Construction Environmental Management Plan

Hastings Secondary College - 21026

Business Unit / PCBU / Principal Contractor: FK Gardner & Sons Pty Ltd

ABN 99 010 136 053

PLAN APPROVAL

Completion of this section indicates acceptance of the content and approval to proceed with use on the project as specified. All fields must be completed prior to commencing works. The **CEMP** will be retained in the site office, head contract file and uploaded to Aconex.

Role	NAME	CONTACT NUMBER	DATE	SIGNATURE
FKG Project Manager	Josh Pointon	0418 640 888	15/01/2022	
FKG Site Manager	Steve Ross	0477 765 640	15/01/2022	
FKG Project Engineer	Luke Brazier	0467 758 776	15/01/2022	
FKG EHS Advisor	Anthony Trojkovic	0467 758 682	15/01/2022	
FKG Operations Manager	Trent Sutton	0448 463 285	15/01/2022	

CHANGE REGISTER

The below table reflects any updates that have occurred to the CEMP.

Revision #	1	2	3	4	
Date	30/12/2021	15/01/2022	07/03/2022	06/07/2022	
Approved by	J. Pointon	J. Pointon	J. Pointon	J. Pointon	
Signed					

Reason for revision:

1 – Revised CEMP with comments incorporated

2 – CEMP updated to include page numbers and links to satisfy SSD Conditions

3 – CEMP updated to include DPIE Comments

4 – CEMP reviewed after WolfPeak audit

Compliance with SSD Conditions

Condition	Condition requirements	Document reference
B14	Prior to the commencement of construction, the Applicant must submit a Construction Environmental Management Plan (CEMP) to the Certifier and provide a copy to the Planning Secretary. The CEMP must include, but not be limited to, the following: (a) Details of:	
	(i) hours of work;	Yes - Section 1.2.1 pg 14
	(ii) 24-hour contact details of site manager;	Yes – Section 1.2.2 pg 15
	(iii) management of dust and odour to protect the amenity of the neighbourhood;	Yes – Section 3.3 pg 27
	(iv) external lighting in compliance with AS4282-2019 Control of the obtrusive effects of outdoor lighting	Yes – Section 3.10 pg 35 & Appendix M pg 277
	(viii) community consultation and complaints handling as set out in the Community Communications Strategy required by Condition 9	Yes – Section 3.11 pg 35 & CCS Uploaded Separately
	(b) An unexpected finds protocol for contamination and associated communications procedure to ensure that potentially contaminated material is appropriately managed	Yes – 3.6.8 pg 32
	(c) an unexpected finds protocol for Aboriginal and non-Aboriginal heritage and associated communications procedure;	Yes – 3.6.8 pg 32
	(d) Construction Traffic and Pedestrian Management Sub-Plan (see condition B15);	Yes – Appendix H pg 181 CTMP Subplan
	(e) Construction Noise and Vibration Management Sub-Plan (see condition B16);	Yes – Appendix F - Noise & Vibration Management Sub Plan pg 107
	(f) Construction Waste Management Sub-Plan (see condition B17);	Yes – Appendix G – Construction Waste Management Plan pg 158
	(g) Construction Soil and Water Management Sub-Plan (see condition B18);	Yes – Appendix J CSWMSP pg 250
B15	The Construction Traffic and Pedestrian Management Sub-Plan (CTPMSP) must be prepared to achieve the objective of ensuring safety and efficiency of the road network and address, but not be limited to, the following:	Yes – Appendix H – CTMP Subplan
	(a) be prepared by a suitably qualified and experienced person(s);	Yes – CV pg 245
	(b) be prepared in consultation with Council	Yes – Consultation pg 270-276
	(c) Detail (i) measures to ensure road safety and network efficiency during construction in consideration of potential impacts on general traffic, cyclists and pedestrians and bus services	Yes – Section 6.0 CTMP pg 209
	(ii) measures to ensure the safety of vehicles and pedestrians accessing adjoining properties where shared vehicle and pedestrian access occurs;	Yes – Section 5.1 & 5.2 CTMP pg 203
	(iii) detail heavy vehicle routes, access, and parking arrangements	Yes – Section 5.4 CTMP pg 204 & 205, Section 4.2 pg 199
	(iv) 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, in accordance with the latest version of AS 2890.2	Yes – CTMP pg 237-241

