus paniculata* Grey Ironbark	45cm	17m	Good	Good-Fair		

Health/Structure: Good **F**air **P**oor **Crown Class:** Dominant**.** Co-dominant**,** Intermediate**,** Suppressed **ULE** Long Medium Short Remove **Risk: Failure: Imminent** / **Probable** (Possible Improbable)
Target: High / Medium (Low/Very Low) **Consequences of Failure: Severe/ Significant** (Minor/ Negligible)

Appendix F

Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
611	*Eucalyptus resinifera* Red Mahogany	>10cm	8m	Good	Good		
612	*Eucalyptus sp.* (Gum tree)	>10cm	6m	Good	Good		
613	*Angophora costata* (Sydney Red Gum)	3cm+ 3cm	14m	Good	Good		
614	*Corymbia (Euc) gummifera* (Red Bloodwood)	32 + 28 + 27cm	10 x 7m	Good	Good	*Leptospermum sp.* Tea Tree	
615	No tree	-	-	-	-	-	
616	No tree	-	-	-	-	-	
617	No tree	-	-	-	-	-	
618	No tree	-	-	-	-	-	
619	No tree	-	-	-	-	-	
620	No tree	-	-	-	-	-	

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

Appendix F

Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	Works required
621	*Eucalyptus resinifera* (Red Mahogany)						
622	*Eucalyptus sp* (Gum)						
623	*4 x Syncarpia glomulifera* Turpentine	25- 30cm	14m	Good	Good	Also, *Angophora costata* (Sydney Red Gum) and semi mature Turpentine. 6- 8m nearby.	
624	*Eucalyptus punctata* (Grey Gum)	35 +50cm	20m	Good	Fair	Co-dom. from base. D/w to 8cm	
625	3 x *Angophora costata* (Sydney Red Gum) *1 x Eucalyptus punctata* (Grey Gum)	25cm	10m	Good	Fair	Group 3 x Ac and E punctata. Competing and crossing branches. Some D/w. Compacted fill.	
626	*Eucalyptus haemastoma* Scribbly Gum	40cm	10m	Good- Fair	Good- Fair		
627	*Eucalyptus haemastoma* Scribbly Gum	40cm	15m	Good	Good	Suppressed group	
628	*Angophora costata* (Sydney Red Gum)	30cm	14m	Good	Good	Suppressed	
629	*Eucalyptus punctata* (Grey Gum)	90cm	20m	Good	Fair	Co-dom from 2m. High amount of D/w	
630	*Eucalyptus punctata* (Grey Gum)	20cm	10m	Good	Good- Fair		

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

Appendix F

Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	Works required
631	*Eucalyptus haemastoma* Scribbly Gum	45cm	20m	Fair	Good	D/w to 10cm and stubs.	
632	*Eucalyptus haemastoma* Scribbly Gum	35cm	14m	Good- Fair	Good	High epicormic.	
633	*Eucalyptus pilularis* Blackbutt	30cm	12m	Good	Good	Exposed root under demountable. God future tree.	
634	*Eucalyptus haemastoma* Scribbly Gum	45cm	14m	Good	Good	Co-dom form 4m included. Consider sling.	
635	*Eucalyptus haemastoma* Scribbly Gum	45cm	18m	Good	Good	Leaning SE. D/w stubs at height. Damaged leader. Eh and E.g. under 15 – 20cm diameters.	
636	*Eucalyptus haemastoma* Scribbly Gum	50cm	18m	Good	Good	Leaning SW. Borer at base. Fill at base.	
637	*Angophora costata* (Sydney Red Gum)	35 +40cm	16m	Good	Good	Co-dom form base and suckers in ground.	
638	*Corymbia (Euc) maculata* Spotted Gum	40cm	16m	Good	Fair- Poor	Contacting and rubbing leaders/branches. Co-dom form 1. Expansion cracking present.	
639	*Eucalyptus resinifera* (Red Mahogany)	30cm	13m	Good	Good		
640	*Eucalyptus sp* Gum	25cm	12m	Good	Good	Fill at base.	

Health/Structure: Good **F**air **P**oor **Crown Class:** Dominant**. C**o-dominant**, I**ntermediate**, S**uppressed **ULE** Long **M**edium **S**hort **R**emove **Risk: Failure: Imminent** / **Probable** (Possible Improbable)
Target: High / Medium (Low/Very Low) **Consequences of Failure: Severe/ Significant** (Minor/ Negligible)

Appendix F

Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
641	*Eucalyptus resinifera* (Red Mahogany)	30cm	13m	Good	Good		
642	*Syncarpia glomulifera* Turpentine	30cm	11m	Good	Good		
643	*Eucalyptus resinifera* (Red Mahogany)	40cm	14m	Good	Good- Fair	Co-dom from 4m. Fill in area. Allo's and Hakea under	
643a	*Angophora costata* (Sydney Red Gum)	15+35 +40cm	8m	Good	Good- Fair	Multi from base. Outside fence. Hackberry under	
644	*Corymbia (Euc) gummifera* Red Bloodwood	30cm	15m	Good	Good	Forest form.	
645	*Angophora costata* (Sydney Red Gum)	30cm	11m	Good	Good	Near fence	
646	*Eucalyptus resinifera* (Red Mahogany)	25cm	11m	Good	Fair	Inside fence	
647	*Eucalyptus haemastoma* Scribbly Gum	55cm	16m	Good-Fair	Good	Mounding at base and buttressing. Scribbly near fence E. Semi mature 25cm DBH G/G.	
648	*Eucalyptus haemastoma* Scribbly Gum	40cm	16m	Fair-Poor	Good-Fair	Leaning south from 7-8m. Small gums and Angophora nearby.	
649	*Eucalyptus paniculata* (Grey Ironbark)	20cm	13m	Good	Good		
650	*Eucalyptus haemastoma* Scribbly Gum	14cm	17m	Fair	Fair-Poor	Co-dom from 1.5m. Damaged bark at base.	

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk: Failure:** **Imminent** / **Probable** (Possible Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

Appendix F

Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Works required
651	*Eucalyptus resinifera* (Red Mahogany)	20 +25cm	12m	Good	Fair	2 co-dom from base. Possibly regrowth.	
652	*Eucalyptus haemastoma* Scribbly Gum	40cm	15m	Fair-Poor	Fair	Leaning south – reason not clear. Mostly epi.	
653	*Eucalyptus resinifera* (Red Mahogany)	40cm	18m	Good	Good-Fair	Co-dom from 5m, possibly included	
653a	*3 x Angophora costata* (Sydney Red Gum)	20cm 25cm 30cm	10m	Good	Good	East of 653. Shared canopy	
654	*Angophora costata* (Sydney Red Gum)	35cm	14m	Good	Fair	Trunk damaged at height. High D/w and stubs.	
654a	*Eucalyptus resinifera* (Red Mahogany)	30cm	10m	Good	Good-Fair	Canopy over school	
655	*Eucalyptus haemastoma* Scribbly Gum	40cm	17m	Fair	Good - Fair	D/w to 5cm.Co-dom from 4m.	
656	*Corymbia (Euc) gummifera* Red Bloodwood	25+25 +25cm	13m	Fair	Fair	3 trunks from ground. Shared canopy. D/w to 5cm.	
657	*2 x Eucalyptus resinifera* (Red Mahogany)	25 & 25cm	11m	Good	Good		
658	*Syncarpia glomulifera* Turpentine	10+ 15cm	12m	Good	Fair- Poor	Co-dom from base. Remove trunk near street.	

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove **Risk:** **Failure:** **Imminent** / **Probable** (Possible/Improbable)
Target: **High / Medium** (Low/Very Low) **Consequences of Failure:** **Severe/ Significant** (Minor/ Negligible)

Appendix F

Samuel Gilbert PS **Tree Data Schedule**

Tree #	Species	DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	Works required
659	*Eucalyptus resinifera* (Red Mahogany)	30cm	16m	Fair	Fair	High epicormic growth. D/w to 10cm	
659a	*Eucalyptus paniculata* Grey Ironbark	20cm	16m	Good	Good	Vine over, shared canopy. Intermediate tree.	
660	*2 x Eucalyptus resinifera* (Red Mahogany)	30cm 15cm	13m	Good	Fair	D/w to 5cm, lesser tree supressed	

Health/Structure: Good **F**air **P**oor **Crown Class:** Dominant. **C**o-dominant, **I**ntermediate, **S**uppressed **ULE** Long Medium Short Remove **Risk: Failure: Imminent** / **Probable** (Possible Improbable)
Target: High / Medium (Low/Very Low) **Consequences of Failure: Severe/ Significant** (Minor/ Negligible)

APPENDIX O – PRELIMINARY SITE INVESTIGATION AND DETAILED SITE INVESTIGATION

FULTON TROTTER ARCHITECTS

PRELIMINARY SITE INVESTIGATION (PSI) AND DETAILED SITE INVESTIGATION (DSI)

SAMUEL GILBERT PUBLIC SCHOOL, RIDGECROP DRIVE, CASTLE HILL, NSW

Question today
Imagine tomorrow
Create for the future

PRELIMINARY SITE INVESTIGATION (PSI) AND DETAILED SITE INVESTIGATION (DSI)

Samuel Gilbert Public School, Ridgecrop Drive, Castle Hill, NSW

Fulton Trotter Architects

WSP
Level 27, 680 George Street
Sydney NSW 2000
GPO Box 5394
Sydney NSW 2001

Tel: +61 2 9272 5100
Fax: +61 2 9272 5101
wsp.com

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A	14/08/2018	Draft
B	04/10/2018	Final

	NAME	DATE	SIGNATURE
Prepared by:	Beejal Patel	31/07/2018	
Reviewed by:	Amy Valentine	04/10/2018	
Approved by:	Beejal Patel	04/10/2018	

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ABBREVIATIONS

ACM	Asbestos-containing material
FA	Friable asbestos
AF	Asbestos fines
ASRIS	Australian Soil Resource Information System
BTEX	Benzene, toluene, ethylbenzene and xylene
DSI	Detailed site investigation
DQI	Data quality indicators
EPA	Environmental Protection Authority, formerly also known as Department of Environment, Climate Change and Water (DECCW)
EIL	Ecological investigation levels
Ha	Hectares
HIL	Health investigation level
HSL	Health screening level
LEP	Local Environment Plan
mAHD	metres relative to Australian Height Datum
mBGL	metres below ground level
mBTOC	metres below top of casing
NATA	National Association of Testing Authorities
NEPM	National Environment Protection Measure
NL	Not limiting
PAHs	Polycyclic aromatics hydrocarbons
PID	Photo-ionisation detector
PQL	Practical quantitation limit
PSI	Preliminary site investigation
QA/QC	Quality assurance and quality control
RAP	Remediation action plan
RPD	Relative percentage difference
SSD	State Significant Design
TRH	Total recoverable hydrocarbon

EXECUTIVE SUMMARY

WSP Australia Pty (WSP) was commissioned by Fulton Trotter Architects (FTA) to undertake a preliminary site investigation (PSI) and a detailed site investigation (DSI) at Samuel Gilbert Public School, described as Lot 1 in Deposited Plan 719671, Ridgecrop Drive, Caste Hill, NSW (the school).

The school is currently operating as a pre-kindergarten and primary school. Portions of the school are proposed to be demolished and upgraded. The portion of the school proposed for redevelopment is referred to as 'the site'.

Due to the scale of the project, a State Significant Design (SSD) approval supersedes the requirement for a local council development application. The SSD application (SSD 9274) requires the site contamination assessment to, 'assess and quantify soil and groundwater contamination and demonstrate that the site is suitable for the proposed use in accordance with [State Environmental Planning Policy No 55]'.

The purpose of the PSI and DSI was to determine the current contamination status of soil beneath the site. The objectives of the investigation were to:

— assess the current contamination status of the site, with respect to soil contamination, within the identified design footprint to meet the requirements of the SSD

— assess the potential risks associated with contamination at the site (if identified), with respect to demonstrating the site's suitability for proposed use in accordance with the SSD

The scope of works comprised a desktop review of available information (current and historical) and investigation works comprising soil investigations at 20 locations, including 11 test pit locations and hand augering at 9 locations, and analysis of selected soil samples for contaminants of concern.

Arial imagery indicates that the site was heavily vegetated prior to 1986 when the school was constructed in its current configuration, without the current demountable buildings. The current demountable buildings were installed prior to 2014. The school was owned by the Crown (for the purposes of the Public Instruction Act, as a public school) since 1985.

The historical review has not identified any uses or owners which suggest grossly contaminating activities have been undertaken on the site. Surrounding land has been utilised for residential and educational purposes since at least the 1980s and no potentially significant contaminating activities have been identified for surrounding land uses immediately adjacent to the school property. Properties further south-west of the site located within an industrial zone have been identified to hold licences for waste generating activities.

No field indicators of contamination were observed. Subsurface material generally consisted of fill described as silty sand and silty clay to approximately 0.1 m below ground level (mBGL) to 0.5 mBGL, then natural silty clays, silty sand or clayey sand, then sandstone from approximately 0.6 mBGL to the extent of the investigation.

Concentrations of total recoverable hydrocarbons (TRH) were reported in primary samples from test pit TP03 and hand augers HA03, HA04 and HA08. The majority of the detections were only marginally above the practical quantitation limits (PQLs). Concentrations were not considered to be significant and were reported below the health-based adopted site criteria.

All results for volatile hydrocarbons and polycyclic aromatic hydrocarbons were below the laboratory PQLs. Concentrations of some heavy metals were reported in soil samples for the site, with results generally consistent between locations and below the adopted site criteria.

No asbestos was observed in soil during the on-site work or detected by the laboratory in soil samples submitted for analysis.

The results of the investigation indicate the identified design footprint at the school is suitable for development and future use as a primary school under the SSD.

1 PROJECT BACKGROUND

1.1 BACKGROUND

WSP Australia Pty (WSP) was commissioned by Fulton Trotter Architects (FTA) to undertake a preliminary site investigation (PSI) and a detailed site investigation (DSI) at Samuel Gilbert Public School, described as Lot 1 in Deposited Plan 719671, Ridgecrop Drive, Caste Hill, NSW (the school).

The school is currently operating as a pre-kindergarten and primary school and includes several demountable buildings, permanent teaching spaces, sporting fields, paved courtyards and large vegetated areas.

It is understood that FTA has been engaged by the Department of Education as the head design consultant for the demolition and upgrade of a portion of the school. The upgrade will comprise replacing 11 demountables with 25 new permanent teaching spaces. The portion of the school proposed for redevelopment is referred to as 'the site'. The proposed design footprint is presented on Figure 1.

Due to the scale of the project, a State Significant Design (SSD) approval supersedes the requirement for a local council development application. The SSD application (SSD 9274) requires the site contamination assessment to, 'assess and quantify soil and groundwater contamination and demonstrate that the site is suitable for the proposed use in accordance with [State Environmental Planning Policy No 55]'.

The purpose of the PSI and DSI was to determine the current contamination status of soil beneath the site.

1.2 OBJECTIVES

The objectives of the investigation were to:

- assess the current contamination status of the site, with respect to soil contamination within the identified design footprint, to meet the requirements of the SSD
- assess the potential risks associated with contamination at the site (if identified), with respect to demonstrating the site's suitability for proposed use in accordance with the SSD.

2 SCOPE OF WORKS

The scope of works for the investigation comprised:

- a desktop review of available information (current and historical) including:
  - site setting (geology, hydrogeology, topography and surrounding land uses)
  - regional groundwater bore search
  - NSW Environment Protection Authority (EPA) regulatory databases
  - planning certificates
  - historical aerial photographs
  - historical land titles search
- DSI works including:
  - soil investigations at 20 locations including 11 test pit locations (TP01 and TP03 to TP12) and hand augering at 9 locations (HA1 to HA9)
  - laboratory analysis of selected representative soil samples for contaminants of concern, which comprise eight heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylene and naphthalene (BTEXN), polycyclic aromatic hydrocarbons (PAHs) and asbestos.
- preparation of this report which focuses on assessing the soil contamination status of the site and assessing the need for remediation.

3 SITE LOCATION AND SETTING

3.1 SITE LOCATION AND IDENTIFICATION

The general site identification details are provided in Table 3.1.

Table 3.1 Summary of general site information

Site address	The corner of Ridgecrop Drive and Gilbert Road, Castle Hill, NSW
Property identification	Lot 1 in Deposited Plan 719671
Site area	0.85 hectares (ha)
Current site use	Pre-kindergarten and primary school
Local government area	The Hills Shire Council
Current zoning	R2 Low density residential land use under *The Hills Shire Council Local Environmental Plan 2012*
Proposed site use	Continued use as a pre-kindergarten and primary school

3.2 SITE INSPECTION

A site inspection was conducted on 9 July 2018 by a WSP environmental scientist. The school is bound by Ridgecrop Drive to the south and Gilbert Road to the south-east, Knightsbridge Shopping Centre to the east, Castle Glen Reserve to the north and heavily vegetated bushland to the west. The main access to the school was via Ridgecrop Drive, however there was also an access driveway off Gilbert Road.

The school included the following:

- The northern portion of the school comprised an oval and heavily vegetated land.
- The central portion of the school was occupied by 20 permanent buildings, 13 demountable buildings, a library, a special programs building, open and shaded paved courtyards, paved walkways, two halls, two paved sports courts, and an after school care building.
- A carpark is located at the western portion of the school.
- Land along the southern portion is occupied by heavily vegetated and grasses land.

The site consists of a portion of the school proposed to be upgraded and includes a portion of grassed and vegetated land at the southern portion of the school, portions of two home base buildings and a central open courtyard.

The site location and site layout are shown on Figures 1 and 2, respectively, with site photographs taken during the site inspection and field works included in Appendix E.

3.3 TOPOGRAPHY

The site is situated at approximately 95 metres Australian Height Datum (mAHD). Surrounding topography at the school generally slopes from the north (102 mAHD) to south towards the corner of Ridgecrop Drive and Gilbert Road (92 mAHD; Google Earth, 2018).

The nearest surface water body is Castle Hill Creek, located approximately 150 m south of the site.

3.4 GEOLOGY

The Department of Minerals and Energy, 1991, 1:100,000 Penrith Geological Map Sheet 9030 indicates that the regional geology in the vicinity of the site is underlain by Hawkesbury Sandstone described as medium to very coarse-grained quartz sandstone, minor laminated mudstone and siltstone lenses.

The CSIRO Australian Soil Resource Information System (ASRIS), http://www.asris.csiro.au/index_ie.html) accessed July 2018, indicates that soils underlying the site are mapped as having an extremely low probability of occurrence of acid sulfate soils.

3.5 HYDROGEOLOGY

A review of the licensed borehole register on the NSW Government Water Information website (https://realtimedata.waternsw.com.au/water.stm) accessed July 2018 indicated that there were no registered groundwater bores within a 1 km radius of the site.

Based on the surrounding topography, and the proximity of the school to Castle Hill Creek it is considered that groundwater is likely to flow south.

4 SITE HISTORY REVIEW

4.1 SECTION 10.7

In order to assess any changes to the heritage listing zoning and other planning properties pertaining to the site, a current Section 10.7 (2) and (5) certificate of the *Environmental Planning and Assessment Act 1979* (formerly Section 147) was requested from the Hills Shire Council. The certificate did not identify planning issues or heritage listed items.

A copy of the Section 10.7 certificate is provided in Appendix B.

4.2 HISTORICAL AERIAL PHOTOGRAPHS

Historical aerial photographs taken in 1943, 1961, 1970, 1986, 1991 and 2014 which capture the site were reviewed, and a summary of the observed land use changes is presented in Table 3.1. The historical aerial photographs are presented in Appendix C.

Table 4.1 Historical Aerial Photograph Review

YEAR	ON-SITE LAND USES	SURROUNDINGS
1943	The site and remaining portions of the school is heavily vegetated. Unpaved roads cross the school at the western portion of northern portions.	The site is surrounded by heavily vegetated land to the north, south and west. Land to the east is occupied by rural land used for agricultural purposes with small residential units.
1961	The site and school remain the largely unchanged.	The surrounding land uses remain largely unchanged.
1970	The site and school remain largely unchanged.	The surrounding land uses remain largely unchanged.
1986	The school infrastructure including the permenant buildings, library, special programs building, courtyards, halls and paved sports courts at the central portion of the school has been constructed. The carpark to the west has been paved. The large oval at the northern portion of the school is present. The school appears to be heavily vegetated in remaining portions. The portion of the school which comprise the site is largely in its current configuration.	Castle Glen Reserve has been formed to the north, land to the west is heavily vegetated. Ridgecorp Drive and Gilbert Road have been paved south and south-east of the site respectively. Land to the south and east is occupied by residential land.

YEAR	ON-SITE LAND USES	SURROUNDINGS
1991	The site and school remain largely unchanged	The surrounding land use remains largely unchanged except for the construction of Knightsbridge Shopping Centre east of the school.
2014	The school remains the same except for the placement of demountable buildings. The school is in its current configuration.	The surrounding land uses remain largely unchanged.

4.3 TITLE SEARCH

Historical certificates of title were provided by the Land and Registry Services, NSW and are presented in Appendix D.

The historical titles indicate that the current lot was previously subdivided and has had a range of proprietors including private individuals (1926 to 1985 at the latest date), Her Majesty Queen Elizabeth II (for the purposes of the Public Instruction Act) (1985 to 2006) and the Minister for Education and youth Training (2006 to date).

4.4 EPA ONLINE RECORDS

The following information was collected from the NSW EPA *Protection of the Environment Operations Act 1997* (POEO Act) public register (http://www.epa.nsw.gov.au/prpoeoapp/) and NSW EPA contaminated land record database (http://www.epa.nsw.gov.au/prclmapp/searchregister.aspx) website databases (searches undertaken on 19 July 2018). The search found the following:

- There are no notices or licenses listed for the site on the POEO Act register. Licences have been issued for the following sites within a 2 km radius of the site:
  - A licence was issued for Hobson Engineering Co Pty Ltd located approximately 1.8 km south-west of the site. The licence is no longer in force and was issued for hazardous, industrial or Group A waste generation or storage.
  - A licence was issued for Holt Lloyd Australasia Pty Ltd located approximately 2 km south-west of the site. The licence is no longer in force and was issued for hazardous, industrial or Group A waste generation or storage.
  - A licence was issued for Parker Hannifin (Australia) Pty Ltd, located approximately 1.5 km south-west of the site, for hazardous, industrial or Group A waste generation or storage.
  - A licence for Sigma-Aldrich Pty Ltd located approximately 1.2 km south-west for hazardous, industrial or Group A waste generation or storage. An additional licence was also held for hazardous, industrial or Group A waste generation or pharmaceutical and veterinary products production, under a separate section of the POEO Act.
- There are no sites within a 2 km radius of the site on the list of contaminated sites notified to the NSW EPA.

4.5 HERITAGE

No sites are listed on the NSW Environment and Heritage register.

4.6 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

WSP have not been supplied with any previous environmental investigations pertaining to the site.

4.7 HISTORICAL SUMMARY

Arial imagery indicates that the site was occupied by heavily vegetated land prior to 1986 when the school was constructed in its current configuration without the current demountable buildings. The current demountable buildings were installed prior to 2014. The school was owned by the Crown (for the purposes of the Public Instruction Act, as a public school) since 1985.

The historical review has not identified any uses or owners which suggest grossly contaminating activities have been undertaken on the site. Surrounding land has been utilised for residential and educational purposes since at least the 1980s and no potentially significant contaminating activities have been identified for surrounding land uses immediately adjacent to the school. Sites further south-west of the school located within an industrial zone have been identified to be licenced for waste generating activities.

5 ENVIRONMENTAL DATA QUALITY OBJECTIVES

Systematic planning and verification is critical to successful implementation of a contaminated site investigation to ensure that the data from the site assessment is reliable and representative of the conditions of the site. A process for establishing data quality objectives (DQOs) for an investigation has been defined by the United States Environmental Protection Agency. That process has been adopted by the Australian Standard AS4482.1-2005 and referenced by the *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPM, as amended 2013).

The DQO process is a seven-step iterative planning approach used to plan for environmental data collection activities. It provides a systematic approach for defining the criteria that a data collection design should satisfy, including when, where and how to collect samples or measurements, determination of tolerable decision error rates and the number of samples or measurements that should be collected. The seven step process for this investigation is discussed and summarised in Table 5.1.

Table 5.1 Project DQOs

STEP/PURPOSE	DQO INPUT
Step 1 State the problem To summarise the contamination problem that will require new environmental data and to identify the resources available to resolve the problem.	FTA have identified a portion of Samuel Gilbert Public School to be redeveloped for continued use as a school. Therefore, an DSI was required to provide a more detailed understanding of potential contamination at the site to facilitate remedial strategy assessment (if required). More specifically, the objectives are to: — assess the soil contamination status of the site — assess the potential risks associated with contamination (if identified) with respect to ongoing school use.
Step 2 Identify the decisions To identify the decisions that requires new environmental data to address the contamination problem.	The principal study question is: to what extent has the site been impacted by potential contamination? In order to answer this question, the decisions the additional investigation is required to address are: — What is the extent of contamination at the site? — Do contaminant concentrations in soil pose an unacceptable risk to potential receptors? — Do contaminant concentrations exceed the relevant regulatory assessment criteria? — Is remediation or corrective action required to manage contamination?
Step 3 Identify inputs to the decisions To identify the information required to support the decision and to specify which inputs require new environmental measurements.	To establish the extent of the contamination, a targeted soil investigation was undertaken at 11 on-site test pit locations and 9 on-site soil bores locations. Environmental data included in the soil assessment comprised subsurface condition descriptions, photo-ionisation detector (PID) readings and laboratory data. Soil samples were collected from each soil bore and analysed for TRH, benzene, toluene, ethylbenzene and xylene (BTEXN compounds), polycyclic aromatic hydrocarbons (PAHs) and arsenic, cadmium, chromium, copper, mercury, nickel and zinc (heavy metals) and asbestos. Analytical results were compared to the assessment criteria detailed in Section 7.

STEP/PURPOSE	DQO INPUT
Step 4 Define the study boundaries To define the spatial and temporal boundaries that the data must represent to support the decision.	The location and extent of the study area is shown on Figures 1 and 2. The total depth of investigation was 1.5 mBGL. The temporal boundaries of the investigation were June 2018 to July 2018.
Step 5 Develop a decision rule To develop a logical 'if...then...' statement that defines the conditions that would cause the decision maker to choose among alternative actions.	Analytical results have been compared to land use criteria provided in Schedule B1 Investigation Levels for Soil and Groundwater of the NEPM (2013), For the purposes of this assessment, criteria were adopted taking into account both the site's current use as a primary school and future use as a continued primary school (of which a low residential land use criteria is applicable). If the results are found to exceed the criteria, then further investigation, management or remediation will be required.
Step 6 Specific limits on decision errors To ensure the quality of a dataset, data has to be precise, complete and comparable in order for decisions on the data to be made.	The data was assessed against various quality attributes such as selectivity, precision, completeness and comparability. In accordance with the NEPM (2013), data was evaluated to determine any limitations within the dataset. This included the use of limits regarding limits for relative percentage differences (RPDs) between primary and quality assurance and quality control (QA/QC) data, rinsates, spikes and duplicates.
Step 7 Optimise the design for obtaining data To identify a resource-effective sampling and analysis design for generating data that can reasonably satisfy the DQOs.	This assessment was designed after a review of environmental information pertaining to the site, identification of site features/structures and accessibility of specific areas of the site and neighbouring properties. The investigation proposal was reviewed at critical times during the project and amended where necessary based on site conditions, professional judgement and liaison with FTA.

6 SAMPLING AND ANALYSIS PROGRAM

6.1 SAMPLING RATIONALE

The sampling plan comprised 20 grid-based sampling locations. For grid-spaced sampling, Table A in the NSW EPA 1995, *Sampling Design Guidelines* provides the recommended minimum number of sampling points required for site characterisation based on detecting circular hot spots. The guideline indicated a minimum of 20 sampling locations are recommended for an 0.85 ha site. Sampling locations were selected taking into account the presence of heavy vegetation, buildings on-site, other physical limitations associated with the school infrastructure and the limitations of subsurface conditions. Test pit locations were advanced to depths varying from 0.75 mBGL to 1.45 mBGL and hand auger locations were advanced to depths varying from 0.5 mBGL to 1.5 mBGL.

The investigation comprised a mix of boreholes and test pits. Test pits were advanced where possible to allow for a better visual understanding of the soil profile below the site, boreholes were advanced at remaining locations limited by accessibility.

6.2 FIELDWORK METHODOLOGY

6.2.1 PRELMINARIES

A desktop search for underground services using the Dial Before You Dig (DBYD) service was undertaken prior to intrusive investigations. Service location and the intrusive investigation was conducted on 9 July 2018. In accordance with WSP policy, all works were undertaken in accordance with the health, environment and safety plan and safe work method statements prepared for the site. All site locations were cleared by a suitably qualified service locator prior to the commencement of intrusive works, utilising DBYD plans provided by asset owners.

6.2.2 FIELDWORKS METHODOLOGY

The fieldworks methodologies adopted during the investigation were consistent with WSP field procedures. These have been summarised in Table 6.1.

Table 6.1 Field methodologies

TASK	DETAILS
Service clearance	All investigation locations were checked for the presence of buried services by an experienced service locator and cross-checked with the DBYD plans obtained from all asset owners.
Test pitting	Test pits were advanced using a five tonne excavator attached with a toothless bucket using 50 mm scrapes.
Drilling method	All bores were advanced using either hand auger when the geology comprised fill or solid stem auger in natural material to the maximum depth of investigation (1.5 mBGL).
Soil logging	Soil logging was completed based on field interpretation and was generally consistent with Unified Soil Classification System and Australian standard (AS) 1726-1993.

TASK	DETAILS
Soil bore and test pit backfilling	All soil bores and test pits were backfilled using excavated soil.
Soil sampling method	Soil samples were collected directly from the hand auger or the excavator bucket using disposable nitrile gloves. All samples collected were placed in laboratory supplied containers with Teflon lined lids. Soil samples were generally collected from the following depths: — surface (0.1-0.2 mBGL) — 0.5 mBGL — 1.0 mBGL — 1.5 m BGL — at changes in lithology or evidence of contamination. All soil samples collected during the works were screened with a calibrated photo-ionisation detector (PID) to assess if volatile organic compounds (VOCs) were present. Samples were collected directly from the auger, with the sampling equipment cleaned with suitable phosphate-free detergent and rinsed with distilled water between sampling episodes to minimise the potential for cross-contamination.
Sample preservation	Samples were stored in an insulated cooler box with ice immediately after sampling. Samples were kept chilled prior to and during delivery to the selected National Association of Testing Authorities (NATA) accredited laboratory via a courier under appropriate 'chain of custody' documentation.
Quality assurance/quality control (QA/QC)	Intra- and inter-laboratory duplicate samples were collected in the field at the rate of 1 duplicate pair for 22 primary samples. One trip blank and one rinsate blank sample was collected during the sampling event.

6.3 LABORATORY ANALYSIS

Selected soil samples collected were submitted to the primary analytical laboratory for analysis for contaminants of concern at the site. Soil samples were selected based on a combination of sample location and field observations, including PID results. One intra-laboratory and one inter-laboratory duplicate samples were collected.

Eurofins Australia Pty Ltd (Eurofins) was the primary laboratory for the soil sample analysis, with SGS Australia Pty Ltd (SGS) used as a secondary laboratory. Both Eurofins and SGS are NATA accredited for the soil analyses conducted with the exception of asbestos quantification, for which no NATA-approved methodology exists.

A summary of samples and initial analyses is presented in Table 6.2.

Table 6.2 Soil laboratory sampling and analysis plan

ANALYTE	PRIMARY SAMPLES	INTRA- AND INTER-LABORATORY DUPLICATES	RINSATE	TRIP SPIKE/TRIP BLANK
Heavy metals	22	2	1	-
PAHs	22	2	1	-
TRH	22	2	1	2

ANALYTE	PRIMARY SAMPLES	INTRA- AND INTER-LABORATORY DUPLICATES	RINSATE	TRIP SPIKE/TRIP BLANK
BTEXN	22	2	1	2
Asbestos (quantitative method as per NEPM (2013)[1]	20	2	-	-
pH	1	-	-	-
Cation exchange capacity	1	-	-	-
Clay content	1	-	-	-

NEPM – National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013)

TRH –total recoverable hydrocarbons

BTEXN – Benzene, toluene, ethylbenzene, xylene and naphthalene

PAHs – Polycyclic aromatic hydrocarbons

7 SOIL ASSESSMENT CRITERIA

To assess the contamination status, the NSW Environment Protection Authority (EPA) refers to the NEPM (2013), specifically Schedule B1, Investigation Levels for Soil and Groundwater. Schedule B1 provides a framework for the use of investigation and screening levels based on a matrix of human health and ecological risks.

7.1 HEALTH BASED CRITERIA

To assess the presence and extent of soil contamination at a site, the NEPM (2013) provides health investigation levels (HILs) and health screening levels (HSLs) for the assessment of impacted soil.

HILs provide an assessment of potential risk to human health from chronic exposure to contaminants, and have been developed based on land use setting. As the purpose of this investigation is to assess the site against both the future land use as a primary school the 'HIL A' criteria for low density residential land use with gardens/accessible soil has been adopted which is the applicable land use criteria for a primary school setting.

HSLs have been developed for selected petroleum compounds and fractions and are applicable to assessing human health risk via the vapour intrusion and inhalation pathway. The HSLs depend on specific soil physicochemical properties and land use scenarios. They apply to different soil types and depths. For the purpose of this investigation, both the 'HSL A' criteria for low density residential land use with gardens/accessible soil has been adopted.

HSLs have been adopted based on a subsurface comprising of sand. This soil type has been selected taking a conservative approach based on site observations of the geology encountered and the results of clay content analysis undertaken on soils at the site. Analysis of composite soil samples collected from 0.1 mBGL in location TP10 indicated that clay content was <1%. The HSLs for sand have been adopted as a conservative approach given the sandy silt material observed in the upper soil profile of most sampling locations.

HSLs are also provided for asbestos contamination in soil, for bonded asbestos-containing material (ACM), friable asbestos (FA) and asbestos fines (AF). As per the WA Department of Health (DoH) 2009, *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, a 10 L sample is collected and screened manually on-site through a ≤7 mm sieve. Any ACM/FA retained on the sieve (i.e. >7 mm in size) is then analysed in the laboratory for bonded ACM, with results quantified in percent weight by weight (%w/w). For FA/AF a separate sample of approximately 500 mL is collected, sieved in the laboratory and gravimetric determination of asbestos (<7 mm) undertaken. The results are then compared to the NEPM HSLs. If the HSLs are not exceeded, then no contamination management options are required provided the surface soil is free of visual asbestos. If results exceed the HSLs, further assessment, management and/or remediation is required.

Management limits have also been provided for TRH fractions and applied for a 'urban residential and open space' land use. Management limits are the maximum values that should remain in a site following evaluation of human health and ecological risks.

Table 7.1 Soil assessment criteria – health-based criteria

ANALYTE	LOW DENSITY RESIDENTIAL LAND USE			
	HSL D, sand[1] (mg/kg)		HILs[2] (mg/kg)	Management limits[3] (mg/kg)
	0 m TO <1 m	1 m TO <2 m		
TRH/BTEXN COMPOUNDS				
TRH C_6–C_{10} less BTEX (F1)	45	70	-	700
TRH >C_{10}–C_{16} less naphthalene (F2)	110	240	-	1000

ANALYTE	LOW DENSITY RESIDENTIAL LAND USE			
	HSL D, sand[1] (mg/kg)		HILs[2] (mg/kg)	Management limits[3] (mg/kg)
	0 m TO <1 m	1 m TO <2 m		
TRH >C_{16}-C_{34}	-	-	-	2,500
TRH >C_{34}-C_{40}	-	-	-	10,000
Benzene	0.5	0.5	-	-
Toluene	160	220	-	-
Ethylbenzene	55	NL	-	-
Xylene (total)	40	60	-	-
PAHs				
Naphthalene	3	NL	-	-
PAHs (total)	-	-	300	-
Benzo(a)pyrene TEQ[4]	-	-	3	-
HEAVY METALS				
Arsenic	-	-	100	-
Cadmium	-	-	20	-
Chromium (total)	-	-	100	-
Copper	-	-	6,000	-
Lead	-	-	300	-
Mercury	-	-	40	-
Nickel	-	-	400	-
Zinc	-	-	7,400	-
ASBESTOS				
Bonded ACM	0.05% w/w		-	-
FA and AF	0.001% w/w		-	-
All forms of asbestos	Not visible in surface soil		-	-

Notes

- No assessment criteria available

NL Non-limiting due to maximum vapour concentrations being below the acceptable health risk level.

(1) NEPM (2013) Schedule B1 Table 1A(3)
(2) NEPM (2013) Schedule B1 Table 1A(1)
(3) NEPM (2013) Schedule B1 Table 1B(7)
(4) Toxicity equivalency quotient, a weighted sum of carcinogenic PAHs

7.2 ECOLOGICAL SCREENING LEVELS AND ECOLOGICAL INVESTIGATION LEVELS

The NEPM (2013) also provides ecological investigation levels (EILs), which were developed for metals, naphthalene and pesticides. The EILs take into consideration the physiochemical properties of soil and contaminants and the capacity of the local ecosystem to accommodate increases in the contaminant levels. The EILs are derived using the following equation:

$$EIL = added\ contaminant\ limit\ (ACL) + ambient\ background\ concentration\ (ABC)$$

The ABC is the background contaminant level and requires measurement at appropriate reference points at the site. The ACL, which is provided in the NEPM (2013), is the maximum contaminant concentration added to the naturally occurring background level, exceedances of which may result in adverse effects on plant health. EILs corresponding to urban residential land use were applicable for this investigation.

Tables 1B(4) and 1B(5) of the NEPM (2013) provide generic EILs for aged arsenic and lead, and fresh DDT and naphthalene in soils (irrespective of their physiochemical properties). Aged values are applicable for contamination present in soil for at least two years. EILs are provided for various land uses including 'areas of ecological significance', 'urban residential and open space', and 'commercial and industrial'. The 'urban residential and open space' land use EILs have been considered for this investigation.

Site-specific EILs for chromium (III), copper, nickel and zinc have been calculated using the CSIRO Ecological Investigation Level Calculation Spreadsheet provided online in the ASC NEPM Toolbox (http://www.scew.gov.au/node/941). These calculations require an understanding of the cation exchange capacity (CEC), clay content and pH of the residual soil at the site.

A composite soil sample from location TP10 was analysed for clay content, CEC and pH. Based on the results of these analyses, the following values were used for calculation of EILs:

— a pH of 8

— a CEC of 16 cmol/kg

— clay content of 1%.

To calculate aged ABCs, the spreadsheet requires the state and traffic volume to also be entered. These were entered as 'NSW' and 'low' respectively.

The NEPM (2013) provides ecological screening levels (ESLs) for TRH, BTEXN compounds and PAHs for use as an initial screening risk assessment to determine whether laboratory analysed concentrations of contaminants potentially pose a risk to plant growth. For the purpose of this investigation, ESLs for 'urban residential and public open space' land uses with coarse-grained soil textures have been considered.

Ecological criteria are outlined in Table 7.2.

Table 7.2 Soil assessment criteria – ecological criteria

ANALYTE	EILs (mg/kg)[1]	ESLs (mg/kg)[2]
TRH F1	-	180
TRH >C_{10}-C_{16}	-	120
TRH >C_{16}-C_{34}	-	300
TRH >C_{34}-C_{40}	-	2,800
Benzene	-	50

ANALYTE	EILs (mg/kg)[1]	ESLs (mg/kg)[2]
Toluene	-	85
Ethylbenzene	-	70
Xylene (total)	-	105
Naphthalene	170	-
Benzo(a)pyrene	-	0.7
Arsenic	100	-
Chromium	190	-
Copper	190	-
Lead	1,100	-
Nickel	170	-
Zinc	400	-

(1) NEPM (2013) Schedule B1 Tables 1B(1)-Table 1B(5)

(2) NEPM (2013) Schedule B1 Table 1B(6)

8 INVESTIGATION RESULTS

8.1 SUBSURFACE CONDITIONS

Table 8.1 provides a description of the soil profile below the site.

Table 8.1 Subsurface profile

DEPTH	DESCRIPTION
0.0 mBGL to 0.1-0.5 mBGL	Fill, primarily silty sand and silty clay, loose, low plasticity, brown
0.1-0.5 mBGL to 0.6-1.0 mBGL	Primarily silty clays, silty sand or clayey sand, orange/brown gravelly sand, low plasticity, coarse, dry
0.6-1.0 mBGL to 1.5 mBGL	Sandstone, weathered to highly weathered, red/yellow, low to high strength, dry

Headspace analysis of VOCs was undertaken on all soil samples collected using a calibrated PID. PID readings ranged from 0.0 ppm to 0.2 ppm. Site photographs are provided in Appendix E and borelogs are provided in Appendix I.

8.2 ENVIRONMENTAL RESULTS

8.2.1 SOIL LABORATORY RESULTS

Samples of analytes tested did not exceed the adopted health-based criteria adopted for the site. One sample, from TP03 at 0.1 mBGL, exceeded the ESL for TRH C_{16}-C_{34}. Table 8.2 provides a summary of the number of primary samples analysed, analytes tested for and minimum/maximum constituent concentrations.

A more detailed summary tables of analytical results are provided in the tables in Appendix F, and laboratory reports are provided in Appendix G.

Table 8.2 Summary of soil results

NUMBER OF PRIMARY SAMPLES	ANALYTE	CONCENTRATION (mg/kg)	
		Minimum	Maximum
22	TRH F1	<10	<10
22	TRH F2	<50	63
22	TRH C_{16}-C_{34}	<100	320
22	TRH C_{34}-C_{40}	<100	120
22	Benzene	<0.2	<0.2
22	Toluene	<0.5	<0.5
22	Ethylbenzene	<0.5	<0.5
22	Xylene (total)	<0.5	<0.5
22	Naphthalene	<1	<1
22	PAHs (total)	<0.5	<0.5

NUMBER OF PRIMARY SAMPLES	ANALYTE	CONCENTRATION (mg/kg)	
		Minimum	Maximum
22	Benzo(a)pyrene TEQ	<0.5	<0.5
22	Arsenic	<2	9.5
22	Cadmium	<0.4	<1
22	Chromium	8.3	23
22	Copper	<5	25
22	Lead	9	23
22	Mercury	<0.1	<0.1
22	Nickel	<5	36
22	Zinc	<5	73
20	Asbestos in soil	Not detected	

9 QA/QC

9.1 DATA QUALITY INDICATORS (DQIS) FOR ANALYTICAL DATA

The DQIs for sampling techniques and laboratory analyses of collected representative soil and groundwater samples define the acceptable level of error required for this investigation. The DQOs have been assessed by reference to the attributes presented in Table 8.1.

Table 9.1 Data quality indicators

DQI	DESCRIPTION	APPLICATION
Completeness	The measure of the amount of usable data from a data collection activity. Valid chemical data are the values that have been identified as acceptable or validated.	The completeness goal was set at there being sufficient valid data generated during the study. Measurements made were judged to be valid measurements.
Comparability	The confidence that data may be considered to be equivalent for each sampling analytical event, i.e. the confidence with which one data set can be compared with another. Achieved through qualitative assessment of QA/QC procedures, using comparable field sampling, laboratory sample preparation and analytical procedures and reporting units.	The sampling was in general accordance with the sampling and analysis procedures and as per standard industry procedures. Each sample was analysed using identical methods for each analyte and laboratory practical quantitation limits (PQLs) were consistent over each laboratory batch. A check laboratory was used to provide data to make a comparative assessment of variability between laboratories.
Representativeness	The confidence that the data are representative of each media present on the site. Expresses the degree to which sample data accurately and precisely represents a characteristic of a population or an environmental condition. Controlled through selecting sampling locations that exemplify site conditions and obtaining suitable samples.	Consistent and repeatable sampling techniques and methods were utilised.

DQI	DESCRIPTION	APPLICATION
Precision	The quantitative measure of the variability (or reproducibility) of data. Expressed as RPDs, assessed by determining the RPDs between the original and duplicate samples tested. Validity of the data is questioned if the RPD limits are exceeded and upon further investigation a reason cannot be determined.	Work was conducted in accordance with WSP standard procedures. The precision of the data was assessed by calculating the RPDs of duplicate samples following AS 4482.1 (2005).
Accuracy	The quantitative measure of the closeness of reported data to the true values. Accuracy can be undermined by such factors as field contamination of samples, poor preservation or preparation techniques.	Accuracy was assessed by using equipment blanks and laboratory QA/QC analytical results (including laboratory control samples, spikes, and reference samples).

Table 9.2 QA/QC results

ITEM	OBJECTIVES MET
Environmental consultant	The environmental consultant maintains quality assurance systems certified to AS/NZS ISO 9001:2000. Qualified and experienced environmental scientists with 2 years' experience completed field works.
Procedures	All work was conducted in accordance with relevant statutory work health and safety (WHS) and environmental sampling guidelines, as well as standard company WHS and environmental field procedures. Standard field sampling sheets were used. Details recorded included WSP staff and contractors present, time on-/off-site, weather conditions, calibration records and comments.
Sampling	Collection of samples was undertaken by appropriately qualified and experienced personnel following WSP standard field procedures which are based on industry accepted standard practice. Chain of custody was used to ensure the integrity of samples from collection to receipt by the laboratory.
Field equipment	Equipment was serviced and calibrated as per the manufacturer requirements.
Equipment decontamination	Undertaken after each sampling episode where equipment used was not dedicated. Rinsate blanks to be below detection for the potential contaminants (one rinsate blank per day). Field sampling procedures conformed to WSP QA/QC protocols to prevent cross-contamination, preserve sample integrity, and allow for collection of a suitable data set from which to make technically sound and justifiable decisions with data of satisfactory usability. QA/QC sample results are presented in the tables in Appendix G.

ITEM	OBJECTIVES MET
Transportation	Samples were stored in chilled eskies on-site and during transport via courier to the laboratory. A chain of custody form was completed on-site and sent with the samples. The laboratory confirmed receipt of the samples and specified the condition on delivery and the scheduled analyses. Appropriate holding times were met. Trip blank samples were carried during field works (at a rate of one per sample batch) to assess contamination through field activities and transport. Results were below laboratory PQLs.
Field QA/QC	Two rinsate blanks were collected during the works. Both rinsate blanks were analysed for TRH, BTEXN, PAHs and heavy metals. All results were below detection. One trip blank was analysed for TRH C_6-C_{10} and BTEXN compounds. All results were below detection. One trip spike was analysed for BTEX compounds, TRH C_6-C_{10} and naphthalene. Recovery results were reported between 91% and 110%. This was considered acceptable. QA/QC sampling was undertaken to industry standard procedures including 1 in 20 blind duplicates (intra-laboratory) to the primary laboratory and 1 in 20 blind duplicates (inter-laboratory) to the secondary laboratory. Field and laboratory acceptable limits are between 30-50% RPD as stated by AS 4482.1-1997. Exceedances of the applied RPDs are as follows: — Arsenic in primary sample HA07_0.2 and intra-laboratory sample QA01 at 86% — Chromium in primary sample HA07_0.2 and inter-laboratory sample QA01 at 55%.
Laboratory analysis	Analysis was carried out by laboratories with NATA certification for the required analyses. Detection limits were sufficient to enable comparison against the appropriate guidelines. All PQLs were less than the adopted assessment criteria.
Acceptable limits for QA/QC samples	Primary laboratory QA/QC acceptance limits for recovery of surrogates, control samples are matrix spikes to be 70 to 130% for organics and 80 to 120% recovery for inorganics and waters. All method blanks to be less than PQL.
Reporting	Report generally complies with the NEPM (2013).

9.2 SUMMARY OF QA/QA RESULTS

WSP considers that the sample collection, documentation, handling, storage and transportation procedures utilised are of an acceptable standard and the analytical results provided by the laboratories are deemed reliable and complete, therefore the data are considered fit for purpose.

It is considered that the QA/QC procedures and results were acceptable and that the conclusions of the report have not been significantly affected by the sampling or analytical procedures. Based on the results of laboratory QA/QC samples and the sampling and handling procedures used for the collection and analysis of soil and groundwater samples, the data were considered representative and appropriate for use in this assessment.

10 DISCUSSION AND CONCLUSIONS

Concentrations of TRH C_{16}-C_{34} were reported in some primary samples (HA03-0.1, HA03-0.9 and HA04-0.1) marginally above the PQL and accompanied by low PID readings. Concentrations were not considered to be significant and were generally below the adopted site criteria, although one result exceeded the ecological criteria.

All results for BTEXN and PAHs were below the laboratory PQLs. Concentrations of some heavy metals were reported in soil samples for the site, with results generally consistent between locations and were reported below the adopted site criteria.

No asbestos was observed in soil during the on-site work or detected by the laboratory in soil samples submitted for analysis.

The objectives of the PSI and DSI were to:

- assess the current contamination status of the site, with respect to soil contamination within the identified design footprint, to meet the requirements of the SSD
- assess the potential risks associated with contamination at the site (if identified), with respect to demonstrating the Site's suitability for proposed use in accordance with the SSD

The results of the investigation indicate the identified design footprint at the school is suitable for development and future use as a primary school under the SSD.

11 LIMITATIONS

This Report is provided by WSP Australia Pty Limited (WSP) for FTA (Client) in response to specific instructions from the Client and in accordance with WSP's proposal dated 23 May 2018 and agreement with the Client dated 23 May 2018 (Agreement).

PERMITTED PURPOSE

This Report is provided by WSP for the purpose described in the Agreement and no responsibility is accepted by WSP for the use of the Report in whole or in part, for any other purpose (Permitted Purpose).

QUALIFICATIONS AND ASSUMPTIONS

The services undertaken by WSP in preparing this Report were limited to those specifically detailed in the Report and are subject to the scope, qualifications, assumptions and limitations set out in the Report or otherwise communicated to the Client.

Except as otherwise stated in the Report and to the extent that statements, opinions, facts, conclusion and / or recommendations in the Report (Conclusions) are based in whole or in part on information provided by the Client and other parties identified in the report (Information), those Conclusions are based on assumptions by WSP of the reliability, adequacy, accuracy and completeness of the Information and have not been verified. WSP accepts no responsibility for the Information.

The Conclusions are reflective of the current Site conditions and cannot be regarded as absolute without further extensive intrusive investigations, outside the scope of the services set out in the Agreement and are indicative of the environmental condition of the Site at the time of preparing the Report. As a general principle, vertical and horizontal soil or groundwater conditions are not uniform. No monitoring, common or intrusive testing or sampling technique can eliminate the possibility that monitoring or testing results or samples taken, are not totally representative of soil and / or groundwater conditions encountered at the Site. It should also be recognised that Site conditions, including subsurface conditions can change with time due to the presence and concentration of contaminants, changing natural forces and man-made influences.