	(v) arrangements to ensure that construction vehicles enter and leave the site in a forward direction unless in specific exceptional circumstances under the supervision of accredited traffic controller(s)	Yes – Section 5.1 CTMP pg 203
B16	The Construction Noise and Vibration Management Sub-Plan must address, but not be limited to, the following:	Yes – Appendix F – CVNMP pg 107
	(a) be prepared by a suitably qualified and experienced noise expert;	Yes – CVNMP – CV pg 153
	(b) describe procedures for achieving the noise management levels in EPA's Interim Construction Noise Guideline (DECC, 2009);	Yes – CVNMP Section 7 pg 135
	(c) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers;	Yes – CVNMP Section 7.31 pg 135
	(d) include strategies that have been developed with the community for managing high noise generating works;	Yes – CVNMP pg 154-156 Section 7.5 pg 137
	(e) describe the community consultation undertaken to develop the strategies in condition B16(c)(d);	Yes – CVNMP pg 154-156 Section 7.5 pg 137
	(f) include a complaints management system that would be implemented for the duration of the construction; and	Yes – CVNMP Section 7.5 pg 137 Section 3.11 pg 35
	(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 B13.	Yes – CVNMP Section 7.9 pg 140 Section 5.2.6 pg 40
B17	The Construction Waste Management Sub-Plan (CWMSP) must address, but not be limited to, the following:	Yes – Appendix G – Construction Waste Management Plan pg 158
	(a) detail the quantities of each waste type generated during construction and the proposed reuse, recycling and disposal locations; and	Yes – CWMSP – Section 3.2 pg 171 Pg2 of CWMSP has note on re-use of materials in project.
	(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 construction.	Yes – CWMSP – Section 2.4 pg 168
	(c) confirmation of the contamination status of the development areas of the site based on the validation results.	Contamination status of the development is contained within the Douglas Partners HBM & subsequent HMMP Appendix N – pg 330-339
B18	The Applicant must prepare a Construction Soil and Water Management Sub-Plan (CSWMSP) and the plan must address, but not be limited to the following:	Yes – CS&WMSP pg 250
	(a) be prepared by a suitably qualified expert, in consultation with Council;	Yes – CS&WMSP pg 265 Consultation pg 270
	(b) measures to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site	Yes – CS&WMSP pg 256 Appendix A pg 259 – 261
	(c) describe all erosion and sediment controls to be implemented during construction including, as a minimum, measures in accordance with the publication Managing Urban Stormwater: Soils & Construction (4th edition, Landcom 2004) commonly referred to as the 'Blue Book'.	Yes – CS&WMSP pg 256 Appendix A pg 259 - 261

	(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);	Yes – CS&WMSP pg 256
	(e) detail all off-Site flows from the Site; and	Yes – CS&WMSP pg 256
	(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 and 1 in 5-year ARI.	Yes – CS&WMSP pg 256
B19	A Driver Code of Conduct must be prepared and communicated by the Applicant to heavy vehicle drivers and must address the following:	Yes – Appendix I – pg 247-248
	(a) minimise the impacts of earthworks and construction on the local and regional road network;	Yes – Appendix I – pg 247-248
	(b) minimise conflicts with other road users;	Yes – Appendix I – pg 247-248
	(c) minimise road traffic noise; and	Yes – Appendix I – pg 247-248
	(d) ensure truck drivers use specified routes.	Yes – Appendix I – pg 247-248

EMP Preparation Checklist (Condition B13)

Use the checklist below to help develop an EMP that contains all the required information. The checklist should be completed and supplied tothe Department with the EMP. One checklist should be submitted for each EMP.

Requirement	Plan Reference	Yes/No/ Not Applicable
Document preparation and endorsement		
Has the EMP been prepared in consultation with all relevant stakeholders as per the requirements of the conditions of consent? (Section 4.1)	**Appendix. H** CPTMSP – 4 Traffic Management plan Sent to Council 16/12 **Appendix. F** CNVMSP – 6 Noise and Vibration Management Plan Consultation with HSC – Complete 15/12/21 Community Consultation - Complete **Appendix. J** CSWMSP Sent to Council 16/12/2021	Yes
Have the views of the relevant stakeholders been taken into consideration? Have appropriate amendments been made to the EMP and does the EMP clearly identifythe location of any changes? (Section 4.1)	**Appendix. H** CPTMSP – 4.1 Traffic Management Planning Process **Appendix. F** CNVMSP – Appendix C Community Consultant Summary Report **Appendix. J** CSWMSP – Attachment3 SI Consultation Form	Yes
Has the EMP been internally approved by an authorised representative of the proponent or	**Revision Register CEMP**	Yes

contractor? (Section 4.2)	**Appendix. H** CPTMSP – Document Control **Appendix. F** CNVMSP – Document Control **Appendix. J** CSWMSP – Document Control	
Version and content		
Does the EMP describe the proponent's Environmental Management System (EMS) (if any), and identify how the EMP relates to other documents required by the conditions of consent? (Section 3.5.1)	**1.3** EMP Interrelationship other documents	Yes
Does the EMP include the required general content and version control information? (Section 3.1)	**Revision Register CEMP** **Appendix. H** CPTMSP – Document Control **Appendix. F** CNVMSP – Document Control **Appendix. J** CSWMSP – Document Control	Yes
Does the EMP have an introduction that describes the project, scope of works, site location and any staging or timing considerations? (Section 3.2)	CEMP Section 1.1 Scope & Application CEMP Section 1.2 Project Description CEMP Section 1.2.1 Hours of Work **Appendix H.** CPTMSP – 2.2 Proposed Development **Appendix. F** CNVMSP – 1.1 Overview **Appendix J** CSWMSP – 1.1 Site Locality ,1.2 Development Proposal **Appendix. G** CWMSP – 2 Project	Yes
Does the EMP reference the project description? (Section 3.3)	**4.2** Project Description	Yes
Does the EMP reference a Community and Stakeholder Engagement Plan(or similar) or include community and stakeholder engagement actions (if required)? (Section 3.4)	**3.11.1** Community Consultation	Yes
Have all other relevant approvals been identified? Has appropriate information been provided regarding how each approval is relevant? (Section 4)	**Appendix. H** CPTMSP **Appendix. F** CNVMSP **Appendix. J** CSWMSP	Yes

Has the environmental management structure and responsibilities been included? (Section 3.5.2)	**1.7** Roles and Responsibilities	Yes
Does the EMP include processes for training of project personnel and identify how training and awareness needs will be identified? (Section 3.5.3)	**2.1** Environmental Awareness **Appendix. F** CNVMSP – 7.10 Workers Training and Awareness **Appendix. H** CPTMSP – 5.8 Workers' Site Induction	Yes
Does the EMP clearly identify the relevant legal and complianceerequirements that relate to the EMP? (Section 3.5.3)	**7** References **1.6.3** Legal Compliance and Other Requirements **1.4** Policy and Objectives	Yes
Does the EMP include all the conditions of consent to be addressed by the EMP and identify where in the EMP each requirement has been addressed? (Section 3.5.13)	Compliance with SSD Conditions **Appendix. H** CPTMSP – Compliance with Conditions of Consent **Appendix. F** CNVMSP – SSD Compliance **Appendix. J** CSWMSP – Compliance with Conditions of Consent	Yes
Have all relevant guidelines, policies and standards been identified,including details of how they are relevant? (Section 3.5)	**1.6.3** Legal Compliance and Other Requirements **7** References **Appendix. F** CNVMSP – 3.1 General	Yes
Is the process that will be adopted to identify and analyse the environmental risks included? (Section 3.5.5)	**2.4** Environmental Risk Register **5.1** Measurement & Evaluation **Appendix. A** Project Risk Register	Yes
Have all the environmental management measures in the EIA been directly reproduced into the EMP? (Section 3.5.7)	**3** Specific Environmental Issues	Yes
Have any additional environmental management measures been includedin the EMP? (Section 3.5.7)	**3** Specific Environmental Issues **5** Monitoring & Review	Yes
Have environmental management measures been written in committed language? (Section 3.5.7)	**2** Implementation	Yes