Within the limitations imposed by the scope of the services undertaken by WSP, the monitoring, testing (intrusive or otherwise), sampling for the preparation of this Report has been undertaken and performed in a professional manner in accordance with generally accepted practices, using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

WSP has prepared the Report without regard to any special interest of any person other than the Client when undertaking the services described in the Agreement or in preparing the Report.

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WSP is not (and will not be) obliged to provide an update of this Report to include any event, circumstance, revised Information or any matter coming to WSP's attention after the date of this Report. Data reported and conclusions drawn are based solely on the information made available to WSP at the time of preparing the Report. The passage of time; unexpected variations in ground conditions; manifestations of latent conditions; or the impact of future events (including (without limitation) changes in policy, legislation, guidelines, scientific knowledge; and changes in interpretation of policy by statutory authorities); may require further investigation or subsequent re-evaluation of the Conclusions.

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12 REFERENCES

Australian Standard AS4964, 2004, Method for Qualitative Identification of Asbestos in Bulk Samples

CSIRO Australian Soil Resource Information System (http://www.asris.csiro.au/index_ie.html)

The Department of Minerals and Energy, 1991, 1:100,000 Penrith Geological Map Sheet 9030

National Environment Protection Council (NEPC), 2013, National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1) (NEPM)

NSW DEC (2006) Guidelines for the NSW Site Auditor Scheme (2nd Edition)

NSW EPA (1995) Sampling Design Guidelines

NSW EPA (1997) Guidelines for Consultants Reporting on Contaminated Sites

NSW EPA (2009) Waste Classification Guidelines Part 1: Classifying Waste.

NSW EPA Contaminated land record database (http://www.epa.nsw.gov.au/prclmapp/searchregister.aspx)

NSW EPA Protection of the Environment Operations Act 1997 public register (http://www.epa.nsw.gov.au/prpoeoapp/)

NSW Government Water Information website (https://realtimedata.waternsw.com.au/water.stm)

WA DoH, 2009, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia

APPENDIX A

FIGURES

Map: PS110639_GIS_001_A1	Author: HartS		0 80 160 m 1:8,000 Coordinate system: GDA 1994 MGA Zone 56 Scale ratio correct when printed at A4
Date: 26/07/2018	Approved by: -		

Source: © OpenStreetMap (and) contributors, CC-BY-SA
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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Preliminary Site Investigation (PSI) and Detailed Site Investigation
Samuel Gilbert Public School, Ridgecrop Drive, Castle Hill, NSW
Figure 1
Site location

Map: PS110639_GIS_002_A1	Author: HartS		
Date: 26/07/2018	Approved by: -		

Source: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 20 40 m

1:2,000

Coordinate system: GDA 1994 MGA Zone 56

Scale ratio correct when printed at A4

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Preliminary Site Investigation (PSI) and Detailed Site Investigation
Samuel Gilbert Public School, Ridgecrop Drive, Castle Hill, NSW
Figure 2
Sampling locations

APPENDIX B

SECTION 10.7 CERTIFICATE

THE HILLS SHIRE COUNCIL
3 Columbia Court, Norwest NSW 2153
PO Box 7064, Norwest 2153
ABN 25 034 494 656 | DX 9966 Norwest

PLANNING CERTIFICATE UNDER SECTION 10.7 (2) & (5)

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 AS AMENDED.

Certificate Number:	**62463**
Reference:	LIR 235:119055
Issue Date:	12 July 2018
Receipt No:	5759148
Fee Paid:	$ 133.00

ADDRESS:	Samuel Gilbert Primary School, 1 Ridgecrop Drive, CASTLE HILL NSW 2154
DESCRIPTION:	Lot 1 DP 719671

The land is zoned:
Zone R2 Low Density Residential

The following prescribed matters apply to the land to which this certificate relates:

The Environmental Planning and Assessment Amendment Act 1997 commenced operation on 1 July 1998. As a consequence of this Act, the information contained in this certificate needs to be read in conjunction with the provisions of the Environmental Planning and Assessment Regulation 2000.

PLEASE NOTE: THIS CERTIFICATE IS AUTOMATICALLY GENERATED. IT MAY CONTAIN EXCESSIVE SPACES AND/OR BLANK PAGES.

THIS CERTIFICATE IS DIRECTED TO THE FOLLOWING MATTERS PRESCRIBED UNDER SECTION 10.7 (2) OF THE ABOVE ACT.

1. Names of relevant planning instruments and DCPs

(1) The name of each environmental planning instrument that applies to the carrying out of development on the land.

(A) **Local Environmental Plans**

The Hills Local Environmental Plan 2012, as amended, applies to all land in the Shire unless otherwise stated in this certificate.

State Environmental Planning Policies

SEPP No.19 - Bushland In Urban Areas
SEPP No.21 - Caravan Parks
SEPP No.30 - Intensive Agriculture
SEPP No.33 - Hazardous And Offensive Development
SEPP No.50 - Canal Estate Development
SEPP No.55 - Remediation Of Land
SEPP No.62 - Sustainable Aquaculture
SEPP No.64 - Advertising And Signage
SEPP No.65 - Design Quality Of Residential Apartment Development
SEPP No.70 - Affordable Housing (Revised Schemes)
SEPP (Building Sustainability Index: Basix) 2004
SEPP (State Significant Precincts) 2005
SEPP (Mining, Petroleum Production And Extractive Industries) 2007
SEPP (Miscellaneous Consent Provisions) 2007
SEPP (Infrastructure) 2007
SEPP (Exempt and Complying Development Codes) 2008
SEPP (Affordable Rental Housing) 2009
SEPP (State and Regional Development) 2011

SEPP (Vegetation in Non-Rural Areas) 2017
SEPP (Educational Establishments and Child Care Facilities) 2017

Sydney Regional Environmental Plan No. 9 Extractive Industry (No.2 - 1995)
Sydney Regional Environmental Plan No. 20 Hawkesbury – Nepean River (No.2 – 1997)

The following SEPP's may apply to the land. Please refer to **'Land to which Policy applies'** for each individual SEPP.

SEPP (Housing For Seniors Or People With A Disability) 2004

(2) The name of each **proposed environmental planning instrument** that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act (unless the Secretary has notified the council that the making of the proposed instrument has been deferred indefinitely or has not been approved).

(A) **Proposed Local Environmental Plans**

Proposed The Hills Local Environmental Plan 2012 (Amendment No.) applies to this land.

Refer Attachment 1(2)(A)

(B) **Proposed State Environmental Planning Policies**

Draft Primary Production and Rural Development State Environmental Planning Policy and planning reforms
Draft State Environmental Planning Policy (Environment)
Draft Remediation of Land State Environmental Planning Policy

(3) The name of each development control plan that applies to the carrying out of development on the land.

The Hills Development Control Plan 2012

Note: the land is within The Hills Development Control Plan 2012 Part B map sheet. Refer Council's website www.thehills.nsw.gov.au to view the map sheet.

(4) In this clause, proposed environmental planning instrument includes a planning proposal for a LEP or a draft environmental planning instrument.

2. Zoning and land use under relevant LEPs

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP).

(A) The Hills Local Environmental Plan 2012 applies to the land unless otherwise stated in this certificate and identifies the land to be:

Zone R2 Low Density Residential

(B) The purposes for which the instrument provides that development may be carried out within the zone without development consent:

Refer Attachment 2(B)

Also refer to the applicable instrument for provisions

regarding Exempt Development

(C) The purposes for which the instrument provides that development may not be carried out within the zone except with development consent:

Refer Attachment 2(B)

Also refer to the applicable instrument for provisions regarding Complying Development

(D) The purposes for which the instrument provides that development is prohibited in the zone:

Refer Attachment 2(B)

(E) Whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed?

The Hills Local Environmental Plan 2012?

NO

Any other Planning Proposal?

NO

(F) Whether the land includes or comprises critical habitat?

The Hills Local Environmental Plan 2012?

NO

Any other Planning Proposal?

NO

(G) Whether the land is in a conservation area (however described)?

The Hills Local Environmental Plan 2012?

NO

Any Other Planning Proposal?

NO

(H) Whether an item of environmental heritage (however described) is situated on the land?

The Hills Local Environmental Plan 2012?

NO

Any other Planning Proposal?

NO

2A. Zoning and land use under State Environmental Planning Policy (Sydney Region Growth Centres) 2006

To the extent that the land is within any zone (however described) under:

(a) Part 3 of the *State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (the 2006 SEPP), or*

(b) a Precinct Plan (within the meaning of the 2006 SEPP), or

(c) a proposed Precinct Plan that is or has been the subject of community consultation or on public exhibition under the ACT.

(A) State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan) applies to the land unless otherwise stated in this certificate and identifies the land to be:

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan) does not apply.

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan) applies to the land unless otherwise stated in this certificate and identifies the land to be:

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan) does not apply.

Note: This precinct plan applies to land within the Box Hill Precinct or Box Hill Industrial Precinct.

(B) The purposes for which the instrument provides that development may be carried out within the zone without development consent:

Refer Attachment 2(B)

Also refer to the applicable instrument for provisions regarding Exempt Development.

(C) The purposes for which the instrument provides that development may not be carried out within the zone except with development consent:

Refer Attachment 2(B)

Also refer to the applicable instrument for provisions regarding Complying Development

(D) The purposes for which the instrument provides that development is prohibited in the zone:

Refer Attachment 2(B)

(E) Whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed?

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan)?

NO

Any amendments to State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan)?

NO

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan)?

NO

Any amendments to State Environmental Planning Policy (Sydney Region Growth Centres 2006 (Appendix 11 The Hills Growth Centre Precincts Plan)?

NO

(F) Whether the land includes or comprises critical habitat?

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan)?

NO

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan)?

NO

(G) Whether the land is in a conservation area (however described)?

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan)?

NO

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan)?

NO

(H) Whether an item of environmental heritage (however described) is situated on the land?

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan)?

NO

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan)?

NO

3. Complying Development

(1) The extent to which the land is land on which complying development may be carried out under each of the codes for complying development because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

(2) The extent to which complying development may not be carried out on that land because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of that Policy and the reasons why it may not be carried out under those clauses.

(3) If the council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land, a statement that a restriction applies to the land, but it may not apply to all of the land, and that council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land.

Housing Code and Rural Housing Code
Complying Development under the Housing Code and Rural Housing Code **may be** carried out on the land.

Housing Alterations Code and General Development Code
Complying Development under the Housing Alterations Code and General Development Code **may be** carried out on the land.

Commercial and Industrial (New Buildings and Additions) Code
Complying Development under the Commercial and Industrial (New Buildings and Additions) Code **may be** carried out on the land.

Commercial and Industrial Alterations, Container Recycling Facilities, Subdivision, Demolition and Fire Safety Codes
Complying Development under the Commercial and Industrial Alterations, Container Recycling Facilities, Subdivision, Demolition and Fire Safety Codes **may be** carried out on the land.

Note: Where reference is made to an applicable map, this information can be sourced from the following websites:

The Hills Local Environmental Plan 2012 - www.thehills.nsw.gov.au
State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct) or (Appendix 11 The Hills Growth

Centre Precincts Plan) – http://www.planning.nsw.gov.au/Plans-for-your-area/Priority-Growth-Areas-and-Precincts/North-West-Priority-Growth-Area

4, 4A (Repealed)

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

Whether the owner (or any previous owner) of the land has consented in writing to the land being subject to annual charges under section 496B of the *Local Government Act 1993* for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).

NO

Note. "Existing coastal protection works" are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of section 553B of the *Local Government Act 1993*.

5. Mine subsidence

Whether or not the land is proclaimed to be a mine subsidence district within the meaning of section 15 of the *Mine Subsidence Compensation Act 1961*?

NO

6. Road widening and road realignment

Whether or not the land is affected by any road widening or road realignment under -

(A) Division 2 of Part 3 of the *Roads Act 1993*; or

NO

(B) any environmental planning instrument; or

NO

(C) any resolution of council?

a) The Hills Development Control Plan 2012?

NO

b) Any other resolution of council?

NO

7. Council and other public authority policies on hazard risk restrictions

Whether or not the land is affected by a policy:

(a) adopted by council, or

(b) adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council,

that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding)?

Council's policies on hazard risk restrictions are as follows:

(i) Landslip

a) By The Hills Local Environmental Plan 2012 zoning?

NO

No resolution has been adopted but attention is directed to the fact that there are areas within the Shire liable to landslip.

b) By The Hills Local Environmental Plan 2012 local provision?

NO

No resolution has been adopted but attention is directed to the fact that there are areas within the Shire liable to landslip.

c) By The Hills Development Control Plan 2012 provision?

NO

No resolution has been adopted but attention is directed to the fact that there are areas within the Shire liable to landslip.

(ii) Bushfire

YES

Please note this is a statement of Council policy only and NOT a statement on whether or not the property is affected by bushfire. That question is answered in Section 11 of this certificate.

Council has adopted the NSW Rural Fire Service Guidelines entitled 'Planning for Bushfire Protection 2006'. Development subject to bushfire risk will be required to address the requirements in these guidelines and can be downloaded off the RFS web site www.rfs.nsw.gov.au

The Development Control Plan may also contain provisions for development on Bushfire Prone Land and Bushfire Hazard Management. Refer Part 1(3) of this certificate for the applicable Development Control Plan.

(iii) Tidal inundation

NO

Please note this is a statement of Council policy only and NOT a statement on whether or not the property is affected by tidal inundation.

(iv) Subsidence

NO

Please note this is a statement of Council policy only and NOT a statement on whether or not the property is affected by subsidence.

(v) Acid sulphate soils

NO

(vi) Land contamination

NO

Please note this is a statement of Council policy only and NOT a statement on whether or not the property is affected by contamination or potential contamination.

(vii) Any other risk

NO

7A. Flood related development controls information

(1) Whether or not development on that land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related development controls?

NO

Please note this is a statement of flood related development controls and is NOT a statement on whether or not the property is subject to flooding.

(2) Whether or not development on that land or part of the land for any other purpose is subject to flood related development controls?

NO

Please note this is a statement of flood related development controls and is NOT a statement on whether or not the property is subject to flooding.

(3) Words and expressions in this clause have the same meanings as in the standard instrument set out in the *Standard Instrument (Local Environmental Plans) Order 2006*.

8. Land reserved for acquisition

Whether or not any environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.

The Hills Local Environmental Plan 2012?

NO

Any other Planning Proposal?

NO

State Environmental Planning Policy?

NO

Proposed State Environmental Planning Policy?

NO

9. Contributions plans

The name of each contributions plan applying to the land:

THE HILLS SECTION 94A

9A. Biodiversity Certified Land

Whether the land is biodiversity certified land under Part 8 of the *Biodiversity Conservation Act 2016*?

NO

Note: Biodiversity certified land includes land certified under Part 7AA of the *Threatened Species Conservation Act 1995* that is taken to be certified under Part 8 of the *Biodiversity Conservation Act 2016*.

10. Biodiversity stewardship sites

Whether the land is a biodiversity stewardship site under a biodiversity stewardship agreement under Part 5 of the *Biodiversity Conservation Act 2016* (but only if the council has been notified of the existence of the agreement by the Chief Executive of the Office of Environment and Heritage)?

NO

Note: Biodiversity stewardship agreements include biobanking agreements under Part 7A of the *Threatened Species Conservation Act 1995* that are taken to be biodiversity stewardship agreements under Part 5 of the *Biodiversity Conservation Act 2016*.

10A. Native vegetation clearing set asides

Whether the land contains a set aside area under section 60ZC of the *Local Land Services Act 2013* (but only if the council has been notified of the existence of the set aside area by Local Land Services or it is registered in the public register under that section)?

NO

11. Bush fire prone land

Has the land been identified as bush fire prone land?

YES

The land is identified on Council's certified Bush Fire Prone Land map as being partly or wholly bush fire prone land. For details refer to the Bush Fire Prone Land map that can be viewed on Council's website at www.thehills.nsw.gov.au

12. Property vegetation plans

Has the council been notified that a property vegetation plan approved under Part 4 of the *Native Vegetation Act 2003* (and that continues in force) applies to this land?

NO

13. Orders under Trees (Disputes Between Neighbours) Act 2006

Whether an order has been made under the *Trees (Disputes Between Neighbours) Act 2006* to carry out work in relation to a tree on this land (but only if the council has been notified of the order)?

NO

14. Directions under Part 3A

Whether there is a direction by the Minister in force under section 75P (2)(c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect?

NO

15. Site compatibility certificates and conditions for seniors housing

(a) Whether there is a current site compatibility certificate (seniors housing) of which council is aware, issued under *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* in respect of proposed development on the land?

NO

(b) Whether there are any terms of a kind referred to in clause 18(2) of *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* that have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land?

NO

16. Site compatibility certificates for infrastructure, schools or TAFE establishments

Whether there is a valid site compatibility certificate (infrastructure) or site compatibility certificate (schools or TAFE establishments), of which the council is aware, in respect of proposed development on the land?

NO

17. Site compatibility certificates and conditions for affordable rental housing

(1) Whether there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land?

NO

(2) Whether there are any terms of a kind referred to in clause 17(1) or 38(1) of *State Environmental Planning Policy (Affordable Rental Housing) 2009* that have been imposed as a condition of consent to a development application in respect of the land?

NO

18. Paper subdivision information

(1) The name of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot.

NO DEVELOPMENT PLAN APPLIES

(2) The date of any subdivision order that applies to the land.

NO SUBDIVISION ORDER APPLIES

(3) Words and expressions used in this clause have the same meaning as they have in Part 16C of this Regulation.

19. Site verification certificates

Whether there is a current site verification certificate, of which the council is aware, in respect of the land?

NO

Note. A site verification certificate sets out the Secretary's opinion as to whether the land concerned is or is not biophysical strategic agricultural land

or critical industry cluster land - see Division 3 of Part 4AA of *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.*

20. Loose-fill asbestos insulation

Does the land include any residential premises (within the meaning of Division 1A of Part 8 of the *Home Building Act 1989*) that is listed on the Loose-Fill Asbestos Insulation Register that is required to be maintained under that Division?

Council has **not** been notified by NSW Fair Trading that the land includes any residential premises that are listed on the register. Refer to the NSW Fair Trading website at www.fairtrading.nsw.gov.au to confirm that the land is not listed on this register.

Note: There is potential for loose-fill asbestos insulation in residential premises that are not listed on the Register. Contact NSW Fair Trading for further information.

21. Affected building notices and building product rectification orders

(1) Whether there is any affected building notice of which the council is aware that is in force in respect of the land?

NO

(2) (a) Whether there is any building product rectification order of which the council is aware that is in force in respect of the land and has not been fully complied with?

NO

(b) Whether any notice of intention to make a building product rectification order of which the council is aware has been given in respect of the land and is outstanding?

NO

(3) In this clause:

affected building notice has the same meaning as in Part 4 of the *Building Products (Safety) Act 2017*.
building product rectification order has the same meaning as in the *Building Products (Safety) Act 2017*.

Note. The following matters are prescribed by section 59 (2) of the *Contaminated Land Management Act 1997* as additional matters to be specified in a planning certificate:

(a) that the land to which the certificate relates is significantly contaminated land within the meaning of that Act – if the land (or part of the land) is significantly contaminated land at the date when the certificate is issued,

NO

(b) that the land to which the certificate relates is subject to a management order within the meaning of that Act – if it is subject to such an order at the date when the certificate is issued,

NO

(c) that the land to which the certificate relates is the subject of an approved voluntary management proposal within the meaning of that Act – if it is the subject of such an approved proposal at the date when the certificate is issued,

NO

(d) that the land to which the certificate relates is subject to an ongoing maintenance order within the meaning of the Act – if it is subject to such an order at the date when the certificate is issued,

NO

(e) that the land to which the certificate relates is the subject of a site audit statement within the meaning of the Act – if a copy of such a statement has been provided at any time to the local authority issuing the certificate.

NO

THIS PART IS DIRECTED TO THE FOLLOWING MATTERS PRESCRIBED UNDER SECTION 10.7 (5) OF THE ABOVE ACT

NOTE: "When information pursuant to Section 10.7 (5) is requested the council is under no obligation to furnish any of the information supplied herein pursuant to that Section. Council draws your attention to Section 10.7 (6), which states that a council shall not incur any liability in respect of any advice provided in good faith pursuant to sub-section (5). The absence of any reference to any matter affecting the land shall not imply that the land is not affected by any matter not referred to in this certificate."

A. Whether there are any provisions applying to the land that control the management of trees and bushland?

YES

Part C Section 3 of The Hills Development Control Plan 2012 contain provisions for the control and management of actions in respect of trees and bushland.

B. Does the land contain a foreshore area as identified on The Hills Local Environmental Plan 2012 Foreshore Building Line map?

NO

C. Under the Protection of the Environment Operations Act 1997, is the property subject to a listing on the public register maintained by council with respect to an environmental notice or civil proceedings in the Land and Environment Court, or a prosecution under this Act?

NO

D. Is the land affected by any special provisions of Sydney Regional Environmental Plan No 9 – Extractive Industry (No 2 – 1995)?

NO

E. Is the land affected by a restricted development area as identified under The Hills Development Control Plan 2012?

NO

F. Is the land within an area where a Special Infrastructure Contribution, as determined by the Minister for Planning and Infrastructure, applies?

NO

G. Is the land in the vicinity of a heritage item or heritage conservation area as described in The Hills Local Environmental Plan 2012 **OR** State Environmental Planning Policy (Sydney Region Growth Centres) 2006?

NO

H. Whether Council has adopted a Voluntary Planning Agreement within the meaning of S93F of the Environmental Planning and Assessment Act, 1979, as amended, in relation to the land?

NO

I. Is the land within or adjacent to the Sydney Metro Northwest as identified on the maps prepared by Transport NSW?

NO

J. Does the land contain a proposed road as identified within a Development Control Plan under State Environmental Planning Policy (Sydney Region Growth Centres) 2006?

NO

K. Has Council been notified by NSW Land and Property Information that the land is affected by a plan of acquisition for railway purposes (Sydney Metro Northwest)?

NO

THE HILLS SHIRE COUNCIL

MICHAEL EDGAR
GENERAL MANAGER

Per:

PLEASE NOTE: COUNCIL RETAINS THE ELECTRONIC ORIGINAL OF THIS CERTIFICATE. WHERE THIS CERTIFICATE REFERS TO INFORMATION DISPLAYED ON COUNCIL'S WEBSITE OR TO ANY EXTERNAL WEBSITE, IT REFERS TO INFORMATION DISPLAYED ON THE WEBSITE ON THE DATE THIS CERTIFICATE IS ISSUED.

ATTACHMENT 1(2)(A)

PLANNING PROPOSAL 1/2017/PLP - REMOVES CITY OF PARRAMATTA FROM THE HILLS SHIRE COUNCIL & CREATES LEP 2017

As a result of the State-wide Council Boundary Review process in May 2016, the Hills Shire Council area was reduced, with part of The Hills Shire becoming part of the new City of Parramatta Council Local Government Area.

This means that LEP 2012 is currently being administered by two Councils. The planning proposal seeks an administrative amendment to The Hills Local Environmental Plan 2012 to:

1. Create a new local environmental plan and associated maps which will be known as *The Hills Local Environmental Plan 2017* and which will apply to land within The Hills Local Government Area.

2. Amend *The Hills Local Environmental Plan 2012* and associated maps so that it only applies to land formerly in The Hills Local Government Area, now in the City of Parramatta. This instrument will continue to be known as *The Hills Local Environmental Plan 2012.*

The separation of LEP 2012 into two plans will allow both Councils to manage the ongoing planning framework independently. The proposal is an administrative amendment only and there is no proposal to change the planning controls that currently apply to land within The Hills Shire or the City of Parramatta.

Delegation for making of the LEP 2012 has not been issued to Council under the Gateway Determination.

For further information please contact Council's Duty Planner on 9843 0469.

The above details are in keeping with the exhibited planning proposal. Please note that changes to the planning proposal may be made post exhibition. The current status and details of the planning proposal can be viewed on Council's website www.thehills.nsw.gov.au under the 'Building & Planning' menu bar, then 'Application Tracking'.

ATTACHMENT 2(B)

Zone R2 Low Density Residential

1 Objectives of zone

- To provide for the housing needs of the community within a low density residential environment.
- To enable other land uses that provide facilities or services to meet the day to day needs of residents.
- To maintain the existing low density residential character of the area.

2 Permitted without consent

Home business; Home occupations

3 Permitted with consent

Bed and breakfast accommodation; Boarding houses; Building identification signs; Business identification signs; Centre-based child care facilities; Dual occupancies; Dwelling houses; Group homes; Health consulting rooms; Home-based child care; Respite day care centres; Roads; Any other development not specified in item 2 and 4

4 Prohibited

Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Boat building and repair facilities; Boat launching ramps; Boat sheds; Camping grounds; Car parks; Caravan parks; Cemeteries; Charter and tourism boating facilities; Commercial premises; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Entertainment facilities; Environmental facilities; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Function centres; Health services facilities; Heavy industrial storage establishments; Helipads; Highway service centres; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Industries; Information and education facilities; Jetties; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Passenger transport facilities; Port facilities; Public administration buildings; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Registered clubs; Research stations; Residential accommodation; Restricted premises; Rural industries; Service stations; Sewerage systems; Sex services premises; Signage; Storage premises; Tourist and visitor accommodation; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Veterinary hospitals; Warehouse or distribution centres; Waste or resource management facilities; Water recreation structures; Water supply systems; Wharf or boating facilities; Wholesale supplies.

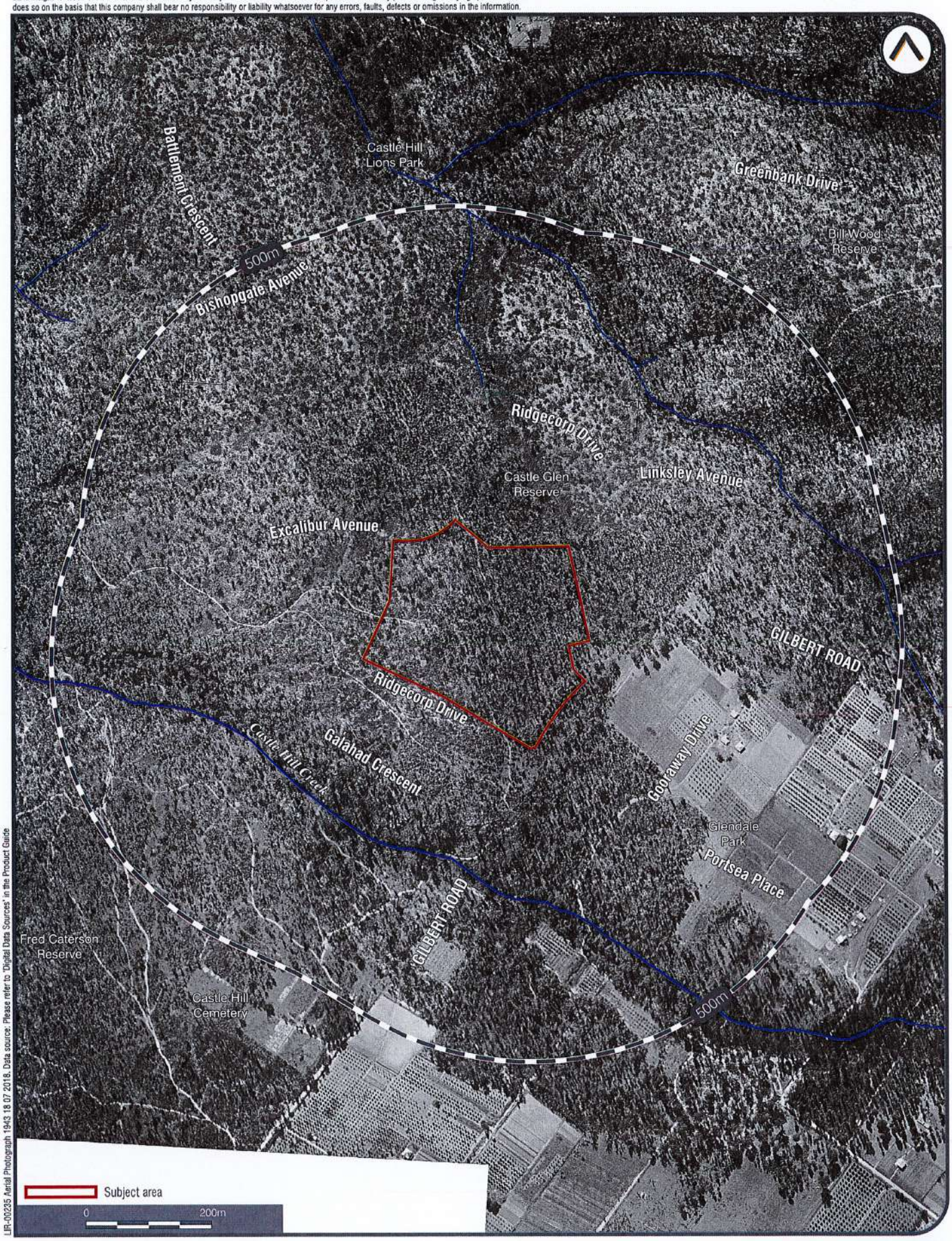
NOTE: This land use table should be read in conjunction with the Dictionary at the end of The Hills LEP 2012 which defines words and expressions for the purpose of the plan.

NOTE: Activities permitted without development consent are still subject to other provisions in Environmental Planning Instruments and/or Acts.

APPENDIX C

HISTORICAL AERIAL PHOTOGRAPHS

Land Insight & Resources do no warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that this company shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.



LIR-00235 Aerial Photograph 1943 18 07 2018. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1943

LAND INSIGHT & RESOURCES

MAP 12

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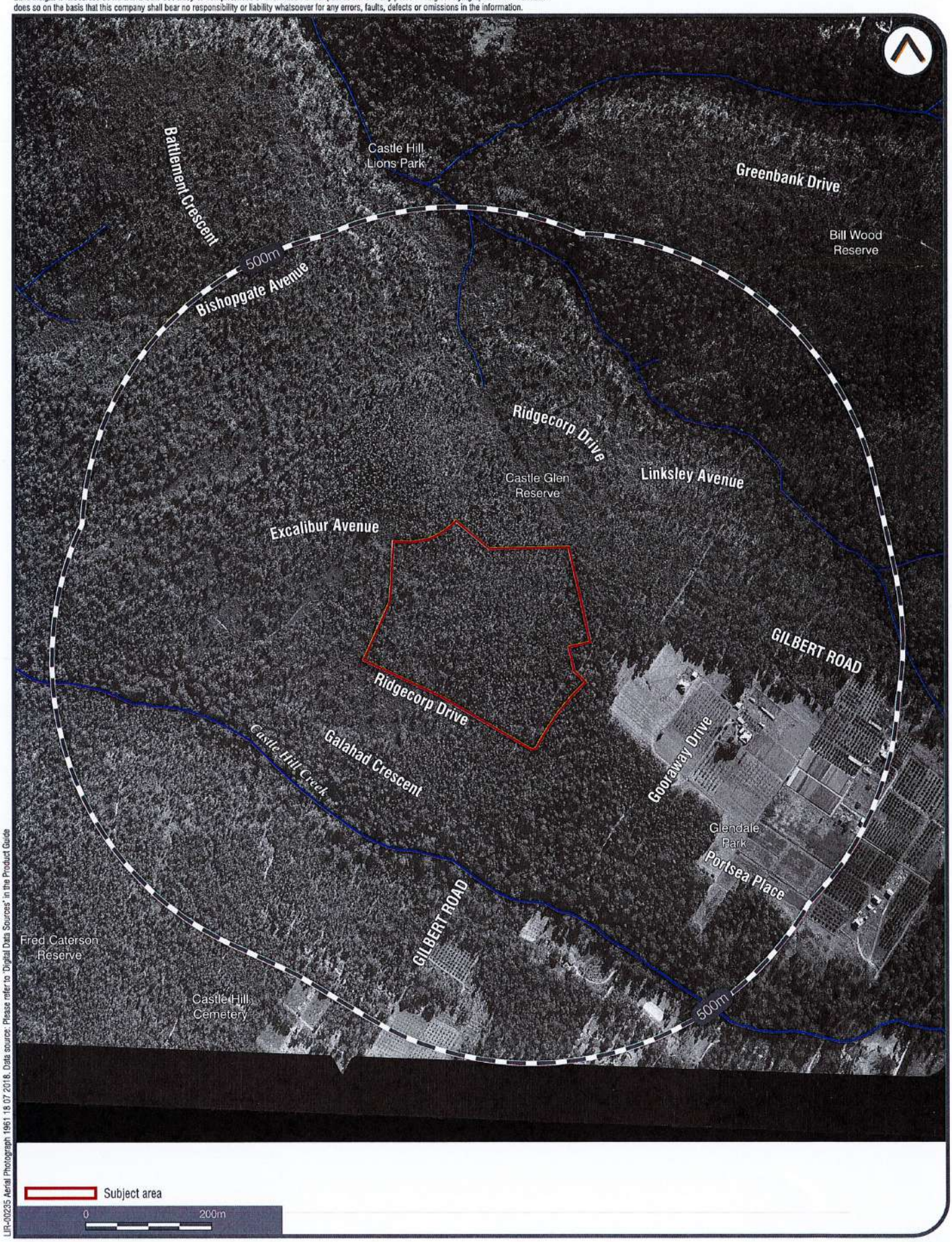

LIR-00235 Aerial Photograph 1961 18.07.2018. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1961

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MAP 14

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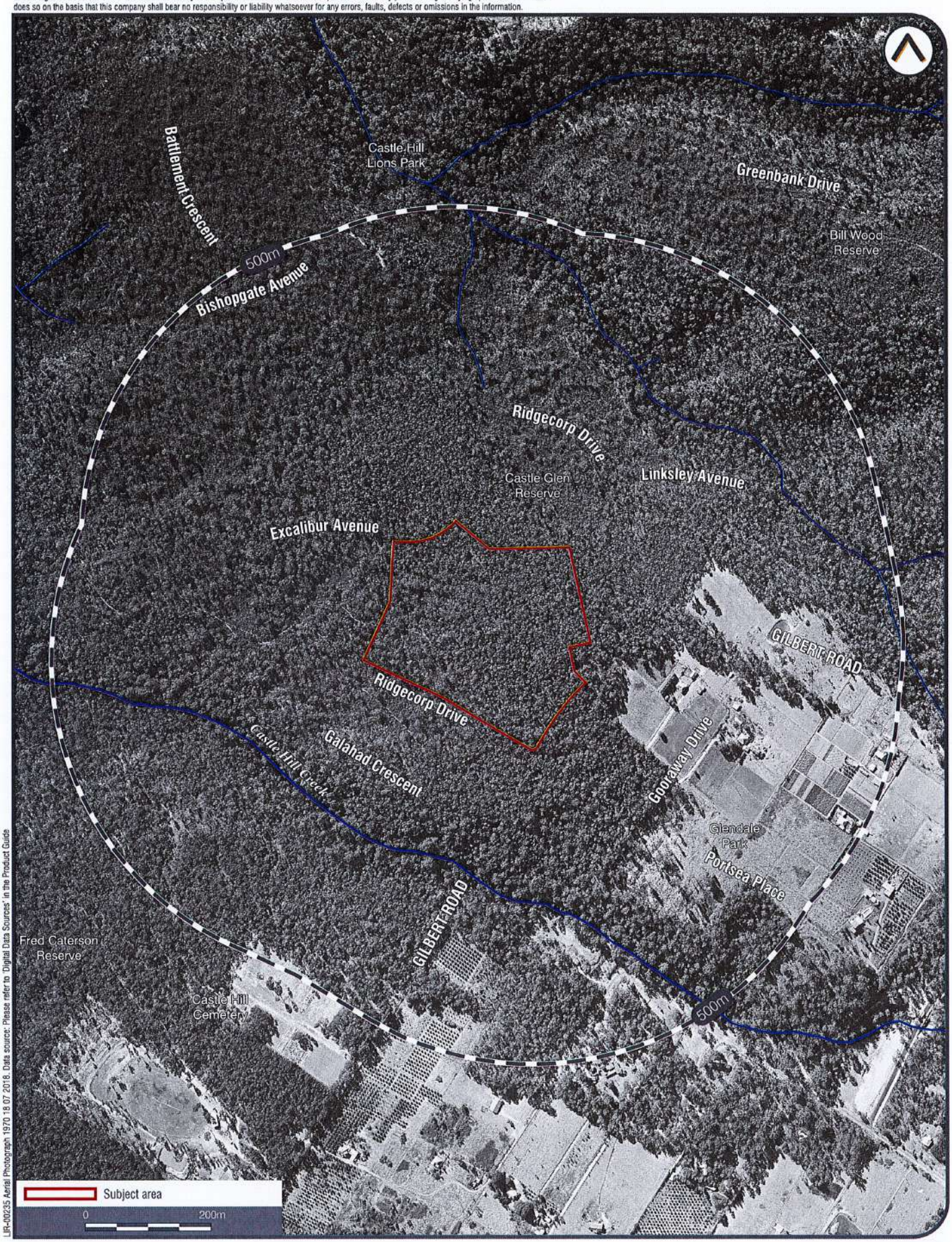

LIR-00235 Aerial Photograph 1970 18 07 2018. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1970

LAND INSIGHT & RESOURCES

MAP 15

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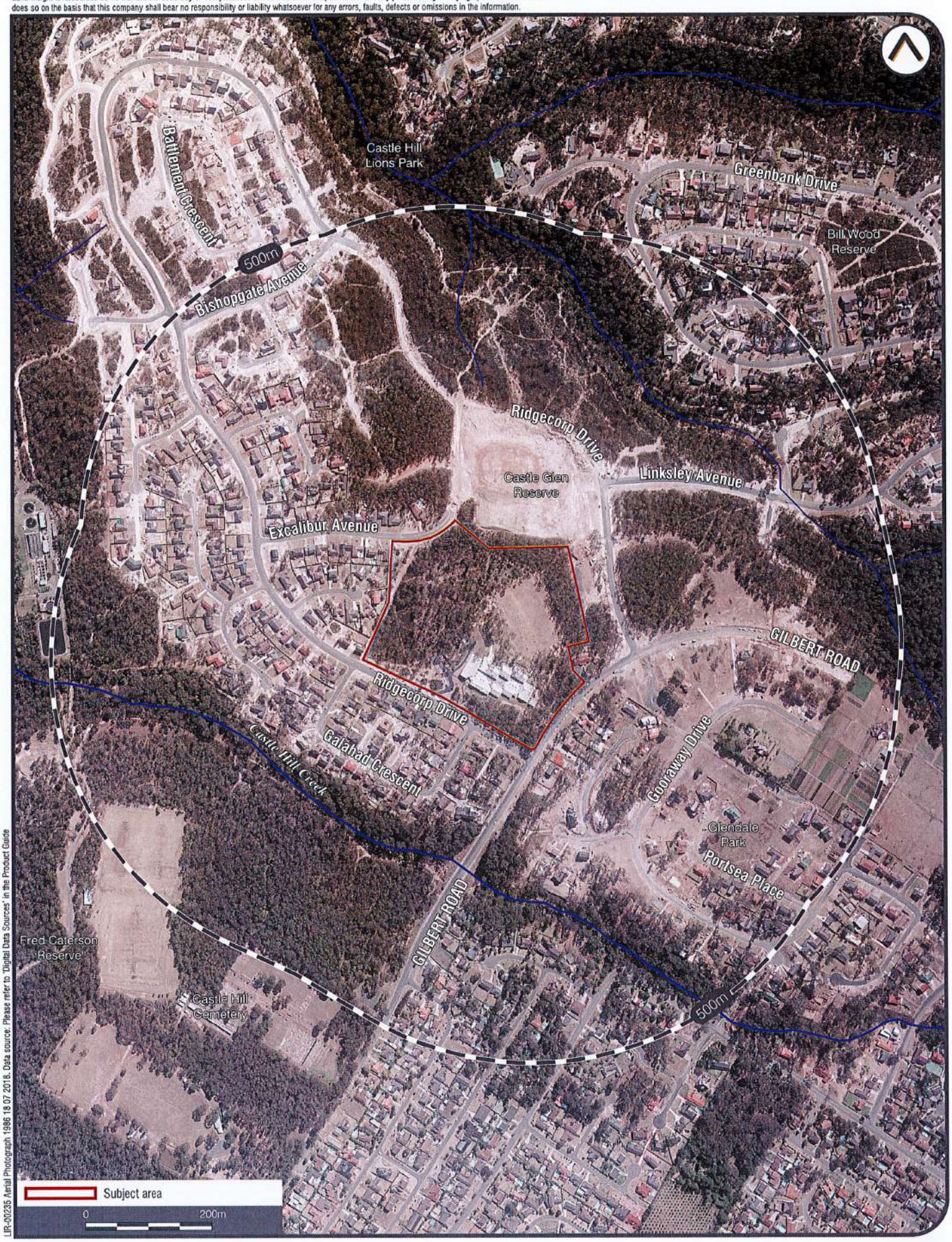

LIR-00235 Aerial Photograph 1986 18 07 2018. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1986

LAND INSIGHT & RESOURCES

MAP 16

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LIR-00235 Aerial Photograph 1991 18.07.2016. Data source. Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1991

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MAP 17

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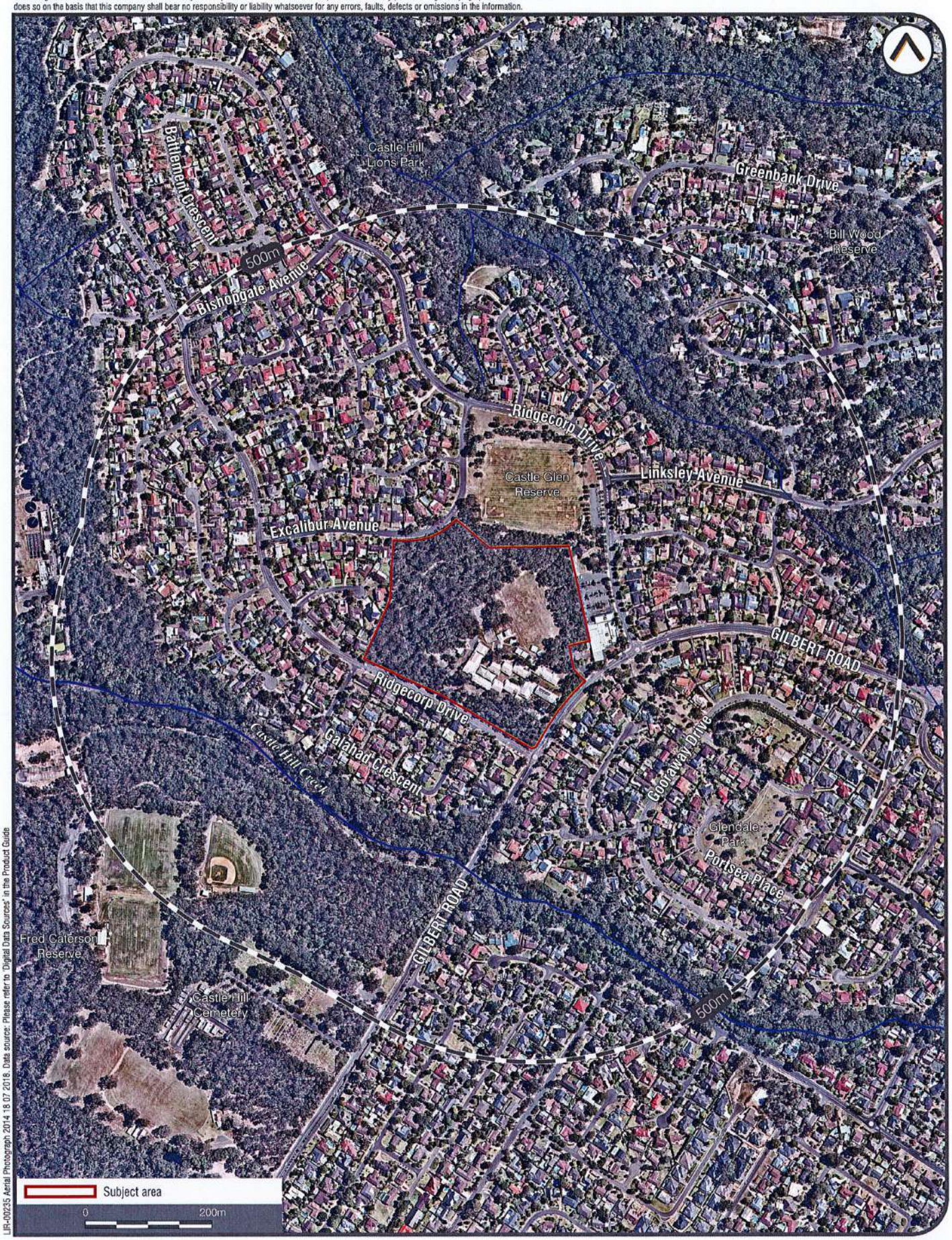


LIR-00235 Aerial Photograph 2014 18.07.2018. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2014

LAND INSIGHT & RESOURCES

MAP 21

APPENDIX D

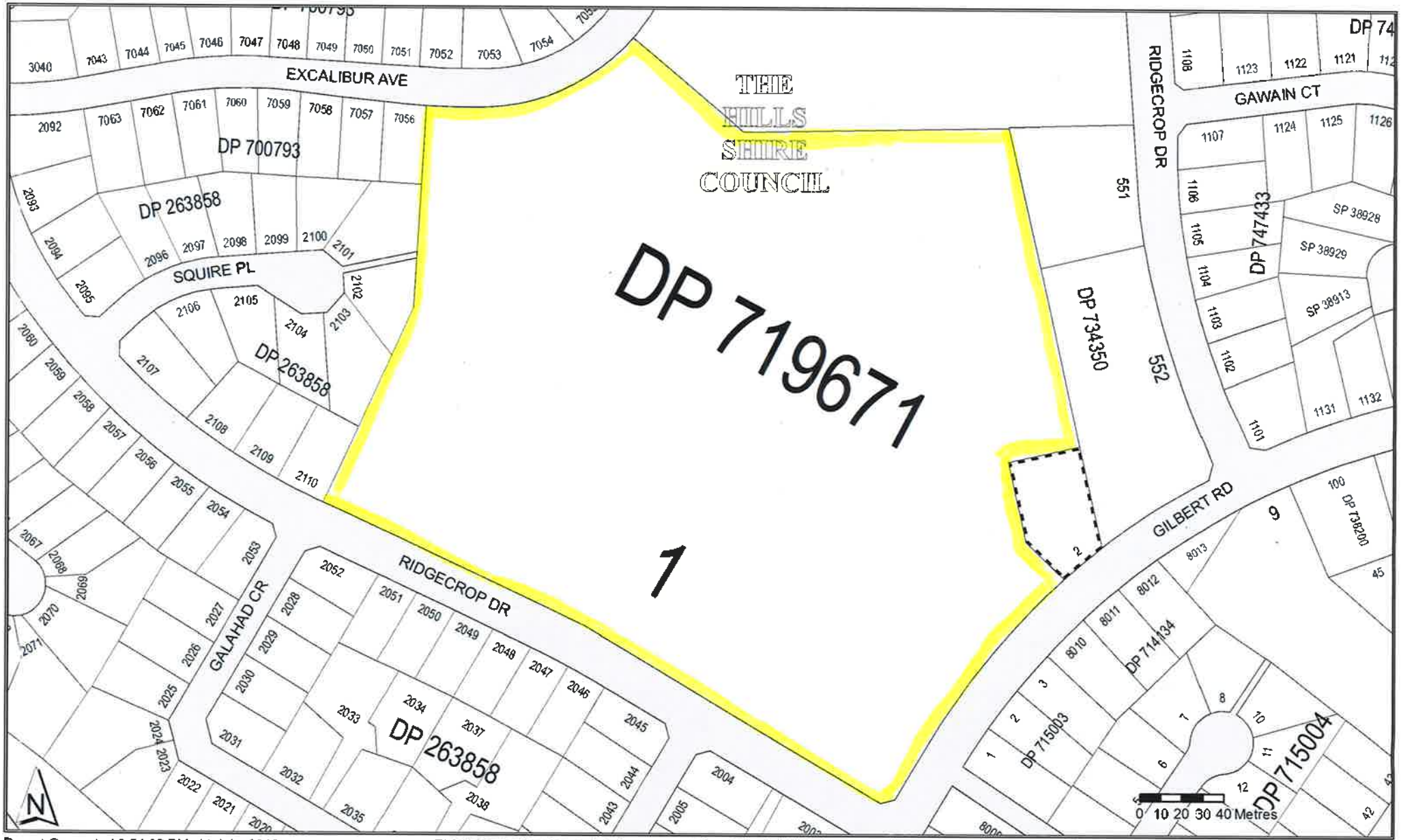
HISTORICAL CERTIFICATES OF TITLE

LAND REGISTRY SERVICES

Cadastral Records Enquiry Report : Lot 1 DP 719671

Locality : CASTLE HILL
LGA : THE HILLS SHIRE
Parish : CASTLE HILL
County : CUMBERLAND

Ref : CMapIT



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This information is provided as a searching aid only.Whilst every endeavour is made to ensure that current map, plan and titling information is accurately reflected, the Registrar General cannot guarantee the information provided. For ALL ACTIVITY PRIOR TO SEPTEMBER 2002 you must refer to the RGs Charting and Reference Maps

InfoTrack

Req:R905449 /Doc:CT 11784-013 CT /Rev:10-Jan-2011 /Sts:OK.SC /Pgs:ALL /Prt:11-Jul-2018 16:02
Ref:castle hill /Src:M

CERTIFICATE OF TITLE

NEW SOUTH WALES — PROPERTY ACT, 1900

11784-013

Appln. No. 27002

Prior Title Vol. 4642 Fol. 186

Vol. 11784 Fol. 13

CANCELLED

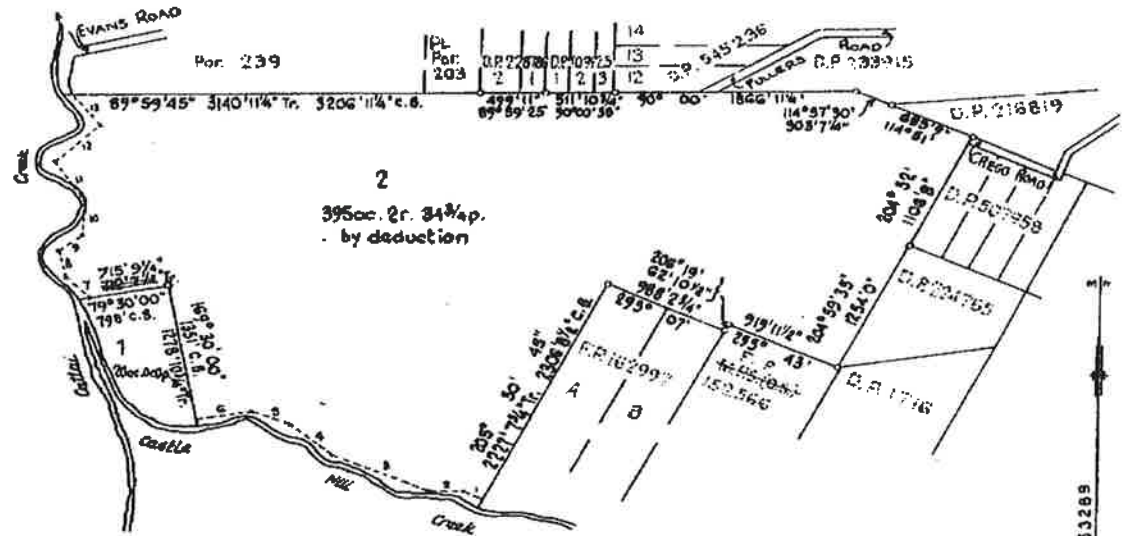
Edition issued 24-2-1972

(Page 1) Vol. 11784 Fol. 13

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

PLAN SHOWING LOCATION OF LAND



No.	Bearing	Distance
1	294° 39' 30"	172' 9½"
2	270° 57' 50"	257' 4"
3	294° 02' 10"	830' 0¼"
4	311° 58' 15"	448' 1"
5	298° 00' 30"	308' 0¼"
6	260° 85' 30"	384' 11¼"
7	318° 43' 20"	2777' 3¾"

No	Bearing	Distance
8	347° 57' 20"	252' 11"
9	31° 21' 20"	232' 6¾"
10	0° 55' 25"	322' 3"
11	327° 52' 10"	418' 5¼"
12	45° 00' 20"	481' 4"
13	322° 21' 10"	857' 11¾"

Table of Traverse Boundaries

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 2 in Deposited Plan 553269 at Glenhaven in the Shire of Baulkham Hills Parish of Castle Hill and County of Cumberland being part of Portion 147 granted to John Terry Hughes on 19-7-1838.

FIRST SCHEDULE

HAGEN INVESTMENTS PTY. LIMITED.

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. The registered proprietor holds subject to Section 604 Local Government Act, 1919.
3. Right of Way created by Transfer No.C261921 appurtenant to the land above described affecting the piece of land shown as "site of proposed right of way 66 feet wide" in F.P.185185.
4. Mortgage No.M193846 to The Commercial Bank of Australia Limited. Entered 19-3-1971.

Registrar General.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE LAND TITLES OFFICE.

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED.

Vol. 11784 Fol. 13

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar General
This deed is cancelled as to Whole New Certificates of Title have issued on 9-10-1972 for lots in Deposited Plan No. 55719 as follows: Lots 21-22 Vol. 11945 Fol. 126/27 respectively. REGISTRAR GENERAL					

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar General	CANCELLATION		

(Page 2 of 2 pages)

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Req:R905449 /Doc:CT 11784-013 CT /Rev:10-Jan-2011 /Sts:OK.SC /Pgs:ALL /Prt:11-Jul-2018 16:02
Ref:castle hill /Src:M

Req:R905440 /Doc:CT 11945-127 CT /Rev:11-Jan-2011 /Sts:OK.SC /Pgs:ALL /Prt:11-Jul-2018 16:01
Ref:castle hill /Src:M

[redacted]ICATE OF TITLE

11945127

NEW SOUTH WALES

PROPERTY ACT, 1900

Vol. 11945 Fol. 127

Appln.No.27002

Prior Title Vol.11784 Fol.13

CANCELLED

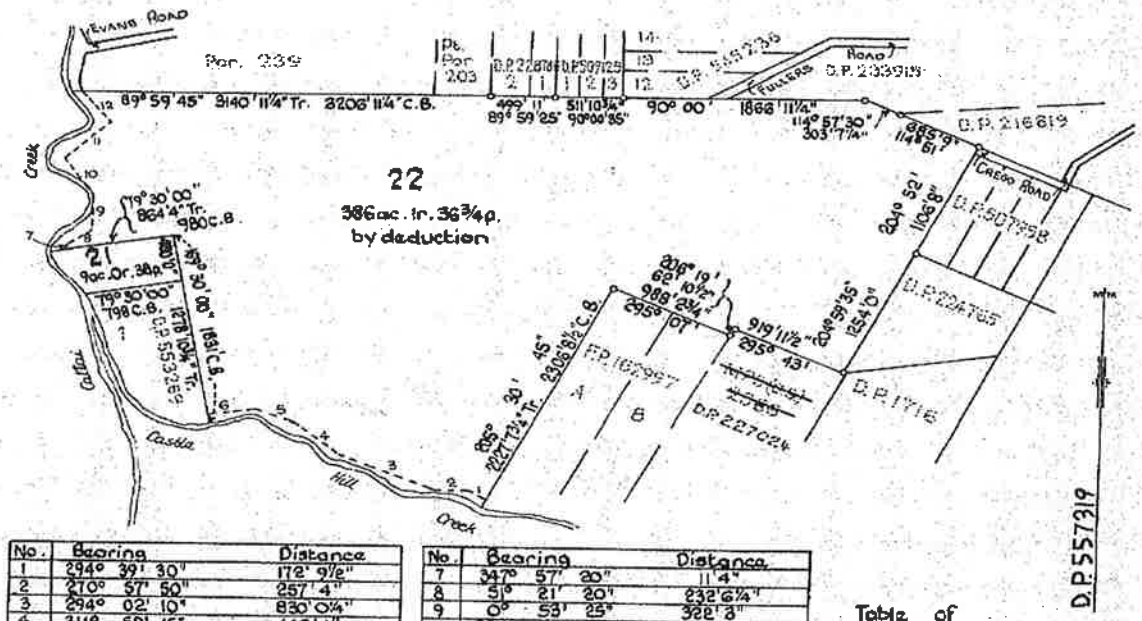
Edition issued 9-10-1972.

(Page 1) Vol. 11945 Fol. 127

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

PLAN SHOWING LOCATION OF LAND



No.	Bearing	Distance
1	294° 39' 30"	172' 9½"
2	270° 57' 50"	257' 4"
3	294° 02' 10"	830' 0¼"
4	311° 58' 15"	448' 1"
5	292° 00' 30"	308' 0¼"
6	260° 53' 30"	334' 11¼"

No.	Bearing	Distance
7	347° 57' 20"	11' 4"
8	5° 21' 20"	232' 6¼"
9	0° 53' 25"	322' 3"
10	327° 52' 10"	418' 5¼"
11	45° 00' 20"	481' 4"
12	322° 21' 10"	357' 1¾"

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 22 in Deposited Plan 557319 at Glenhaven in the Shire of Baulkham Hills Parish of Castle Hill and County of Cumberland being part of Portion 147 granted to John Terry Hughes on 19-7-1838.

FIRST SCHEDULE

HAGEN INVESTMENTS PTY.LIMITED.

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. The registered proprietor holds subject to Section 604 Local Government Act 1919.
3. Right of Way created by Transfer No.C261921 appurtenant to the land above described affecting the piece of land shown as "Site of Proposed Right of Way 66 feet wide" in Filed Plan 185185.
4. Mortgage No.M193846 to The Commercial Bank of Australia Limited. Entered 19-3-1971.

Registrar General

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE LAND TITLES OFFICE.

Vol. 11945 Fol. 127

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar General
This deed is cancelled as to whole New certificates of Title have issued on 24-7-1929 for lots in Town of Lee Plan No 60355 now Lots 1 & 2 Vol 1390 Fol 184 & 185 respectively. REGISTRAR GENERAL NEW CERTIFICATE(S) OF TITLE ISSUED ON DP 60355 NO DEALING TO BE REGISTERED WITHOUT REFERENCE TO SURVEY DRAFTING BRANCH					

DP 59358
CT 11-6 79
DP 60355
12/3/3

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar General	CANCELLATION		

(Page 2 of 2 pages)

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Req:R905440 /Doc:CT 11945-127 CT /Rev:11-Jan-2011 /Sts:OK.SC /Pgs:ALL /Prt:11-Jul-2018 16:01
Ref:castle hill /Src:M

Req:R905422 /Doc:CT 13910-185 CT /Rev:10-Jan-2011 /Sts:OK.SC /Pgs:ALL /Prt:11-Jul-2018 16:00
Ref:castle hill /Src:M

[redacted]

CERTIFICATE OF TITLE

NEW SOUTH WALES

REAL PROPERTY ACT, 1900

Vol. 13910 Fol. 185

Appln. No.27002

Prior Title Vol.11945 Fol.127

EDITION ISSUED

24 7 1979

13910 Fol. 185

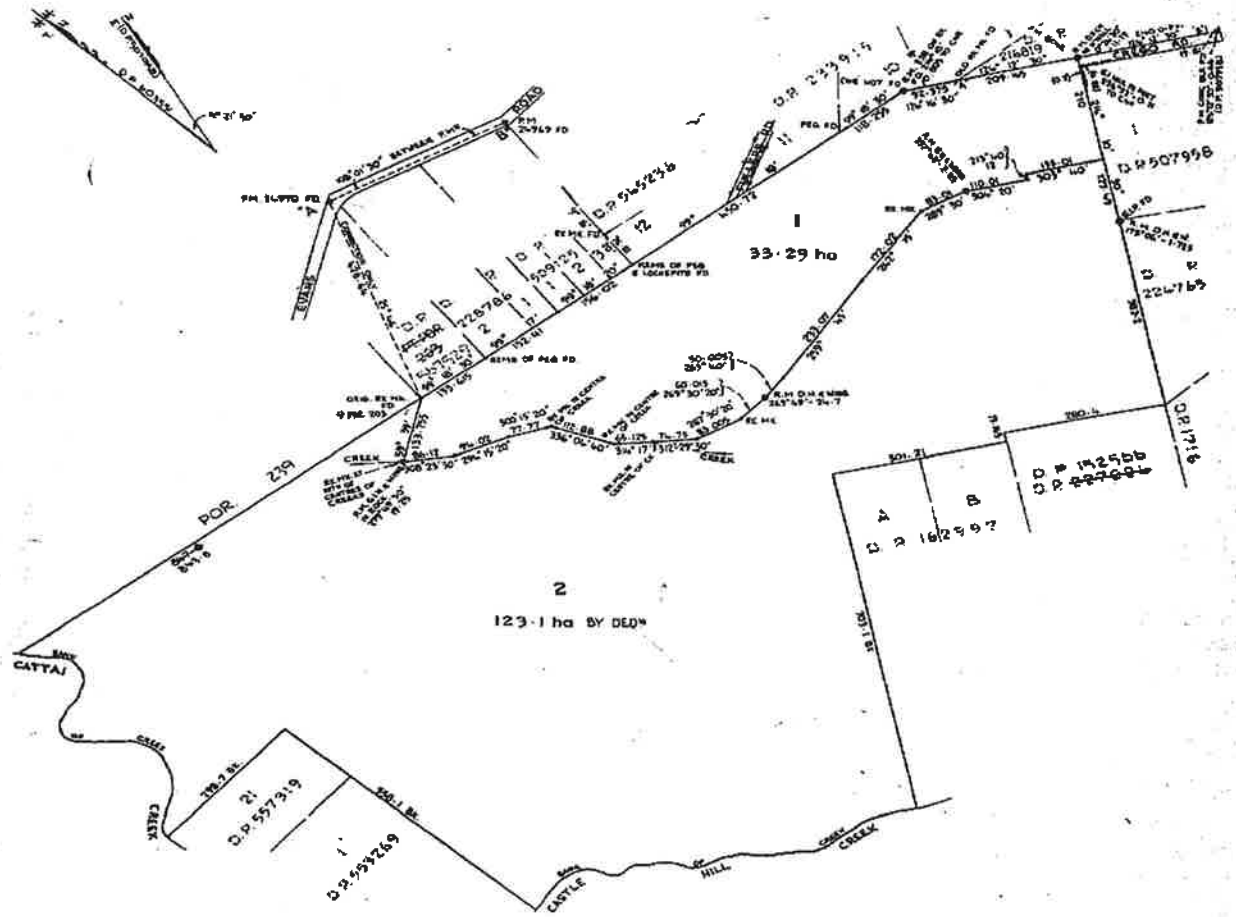
(Page 1) Vol. .....

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 2 in Deposited Plan 603551 at Glenhaven in the Shire of Baulkham Hills Parish of Castle Hill and County of Cumberland being part of Portion 147 granted to John Terry Hughes on 19-7-1838.

FIRST SCHEDULE

~~HAGEN INVESTMENTS PTY. LIMITED.~~

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. The registered proprietors hold subject to section 604 Local Government Act,1919
3. C261921 Right of way appurtenant to the land above described affecting the land shown so burdened in Deposited Plan 603551.
4. ~~M193846 Mortgage to The Commercial Bank of Australia Limited.~~ Discharged R376484

RG 2/62

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE REGISTRAR GENERAL'S OFFICE.

Req:R905422 /Doc:CT 13910-185 CT /Rev:10-Jan-2011 /Sts:OK.SC /Pgs:ALL /Prt:11-Jul-2018 16:00
Ref:castle hill /Src:M

Vol. 13910 Fol. 185

R376485
DP619848
DP 630187
DP 263857
DP 263858
T420795 Application
DP263997
T438731 Application
Cancel Limit
T422418 Application
Set aside Limit
T450082
T811096 Request for Limit

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	REGISTERED	Signature of Registrar General
Land Commission of New South Wales. part	Transfer	R376485	2-10-1979	

28-3-1983

for lots in Deposited No. 630187
Lots 130-132 Vol 15024 Fol 164-166 &c. excepting

REGISTRAR GENERAL

This deed is cancelled as to Part ex Road
New Certificates of Title have issued on 31-3-1983
for lots in Deposited Plan No. 263857 as follows:
Lots 1001 to 1096 Vol. 15026 Fol 99 to 188 respectively.

REGISTRAR GENERAL

This deed is cancelled as to Part ex Road
New Certificates of Title have issued on 31-3-1983
for lots in Deposited Plan No. 263858 as follows:
Lots 2001 to 2112 Vol. 15027 Fol. 1 to 112 respectively.

REGISTRAR GENERAL

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	PARTICULARS	REGISTERED	Signature of Registrar General	CANCELLATION
	DP.263858	Interests created pursuant to Section 88B Conveyancing Act, 1919, by the registration of Deposited Plan. 263858	19.1.1983		This deed is cancelled as to Part ex Road New Certificates of Title have issued on 31-3-1983 for lots in Deposited Plan No. 263997 Lots 3001 to 3041 Vol. 15027 Fol 113 to 153
	D.P. 263857	Interests created pursuant to Section 88B Conveyancing Act, 1919, by the registration of Deposited Plan. 263857	19.1.1983		
T420795		Application. The registered proprietor holds subject to Section 14(A) of the Land Commission Act, 1976 as regards Lots 2001 to 2110 inclusive in D.P.263858. Registered 10-3-1983.			
T422418		Application. The registered proprietor holds subject to Section 14(A) of the Land Commission Act, 1976 as regards Lots 1001 to 1093 inclusive in D.P.263857. Registered 10-3-1983.			
T450082		Application. The registered proprietor holds subject to Section 14(A) of the Land Commission Act, 1976 as regards Lots 3001 to 3040 inclusive in D.P.263997. Rg Registered 10-3-1983.			
T438731		Application. Easement to drain water 2 wide created by D.P.263858 is hereby released insofar as it affects Lots 2085, 2091 and 2093. Registered 16-3-1983.			
T438731		Application. Easement to drain water 2 wide created by D.P.263858 affecting Lots 2083, 2086, 2089, 2090, 2091 and 2111 is partially released insofar as it is appurtenant to Lot 2113. Registered 16-3-1983.			

The residue of land in this folio comprises Part DP 263858 & DP 263997

REGISTRAR GENERAL

T811096 Req. Gen

(Page 2 of 2 pages)

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Req:R905331 /Doc:CT 15024-164 CT /Rev:23-Dec-2010 /Sts:OK.SC /Pgs:ALL /Prt:11-Jul-2018 15:53
Ref:wenty /Src:M

[redacted]

FICATE OF TITLE

NEW SOUTH WALES — [redacted]L PROPERTY ACT, 1900

15024164

First Title : Old System

Prior Title : Vol.13910 Fol.185

Vol. 15024 Fol. 164

EDITION 1 ISSUED 29 3 1983

I certify that the person named in the First Schedule is the registered proprietor of an estate in fee simple (or such other estate or interest as is set out below) in the land described subject to the recordings appearing in the Second Schedule and to the provisions of the Real Property Act, 1900.

Registrar General.

(Page 1) Vol. 15024 Fol. 164

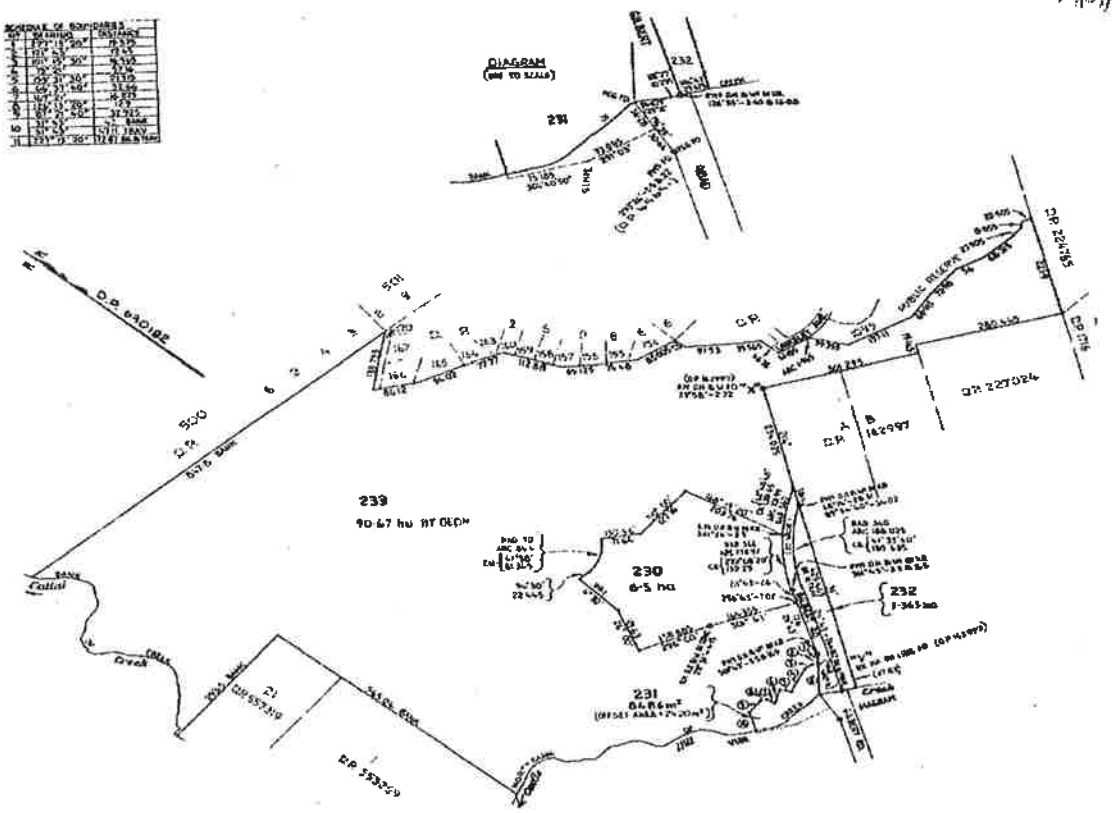
PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES

CANCELLED



LAND REFERRED TO

Lot 230 in Deposited Plan 630182 at Glenhaven in the Shire of Baulkham Hills Parish of Castle Hill and County of Cumberland.

FIRST SCHEDULE

LAND COMMISSION OF NEW SOUTH WALES.

SECOND SCHEDULE

GRY 1. Reservations and conditions, if any, contained in the Crown Grant.
2. ~~The registered proprietor holds subject to section 604 Local Government Act, 1919.~~
RWZ 3. C261921P Right of way appurtenant to the land above described affecting the land shown so burdened in Deposited Plan 603551.

Vol 15024 Fol 164

99346D 8.81 D. West, Government Printer

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR | Registrar General

DP/SP 700793 Registered 18-1-1984
This folio is cancelled as to whole/~~part~~ ex road upon creation of computer folios for lots 7001 - 7066 in the abovementioned plan.

Registrar General.

SECOND SCHEDULE (continued)

PARTICULARS | Registrar General | CANCELLATION

Interests created pursuant to Section 88B Conveyancing Act, 1919, by the registration of Deposited Plan. 700793

The residue of land in this folio comprises road shown in D.P. 700793

REGISTRAR GENERAL

NOTATIONS AND UNREGISTERED DEALINGS

DP 700793 T693570 BC Lots 7001 to 7066 (inclusive) & roads created by DP 700793

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CAN

Req:R905331 /Doc:CT 15024-164 CT /Rev:23-Dec-2010 /Sts:OK.SC /Pgs:ALL /Prt:11-Jul-2018 15:53
Ref:Wentg /Src:M

LAND REGISTRY SERVICES — Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
11/7/2018 3:53PM

FOLIO: 7066/700793

First Title(s): OLD SYSTEM
Prior Title(s): VOL 15024 FOL 164

Recorded	Number	Type of Instrument	C.T. Issue
20/1/1984	DP700793	DEPOSITED PLAN	FOLIO CREATED EDITION 1
16/3/1984	V39261	DEPARTMENTAL DEALING	EDITION 2
18/6/1984	V79336	REQUEST	EDITION 3
26/7/1985	V857103	TRANSFER	EDITION 4
17/12/1985	DP719671	DEPOSITED PLAN	
6/7/1988	X663510	APPLICATION	
19/5/1989	Y330174	APPLICATION FOR ISSUE OF CERTIFICATE OF TITLE	FOLIO CANCELLED
21/1/2000	6505025	DEPARTMENTAL DEALING	

*** END OF SEARCH ***

wenty

PRINTED ON 11/7/2018

InfoTrack an approved NSW Information Broker hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 96B(2) of the Real Property Act 1900.

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Received: 11/07/2018 15:53:04

Req:R906405 /Doc:DL V079336 /Rev:22-Jul-1997 /Sts:OK.OK /Pgs:ALL /Prt:13-Jul-2018 18:36 /Seq:1 of 2
Ref:castle hill /Src:M

APR 1984

APPLICATION TO CANCEL RECORDING OF EASEMENT

SECTION 47 (6A) REAL PROPERTY ACT, 1900
(For instructions for Completion on back of form)

C 1 of 1

$ 76.

DESCRIPTION OF LAND Note (a)	Dominant Tenement (land benefited) Torrens Title Reference	Servient Tenement (land burdened) Torrens Title References
	Land in Folio Identifiers 7006, 7010, 7015, 7017, 7019, 7021, 7025, 7028, 7031 to 7033 incl., 7036, 7045 to 7053 incl., and 7064 to 7066 incl. / 700193.	Vol. 15027 Fol. 83 (Lot 2083 DP 263856) Vol. 15027 Fol. 85 (Lot 2085 DP 263856) Vol. 15027 Fol. 86 (Lot 2086 DP 263856) Vol. 15027 Fols. 89-91 incl. (Lots 2089-2091 incl. DP 263856) Vol. 15027 Fol. 93 (Lot 2093 DP 263856) Vol. 15027 Fol. 110 (Lot 2131 DP 263856)

APPLICANT Note (b)

LAND COMMISSION OF NEW SOUTH WALES

herein referred to as the Applicant, being the registered proprietor of the undermentioned easement, hereby applies to have the recording relating to the said easement cancelled on the folios of the Register shown above.

PARTICULARS OF EASEMENT TO BE CANCELLED Note (c)

Easement created by Instrument No. DP 263856

Description of easement to be cancelled Easement to Drain Water 2 wide

OFFICE USE ONLY

CANCEL

The full names of persons having registered interests in the land benefited by the easement and the nature of the interest and references to the instruments by which the interests were created are shown below. (The consents of these persons are set out overleaf.)

Note (d)	Full Name	Nature of Interest and reference to Instrument by which created
	LAND COMMISSION OF NEW SOUTH WALES	REGISTERED PROPRIETOR

EXECUTION Note (e)

I hereby certify this application to be correct for the purposes of the Real Property Act, 1900.

Signed in my presence by the applicant who is personally known to me

SIGNED by me JOHN MARTIN VAGULANS as DELEGATE of the LAND COMMISSION OF N.S.W. and I certify that I have no notice of the revocation of such delegation.

Signature of Witness

KEN BUTLER
Name of Witness (BLOCK LETTERS)

LEVEL 23, TOWN HALL HOUSE,
SYDNEY SQUARE, NSW 2000
PROJECTS OFFICER
Occupation of Witness

Signature of Applicant

087

TO BE COMPLETED BY LODGING PARTY Notes (f) and (g)

LODGED BY
LAND COMMISSION OF N.S.W.
LEVEL 23, TOWN HALL HOUSE,
SYDNEY SQUARE, 2000.

Delivery Box Number 984A

LOCATION OF DOCUMENTS

CT	OTHER	
361		Herewith
		In R.G.O. with
		Produced by

OFFICE USE ONLY

Checked	Passed	REGISTERED 15-6-1984 (Manual Folios) 18-6-1984 (Computer Folios)	Secondary Directions	
Signed	Extra Fee	Registrar General	Delivery Directions	

Req:R906405 /Doc:DL V079336 /Rev:22-Jul-1997 /Sts:OI.OK /Pgs:ALL /Prt:12-Jul-2018 18:38 /Seq:2 of 3
Ref:Onstle hill /Src:M

RPS3

I/We .....
hereby consent to this application.

Signed in my presence by .....
the mortgagee/lessee under mortgage/lease, who is personally known to me

Date (h)

.....
Signature of Witness

.....
Name of Witness (BLOCK LETTERS)

.....
Address and occupation of Witness

.....
Signature

INSTRUCTIONS FOR COMPLETION

This dealing should be lodged by hand at the Registrar General's Office.

Typewriting and handwriting should be clear, legible and in permanent black non-copying ink.

Alterations are not to be made by erasure: the words rejected are to be ruled through and initialled by the applicant.

If the space provided is insufficient, additional sheets of the same size and quality of paper and having the same margins as this form should be used. Each additional sheet must be identified as an annexure and signed by the applicant and the attesting witness.

Rule up all blanks.

The following instructions refer to the side notes on the form.

(a) Description of land.
(i) TORRENS TITLE REFERENCE.—For a manual reference insert the Volume and Folio (e.g., Vol. 8814 Fol. 134).—For a computer folio insert the Folio Identifier (e.g., 12/701226).

(b) Show the full name, address and occupation or description.

(c) Show the registered number of the easement to be cancelled, and a brief description thereof (e.g., Q423456 Easement for drainage).

(d) Show the full names of persons having registered interests in the land benefited by the easements, e.g., William James Smith/Mortgage Q881969.

(e) Execution.

GENERALLY (i) Should there be insufficient space for the execution of this dealing, use an annexure sheet.
(ii) The certificate of correctness under the Real Property Act, 1900, must be signed by the applicant, who should execute the dealing in the presence of an adult witness, who is to sign the application, to whom he is personally known. Any person falsely or negligently certifying is liable to the penalties provided by section 117 of the Real Property Act, 1900.

ATTORNEY (iii) If the application is executed by an attorney for the applicant pursuant to a registered power of attorney, the form of execution must set out the full name of the attorney and the form of execution must indicate the source of his authority, e.g., "A/I by his attorney [or receiver or delegate, as the case may be] XY pursuant to power of attorney registered Book No. , and I declare that I have no notice of the revocation of the said power of attorney".

AUTHORITY (iv) If the application is executed pursuant to an authority (other than specified in (iii)), the form of execution must indicate the authority, judicial or other authority for the application has been executed.

CORPORATION (v) If the application is executed by a corporation under seal, the form of execution should include a statement that the seal has been properly affixed, e.g., in accordance with the Articles of Association of the corporation. Each person attesting the affixing of the seal must state his position (e.g., director, secretary) in the corporation.

(f) Insert the name, postal address, Document Exchange reference, telephone number and delivery box number of the lodging party.

(g) The lodging party is to complete the LOCATION OF DOCUMENTS panel. Place a tick in the appropriate box to indicate the whereabouts of the Certificate of Title. List in an abbreviated form, other documents lodged, e.g., stat. dec. for statutory declaration.

(h) The consent is to be completed by the persons having registered interests in the land benefited by the easement (as set out on the front of this form). The person signing the consent should delete "mortgagee/lessee" and "mortgage/lease" as appropriate. Should there be insufficient space for the recording of the consents, use an annexure sheet.

OFFICE USE ONLY

FIRST SCHEDULE DIRECTIONS

(A) FOLIO IDENTIFIER	(B) DIRECTION	(C) NAME

SECOND SCHEDULE AND OTHER DIRECTIONS

(D) FOLIO IDENTIFIER	(E) DIRECTION	(F) NOTIFN TYPE	(G) DEALING NUMBER	(H) DETAILS
15027-83	ON			Easement to drain water 2 wide created by DP263858 affecting the land and within described is released insofar as it is appurtenant to Lots 7013, 7014, 7015, 7017, 7019, 7021, 7025, 7028, 7031 to 7033 ind., 7036, 7041 to 7043 ind., 7045 to 7066 incl. in DP 700793
15027-85&139,999,43,111	ON			Easement to drain water created by DP263858 affecting the land of the land within described is released insofar as it is appurtenant to Lots 7006, 7010, 7015, 7017, 7019, 7021, 7025, 7028, 7031 to 7033 ind., 7036, 7041 to 7043 ind., 7045 to 7066 incl. in DP 700793
7006, 7010, 7015, 7017, 7019, 7021, 7025, 7028, 7031, 7033, 7036, 7041, 7043, 7045, 7046, 7047, 7048, 7049, 7050, 7051, 7053, 7054, 7065, 7066 / 700793	OFF	EE	DP 263858	

H.P. 366 D. WEST, GOVERNMENT PRINTER

Req:R2906190 /Doc:DL V857103 /Rev:02-Dec-2010 /Sts:OK.SC /Pgs:ALL /Prt:11-Jul-2016 17:25 /Sc
Ref:castle hill /Src:M

Crown Instrume
payment of Reg
H. K. ROBERT
Crown Solicitor

V857103

per

TRANSFER

REAL PROPERTY ACT, 1900

C 1 of 1

$ NIL

Torrens Title Reference	If Part Only, Delete Whole and Give Details	Location
Certificate of Title Identifier 7066/700793	WHOLE	PARISH of Castle Hill COUNTY of Cumberland

DESCRIPTION OF LAND Note (a)

TRANSFEROR Note (b)

LAND COMMISSION OF NEW SOUTH WALES SYDNEY 2000

(the abovenamed TRANSFEROR) hereby acknowledges receipt of the consideration of $ 1,600,000.00

ESTATE Note (c)

and transfers an estate in fee simple

in the land above described to the TRANSFEREE

TRANSFEREE Note (d)

HER MAJESTY QUEEN ELIZABETH II for the purposes of the Public Instruction Act.

OFFICE USE ONLY

5

TENANCY Note (e)

as joint tenants/tenants in common

PRIOR ENCUMBRANCES Note (f)

subject to the following PRIOR ENCUMBRANCES 1. Nil

2. 3.

DATE 28th July, 1955

We hereby certify this dealing to be correct for the purposes of the Real Property Act, 1900.

EXECUTION Note (g)

Signed in my presence by the transferor who is personally known to me

Signature of Witness

L. TAYLOR

Name of Witness (BLOCK LETTERS)

TOWN HALL HOUSE SYDNEY, CLERK

Address and occupation of Witness

I certify that I am the person(s) entitled to receive the above consideration

Signature of Transferor

For HUGH KING ROBERTS State Crown Solicitor

Signed in my presence by the transferee by JOHN ANTHONY MAHONEY State Crown Solicitor's Office who is personally known to me:

Note (g)

Signature of Witness

R. SEYMOUR

Name of Witness (BLOCK LETTERS)

STATE CROWN SOLICITOR

Address and occupation of Witness

H. K. ROBERTS
State Crown Solicitor
DPT

Signature of Transferee

85/7442 CLO/RS

TO BE COMPLETED BY LODGING PARTY Notes (h) and (i)

LODGED BY

State Crown Solicitor
STATE CROWN SOLICITORS OFFICE
GOODSELL BUILDING
8-12 CHIFLEY SQUARE, SYDNEY. 2000
DX19 PHONE: 258-7466
313E

Delivery Box Number

LOCATION OF DOCUMENTS

CT	OTHER	
		Herewith.
		In R.G.O. with
		Produced by

OFFICE USE ONLY

Checked	Passed	REGISTERED -/9
Signed	Extra Fee	28 JUL 1955 Registrar General

Secondary Directions		
Delivery Directions	CT	CP

Req:R906191 /Doc:DL X663510 /Rev:06-Sep-2010 /Sts:OK.SC /Pgs:ALL /Prt:11-Jul-2013 17:23 /Se
Ref:castle hill /Src:M

RPA

X663510

APPLICATION

REAL PROPERTY ACT, 1900

(See Instructions for Completion on back of form)

AP

CER 1 of 1

$ NO FEE

DESCRIPTION OF LAND Note (a)

Torrens Title reference	If Part Only, Delete Whole and Give Details	Location
7066 / 700793.	WHOLE / PART BEING LOT 2 IN DP 719671	PARISH CASTLE HILL COUNTY CUMBERLAND.

REGISTERED DEALING Note (b)

Type of Dealing	Registered Number	Torrens Title Reference

PRESENT REGISTERED PROPRIETOR Note (c)

HER MAJESTY QUEEN ELIZABETH II.

Note (d) is presently recorded as REGISTERED PROPRIETOR of the land above described, abovementioned registered dealing. Application is hereby made to record

NEW REGISTERED PROPRIETOR(S) Note (e)

THE STATE OF NEW SOUTH WALES.

OFFICE USE ONLY

OVER

Note (d) as REGISTERED PROPRIETOR of the land above described, abovementioned registered dealing.

Note (f) PURSUANT TO SECTION 25A CROWN LANDS CONSOLIDATION ACT, 1913 SEE G.G. DATED 15-4-1988.

DECLARATION UNDER SECTION 25A, CROWN LANDS CONSOLIDATION ACT 1913, IN RESPECT OF LANDS

IN pursuance of the provisions of section 25A, Crown Lands Consolidation Act 1913, I declare that the lands particularised hereunder may be dealt with as if they had been acquired under the Closer Settlement Acts or as Crown land within the meaning of the Crown Lands Consolidation Act 1913.

I. R. CAUSLEY, Minister for Natural Resources.

Sydney, 15th April, 1988.

LAND VESTED IN HER MAJESTY QUEEN ELIZABETH II

Land District—Metropolitan; *Shire*—Baulkham Hills

Parish Castle Hill (Sheet 3), County Cumberland, 1 366 square metres at Castle Hill, being lot 2, D.P. 719671, and comprising part of the land in Certificate of Title Folio Identifier 7066 / 700793. MN87 I 504.

DATE 27 JUN 1988

EXECUTION Note (g)

I hereby certify this dealing to be correct for the purposes of the Real Property Act, 1900. Signed in my presence by the applicant who is personally known to me.

Signature of Witness

Name of Witness (BLOCK LETTERS)

Address and occupation of Witness

Signature of Applicant

TO BE COMPLETED BY LODGING PARTY Notes (h) and (i)

LODGED BY

LTO

10V

Delivery Box Number

LOCATION OF DOCUMENTS

CT	OTHER	
		Herewith
		In L.T.O. with
		Produced by

OFFICE USE ONLY

Checked	Passed
Signed	Extra Fee

REGISTERED - -19

5 JUL 1988

Secondary Directions		
Delivery Directions	OVER	

4991

INSTRUCTIONS FOR COMPLETION

This form is to be used only if no other approved form is appropriate for the purpose, e.g., Applications under section 46 (c) Real Property Act, 1900; Application under section 12 (d) Division Act, 1922–1942.

Where so required by the Stamp Duties Act, 1920 this dealing should be marked by the Stamp Duties Division, Department of Finance before lodgment at the Land Titles Office.

Typewriting and handwriting should be clear, legible and in permanent dense black or dark blue non-copying ink.

Alterations are not to be made by erasure; the words rejected are to be ruled through and initialled by the applicant.

If the space provided is insufficient, additional sheets of the same size and quality of paper and having the same margins as this form should be used. Each additional sheet must be identified as an annexure and signed by the applicant and the attesting witness.

Date to fill blanks.

The following instructions relate to the side notes on the form.

(a) Description of land. (If the discharge of mortgage is only in respect of a registered dealing, rule through this panel.)

(i) FOLIO REFERENCE – For a Master Title insert the Volume and Folio (e.g., Vol. 9364 Fol. 140). For a Computer Folio insert the Folio Identifier (e.g. 1/770107).

(ii) PART/WHOLE – If part only of the land in the folio of the Register is being discharged, delete the word "WHOLE" and insert the lot and plan number, portion, &c.

(b) Registered dealing. (If the discharge of mortgage is only in respect of a folio of the Register, rule through this panel.)
Show the registered number of the lease, mortgage, or charge and the title reference affected thereby, Lease—V123456—Vol. 13456 Fol. 124.—Folio Identifier 1/770152.

(c) Show the full name of the registered proprietor as recorded on the Register.

(d) Strike out "land above described" or "above mentioned registered dealing", whichever does not apply.

(e) Show the full names, address and occupation or description of the person(s) to be registered as proprietor(s).

(f) Set out the terms of the request, e.g., consequent upon the appointment of, etc.

(g) Execution.

GENERALLY (i) Should there be insufficient space for the execution of this dealing, use an annexure sheet.

(ii) The certificate of correctness under the Real Property Act, 1900, must be signed by the applicant who should execute the dealing in the presence of an adult witness, not being a party to the application, to whom he/she is personally known. Any person falsely or negligently certifying is liable to the penalties provided by section 117 of the Real Property Act, 1900.

ATTORNEY (iii) If the application is executed by an attorney for the applicant pursuant to a registered power of attorney, the form of attestation must set out the full name of the attorney, and the form of execution must indicate the source of his/her authority, e.g. "All by his/her attorney (or receiver or delegate, as the case may be), XY pursuant to power of attorney registered Book No.".

AUTHORITY (iv) If the application is executed pursuant to an authority (other than specified in (iii)), the form of execution must indicate the statutory, judicial or other authority pursuant to which the application has been executed.

CORPORATION (v) If the application is executed by a corporation under seal, the form of execution should include a statement that the seal has been properly affixed, e.g. in accordance with the Articles of Association of the corporation. Each person attesting the affixing of the seal must state his/her position (e.g., director, secretary) in the corporation.

(h) Insert the name & postal address, Document Exchange reference, telephone number and delivery box number of the lodging party.

(i) The lodging party is to complete the LOCATION OF DOCUMENTS panel. Place a tick in the appropriate box to indicate the whereabouts of the Certificate of Title. List, in an alphabetised form, other documents lodged, e.g., stat. dec. for statutory declaration.

OFFICE USE ONLY

FIRST SCHEDULE AND OTHER DIRECTIONS

(A) FOLIO IDENTIFIER	(B) DIRECTION	(C) NAME
	PROP	THE STATE OF NEW SOUTH WALES of Lot 1 in DP719671 and HER MOST GRACIOUS MAJESTY QUEEN ELIZABETH THE SECOND of the residue being Lot 1 in DP719671.

SECOND SCHEDULE AND OTHER DIRECTIONS

(D) FOLIO IDENTIFIER	(E) DIRECTION	(F) NOTEN TYPE	(G) DEALING NUMBER	(H) DETAILS
	C/T		NOTE	

Req:R906191 /Doc:DL X663510 /Rev:06-Sep-2010 /Sts:CK.SC /Pgs:ALL /Prt:11-Jul-2019 17:25 /Seq:
Ref:castle hill /Src:M

LAND REGISTRY SERVICES

Historical Title

InfoTrack

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
11/7/2018 3:53PM

FOLIO: 1/719671

First Title(s): OLD SYSTEM
Prior Title(s): 7066/700793

Recorded	Number	Type of Instrument	C.T. Issue
17/12/1985	DP719671	DEPOSITED PLAN	LOT RECORDED FOLIO NOT CREATED
22/5/1989	Y330174	APPLICATION FOR ISSUE OF CERTIFICATE OF TITLE	FOLIO CREATED EDITION 1
1/5/1992	DP646017	DEPOSITED PLAN	
19/12/2006	AC809654	APPLICATION	EDITION 2
20/7/2016	AK607998	DEPARTMENTAL DEALING	

*** END OF SEARCH ***

wonty

PRINTED ON 11/7/2018

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LAND REGISTRY SERVICES Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 1/719671

SEARCH DATE	TIME	EDITION NO	DATE
11/7/2018	4:04 PM	2	19/12/2006

LAND

LOT 1 IN DEPOSITED PLAN 719671
AT GLENHAVEN
LOCAL GOVERNMENT AREA THE HILLS SHIRE
PARISH OF CASTLE HILL COUNTY OF CUMBERLAND
TITLE DIAGRAM DP719671

FIRST SCHEDULE

MINISTER FOR EDUCATION AND TRAINING (AP AC809654)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 C261921 RIGHT OF WAY APPURTENANT TO THE LAND ABOVE DESCRIBED AFFECTING THE LAND SHOWN AS "PROPOSED RIGHT OF WAY 66' WIDE" IN DP185185

NOTATIONS

DP646017 PLAN FOR LEASE PURPOSES

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

* Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title. Warning: the information appearing under notations has not been formally recorded in the Register. InfoTrack an approved NSW Information Broker hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 968(2) of the Real Property Act 1900.

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Received: 11/07/2018 16:04:15

APPENDIX E

SITE PHOTOGRAPHS

Photo 1. Test pitting at the southern vegetated portion of the site

Photo 2. Natural silty clay material viewed

Photo 3. Subsurface material at HA03

Photo 4. Subsurface material at HA06

APPENDIX F

ANALYTICAL RESULTS TABLES

Table F1 soil analytical results - TRH/BTEXN/Lead

Samuel Gilbert Public School DSI

Ridgecrop Drive, Caste Hill, NSW

					TRH						BTEX compounds						
Sample ID	Date sampled	Laboratory report no.	Sample depth (mBGL)	PID (ppm)	F1: C_6-C_{10} less BTEX	F2: >C_{10}-C_{16} less naphthalene	>C_{10}-C_{16}	F3: >C_{16}-C_{34}	F4: >C_{34}-C_{40}	Total >C_{10} - C_{40}	Benzene	Toluene	Ethylbenzene	m- & p-Xylene	o-Xylene	Total xylene	Naphthalene
Soil investigation levels for commercial workers[1]																	
HSL-A for vapour intrusion			0 to <1 m		45	110	-	-	-	-	0.5	160	55	-	-	40	3
			1 m to <2 m		70	240	-	-	-	-	0.5	220	NL	-	-	60	NL
Health investigation levels			-		-	-	-	-	-	-	-	-	-	-	-	-	-
Ecological Screening Levels																	
ESL - Residential A			-		180	120	-	300	2,800	-	50	85	70	-	-	105	-
Drilling soil samples																	
TP01-0.4	11/7/18	607407	0.4	0.4	< 20	<50	<50	<100	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
TP03-0.1	11/7/18	607407	0.1	0.1	< 20	63	63	320	120	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
TP04-0.1	11/7/18	607407	0.1	0.2	< 20	<50	<50	<100	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
TP05-0.2	11/7/18	607407	0.2	0.1	< 20	<50	<50	<100	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
TP06-0.3	11/7/18	607407	0.3	0.2	< 20	<50	<50	<100	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
TP07-0.3	11/7/18	607407	0.3	0.1	< 20	<50	<50	<100	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
TP08-0.1	11/7/18	607407	0.1	0.1	< 20	<50	<50	<100	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
TP09-0.1	11/7/18	607407	0.1	0.1	< 20	<50	<50	<100	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
TP10-0.1	11/7/18	607407	0.1	0.2	< 20	<50	<50	<100	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
TP11-0.1	11/7/18	607407	0.1	0.1	< 20	<50	<50	<100	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
TP12-0.1	11/7/18	607407	0.1	0.4	< 20	<50	<50	<100	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
TP12-0.9	11/7/18	607407	0.9	0.1	< 20	<50	<50	<100	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
HA01-0.4	11/7/18	607407	0.4	0.1	< 20	<50	<50	<100	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
HA02-0.4	11/7/18	607407	0.4	0.1	< 20	<50	<50	<100	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
HA03-0.1	11/7/18	607407	0.1	0.1	< 20	<50	<50	130	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
HA03-0.9	11/7/18	607407	0.9	0.1	< 20	<50	<50	140	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
HA04-0.1	11/7/18	607407	0.1	0.1	< 20	<50	<50	120	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
HA05-0.1	11/7/18	607407	0.1	0.1	< 20	<50	<50	<100	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
HA06-0.5	11/7/18	607407	0.5	0.1	< 20	<50	<50	<100	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
HA07-0.2	11/7/18	607407	0.2	0.1	< 20	<50	<50	<100	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
QA01 (Duplicate of HA07-0.2)	11/7/18	607407	0.2	0.1	< 20	<50	<50	<100	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
QA02 (Triplicate of HA07-0.2)	11/7/18	SE181538	0.2	0.1	< 25	<25	<25	<90	<120	<210	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	< 0.1
HA08-0.2	11/7/18	607407	0.2	0.1	< 20	<50	<50	180	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
HA09-0.8	11/7/18	607407	0.8	0.1	< 20	<50	<50	<100	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
Practical quantitation limit					20	50	50	100	100	100	0.1	0.1	0.1	0.2	0.1	0.3	0.5

Notes:

Concentration expressed in mg/kg

[1] NEPM (2013) *Schedule B1 - Investigation levels for soil and groundwater*

[2] Friebel & Nadebaum (2011) *Health screening levels for petroleum hydrocarbons in soil and groundwater. Part 1: Technical development document. CRC CARE Technical Report no. 10*

NL - non limiting

Table F2 soil analytical results - PAH
Samuel Gilbert Public School DSI
Ridgecrop Drive, Caste Hill, NSW

Sample ID	Date sampled	Laboratory report no.	Sample depth (mBGL)	PID (ppm)	PAHs																	
					Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b+j)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3,cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene	Total PAH	Benzo(a)pyrene TEQ
Soil investigation levels for commercial workers[1]																						
Health investigation levels - Residential A					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300	3
HSL-A for vapour intrusion			0 to <1 m		3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			1 m to <2 m		NL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soil Ecological investigation levels																						
EIL - Residential A					370	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-
Soil Ecological screening levels																						
ESL - Residential A					-	-	-	-	-	-	-	-	-	-	-	-	0.7	-	-	-	-	-
Drilling soil samples																						
TP01-0.4	11/7/18	607407	0.4	0.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP03-0.1	11/7/18	607407	0.1	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP04-0.1	11/7/18	607407	0.1	0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP05-0.2	11/7/18	607407	0.2	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP06-0.3	11/7/18	607407	0.3	0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP07-0.3	11/7/18	607407	0.3	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP08-0.1	11/7/18	607407	0.1	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP09-0.1	11/7/18	607407	0.1	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP10-0.1	11/7/18	607407	0.1	0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP11-0.1	11/7/18	607407	0.1	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP12-0.1	11/7/18	607407	0.1	0.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP12-0.9	11/7/18	607407	0.9	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
HA01-0.4	11/7/18	607407	0.4	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
HA02-0.4	11/7/18	607407	0.4	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
HA03-0.1	11/7/18	607407	0.1	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
HA03-0.9	11/7/18	607407	0.9	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
HA04-0.1	11/7/18	607407	0.1	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
HA05-0.1	11/7/18	607407	0.1	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
HA06-0.5	11/7/18	607407	0.5	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
HA07-0.2	11/7/18	607407	0.2	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QA01 (Duplicate of HA07-0.2	11/7/18	607407	0.2	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QA02 (Triplicate of HA07-0.2	11/7/18	SE181538	0.2	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HA08-0.2	11/7/18	607407	0.2	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
HA09-0.8	11/7/18	607407	0.8	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Practical quantitation limit					0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

Notes:
Concentration expressed in mg/kg
(1) NEPM (2013) *Schedule B1 - Investigation levels for soil and groundwater*
(2) Friebel & Nadebaum (2011) *Health screening levels for petroleum hydrocarbons in soil and groundwater. Part 1: Technical development document. CRC CARE Technical Report no. 10*