Have project environmental management measures, including hold points, been identified and included? (Section 3.5.6)	**2.3** Environmental Risk Register	Yes
Are relevant details of environmental monitoring that will be carried out included? (Section 3.5.8)	**5.** Monitoring & Review **Appendix. F** CNVMSP – 7.9 Monitoring Program **Appendix. J** CSWMSP – 2.2 Sediment and ErosionControl Measures **Appendix. G** CWMP – 7 Waste Management Plan – Monitoring & Reporting	Yes
Have the components of any environmental monitoring programs beenincorporated? (Section 3.5.8)	**5** Project Monthly Review **Appendix. J** CSWMSP – 2.3 Soil and Water Management Plan **Appendix. G** CWMP – 7 Waste Management Plan Application	Yes
Are environmental inspections included? (Section 3.5.9)	**5.2.1** General Requirements **5.3** Site Inspection	Yes
Does the EMP document all relevant compliance monitoring and reporting requirements for the project? (Section 3.5.12 and 3.5.13)	**5.1** Monitoring of Project Objectives, Targets & Risks	Yes
Does the EMP describe the types of plans or maps (such as environmentalcontrol maps) that will be used to assist with the management of environmental matters on site? (Section 3.5.10)	**Appendix B**: Erosion and Sediment Control Plan **Appendix F**: Noise and Vibration Management Plan **Appendix H**: Construction Traffic & Pedestrian Sub Plan **Appendix J:** Construction Soil & Water Mgnt Sub-Plan	Yes
Does the EMP list environmental management documents? (Section 3.5.11)	**Appendix B**: Erosion and Sediment Control Plan **Appendix C**: Contaminated, Acid Sulphate & Sodic Soil Plan **Appendix E**: Water Management Control Plan **Appendix F**: Noise and Vibration Management Plan **Appendix H**: Construction Traffic & Pedestrian Sub Plan **Appendix I**: Driver Code of Conduct **Appendix J**: Construction Soil & Water Mgnt Sub-Plan	Yes
Is an auditing program referenced? (Section 3.5.13)	**5.3** Site Inspections and External Audits	Yes
Does the EMP include the incident notification and reporting protocols that comply with the relevant conditions of consent? (Section 3.5.15)	**4.3** Incident Notification & Reporting	Yes
Does the EMP identify the project role/position that is responsible for deciding whether an occurrence is an incident? (Section 3.5.15)	**1.7** Roles and Responsibilities	Yes

Does the EMP describe a corrective and preventative action process that addresses the requirements? (Section 3.5.16)	**4.3** Incident Notification & Reporting	Yes
Does the EMP include details of a review and revision process that complies with the requirements? (Section 3.6)	**1.4** Policy and Objectives	Yes

Definitions and Abbreviations

When used in this document, the following terms have the following meanings (unless the context provides otherwise).