Table F4 - soil analytical results - metals

Samuel Gilbert Public School DSI

Ridgecrop Drive, Caste Hill, NSW

Heavy Metals																
Sample ID	Date sampled	Laboratory report no.	Sample depth (mBGL)	PID (ppm)	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	pH	Clay percentage (%)	Cation Exchange Capacity (meq/100g)
Health-based investigation levels - Residential A[1]					100	20	100	6,000	300	40	400	7,400	-	-	-
Generic and calculated EIL for Urban residential/public open space [2]					100	-	190		1,100	-	170	400	-	-	-
`															
TP01-0.4	11/7/18	607407	0.4	0.4	7.7	< 0.4	14	11	23	< 0.1	< 5	20	-	-	-
TP03-0.1	11/7/18	607407	0.1	0.1	< 2	< 0.4	7.7	11	12	< 0.1	< 5	35	-	-	-
TP04-0.1	11/7/18	607407	0.1	0.2	5.4	< 0.4	11	< 5	14	< 0.1	< 5	12	-	-	-
TP05-0.2	11/7/18	607407	0.2	0.1	11	< 0.4	23	< 5	21	< 0.1	< 5	6.3	-	-	-
TP06-0.3	11/7/18	607407	0.3	0.2	5.1	< 0.4	18	< 5	12	< 0.1	< 5	< 5	-	-	-
TP07-0.3	11/7/18	607407	0.3	0.1	9.5	< 0.4	19	< 5	13	< 0.1	< 5	5.1	-	-	-
TP08-0.1	11/7/18	607407	0.1	0.1	7.1	< 0.4	17	< 5	14	< 0.1	< 5	10	-	-	-
TP09-0.1	11/7/18	607407	0.1	0.1	7.1	< 0.4	19	< 5	10	< 0.1	< 5	< 5	-	-	-
TP10-0.1	11/7/18	607407	0.1	0.2	6.1	< 0.4	19	25	12	< 0.1	36	35	8	<1	16
TP11-0.1	11/7/18	607407	0.1	0.1	5.8	< 0.4	14	< 5	15	< 0.1	< 5	13	-	-	-
TP12-0.1	11/7/18	607407	0.1	0.4	5.9	< 0.4	20	< 5	11	< 0.1	< 5	< 5	-	-	-
TP12-0.9	11/7/18	607407	0.9	0.1	< 2	< 0.4	8.3	< 5	6.4	< 0.1	< 5	< 5	-	-	-
HA01-0.4	11/7/18	607407	0.4	0.1	5.9	< 0.4	24	< 5	13	< 0.1	< 5	< 5	-	-	-
HA02-0.4	11/7/18	607407	0.4	0.1	< 2	< 0.4	12	< 5	12	< 0.1	< 5	6.5	-	-	-
HA03-0.1	11/7/18	607407	0.1	0.1	5.1	< 0.4	11	10	13	< 0.1	9.3	39	-	-	-
HA03-0.9	11/7/18	607407	0.9	0.1	9.5	< 0.4	19	25	14	< 0.1	14	30	-	-	-
HA04-0.1	11/7/18	607407	0.1	0.1	4.7	< 0.4	12	16	16	< 0.1	6.1	47	-	-	-
HA05-0.1	11/7/18	607407	0.1	0.1	4.7	< 0.4	8.3	7.4	14	< 0.1	< 5	37	-	-	-
HA06-0.5	11/7/18	607407	0.5	0.1	8.8	< 0.4	16	< 5	16	< 0.1	< 5	6.3	-	-	-
HA07-0.2	11/7/18	607407	0.2	0.1	5	< 0.4	17	19	13	< 0.1	27	50	-	-	-
QA01 (Duplicate of HA07-0.2)	11/7/18	607407	0.8	0.1	< 2	< 0.4	13	21	13	< 0.1	23	73	-	-	-
QA02 (Triplicate of HA07-0.2)	11/7/18	SE181538	0.2	0.1	4	<0.3	9.7	17	10	<0.05	15	42	-	-	-
HA08-0.2	11/7/18	607407	0.2	0.1	< 2	< 0.4	8.9	7.1	9	< 0.1	6.4	31	-	-	-
HA09-0.8	11/7/18	607407	0.8	0.1	10	< 0.4	31	< 5	15	< 0.1	< 5	5.5	-	-	-
Practical quantitation limit					2	0.4	5	5	5	0.1	5	5	0.1	1	0.05

Notes:

Concentration expressed in mg/kg

(1) NEPM (2013) *Schedule B1 - Investigation levels for soil and groundwater*

[2] NEPC (2013) NEPM - Schedule B1- Investigation Levels for Soil and Groundwater - Table 1B(1)-(5) Soil-specific and calculated EILs for Residential A

NL - non limiting

BOLD Exceeds adopted criteria

Table F5 - soil analytical results - asbestos and exchangeable cations

Samuel Gilbert Public School DSI

Ridgecrop Drive, Caste Hill, NSW

Asbestos								
Sample ID	Date sampled	Laboratory report no.	Sample depth (mBGL)	Asbestos detected (g/kg)	Asbestos type	Sample weight (dry)	Free Fibres	Friable Asbestos (%w/w)
Drilling soil samples								
TP01-0.4	11/7/18	607407	0.4	No	-	501	No	<0.001
TP03-0.1	11/7/18	607407	0.1	No	-	370	No	<0.001
TP04-0.1	11/7/18	607407	0.1	No	-	567	No	<0.001
TP05-0.2	11/7/18	607407	0.2	No	-	510	No	<0.001
TP06-0.3	11/7/18	607407	0.3	No	-	455	No	<0.001
TP07-0.3	11/7/18	607407	0.3	No	-	485	No	<0.001
TP08-0.1	11/7/18	607407	0.1	No	-	648	No	<0.001
TP09-0.1	11/7/18	607407	0.1	No	-	673	No	<0.001
TP10-0.1	11/7/18	607407	0.1	No	-	727	No	<0.001
TP11-0.1	11/7/18	607407	0.1	No	-	853	No	<0.001
TP12-0.1	11/7/18	607407	0.1	No	-	921	No	<0.001
HA01-0.4	11/7/18	607407	0.4	No		869	No	<0.001
HA02-0.4	11/7/18	607407	0.4	No		760	No	<0.001
HA03-0.1	11/7/18	607407	0.1	No		620	No	<0.001
HA04-0.1	11/7/18	607407	0.1	No		841	No	<0.001
HA05-0.1	11/7/18	607407	0.1	No	-	813	No	<0.001
HA06-0.1	11/7/18	607407	0.5	No	-	817	No	<0.001
HA07-0.2	11/7/18	607407	0.2	No	-	763	No	<0.001
HA08-0.2	11/7/18	607407	0.2	No	-	711	No	<0.001
HA09-0.8	11/7/18	607407	0.8	No	-	827	No	<0.001
Practical quantitation limit				-	-	-	-	0.001

Notes:

Concentration expressed in mg/kg

NL - non limiting

APPENDIX G

LABORATORY REPORTS

Certificate of Analysis

WSP Australia P/L NSW
Level 27, Ernst & Young Centre
Sydney
NSW 2001

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Alexander Carpenter**

Report **607407-S**
Project name SAMUEL GILBERT PUBLIC SCHOOL ESA
Project ID PS110639
Received Date Jul 12, 2018

Client Sample ID			**TP01-0.4**	**TP03-0.1**	**TP04-0.1**	**TP05-0.2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-Jl14650**	**S18-Jl14651**	**S18-Jl14652**	**S18-Jl14653**
Date Sampled			**Jul 11, 2018**	**Jul 11, 2018**	**Jul 11, 2018**	**Jul 11, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	63	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	63	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	320	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	120	< 100	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	32	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	190	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	230	65	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	452	65	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	67	89	87	74
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			TP01-0.4	TP03-0.1	TP04-0.1	TP05-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-Jl14650	S18-Jl14651	S18-Jl14652	S18-Jl14653
Date Sampled			Jul 11, 2018	Jul 11, 2018	Jul 11, 2018	Jul 11, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	87	92	88	91
p-Terphenyl-d14 (surr.)	1	%	83	80	77	99
% Moisture	1	%	8.9	14	8.4	16
Heavy Metals						
Arsenic	2	mg/kg	7.7	< 2	5.4	11
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	14	7.7	11	23
Copper	5	mg/kg	11	11	< 5	< 5
Lead	5	mg/kg	23	12	14	21
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	20	35	12	6.3

Client Sample ID			TP06-0.3	TP07-0.3	TP08-0.1	TP09-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-Jl14654	S18-Jl14655	S18-Jl14656	S18-Jl14657
Date Sampled			Jul 11, 2018	Jul 11, 2018	Jul 11, 2018	Jul 11, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	65	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	65	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	76	72	70	76

Client Sample ID			TP06-0.3	TP07-0.3	TP08-0.1	TP09-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-Jl14654	S18-Jl14655	S18-Jl14656	S18-Jl14657
Date Sampled			Jul 11, 2018	Jul 11, 2018	Jul 11, 2018	Jul 11, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	94	98	103	90
p-Terphenyl-d14 (surr.)	1	%	98	125	96	89
% Moisture	1	%	10.0	13	8.8	9.7
Heavy Metals						
Arsenic	2	mg/kg	5.1	9.5	7.1	7.1
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	18	19	17	19
Copper	5	mg/kg	< 5	< 5	< 5	< 5
Lead	5	mg/kg	12	13	14	10
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	< 5	5.1	10	< 5

Client Sample ID			TP10-0.1	TP11-0.1	TP12-0.1	TP12-0.9
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-Jl14658	S18-Jl14659	S18-Jl14660	S18-Jl14661
Date Sampled			Jul 11, 2018	Jul 11, 2018	Jul 11, 2018	Jul 11, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100

Client Sample ID			TP10-0.1	TP11-0.1	TP12-0.1	TP12-0.9
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-Jl14658**	**S18-Jl14659**	**S18-Jl14660**	**S18-Jl14661**
Date Sampled			**Jul 11, 2018**	**Jul 11, 2018**	**Jul 11, 2018**	**Jul 11, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	68	77	78	78
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	84	84	99	77
p-Terphenyl-d14 (surr.)	1	%	83	84	95	74
% Clay	1	%	< 1	-	-	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	17	-	-	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	8.0	-	-	-
% Moisture	1	%	12	14	8.9	5.3
Heavy Metals						
Arsenic	2	mg/kg	6.1	5.8	5.9	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	19	14	20	8.3
Copper	5	mg/kg	25	< 5	< 5	< 5
Lead	5	mg/kg	12	15	11	6.4
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	36	< 5	< 5	< 5
Zinc	5	mg/kg	35	13	< 5	< 5

Client Sample ID			TP10-0.1	TP11-0.1	TP12-0.1	TP12-0.9
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-Jl14658	S18-Jl14659	S18-Jl14660	S18-Jl14661
Date Sampled			Jul 11, 2018	Jul 11, 2018	Jul 11, 2018	Jul 11, 2018
Test/Reference	LOR	Unit				
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	16	-	-	-

Client Sample ID			HA01-0.4	HA02-0.4	HA03-0.1	HA03-0.9
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-Jl14662	S18-Jl14663	S18-Jl14664	S18-Jl14665
Date Sampled			Jul 11, 2018	Jul 11, 2018	Jul 11, 2018	Jul 11, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	130	140
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	31
TRH C15-C28	50	mg/kg	< 50	< 50	51	69
TRH C29-C36	50	mg/kg	< 50	68	110	130
TRH C10-36 (Total)	50	mg/kg	< 50	68	161	230
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	59	59	65	66
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			HA01-0.4	HA02-0.4	HA03-0.1	HA03-0.9
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-Jl14662	S18-Jl14663	S18-Jl14664	S18-Jl14665
Date Sampled			Jul 11, 2018	Jul 11, 2018	Jul 11, 2018	Jul 11, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	96	89	95	96
p-Terphenyl-d14 (surr.)	1	%	96	91	92	91
% Moisture	1	%	13	8.5	8.8	8.8
Heavy Metals						
Arsenic	2	mg/kg	5.9	< 2	5.1	9.5
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	24	12	11	19
Copper	5	mg/kg	< 5	< 5	10	25
Lead	5	mg/kg	13	12	13	14
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	9.3	14
Zinc	5	mg/kg	< 5	6.5	39	30

Client Sample ID			HA04-0.1	HA05-0.1	HA06-0.5	HA07-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-Jl14666	S18-Jl14667	S18-Jl14669	S18-Jl14670
Date Sampled			Jul 11, 2018	Jul 11, 2018	Jul 11, 2018	Jul 11, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	120	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	25	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	69	58	< 50	< 50
TRH C29-C36	50	mg/kg	100	76	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	194	134	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	65	64	58	65

Client Sample ID			HA04-0.1	HA05-0.1	HA06-0.5	HA07-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-Jl14666	S18-Jl14667	S18-Jl14669	S18-Jl14670
Date Sampled			Jul 11, 2018	Jul 11, 2018	Jul 11, 2018	Jul 11, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	104	101	110	107
p-Terphenyl-d14 (surr.)	1	%	93	86	98	103
% Moisture	1	%	7.0	11	11	14
Heavy Metals						
Arsenic	2	mg/kg	4.7	4.7	8.8	5.0
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	12	8.3	16	17
Copper	5	mg/kg	16	7.4	< 5	19
Lead	5	mg/kg	16	14	16	13
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	6.1	< 5	< 5	27
Zinc	5	mg/kg	47	37	6.3	50

Client Sample ID			HA08-0.2	HA09-0.8	QA01	TB01
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-Jl14671	S18-Jl14672	S18-Jl14673	S18-Jl14674
Date Sampled			Jul 11, 2018	Jul 11, 2018	Jul 11, 2018	Jul 11, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	-
TRH >C16-C34	100	mg/kg	180	< 100	< 100	-
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	-

Client Sample ID			HA08-0.2	HA09-0.8	QA01	TB01
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-Jl14671	S18-Jl14672	S18-Jl14673	S18-Jl14674
Date Sampled			Jul 11, 2018	Jul 11, 2018	Jul 11, 2018	Jul 11, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	23	< 20	< 20	-
TRH C15-C28	50	mg/kg	120	< 50	< 50	-
TRH C29-C36	50	mg/kg	130	< 50	< 50	-
TRH C10-36 (Total)	50	mg/kg	273	< 50	< 50	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	67	59	57	86
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	96	104	99	-
p-Terphenyl-d14 (surr.)	1	%	85	93	85	-
% Moisture	1	%	11	12	20	-
Heavy Metals						
Arsenic	2	mg/kg	< 2	10	< 2	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	-
Chromium	5	mg/kg	8.9	31	13	-
Copper	5	mg/kg	7.1	< 5	21	-
Lead	5	mg/kg	9.0	15	13	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Nickel	5	mg/kg	6.4	< 5	23	-
Zinc	5	mg/kg	31	5.5	73	-

Client Sample ID			[R20]TS01
Sample Matrix			Soil
Eurofins | mgt Sample No.			S18-Jl14675
Date Sampled			Jul 11, 2018
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.5	mg/kg	98
TRH C6-C10	20	mg/kg	97
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	99
BTEX			
Benzene	0.1	mg/kg	91
Toluene	0.1	mg/kg	110
Ethylbenzene	0.1	mg/kg	100
m&p-Xylenes	0.2	mg/kg	100
o-Xylene	0.1	mg/kg	110
Xylenes - Total	0.3	mg/kg	100
4-Bromofluorobenzene (surr.)	1	%	110

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jul 18, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons	Sydney	Jul 18, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jul 18, 2018	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Jul 18, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Eurofins | mgt Suite B7			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jul 18, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Jul 18, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Melbourne	Jul 18, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Clay	Brisbane	Jul 16, 2018	6 Day
- Method: LTM-GEN-7040			
pH (1:5 Aqueous extract at 25°C as rec.)	Melbourne	Jul 16, 2018	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Melbourne	Jul 16, 2018	7 Day
- Method: LTM-INO-4030 Conductivity			
Cation Exchange Capacity	Melbourne	Jul 18, 2018	180 Days
- Method: LTM-MET-3060 - Cation Exchange Capacity (CEC) & Exchangeable Sodium Percentage (ESP)			
% Moisture	Melbourne	Jul 16, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: WSP Australia P/L NSW
Address: Level 27, Ernst & Young Centre
Sydney
NSW 2001

Project Name: SAMUEL GILBERT PUBLIC SCHOOL ESA
Project ID: PS110639

Order No.:
Report #: 607407
Phone: 02 9272 5586
Fax: 02 9272 5101

Received: Jul 12, 2018 6:27 PM
Due: Jul 20, 2018
Priority: 5 Day
Contact Name: Alexander Carpenter

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail	% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271			X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217		X					X	X
Brisbane Laboratory - NATA Site # 20794	X							
Perth Laboratory - NATA Site # 23736								
External Laboratory								

No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID								
1	TP01-0.4	Jul 11, 2018		Soil	S18-Jl14650		X			X		X	
2	TP03-0.1	Jul 11, 2018		Soil	S18-Jl14651		X			X		X	
3	TP04-0.1	Jul 11, 2018		Soil	S18-Jl14652		X			X		X	
4	TP05-0.2	Jul 11, 2018		Soil	S18-Jl14653		X			X		X	
5	TP06-0.3	Jul 11, 2018		Soil	S18-Jl14654		X			X		X	
6	TP07-0.3	Jul 11, 2018		Soil	S18-Jl14655		X			X		X	
7	TP08-0.1	Jul 11, 2018		Soil	S18-Jl14656		X			X		X	
8	TP09-0.1	Jul 11, 2018		Soil	S18-Jl14657		X			X		X	
9	TP10-0.1	Jul 11, 2018		Soil	S18-Jl14658	X	X		X	X	X	X	

eurofins | mgt

ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: WSP Australia P/L NSW
Address: Level 27, Ernst & Young Centre
Sydney
NSW 2001

Project Name: SAMUEL GILBERT PUBLIC SCHOOL ESA
Project ID: PS110639

Order No.:
Report #: 607407
Phone: 02 9272 5586
Fax: 02 9272 5101

Received: Jul 12, 2018 6:27 PM
Due: Jul 20, 2018
Priority: 5 Day
Contact Name: Alexander Carpenter

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217							X					X	X
Brisbane Laboratory - NATA Site # 20794						X							
Perth Laboratory - NATA Site # 23736													
10	TP11-0.1	Jul 11, 2018		Soil	S18-Jl14659		X			X		X	
11	TP12-0.1	Jul 11, 2018		Soil	S18-Jl14660		X			X		X	
12	TP12-0.9	Jul 11, 2018		Soil	S18-Jl14661					X		X	
13	HA01-0.4	Jul 11, 2018		Soil	S18-Jl14662		X			X		X	
14	HA02-0.4	Jul 11, 2018		Soil	S18-Jl14663		X			X		X	
15	HA03-0.1	Jul 11, 2018		Soil	S18-Jl14664		X			X		X	
16	HA03-0.9	Jul 11, 2018		Soil	S18-Jl14665					X		X	
17	HA04-0.1	Jul 11, 2018		Soil	S18-Jl14666		X			X		X	
18	HA05-0.1	Jul 11, 2018		Soil	S18-Jl14667		X			X		X	
19	HA06-0.1	Jul 11, 2018		Soil	S18-Jl14668		X						
20	HA06-0.5	Jul 11, 2018		Soil	S18-Jl14669					X		X	
21	HA07-0.2	Jul 11, 2018		Soil	S18-Jl14670		X			X		X	

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ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: WSP Australia P/L NSW
Address: Level 27, Ernst & Young Centre
Sydney
NSW 2001

Project Name: SAMUEL GILBERT PUBLIC SCHOOL ESA
Project ID: PS110639

Order No.:
Report #: 607407
Phone: 02 9272 5586
Fax: 02 9272 5101

Received: Jul 12, 2018 6:27 PM
Due: Jul 20, 2018
Priority: 5 Day
Contact Name: Alexander Carpenter

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217							X					X	X
Brisbane Laboratory - NATA Site # 20794						X							
Perth Laboratory - NATA Site # 23736													
22	HA08-0.2	Jul 11, 2018		Soil	S18-Jl14671		X			X		X	
23	HA09-0.8	Jul 11, 2018		Soil	S18-Jl14672		X			X		X	
24	QA01	Jul 11, 2018		Soil	S18-Jl14673					X		X	
25	TB01	Jul 11, 2018		Soil	S18-Jl14674								X
26	TS01	Jul 11, 2018		Soil	S18-Jl14675								X
27	R_11072018	Jul 11, 2018		Water	S18-Jl14677							X	
28	R_12072018	Jul 11, 2018		Water	S18-Jl14678							X	
29	TP02-0.1	Jul 11, 2018		Soil	S18-Jl15309			X					
30	TP02-0.6	Jul 11, 2018		Soil	S18-Jl15310			X					
31	TP03-0.6	Jul 11, 2018		Soil	S18-Jl15311			X					
32	TP04-0.8	Jul 11, 2018		Soil	S18-Jl15312			X					
33	TP05-1.1	Jul 11, 2018		Soil	S18-Jl15313			X					

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Oakleigh VIC 3166
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NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
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Kewdale WA 6105
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Sample Detail						% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217							X					X	X
Brisbane Laboratory - NATA Site # 20794						X							
Perth Laboratory - NATA Site # 23736													
34	TP06-0.7	Jul 11, 2018		Soil	S18-Jl15314			X					
35	TP07-0.9	Jul 11, 2018		Soil	S18-Jl15315			X					
36	TP08-0.6	Jul 11, 2018		Soil	S18-Jl15316			X					
37	TP09-0.8	Jul 11, 2018		Soil	S18-Jl15317			X					
38	TP10-0.8	Jul 11, 2018		Soil	S18-Jl15318			X					
39	TP11-1.0	Jul 11, 2018		Soil	S18-Jl15319			X					
40	HA04-0.7	Jul 11, 2018		Soil	S18-Jl15321			X					
41	HA05-0.4	Jul 11, 2018		Soil	S18-Jl15322			X					
42	HA07-1.2	Jul 11, 2018		Soil	S18-Jl15323			X					
43	HA09-0.1	Jul 11, 2018		Soil	S18-Jl15324			X					
44	QA02	Jul 11, 2018		Soil	S18-Jl15325			X					
45	QA02A	Jul 11, 2018		Soil	S18-Jl17154			X					

ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
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Company Name:	WSP Australia P/L NSW	**Order No.:**		**Received:**	Jul 12, 2018 6:27 PM
Address:	Level 27, Ernst & Young Centre Sydney NSW 2001	**Report #:** **Phone:** **Fax:**	607407 02 9272 5586 02 9272 5101	**Due:** **Priority:** **Contact Name:**	Jul 20, 2018 5 Day Alexander Carpenter
Project Name:	SAMUEL GILBERT PUBLIC SCHOOL ESA				
Project ID:	PS110639				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail	% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271			X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217		X					X	X
Brisbane Laboratory - NATA Site # 20794	X							
Perth Laboratory - NATA Site # 23736								
Test Counts	1	20	17	1	23	1	25	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
% Clay	%	< 1			1	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	< 10			10	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	93			70-130	Pass	
Naphthalene	%	85			70-130	Pass	
TRH C6-C10	%	96			70-130	Pass	
TRH C6-C10	%	100			70-130	Pass	
TRH >C10-C16	%	83			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	100			70-130	Pass	
TRH C10-C14	%	82			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	84			70-130	Pass	
Toluene	%	88			70-130	Pass	
Ethylbenzene	%	90			70-130	Pass	
m&p-Xylenes	%	91			70-130	Pass	
Xylenes - Total	%	91			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	70			70-130	Pass	
Acenaphthylene	%	71			70-130	Pass	
Anthracene	%	77			70-130	Pass	
Benz(a)anthracene	%	72			70-130	Pass	
Benzo(a)pyrene	%	71			70-130	Pass	
Benzo(b&j)fluoranthene	%	79			70-130	Pass	
Benzo(g.h.i)perylene	%	73			70-130	Pass	
Benzo(k)fluoranthene	%	88			70-130	Pass	
Chrysene	%	74			70-130	Pass	
Dibenz(a.h)anthracene	%	98			70-130	Pass	
Fluoranthene	%	75			70-130	Pass	
Fluorene	%	72			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	94			70-130	Pass	
Naphthalene	%	71			70-130	Pass	
Phenanthrene	%	72			70-130	Pass	
Pyrene	%	75			70-130	Pass	
LCS - % Recovery							
% Clay	%	82			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	96			80-120	Pass	
Cadmium	%	86			80-120	Pass	
Chromium	%	99			80-120	Pass	
Copper	%	90			80-120	Pass	
Lead	%	100			80-120	Pass	
Mercury	%	108			75-125	Pass	
Nickel	%	102			80-120	Pass	
Zinc	%	106			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S18-Jl14652	CP	%	78			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C10-C14	S18-Jl14652	CP	%	83			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S18-Jl14652	CP	%	95			70-130	Pass	
Acenaphthylene	S18-Jl14652	CP	%	90			70-130	Pass	
Anthracene	S18-Jl14652	CP	%	92			70-130	Pass	
Benz(a)anthracene	S18-Jl14652	CP	%	78			70-130	Pass	
Benzo(a)pyrene	S18-Jl14652	CP	%	94			70-130	Pass	
Benzo(b&j)fluoranthene	S18-Jl14652	CP	%	92			70-130	Pass	
Benzo(g.h.i)perylene	S18-Jl14652	CP	%	71			70-130	Pass	
Benzo(k)fluoranthene	S18-Jl14652	CP	%	82			70-130	Pass	
Chrysene	S18-Jl14652	CP	%	81			70-130	Pass	
Dibenz(a.h)anthracene	S18-Jl14652	CP	%	78			70-130	Pass	
Fluoranthene	S18-Jl14652	CP	%	72			70-130	Pass	
Fluorene	S18-Jl14652	CP	%	92			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S18-Jl14652	CP	%	79			70-130	Pass	
Naphthalene	S18-Jl14652	CP	%	86			70-130	Pass	
Phenanthrene	S18-Jl14652	CP	%	86			70-130	Pass	
Pyrene	S18-Jl14652	CP	%	76			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S18-Jl14655	CP	%	81			70-130	Pass	
TRH C6-C10	S18-Jl14655	CP	%	87			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S18-Jl14655	CP	%	90			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S18-Jl14655	CP	%	76			70-130	Pass	
Toluene	S18-Jl14655	CP	%	79			70-130	Pass	
Ethylbenzene	S18-Jl14655	CP	%	82			70-130	Pass	
m&p-Xylenes	S18-Jl14655	CP	%	83			70-130	Pass	
o-Xylene	S18-Jl14655	CP	%	85			70-130	Pass	
Xylenes - Total	S18-Jl14655	CP	%	84			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S18-Jl14655	CP	%	99			70-130	Pass	
Acenaphthylene	S18-Jl14655	CP	%	99			70-130	Pass	
Anthracene	S18-Jl14655	CP	%	123			70-130	Pass	
Benz(a)anthracene	S18-Jl14655	CP	%	92			70-130	Pass	
Benzo(a)pyrene	S18-Jl14655	CP	%	90			70-130	Pass	
Benzo(b&j)fluoranthene	S18-Jl14655	CP	%	94			70-130	Pass	
Benzo(g.h.i)perylene	S18-Jl14655	CP	%	71			70-130	Pass	
Benzo(k)fluoranthene	S18-Jl14655	CP	%	106			70-130	Pass	
Chrysene	S18-Jl14655	CP	%	128			70-130	Pass	
Dibenz(a.h)anthracene	S18-Jl14655	CP	%	86			70-130	Pass	
Fluoranthene	S18-Jl14655	CP	%	128			70-130	Pass	
Fluorene	S18-Jl14655	CP	%	101			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S18-Jl14655	CP	%	78			70-130	Pass	
Naphthalene	S18-Jl14655	CP	%	99			70-130	Pass	
Phenanthrene	S18-Jl14655	CP	%	101			70-130	Pass	
Pyrene	S18-Jl14655	CP	%	128			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Arsenic	S18-Jl14657	CP	%	102			75-125	Pass	
Cadmium	S18-Jl14657	CP	%	90			75-125	Pass	
Chromium	S18-Jl14657	CP	%	115			75-125	Pass	
Copper	S18-Jl14657	CP	%	103			75-125	Pass	
Lead	S18-Jl14657	CP	%	103			75-125	Pass	
Mercury	S18-Jl14657	CP	%	101			70-130	Pass	
Nickel	S18-Jl14657	CP	%	101			75-125	Pass	
Zinc	S18-Jl14657	CP	%	102			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S18-Jl14665	CP	%	86			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S18-Jl14665	CP	%	97			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S18-Jl14665	CP	%	108			70-130	Pass	
Acenaphthylene	S18-Jl14665	CP	%	104			70-130	Pass	
Anthracene	S18-Jl14665	CP	%	106			70-130	Pass	
Benz(a)anthracene	S18-Jl14665	CP	%	89			70-130	Pass	
Benzo(a)pyrene	S18-Jl14665	CP	%	73			70-130	Pass	
Benzo(b&j)fluoranthene	S18-Jl14665	CP	%	82			70-130	Pass	
Benzo(g.h.i)perylene	S18-Jl14665	CP	%	80			70-130	Pass	
Benzo(k)fluoranthene	S18-Jl14665	CP	%	76			70-130	Pass	
Chrysene	S18-Jl14665	CP	%	93			70-130	Pass	
Dibenz(a.h)anthracene	S18-Jl14665	CP	%	77			70-130	Pass	
Fluoranthene	S18-Jl14665	CP	%	84			70-130	Pass	
Fluorene	S18-Jl14665	CP	%	108			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S18-Jl14665	CP	%	84			70-130	Pass	
Naphthalene	S18-Jl14665	CP	%	100			70-130	Pass	
Phenanthrene	S18-Jl14665	CP	%	98			70-130	Pass	
Pyrene	S18-Jl14665	CP	%	87			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S18-Jl14667	CP	%	105			75-125	Pass	
Cadmium	S18-Jl14667	CP	%	92			75-125	Pass	
Chromium	S18-Jl14667	CP	%	114			75-125	Pass	
Copper	S18-Jl14667	CP	%	104			75-125	Pass	
Lead	S18-Jl14667	CP	%	108			75-125	Pass	
Mercury	S18-Jl14667	CP	%	106			70-130	Pass	
Nickel	S18-Jl14667	CP	%	106			75-125	Pass	
Zinc	S18-Jl14667	CP	%	105			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S18-Jl14651	CP	mg/kg	63	63	1.0	30%	Pass	
TRH >C16-C34	S18-Jl14651	CP	mg/kg	320	360	11	30%	Pass	
TRH >C34-C40	S18-Jl14651	CP	mg/kg	120	150	18	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S18-Jl14651	CP	mg/kg	32	33	5.0	30%	Pass	
TRH C15-C28	S18-Jl14651	CP	mg/kg	190	200	6.0	30%	Pass	
TRH C29-C36	S18-Jl14651	CP	mg/kg	230	260	14	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S18-Jl14651	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S18-Jl14651	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S18-Jl14651	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S18-Jl14651	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S18-Jl14651	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S18-Jl14651	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S18-Jl14651	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S18-Jl14651	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S18-Jl14651	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S18-Jl14651	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S18-Jl14651	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S18-Jl14651	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S18-Jl14651	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S18-Jl14651	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S18-Jl14651	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S18-Jl14651	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-Jl14653	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S18-Jl14653	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S18-Jl14653	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-Jl14653	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S18-Jl14653	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S18-Jl14653	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S18-Jl14653	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S18-Jl14653	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S18-Jl14653	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S18-Jl14653	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S18-Jl14653	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S18-Jl14653	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S18-Jl14653	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S18-Jl14653	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S18-Jl14653	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S18-Jl14653	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S18-Jl14653	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S18-Jl14653	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S18-Jl14653	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S18-Jl14653	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S18-Jl14653	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S18-Jl14653	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S18-Jl14653	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S18-Jl14653	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S18-Jl14653	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S18-Jl14656	CP	%	8.8	8.7	1.0	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S18-Jl14656	CP	mg/kg	7.1	6.9	3.0	30%	Pass	
Cadmium	S18-Jl14656	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S18-Jl14656	CP	mg/kg	17	16	4.0	30%	Pass	
Copper	S18-Jl14656	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	S18-Jl14656	CP	mg/kg	14	15	11	30%	Pass	
Mercury	S18-Jl14656	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S18-Jl14656	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S18-Jl14656	CP	mg/kg	10	12	15	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S18-Jl14657	CP	mg/kg	7.1	6.3	12	30%	Pass	
Cadmium	S18-Jl14657	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S18-Jl14657	CP	mg/kg	19	19	1.0	30%	Pass	
Copper	S18-Jl14657	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	S18-Jl14657	CP	mg/kg	10	10.0	3.0	30%	Pass	
Mercury	S18-Jl14657	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S18-Jl14657	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S18-Jl14657	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Clay	B17-Oc23882	NCP	%	28	26	5.0	30%	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	M18-Jl13251	NCP	uS/cm	77	78	1.8	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	M18-Jl13393	NCP	pH Units	8.2	8.4	pass	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S18-Jl14664	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S18-Jl14664	CP	mg/kg	130	130	5.0	30%	Pass	
TRH >C34-C40	S18-Jl14664	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S18-Jl14664	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S18-Jl14664	CP	mg/kg	51	< 50	3.0	30%	Pass	
TRH C29-C36	S18-Jl14664	CP	mg/kg	110	100	5.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S18-Jl14666	CP	%	7.0	7.2	4.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S18-Jl14666	CP	mg/kg	4.7	5.7	19	30%	Pass	
Cadmium	S18-Jl14666	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S18-Jl14666	CP	mg/kg	12	12	4.0	30%	Pass	
Copper	S18-Jl14666	CP	mg/kg	16	17	7.0	30%	Pass	
Lead	S18-Jl14666	CP	mg/kg	16	17	8.0	30%	Pass	
Mercury	S18-Jl14666	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S18-Jl14666	CP	mg/kg	6.1	6.1	1.0	30%	Pass	
Zinc	S18-Jl14666	CP	mg/kg	47	53	14	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S18-Jl14667	CP	mg/kg	4.7	4.5	3.0	30%	Pass	
Cadmium	S18-Jl14667	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S18-Jl14667	CP	mg/kg	8.3	8.8	6.0	30%	Pass	
Copper	S18-Jl14667	CP	mg/kg	7.4	7.9	7.0	30%	Pass	
Lead	S18-Jl14667	CP	mg/kg	14	15	3.0	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Mercury	S18-Jl14667	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S18-Jl14667	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S18-Jl14667	CP	mg/kg	37	38	3.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Jonathon Angell	Senior Analyst-Inorganic (QLD)
Joseph Edouard	Senior Analyst-Organic (VIC)
Michael Brancati	Senior Analyst-Inorganic (VIC)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Certificate of Analysis

WSP Australia P/L NSW
Level 27, Ernst & Young Centre
Sydney
NSW 2001

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Alexander Carpenter**

Report **607407-W**
Project name SAMUEL GILBERT PUBLIC SCHOOL ESA
Project ID PS110639
Received Date Jul 12, 2018

Client Sample ID			**R_11072018**	**R_12072018**
Sample Matrix			**Water**	**Water**
Eurofins | mgt Sample No.			**S18-Jl14677**	**S18-Jl14678**
Date Sampled			**Jul 11, 2018**	**Jul 11, 2018**
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1
TRH C10-36 (Total)	0.1	mg/L	< 0.1	< 0.1
BTEX				
Benzene	0.001	mg/L	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	107	109
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1
Polycyclic Aromatic Hydrocarbons				
Acenaphthene	0.001	mg/L	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001

Client Sample ID			R_11072018	R_12072018
Sample Matrix			**Water**	**Water**
Eurofins | mgt Sample No.			**S18-Jl14677**	**S18-Jl14678**
Date Sampled			**Jul 11, 2018**	**Jul 11, 2018**
Test/Reference	LOR	Unit		
Polycyclic Aromatic Hydrocarbons				
Naphthalene	0.001	mg/L	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	86	84
p-Terphenyl-d14 (surr.)	1	%	107	117
Heavy Metals				
Arsenic	0.001	mg/L	< 0.001	< 0.001
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002
Chromium	0.001	mg/L	< 0.001	< 0.001
Copper	0.001	mg/L	< 0.001	< 0.001
Lead	0.001	mg/L	< 0.001	< 0.001
Mercury	0.0001	mg/L	< 0.0001	< 0.0001
Nickel	0.001	mg/L	< 0.001	< 0.001
Zinc	0.005	mg/L	< 0.005	< 0.005

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jul 17, 2018	7 Day
- Method: LTM-ORG-2010 TRH C6-C36			
BTEX	Melbourne	Jul 16, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jul 16, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Eurofins | mgt Suite B7			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jul 17, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Jul 17, 2018	7 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Melbourne	Jul 16, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: WSP Australia P/L NSW
Address: Level 27, Ernst & Young Centre
Sydney
NSW 2001

Project Name: SAMUEL GILBERT PUBLIC SCHOOL ESA
Project ID: PS110639

Order No.:
Report #: 607407
Phone: 02 9272 5586
Fax: 02 9272 5101

Received: Jul 12, 2018 6:27 PM
Due: Jul 20, 2018
Priority: 5 Day
Contact Name: Alexander Carpenter

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail	% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271			X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217		X					X	X
Brisbane Laboratory - NATA Site # 20794	X							
Perth Laboratory - NATA Site # 23736								
External Laboratory								

No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	TP01-0.4	Jul 11, 2018		Soil	S18-Jl14650		X			X		X	
2	TP03-0.1	Jul 11, 2018		Soil	S18-Jl14651		X			X		X	
3	TP04-0.1	Jul 11, 2018		Soil	S18-Jl14652		X			X		X	
4	TP05-0.2	Jul 11, 2018		Soil	S18-Jl14653		X			X		X	
5	TP06-0.3	Jul 11, 2018		Soil	S18-Jl14654		X			X		X	
6	TP07-0.3	Jul 11, 2018		Soil	S18-Jl14655		X			X		X	
7	TP08-0.1	Jul 11, 2018		Soil	S18-Jl14656		X			X		X	
8	TP09-0.1	Jul 11, 2018		Soil	S18-Jl14657		X			X		X	
9	TP10-0.1	Jul 11, 2018		Soil	S18-Jl14658	X	X		X	X	X	X	

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ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: WSP Australia P/L NSW
Address: Level 27, Ernst & Young Centre
Sydney
NSW 2001

Project Name: SAMUEL GILBERT PUBLIC SCHOOL ESA
Project ID: PS110639

Order No.:
Report #: 607407
Phone: 02 9272 5586
Fax: 02 9272 5101

Received: Jul 12, 2018 6:27 PM
Due: Jul 20, 2018
Priority: 5 Day
Contact Name: Alexander Carpenter

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217							X					X	X
Brisbane Laboratory - NATA Site # 20794						X							
Perth Laboratory - NATA Site # 23736													
10	TP11-0.1	Jul 11, 2018		Soil	S18-Jl14659		X			X		X	
11	TP12-0.1	Jul 11, 2018		Soil	S18-Jl14660		X			X		X	
12	TP12-0.9	Jul 11, 2018		Soil	S18-Jl14661					X		X	
13	HA01-0.4	Jul 11, 2018		Soil	S18-Jl14662		X			X		X	
14	HA02-0.4	Jul 11, 2018		Soil	S18-Jl14663		X			X		X	
15	HA03-0.1	Jul 11, 2018		Soil	S18-Jl14664		X			X		X	
16	HA03-0.9	Jul 11, 2018		Soil	S18-Jl14665					X		X	
17	HA04-0.1	Jul 11, 2018		Soil	S18-Jl14666		X			X		X	
18	HA05-0.1	Jul 11, 2018		Soil	S18-Jl14667		X			X		X	
19	HA06-0.1	Jul 11, 2018		Soil	S18-Jl14668		X						
20	HA06-0.5	Jul 11, 2018		Soil	S18-Jl14669					X		X	
21	HA07-0.2	Jul 11, 2018		Soil	S18-Jl14670		X			X		X	

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ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

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Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217							X					X	X
Brisbane Laboratory - NATA Site # 20794						X							
Perth Laboratory - NATA Site # 23736													
22	HA08-0.2	Jul 11, 2018		Soil	S18-Jl14671		X			X		X	
23	HA09-0.8	Jul 11, 2018		Soil	S18-Jl14672		X			X		X	
24	QA01	Jul 11, 2018		Soil	S18-Jl14673					X		X	
25	TB01	Jul 11, 2018		Soil	S18-Jl14674								X
26	TS01	Jul 11, 2018		Soil	S18-Jl14675								X
27	R_11072018	Jul 11, 2018		Water	S18-Jl14677							X	
28	R_12072018	Jul 11, 2018		Water	S18-Jl14678							X	
29	TP02-0.1	Jul 11, 2018		Soil	S18-Jl15309			X					
30	TP02-0.6	Jul 11, 2018		Soil	S18-Jl15310			X					
31	TP03-0.6	Jul 11, 2018		Soil	S18-Jl15311			X					
32	TP04-0.8	Jul 11, 2018		Soil	S18-Jl15312			X					
33	TP05-1.1	Jul 11, 2018		Soil	S18-Jl15313			X					

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Oakleigh VIC 3166
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NATA # 1261
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Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217							X					X	X
Brisbane Laboratory - NATA Site # 20794						X							
Perth Laboratory - NATA Site # 23736													
34	TP06-0.7	Jul 11, 2018		Soil	S18-Jl15314			X					
35	TP07-0.9	Jul 11, 2018		Soil	S18-Jl15315			X					
36	TP08-0.6	Jul 11, 2018		Soil	S18-Jl15316			X					
37	TP09-0.8	Jul 11, 2018		Soil	S18-Jl15317			X					
38	TP10-0.8	Jul 11, 2018		Soil	S18-Jl15318			X					
39	TP11-1.0	Jul 11, 2018		Soil	S18-Jl15319			X					
40	HA04-0.7	Jul 11, 2018		Soil	S18-Jl15321			X					
41	HA05-0.4	Jul 11, 2018		Soil	S18-Jl15322			X					
42	HA07-1.2	Jul 11, 2018		Soil	S18-Jl15323			X					
43	HA09-0.1	Jul 11, 2018		Soil	S18-Jl15324			X					
44	QA02	Jul 11, 2018		Soil	S18-Jl15325			X					
45	QA02A	Jul 11, 2018		Soil	S18-Jl17154			X					

ABN– 50 005 085 521
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Project Name:	SAMUEL GILBERT PUBLIC SCHOOL ESA				
Project ID:	PS110639				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail	% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271			X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217		X					X	X
Brisbane Laboratory - NATA Site # 20794	X							
Perth Laboratory - NATA Site # 23736								
Test Counts	1	20	17	1	23	1	25	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

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Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	106			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C10-C14	%	96			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	100			70-130	Pass	
Toluene	%	93			70-130	Pass	
Ethylbenzene	%	95			70-130	Pass	
m&p-Xylenes	%	91			70-130	Pass	
Xylenes - Total	%	92			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	85			70-130	Pass	
TRH C6-C10	%	111			70-130	Pass	
TRH >C10-C16	%	82			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	73			70-130	Pass	
Acenaphthylene	%	72			70-130	Pass	
Anthracene	%	91			70-130	Pass	
Benz(a)anthracene	%	99			70-130	Pass	
Benzo(a)pyrene	%	93			70-130	Pass	
Benzo(b&j)fluoranthene	%	99			70-130	Pass	
Benzo(g.h.i)perylene	%	111			70-130	Pass	
Benzo(k)fluoranthene	%	106			70-130	Pass	
Chrysene	%	101			70-130	Pass	
Dibenz(a.h)anthracene	%	94			70-130	Pass	
Fluoranthene	%	123			70-130	Pass	
Fluorene	%	84			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	105			70-130	Pass	
Naphthalene	%	79			70-130	Pass	
Phenanthrene	%	93			70-130	Pass	
Pyrene	%	121			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	95			80-120	Pass	
Cadmium	%	84			80-120	Pass	
Chromium	%	97			80-120	Pass	
Copper	%	86			80-120	Pass	
Lead	%	95			80-120	Pass	
Mercury	%	85			75-125	Pass	
Nickel	%	93			80-120	Pass	
Zinc	%	96			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M18-Jl16770	NCP	%	76			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M18-Jl16770	NCP	%	72			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-Jl16302	NCP	%	113			70-130	Pass	
Acenaphthylene	M18-Jl16302	NCP	%	115			70-130	Pass	
Anthracene	M18-Jl16302	NCP	%	104			70-130	Pass	
Benz(a)anthracene	M18-Jl16302	NCP	%	111			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(a)pyrene	M18-Jl16302	NCP	%	122			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Jl16302	NCP	%	114			70-130	Pass	
Benzo(g.h.i)perylene	M18-Jl16302	NCP	%	119			70-130	Pass	
Benzo(k)fluoranthene	M18-Jl16302	NCP	%	127			70-130	Pass	
Chrysene	M18-Jl16302	NCP	%	113			70-130	Pass	
Dibenz(a.h)anthracene	M18-Jl16302	NCP	%	101			70-130	Pass	
Fluoranthene	M18-Jl16302	NCP	%	125			70-130	Pass	
Fluorene	M18-Jl16302	NCP	%	112			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M18-Jl16302	NCP	%	110			70-130	Pass	
Naphthalene	M18-Jl16302	NCP	%	110			70-130	Pass	
Phenanthrene	M18-Jl16302	NCP	%	113			70-130	Pass	
Pyrene	M18-Jl16302	NCP	%	125			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S18-Jl14677	CP	%	98			75-125	Pass	
Cadmium	S18-Jl14677	CP	%	99			75-125	Pass	
Chromium	S18-Jl14677	CP	%	101			75-125	Pass	
Copper	S18-Jl14677	CP	%	101			75-125	Pass	
Lead	S18-Jl14677	CP	%	104			75-125	Pass	
Mercury	S18-Jl14677	CP	%	93			70-130	Pass	
Nickel	S18-Jl14677	CP	%	100			75-125	Pass	
Zinc	S18-Jl14677	CP	%	101			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S18-Jl11761	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M18-Jl15745	NCP	mg/L	1.0	1.1	6.0	30%	Pass	
TRH C15-C28	M18-Jl15745	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M18-Jl15745	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-Jl11761	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S18-Jl11761	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S18-Jl11761	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S18-Jl11761	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S18-Jl11761	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	S18-Jl11761	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-Jl11761	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	S18-Jl11761	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	M18-Jl15745	NCP	mg/L	0.87	1.1	19	30%	Pass	
TRH >C16-C34	M18-Jl15745	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M18-Jl15745	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M18-Jl16301	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	M18-Jl16301	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	M18-Jl16301	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	M18-Jl16301	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M18-Jl16301	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-Jl16301	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	M18-Jl16301	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M18-Jl16301	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Chrysene	M18-Jl16301	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	M18-Jl16301	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	M18-Jl16301	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M18-Jl16301	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-Jl16301	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	M18-Jl16301	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	M18-Jl16301	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	M18-Jl16301	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S18-Jl14677	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	S18-Jl14677	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	S18-Jl14677	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	S18-Jl14677	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead	S18-Jl14677	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	S18-Jl14677	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	S18-Jl14677	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc	S18-Jl14677	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

WSP Australia P/L NSW
Level 27, Ernst & Young Centre
Sydney
NSW 2001

Attention:	Alexander Carpenter
Report	607407-AID
Project Name	SAMUEL GILBERT PUBLIC SCHOOL ESA
Project ID	PS110639
Received Date	Jul 12, 2018
Date Reported	Jul 20, 2018

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS4964 method for inhomogeneous samples is around 0.1 g/kg (0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis where required, this is considered to be at the nominal reporting limit of 0.01 % (w / w).The examination of large sample sizes(500 mL is recommended) may improve the likelihood of identifying ACM in the > 2mm fraction.The NEPM screening level of 0.001 % (w / w) asbestos in soil for FA(friable asbestos) and AF(asbestos fines) then applies where they are able to be quantified by gravimetric procedures.This quantitative screening is not generally applicable to FF(free fibres) and results of Trace Analysis are referred. *NOTE: NATA News March 2014, p.7, states in relation to AS4964: "This is a qualitative method with a nominal reporting limit of 0.01%" and that currently in Australia "there is no validated method available for the quantification of asbestos". Accordingly, NATA Accreditation does not cover the performance of this service (indicated with an asterisk).* *This report is consistent with the analytical procedures and reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended) and the Western Australia Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, 2009, including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil, June 2011.*

Project Name SAMUEL GILBERT PUBLIC SCHOOL ESA
Project ID PS110639
Date Sampled Jul 11, 2018
Report 607407-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
TP01-0.4	18-Jl14650	Jul 11, 2018	Approximate Sample 501g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP03-0.1	18-Jl14651	Jul 11, 2018	Approximate Sample 370g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP04-0.1	18-Jl14652	Jul 11, 2018	Approximate Sample 567g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP05-0.2	18-Jl14653	Jul 11, 2018	Approximate Sample 510g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP06-0.3	18-Jl14654	Jul 11, 2018	Approximate Sample 455g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP07-0.3	18-Jl14655	Jul 11, 2018	Approximate Sample 485g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP08-0.1	18-Jl14656	Jul 11, 2018	Approximate Sample 648g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP09-0.1	18-Jl14657	Jul 11, 2018	Approximate Sample 673g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP10-0.1	18-Jl14658	Jul 11, 2018	Approximate Sample 727g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP11-0.1	18-Jl14659	Jul 11, 2018	Approximate Sample 853g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
TP12-0.1	18-Jl14660	Jul 11, 2018	Approximate Sample 921g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
HA01-0.4	18-Jl14662	Jul 11, 2018	Approximate Sample 869g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
HA02-0.4	18-Jl14663	Jul 11, 2018	Approximate Sample 760g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
HA03-0.1	18-Jl14664	Jul 11, 2018	Approximate Sample 620g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
HA04-0.1	18-Jl14666	Jul 11, 2018	Approximate Sample 841g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
HA05-0.1	18-Jl14667	Jul 11, 2018	Approximate Sample 813g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
HA06-0.1	18-Jl14668	Jul 11, 2018	Approximate Sample 817g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
HA07-0.2	18-Jl14670	Jul 11, 2018	Approximate Sample 763g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
HA08-0.2	18-Jl14671	Jul 11, 2018	Approximate Sample 711g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
HA09-0.8	18-Jl14672	Jul 11, 2018	Approximate Sample 827g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jul 13, 2018	Indefinite

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ABN – 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	WSP Australia P/L NSW	**Order No.:**		**Received:**	Jul 12, 2018 6:27 PM
Address:	Level 27, Ernst & Young Centre Sydney NSW 2001	**Report #:**	607407	**Due:**	Jul 20, 2018
		Phone:	02 9272 5586	**Priority:**	5 Day
		Fax:	02 9272 5101	**Contact Name:**	Alexander Carpenter
Project Name:	SAMUEL GILBERT PUBLIC SCHOOL ESA				
Project ID:	PS110639				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217							X					X	X
Brisbane Laboratory - NATA Site # 20794						X							
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	TP01-0.4	Jul 11, 2018		Soil	S18-Jl14650		X			X		X	
2	TP03-0.1	Jul 11, 2018		Soil	S18-Jl14651		X			X		X	
3	TP04-0.1	Jul 11, 2018		Soil	S18-Jl14652		X			X		X	
4	TP05-0.2	Jul 11, 2018		Soil	S18-Jl14653		X			X		X	
5	TP06-0.3	Jul 11, 2018		Soil	S18-Jl14654		X			X		X	
6	TP07-0.3	Jul 11, 2018		Soil	S18-Jl14655		X			X		X	
7	TP08-0.1	Jul 11, 2018		Soil	S18-Jl14656		X			X		X	
8	TP09-0.1	Jul 11, 2018		Soil	S18-Jl14657		X			X		X	
9	TP10-0.1	Jul 11, 2018		Soil	S18-Jl14658	X	X		X	X	X	X	

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web : www.eurofins.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
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Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
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NSW 2001

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Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217							X					X	X
Brisbane Laboratory - NATA Site # 20794						X							
Perth Laboratory - NATA Site # 23736													
10	TP11-0.1	Jul 11, 2018		Soil	S18-Jl14659		X			X		X	
11	TP12-0.1	Jul 11, 2018		Soil	S18-Jl14660		X			X		X	
12	TP12-0.9	Jul 11, 2018		Soil	S18-Jl14661					X		X	
13	HA01-0.4	Jul 11, 2018		Soil	S18-Jl14662		X			X		X	
14	HA02-0.4	Jul 11, 2018		Soil	S18-Jl14663		X			X		X	
15	HA03-0.1	Jul 11, 2018		Soil	S18-Jl14664		X			X		X	
16	HA03-0.9	Jul 11, 2018		Soil	S18-Jl14665					X		X	
17	HA04-0.1	Jul 11, 2018		Soil	S18-Jl14666		X			X		X	
18	HA05-0.1	Jul 11, 2018		Soil	S18-Jl14667		X			X		X	
19	HA06-0.1	Jul 11, 2018		Soil	S18-Jl14668		X						
20	HA06-0.5	Jul 11, 2018		Soil	S18-Jl14669					X		X	
21	HA07-0.2	Jul 11, 2018		Soil	S18-Jl14670		X			X		X	

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ABN – 50 005 085 521
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web : www.eurofins.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
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2/91 Leach Highway
Kewdale WA 6105
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Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217							X					X	X
Brisbane Laboratory - NATA Site # 20794						X							
Perth Laboratory - NATA Site # 23736													
22	HA08-0.2	Jul 11, 2018		Soil	S18-Jl14671		X			X		X	
23	HA09-0.8	Jul 11, 2018		Soil	S18-Jl14672		X			X		X	
24	QA01	Jul 11, 2018		Soil	S18-Jl14673					X		X	
25	TB01	Jul 11, 2018		Soil	S18-Jl14674								X
26	TS01	Jul 11, 2018		Soil	S18-Jl14675								X
27	R_11072018	Jul 11, 2018		Water	S18-Jl14677							X	
28	R_12072018	Jul 11, 2018		Water	S18-Jl14678							X	
29	TP02-0.1	Jul 11, 2018		Soil	S18-Jl15309			X					
30	TP02-0.6	Jul 11, 2018		Soil	S18-Jl15310			X					
31	TP03-0.6	Jul 11, 2018		Soil	S18-Jl15311			X					
32	TP04-0.8	Jul 11, 2018		Soil	S18-Jl15312			X					
33	TP05-1.1	Jul 11, 2018		Soil	S18-Jl15313			X					

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3-5 Kingston Town Close
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Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217							X					X	X
Brisbane Laboratory - NATA Site # 20794						X							
Perth Laboratory - NATA Site # 23736													
34	TP06-0.7	Jul 11, 2018		Soil	S18-Jl15314			X					
35	TP07-0.9	Jul 11, 2018		Soil	S18-Jl15315			X					
36	TP08-0.6	Jul 11, 2018		Soil	S18-Jl15316			X					
37	TP09-0.8	Jul 11, 2018		Soil	S18-Jl15317			X					
38	TP10-0.8	Jul 11, 2018		Soil	S18-Jl15318			X					
39	TP11-1.0	Jul 11, 2018		Soil	S18-Jl15319			X					
40	HA04-0.7	Jul 11, 2018		Soil	S18-Jl15321			X					
41	HA05-0.4	Jul 11, 2018		Soil	S18-Jl15322			X					
42	HA07-1.2	Jul 11, 2018		Soil	S18-Jl15323			X					
43	HA09-0.1	Jul 11, 2018		Soil	S18-Jl15324			X					
44	QA02	Jul 11, 2018		Soil	S18-Jl15325			X					
45	QA02A	Jul 11, 2018		Soil	S18-Jl17154			X					

ABN – 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Melbourne
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Address:	Level 27, Ernst & Young Centre Sydney NSW 2001	**Report #:**	607407	**Due:**	Jul 20, 2018
		Phone:	02 9272 5586	**Priority:**	5 Day
		Fax:	02 9272 5101	**Contact Name:**	Alexander Carpenter
Project Name:	SAMUEL GILBERT PUBLIC SCHOOL ESA				
Project ID:	PS110639				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail	% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271			X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217		X					X	X
Brisbane Laboratory - NATA Site # 20794	X							
Perth Laboratory - NATA Site # 23736								
Test Counts	1	20	17	1	23	1	25	2

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Western Australia Department of Health
NOHSC	National Occupational Health and Safety Commission
ACM	Bonded asbestos-containing material means any material containing more than 1% asbestos and comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. Common examples of ACM include but are not limited to: pipe and boiler insulation, sprayed-on fireproofing, troweled-on acoustical plaster, floor tile and mastic, floor linoleum, transite shingles, roofing materials, wall and ceiling plaster, ceiling tiles, and gasket materials. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release.
FA	FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).
PACM	Presumed Asbestos-Containing Material means thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980 that are assumed to contain greater than one percent asbestos but have not been sampled or analyzed to verify or negate the presence of asbestos.
AF	Asbestos fines (AF) are defined as free fibres, or fibre bundles, smaller than 7mm. It is the free fibres which present the greatest risk to human health, although very small fibres (< 5 microns in length) are not considered to be such a risk. AF also includes small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substatntial degree of damage which increases the potential for fibre release.)
AC	Asbestos cement means a mixture of cement and asbestos fibres (typically 90:10 ratios).

Comments

Samples Jl14651, Jl14654 and Jl14655 received were less than the nominal 500mL as recommended in Section 4.10 of the NEPM Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

Authorised by:

Laxman Dias	Senior Analyst-Asbestos (NSW)

Glenn Jackson
National Operations Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: WSP Australia P/L NSW
Address: Level 27, Ernst & Young Centre
Sydney
NSW 2001

Project Name: SAMUEL GILBERT PUBLIC SCHOOL ESA
Project ID: PS110639

Order No.:
Report #: 607407
Phone: 02 9272 5586
Fax: 02 9272 5101

Received: Jul 12, 2018 6:27 PM
Due: Jul 20, 2018
Priority: 5 Day
Contact Name: Alexander Carpenter

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217							X					X	X
Brisbane Laboratory - NATA Site # 20794						X							
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	TP01-0.4	Jul 11, 2018		Soil	S18-Jl14650		X			X		X	
2	TP03-0.1	Jul 11, 2018		Soil	S18-Jl14651		X			X		X	
3	TP04-0.1	Jul 11, 2018		Soil	S18-Jl14652		X			X		X	
4	TP05-0.2	Jul 11, 2018		Soil	S18-Jl14653		X			X		X	
5	TP06-0.3	Jul 11, 2018		Soil	S18-Jl14654		X			X		X	
6	TP07-0.3	Jul 11, 2018		Soil	S18-Jl14655		X			X		X	
7	TP08-0.1	Jul 11, 2018		Soil	S18-Jl14656		X			X		X	
8	TP09-0.1	Jul 11, 2018		Soil	S18-Jl14657		X			X		X	
9	TP10-0.1	Jul 11, 2018		Soil	S18-Jl14658	X	X		X	X	X	X	

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web : www.eurofins.com.au

Melbourne
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Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
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2/91 Leach Highway
Kewdale WA 6105
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Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217							X					X	X
Brisbane Laboratory - NATA Site # 20794						X							
Perth Laboratory - NATA Site # 23736													
10	TP11-0.1	Jul 11, 2018		Soil	S18-Jl14659		X			X		X	
11	TP12-0.1	Jul 11, 2018		Soil	S18-Jl14660		X			X		X	
12	TP12-0.9	Jul 11, 2018		Soil	S18-Jl14661					X		X	
13	HA01-0.4	Jul 11, 2018		Soil	S18-Jl14662		X			X		X	
14	HA02-0.4	Jul 11, 2018		Soil	S18-Jl14663		X			X		X	
15	HA03-0.1	Jul 11, 2018		Soil	S18-Jl14664		X			X		X	
16	HA03-0.9	Jul 11, 2018		Soil	S18-Jl14665					X		X	
17	HA04-0.1	Jul 11, 2018		Soil	S18-Jl14666		X			X		X	
18	HA05-0.1	Jul 11, 2018		Soil	S18-Jl14667		X			X		X	
19	HA06-0.1	Jul 11, 2018		Soil	S18-Jl14668		X						
20	HA06-0.5	Jul 11, 2018		Soil	S18-Jl14669					X		X	
21	HA07-0.2	Jul 11, 2018		Soil	S18-Jl14670		X			X		X	

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Melbourne
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Oakleigh VIC 3166
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Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217							X					X	X
Brisbane Laboratory - NATA Site # 20794						X							
Perth Laboratory - NATA Site # 23736													
22	HA08-0.2	Jul 11, 2018		Soil	S18-Jl14671		X			X		X	
23	HA09-0.8	Jul 11, 2018		Soil	S18-Jl14672		X			X		X	
24	QA01	Jul 11, 2018		Soil	S18-Jl14673					X		X	
25	TB01	Jul 11, 2018		Soil	S18-Jl14674								X
26	TS01	Jul 11, 2018		Soil	S18-Jl14675								X
27	R_11072018	Jul 11, 2018		Water	S18-Jl14677							X	
28	R_12072018	Jul 11, 2018		Water	S18-Jl14678							X	
29	TP02-0.1	Jul 11, 2018		Soil	S18-Jl15309			X					
30	TP02-0.6	Jul 11, 2018		Soil	S18-Jl15310			X					
31	TP03-0.6	Jul 11, 2018		Soil	S18-Jl15311			X					
32	TP04-0.8	Jul 11, 2018		Soil	S18-Jl15312			X					
33	TP05-1.1	Jul 11, 2018		Soil	S18-Jl15313			X					

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Melbourne
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Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217							X					X	X
Brisbane Laboratory - NATA Site # 20794						X							
Perth Laboratory - NATA Site # 23736													
34	TP06-0.7	Jul 11, 2018		Soil	S18-Jl15314			X					
35	TP07-0.9	Jul 11, 2018		Soil	S18-Jl15315			X					
36	TP08-0.6	Jul 11, 2018		Soil	S18-Jl15316			X					
37	TP09-0.8	Jul 11, 2018		Soil	S18-Jl15317			X					
38	TP10-0.8	Jul 11, 2018		Soil	S18-Jl15318			X					
39	TP11-1.0	Jul 11, 2018		Soil	S18-Jl15319			X					
40	HA04-0.7	Jul 11, 2018		Soil	S18-Jl15321			X					
41	HA05-0.4	Jul 11, 2018		Soil	S18-Jl15322			X					
42	HA07-1.2	Jul 11, 2018		Soil	S18-Jl15323			X					
43	HA09-0.1	Jul 11, 2018		Soil	S18-Jl15324			X					
44	QA02	Jul 11, 2018		Soil	S18-Jl15325			X					
45	QA02A	Jul 11, 2018		Soil	S18-Jl17154			X					

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ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Melbourne
2-5 Kingston Town Close
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Melbourne Laboratory - NATA Site # 1254 & 14271			X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217		X					X	X
Brisbane Laboratory - NATA Site # 20794	X							
Perth Laboratory - NATA Site # 23736								
Test Counts	1	20	17	1	23	1	25	2

APPENDIX H

QAQC RESULTS

Table H1
Samuel Gilbert Public School DSI
Ridgecrop Drive, Caste Hill, NSW

		>C6-C10	>C10-C16	F3: >C16-C34	F4: >C34-C40	Total >C10 - C40	Benzene	Toluene	Ethylbenzene	m- & p-Xylene	o-Xylene	Total xylene	Naphthalene
HA07-0.2	607407	< 20	<50	<100	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
QA01	607407	< 20	<50	<100	<100	<100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
RPD (%)		-	-	-	-	-	-	-	-	-	-	-	-
HA07-0.2	607407	< 20	<50	*<100*	*<100*	*<100*	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	<0.3	< 0.5
QA02	SE181538	< 25	<25	<90	<120	<210	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	< 0.1
RPD (%)		-	-	-	-	-	-	-	-	-	-	-	-

Notes:
All results are expressed in mg/kg for soil or µg/L for groundwater
Italics: A value equal to the PQL has been used for the calculation of RPDs

BOLD RPD exceeds acceptable levels.

Table H2
Samuel Gilbert Public School DSI
Ridgecrop Drive, Caste Hill, NSW

		Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b+j)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1.2.3.cd)pyrene	Dibenz(a.h)anthracene	Benzo(g.h.i)perylene	Total PAH	Benzo(a)pyrene TEQ
HA07-0.2	607407	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QA01	607407	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
RPD (%)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA07-0.2	607407	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QA02	SE181538	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
RPD (%)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

All results are expressed in mg/kg

Italics: A value equal to the PQL has been used for the calculation of RPDs

BOLD RPD exceeds acceptable levels.

Table H3
Samuel Gilbert Public School DSI
Ridgecrop Drive, Caste Hill, NSW

		Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
HA07-0.2	607407	5	< 0.4	17	19	13	< 0.1	27	50
QA01	607407	*2*	< 0.4	13	21	13	< 0.1	23	73
RPD (%)		**86%**	**-**	27%	10%	0%	-	16%	37%
HA07-0.2	607407	5	< 0.4	17	19	13	< 0.1	27	50
QA02	SE181538	4	<0.3	9.7	17	10	<0.05	15	42
RPD (%)		22%	-	**55%**	11%	26%	-	40%	17%

Notes:

All results are expressed in mg/kg

Italics: A value equal to the PQL has been used for the calculation of RPDs

BOLD RPD exceeds acceptable levels.

Table H4 Summary results of QA/QC - Rinsates and trip blanks

Samuel Gilbert Public School DSI

Ridgecrop Drive, Caste Hill, NSW

Type of sample	Rinsate blanks	Rinsate blanks	Trip blanks/spikes	
Sample ID	R_11072018	R_12072018	TB01	TS01
Date sampled	11/07/18	12/07/18	11/07/18	11/07/18
Laboratory report no.	607407	607407	607407	607407
Total recoverable hydrocarbons				
F1: C6-C10 less BTEX	<20	<20	<20	
F2: >C10-C16 less naphthalene	<100	<100	-	-
>C10-C16	<100	<100	-	-
F3: >C16-C34	<100	<100	-	-
F4: >C34-C40	<100	<100	-	-
Total >C10 - C40	<100	<100	-	-
C6-C9	<20	<20	-	-
C10-C14	<50	<50	-	-
C15-C28	<100	<100	-	-
C29-C36	<50	<50	-	-
Total C10-C36	<50	<50	-	-
Aromatic hydrocarbons				
Benzene	<1	<1	<0.2	91%
Toluene	<1	<1	<0.5	100%
Ethylbenzene	<1	<1	<0.5	100%
m- & p-Xylene	<2	<2	<0.5	100%
o-Xylene	<1	<1	<0.5	110%
Total Xylenes	<3	<3	<0.5	110%
Naphthalene	<10	<10	<0.5	-
Polycyclic aromatic hydrocarbons				
Naphthalene	<1.0	<1.0	-	-
Acenaphthylene	<1.0	<1.0	-	-
Acenaphthene	<1.0	<1.0	-	-
Fluorene	<1.0	<1.0	-	-
Phenanthrene	<1.0	<1.0	-	-
Anthracene	<1.0	<1.0	-	-
Fluoranthene	<1.0	<1.0	-	-
Pyrene	<1.0	<1.0	-	-
Benz(a)anthracene	<1.0	<1.0	-	-
Chrysene	<1.0	<1.0	-	-
Benzo(b+j)fluoranthene	<1.0	<1.0	-	-
Benzo(k)fluoranthene	<1.0	<1.0	-	-
Benzo(a)pyrene	<0.5	<0.5	-	-
Indeno(1.2.3.cd)pyrene	<1.0	<1.0	-	-
Dibenz(a.h)anthracene	<1.0	<1.0	-	-
Benzo(g.h.i)perylene	<1.0	<1.0	-	-
Total PAH	<0.5	<0.5	-	-
Benzo(a)pyrene TEQ	<0.5	<0.5	-	-
Total dissolved metals				
Arsenic	<0.001	<0.001	-	
Cadmium	<0.0001	<0.0001	-	
Chromiium	<0.001	<0.001	-	
Copper	<0.001	<0.001	-	
Nickel	<0.001	<0.001	-	
Lead	<0.001	<0.001	-	
Zinc	<0.005	<0.005	-	
Mercury	<0.0001	<0.0001	-	

APPENDIX I

BORELOGS

TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

HA01

SHEET 1 OF 1

Client:	**Fulton Trotter Architects**	Date Commenced:	**11/7/18**
Project:	**Samuel Gilbert Public School**	Date Completed:	**11/7/18**
Test Pit Location:	**Ridgecrop Dr, Castle Hill NSW 2154**	Recorded By:	**AW**
Project Number:	**Ps110639**	Log Checked By:	

Excavation Method:

Surface RL:

Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
		PID=0.1 ppm				Silty Clay: Medium plasticity, orange/brown, low strength	D			HA01_0.4
	0.60					Sandstone: White/yellow, high strength				
	1					END OF TEST PIT AT 0.70 m				

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TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

HA02

SHEET 1 OF 1

Client:	**Fulton Trotter Architects**	Date Commenced:	**11/7/18**
Project:	**Samuel Gilbert Public School**	Date Completed:	**11/7/18**
Test Pit Location:	**Ridgecrop Dr, Castle Hill NSW 2154**	Recorded By:	**AC**
Project Number:	**Ps110639**	Log Checked By:	

Excavation Method:

Surface RL:

Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY: VS S F ST VST H / FB VL L MD D VD	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
						Silty Clay: medium plasticity, orange/brown, low strength, siltstone inclusions	D			HA02_0.4
	1					END OF TEST PIT AT 0.50 m				

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TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

HA03

SHEET 1 OF 1

Client:	**Fulton Trotter Architects**	Date Commenced:	**12/7/18**
Project:	**Samuel Gilbert Public School**	Date Completed:	**12/7/18**
Test Pit Location:	**Ridgecrop Dr, Castle Hill NSW 2154**	Recorded By:	**AC**
Project Number:	**Ps110639**	Log Checked By:	

Excavation Method:

Surface RL:

Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
		PID=0.1 ppm				Sandy silt: fine grained, brown loose, inclusions of organic material, roots and plastic				HA03_0.1
	0.50					Silty Clay: low plasticity, light brown, low strength and large siltstone inclusions <60mm and roots				
		PID=0.1 ppm					D			HA03_0.9
	1					END OF TEST PIT AT 1.50 m				

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TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

HA04

SHEET 1 OF 1

Client:	**Fulton Trotter Architects**	Date Commenced:	**12/7/18**
Project:	**Samuel Gilbert Public School**	Date Completed:	**12/7/18**
Test Pit Location:	**Ridgecrop Dr, Castle Hill NSW 2154**	Recorded By:	**AC**
Project Number:	**Ps110639**	Log Checked By:	

Excavation Method:

Surface RL:

Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY: VS S F ST VST H / FB VL L MD D VD	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
		PID=0.1 ppm				Silty Gravelly Sand: dark brown, loose, inclusions of angular rock, organic matter and plastic	D			HA04_0.1
	0.20					Silty Clay: low plasticity, light brown, low strength with inclusions of siltstone and organic matter				
		PID=0.1 ppm								HA04_0.7
	0.80					Sandstone: white/yellow, hard				
						END OF TEST PIT AT 0.90 m				
	1									

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TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

HA05

SHEET 1 OF 1

Client:	**Fulton Trotter Architects**	Date Commenced:	**12/7/18**
Project:	**Samuel Gilbert Public School**	Date Completed:	**12/7/18**
Test Pit Location:	**Ridgecrop Dr, Castle Hill NSW 2154**	Recorded By:	**AC**
Project Number:	**Ps110639**	Log Checked By:	

Excavation Method:

Surface RL:

Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
		PID=0.1 ppm				Sandy silt: fine to medium grained, loose, dark brown, inclusions of organic matter and small rocks				HA05_0.1
	0.15					Silty Clay: low plasticity, light brown, low strength, siltstone inclusions <50mm				
		PID=0.1 ppm					D			HA05_0.4
	1					END OF TEST PIT AT 0.60 m				Refusal - potentiall concrete slab

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TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

HA06

SHEET 1 OF 1

Client:	**Fulton Trotter Architects**	Date Commenced:	**12/7/18**
Project:	**Samuel Gilbert Public School**	Date Completed:	**12/7/18**
Test Pit Location:	**Ridgecrop Dr, Castle Hill NSW 2154**	Recorded By:	**AC**
Project Number:	**Ps110639**	Log Checked By:	

Excavation Method:

Surface RL:

Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
		PID=0.1 ppm				Sandy Silt: dark brown, loose, inclusions of organic matter, woodchips, plastic and blue metal	M			HA06_0.1
	0.20					Silty Clay: low plasticity, light brown, low strength, inclusions of siltstone <40mm and roots				
		PID=0.1 ppm					D			HA06_0.5
	0.90					Sandstone: red/white/yellow, hard				
	1					END OF TEST PIT AT 1.10 m				

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TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

HA07

SHEET 1 OF 1

Client:	**Fulton Trotter Architects**	Date Commenced:	**12/7/18**
Project:	**Samuel Gilbert Public School**	Date Completed:	**12/7/18**
Test Pit Location:	**Ridgecrop Dr, Castle Hill NSW 2154**	Recorded By:	**AC**
Project Number:	**Ps110639**	Log Checked By:	

Excavation Method:

Surface RL:

Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
		PID=0.1 ppm				Sandy Silt: fine grained, brown, loose, dry, inclusions of organic material	D			HA02_0.2 QA01/QA01A
	0.30					Silty Clay: medium plasticity, light brown, moist, medium strength, inclusions of siltstone	M			
	0.90					Clay: Low plasticity, red/yellow mottles, high strength, moist				
	1	PID=0.1 ppm					M			HA07_1.2
						END OF TEST PIT AT 1.50 m				

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TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

HA08

SHEET 1 OF 1

Client:	**Fulton Trotter Architects**	Date Commenced:	**12/7/18**
Project:	**Samuel Gilbert Public School**	Date Completed:	**12/7/18**
Test Pit Location:	**Ridgecrop Dr, Castle Hill NSW 2154**	Recorded By:	**AC**
Project Number:	**Ps110639**	Log Checked By:	

Excavation Method:

Surface RL:

Co-ords:

Test Pit Information				Field Material Description						
1	2		3	4	5	6	7	8	9	10	11
WATER	RL(m)	DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY VS S F ST VST H / FB VL L MD D VD	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
							Sandy Silt: fine grained, dark brown, loose, slightly moist, inclusions of organic material, roots, mulch, large sandstone rocks and bricks.				HA08_0.2
							END OF TEST PIT AT 0.50 m				Refusal

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TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

Ha09

SHEET 1 OF 1

Client:	**Fulton Trotter Architects**	Date Commenced:	**12/7/18**
Project:	**Samuel Gilbert Public School**	Date Completed:	**12/7/18**
Test Pit Location:	**Ridgecrop Dr, Castle Hill NSW 2154**	Recorded By:	**AC**
Project Number:	**Ps110639**	Log Checked By:	

Excavation Method:

Surface RL:

Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY: VS S F ST VST H / FB VL L MD D VD	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
		PID=0.1 ppm				Sandy Silt: fine grained, dark brown, loose, inclusions of mulch and organic matter				HA09_0.2 QA02/QA02A
	0.20					Silty clay: low plasticity, light brown, dry, low strength, large siltstone inclusions <50mm				
	0.80	PID=0.1 ppm				CLAY: low plasticity, red/yellow mottles, high strength, sandstone inclusions				HA09_0.8
	1					END OF TEST PIT AT 1.00 m				

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TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

TP01

SHEET 1 OF 1

Client:	**Fulton Trotter Architects**	Date Commenced:	**7/11/18**
Project:	**Samuel Gilbert Public School**	Date Completed:	**7/11/18**
Test Pit Location:	**Ridgecrop Dr, Castle Hill NSW 2154**	Recorded By:	**AC**
Project Number:	**PS110639**	Log Checked By:	

Excavation Method:

Surface RL:

Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (FB VS, VL S, L F, MD ST, D VST, VD H)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0.15					Fill: Silty SAND: brown, dry, loose, woodchips, small rock inclusions and organic material				
		PID=0.2 ppm	B&J			Fill: Silty CLAY, brown, dry, low strength				TP01_0.4
	0.50					Silty Clay: orange/brown, low strength, siltstone inclusions				
	1					END OF TEST PIT AT 0.75 m				

This test pit log should be read in conjunction with WSP's accompanying standard notes.

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TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

TP03

SHEET 1 OF 1

Client:	**Fulton Trotter Architects**	Date Commenced:	**7/11/18**
Project:	**Samuel Gilbert Public School**	Date Completed:	**7/11/18**
Test Pit Location:	**Ridgecrop Dr, Castle Hill NSW 2154**	Recorded By:	**AC**
Project Number:	**PS110639**	Log Checked By:	

Excavation Method:

Surface RL:

Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
						FILL: Silty SAND: brown, dry, loose, inclusions of organic material and roots				
	0.15					Clay, medium plasticity, red/orange/brown mottled, high strength, small rock inclusions <30mm				
		PID=0.1 ppm								TP03_0.1
	0.40					Shale: weathered, dry, red/orange/white				
		PID=0.1 ppm								TP03_0.6
	1					END OF TEST PIT AT 0.80 m				

This test pit log should be read in conjunction with WSP's accompanying standard notes.

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TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

TP04

SHEET 1 OF 1

Client:	**Fulton Trotter Architects**	Date Commenced:	**7/11/18**
Project:	**Samuel Gilbert Public School**	Date Completed:	**7/11/18**
Test Pit Location:	**Ridgecrop Dr, Castle Hill NSW 2154**	Recorded By:	**AC**
Project Number:	**PS110639**	Log Checked By:	

Excavation Method:

Surface RL:

Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (FB VL L MD D VD / VS S F ST VST H)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
		PID=0.2 ppm				Fill: Silty SAND; fine to medium grained, brown, loose, dry, inclusions of organic material and leaf matter	D			TP04_0.1
	0.15					Fill: Silty CLAY; medium plasticity, brown/orange, low strength, inclusions of organic material				
	0.40					Weathered Sandstone: red/white/orange, hard, low strength				
		PID=0.1 ppm								TP04_0.8
	1					END OF TEST PIT AT 1.00 m				

This test pit log should be read in conjunction with WSP's accompanying standard notes.

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TEST PIT NO.

TEST PIT ENVIRONMENTAL LOG

TP05

SHEET 1 OF 1

Client:	**Fulton Trotter Architects**	Date Commenced:	**7/11/18**
Project:	**Samuel Gilbert Public School**	Date Completed:	**7/11/18**
Test Pit Location:	**Ridgecrop Dr, Castle Hill NSW 2154**	Recorded By:	**AC**
Project Number:	**PS110639**	Log Checked By:	

Excavation Method:

Surface RL:

Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0.10	PID=0.1 ppm				FILL: Silty SAND; fine to medium grained, brown, loose, dry, inclusions of organic material				TP05_0.2
						Fill: Silty Clay, medium plasticity, brown, dry, low strength				
	0.50					Clay: low plasticity, orange/brown, dry, low strength, inclusions of ironstone <70mm, weathered sandstone, orangic material and roots.				
	1	PID=0.1 ppm								TP05_1.1
						END OF TEST PIT AT 1.20 m				

This test pit log should be read in conjunction with WSP's accompanying standard notes.

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TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

TP06

SHEET 1 OF 1

Client:	**Fulton Trotter Architects**	Date Commenced:	**7/11/18**
Project:	**Samuel Gilbert Public School**	Date Completed:	**7/11/18**
Test Pit Location:	**Ridgecrop Dr, Castle Hill NSW 2154**	Recorded By:	**AC**
Project Number:	**PS110639**	Log Checked By:	

Excavation Method:

Surface RL:

Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
						FILL: Silty CLAY: low plasticity, brown, dry, low strength, small gravel inclusions				
	0.10					Silty CLAY: brown, dry, loose, inclusions of organic material and roots				
		PID=0.2 ppm								TP06_0.3
	0.70	PID=0.1 ppm				Weathered Sandstone: white/red/yellow, low strength				TP06_1.2
	1					END OF TEST PIT AT 1.20 m				

This test pit log should be read in conjunction with WSP's accompanying standard notes.

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TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

TP07

SHEET 1 OF 1

Client:	**Fulton Trotter Architects**	Date Commenced:	**7/11/18**
Project:	**Samuel Gilbert Public School**	Date Completed:	**7/11/18**
Test Pit Location:	**Ridgecrop Dr, Castle Hill NSW 2154**	Recorded By:	**AC**
Project Number:	**PS110639**	Log Checked By:	

Excavation Method:

Surface RL:

Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0.10					FILL: Silty SAND: brown, dry, loose, inclusions of organic material and roots				
						Silty Clay: low plasticitym, dry, low strength				
		PID=0.1 ppm								TP07_0.3
	0.50					Weathered Sandstone: White/red/yellow, low strength				
		PID=0.1 ppm								TP07_0.9
	1					END OF TEST PIT AT 1.10 m				

This test pit log should be read in conjunction with WSP's accompanying standard notes.

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TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

TP08

SHEET 1 OF 1

Client:	**Fulton Trotter Architects**	Date Commenced:	**7/11/18**
Project:	**Samuel Gilbert Public School**	Date Completed:	**7/11/18**
Test Pit Location:	**Ridgecrop Dr, Castle Hill NSW 2154**	Recorded By:	**AW**
Project Number:	**PS110639**	Log Checked By:	

Excavation Method:

Surface RL:

Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
						Silty Sand: loose, brown, inclusions of organic matter				
	0.10	PID=0.1 ppm				Silty Clay: low plasticty, orange/brown, low strength				TP08_0.1
	0.40					Sandstone: Natural, white/orange/red, hard				
		PID=0.1 ppm								TP08_0.6
						END OF TEST PIT AT 0.90 m				
	1									

This test pit log should be read in conjunction with WSP's accompanying standard notes.

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TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

TP09

SHEET 1 OF 1

Client:	**Fulton Trotter Architects**	Date Commenced:	**7/11/18**
Project:	**Samuel Gilbert Public School**	Date Completed:	**7/11/18**
Test Pit Location:	**Ridgecrop Dr, Castle Hill NSW 2154**	Recorded By:	**AW**
Project Number:	**PS110639**	Log Checked By:	

Excavation Method:

Surface RL:

Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
						FILL: Silty SAND: brown, loose, dry, inclusions of organic matter				
	0.10	PID=0.1 ppm				Silty Clay: coarse grained, orange, dry, loose, low strength				TP09_0.1
	0.70					Sandstone: fine grained, orange/red, hard				
		PID=0.1 ppm								TP09_0.8
	1									
						END OF TEST PIT AT 1.10 m				

This test pit log should be read in conjunction with WSP's accompanying standard notes.

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TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

TP10

SHEET 1 OF 1

Client:	**Fulton Trotter Architects**	Date Commenced:	**7/11/18**
Project:	**Samuel Gilbert Public School**	Date Completed:	**7/11/18**
Test Pit Location:	**Ridgecrop Dr, Castle Hill NSW 2154**	Recorded By:	**AW**
Project Number:	**PS110639**	Log Checked By:	

Excavation Method:

Surface RL:

Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST / FB VL L MD D VD H)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
		PID=0.2 ppm				FILL: Silty Clayey SAND: dark brown, moist, inclusions of organic matter, small blue gravels and small white/dark grey rocks with air bubbles				TP10_0.1
	0.20					Silty Clay: high plasticty, dark orange, moist, low strength				
		PID=0.1 ppm								TP10_0.8
	1.00 1					Sandstone: fine grained, white/yellow/red, dry, hard				
						END OF TEST PIT AT 1.10 m				

This test pit log should be read in conjunction with WSP's accompanying standard notes.

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TEST PIT NO.

TEST PIT ENVIRONMENTAL LOG

TP11

SHEET 1 OF 1

Client:	**Fulton Trotter Architects**	Date Commenced:	**7/11/18**
Project:	**Samuel Gilbert Public School**	Date Completed:	**7/11/18**
Test Pit Location:	**Ridgecrop Dr, Castle Hill NSW 2154**	Recorded By:	**AW**
Project Number:	**PS110639**	Log Checked By:	

Excavation Method:

Surface RL:

Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
		PID=0.1 ppm				FILL: Silt; dark brown, moist, inclusions of plastic, bitumen, roots and organic matter				TP11_0.1
	0.50					Clayey Sand: medium plasticty, stiff, moist, orange, plastic inclusions				
	1.00 1	PID=0.2 ppm				Weathered Sandstone: Red/yellow/white, moist, hard				TP11_1.0
						END OF TEST PIT AT 1.45 m				

This test pit log should be read in conjunction with WSP's accompanying standard notes.

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TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

TP12

SHEET 1 OF 1

Client:	**Fulton Trotter Architects**	Date Commenced:	**7/11/18**
Project:	**Samuel Gilbert Public School**	Date Completed:	**7/11/18**
Test Pit Location:	**Ridgecrop Dr, Castle Hill NSW 2154**	Recorded By:	**AW**
Project Number:	**PS110639**	Log Checked By:	

Excavation Method:

Surface RL:

Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
						FILL: Silty Sand; inclusions of leaves and sticks, dry				
	0.10	PID=0.4 ppm				Silty Sand: low plasticity, orange, dry, low strength				TP12_0.1
	0.90	PID=0.1 ppm				Weathered Sandstone: Red/yellow/white, low strength				TP12_0.9
	1									
						END OF TEST PIT AT 1.30 m				

This test pit log should be read in conjunction with WSP's accompanying standard notes.

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APPENDIX P – GEOTECHNICAL SURVEY REPORT

REPORT

TO
FULTON TROTTER ARCHITECTS

ON
GEOTECHNICAL INVESTIGATION

FOR
PROPOSED NEW BUILDINGS

AT
SAMUEL GILBERT PUBLIC SCHOOL
RIDGECROP DRIVE, CASTLE HILL, NSW

19 June 2018
Ref: 31056Srptrev1

JK Geotechnics
GEOTECHNICAL & ENVIRONMENTAL ENGINEERS

PO Box 976, North Ryde BC NSW 1670
Tel: 02 9888 5000 Fax: 02 9888 5003
www.jkgeotechnics.com.au

Jeffery & Katauskas Pty Ltd, trading as JK Geotechnics ABN 17 003 550 801

Date: 19 June 2018
Report No: 31056Srptrev1
Revision No: 1

Report prepared by:

Paul Stubbs
Principal I Geotechnical Engineer

For and on behalf of
JK GEOTECHNICS
PO Box 976
NORTH RYDE BC NSW 1670

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BOREHOLE LOGS 101 TO 103 INCLUSIVE
CORE PHOTOGRAPHS
DYNAMIC CONE PENETRATION TEST RESULTS No 6
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1 INTRODUCTION

This report presents the results of a two-stage geotechnical investigation for the proposed alterations and additions at Samuel Gilbert Public School, Ridgecrop Drive, Castle Hill, NSW. A site location plan is presented as Figure 1. The investigations were commissioned by John Kennedy of Fulton Trotter by email dated 9 November 2017 and letter dated 21 May 2018. The commissions were on the basis of our proposals (Ref. P45897Srev1 dated 20 October 2017 and 31056Sprop dated 7 May 2018).

The purpose of the investigations was to obtain geotechnical information on subsurface conditions as a basis for comments and recommendations on excavation conditions and support, retaining walls, footings and on-grade floor slabs and soil aggression. Details of the proposed development are not known at the time of preparing this report though in general terms it is proposed to create 15 new teaching spaces to replace 11 demountable buildings. New buildings are expected to be between one and three stories in height. The larger buildings will be situated in the southern part of the site adjoining Ridgecrop Drive.

We were also commissioned to carry out a Waste Classification Assessment. The results are presented in the report (E31057K dated December 2017) prepared by Environmental Investigation Services (EIS), the environmental consulting division of the JK Group. This geotechnical report must be read in conjunction with the EIS report.

2 INVESTIGATION PROCEDURE

The first stage of fieldwork for the investigation comprised the auger drilling of eight boreholes (BH1 to BH8). Seven of the boreholes were auger drilled to depths between 1.5m and 4.5m using our track mounted JK305 drilling rig. One borehole location was inaccessible to the rig and so a hand augered borehole and Dynamic Cone penetration (DCP) test were completed.

The second stage of fieldwork involved drilling three additional boreholes using our track mounted JK308 drilling rig. The boreholes were initiated by auger drilling until high resistance or refusal was encountered and then continued by diamond core drilling using NMLC equipment and water flush. Approximately 3m of core were recovered from each borehole and the drilling was terminated at depths between 4.2m and 5.9m.

The borehole locations, as indicated on attached Figure 2A and 2B, were set out using taped measurements from existing surface features and were electromagnetically scanned for buried services prior to drilling commencing. Ground levels at Boreholes BH101 to BH103 were interpolated from spot levels shown on the supplied survey plan prepared by LandPartners Ltd and hence are only approximate.

The nature and composition of the subsurface soil and rock horizons were assessed by logging the materials recovered during drilling. The relative strength of the subsoils was assessed from the Standard Penetration Test (SPT) 'N' numbers augmented by hand penetrometer readings on clay samples recovered in the split tube SPT sampler. The strength of the underlying bedrock in the augered boreholes was assessed by observation of drilling resistance when using a tungsten carbide (TC) bit, examination of the recovered rock chip samples, and subsequent correlation with laboratory moisture content testing. Rock strength in the cored boreholes was assessed on site and later confirmed with reference to point load strength index tests completed on the core samples. The hand augered borehole and DCP test both refused at shallow depth which is considered likely to correspond to the bedrock surface. Groundwater observations were made during and on completion of drilling individual boreholes. Long term groundwater monitoring was not carried out. For further details on the investigation procedures adopted, reference should be made to the attached Report Explanation Notes.

Our geotechnical engineer was present full time on site during the fieldwork and set out the borehole locations, directed electromagnetic scanning, nominated sampling and testing, and logged the subsurface profile. The borehole logs are presented with this report together with a glossary of logging terms and symbols used and colour photographs of the recovered rock core.

Rock chip samples were submitted to Soil Test Services Pty Ltd (STS) for moisture content testing. The test results are presented in attached STS Table A. The point load strength test results are presented in Table B and plotted on the borehole logs. Selected samples were submitted to Envirolab Services Pty Ltd for soil pH, resistivity, chloride and sulphate content testing; the test results are summarised in Section 3.3 below and the Envirolab Services 'Certificate of Analysis' which is attached.

3 RESULTS OF INVESTIGATION

3.1 Site Description

The site is situated in hilly terrain generally sloping down to the south-east at 4-6°. The site slopes at a similar grade as the general terrain and was bound by Gilbert Road and Ridgecrop Drive to the east and south respectively.

At the time of the investigation the southern end of the site was occupied by one and two storey brick buildings with demountable classrooms on brick piers on their northern and eastern sides. An on grade asphaltic concrete (AC) car park and associated access roads located on the western side of the site were generally in good condition with isolated cracking in places. A concrete basketball court and small shelter structures were located at the north-western corner of the site. An approximately level grassed playing field was located at the northern end of the site. Bushland was located adjacent to the north, south and west of the buildings and playing field and extended beyond the site's northern and western boundaries. Medium to large trees were observed within the bushland and scattered throughout the site within planter beds.

At the time of the fieldwork, all structures mentioned above appeared to be in good condition based on a cursory inspection from within the subject site.

3.2 Subsurface Conditions

The 1:100,000 geological map of Sydney indicates that the site is underlain by the Hawkesbury Sandstone. The investigation has revealed a subsurface profile generally comprising a shallow cover of sandy soils overlying weathered sandstone. Groundwater was not encountered within the depths investigated. Reference should be made to the attached borehole logs for detailed subsurface conditions at specific locations. A graphical summary of the augered boreholes is presented in Figure 3 and a summary of the subsurface conditions, as encountered, is presented below:

Fill

Fill comprising silty sand with a trace of gravel was encountered only in BH 3 to 0.2m depth. In BH101 to BH103 the surface topsoil layer is logged as fill and was only 100mm in thickness.

Residual Soil

The natural soil cover is probably residual in origin but may also be slopewash. It comprises a fine to medium grained silty sand.

Sandstone Bedrock

Sandstone was encountered at depths between 0.1m and 0.5m at all borehole locations. In most locations there was an upper layer of extremely low to very low strength material but at depths between 0.7m and 1.1m there is a transition to low strength and from between 1.2m and 2.5m an increase to medium to high strength. Most augered boreholes were terminated at or close to Tungsten Carbide bit refusal which is consistent with the medium to high strength assessment.

Groundwater

No groundwater was encountered within the depth of investigation. Water levels recorded in the cored boreholes on completion were almost certainly due to the drill flush water which had not had time to drain away.

3.3 Laboratory Test Results

The moisture content test results were generally consistent with the field assessments of rock strength. The point load strength index tests showed rock strengths (UCS calculated empirically from point load results) ranging from 18MPa to 30 MPa.

The soil chemistry testing showed the following:

- pH values between 5.0 and 6.7 which is slightly acidic;
- Chloride contents between 20 and 89 mg/kg which are low;
- Sulphate contents between 10mg/kg and 44mg/kg which are low;
- Resistivity between 14000 ohm.cm and 44,000 ohm.cm which are quite high.

In light of the above the results indicate a mild aggression potential for buried concrete and non-aggressive condition for steel structures, in accordance with the guidelines in AS2159-2009.

Based on the borehole logs and laboratory test results, the bedrock classifications in accordance with the Pells *et* al (1998) system, in the table below, apply to the sandstone bedrock encountered.

Borehole	Surface RL (m AHD)	Depth (m)			
		Class V	Class IV	Class III	Class II/I
101	~98.1	0.1 - 1.0	1.0 – 2.5	2.5 – 3.0	3.0 – 5.9
102	~99.1	0.1 – 0.9	0.9 – 2.91	-	2.91 – 4.2
103	~97.2	0.1 – 0.9	0.9 – 1.2	-	1.2 – 4.3

Note that the rock class of the deepest layer assumes the rock quality below the termination depth of the borehole does not decrease which is not necessarily the case. The zone of influence of a footing is taken as 1.5 times its width/diameter.

4 COMMENTS AND RECOMMENDATIONS

4.1 Summary of Principal Geotechnical Findings and Issues

The boreholes encountered a fairly consistent subsurface profile of very minor surficial fill underlain by residual sandy soils that overlie sandstone bedrock at shallow depths in the range of 0.1m to 0.5m.

Based on the above known subsurface conditions, the following are considered to be principal geotechnical issues for prospective development of typical one to three storey school buildings, associated structures and pavements. It must be noted that the recommendations are of a general nature as we have no details of the proposed developments.

1. The presence of fill of generally minor thicknesses is not generally sufficient to result in a site classification of Class P in accordance with AS2870-2011.
2. Sandstone bedrock is at such shallow depth that all footings should be supported uniformly upon it.
3. Any significant excavation to regrade the site will encounter sandstone bedrock and “hard rock” excavation equipment will be needed. This will also affect buried service installation.
4. The sandy soils will form a moderate subgrade for pavement construction but will require care in preparation including careful moisture control to enable good compaction.

4.2 Excavation Conditions

4.2.1 Excavation Methods

Based on the investigation results, even shallow excavation will encounter the sandstone bedrock.

The soil cover should be readily excavated by conventional earthworks equipment (eg. hydraulic excavator). Some of the underlying weathered sandstone of extremely and very low strength, if encountered, may also be excavated by large bucket excavator, possibly with some ripping. However, we expect excavation of medium strength and stronger sandstone would be most effectively excavated using hydraulic impact rock hammers. This equipment would also be required for breaking up of boulders or blocks, for trimming rock excavation side slopes and for detailed rock excavations such as for footings or buried services.

4.2.2 Excavation Techniques

We recommend that considerable caution be taken during rock excavation on this site as there will likely be direct transmission of ground vibrations to adjoining structures and buildings. Prior to excavation commencing, consideration should be given to preparing detailed dilapidation reports on the existing buildings so that careless work by the contractor can be clearly identified. Excavation procedures and the dilapidation reports should be carefully reviewed prior to excavation commencing so that appropriate equipment is used.

The excavation with hydraulic rock hammers, if used, should preferably commence away from likely critical areas using a moderately sized excavator fitted with a relatively low energy hydraulic hammer no larger than a Krupp 900 size or equivalent. We commend that continuous quantitative vibration monitoring be undertaken on the closest buildings during rock excavations with impact hammers. Subject to review of the dilapidation reports, we recommend that vibrations on the existing buildings, measured as Peak Particle Velocity (PPV), be limited to no higher than 5mm/sec. If it is confirmed that higher vibrations are measured, they should be assessed against the attached Vibration Emission Design Goals sheet, as higher vibrations may be acceptable, depending on the associated vibration frequency. If it is confirmed that transmitted vibrations are excessive, it would be necessary to change to a considerably smaller rock hammer or to use alternative excavation techniques. Alternative excavation techniques which will significantly reduce vibrations include a rotary grinder or the use of grid sawing in conjunction with ripping and/or hammering. The vibrations due to rock hammering or ripping may be further dampened by providing a vertical saw cut slot along the perimeter of the excavation and maintaining the base of the slot at a lower level than the adjoining rock excavation at all times. When using a rock saw or rotary grinder the resulting dust must be suppressed by spraying with water.

The following procedures are recommended to reduce vibrations if rock hammers are used.

- Maintain rock hammer orientated towards the face and enlarge excavation by breaking small wedges off the face.
- Operate hammer in short bursts only to reduce amplification of vibrations.
- Use excavation contractors with experience in confined work with a competent supervisor who is aware of vibration damage risks, possible rock face instability issues etc. The contractor should be provided with a copy of this report and have all appropriate statutory and public liability insurances.

4.3 Excavation Batters

Temporary batter slopes will likely be feasible for the perimeter of any proposed excavations. Temporary batters through the sandy soils should be no steeper than 2 Horizontal (H) to 1 Vertical (V) and all bedrock up to and including low strength should be battered at not steeper than 1 Vertical (V) in 1 Horizontal (H). At the toe of such batters and at the soil rock interface some seepage may occur following wet weather and it may be necessary to flatten batters or to provide some other local toe support, where there is a risk of instability.

Permanent batters should be no steeper than 2H:1V and protected by vegetation or hard surfacing. Flatter batters of at least 3H:IV are strongly recommended to allow maintenance of vegetation etc. It is very difficult to establish topsoil and vegetation on slopes as steep as 2H:1V.

Sandstone of medium or high strength may be cut vertically subject to geotechnical inspection to identify whether there are any adverse defects in the rock that would give rise to instability. Faces should be inspected at vertical intervals no greater than 1.5m and allowance made in the contract for stabilisation works such as rock bolts and shotcrete.

Surcharge loads, including construction loads, must be kept well clear of the crest of temporary batters (at least 2H from the crest, where H is the vertical height of the batter slope in metres).

Where temporary batters are formed to allow construction of retaining walls, consideration needs to be given to the type of backfill to be used against permanent basement and/or lower ground floor walls. Uncompacted backfill placed up against walls will result in large settlements which can have adverse effects on structures, paving or landscaping supported above. Compaction will be difficult in confined spaces with light equipment and therefore the backfill placed against the permanent retaining walls should preferably comprise a uniform durable granular material such as blue metal which is surrounded in a geotextile fabric.

4.4 Retaining Walls

Retaining walls may be required to support low height cuts and/or fills. The following characteristic earth pressure coefficients and subsoil parameters may be adopted for the design of such retention systems including cantilevered soldier pile shoring type walls.

- For free-standing cantilever walls located in areas where movement is of little concern (ie. where grassed or garden areas are being retained), adopt a triangular lateral earth pressure

distribution and an "active" earth pressure coefficient (K_a) of 0.35 for the soil profile and weathered sandstone, assuming a horizontal backfill surface.

- For free-standing cantilever walls located in areas where movement is of concern (ie. where the walls are supporting proposed on-grade floor slabs and external pavements), adopt a triangular lateral earth pressure distribution and an "at rest" earth pressure coefficient (K_0) of 0.55 for the retained profile, assuming a horizontal backfill surface.
- For retaining walls incorporated into and supported by propping from the proposed new buildings, adopt the above K_0 value, assuming a horizontal backfill surface.
- A bulk unit weight of 20kN/m^3 should be adopted for the soil profile and 24kN/m^3 for weathered sandstone.
- Any surcharge affecting the walls (eg. construction traffic, pavement and ground floor slab loads, compaction stresses during backfilling, etc.) should be allowed in the design using the appropriate above earth pressure coefficients.
- The retaining walls should be designed as permanently drained. Subsurface drains should incorporate a non-woven geotextile filter fabric such as Bidim A34 to control subsoil erosion.
- The passive lateral toe resistance for retaining walls founded in weathered sandstone may be designed for an allowable lateral resistance of 200kPa. The upper 0.3m below bulk excavation level should be ignored in the design to cater for excavation tolerances.
- Following retaining wall construction and backfilling, we recommend that a dish drain be provided immediately uphill of the walls to intercept surface water run-off. The discharge from such drains should be piped to the stormwater system.

4.5 Subgrade Preparation

The proposed development may require the removal of existing trees (including their root balls), stripping of grass, topsoil and root-affected soil, and any poorly compacted, deleterious or contaminated existing fill. Stripped topsoil and root affected soils should be stockpiled separately as they are not suitable for reuse as engineered fill. They may be reused at a later stage for landscaping purposes. The site can then be excavated down to design subgrade level using hydraulic excavators.

Following stripping and excavation, we recommend that the subgrade be inspected by a geotechnical engineer and any poor quality material removed. If the fill is to support structures then all existing fill should be removed. Some fill may be suitable for replacement as engineered fill, if it is appropriately moisture conditioned. The surface should then be proof rolled with at least eight passes of a static smooth drum roller (at least 8 tonnes deadweight). The final two passes of proof

rolling should be carried out under the direction of an experienced geotechnical engineer for the detection of unstable or soft areas.

Subgrade heaving may occur if the subgrade becomes “saturated” or there are areas of poorly compacted fill. Heaving areas should be locally removed to a stable base and replaced with engineered fill, or further advice could be sought. Engineered fill should also be used where site levels need to be raised.

4.6 Engineered Fill

The excavated sandy soils and ripped sandstone may be reused as engineered fill. Material must be free of organic matter and free of particle sizes greater than 75mm prior to reuse as engineered fill. The select engineered fill should be compacted in maximum 200mm loose layers using a minimum 8 tonne static roller to a minimum density of 98% of SMDD. Clay soils and ripped shale should not be brought onto the site for use as engineered fill.

4.7 Footings

The proposed buildings should be uniformly supported on the underlying sandstone bedrock. The site classifies as Class A in its current condition.

Strip or pad footings bearing on the upper weathered sandstone (Class V) may be designed for an allowable bearing pressure (ABP) of 700kPa increasing to 1000kPa on the low strength sandstone (Class IV) which generally occurs within 1m of the rock surface and 3500kPa for the Class III or better sandstone. Unless there is significant excavation it would be necessary to use bored piers to found on the Class III or better sandstone; rigs would need to be able to penetrate medium strength sandstone to reach the consistently better quality rock.

All footings should be free of any loose or softened material and any water prior to concreting. At least a selection of footings should be inspected by a geotechnical engineer to confirm conditions are in accordance with expectations.

4.8 Ground Floor Slabs and Pavements

Slab-on-grade construction for the proposed buildings are considered feasible provided the subgrade is prepared as discussed in Section 4.5. The slabs-on-grade should be constructed

independent of the building footings and walls (ie. designed as “floating” slabs) to permit relative movement.