Table 1: Definitions

Defined Term	Meaning
Aconex	means the construction management software platform known as Aconex and established by FKG for the purposes of the Project.
BASE	means the FKG SharePoint site, Building Artisans Striving (for) Excellence.
CDMS	means the Construction Division Management System.
CDMS OM	means CDMS Operations Manual
Client	means School Infrastructure NSW
EHS	means environment, health and safety.
CEHSMP	means this document, including any annexures or schedules hereto.
FKG	means the party named as 'Business Unit / PCBU' on page 1.
GMC	means Group Manager - Construction
High Risk Activities	has the meaning given to 'high risk construction work' as per the *Work Health and Safety Regulation 2011* as those activities identified as High Risk Activities in section 9.2 of this **CEMP**.
SWMS	means Safe Work Method Statement.
IMS	means integrated management system.
Lucidity	means the online software platform utilised for the management of QSE on the project.
PCBU	has the meaning in the *Work Health and Safety Act 2011* (Qld).
PPE	means Personal Protective Equipment.
Project	means the Hastings Secondary College – Port Mac Campus
Project Folder	means the computing folder applicable to the Project and stored on FKG's internal network on L:\Jobs or on **BASE**.
Project Team	means the people employed or engaged by FKG for the purposes of the Project and identified on the Plan Approval section of page 1, as updated from time to time.
PRR	means the Project Risk Register.
QSE	means quality, safety and environment.
SDS	means Safety Data Sheet
Senior Management	means the Group Manager, Safety Manager, and Operations Manager with the conduct of the Project.
Site	means the Hastings Secondary College – Port Mac Campus
Subcontractor	means any PCBU carrying out (or intending to carry out) work that forms part of the work to be carried out by FKG for the Project.
Subcontractor Supervisor	means the person nominated as the supervisor for a Subcontractor.
TOC	means Task Observation Checklist.
WHSR	means Workplace Health and Safety Representative.
Workers	means a worker engaged on behalf of FKG or any Subcontractor to carry out work in connection with the Project.

Table 2: Abbreviations

Term	Definition
ACP	Access Control Point
AHD	Australian Height Datum
ALARP	As Low As Reasonably Practicable
AQF	Australian Qualifications Framework
AS	Australian Standards
AS/NZ	Australian / New Zealand Standards

Term	Definition
ASS	Acid Sulphate Soils
BCA	Building Code of Australia
CAD	Computer Aided Design
CBD	Central Business District
CCS	Community Communications Strategy
CCTV	Close Circuit Television
CEMP	Construction Environmental Management Plan
CD	Compact Disk
DATSIP	Department of Aboriginal and Torres Strait Islander Partnerships
DDA	Disability Discrimination Act 1992 (Cth)
DDR	Draft Design Report
DLP	Defects Liability Period
DSC	Design Services Consultant
EA	Environmental Authority
EMS	Environmental Management System
EPA	Environmental Protection Agency
EPBC Act	*Environment Protection and Biodiversity Conservation Act* 1999 (Cth)
ESD	Ecologically Sustainable Design
FF&E	Furniture, Fixtures and Equipment
FAT	Factory Acceptance Testing
HV	High Voltage
HVAC	Heating, Ventilation and Air Conditioning
ICT	Information Communication Technology
ISO	International Organisation for Standardisation
LBP	Lead Based Paint
LCM	Lead Containing Material
LED	Light Emitting Diode
LOS	Level of Service
LTI	Lost Time Injury
LV	Low Voltage
M/E or M&E	Mechanical and Electrical
NATA	National Association of Testing Authorities, Australia
NCC	National Construction Code
NEPC	National Environmental Protection Council
O&M	Operations and Maintenance
PAC	Packaged Air Conditioning
PFAS	Per and Polyfluoroalkyl Substance
PMT	Project Management Team
PPE	Personal Protective Equipment
PUA	Public Utility Authority
PUP	Public Utility Plant
QFE	Qualified Fire Engineer
QMP	Quality Management Plan
SDS	Safety Data Sheet
SID	Safety in Design
SLS	Signage and Labelling Standards
SRA	Safety Risk Assessment

Term	Definition
SWMS	Safe Work Method Statement
TMP	Traffic Management Plan
UPS	Uninterruptible Power Supply
WBS	Work Breakdown Structure
WC	Water Closet
WHS	Work Health and Safety
WOL	Whole of Life
WRMP	Workplace Relations Management Plan