Based on the laboratory test results we recommend that the design of pavements and concrete slabs be based on an estimated CBR of 5%. For pavements subject to heavy vehicle traffic there will need to a 300mm thick capping layer of material with a CBR of at least 10%. This can be a product such as crushed/ripped sandstone.

Building slabs-on-grade and light duty concrete pavements should be supported on at least a 100mm thick sub-base of good quality fine crushed rock such as RTA Specification 3051 unbound base (eg. DGB20) or similar quality, and compacted to a minimum density of 100% of SMDD. The sub-base material will provide a more uniform slab support and would reduce “pumping” of subgrade “fines” at joints. Slab joints should be designed to resist shear forces but not bending moments by providing dowelled or keyed joints.

Subsoil drains should be provided along the upslope perimeter of all proposed new external pavement areas, with invert levels at least 200mm below subgrade level. The drainage trench should be excavated with a uniform longitudinal fall to appropriate discharge points so as to reduce the risk of water ponding. The subgrade should be graded to promote water flow towards the subsoil drains. Discharge from the subsoil drains should be piped to the stormwater system.

4.9 Further Geotechnical Input

The following is a summary of the further geotechnical input which is required and which has been detailed in the preceding sections of this report:

- Review design when details of specific buildings are known and provide additional advice as necessary
- Inspect subgrade after stripping
- Proof roll subgrade prior to filling
- Compaction testing of fill
- Inspect footing excavations

5 GENERAL COMMENTS

The recommendations presented in this report include specific issues to be addressed during the construction phase of the project. In the event that any of the construction phase recommendations presented in this report are not implemented, the general recommendations may become inapplicable and JK Geotechnics accept no responsibility whatsoever for the performance of the structure where recommendations are not implemented in full and properly tested, inspected and documented.

The long term successful performance of floor slabs and pavements may be dependent on the satisfactory completion of the earthworks. In order to achieve this, the quality assurance program should not be limited to routine compaction density testing only. Other critical factors associated with the earthworks may include subgrade preparation, selection of fill materials, control of moisture content and drainage, etc. The satisfactory control and assessment of these items may require judgment from an experienced engineer. Such judgment often cannot be made by a technician who may not have formal engineering qualifications and experience. In order to identify potential problems, we recommend that a pre-construction meeting be held so that all parties involved understand the earthworks requirements and potential difficulties. This meeting should clearly define the lines of communication and responsibility.

Occasionally, the subsurface conditions between the completed boreholes may be found to be different (or may be interpreted to be different) from those expected. Variation can also occur with groundwater conditions, especially after climatic changes. If such differences appear to exist, we recommend that you immediately contact this office.

This report provides advice on geotechnical aspects for the proposed civil and structural design. As part of the documentation stage of this project, Contract Documents and Specifications may be prepared based on our report. However, there may be design features we are not aware of or have not commented on for a variety of reasons. The designers should satisfy themselves that all the necessary advice has been obtained. If required, we could be commissioned to review the geotechnical aspects of contract documents to confirm the intent of our recommendations has been correctly implemented.

A waste classification will need to be assigned to any soil excavated from the site prior to offsite disposal. Subject to the appropriate testing, material can be classified as Virgin Excavated Natural Material (VENM), General Solid, Restricted Solid or Hazardous Waste. Analysis takes seven to 10 working days to complete, therefore, an adequate allowance should be included in the

construction program unless testing is completed prior to construction. If contamination is encountered, then substantial further testing (and associated delays) should be expected. We strongly recommend that this issue is addressed prior to the commencement of excavation on site.

This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose. If there is any change in the proposed development described in this report then all recommendations should be reviewed. Copyright in this report is the property of JK Geotechnics. We have used a degree of care, skill and diligence normally exercised by consulting engineers in similar circumstances and locality. No other warranty expressed or implied is made or intended. Subject to payment of all fees due for the investigation, the client alone shall have a licence to use this report. The report shall not be reproduced except in full.

115 Wicks Road
Macquarie Park, NSW 2113
PO Box 976
North Ryde, BC 1670
Telephone: 02 9888 5000
Facsimile: 02 9888 5001

SOIL TEST SERVICES

ABN 43 002 145 173

TABLE A
MOISTURE CONTENT TEST REPORT

Client:	JK Geotechnics	**Ref No:**	31056S
Project:	Proposed Alterations and Additions	**Report:**	A
Location:	Samuel Gilbert Public School, Ridgecrop Drive, Castle Hill, NSW	**Report Date:**	11/12/2017
		Page 1 of 1	

AS 1289	**TEST METHOD**	**2.1.1**
BOREHOLE NUMBER	**DEPTH m**	**MOISTURE CONTENT %**
1	0.80-1.50	10.1
1	2.20-2.60	2.3
2	2.20-2.60	2.9
3	1.10-1.50	5.0
3	1.50-2.70	3.4
4	2.20-2.70	3.4
8	1.00-1.50	7.2
8	2.30-3.00	4.3

All services provided by STS are subject to our standard terms and conditions. A copy is available on request.

115 Wicks Road
Macquarie Park NSW 2113
Telephone: 02 9888 5000
Facsimile: 02 9888 5001

SOIL TEST SERVICES

TABLE B
POINT LOAD STRENGTH INDEX TEST REPORT

Client:	JK Geotechnics	**Ref No:**	31056S
Project:	Proposed alterations and additions	**Report:**	B
Location:	Samuel Gilbert Public School - Ridgecrop Drive, Castle Hill, NSW	**Report Date:**	6/06/2018
		Page 1 of 1	

BOREHOLE NUMBER	DEPTH m	$I_{S\,(50)}$ MPa	ESTIMATED UNCONFINED COMPRESSIVE STRENGTH (MPa)
BH101	2.56 - 2.59	1.0	20
	2.82 - 2.85	1.3	26
	3.21 - 3.25	1.2	24
	3.69 - 3.73	1.4	28
	4.31 - 4.35	0.9	18
	4.76 - 4.79	1.2	24
	5.21 - 5.24	1.5	30
	5.86 - 5.89	1.9	38
BH102	1.34 - 1.37	0.8	16
	1.86 - 1.89	1.1	22
	2.21 - 2.24	0.9	18
	2.57 - 2.61	0.8	16
	3.11 - 3.13	0.9	18
	3.4 - 3.44	0.8	16
	3.78 - 3.81	1.0	20
	4.11 - 4.13	0.9	18
	4.17 - 4.2	1.3	26
BH103	1.25 - 1.28	1.0	20
	1.86 - 1.89	1.0	20
	1.89 - 1.91	0.9	18
	2.24 - 2.27	1.4	28
	2.73 - 2.76	1.0	20
	3.27 - 3.3	1.6	32
	3.79 - 3.82	1.0	20
	4.22 - 4.25	1.2	24

NOTES:

1. In the above table testing was completed in the Axial direction.
2. The above strength tests were completed at the 'as received' moisture content.
3. Test Method: RMS T223.
4. For reporting purposes, the $I_{S(50)}$ has been rounded to the nearest 0.1MPa, or to one significant figure if less than 0.1MPa
5. The Estimated Unconfined Compressive Strength was calculated from the point load Strength Index by the following approximate relationship and rounded off to the nearest whole number : U.C.S. = 20 IS (50)

All services provided by STS are subject to our standard terms and conditions. A copy is available on request.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 181465

Client Details

Client	JK Geotechnics
Attention	A Frost
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**31056S, Castle Hill**
Number of Samples	3 Soil
Date samples received	06/12/2017
Date completed instructions received	06/12/2017

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

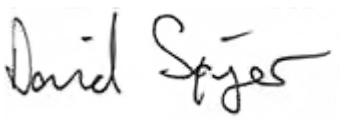
Date results requested by	13/12/2017
Date of Issue	11/12/2017

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Nick Sarlamis, Inorganics Supervisor

Authorised By



David Springer, General Manager

Misc Inorg - Soil				
Our Reference		181465-1	181465-2	181465-3
Your Reference	UNITS	BH2	BH4	BH6
Depth		0.5-0.65	0.5-0.65	0.2-0.4
Date Sampled		02/12/2017	02/12/2017	02/12/2017
Type of sample		Soil	Soil	Soil
Date prepared	-	07/12/2017	07/12/2017	07/12/2017
Date analysed	-	07/12/2017	07/12/2017	07/12/2017
pH 1:5 soil:water	pH Units	6.7	5.0	5.3
Chloride, Cl 1:5 soil:water	mg/kg	30	89	20
Sulphate, SO4 1:5 soil:water	mg/kg	44	27	<10
Resistivity in soil*	ohm m	210	140	440

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25oC in accordance with APHA 22nd ED 2510 and Rayment & Lyons. Resistivity is calculated from Conductivity.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Alternatively determined by colourimetry/turbidity using Discrete Analyer.

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			07/12/2017	[NT]	[NT]	[NT]	[NT]	07/12/2017	[NT]
Date analysed	-			07/12/2017	[NT]	[NT]	[NT]	[NT]	07/12/2017	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	102	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	[NT]	[NT]	[NT]	[NT]	113	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	[NT]	[NT]	[NT]	[NT]	105	[NT]
Resistivity in soil*	ohm m	1	Inorg-002	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

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BOREHOLE LOG

Borehole No. 1
1/1

Client: FULTON TROTTER ARCHITECTS

Project: PROPOSED ALTERATIONS AND ADDITIONS

Location: SAMUEL GILBERT PUBLIC SCHOOL, RIDGECROP DRIVE, CASTLE HILL, NSW

Job No. 31056S
Date: 2-12-17
Method: SPIRAL AUGER JK305
Logged/Checked by: A.F./P.S.
R.L. Surface: N/A
Datum:

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION						0		SM	SILTY SAND: fine to medium grained, orange brown, trace of fine to coarse grained ironstone and sandstone gravel.				RESIDUAL
					N = SPT 8/100mm REFUSAL			-	SANDSTONE: fine to medium grained, orange grey.	XW-DW	EL-VL		VERY LOW 'TC' BIT RESISTANCE
						1				DW	L		LOW RESISTANCE
						2				SW	M-H		MODERATE TO HIGH RESISTANCE
									END OF BOREHOLE AT 2.6m				
						3							
						4							
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. 2
1/1

Client: FULTON TROTTER ARCHITECTS

Project: PROPOSED ALTERATIONS AND ADDITIONS

Location: SAMUEL GILBERT PUBLIC SCHOOL, RIDGECROP DRIVE, CASTLE HILL, NSW

Job No. 31056S
Date: 2-12-17
Method: SPIRAL AUGER JK305
Logged/Checked by: A.F./P.S.
R.L. Surface: N/A
Datum:

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■					0		SM	SILTY SAND: fine to medium grained, brown, trace of fine to coarse grained ironstone and sandstone gravel.	D			RESIDUAL
	■							-	SANDSTONE: fine to medium grained, orange grey.	XW	EL		
				■		1				DW	L		LOW 'TC' BIT RESISTANCE
				■		2				SW-FR	M-H		MODERATE TO HIGH RESISTANCE
									END OF BOREHOLE AT 2.6m				'TC' BIT REFUSAL
						3							
						4							
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. 3
1/1

Client: FULTON TROTTER ARCHITECTS

Project: PROPOSED ALTERATIONS AND ADDITIONS

Location: SAMUEL GILBERT PUBLIC SCHOOL, RIDGECROP DRIVE, CASTLE HILL, NSW

Job No. 31056S
Date: 2-12-17
Method: SPIRAL AUGER JK305
Logged/Checked by: A.F./P.S.
R.L. Surface: N/A
Datum:

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION						0			FILL: Silty sand, fine to coarse grained, grey brown, trace of fine grained ironstone and igneous gravel.				
								SM					RESIDUAL
					N = 28 7,12,16			-	SILTY SAND: fine to medium grained, orange brown and light grey. SANDSTONE: fine to medium grained, orange brown and light grey.	XW-DW	EL-VL	>600 >600 >600	
						1				DW	L		LOW 'TC' BIT RESISTANCE
													MODERATE RESISTANCE
						2				SW	M-H		HIGH RESISTANCE
									END OF BOREHOLE AT 2.7m				'TC' BIT REFUSAL
						3							
						4							
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. 4
1/1

Client: FULTON TROTTER ARCHITECTS

Project: PROPOSED ALTERATIONS AND ADDITIONS

Location: SAMUEL GILBERT PUBLIC SCHOOL, RIDGECROP DRIVE, CASTLE HILL, NSW

Job No. 31056S
Date: 2-12-17
Method: SPIRAL AUGER JK305
Logged/Checked by: A.F./P.S.
R.L. Surface: N/A
Datum:

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■					0		SM	SILTY SAND: fine to medium grained, orange brown.				
	■			■	N > 12 12/150mm REFUSAL			-	SANDSTONE: fine to medium grained, orange brown/grey.	XW	EL		VERY LOW 'TC' BIT RESISTANCE
				■		1				DW	VL-L		LOW RESISTANCE
				■		2				SW	M		MODERATE RESISTANCE
				■							H		HIGH RESISTANCE
									END OF BOREHOLE AT 2.7m				'TC' BIT REFUSAL
						3							
						4							
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. 5
1/1

Client: FULTON TROTTER ARCHITECTS

Project: PROPOSED ALTERATIONS AND ADDITIONS

Location: SAMUEL GILBERT PUBLIC SCHOOL, RIDGECROP DRIVE, CASTLE HILL, NSW

Job No. 31056S
Date: 2-12-17
Method: SPIRAL AUGER JK305
Logged/Checked by: A.F./P.S.
R.L. Surface: N/A
Datum:

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■			■		0		SM	SILTY SAND: fine to medium grained, orange brown, trace of root fibres and fine to coarse grained ironstone and sandstone gravel.	D			
	■			■	N > 21 7,9,12/ 50mm			-	SANDSTONE: fine to medium grained, orange brown.	XW	EL	>600	VERY LOW 'TC' BIT RESISTANCE
					REFUSAL	1						>600	
				■						DW	L	>600	LOW RESISTANCE
									as above, but orange brown and light grey.	SW	M-H		MODERATE TO HIGH RESISTANCE
						2							
									END OF BOREHOLE AT 2.6m				'TC' BIT REFUSAL
						3							
						4							
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. 6
1/1

Client: FULTON TROTTER ARCHITECTS

Project: PROPOSED ALTERATIONS AND ADDITIONS

Location: SAMUEL GILBERT PUBLIC SCHOOL, RIDGECROP DRIVE, CASTLE HILL, NSW

Job No. 31056S **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 2-12-17 **Datum:**

Logged/Checked by: A.F./P.S.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■			■	REFER TO DCP TEST RESULTS	0		SM	SILTY SAND: fine to medium grained, yellow brown, trace of root root fibres and fine to coarse grained ironstone and sandstone gravel.	D	MD		
									END OF BOREHOLE AT 0.4m				HAND AUGER REFUSAL ON INFERRED SANDSTONE BRDROCK
						1							
						2							
						3							
						4							
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. 7
1/1

Client: FULTON TROTTER ARCHITECTS

Project: PROPOSED ALTERATIONS AND ADDITIONS

Location: SAMUEL GILBERT PUBLIC SCHOOL, RIDGECROP DRIVE, CASTLE HILL, NSW

Job No. 31056S
Date: 2-12-17
Method: SPIRAL AUGER JK305
Logged/Checked by: A.F./P.S.
R.L. Surface: N/A
Datum:

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■					0		SM	SILTY SAND: fine to medium grained, orange brown, trace of root root fibres and fine grained ironstone gravel.	D	MD		GRASS COVER
								-					RESIDUAL
	■			■	N > 24 8,16/ 150mm				SANDSTONE: fine to medium grained, orange brown and light grey.	DW	VL		VERY LOW 'TC' BIT RESISTANCE
					REFUSAL						L		LOW RESISTANCE
				■		1				SW			MODERATE TO HIGH RESISTANCE
									END OF BOREHOLE AT 1.2m				'TC' BIT REFUSAL
						2							
						3							
						4							
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. 8
1/1

Client: FULTON TROTTER ARCHITECTS

Project: PROPOSED ALTERATIONS AND ADDITIONS

Location: SAMUEL GILBERT PUBLIC SCHOOL, RIDGECROP DRIVE, CASTLE HILL, NSW

Job No. 31056S
Date: 2-12-17
Method: SPIRAL AUGER JK305
Logged/Checked by: A.F./P.S.
R.L. Surface: N/A
Datum:

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■					0		SM	SILTY SAND: fine to medium grained, orange brown, trace of root root fibres and fine grained ironstone and sandstone gravel.	D	MD		RESIDUAL
	■			■	N > 20 12,8/50mm REFUSAL			-	SANDSTONE: fine to medium grained, orange brown and grey.	XW-DW	EL-VL		VERY LOW 'TC' BIT RESISTANCE
				■		1				DW	L-M		LOW TO MODERATE RESISTANCE
				■		2				SW	M-H		MODERATE TO HIGH RESISTANCE
						3			END OF BOREHOLE AT 3.0m				
						4							
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. 101
1 / 2

Client: FULTON TROTTER ARCHITECTS
Project: SAMUEL GILBERT PUBLIC SCHOOL - RIDGECROP DRIVE, CASTLE HILL, NSW
Location: PROPOSED ALTERATIONS AND ADDITIONS

Job No.: 31056S **Method:** SPIRAL AUGER **R.L. Surface:** ~98.1 m
Date: 2/6/18 **Datum:** AHD
Plant Type: JK308 **Logged/Checked By:** B.Z./P.S.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING				■		98			-	FILL: Silty sand, fine to medium grained, brown, trace of fine to coarse grained sub angular and angular ironstone gravel. with timber fragments and root fibres.	D XW	(Hd)		APPEARS POORLY COMPACTED
				■	N > 14 14,14/ 69mm REFUSAL					Extremely Weathered sandstone, Silty SAND, fine grained, brown, trace of fine to medium grained sub angular ironstone gravel, and moderately cemented sandstone gravel.	DW	VL		HAWKESBURY SANDSTONE
						97	1			SANDSTONE: fine to medium grained, orange brown and yellow brown, with extremely weathered bands and iron indurated bands.		L - M		LOW 'TC' BIT RESISTANCE WITH MODERATE BANDS
				■		96	2			as above, but light grey and orange brown.				
										REFER TO CORED BOREHOLE LOG				MODERATE TO HIGH RESISTANCE
						95	3							
						94	4							
						93	5							
						92	6							

JK 9.01.2 LIB.GLB Log JK AUGERHOLE - MASTER 31056S CASTLE HILL.GPJ <<DrawingFile>> 18/06/2018 17:18 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.01.2 2018-04-02 Prj: JK 9.01.0 2018-03-20

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 101
2 / 2

CORED BOREHOLE LOG

Client: FULTON TROTTER ARCHITECTS

Project: SAMUEL GILBERT PUBLIC SCHOOL - RIDGECROP DRIVE, CASTLE HILL, NSW

Location: PROPOSED ALTERATIONS AND ADDITIONS

Job No.: 31056S | **Core Size:** NMLC | **R.L. Surface:** ~98.1 m

Date: 2/6/18 | **Inclination:** VERTICAL | **Datum:** AHD

Plant Type: JK308 | **Bearing:** N/A | **Logged/Checked By:** B.Z./P.S.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	DEFECT DETAILS: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
		96			START CORING AT 2.52m						
					SANDSTONE: fine to medium grained, orang brown and light grey, with iron indurated bands.	SW	M	1.0, 1.3		'TC' BIT RESISTANCE; (2.78m) XWS, 10°, 20 mm.t; (2.91m) XWS, 10°, 5 mm.t; (3.07m) J, 80°, P, Vr, Cn	
		95	3		as above, but very thinly bedded at 20-30°.			1.2			
▽					as above, but light grey and light brown.						
100% RETURN		94	4		as above, but light brown and red brown.			1.4, 0.90		(4.30m) XWS, 5°, 3 mm.t; (4.43m) Be, 0°, P, Vr, Fe Sn; (4.46m) Be, 0°, P, Vr, Fe Sn; (4.47m) Be, 0°, P, Vr, Fe Sn; (4.49m) Be, 0°, P, Vr, Fe Sn	
					as above, but bedded at 10-20°.						
		93	5		as above, but light grey and dark grey.	FR	M - H	1.2, 1.5			
					as above, but with carbonaceous laminae.						
					as above, but trace of carbonaceous laminae.			1.9			
		92	6		END OF BOREHOLE AT 5.89 m						
		91	7								
		90	8								

Hawkesbury Sandstone

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31056S BH101 Coring Starts at: 2.52m
2
2.52 →
3
4
5
←5.89
Coring End

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. 102
1 / 2

Client: FULTON TROTTER ARCHITECTS
Project: SAMUEL GILBERT PUBLIC SCHOOL - RIDGECROP DRIVE, CASTLE HILL, NSW
Location: PROPOSED ALTERATIONS AND ADDITIONS

Job No.: 31056S **Method:** SPIRAL AUGER **R.L. Surface:** ~99.1 m
Date: 2/6/18 **Datum:** AHD
Plant Type: JK308 **Logged/Checked By:** B.Z./P.S.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING						99			-	FILL: Silty sand, fine to medium grained, brown and dark brown, trace of fine to medium grained sub angular ironstone gravel, timber fragments and root fibres.	D XW	Hd		APPEARS POORLY COMPACTED
					N = 21 6,10,11					Extremely Weathered sandstone: Silty SAND, fine to medium grained, brown and yellow brown, with fine to medium grained sub angular moderately cemented sand gravel, trace of fine to medium grained sub angular ironstone gravel.	DW	L - M		HAWKESBURY SANDSTONE
						98	1			as above, but with roots.				MODERATE TO HIGH 'TC' BIT RESISTANCE
										SANDSTONE: fine to medium grained, light brown and yellow brown.				'TC' BUT REFUSAL
										REFER TO CORED BOREHOLE LOG				
						97	2							
						96	3							
						95	4							
						94	5							
						93	6							

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No.
102
2 / 2

CORED BOREHOLE LOG

Client: FULTON TROTTER ARCHITECTS

Project: SAMUEL GILBERT PUBLIC SCHOOL - RIDGECROP DRIVE, CASTLE HILL, NSW

Location: PROPOSED ALTERATIONS AND ADDITIONS

Job No.: 31056S | **Core Size:** NMLC | **R.L. Surface:** ~99.1 m

Date: 2/6/18 | **Inclination:** VERTICAL | **Datum:** AHD

Plant Type: JK308 | **Bearing:** N/A | **Logged/Checked By:** B.Z./P.S.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ VL 0.1 L 0.3 M 1 H 3 VH 10 EH	DEFECT DETAILS SPACING (mm) 600 200 60 20	DESCRIPTION Type, orientation, defect roughness and shape, defect coatings and seams, openness and thickness Specific / General	Formation
		98			START CORING AT 1.19m						
100% RETURN		97	2		SANDSTONE: fine to medium grained, yellow brown and light grey, with iron indurated bands.	MW	M	0.80		(1.49m) XWS, 0°, 3 mm.t	Hawkesbury Sandstone
					as above, but purple brown, with fine to medium grained sub rounded quartz gravel.			1.1 0.90			
					as above, but without quartz gravel, light grey and yellow brown, very thinly bedded at 10-20°.			0.80		(2.62m) J, 80°, P, Vr, Cn (2.66m) XWS, 0°, 30 mm.t	
					NO CORE 0.10m						
		96	3		SANDSTONE: fine to medium grained, light grey and yellow brown, very thinly bedded at 10-20°.			0.90 0.80		(3.24m) J, 70°, P, Vr, Cn	
		95	4			SW	M - H	1.0 0.90 1.3		(3.63m) J, 30°, P, Vr, Fe Sn (3.72m) XWS, 15°, 3 mm.t (3.75m) Be, 15°, P, Vr, Fe Vn (3.84m) J, 75°, P, Vr, Fe Vn (3.96m) Be, 15°, P, Vr, Fe Vn	
					END OF BOREHOLE AT 4.20 m						
		94	5								
		93	6								
		92	7								

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310565 BH 102 Coring Starts at: 1.19
1
1.19 →
2
3
4
← 4.2 Coring End

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. 103
1 / 2

Client: FULTON TROTTER ARCHITECTS
Project: SAMUEL GILBERT PUBLIC SCHOOL - RIDGECROP DRIVE, CASTLE HILL, NSW
Location: PROPOSED ALTERATIONS AND ADDITIONS

Job No.: 31056S **Method:** SPIRAL AUGER **R.L. Surface:** ~97.2 m
Date: 2/6/18 **Datum:** AHD
Plant Type: JK308 **Logged/Checked By:** B.Z./P.S.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING				■		97			-	FILL: Silty sand, fine to medium grained, brown and orange brown, trace of fine to medium grained sub angular ironstone gravel, timber fragments and roots.	D			APPEARS POORLY COMPACED
				■	N = 18 8,8,10					Extremely Weathered sandstone: Silty SAND, fine to medium grained, brown and yellow brown, with fine to medium grained sub angular moderately cemented sand gravel, trace of fine to medium grained sub angular ironstone gravel, and roots,	XW	(Hd)		
				■			1				DW	VL - L		HAWKESBURY SANDSTONE
						96				SANDSTONE: fine to medium grained, light brown and yellow brown, with fine to medium grained sub rounded quartz gravel.				'TC' BIT REFUSAL
							2			REFER TO CORED BOREHOLE LOG				
						95								
							3							
						94								
							4							
						93								
							5							
						92								
							6							
						91								

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Borehole No. 103
2 / 2

CORED BOREHOLE LOG

Client: FULTON TROTTER ARCHITECTS

Project: SAMUEL GILBERT PUBLIC SCHOOL - RIDGECROP DRIVE, CASTLE HILL, NSW

Location: PROPOSED ALTERATIONS AND ADDITIONS

Job No.: 31056S | **Core Size:** NMLC | **R.L. Surface:** ~97.2 m

Date: 2/6/18 | **Inclination:** VERTICAL | **Datum:** AHD

Plant Type: JK308 | **Bearing:** N/A | **Logged/Checked By:** B.Z./P.S.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
					START CORING AT 1.18m						
100% RETURN		96			SANDSTONE: fine to medium grained, light grey and light brown, with fine to medium grained sub angular and sub rounded quartz gravel inclusion, very thinly bedded at 15-20°, with iron indurated bands.	SW	M - H	1.0			Hawkesbury Sandstone
			2					1.0, 0.90		(2.00m) Be, 10°, P, Vr, Fe Vn (2.06m) Be, 10°, P, Vr, Fe Vn	
		95						1.4			
								1.0			
			3								
		94						1.6			
								1.0			
			4								
		93						1.2			
					END OF BOREHOLE AT 4.30 m						
			5								
		92									
			6								
		91									
			7								
		90									

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310565 BH 103 Coring Starts at: 1.18
1
1.18 →
2
3
4
← 43 Coring End

JK Geotechnics

GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

DYNAMIC CONE PENETRATION TEST RESULTS

Client:	FULTON TROTTER ARCHITECTS		
Project:	PROPOSED ALTERATIONS AND ADDITIONS		
Location:	SAMUEL GILBERT PUBLIC SCHOOL, RIDGECROP DRIVE, CASTLE HILL, NSW		
Job No.	31056S	Hammer Weight & Drop:	9kg/510mm
Date:	2-12-17	Rod Diameter:	16mm
Tested By:	A.F.	Point Diameter:	20mm

Number of Blows per 100mm Penetration							
Test Location							
Depth (mm)	**6**						
0 - 100	5						
100 - 200	7						
200 - 300	14						
300 - 400	17						
400 - 500	25						
500 - 600	REFUSAL						
600 - 700							
700 - 800							
800 - 900							
900 - 1000							
1000 - 1100							
1100 - 1200							
1200 - 1300							
1300 - 1400							
1400 - 1500							
1500 - 1600							
1600 - 1700							
1700 - 1800							
1800 - 1900							
1900 - 2000							
2000 - 2100							
2100 - 2200							
2200 - 2300							
2300 - 2400							
2400 - 2500							
2500 - 2600							
2600 - 2700							
2700 - 2800							
2800 - 2900							
2900 - 3000							

Remarks: 1. The procedure used for this test is similar to that described in AS1289.6.3.2-1997, Method 6.3.2.
2. Usually 8 blows per 20mm is taken as refusal

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This plan should be read in conjunction with the JK Geotechnics report.

Title: **SITE LOCATION PLAN**

Location: SAMUEL GILBERT SCHOOL
RIDGECROP DRIVE, CASTLE HILL, NSW

Report No: 31056S

Figure No: 1

JK **Geotechnics**

PLOT DATE: 6/06/2018 2:55:09 PM DWG FILE: S:\6 GEOTECHNICAL\6F GEOTECHNICAL JOBS\31000'S\31056S CASTLE HILL\CAD\31056S.DWG

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LEGEND

- BOREHOLE
- HAND AUGER AND DCP TEST

0 10 20 30 40 50

SCALE 1:1000 @A3 METRES

This plan should be read in conjunction with the JK Geotechnics report.

Title: **TEST LOCATION PLAN**

Location: SAMUEL GILBERT SCHOOL
RIDGECROP DRIVE, CASTLE HILL, NSW

Report No: 31056S

Figure No: 2A

JK **Geotechnics**

PLOT DATE: 18/06/2018 3:36:20 PM DWG FILE: S:\6 GEOTECHNICAL\6F GEOTECHNICAL JOBS\31000'S\31056S CASTLE HILL\CAD\31056S.DWG

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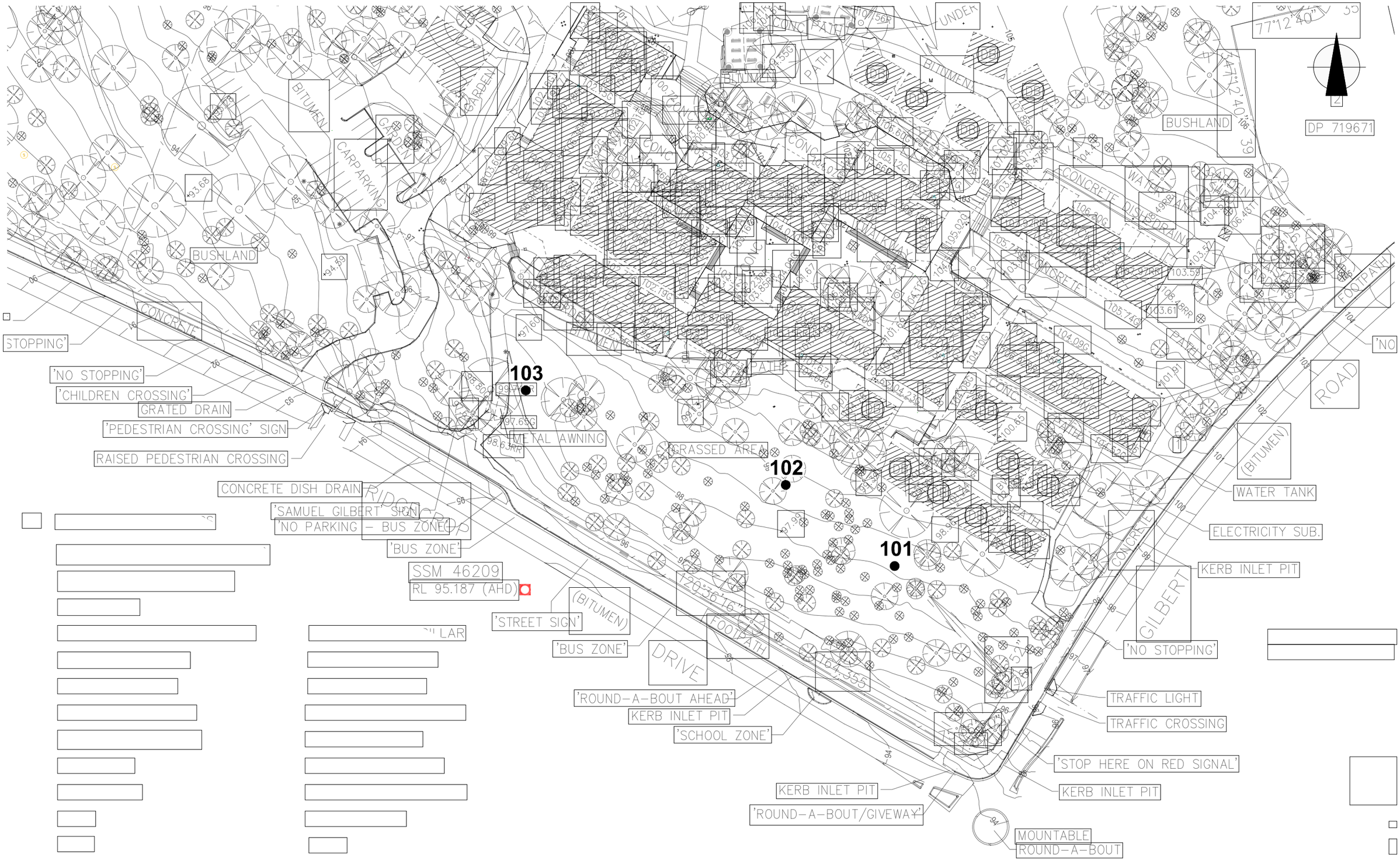

0 8 16 24 32 40

SCALE 1:800 @A3 METRES

This plan should be read in conjunction with the JK Geotechnics report.

Title: **BOREHOLE LOCATION PLAN**

Location: SAMUEL GILBERT SCHOOL
RIDGECROP DRIVE, CASTLE HILL, NSW

Report No: 31056S

Figure No: 2B

JK **Geotechnics**

PLOT DATE: 18/06/2018 3:32:45 PM DWG FILE: S:\6 GEOTECHNICAL\6F GEOTECHNICAL JOBS\31000'S\31056S CASTLE HILL\CAD\31056S.DWG

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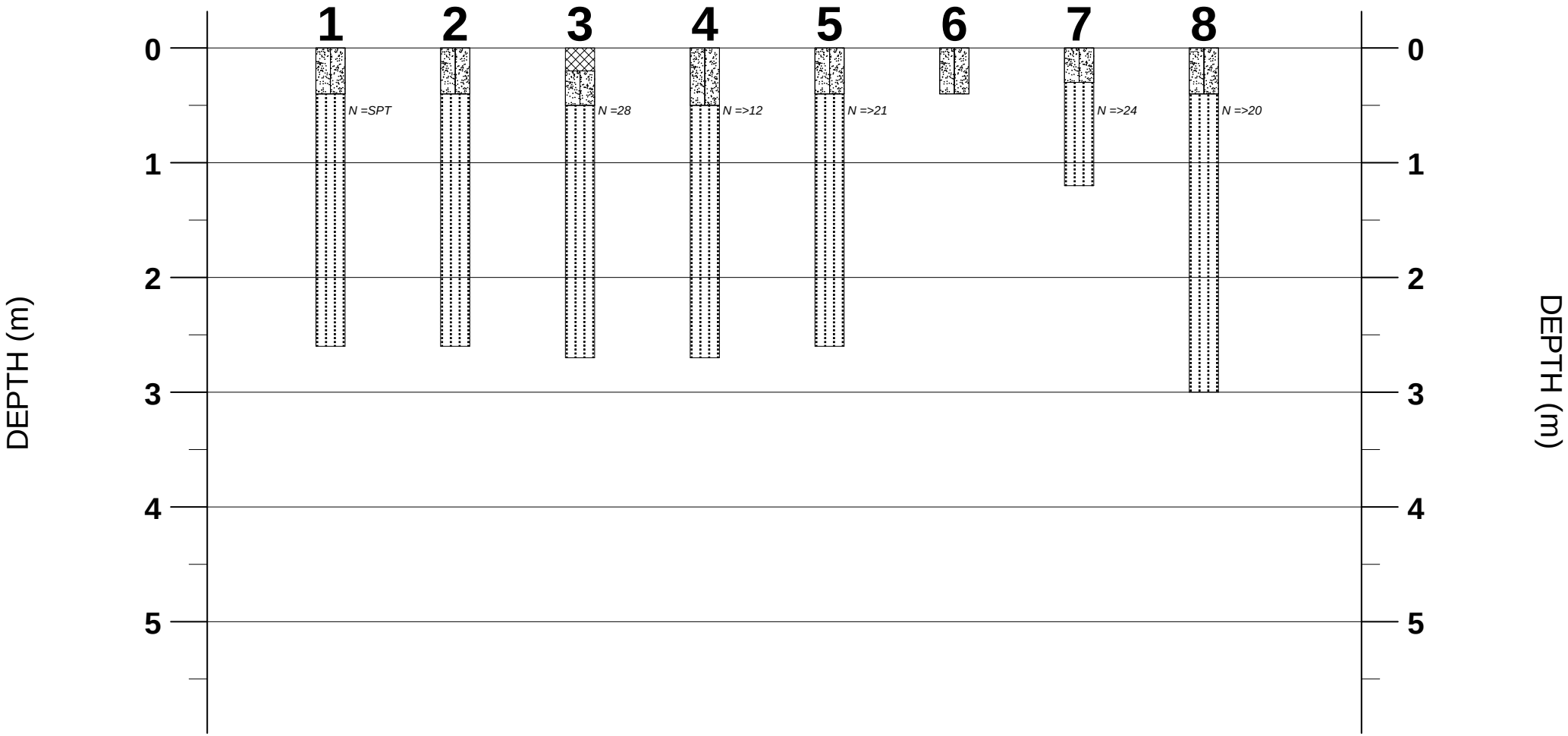
GRAPHICAL BOREHOLE SUMMARY



Silty Sand

Sandstone/ Greywacke

Fill

N SPT "N" VALUE

Nc SOLID CONE BLOW COUNTS PER 150mm

NOTE: REFER TO BOREHOLE LOGS

Scale: 1 : 50 (vert) ; NTS (horiz)

JK Geotechnics

Job No.: 31056S

Figure No.: 3

VIBRATION EMISSION DESIGN GOALS

German Standard DIN 4150 – Part 3: 1999 provides guideline levels of vibration velocity for evaluating the effects of vibration in structures. The limits presented in this standard are generally recognised to be conservative.

The DIN 4150 values (maximum levels measured in any direction at the foundation, OR, maximum levels measured in (x) or (y) horizontal directions, in the plane of the uppermost floor), are summarised in Table 1 below.

It should be noted that peak vibration velocities higher than the minimum figures in Table 1 for low frequencies may be quite 'safe', depending on the frequency content of the vibration and the actual condition of the structure.

It should also be noted that these levels are 'safe limits', up to which no damage due to vibration effects has been observed for the particular class of building. 'Damage' is defined by DIN 4150 to include even minor non-structural effects such as superficial cracking in cement render, the enlargement of cracks already present, and the separation of partitions or intermediate walls from load bearing walls. Should damage be observed at vibration levels lower than the 'safe limits', then it may be attributed to other causes. DIN 4150 also states that when vibration levels higher than the 'safe limits' are present, it does not necessarily follow that damage will occur. Values given are only a broad guide.

Table 1: DIN 4150 – Structural Damage – Safe Limits for Building Vibration

Group	Type of Structure	Peak Vibration Velocity in mm/s			
		At Foundation Level at a Frequency of:			Plane of Floor of Uppermost Storey
		Less than 10Hz	10Hz to 50Hz	50Hz to 100Hz	All Frequencies
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design.	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or use.	5	5 to 15	15 to 20	15
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Group 1 and 2 and have intrinsic value (eg. buildings that are under a preservation order).	3	3 to 8	8 to 10	8

Note: For frequencies above 100Hz, the higher values in the 50Hz to 100Hz column should be used.

REPORT EXPLANATION NOTES

INTRODUCTION

These notes have been provided to amplify the geotechnical report in regard to classification methods, field procedures and certain matters relating to the Comments and Recommendations section. Not all notes are necessarily relevant to all reports.

The ground is a product of continuing natural and man-made processes and therefore exhibits a variety of characteristics and properties which vary from place to place and can change with time. Geotechnical engineering involves gathering and assimilating limited facts about these characteristics and properties in order to understand or predict the behaviour of the ground on a particular site under certain conditions. This report may contain such facts obtained by inspection, excavation, probing, sampling, testing or other means of investigation. If so, they are directly relevant only to the ground at the place where and time when the investigation was carried out.

DESCRIPTION AND CLASSIFICATION METHODS

The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726:2017 *'Geotechnical Site Investigations'*. In general, descriptions cover the following properties – soil or rock type, colour, structure, strength or density, and inclusions. Identification and classification of soil and rock involves judgement and the Company infers accuracy only to the extent that is common in current geotechnical practice.

Soil types are described according to the predominating particle size and behaviour as set out in the attached soil classification table qualified by the grading of other particles present (eg. sandy clay) as set out below:

Soil Classification	Particle Size
Clay	< 0.002mm
Silt	0.002 to 0.075mm
Sand	0.075 to 2.36mm
Gravel	2.36 to 63mm
Cobbles	63 to 200mm
Boulders	> 200mm

Non-cohesive soils are classified on the basis of relative density, generally from the results of Standard Penetration Test (SPT) as below:

Relative Density	SPT 'N' Value (blows/300mm)
Very loose (VL)	< 4
Loose (L)	4 to 10
Medium dense (MD)	10 to 30
Dense (D)	30 to 50
Very Dense (VD)	> 50

Cohesive soils are classified on the basis of strength (consistency) either by use of a hand penetrometer, vane shear, laboratory testing and/or tactile engineering examination. The strength terms are defined as follows.

Classification	Unconfined Compressive Strength (kPa)	Indicative Undrained Shear Strength (kPa)
Very Soft (VS)	≤ 25	≤ 12
Soft (S)	> 25 and ≤ 50	> 12 and ≤ 25
Firm (F)	> 50 and ≤ 100	> 25 and ≤ 50
Stiff (St)	> 100 and ≤ 200	> 50 and ≤ 100
Very Stiff (VSt)	> 200 and ≤ 400	> 100 and ≤ 200
Hard (Hd)	> 400	> 200
Friable (Fr)	Strength not attainable – soil crumbles	

Rock types are classified by their geological names, together with descriptive terms regarding weathering, strength, defects, etc. Where relevant, further information regarding rock classification is given in the text of the report. In the Sydney Basin, 'shale' is used to describe fissile mudstone, with a weakness parallel to bedding. Rocks with alternating inter-laminations of different grain size (eg. siltstone/claystone and siltstone/fine grained sandstone) is referred to as 'laminite'.

SAMPLING

Sampling is carried out during drilling or from other excavations to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on plasticity, grain size, colour, moisture content, minor constituents and, depending upon the degree of disturbance, some information on strength and structure. Bulk samples are similar but of greater volume required for some test procedures.

Undisturbed samples are taken by pushing a thin-walled sample tube, usually 50mm diameter (known as a U50), into the soil and withdrawing it with a sample of the soil contained in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shrink-swell behaviour, strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Details of the type and method of sampling used are given on the attached logs.

INVESTIGATION METHODS

The following is a brief summary of investigation methods currently adopted by the Company and some comments on their use and application. All methods except test pits, hand auger drilling and portable Dynamic Cone Penetrometers require the use of a mechanical rig which is commonly mounted on a truck chassis or track base.

Test Pits: These are normally excavated with a backhoe or a tracked excavator, allowing close examination of the insitu soils and 'weaker' bedrock if it is safe to descend into the pit. The depth of penetration is limited to about 3m for a backhoe and up to 6m for a large excavator. Limitations of test pits are the problems associated with disturbance and difficulty of reinstatement and the consequent effects on close-by structures. Care must be taken if construction is to be carried out near test pit locations to either properly recompact the backfill during construction or to design and construct the structure so as not to be adversely affected by poorly compacted backfill at the test pit location.

Hand Auger Drilling: A borehole of 50mm to 100mm diameter is advanced by manually operated equipment. Refusal of the hand auger can occur on a variety of materials such as obstructions within any fill, tree roots, hard clay, gravel or ironstone, cobbles and boulders, and does not necessarily indicate rock level.

Continuous Spiral Flight Augers: The borehole is advanced using 75mm to 115mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling and insitu testing. This is a relatively economical means of drilling in clays and in sands above the water table. Samples are returned to the surface by the flights or may be collected after withdrawal of the auger flights, but they can be very disturbed and layers may become mixed. Information from the auger sampling (as distinct from specific sampling by SPTs or undisturbed samples) is of limited reliability due to mixing or softening of samples by groundwater, or uncertainties as to the original depth of the samples. Augering below the groundwater table is of even lesser reliability than augering above the water table.

Rock Augering: Use can be made of a Tungsten Carbide (TC) bit for auger drilling into rock to indicate rock quality and continuity by variation in drilling resistance and from examination of recovered rock cuttings. This method of investigation is quick and relatively inexpensive but provides only an indication of the likely rock strength and predicted values may be in error by a strength order. Where rock strengths may have a significant impact on construction feasibility or costs, then further investigation by means of cored boreholes may be warranted.

Wash Boring: The borehole is usually advanced by a rotary bit, with water being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be assessed from the cuttings, together with some information from "feel" and rate of penetration.

Mud Stabilised Drilling: Either Wash Boring or Continuous Core Drilling can use drilling mud as a circulating fluid to stabilise the borehole. The term 'mud' encompasses a range of products ranging from bentonite to polymers. The mud tends to mask the cuttings and reliable identification is only possible from intermittent intact sampling (eg. from SPT and U50 samples) or from rock coring, etc.

Continuous Core Drilling: A continuous core sample is obtained using a diamond tipped core barrel. Provided full core recovery is achieved (which is not always possible in very low strength rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation. In rocks, NMLC or HQ triple tube core barrels, which give a core of about 50mm and 61mm diameter, respectively, is usually used with water flush. The length of core recovered is compared to the length drilled and any length not recovered is shown as NO CORE. The location of NO CORE recovery is determined on site by the supervising engineer; where the location is uncertain, the loss is placed at the bottom of the drill run.

Standard Penetration Tests: Standard Penetration Tests (SPT) are used mainly in non-cohesive soils, but can also be used in cohesive soils, as a means of indicating density or strength and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289.6.3.1–2004 (R2016) *'Methods of Testing Soils for Engineering Purposes, Soil Strength and Consolidation Tests – Determination of the Penetration Resistance of a Soil – Standard Penetration Test (SPT)'*.

The test is carried out in a borehole by driving a 50mm diameter split sample tube with a tapered shoe, under the impact of a 63.5kg hammer with a free fall of 760mm. It is normal for the tube to be driven in three successive 150mm increments and the 'N' value is taken as the number of blows for the last 300mm. In dense sands, very hard clays or weak rock, the full 450mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form:

- In the case where full penetration is obtained with successive blow counts for each 150mm of, say, 4, 6 and 7 blows, as

  N = 13
  4, 6, 7

- In a case where the test is discontinued short of full penetration, say after 15 blows for the first 150mm and 30 blows for the next 40mm, as

  N > 30
  15, 30/40mm

The results of the test can be related empirically to the engineering properties of the soil.

A modification to the SPT is where the same driving system is used with a solid 60° tipped steel cone of the same diameter as the SPT hollow sampler. The solid cone can be continuously driven for some distance in soft clays or loose sands, or may be used where damage would otherwise occur to the SPT. The results of this Solid Cone Penetration Test (SCPT) are shown as 'N_c' on the borehole logs, together with the number of blows per 150mm penetration.

Cone Penetrometer Testing (CPT) and Interpretation: The cone penetrometer is sometimes referred to as a Dutch Cone. The test is described in Australian Standard 1289.6.5.1–1999 (R2013) *'Methods of Testing Soils for Engineering Purposes, Soil Strength and Consolidation Tests – Determination of the Static Cone Penetration Resistance of a Soil – Field Test using a Mechanical and Electrical Cone or Friction-Cone Penetrometer'*.

In the tests, a 35mm or 44mm diameter rod with a conical tip is pushed continuously into the soil, the reaction being provided by a specially designed truck or rig which is fitted with a hydraulic ram system. Measurements are made of the end bearing resistance on the cone and the frictional resistance on a separate 134mm or 165mm long sleeve, immediately behind the cone. Transducers in the tip of the assembly are electrically connected by wires passing through the centre of the push rods to an amplifier and recorder unit mounted on the control truck. The CPT does not provide soil sample recovery.

As penetration occurs (at a rate of approximately 20mm per second), the information is output as incremental digital records every 10mm. The results given in this report have been plotted from the digital data.

The information provided on the charts comprise:

- Cone resistance – the actual end bearing force divided by the cross sectional area of the cone – expressed in MPa. There are two scales presented for the cone resistance. The lower scale has a range of 0 to 5MPa and the main scale has a range of 0 to 50MPa. For cone resistance values less than 5MPa, the plot will appear on both scales.
- Sleeve friction – the frictional force on the sleeve divided by the surface area – expressed in kPa.
- Friction ratio – the ratio of sleeve friction to cone resistance, expressed as a percentage.

  The ratios of the sleeve resistance to cone resistance will vary with the type of soil encountered, with higher relative friction in clays than in sands. Friction ratios of 1% to 2% are commonly encountered in sands and occasionally very soft clays, rising to 4% to 10% in stiff clays and peats. Soil descriptions based on cone resistance and friction ratios are only inferred and must not be considered as exact.

Correlations between CPT and SPT values can be developed for both sands and clays but may be site specific.

Interpretation of CPT values can be made to empirically derive modulus or compressibility values to allow calculation of foundation settlements.

Stratification can be inferred from the cone and friction traces and from experience and information from nearby boreholes etc. Where shown, this information is presented for general guidance, but must be regarded as interpretive. The test method provides a continuous profile of engineering properties but, where precise information on soil classification is required, direct drilling and sampling may be preferable.

There are limitations when using the CPT in that it may not penetrate obstructions within any fill, thick layers of hard clay and very dense sand, gravel and weathered bedrock. Normally a 'dummy' cone is pushed through fill to protect the equipment. No information is recorded by the 'dummy' probe.

Flat Dilatometer Test: The flat dilatometer (DMT), also known as the Marchetti Dilometer comprises a stainless steel blade having a flat, circular steel membrane mounted flush on one side.

The blade is connected to a control unit at ground surface by a pneumatic-electrical tube running through the insertion rods. A gas tank, connected to the control unit by a pneumatic cable, supplies the gas pressure required to expand the membrane. The control unit is equipped with a pressure regulator, pressure gauges, an audio-visual signal and vent valves.

The blade is advanced into the ground using our CPT rig or one of our drilling rigs, and can be driven into the ground using an SPT hammer. As soon as the blade is in place, the membrane is inflated, and the pressure required to lift the membrane (approximately 0.1mm) is recorded. The pressure then required to lift the centre of the membrane by an additional 1mm is recorded. The membrane is then deflated before pushing to the next depth increment, usually 200mm down. The pressure readings are corrected for membrane stiffness.

The DMT is used to measure material index (I_D), horizontal stress index (K_D), and dilatometer modulus (E_D). Using established correlations, the DMT results can also be used to assess the 'at rest' earth pressure coefficient (K_o), over-consolidation ratio (OCR), undrained shear strength (C_u), friction angle (ϕ), coefficient of consolidation (C_h), coefficient of permeability (K_h), unit weight (γ), and vertical drained constrained modulus (M).

The seismic dilatometer (SDMT) is the combination of the DMT with an add-on seismic module for the measurement of shear wave velocity (V_s). Using established correlations, the SDMT results can also be used to assess the small strain modulus (G_o).

Portable Dynamic Cone Penetrometers: Portable Dynamic Cone Penetrometer (DCP) tests are carried out by driving a 16mm diameter rod with a 20mm diameter cone end with a 9kg hammer dropping 510mm. The test is described in Australian Standard 1289.6.3.2–1997 (R2013) *'Methods of Testing Soils for Engineering Purposes, Soil Strength and Consolidation Tests – Determination of the Penetration Resistance of a Soil – 9kg Dynamic Cone Penetrometer Test'*.

The results are used to assess the relative compaction of fill, the relative density of granular soils, and the strength of cohesive soils. Using established correlations, the DCP test results can also be used to assess California Bearing Ratio (CBR).

Refusal of the DCP can occur on a variety of materials such as obstructions within any fill, tree roots, hard clay, gravel or ironstone, cobbles and boulders, and does not necessarily indicate rock level.

Vane Shear Test: The vane shear test is used to measure the undrained shear strength (C_u) of typically very soft to firm fine grained cohesive soils. The vane shear is normally performed in the bottom of a borehole, but can be completed from surface level, the bottom and sides of test pits, and on recovered undisturbed tube samples (when using a hand vane).

The vane comprises four rectangular blades arranged in the form of a cross on the end of a thin rod, which is coupled to the bottom of a drill rod string when used in a borehole. The size of the vane is dependent on the strength of the fine grained cohesive soils; that is, larger vanes are normally used for very low strength soils. For borehole testing, the size of the vane can be limited by the size of the casing that is used.

For testing inside a borehole, a device is used at the top of the casing, which suspends the vane and rods so that they do not sink under self-weight into the 'soft' soils beyond the depth at which the test is to be carried out. A calibrated torque head is used to rotate the rods and vane and to measure the resistance of the vane to rotation.

With the vane in position, torque is applied to cause rotation of the vane at a constant rate. A rate of 6° per minute is the common rotation rate. Rotation is continued until the soil is sheared and the maximum torque has been recorded. This value is then used to calculate the undrained shear strength. The vane is then rotated rapidly a number of times and the operation repeated until a constant torque reading is obtained. This torque value is used to calculate the remoulded shear strength. Where appropriate, friction on the vane rods is measured and taken into account in the shear strength calculation.

LOGS

The borehole or test pit logs presented herein are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on the frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will enable the most reliable assessment, but is not always practicable or possible to justify on economic grounds. In any case, the boreholes or test pits represent only a very small sample of the total subsurface conditions.

The terms and symbols used in preparation of the logs are defined in the following pages.

Interpretation of the information shown on the logs, and its application to design and construction, should therefore take into account the spacing of boreholes or test pits, the method of drilling or excavation, the frequency of sampling and testing and the possibility of other than 'straight line' variations between the boreholes or test pits. Subsurface conditions between boreholes or test pits may vary significantly from conditions encountered at the borehole or test pit locations.

GROUNDWATER

Where groundwater levels are measured in boreholes, there are several potential problems:

- Although groundwater may be present, in low permeability soils it may enter the hole slowly or perhaps not at all during the time it is left open.
- A localised perched water table may lead to an erroneous indication of the true water table.
- Water table levels will vary from time to time with seasons or recent weather changes and may not be the same at the time of construction.
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must be washed out of the hole or 'reverted' chemically if reliable water observations are to be made.

More reliable measurements can be made by installing standpipes which are read after the groundwater level has stabilised at intervals ranging from several days to perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from perched water tables or surface water.

FILL

The presence of fill materials can often be determined only by the inclusion of foreign objects (eg. bricks, steel, etc) or by distinctly unusual colour, texture or fabric. Identification of the extent of fill materials will also depend on investigation methods and frequency. Where natural soils similar to those at the site are used for fill, it may be difficult with limited testing and sampling to reliably assess the extent of the fill.

The presence of fill materials is usually regarded with caution as the possible variation in density, strength and material type is much greater than with natural soil deposits. Consequently, there is an increased risk of adverse engineering characteristics or behaviour. If the volume and quality of fill is of importance to a project, then frequent test pit excavations are preferable to boreholes.

LABORATORY TESTING

Laboratory testing is normally carried out in accordance with Australian Standard 1289 *'Methods of Testing Soils for Engineering Purposes'* or appropriate NSW Government Roads & Maritime Services (RMS) test methods. Details of the test procedure used are given on the individual report forms.

ENGINEERING REPORTS

Engineering reports are prepared by qualified personnel and are based on the information obtained and on current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal (eg. a three storey building) the information and interpretation may not be relevant if the design proposal is changed (eg. to a twenty storey building). If this happens, the Company will be pleased to review the report and the sufficiency of the investigation work.

Reasonable care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical aspects and recommendations or suggestions for design and construction. However, the Company cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions – the potential for this will be partially dependent on borehole spacing and sampling frequency as well as investigation technique.
- Changes in policy or interpretation of policy by statutory authorities.
- The actions of persons or contractors responding to commercial pressures.
- Details of the development that the Company could not reasonably be expected to anticipate.

If these occur, the Company will be pleased to assist with investigation or advice to resolve any problems occurring.

SITE ANOMALIES

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, the Company requests that it immediately be notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

REPRODUCTION OF INFORMATION FOR CONTRACTUAL PURPOSES

Where information obtained from this investigation is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. The Company would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Copyright in all documents (such as drawings, borehole or test pit logs, reports and specifications) provided by the Company shall remain the property of Jeffery and Katauskas Pty Ltd. Subject to the payment of all fees due, the Client alone shall have a licence to use the documents provided for the sole purpose of completing the project to which they relate. Licence to use the documents may be revoked without notice if the Client is in breach of any obligation to make a payment to us.

REVIEW OF DESIGN

Where major civil or structural developments are proposed or where only a limited investigation has been completed or where the geotechnical conditions/constraints are quite complex, it is prudent to have a joint design review which involves an experienced geotechnical engineer/engineering geologist.

SITE INSPECTION

The Company will always be pleased to provide engineering inspection services for geotechnical aspects of work to which this report is related.

Requirements could range from:

i) a site visit to confirm that conditions exposed are no worse than those interpreted, to

ii) a visit to assist the contractor or other site personnel in identifying various soil/rock types and appropriate footing or pile founding depths, or

iii) full time engineering presence on site.

SYMBOL LEGENDS

SOIL

FILL

TOPSOIL

CLAY (CL, CI, CH)

SILT (ML, MH)

SAND (SP, SW)

GRAVEL (GP, GW)

SANDY CLAY (CL, CI, CH)

SILTY CLAY (CL, CI, CH)

CLAYEY SAND (SC)

SILTY SAND (SM)

GRAVELLY CLAY (CL, CI, CH)

CLAYEY GRAVEL (GC)

SANDY SILT (ML, MH)

PEAT AND HIGHLY ORGANIC SOILS (Pt)

ROCK

CONGLOMERATE

SANDSTONE

SHALE/MUDSTONE

SILTSTONE

CLAYSTONE

COAL

LAMINITE

LIMESTONE

PHYLLITE, SCHIST

TUFF

GRANITE, GABBRO

DOLERITE, DIORITE

BASALT, ANDESITE

QUARTZITE

OTHER MATERIALS

BRICKS OR PAVERS

CONCRETE

ASPHALTIC CONCRETE

CLASSIFICATION OF COARSE AND FINE GRAINED SOILS

Major Divisions		Group Symbol	Typical Names	Field Classification of Sand and Gravel	Laboratory Classification	
Coarse grained soil (more than 65% of soil excluding oversize fraction is greater than 0.075mm)	GRAVEL (more than half of coarse fraction is larger than 2.36mm	GW	Gravel and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 4$ $1 < C_c < 3$
		GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		GM	Gravel-silt mixtures and gravel-sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	Fines behave as silt
		GC	Gravel-clay mixtures and gravel-sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	Fines behave as clay
	SAND (more than half of coarse fraction is smaller than 2.36mm)	SW	Sand and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 6$ $1 < C_c < 3$
		SP	Sand and gravel-sand mixtures, little or no fines	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		SM	Sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	N/A
		SC	Sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	

Major Divisions		Group Symbol	Typical Names	Field Classification of Silt and Clay			Laboratory Classification
				Dry Strength	Dilatancy	Toughness	% < 0.075mm
ine grained soils (more than 35% of soil excluding oversize fraction is less than 0.075mm)	SILT and CLAY (low to medium plasticity)	ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity	None to low	Slow to rapid	Low	Below A line
		CL, CI	Inorganic clay of low to medium plasticity, gravelly clay, sandy clay	Medium to high	None to slow	Medium	Above A line
		OL	Organic silt	Low to medium	Slow	Low	Below A line
	SILT and CLAY (high plasticity)	MH	Inorganic silt	Low to medium	None to slow	Low to medium	Below A line
		CH	Inorganic clay of high plasticity	High to very high	None	High	Above A line
		OH	Organic clay of medium to high plasticity, organic silt	Medium to high	None to very slow	Low to medium	Below A line
	Highly organic soil	Pt	Peat, highly organic soil	–	–	–	–

Laboratory Classification Criteria

A well graded coarse grained soil is one for which the coefficient of uniformity $Cu > 4$ and the coefficient of curvature $1 < C_c < 3$. Otherwise, the soil is poorly graded. These coefficients are given by:

$$C_u = \frac{D_{60}}{D_{10}} \quad \text{and} \quad C_c = \frac{(D_{30})^2}{D_{10}\ D_{60}}$$

Where D_{10}, D_{30} and D_{60} are those grain sizes for which 10%, 30% and 60% of the soil grains, respectively, are smaller.

NOTES:

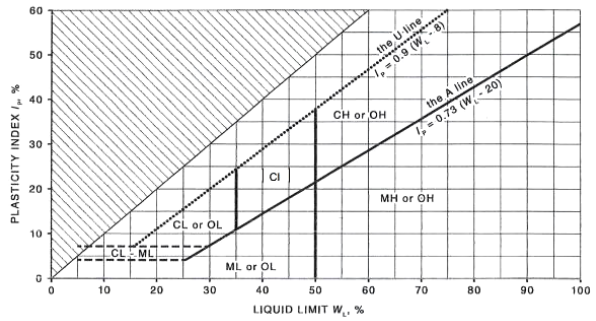
1 For a coarse grained soil with a fines content between 5% and 12%, the soil is given a dual classification comprising the two group symbols separated by a dash; for example, for a poorly graded gravel with between 5% and 12% silt fines, the classification is GP-GM.

2 Where the grading is determined from laboratory tests, it is defined by coefficients of curvature (C_c) and uniformity (C_u) derived from the particle size distribution curve.

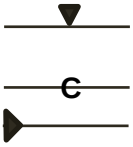
3 Clay soils with liquid limits > 35% and ≤ 50% may be classified as being of medium plasticity.

4 The U line on the Modified Casagrande Chart is an approximate upper bound for most natural soils.

Modified Casagrande Chart for Classifying Silts and Clays according to their Behaviour



LOG SYMBOLS

Log Column	Symbol	Definition
Groundwater Record		Standing water level. Time delay following completion of drilling/excavation may be shown. Extent of borehole/test pit collapse shortly after drilling/excavation. Groundwater seepage into borehole or test pit noted during drilling or excavation.
Samples	ES U50 DB DS ASB ASS SAL	Sample taken over depth indicated, for environmental analysis. Undisturbed 50mm diameter tube sample taken over depth indicated. Bulk disturbed sample taken over depth indicated. Small disturbed bag sample taken over depth indicated. Soil sample taken over depth indicated, for asbestos analysis. Soil sample taken over depth indicated, for acid sulfate soil analysis. Soil sample taken over depth indicated, for salinity analysis.
Field Tests	N = 17 4, 7, 10	Standard Penetration Test (SPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration. 'Refusal' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	N_c = 5 7 3R	Solid Cone Penetration Test (SCPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration for 60° solid cone driven by SPT hammer. 'R' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	VNS = 25 PID = 100	Vane shear reading in kPa of undrained shear strength. Photoionisation detector reading in ppm (soil sample headspace test).
Moisture Condition (Fine Grained Soils)	w > PL $w \approx$ PL w < PL $w \approx$ LL w > LL	Moisture content estimated to be greater than plastic limit. Moisture content estimated to be approximately equal to plastic limit. Moisture content estimated to be less than plastic limit. Moisture content estimated to be near liquid limit. Moisture content estimated to be wet of liquid limit.
(Coarse Grained Soils)	D M W	DRY – runs freely through fingers. MOIST – does not run freely but no free water visible on soil surface. WET – free water visible on soil surface.
Strength (Consistency) Cohesive Soils	VS S F St VSt Hd Fr ( )	VERY SOFT – unconfined compressive strength ≤ 25kPa. SOFT – unconfined compressive strength > 25kPa and ≤ 50kPa. FIRM – unconfined compressive strength > 50kPa and ≤ 100kPa. STIFF – unconfined compressive strength > 100kPa and ≤ 200kPa. VERY STIFF – unconfined compressive strength > 200kPa and ≤ 400kPa. HARD – unconfined compressive strength > 400kPa. FRIABLE – strength not attainable, soil crumbles. Bracketed symbol indicates estimated consistency based on tactile examination or other assessment.
Density Index/ Relative Density (Cohesionless Soils)	VL L MD D VD ( )	**Density Index (I_D) Range (%)** / **SPT 'N' Value Range (Blows/300mm)** VERY LOOSE ≤ 15 — 0 – 4 LOOSE > 15 and ≤ 35 — 4 – 10 MEDIUM DENSE > 35 and ≤ 65 — 10 – 30 DENSE > 65 and ≤ 85 — 30 – 50 VERY DENSE > 85 — > 50 Bracketed symbol indicates estimated density based on ease of drilling or other assessment.
Hand Penetrometer Readings	300 250	Measures reading in kPa of unconfined compressive strength. Numbers indicate individual test results on representative undisturbed material unless noted otherwise.

Log Column	Symbol	Definition
Remarks	'V' bit	Hardened steel 'V' shaped bit.
	'TC' bit	Twin pronged tungsten carbide bit.
	T_{60}	Penetration of auger string in mm under static load of rig applied by drill head hydraulics without rotation of augers.
	Soil Origin	The geological origin of the soil can generally be described as:
		RESIDUAL – soil formed directly from insitu weathering of the underlying rock. No visible structure or fabric of the parent rock.
		EXTREMELY WEATHERED – soil formed directly from insitu weathering of the underlying rock. Material is of soil strength but retains the structure and/or fabric of the parent rock.
		ALLUVIAL – soil deposited by creeks and rivers.
		ESTUARINE – soil deposited in coastal estuaries, including sediments caused by inflowing creeks and rivers, and tidal currents.
		MARINE – soil deposited in a marine environment.
		AEOLIAN – soil carried and deposited by wind.
		COLLUVIAL – soil and rock debris transported downslope by gravity, with or without the assistance of flowing water. Colluvium is usually a thick deposit formed from a landslide. The description 'slopewash' is used for thinner surficial deposits.
		LITTORAL – beach deposited soil.

Classification of Material Weathering

Term		Abbreviation		Definition
Residual Soil		RS		Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.
Extremely Weathered		XW		Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.
Highly Weathered	Distinctly Weathered (Note 1)	HW	DW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Moderately Weathered		MW		The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.
Slightly Weathered		SW		Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh		FR		Rock shows no sign of decomposition of individual minerals or colour changes.

NOTE 1: The term 'Distinctly Weathered' is used where it is not practicable to distinguish between 'Highly Weathered' and 'Moderately Weathered' rock. 'Distinctly Weathered' is defined as follows: *'Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores'*. There is some change in rock strength.

Rock Material Strength Classification

Term	Abbreviation	Uniaxial Compressive Strength (MPa)	Guide to Strength	
			Point Load Strength Index $Is_{(50)}$ (MPa)	Field Assessment
Very Low Strength	VL	0.6 to 2	0.03 to 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 30mm thick can be broken by finger pressure.
Low Strength	L	2 to 6	0.1 to 0.3	Easily scored with a knife; indentations 1mm to 3mm show in the specimen with firm blows of the pick point; has dull sound under hammer. A piece of core 150mm long by 50mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
Medium Strength	M	6 to 20	0.3 to 1	Scored with a knife; a piece of core 150mm long by 50mm diameter can be broken by hand with difficulty.
High Strength	H	20 to 60	1 to 3	A piece of core 150mm long by 50mm diameter cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.
Very High Strength	VH	60 to 200	3 to 10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.
Extremely High Strength	EH	> 200	> 10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

Abbreviations Used in Defect Description

Cored Borehole Log Column		Symbol Abbreviation	Description
Point Load Strength Index		• 0.6	Axial point load strength index test result (MPa)
		x 0.6	Diametral point load strength index test result (MPa)
Defect Details	– Type	Be	Parting – bedding or cleavage
		CS	Clay seam
		Cr	Crushed/sheared seam or zone
		J	Joint
		Jh	Healed joint
		Ji	Incipient joint
		XWS	Extremely weathered seam
	– Orientation	Degrees	Defect orientation is measured relative to normal to the core axis (ie. relative to the horizontal for a vertical borehole)
	– Shape	P	Planar
		C	Curved
		Un	Undulating
		St	Stepped
		Ir	Irregular
	– Roughness	Vr	Very rough
		R	Rough
		S	Smooth
		Po	Polished
		Sl	Slickensided
	– Infill Material	Ca	Calcite
		Cb	Carbonaceous
		Clay	Clay
		Fe	Iron
		Qz	Quartz
		Py	Pyrite
	– Coatings	Cn	Clean
		Sn	Stained – no visible coating, surface is discoloured
		Vn	Veneer – visible, too thin to measure, may be patchy
		Ct	Coating ≤ 1mm thick
		Filled	Coating > 1mm thick
	– Thickness	mm.t	Defect thickness measured in millimetres

APPENDIX Q – CONSTRUCTION WORKER TRANSPORTATION STRATEGY

Construction Worker Transportation Strategy

Requirement

Project – Samuel Gilbert Public School (Ridgecrop Dr, Castle Hill NSW 2154)

Project Number - 26075

This strategy has been prepared as per condition B20 "*Construction Worker Transportation Strategy*" of SSD 9274. It has been developed to minimise the impact of construction workers accessing the site by vehicular means hence minimising the impact on street parking within surrounding streets.

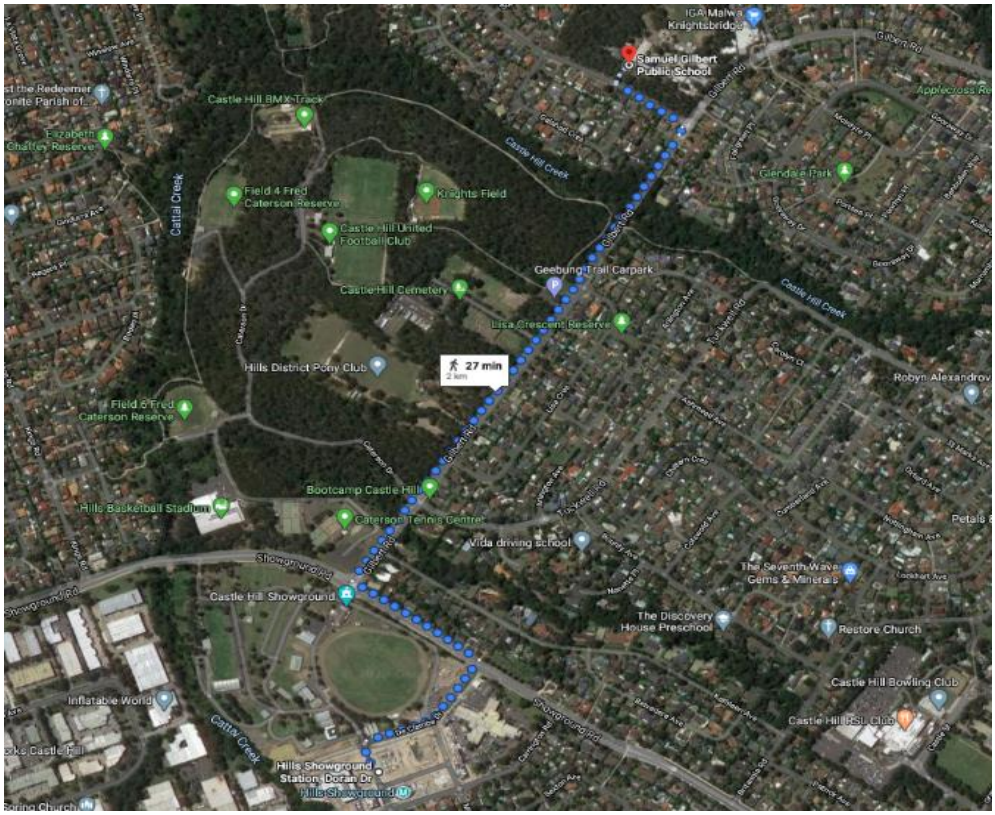
Strategies

The following strategies are to be applied to the **Samuel Gilbert Public School** project.

1. Public Transport Use

- Contractors will be encouraged to use public transport in site inductions and toolbox talks.
- Public Transport information will be made available on site information boards.
- Facilities will be made available onsite for contractors to store tools and other items minimising the need to drive the work vehicle to site daily. There will also be a tool drop-off area so workers will not be inclined to park in the immediate proximity of the site and carry their tools.
- There are a number of Public Transport options for access to **Samuel Gilbert Public School** (Sydney Rail Network and Bus Lines). The Bus Stop is opposite **Samuel Gilbert Public School**. The closest Metro Station is Hills Showground as per the below figure (Figure 1) showing a distance of 2km.

(Figure 1 – Hills Showground to SGPS route)



2. Carpooling

- Contractors will be encourages to car pool to further minimise the number of cars accessing the areas surrounding the site.
- Carpooling to & from the Hills Showground Metro or Castle Hill Metro Station will also be recommended.

3. Street Parking

- Contractors will be encouraged to utilise street parking away from the site. The streets which provide sufficient additional parking to the immediate parking locations (Ridgecrop Drive, Gilbert Road & Galahad Crescent) are as per the following;
    - Fairgreen Place (access to site via New England Way – Figure 2)
    - Gooraway Drive (access to site via Castle Hill Lions Park – Figure 3)
- To avoid any disturbance to the community Hutchinson Builders will notify the relevant authorities of any illegal parking and stopping so that fines can be issued as required. Parking at the Knightsbridge Shopping Centre is time restricted and fines will be issued as required.
- Work Zones will be set up as per the CTPMP to provide some additional stopping areas for the contractors without impacting the local community.

(Figure 2 – Fairgreen Place Street View)

(Figure 3 – Gooraway Drive Street View)

The strategies mentioned within this report are in addition to the information regarding workers transportation which is mentioned in the "Construction Pedestrian and Traffic Management Plan". Through communicating the benefits and ease of public transport within the tender interview, site inductions and tool box talks process the parking demand in nearby areas will be kept to a minimum.

Sydney rail network

NSW GOVERNMENT | Transport

M Metro T Trains

Sydney metro and train lines

M *Metro North West Line* — Chatswood, Tallawong

T1 *North Shore & Western Line* — North Shore, Western, Richmond

T2 *Inner West & Leppington Line* — Inner West, Leppington, City

T3 *Bankstown Line* — Liverpool, Lidcombe, City

T4 *Eastern Suburbs & Illawarra Line* — Eastern Suburbs, Illawarra, Cronulla

T5 *Cumberland Line* — Leppington, Richmond

T6 *Carlingford Line* — Carlingford, Clyde

T7 *Olympic Park Line* — Olympic Park, Lidcombe

T8 *Airport & South Line* — Airport, South, City

T9 *Northern Line* — Northern, Gordon

Stop · Interchange · Interchange · End of line

NORTH

Line under construction

Check timetables and trip planners for train services and connections

Visit **transportnsw.info**

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1812TMS-E-MWT-A4P

603 Rouse Hill Station to Parramatta via Glenhaven

B

How to use this timetable

This timetable provides a snapshot of service information in 24-hour time (e.g. 5am = 05:00, 5pm = 17:00). Information contained in this timetable is subject to change without notice. Please note that timetables do not include minor stops, additional trips for special events, short term changes, holiday timetable changes, real-time information or any disruption alerts.

For the most up-to-date times, use the Trip Planner or Departures on **transportnsw.info**

Real-time planning

You can plan your trip with real-time information using the Trip Planner or Departures on **transportnsw.info** or by downloading travel apps on your smartphone or tablet.

The Trip Planner, Departures and travel apps offer various features:

- favourite your regular trips
- see where your service is on the route
- get estimated pick up and arrival times
- receive service updates
- find nearby stations, stops, wharves and routes
- check accessibility information

Find the latest apps at **transportnsw.info/apps**

Accessible services

All new buses are wheelchair-accessible with low-level floors and space for wheelchairs, prams or strollers. Look for the ♿ symbol in this timetable. Some older buses may not have all the features you need. There will be more accessible services as older buses are replaced.

Who is providing my bus services?

The bus services shown in this timetable are run by Hillsbus.

Fares

In Sydney and surrounding regions, fares are based on:

- the distance you travel from tap on to tap off
- the mode of transport you choose
- whether you're eligible for a concession fare or free travel
- any Opal benefits such as discounts and capped fares that apply

You can use an Opal card or a contactless payment to pay for your travel.

Opal cards

An Opal card is a smartcard you keep and reuse. Add value before you travel and tap on and tap off to pay your fares throughout Sydney, the Blue Mountains, Central Coast, the Hunter and the Illawarra.

Which Opal card is right for you?

Adult - Customers 16 years and over who are not entitled to any concessions and normally pay full fare.

Child/Youth - For customers aged 4-15 (inclusive), or customers 16 years or older who hold a NSW/ACT Senior Secondary Student Concession Card.

Gold Senior/Pensioner - For eligible NSW and interstate seniors, pensioners, war widows/ers and asylum seekers.

Concession - For eligible tertiary students, job seekers, apprentices and trainees.

How to get an Opal card

You can get an Adult or Child/Youth Opal card over the counter at Opal retailers that display the Opal sign. To find your nearest retailer visit **transportnsw.info/opal**.

If you are eligible to travel with concession fares you can apply for a Gold Senior/Pensioner or Concession Opal card online. Visit **transportnsw.info/opal** for more information.

Contactless payments

If you have an American Express, Mastercard, Visa card or linked device, you can use it to pay for all public transport on the Opal network. Just make sure to tap on and tap off at Opal readers at the beginning and end of your trip.

Always separate your cards when you tap on and tap off so your preferred card is charged.

You will receive the same travel benefits of an Adult Opal card when you tap on and tap off consistently with the same credit card, debit card or linked device. This includes daily, weekly and Sunday travel caps, and a $2 transfer discount when you change between metro/train, ferry, bus or light rail services within 60 minutes. Adult Opal fare pricing applies.

Find out more at **transportnsw.info/contactless**

Explanation of definitions and symbols

♿	Wheelchair Accessible
B	Diverts via Greenbank Dr loop

NSW GOVERNMENT | Transport

603 Parramatta to Rouse Hill Station via Glenhaven

B

Valid from: 17 Nov 2019

Creation date: 01 Nov 2019
NOTE: Information is correct on date of download.

Monday to Friday	♿	♿	♿	♿	♿	♿		♿	♿
Castle Hill Station	-	-	-	-	-	-	07:00	-	07:30
Old Northern Rd opp Oakhill College, Castle Hill	-	-	-	-	-	-	07:03	-	07:34
Ridgecrop Dr opp Samuel Gilbert Public School, Castle Hill	-	-	-	-	-	-	07:09	-	07:41
Greenbank Dr before Grange Rd, Glenhaven	-	-	-	-	-	-	07:15	-	07:47
Old Glenhaven Rd after Finley Pl, Glenhaven	-	-	-	-	-	-	07:20	-	07:52
Mills Rd before Glenhaven Rd, Glenhaven	-	-	-	-	-	-	07:24	-	07:56
Samantha Riley Dr opp Foxall Rd, North Kellyville	05:55	06:15	06:30	06:45	07:00	07:15	07:29	07:45	08:01
Kellyville Station	06:03	06:24	06:39	06:54	07:11	07:26	07:42	07:58	08:14
Merriville Rd at Vinegar Hill Rd, Kellyville Ridge	-	-	-	-	-	-	07:51	-	08:23
Rouse Hill Station	-	-	-	-	-	-	08:00	-	08:32

Monday to Friday	♿	♿		♿	♿	♿	♿	♿	♿
Parramatta Station	-	07:12	-	-	07:50	08:30	09:05	10:05	11:05
Church St opp St Patrick's Cemetery, North Parramatta	-	07:22	-	-	08:00	08:40	09:14	10:13	11:13
Windsor Rd after Churchill Dr, Winston Hills	-	07:34	-	-	08:15	08:54	09:23	10:19	11:19
Cross St after Baker Cres, Baulkham Hills	-	07:42	-	-	08:23	09:01	09:30	10:25	11:25
Old Northern Rd after Excelsior Ave, Castle Hill	-	07:49	-	-	08:30	09:07	09:36	10:30	11:30
Castle Hill Station	-	07:57	-	-	08:38	09:15	09:44	10:38	11:38
Old Northern Rd opp Oakhill College, Castle Hill	-	08:01	-	-	08:42	09:18	09:47	10:41	11:41
Ridgecrop Dr opp Samuel Gilbert Public School, Castle Hill	-	08:09	-	-	08:50	09:24	09:53	10:47	11:47
Greenbank Dr before Grange Rd, Glenhaven	-	08:15	-	-	08:56	09:30	09:59	10:53	11:53
Old Glenhaven Rd after Finley Pl, Glenhaven	-	08:20	-	-	09:01	09:34	10:03	10:57	11:57
Mills Rd before Glenhaven Rd, Glenhaven	-	08:24	-	-	09:05	09:38	10:07	11:01	12:01
Samantha Riley Dr opp Foxall Rd, North Kellyville	08:15	08:29	08:45	09:00	09:10	09:43	10:12	11:06	12:06
Kellyville Station	08:28	08:42	08:58	09:09	09:19	09:52	10:20	11:14	12:14
Merriville Rd at Vinegar Hill Rd, Kellyville Ridge	-	08:51	-	-	09:26	09:59	10:27	11:21	12:21
Rouse Hill Station	-	09:00	-	-	09:35	10:08	10:36	11:30	12:30

Monday to Friday	♿	♿	♿	♿	♿		♿	♿	♿
Parramatta Station	12:05	13:05	13:55	14:25	-	14:55	-	15:25	15:55
Church St opp St Patrick's Cemetery, North Parramatta	12:13	13:14	14:04	14:34	-	15:05	-	15:35	16:05
Windsor Rd after Churchill Dr, Winston Hills	12:19	13:21	14:12	14:42	-	15:13	-	15:43	16:14
Cross St after Baker Cres, Baulkham Hills	12:25	13:27	14:18	14:48	-	15:20	-	15:50	16:21
Old Northern Rd after Excelsior Ave, Castle Hill	12:30	13:32	14:24	14:54	-	15:26	-	15:56	16:27
Castle Hill Station	12:38	13:40	14:32	15:02	15:17	15:34	15:49	16:04	16:35
Old Northern Rd opp Oakhill College, Castle Hill	12:41	13:43	14:35	15:06	15:21	15:39	15:54	16:08	16:39
Ridgecrop Dr opp Samuel Gilbert Public School, Castle Hill	12:47	13:49	14:43	15:14	**B**15:29	**B**15:47	**B**16:02	**B**16:16	**B**16:47
Greenbank Dr opp Beacon Ave, Glenhaven	–	–	–	–	15:38	15:56	16:11	16:25	16:56
Greenbank Dr before Grange Rd, Glenhaven	12:53	13:55	14:49	15:20	15:40	15:58	16:13	16:27	16:58
Old Glenhaven Rd after Finley Pl, Glenhaven	12:57	13:59	14:55	15:26	15:45	16:03	16:18	16:32	17:03
Mills Rd before Glenhaven Rd, Glenhaven	13:01	14:03	14:59	15:30	15:49	16:07	16:22	16:36	17:07
Samantha Riley Dr opp Foxall Rd, North Kellyville	13:06	14:08	15:04	15:35	15:54	16:12	16:27	16:41	17:12
Kellyville Station	13:14	14:16	15:14	15:45	16:04	16:22	16:37	16:51	17:22
Merriville Rd at Vinegar Hill Rd, Kellyville Ridge	13:21	14:23	15:22	15:53	-	16:30	-	16:59	17:30
Rouse Hill Station	13:30	14:32	15:32	16:03	-	16:40	-	17:09	17:40

603 Parramatta to Rouse Hill Station via Glenhaven

B

Monday to Friday							
Parramatta Station	16:25	16:55	17:25	17:55	18:25	19:25	-
Church St opp St Patrick's Cemetery, North Parramatta	16:35	17:05	17:35	18:05	18:35	19:33	-
Windsor Rd after Churchill Dr, Winston Hills	16:44	17:15	17:45	18:13	18:42	19:39	-
Cross St after Baker Cres, Baulkham Hills	16:52	17:23	17:53	18:20	18:49	19:45	-
Old Northern Rd after Excelsior Ave, Castle Hill	16:59	17:30	18:00	18:26	18:55	19:51	-
Castle Hill Station	17:07	17:38	18:08	18:34	19:02	19:58	21:00
Old Northern Rd opp Oakhill College, Castle Hill	17:11	17:42	18:11	18:37	19:05	20:01	21:03
Ridgecrop Dr opp Samuel Gilbert Public School, Castle Hill	B17:19	B17:49	B18:18	B18:44	B19:11	20:07	21:09
Greenbank Dr opp Beacon Ave, Glenhaven	17:27	17:57	18:25	18:51	19:18	–	–
Greenbank Dr before Grange Rd, Glenhaven	17:29	17:59	18:27	18:53	19:20	20:13	21:15
Old Glenhaven Rd after Finley Pl, Glenhaven	17:34	18:03	18:31	18:57	19:24	20:17	21:19
Mills Rd before Glenhaven Rd, Glenhaven	17:38	18:07	18:35	19:01	19:28	20:21	21:23
Samantha Riley Dr opp Foxall Rd, North Kellyville	17:43	18:12	18:40	19:06	19:33	-	-
Kellyville Station	17:53	18:20	18:48	19:13	19:40	-	-
Merriville Rd at Vinegar Hill Rd, Kellyville Ridge	18:01	18:27	18:55	19:20	19:47	-	-
Rouse Hill Station	18:10	18:36	19:04	19:29	19:56	-	-

Saturday									
Parramatta Station	-	-	-	10:06	11:06	12:06	13:06	14:06	15:06
Church St opp St Patrick's Cemetery, North Parramatta	-	-	-	10:14	11:14	12:14	13:14	14:14	15:14
Windsor Rd after Churchill Dr, Winston Hills	-	-	-	10:20	11:20	12:21	13:21	14:21	15:21
Cross St after Baker Cres, Baulkham Hills	-	-	-	10:25	11:25	12:26	13:26	14:26	15:26
Old Northern Rd after Excelsior Ave, Castle Hill	-	-	-	10:31	11:31	12:32	13:32	14:32	15:32
Castle Hill Station	07:36	08:36	09:36	10:37	11:38	12:39	13:39	14:39	15:39
Old Northern Rd opp Oakhill College, Castle Hill	07:39	08:39	09:39	10:40	11:41	12:42	13:42	14:42	15:42
Ridgecrop Dr opp Samuel Gilbert Public School, Castle Hill	07:44	08:44	09:44	10:45	11:47	12:48	13:48	14:48	15:48
Greenbank Dr before Grange Rd, Glenhaven	07:50	08:50	09:50	10:51	11:53	12:54	13:54	14:54	15:54
Old Glenhaven Rd after Finley Pl, Glenhaven	07:54	08:54	09:54	10:55	11:57	12:58	13:58	14:58	15:58
Mills Rd before Glenhaven Rd, Glenhaven	07:58	08:58	09:58	10:59	12:01	13:02	14:02	15:02	16:02
Samantha Riley Dr opp Foxall Rd, North Kellyville	08:02	09:02	10:02	11:04	12:06	13:07	14:07	15:07	16:07
Kellyville Station	08:09	09:09	10:09	11:14	12:16	13:17	14:15	15:15	16:15
Merriville Rd at Vinegar Hill Rd, Kellyville Ridge	08:16	09:16	10:16	11:21	12:23	13:24	14:22	15:22	16:22
Rouse Hill Station	08:23	09:23	10:23	11:29	12:31	13:32	14:30	15:30	16:30

Saturday					
Parramatta Station	16:06	17:06	18:06	19:06	-
Church St opp St Patrick's Cemetery, North Parramatta	16:14	17:14	18:14	19:14	-
Windsor Rd after Churchill Dr, Winston Hills	16:21	17:21	18:20	19:19	-
Cross St after Baker Cres, Baulkham Hills	16:26	17:26	18:25	19:24	-
Old Northern Rd after Excelsior Ave, Castle Hill	16:32	17:32	18:30	19:29	-
Castle Hill Station	16:39	17:38	18:36	19:34	20:36
Old Northern Rd opp Oakhill College, Castle Hill	16:42	17:41	18:39	19:37	20:39
Ridgecrop Dr opp Samuel Gilbert Public School, Castle Hill	16:48	17:47	18:45	19:42	20:44
Greenbank Dr before Grange Rd, Glenhaven	16:54	17:53	18:51	19:48	20:50
Old Glenhaven Rd after Finley Pl, Glenhaven	16:58	17:57	18:55	19:52	20:54
Mills Rd before Glenhaven Rd, Glenhaven	17:02	18:01	18:59	19:56	20:58
Samantha Riley Dr opp Foxall Rd, North Kellyville	17:07	18:06	19:04	20:01	21:02
Kellyville Station	17:15	18:14	19:12	20:09	21:09
Merriville Rd at Vinegar Hill Rd, Kellyville Ridge	17:22	18:21	19:19	20:16	21:16
Rouse Hill Station	17:30	18:29	19:27	20:24	21:23

603 Parramatta to Rouse Hill Station via Glenhaven

B

Sunday & Public Holidays	♿	♿	♿	♿	♿	♿	♿	♿	♿
Castle Hill Station	08:25	09:25	10:25	11:25	12:25	13:25	14:25	15:25	16:25
Old Northern Rd opp Oakhill College, Castle Hill	08:28	09:28	10:28	11:28	12:28	13:28	14:28	15:28	16:28
Ridgecrop Dr opp Samuel Gilbert Public School, Castle Hill	08:33	09:33	10:33	11:33	12:33	13:33	14:33	15:33	16:33
Greenbank Dr before Grange Rd, Glenhaven	08:38	09:38	10:38	11:38	12:38	13:38	14:38	15:38	16:38
Old Glenhaven Rd after Finley Pl, Glenhaven	08:42	09:42	10:42	11:42	12:42	13:42	14:42	15:42	16:42
Mills Rd before Glenhaven Rd, Glenhaven	08:46	09:46	10:46	11:46	12:46	13:46	14:46	15:46	16:46
Samantha Riley Dr opp Foxall Rd, North Kellyville	08:50	09:50	10:50	11:50	12:50	13:50	14:50	15:50	16:50
Kellyville Station	08:56	09:56	10:56	11:57	12:57	13:57	14:57	15:57	16:57
Merriville Rd at Vinegar Hill Rd, Kellyville Ridge	09:03	10:03	11:03	12:04	13:04	14:04	15:04	16:04	17:04
Rouse Hill Station	09:10	10:10	11:11	12:12	13:12	14:12	15:12	16:12	17:12

Sunday & Public Holidays	♿	♿	♿
Castle Hill Station	17:25	18:25	19:25
Old Northern Rd opp Oakhill College, Castle Hill	17:28	18:28	19:28
Ridgecrop Dr opp Samuel Gilbert Public School, Castle Hill	17:33	18:33	19:33
Greenbank Dr before Grange Rd, Glenhaven	17:38	18:38	19:38
Old Glenhaven Rd after Finley Pl, Glenhaven	17:42	18:42	19:42
Mills Rd before Glenhaven Rd, Glenhaven	17:46	18:46	19:46
Samantha Riley Dr opp Foxall Rd, North Kellyville	17:50	18:50	19:50
Kellyville Station	17:57	18:57	19:57
Merriville Rd at Vinegar Hill Rd, Kellyville Ridge	18:04	19:04	20:04
Rouse Hill Station	18:12	19:12	20:12

603 Rouse Hill Station to Parramatta via Glenhaven

B

Monday to Friday	♿	♿	♿		♿	♿	♿	♿	♿
Rouse Hill Station	05:50	06:15	06:30	06:45	07:00	-	07:25	07:55	08:55
Merriville Rd at Perfection Ave, Kellyville Ridge	05:54	06:19	06:34	06:49	07:04	-	07:29	07:59	08:59
Kellyville Station	06:00	06:25	06:40	06:55	07:12	07:26	07:40	08:10	09:08
Samantha Riley Dr opp Foxall Rd, North Kellyville	06:06	06:31	06:46	07:01	07:18	07:33	07:48	08:20	09:14
Mills Rd after Glenhaven Rd, Glenhaven	06:11	06:36	06:51	07:06	07:23	07:38	07:56	08:28	09:19
Living Choice Glenhaven, Old Glenhaven Rd, Glenhaven	06:16	06:41	06:56	07:12	07:29	07:44	08:02	08:34	09:24
Greenbank Dr after Grange Rd, Glenhaven	06:21	B06:46	B07:01	B07:17	B07:35	B07:50	B08:08	08:40	09:29
Greenbank Dr opp Beacon Ave, Glenhaven	–	06:47	07:02	07:18	07:36	07:51	08:09	–	–
Samuel Gilbert Public School, Ridgecrop Dr, Castle Hill	06:28	06:55	07:10	07:26	07:44	07:59	08:17	08:48	09:35
Oakhill College, Old Northern Rd, Castle Hill	06:36	07:03	07:18	07:36	07:55	08:10	08:28	08:57	09:43
Castle Hill Station	06:42	07:10	07:25	07:44	08:03	08:18	08:35	09:04	09:50
Excelsior Ave after Old Northern Rd, Castle Hill	06:47	07:17	07:32	07:51	08:10	-	08:42	09:08	09:54
Cross St opp Baker Cres, Baulkham Hills	06:52	07:23	07:38	07:57	08:16	-	08:48	09:14	09:59
Windsor Rd after Mary St, Northmead	07:00	07:32	07:49	08:08	08:27	-	08:57	09:22	10:06
Church St before Fennell St, Parramatta	07:09	07:43	08:00	08:20	08:39	-	09:08	09:32	10:14
Parramatta Station	07:21	07:58	08:16	08:36	08:56	-	09:22	09:44	10:26

Monday to Friday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Rouse Hill Station	09:55	10:55	11:55	12:55	13:55	14:55	15:25	-	15:55
Merriville Rd at Perfection Ave, Kellyville Ridge	09:59	10:59	11:59	12:59	13:59	15:00	15:30	-	16:00
Kellyville Station	10:06	11:06	12:06	13:06	14:06	15:12	15:40	15:55	16:08
Samantha Riley Dr opp Foxall Rd, North Kellyville	10:12	11:12	12:12	13:12	14:12	15:22	15:48	16:03	16:16
Mills Rd after Glenhaven Rd, Glenhaven	10:17	11:17	12:17	13:17	14:17	15:27	15:53	-	16:21
Living Choice Glenhaven, Old Glenhaven Rd, Glenhaven	10:22	11:22	12:22	13:22	14:22	15:32	15:58	-	16:26
Greenbank Dr after Grange Rd, Glenhaven	10:27	11:27	12:27	13:27	14:27	15:37	16:03	-	16:31
Samuel Gilbert Public School, Ridgecrop Dr, Castle Hill	10:33	11:33	12:33	13:33	14:33	15:43	16:09	-	16:37
Oakhill College, Old Northern Rd, Castle Hill	10:41	11:41	12:41	13:41	14:41	15:51	16:17	-	16:45
Castle Hill Station	10:48	11:48	12:48	13:48	14:48	15:58	16:24	-	16:52
Excelsior Ave after Old Northern Rd, Castle Hill	10:52	11:52	12:52	13:52	14:54	16:04	16:30	-	16:58
Cross St opp Baker Cres, Baulkham Hills	10:57	11:57	12:57	13:57	14:59	16:09	16:35	-	17:03
Windsor Rd after Mary St, Northmead	11:04	12:04	13:04	14:04	15:07	16:17	16:43	-	17:11
Church St before Fennell St, Parramatta	11:12	12:12	13:12	14:12	15:16	16:28	16:54	-	17:21
Parramatta Station	11:24	12:24	13:24	14:24	15:29	16:43	17:09	-	17:36

Monday to Friday	♿	♿	♿		♿	♿		♿	
Rouse Hill Station	-	-	-	16:55	-	-	-	17:55	-
Merriville Rd at Perfection Ave, Kellyville Ridge	-	-	-	17:00	-	-	-	18:00	-
Kellyville Station	16:25	16:40	16:55	17:08	17:25	17:40	17:55	18:08	18:25
Samantha Riley Dr opp Foxall Rd, North Kellyville	16:33	16:48	17:03	17:16	17:33	17:48	18:03	18:15	18:32
Mills Rd after Glenhaven Rd, Glenhaven	-	-	-	17:21	-	-	-	18:20	-
Living Choice Glenhaven, Old Glenhaven Rd, Glenhaven	-	-	-	17:26	-	-	-	18:25	-
Greenbank Dr after Grange Rd, Glenhaven	-	-	-	17:30	-	-	-	18:29	-
Samuel Gilbert Public School, Ridgecrop Dr, Castle Hill	-	-	-	17:36	-	-	-	18:35	-
Oakhill College, Old Northern Rd, Castle Hill	-	-	-	17:43	-	-	-	18:42	-
Castle Hill Station	-	-	-	17:49	-	-	-	18:48	-
Excelsior Ave after Old Northern Rd, Castle Hill	-	-	-	17:53	-	-	-	18:52	-
Cross St opp Baker Cres, Baulkham Hills	-	-	-	17:58	-	-	-	18:56	-
Windsor Rd after Mary St, Northmead	-	-	-	18:06	-	-	-	19:03	-
Church St before Fennell St, Parramatta	-	-	-	18:15	-	-	-	19:11	-
Parramatta Station	-	-	-	18:30	-	-	-	19:23	-

603 Rouse Hill Station to Parramatta via Glenhaven

B

Monday to Friday			♿	♿	♿	♿	♿	♿	♿
Rouse Hill Station	-	-	18:57	-	-	-	-	-	-
Merriville Rd at Perfection Ave, Kellyville Ridge	-	-	19:01	-	-	-	-	-	-
Kellyville Station	18:40	18:55	19:08	19:25	19:40	20:00	20:30	21:00	21:30
Samantha Riley Dr opp Foxall Rd, North Kellyville	18:47	19:02	19:15	19:32	19:47	20:07	20:37	21:07	21:37
Mills Rd after Glenhaven Rd, Glenhaven	-	-	19:20	-	-	-	-	-	-
Living Choice Glenhaven, Old Glenhaven Rd, Glenhaven	-	-	19:25	-	-	-	-	-	-
Greenbank Dr after Grange Rd, Glenhaven	-	-	19:29	-	-	-	-	-	-
Samuel Gilbert Public School, Ridgecrop Dr, Castle Hill	-	-	19:35	-	-	-	-	-	-
Oakhill College, Old Northern Rd, Castle Hill	-	-	19:42	-	-	-	-	-	-
Castle Hill Station	-	-	19:47	-	-	-	-	-	-

Monday to Friday	♿
Kellyville Station	22:05
Samantha Riley Dr opp Foxall Rd, North Kellyville	22:12

Saturday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Rouse Hill Station	07:41	08:41	09:41	10:41	11:41	12:41	13:41	14:41	15:41
Merriville Rd at Perfection Ave, Kellyville Ridge	07:44	08:45	09:46	10:46	11:46	12:46	13:46	14:46	15:45
Kellyville Station	07:50	08:51	09:52	10:53	11:53	12:53	13:53	14:53	15:52
Samantha Riley Dr opp Foxall Rd, North Kellyville	07:56	08:57	09:59	11:00	12:00	13:00	14:00	15:00	15:59
Mills Rd after Glenhaven Rd, Glenhaven	08:00	09:01	10:03	11:04	12:04	13:04	14:04	15:04	16:03
Living Choice Glenhaven, Old Glenhaven Rd, Glenhaven	08:04	09:05	10:07	11:08	12:08	13:08	14:08	15:08	16:07
Greenbank Dr after Grange Rd, Glenhaven	08:08	09:10	10:12	11:13	12:12	13:12	14:12	15:12	16:11
Samuel Gilbert Public School, Ridgecrop Dr, Castle Hill	08:13	09:15	10:17	11:18	12:17	13:17	14:17	15:17	16:16
Oakhill College, Old Northern Rd, Castle Hill	08:19	09:22	10:25	11:26	12:23	13:23	14:23	15:23	16:22
Castle Hill Station	08:26	09:30	10:33	11:34	12:31	13:31	14:31	15:31	16:30
Excelsior Ave after Old Northern Rd, Castle Hill	08:31	09:35	10:38	11:39	12:36	13:36	14:36	15:36	16:35
Cross St opp Baker Cres, Baulkham Hills	08:35	09:40	10:43	11:44	12:41	13:41	14:41	15:41	16:40
Windsor Rd after Mary St, Northmead	08:41	09:46	10:49	11:50	12:47	13:47	14:47	15:47	16:46
Church St before Fennell St, Parramatta	08:48	09:54	10:57	11:58	12:54	13:54	14:54	15:54	16:53
Parramatta Station	09:02	10:08	11:11	12:12	13:08	14:08	15:08	16:08	17:07

Saturday	♿	♿	♿	♿
Rouse Hill Station	16:41	17:41	18:41	19:41
Merriville Rd at Perfection Ave, Kellyville Ridge	16:45	17:45	18:45	19:44
Kellyville Station	16:52	17:52	18:52	19:50
Samantha Riley Dr opp Foxall Rd, North Kellyville	16:59	17:59	18:58	19:56
Mills Rd after Glenhaven Rd, Glenhaven	17:03	18:03	19:02	20:00
Living Choice Glenhaven, Old Glenhaven Rd, Glenhaven	17:07	18:07	19:06	20:04
Greenbank Dr after Grange Rd, Glenhaven	17:11	18:11	19:10	20:08
Samuel Gilbert Public School, Ridgecrop Dr, Castle Hill	17:16	18:16	19:14	20:12
Oakhill College, Old Northern Rd, Castle Hill	17:22	18:22	19:20	20:18
Castle Hill Station	17:30	18:30	19:27	20:25
Excelsior Ave after Old Northern Rd, Castle Hill	17:35	18:35	-	-
Cross St opp Baker Cres, Baulkham Hills	17:40	18:39	-	-
Windsor Rd after Mary St, Northmead	17:46	18:45	-	-
Church St before Fennell St, Parramatta	17:53	18:52	-	-
Parramatta Station	18:07	19:04	-	-

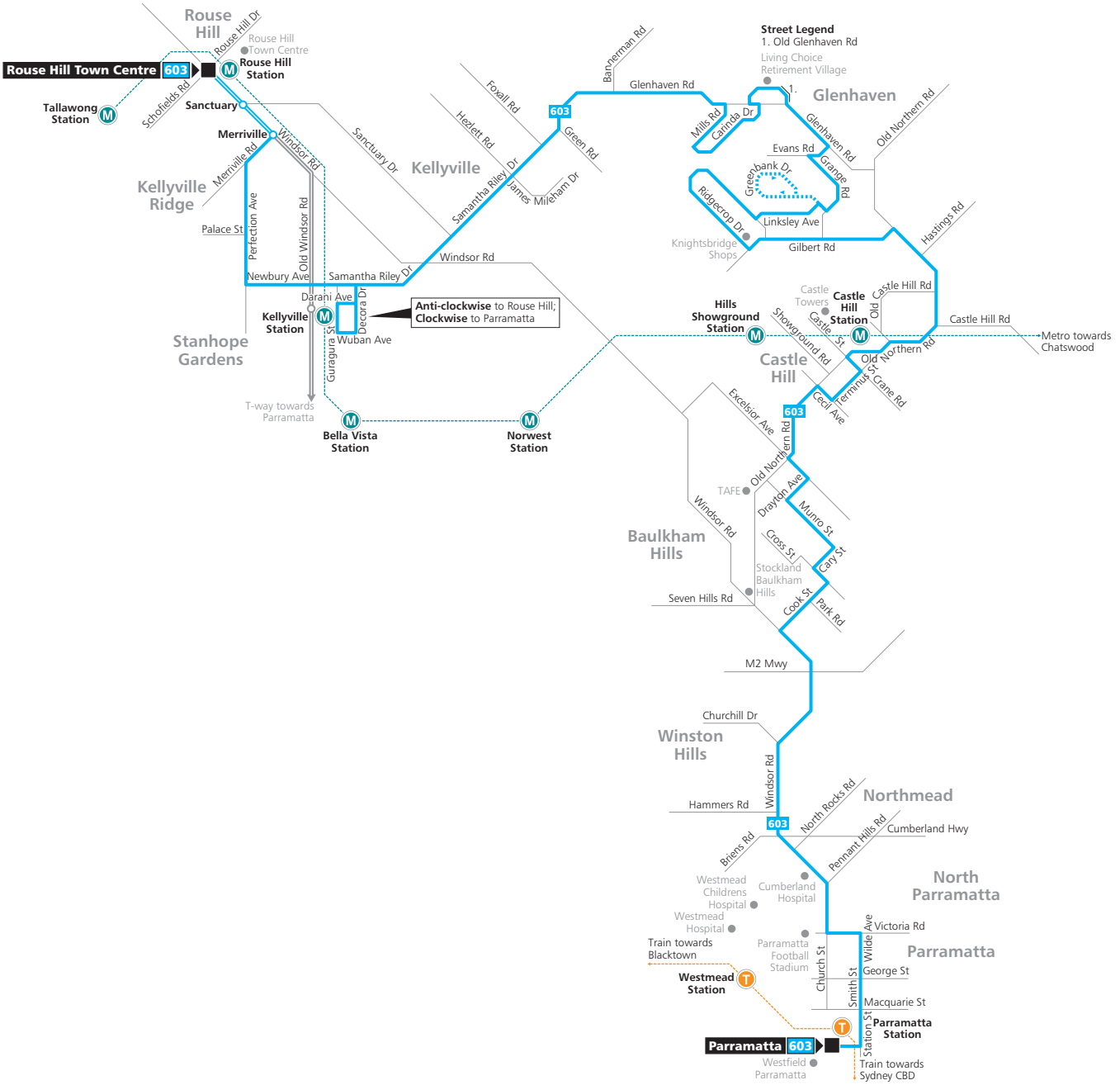
603 Rouse Hill Station to Parramatta via Glenhaven

B

Sunday & Public Holidays	♿	♿	♿	♿	♿	♿	♿	♿	♿
Rouse Hill Station	07:36	08:36	09:36	10:36	11:36	12:36	13:36	14:36	15:36
Merriville Rd at Perfection Ave, Kellyville Ridge	07:39	08:40	09:41	10:41	11:41	12:41	13:41	14:41	15:40
Kellyville Station	07:45	08:46	09:47	10:48	11:48	12:48	13:48	14:48	15:47
Samantha Riley Dr opp Foxall Rd, North Kellyville	07:51	08:52	09:54	10:55	11:55	12:55	13:55	14:55	15:54
Mills Rd after Glenhaven Rd, Glenhaven	07:55	08:56	09:58	10:59	11:59	12:59	13:59	14:59	15:58
Living Choice Glenhaven, Old Glenhaven Rd, Glenhaven	07:59	09:00	10:02	11:03	12:03	13:03	14:03	15:03	16:02
Greenbank Dr after Grange Rd, Glenhaven	08:03	09:05	10:07	11:08	12:07	13:07	14:07	15:07	16:06
Samuel Gilbert Public School, Ridgecrop Dr, Castle Hill	08:08	09:10	10:12	11:13	12:12	13:12	14:12	15:12	16:11
Oakhill College, Old Northern Rd, Castle Hill	08:14	09:17	10:20	11:21	12:18	13:18	14:18	15:18	16:17
Castle Hill Station	08:23	09:28	10:31	11:32	12:29	13:29	14:29	15:29	16:28

Sunday & Public Holidays	♿	♿	♿
Rouse Hill Station	16:36	17:36	18:36
Merriville Rd at Perfection Ave, Kellyville Ridge	16:40	17:40	18:40
Kellyville Station	16:47	17:47	18:47
Samantha Riley Dr opp Foxall Rd, North Kellyville	16:54	17:54	18:53
Mills Rd after Glenhaven Rd, Glenhaven	16:58	17:58	18:57
Living Choice Glenhaven, Old Glenhaven Rd, Glenhaven	17:02	18:02	19:01
Greenbank Dr after Grange Rd, Glenhaven	17:06	18:06	19:05
Samuel Gilbert Public School, Ridgecrop Dr, Castle Hill	17:11	18:11	19:09
Oakhill College, Old Northern Rd, Castle Hill	17:17	18:17	19:15
Castle Hill Station	17:28	18:28	19:24

Route 603



Legend

- Bus route
- 603 Bus route number
- Bus route start/finish
- Metro line/station
- Train line/station
- T-way/stop

North

Diagrammatic Map
Not to Scale

NSW GOVERNMENT Transport

transportnsw.info

APPENDIX R – COMMUNITY COMMUNICATION STRATEGY

NSW GOVERNMENT | Education

March 2020

School Infrastructure NSW

Community Communication Strategy

Upgrade to Samuel Gilbert Public School

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Document Purpose

This Community Communication Strategy (CCS) has been developed to:

- Successfully consider and manage stakeholder and community expectations as integral to the successful delivery of the project.
- Outline interfaces with other disciplines, including safety, construction, design and environment, to ensure all activities are co-ordinated and drive best practice project outcomes.
- Inform affected stakeholders, such as the local community or road users about construction activities.
- Provide a delivery strategy which enables the open and proactive management of issues and communications.
- Highlight supporting procedures and tools to enable the team to deliver this plan effectively.
- Provide support for the broader communications objectives of School Infrastructure NSW (SINSW), including the promotion of the project and its benefits.

This Community Consultation Strategy (CCS) will be implemented through the design and construction phase of the project, and for 12 months following construction completion. Table 1 below lists the communication and engagement requirements outlined in the State Significant Development (SSD) application consent conditions.

Plan review

The CCS will be revised regularly to address any changes in the project management process, comments and feedback by relevant stakeholders, and any changes identified as a result of continuous improvement undertakings. This will be done in close consultation with the SINSW Senior Project Director, appointed Project Management Company and/or Contractor and SINSW Community Engagement Manager.

Approval

The CCS is reviewed and approved by the SINSW Senior Project Director, in close consultation with Schools Operations and Performance, with final endorsement from the SINSW Community Engagement Senior Manager before being submitted to the Planning Secretary for information.

Table 1: List of SSD application consent conditions for communication and engagement and where they are addressed in this strategy

Consent conditions for communication and engagement	The CCS addresses this in section
Identify people to be consulted during the design and construction phase	▪ Section 4 ▪ Section 5
Set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development	▪ Section 6 ▪ Section 7 ▪ Section 8.4
Provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development	▪ Section 4
Set out procedures and mechanisms: ▪ Through which the community can discuss or provide feedback to the Applicant	▪ Section 4, PRG ▪ Section 6 ▪ Section 8.5
Set out procedures and mechanisms: ▪ Through which the Applicant will respond to enquiries or feedback from the community; and	▪ Section 8.5
Set out procedures and mechanisms: ▪ To resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation	▪ Section 8.5

1. Context

The NSW Government is investing $6.7 billion over four years to deliver more than 190 new and upgraded schools to support communities across NSW. In addition, a record $1.3 billion is being spent on school maintenance over five years, along with a record $500 million for the sustainable Cooler Classrooms program to provide air conditioning to schools. This is the largest investment in public education infrastructure in the history of NSW.

An upgrade is underway at Samuel Gilbert Public School, which includes the construction of a new three storey building and modifications to existing buildings.

The benefits

- 25 additional new permanent learning spaces.
- A new library.
- A new hall (with separate access for community use).
- New staff and administration facilities.
- Creation of a new connection to the existing campus.
- Removal of demountable classrooms.

The Samuel Gilbert Public School upgrade is classified as a State Significant Development, and has been assessed by the Department of Planning, Industry and Environment (DPIE). Consent was provided on 15 February 2020.

DPIE's web page on the project is here.

2. Community Engagement Objectives

SINSW's mission is to provide school infrastructure solutions by working collaboratively with all our stakeholders to create learning environments across NSW that serve our future needs and make us all proud.

This CCS has been developed to achieve the following community engagement objectives:

- Promote the benefits of the project
- Build key school community stakeholder relationships and maintain goodwill with impacted communities
- Manage community expectations and build trust by delivering on our commitments
- Provide timely information to impacted stakeholders, schools and broader communities
- Address and correct misinformation in the public domain
- Reduce the risk of project delays caused by negative third party intervention
- Leave a positive legacy in each community.

3. Key Messages

Through each phase of the project, the key messages, community engagement plan, and means of engagement will be regularly reviewed, refined and updated. Information that is currently in the public domain is outlined below.

3.1. High level messaging

The NSW Government is investing $6.7 billion over four years to deliver more than 190 new and upgraded schools to support communities across NSW. In addition, a record $1.3 billion is being spent on school maintenance over five years, along with a record $500 million for the sustainable Cooler Classrooms program to provide air conditioning to schools. This is the largest investment in public education infrastructure in the history of NSW.

3.2. Project messaging

3.2.1. Project status

The State Significant Development Application has been assessed by the Department of Planning, Industry & Environment (DPIE) and consent has been granted.

3.2.2. Project benefits

An upgrade is underway at Samuel Gilbert Public School, which includes the construction of a new three storey building and modifications to existing buildings.

The benefits:

- 25 additional new permanent learning spaces.
- A new library.
- A new hall (with separate access for community use).
- New staff and administration facilities.
- Creation of a new connection to the existing campus.
- Removal of demountable classrooms.

3.2.3. High-quality learning environment

The project will provide state-of-the-art classrooms and learning spaces that make use of the latest technology to enhance the learning experience for the next generation of students. The contemporary and sustainable facilities provide an outstanding working environment for school staff.

Flexible learning spaces are adaptable to accommodate small or large groups and facilitate students' use of modern technology, while working independently and collaboratively.

3.2.4. Environmental benefits

The school will be upgraded in accordance with current sustainability principles. School Infrastructure NSW is committed to environmentally conscious construction and maintenance practices.

3.3. Construction phase

3.3.1. Safety

School Infrastructure NSW is committed to ensuring that work is completed safely and efficiently and with minimal impact to the local community. Prior to construction starting, any hazardous material is required to be removed from the site. This work will be carried out in accordance with regulatory requirements including the provisions of SafeWork NSW.

3.3.2. Traffic management

The construction contractor has developed a Traffic Management Plan to ensure that vehicle movements are managed with minimal disruption to the local community. All construction vehicles (excluding worker vehicles) are to be contained wholly within the site, except if located in an approved on-street work zone, and vehicles must enter the site before stopping.

3.3.3. Noise, vibration and dust

Any activity that could exceed approved construction noise management levels will be managed in strict accordance with the Protection of the Environment Operations Act 1997.

Mitigation measures will be in place to manage noise and dust levels, including hoarding to minimise the effects of noise and dust and hosing down as required to ensure the safety of the school and local community.

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

(a) between 7:00am and 6:00pm, Mondays to Fridays inclusive; and

(b) between 8:00am and 1:00pm, Saturdays.

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

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

Notification of such construction activities as referenced in Condition C5 must be given to affected residents before undertaking the activities or as soon as is practical afterwards.

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.

3.3.4. Fauna and vegetation

School Infrastructure NSW is committed to ensuring construction work has a minimal impact upon fauna and vegetation.

School Infrastructure NSW will comply with all Development Consent Conditions relating to the protection of fauna and vegetation, and will comply with all relevant mitigation measures listed in the Environmental Impact Statement (EIS).

Prior to construction, a Construction Environmental Management Plan (CEMP) will be prepared to govern the completion of all construction works. The CEMP will detail measures to be taken for the protection and management of fauna and vegetation, will be prepared in accordance with relevant guidelines and performance indicators, and will be prepared to the satisfaction of DPIE.

Prior to the commencement of construction and/or vegetation clearing (whichever occurs first), pre clearing surveys and inspections for fauna will be undertaken. The surveys and inspection, and any subsequent relocation of fauna, will be undertaken under the guidance of a suitably qualified ecologist and must be in accordance with the methodology incorporated in a Biodiversity Management Sub-Plan. Evidence of the pre clearing surveys and inspections for fauna and any relocation of fauna must be provided to the satisfaction of the Certifying Authority.

A Vegetation Management Sub Plan will also be prepared to carefully manage the impact to fauna and vegetation during construction. Additionally, a Landscape Plan will be prepared prior to construction, which will include, amongst other important measures, provide for the planting of 54 trees and 50 shrubs and groundcover. Importantly, trees to be removed are salvaged and used in the remnant vegetation on site to enhance habitat including tree hollows and tree trunks (greater than 25-30cm in diameter and 3m in length).

3.3.5. Soil and water

School Infrastructure NSW is committed to the appropriate management of soil and water on the construction site.

School Infrastructure NSW will comply with all Development Consent Conditions relating to soil and water management, and will comply with all relevant mitigation measures listed in the EIS.

Prior to construction, a CEMP will be prepared to govern the completion of all construction works. The CEMP will detail measures for the management of soil and water, will be prepared in accordance with relevant guidelines and performance indicators, and will be prepared to the satisfaction of the DPIE.

A suitably qualified and experienced consultant will prepare a Construction Soil and Water Management Sub-Plan (CSWMSP), which will form part of the CEMP. The CSWMSP will:

- describe erosion and sediment control measures to be implemented during construction

- provide a plan of how construction works will be managed in wet-weather events
- detail flows from the site to surrounding area
- describe the measures to be taken to manage stormwater and flood flows for small and large sized events
- include an Acid Sulfate Soils Management Plan (if required).

Erosion and sediment controls will be installed and maintained in accordance with the "Blue Book" – *Managing Urban Stormwater: Soils and Construction (4th edition)*. These controls will be implemented prior to the commencement of any other site disturbance works.

A rainwater harvesting system will be installed onsite and used on-site during construction. Approval will be obtained prior to the discharge of onsite stormwater to Council's stormwater drainage system or street gutter.

Only approved soil and fill types will be used onsite. Accurate records will be kept on the volume and type of fill used onsite.

3.3.6. Contamination

Prior to construction, a CEMP will be prepared to govern the completion of all construction works. The CEMP will detail contamination management measures, will be prepared in accordance with relevant guidelines and performance indicators, and will be prepared to the satisfaction of the DPIE.

The project site has been tested for contamination and is considered to be safe and suitable for the school upgrade.

The CEMP will include protocols for the management of unexpected contamination discovered during the course of construction works.

3.3.7. Visual amenity

Prior to construction, a CEMP will be prepared to govern the completion of all construction works. The plan will detail measures to maintain visual amenity, will be prepared in accordance with relevant guidelines and performance indicators, and will be prepared to the satisfaction of the DPIE.

The CEMP will include provisions for the management of outdoor lighting. The installation and operation of outdoor lighting will comply with both AS 4282-2019 – Control of the Obtrusive Effects of Outdoor Lighting and AS 1158.3.1-2005 – Lighting for Roads and Public Spaces – Part 3.1: Pedestrian Area (Category P) Lighting.

Visual amenity impacts will be limited during construction via the installation of appropriate site fencing and adherence to site housekeeping procedures.

3.3.8. Heritage

Prior to construction, a CEMP will be prepared to govern the completion of all construction works. The plan will detail measures to protect heritage matters, will be prepared in accordance with relevant guidelines and performance indicators, and will be prepared to the satisfaction of the DPIE.

The CEMP will include unexpected finds protocols for objects of Aboriginal or Historic heritage.

In the event that relics of Aboriginal heritage are discovered, all works in the immediate area will cease immediately, and consultation will occur with a suitably qualified archaeologist, registered Aboriginal representatives and DPIE to determine an appropriate management strategy.

In the event that relics of historic heritage are discovered, all works in the immediate area will cease immediately, and consultation will occur with DPIE to determine an appropriate management strategy.

3.3.9. Disruptive works

Construction work for the Samuel Gilbert Public School redevelopment is underway. The following activities are planned for the upcoming weeks (*works will be outlined*). You can contact us directly using the details below to discuss any aspect of this work.

3.3.10. Get involved

We are committed to working together with our school communities and other stakeholders to deliver the best possible learning facilities for students. Your feedback is important to us. For more information contact us via the details below.

- Email: schoolinfrastructure@det.nsw.edu.au
- Website: schoolinfrastructure.nsw.gov.au

- Phone: 1300 482 651

3.4. Handover phase

3.4.1. Traffic and access

Construction work on the Samuel Gilbert Public School redevelopment has been completed. We are now in a position to confirm access provisions for the new school, including pick-up and drop-off arrangements.

3.5. Official school opening

A redevelopment to Samuel Gilbert Public School was completed today, and delivered 25 new permanent teaching spaces and an upgrade to core facilities.

Thank you for your patience during construction and we are thrilled to deliver this project for the school community.

4. Project Governance

4.1. Project Reference Group

The Department's engagement process strives to engage with key stakeholders from the school community. As part of this process, a Project Reference Group (PRG) is established early in the project with nominated representatives from the school community to ensure input from, and consultation with, impacted stakeholders.

The PRG provides key information from an operational, educational, change and logistics perspective into the planning, through the design and construction phases of the project.

The PRG will receive project briefings and key progress updates on project progress to support its responsibilities in assisting to communicate updates to school staff, parents and stakeholders in the wider local community.

The Project Reference Group will be conducted as two separate groups during the development and delivery of all projects:

(a) Project Reference Group – Planning

A nominated group (limited to 10) will participate in workshops to develop the Educational Principles and Education Rationale which will inform the Functional Design Brief. These workshops are chaired by the SINSW Senior Project Director (or delegate) and may be facilitated by an Education Consultant. This activity will inform the development of the building design.

(b) Project Reference Group – Delivery

The purpose of the group is to seek input and inform design processes and provide operational requirements and information to help minimise the impact of the project on school operations. These workshops are chaired by the Senior Project Director (or delegate) and may be facilitated by the appointed architectural consultant, as required. The PRG will provide key information from an operational and logistics perspective to assist project delivery.

Specifically to communications and engagement related matters, the PRG will also:

- Provide a forum for discussion and exchange of information relating to the planning and delivery of the project
- Identify local issues and concerns to assist the project team with the development of mitigation strategies – to manage and minimise construction and environmental impacts to the school community and local residents
- Provide feedback to the communications and community engagement team on key messages and communications and engagement strategies
- Provide advice on school engagement activities
- Assist to disseminate communications to the school community and other stakeholders.

As per all department led delivery projects, the PRG acts as a consultative forum and not a decision-making forum for the planning and delivery of this school infrastructure.

Figure 1: Project Reference Group (PRG)

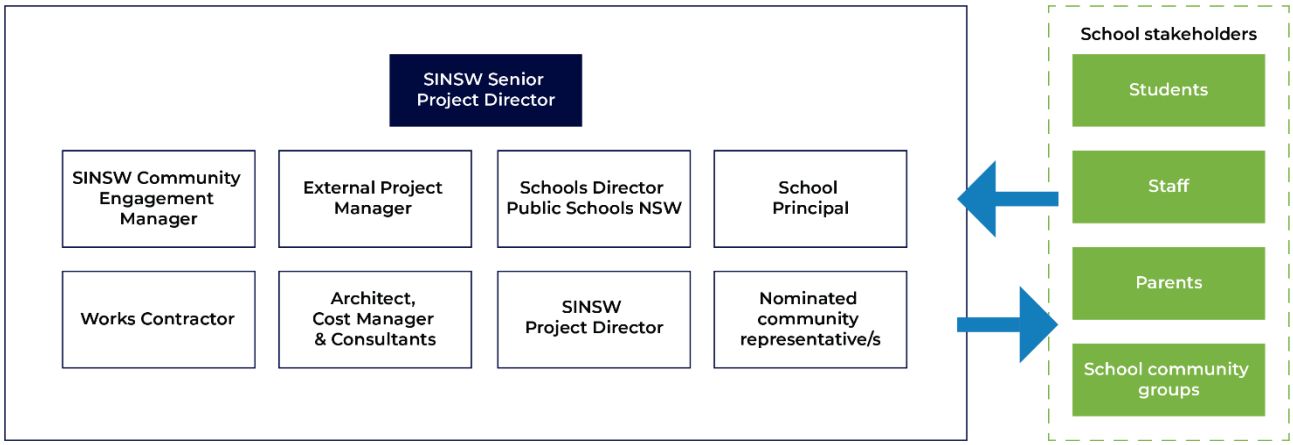
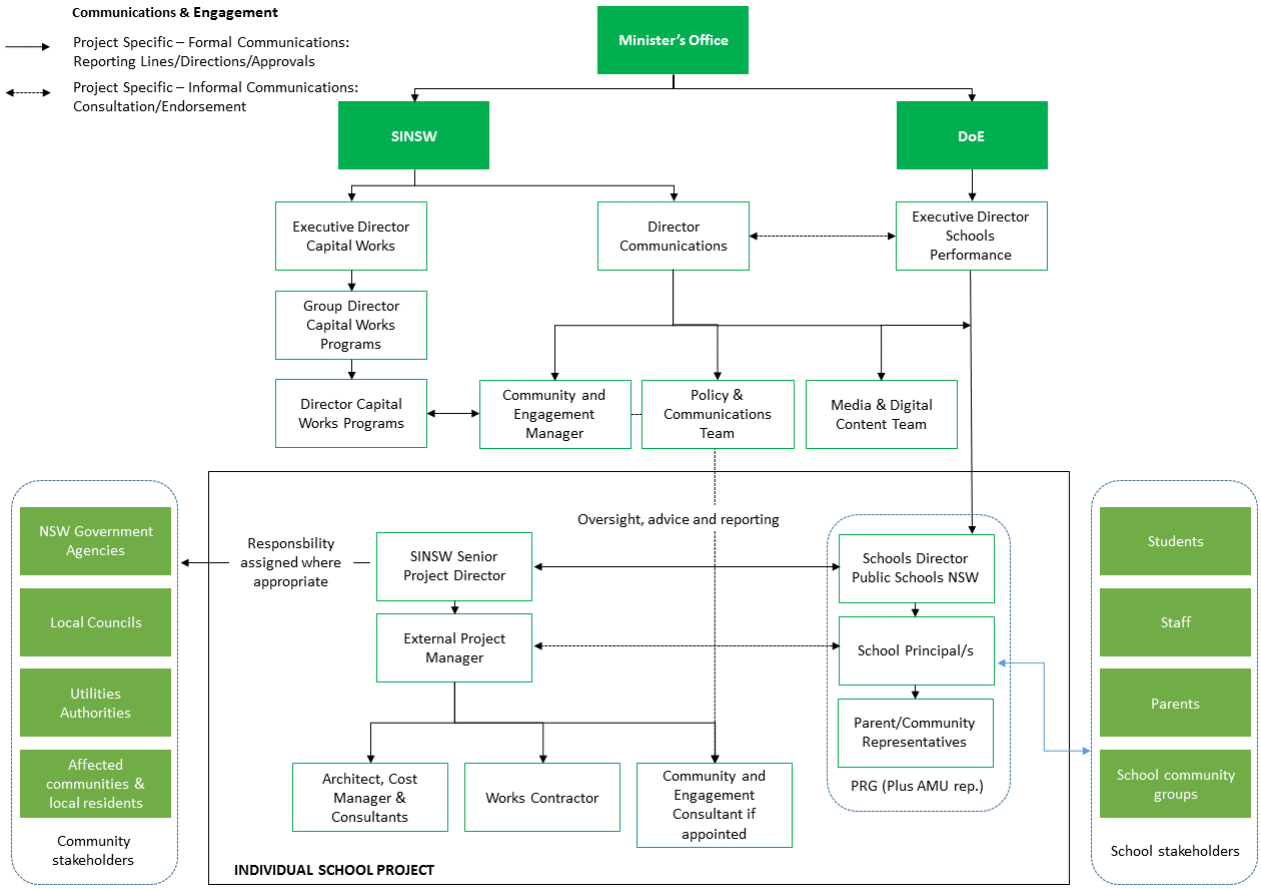


Figure 2 below maps how the department and SINSW will communicate both internally and externally.

Figure 2: SINSW Project Governance



5. Stakeholders

The stakeholder list below summarises who will be consulted during the design and construction phase via ongoing face to face meetings, communications collateral and digital engagement methods.

Table 2: Stakeholders

Stakeholders	Interest and involvement
Local Members of Parliament: ▪ Ray Williams, NSW Member for Castle Hill ▪ Alex Hawke, Federal Member for Mitchell	▪ Meeting the economic, social and environmental objectives of state and federal governments ▪ Delivering increased public education capacity on time ▪ Delivering infrastructure that meets expectations ▪ Addressing local issues such as traffic, congestion and public transport solutions
Government agencies and peak bodies: ▪ Transport for NSW, including Roads and Maritime Services NSW ▪ Fire and Rescue NSW ▪ NSW Department of Education ▪ NSW Department of Planning, Industry and Environment ▪ NSW Environmental Protection Authority ▪ NSW Rural Fire Service ▪ Sydney Water ▪ NSW Heritage Council ▪ NSW Office of Environment, Energy and Science ▪ NSW Department of Premier and Cabinet	▪ Traffic and congestion on the local road system ▪ Adequate public transport options and access ▪ Ensuring new infrastructure meets standard requirements for safety and fire evacuation ▪ Ensuring the development is compliant ▪ Ensuring the development does not impact heritage items ▪ Easing overcrowding in local schools
Cultural and heritage interest: ▪ Metropolitan Local Aboriginal Land Council ▪ Local heritage groups	▪ Discovery of cultural and heritage artefacts during construction
Local Council – The Hills Shire Council ▪ Mayor ▪ General Manager ▪ Councillors	▪ Schedule for construction and opening of school ▪ Impacts to the local community including noise, congestion and traffic ▪ Shared use of community spaces ▪ Providing amenities to meet increase population density
School community ▪ Principal ▪ Teachers ▪ Staff ▪ Parents and carers ▪ Students	▪ Safe pedestrian and traffic access to the temporary school during construction ▪ Plans for enrolled students during the operation of the temporary school ▪ Construction impacts and how these will be minimised ▪ Quality of infrastructure and resources upon project completion ▪ How to access the new school once completed

Stakeholders	Interest and involvement
Local community ▪ Residents of Ridgecrop Drive, Gilbert Road, Galahad Crescent, Excalibur Avenue and Squire Place, adjacent to the school.	▪ Noise and truck movements during construction ▪ Increased traffic and congestion on nearby streets ▪ Local traffic and pedestrian safety ▪ Changed traffic conditions during pick-up and drop-off ▪ Shared use of school facilities and amenities
Nearby public schools ▪ Castle Hill Public School ▪ Crestwood Public School ▪ Excelsior Public School ▪ Matthew Pearce Public School ▪ Baulkham Hills North Public School ▪ Jasper Road Public School ▪ Bella Vista Public School	▪ Impact on school resources ▪ Impact on current students ▪ Implications for teaching staff ▪ Possible impacts on enrolments ▪ Opportunities to view the new facilities
Adjoining affected landowners and businesses Three residential streets adjacent to the school (Ridgecrop Drive, Gilbert Road, Galahad Crescent, Excalibur Avenue and Squire Place) Businesses include: • High Quality Meats • Knightsbridge Shopping Centre • Knightsbridge Pizzeria • Knightsbridge Take Away • IGA Malwa Knightsbridge • The Local Bean • Knights Bakehouse • Louis Carr Real Estate • Castle Glen Child Care Centre • Xchange Business Brokers • Hemmingbird Clothing Alterations • GPS Golf Australia • Lemon Tree Yoga & Massage • Mobile Bar	▪ Noise and truck movements during construction ▪ Increased traffic and congestion on nearby streets ▪ Local traffic and pedestrian safety ▪ Changed traffic conditions during pick-up and drop-off ▪ Shared use of school facilities and amenities ▪ Environmental impacts during construction
Community groups ▪ Castle Hill Art Society	▪ Noise and truck movements during construction ▪ Increased traffic and congestion on nearby streets ▪ Local traffic and pedestrian safety ▪ Changed traffic conditions during pick-up and drop-off ▪ Shared use of school facilities and amenities

6. Engagement Approach

The key consideration in delivering successful outcomes for this project is to make it as easy as possible for anyone with an interest to find out what is going on. In practice, the communications approach across all levels of engagement will involve:

- Using uncomplicated language
- Taking an energetic approach to engagement
- Encouraging and educating whenever necessary
- Engaging broadly including with individuals and groups that fall into harder to reach categories
- Providing a range of opportunities and methods for engagement
- Being transparent
- Explaining the objectives and outcomes of planning and engagement processes.

In addition to engagement with government departments and agencies and the local council, two distinct streams of engagement will continue for the project as follows:

- School community for existing schools being upgraded, or surrounding schools for new schools, and
- Broader local community.

This allows:

- School-centric involvement from school communities (including students, parents/caregivers, teachers, admin staff) unencumbered by broader community issues, and
- Broad community involvement unencumbered by school community wants and needs. Broad community stakeholders include local residents, neighbours and local action groups.

6.1. General community input

Members of the general public impacted by the construction phase are able to enquire and complain about environmental impacts via the following channels:

- Information booths and information sessions held at the school or local community meeting place, and advertised at least 7 days before in local newspapers, on our website and via letterbox drops
- 1300 number that is published on all communications material, including project site signage
- School Infrastructure NSW email address that is published on all communications material, including project site signage

Refer to Section 8.5 of this document for detail on our enquiries and complaints process.

A number of tools and techniques will be used to keep stakeholders and the local community involved as summarised in table 3 below.

For reference, project high level milestones during the delivery phase include:

- Site establishment/early works
- Commencement of main works construction
- Term prior to project completion
- Project completion
- First day of school following project completion
- Official opening

Table 3: School Infrastructure NSW Communications Tools

Communications Tool	Description of Activity	Frequency
1300 community information line	The free call 1300 482 651 number is published on all communication materials and is manned by SINSW. All enquiries that are received are referred to the appointed C&E Manager and/or Senior Project Director as required and logged in our CRM. Once resolved, a summary of the conversation is updated in the CRM.	Throughout the life of the project and accessible for 12 months post completion
Advertising (print)	Advertising in local newspapers is undertaken with at least 7 days' notice of significant construction activities, major disruptions and opportunities to meet the project team or find out more at a face to face event.	At project milestones or periods of disruption
Call centre scripts	High level, project overview information provided to external organisations who may receive telephone calls enquiring about the project, most namely stakeholder councils.	Throughout the project when specific events occur or issues are raised by stakeholders
Community contact cards	These are business card size with all the SINSW contact information. The project team/ contractors are instructed to hand out contact cards to stakeholders and community members enquiring about the project. Cards are offered to school administration offices as appropriate. Directs all enquiries, comments and complaints through to our 1300 number and School Infrastruture NSW email address.	Throughout the life of the project and available 12 months post completion
CRM database	All projects are created in SINSW's Customer Relationship Management system – Darzin - at project inception. Interactions, decisions and feedback from stakeholders are captured, and monthly reports generated. Any enquiries and complaints are to be raised in the CRM and immediately notified to the Senior Project Director, Project Director and Community Engagement Manager.	Throughout the life of the project and updated for 12 months post completion
Display boards	A0 size full colour information boards to use at info sessions or to be permanently displayed in appropriate places (school admin office for example).	As required
Door knocks	Provide timely notification to nearby residents of upcoming construction works, changes to pedestrian movements, temporary bus stops, expected impacts and proposed mitigation. Provide written information of construction activity and contact details.	As required prior to periods of construction impacts
Face-to-face meetings/briefings	Activities include meeting, briefings and "walking the site" to engage directly with key stakeholders, directly impacted residents and business owners and the wider community.	As required/if necessary

Communications Tool	Description of Activity	Frequency
FAQs	Set of internally approved answers provided in response to frequently asked questions. Used as part of relevant stakeholder and community communication tools. These are updated as required, and included on the website if appropriate.	Throughout the life of the project
Information booths	Information booths are held locally and staffed by a project team member to answer any questions, concerns or complaints on the project. Info booths are scheduled from the early stages of project delivery through to project completion. Information booths are to be held both at the school/ neighbouring school, as well for the broad community: ▪ School information booths are held at school locations at times that suit parents and caregivers, with frequency to be aligned with project milestones and as required. ▪ Community information booths are usually held at local shopping centres, community centres and places that are easily accessed by the community. They are held at convenient times, such as out of work hours on weekdays and Saturday's. Collateral to be provided include community contact cards, latest project notification or update, with internal FAQs prepared. All liaison to be summarised and loaded in the CRM. Notice of at least 7 days to be provided.	At project milestones and as required
Information sessions (drop in)	Information sessions are a bigger event than an info booth, held at a key milestone or contentious period. We have more information on the project available on display boards/ screens and an information pack handout – including project scope, planning approvals, any impacts on the school community or residents, project timeline, FAQs. Members from the project and communications team will be available to answer questions about the project. These events occur after school hours on a week day (from 3pm – 7pm to cover working parents). All liaison summarised and loaded on the CRM.	As required
Information pack	A 4 page A4 colour, fold out flyer that can include: ▪ Project scope ▪ Project update ▪ FAQs ▪ Contact information ▪ Project timeline	As required

Communications Tool	Description of Activity	Frequency
	To be distributed at info sessions or at other bigger events/ milestones in hard copy and also made available electronically.	
Media releases/events	Media releases are distributed upon media milestones. They promote major project milestones and activities and generate broader community awareness.	Media milestones: ▪ Project announcement ▪ Concept design completion ▪ Planning approval lodged ▪ Planning approval granted ▪ Construction contract tendered ▪ Construction contract awarded ▪ SOD turning opportunity ▪ Handover ▪ Official opening
Newsletters	Available in hard copy and electronic format. A monthly or quarterly newsletter providing updated information on project scope, benefits, construction progress, achievement of project milestones and other project related issues of interest. Similar to an info pack in content, but used as a regular high level update for the community.	As required, related to high level project milestones
Notifications	A4, single or double sided, printed in colour that can include FAQs if required Notifications are distributed under varying templates with different headings to suit different purposes: ▪ **Works notification** are used to communicate specific information/ impacts about a project to a more targeted section of the community. This template doesn't have an image so it can be more appropriately targeted for matters like hazardous material. ▪ **Project update** is used when communicating milestones and higher level information to the wider community i.e. project announcement, concept design/DA lodgement, construction award, completion. Always includes the project summary, information booths/ sessions if scheduled, progress summary and contact info.	As required according to the construction program. Distibuted via letterbox drop to local residents and via the school community at least 5-7 days prior to construction activities or other milestones throughout the life of the project. Specific timings indicated in table 5 – Section 8.
Photography, time-lapse photography and videography	Captures progress of construction works and chronicles particular construction activities. Images to be used in notifications, newsletters and report, on the website and Social Media channels, at information sessions and in presentations.	Project completion (actual photography and video of completed project)

Communications Tool	Description of Activity	Frequency
	Once the project is complete, SINSW will organise photography of external and internal spaces to be used for a range of communications purposes.	Prior to project completion - artist impressions, flythrough, site plans and contruction progress images are used
Presentations	Details project information for presentations to stakeholder and community groups.	As required
Priority correspondence	Ministerial (and other) correspondence that is subject to strict response timeframes. Includes correspondence to the Premier, Minister, SINSW and other key stakeholders. SINSW is responsible for drafting responses as requested within the required timeframes.	As required
Project Reference Group	SINSW facilitated Project Reference Group sessions providing information on the design solution, construction activities, project timeframes, key issues and communication and engagement strategies.	Meets every month or as required More information on the PRG is detailed in Section 4
Project signage	A0 sized, durable aluminium signage has been installed at Samuel Gilbert Public School Provides high level information including project scope, project image and SINSW contact information. Fixed to external fencing/ entrances etc. that are visible and is updated if any damage occurs.	Throughout the life of the project and installed for 12 months post completion
Site visits	Demonstrate project works and progress and facilitate a maintained level of interest in the project. Includes media visits to promote the reporting of construction progress.	As required
School Infrastructure NSW email address	Provide stakeholders and the community an email address linking direct to the Community Engagement team. Email address (schoolinfrastructure@det.nsw.edu.au) is published on all communications materials.	Throughout the life of the project
School Infrastructure NSW website	A dedicated project page for Samuel Gilbert Public School is located on the SINSW website - https://www.schoolinfrastructure.nsw.gov.au/projects/s/samuel-gilbert-public-school.html	Updated at least monthly and is live for at least 12 months post completion of the project
Welcome pack/ thank you pack	At project completion the following flyers are utilised: ▪ **Welcome pack** – project completion for school community - A 2 to 4 page A4 flyer which is provided to the school community on the first day/week they are returning to school when new facilities are opening, or attending a new school. Includes project overview, map outlining access to the school and key locations, FAQs, contact information. ▪ **Thank you pack** – A 2 to 4 page A4 flyer tailored to the local residents to thank them for their patience and support of the project.	Project completion only

7. Engagement Delivery Timeline

The following engagement delivery timeline maps tailored communications tools and activities by key milestone.

Table 4: Engagement timeline

Project Phase / milestone	Target Audiences	Proposed communication tools / activities / purpose as per Table 3	Timing / implementation
Site establishment and main construction works, including but not limited to: ▪ Works commenced ▪ Demolition ▪ Asbestos removal ▪ Remediation ▪ Works commenced Key impact periods – noise, dust, traffic, vibration	School community Local residents Local Council	▪ Request for feedback on management strategies for high noise works ▪ Notifications – for school community and residents ▪ Door knocks to directly impacted residents ▪ Info booths/ sessions ▪ Website updates ▪ Newsletters ▪ Face to face meetings if required ▪ Advertising of any events and any periods of high disruption	December 2019 to July 2021 (at key construction events as required, as per our notification process in Table 5)
▪ Term prior to project completion	School community Local residents	▪ Info session ▪ Display boards ▪ Info pack ▪ Notifications as required to indicate remaining construction still to occur ▪ Website updates	2021
Handover and welcome to new school	School community Local residents	▪ Media release ▪ Official opening ceremony ▪ Welcome pack ▪ Thank you pack ▪ Photography/videography ▪ Website update	2021
Opening		▪ Official opening ceremony	TBC –at school discrection

8. Protocols

8.1. Media engagement

SINSW manages all media relations activities, and is responsible for:

- Responding to all media enquiries and instigating all proactive media contact.
- Media interviews and delegation to SINSW media spokespeople who are authorised to speak to the media on behalf of the project
- Informing the Minister's Office and SINSW project team members and communications representatives of all media relations activities in advance and providing the opportunity to participate in events where possible.

8.2. Site visits

SINSW in partnership with Schools Operations and Performance organises and hosts guided project site tours and media briefings as required by the Minister's Office. The Project Team will ensure the required visitor site inductions are undertaken and that all required Personal Protective Equipment (PPE) is worn.

For media site visits and events, SINSW creates, or contributes to, the production of an event pack. This will include an event brief, media release, speaking notes and Q&As.

8.3. Social, online and digital media

SINSW initiates and maintains all social and online media channels. These channels can include Facebook, Twitter, LinkedIn and the website. The SINSW Online Content Team upload to the SINSW website.

8.4. Notification process

Notifications (titled works notifications or project updates as per Table 3) are SINSW's prescribed notification requirement and are the primary mechanism to inform the community and key stakeholders about the impact of school construction on the local area. Notifications provide advance warning of activities and planned disruptions, as per the notice periods in Table 5 below, allowing stakeholders and community members to plan for the impacts and make alternative arrangements where required. Notifications are distributed in person via door knocks, via letterbox drop, via the school and electronically via email.

The C&E Manager advises the project team of the relevant notification requirements and timeframes to be met. The team obtains the information necessary to meet these timeframes by:

- Having oversight of the project delivery program
- Visiting site as required
- Attending and participating in construction meetings, planning meetings, and Risk and Opportunity workshops.

Table 5: Notifications periods

Works activity	Minimum community notification period
Notification to communities following major incident	Same day
Emergency works/unforeseen events	Same day
Contamination management and notification	Within 48 hours
Upcoming works notification (minimum disruption)	5- 7 days
Invitation/notification of community event (e.g. info booth)	5 – 7 days
Notifications regarding traffic changes, parking impacts, road closures, major detours	10 – 14 days
Pedestrian route changes and other impacts	10 – 14 days

Works activity	Minimum community notification period
Notifications regarding operational changes for the school community (school drop-off points, entry and exit points)	10 - 14 days
Major construction impacts (out of hours/ significant noise/ demolition)	10 – 14 days
Major impacts to school community e.g. relocation to temporary school	6 months

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.

If a phone call, email or face- to- face complaint is received during construction, they must be logged in our CRM, actively managed, closed out and resolved by SINSW within 24-48 hours.

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.

If the complainant is not satisfied with 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:

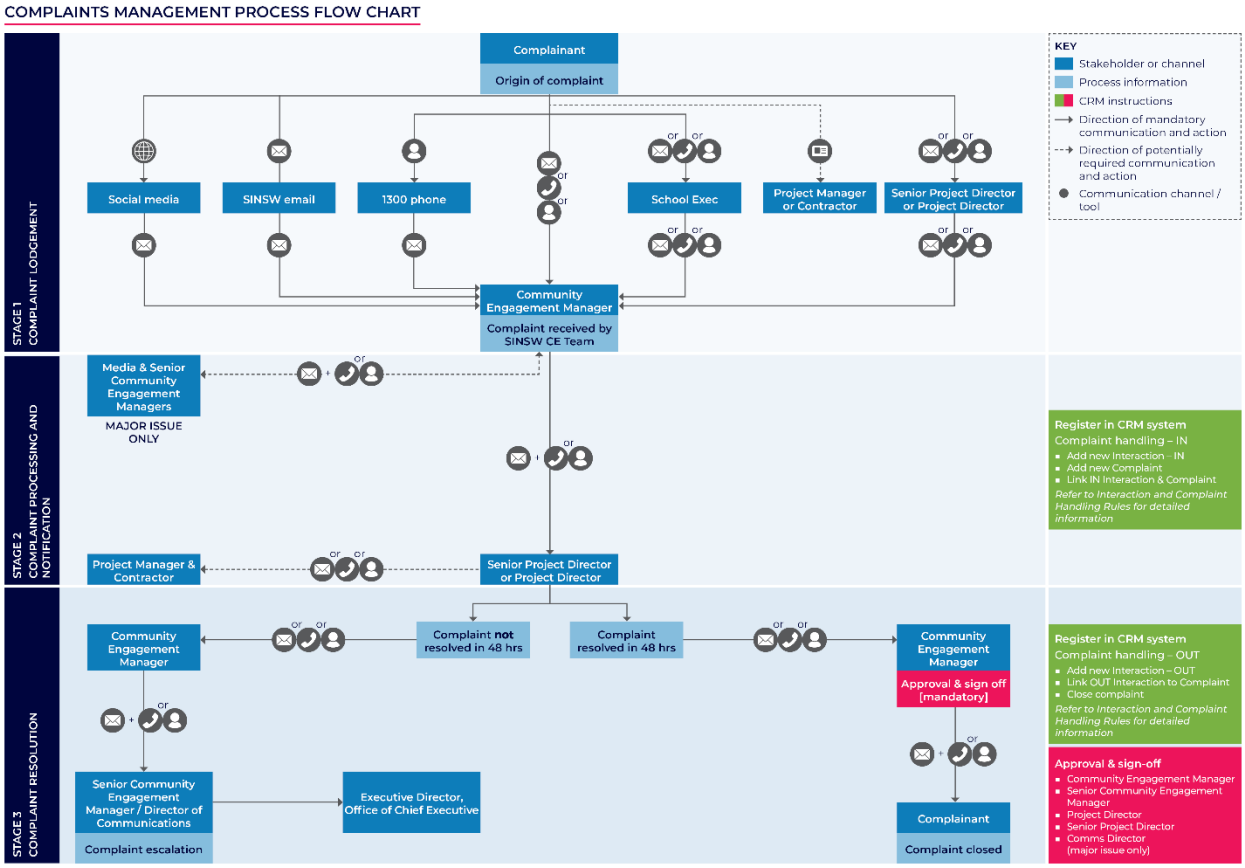
Table 6: Complaint and enquiry response time

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,

Complaint	Acknowledgement times	Response times
		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.
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.

Figure 3 - Internal Complaints Process



8.5.1. Disputes involving compensation and rectification

School Infrastructure NSW is committed to working with the school and broader community to address concerns as they arise. Where disputes arise that involve compensation or rectification, the process for resolving community enquiries and complaints will be followed to investigate the dispute. Depending upon the results of the investigation, School Infrastructure NSW may seek legal advice before proceeding.

8.6. Incident management

An incident is 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 is harm that:

(c) involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial; *or*

(d) 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).

8.6.1. Roles and responsibilities following an incident

In the event of an incident, once emergency services are contacted, the incident must be immediately reported to the SINSW Senior Project Director who will inform:

- SINSW Executive Director
- SINSW C&E Manager
- SINSW Senior Manager, C&E
- SINSW Communications Director

SINSW Communications Director will:

- Lead and manage all communications with the Minister's office in the event of an incident, with assistance as required

- Direct all communications with media to the SINSW Media Manager in the first instance for management
- Notify all other key project stakeholders of an incident.

The school and local community will be notified within 24 hours in the event of an incident, as per our notification timelines in Table 5.

The SINSW Senior Project Director will issue a written incident notification to Department of Planning, Industry & Environment (DPIE) (compliance@planning.nsw.gov.au) and Local Council immediately following the incident to set out the location and nature of the incident.

This must be followed within seven days following the incident of a written notification to the Department of Planning, Industry and Environment (compliance@planning.nsw.gov.au) that:

(e) identifies the development and application number;

(f) provides details of the incident (date, time, location, a brief description of what occurred and why it is classified as an incident);

(g) identifies how the incident was detected;

(h) identifies when SINSW became aware of the incident;

(i) identify any actual or potential non-compliance with conditions of consent;

(j) describes what immediate steps were taken in relation to the incident;

(k) identifies further action(s) that will be taken in relation to the incident; and

(l) provides the contact information for further communication regarding the incident (the Senior Project Director).

Within 30 days of the date on which the incident occurred or as otherwise agreed to by the Planning Secretary, SINSW will provide the Planning Secretary and any relevant public authorities (as determined by the Planning Secretary) with a detailed report on the incident addressing all requirements below:

(m) a summary of the incident;

(n) outcomes of an incident investigation, including identification of the cause of the incident;

(o) details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence; and

(p) details of any communication with other stakeholders regarding the incident.

8.7. Reporting process

Throughout the project, data will be recorded on participation levels both face to face and online, a record of engagement tools and activities carried out in addition to queries received and feedback against emerging themes.

Stakeholder and community sentiment will be evaluated throughout to ensure effectiveness of the engagement strategy and to inform future activities.

Reporting will include but not be limited to:

- Stakeholder engagement reporting – numbers of forums, participation levels and a summary of the outcomes Community sentiment reporting – outputs of all community engagement activities, including numbers in attendance at events, participation levels and feedback received against broad themes
- Online activity – through the project website and via social media
- Media monitoring – as part of the proactive media campaign
- Engagement risk register - to be updated regularly.

Samuel Gilbert Public School (SSD 9274): Submission of Community Communication Strategy in accordance with Condition B8

Condition no.	Condition requirements	Document Reference
B8	No later than **two weeks before the commencement of construction**, a Community Communication Strategy must be submitted to the **Planning Secretary for information**. The Community Communication Strategy must provide mechanisms to facilitate communication between the Applicant, the relevant Council and the community (including adjoining affected landowners and businesses, and others directly impacted by the development), during the design and construction of the development and for a minimum of 12 months following the completion of construction. The Community Communication Strategy must:	SSD 9274 – B8 - Community Communication Strategy - CCS - SINSW – Final Version March 2020
	a) identify people to be consulted during the design and construction phases;	Section 4 - Project Governance, pg.10 Section 5 - Stakeholders, pg.12
	b) set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development;	Section 6 - Engagement Approach, pg.14 Section 7 - Engagement Delivery Timetable, pg.19 Section 8.4 - Notification Process, pg.20
	c) provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development;	Section 4 - Project Governance, pg.10
	d) set out procedures and mechanisms:	
	(i) through which the community can discuss or provide feedback to the Applicant;	Section 4.1 - PRG, pg.10 Section 6 - Engagement Approach, pg.14 Section 8.5 - Enquiries and Complaints Management, pg.21

	(ii) through which the Applicant will respond to enquiries or feedback from the community; and	Section 8.5 - Enquiries and Complaints Management, pg.21
	(iii) to resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation.	Section 8.5 - Enquiries and Complaints Management, pg.21