Table of Contents

1 COMMITMENT & POLICY 14

2 IMPLEMENTATION 20

3 SPECIFIC ENVIRONMENTAL ISSUES 25

4 CONSULTATION, COMMUNICATION AND REPORTING 36

5 MONITORING AND REVIEW 38

6 EMERGENCY PREPAREDNESS AND RESPONSE 41

7 REFERENCES 42

APPENDIX A: CURRENT PROJECT RISK REGISTER 43

APPENDIX B: EROSION AND SEDIMENT CONTROL PLAN 44

APPENDIX C: CONTAMINATED, ACID SULPHATE & SODIC SOIL CP 45

APPENDIX D: ISO14001 - CERTIFICATE 46

APPENDIX E: WATER MANAGEMENT CONTROL PLAN 47

APPENDIX F: NOISE AND VIBRATION MANAGEMENT PLAN 48

APPENDIX G: CONSTRUCTION WASTE MANAGEMENT PLAN 49

APPENDIX H: CONSTRUCTION TRAFFIC & PEDESTRIAN SUB PLAN 50

APPENDIX I: DRIVER CODE OF CONDUCT 51

APPENDIX J: CONSTRUCTION SOIL & WATER MGNT SUB-PLAN 52

APPENDIX K: FKG ENVIRONMENTAL POLICY 53

APPENDIX L: FKG EVIDENCE OF CONSULTATION 54

APPENDIX M: DESIGN CERTIFICATE FOR OUTDOOR LIGHTING 55

APPENDIX N: HAZARDOUS MATERIALS MANAGEMENT PLAN 56

1 Commitment & Policy

1.1 Scope & Application

The Construction Environmental Management Plan (CEMP) has been developed to demonstrate that the proposed Works will be executed in accordance with legislated safety and environmental requirements with minimal inconvenience to stakeholders including neighbours and the general public. This document also addresses Conditions B14-B19 of the SSDA-11920082.

FK Gardner & Sons Pty Ltd (FKG), appointed as Principal Contractor in accordance with NSW WHS legislation, complies with the requirements detailed in this Construction Environmental Management Plan, as well as the requirements of any other legislation or statutory bodies.

The proposed development includes the Design, Novate and Construction services for the upgrade of Hastings Secondary College, Port Macquarie Campus which include, new Creative and Performing Arts (CAPA), Refurbishment of Block L, Refurbishment of Block B, new lifts to CAPA & Block A, & external works including upgrade to main entrance.

A combination of offsite and onsite construction techniques will be used to deliver a revitalised campus to meeting the current and future school and community needs. The design will comply with the requirements as detailed in the Educational Facilities Standards and Guidelines (EFSG) and providing a high level of end user satisfaction.

This EMP has been generated to satisfy the requirements of “ISO 14001:2015, Environmental management systems – Requirements with guidance for use” and the “NSW Government Environmental Management System Guidelines – 3rd edition”. It establishes guidelines and controls for all FKG activities that may impact the surrounding environment for the duration of the works, including but not limited to; air, water, land, natural resource use & waste, flora & fauna, and their respective interrelationship. Furthermore, it has been designed to embrace the environmental management requirements, both in terms of the Contract and generally, to demonstrate FKG as an environmentally responsible organisation to the broader community.

1.2 Project Description

Design, Novate and Construction services for the upgrade of Hastings Secondary College which generally include, but not limited to:

Main Works – Port Macquarie Campus:

- Development of the Detailed Design.
- Construct of the new Creative and Performing Arts (CAPA)
- Refurbishment of Block L
- Refurbishment of Block B
- Construction of new lifts to CAPA, Block A
- Associated external works including upgrade to main entrance

1.2.1 HOURS OF WORK

The proposed hours of work for the project, align to Conditions B14(a)i) and C4 of SSD-11920082, and are as follows:

Monday–Friday – 7am – 6pm

Saturday – 8am – 1pm

Sunday – Nil

The proposed restricted hours of work for the project, provided that noise levels do not exceed the existing background noise level plus 5dB, which aligns to Condition C5 of SSD-11920082, are as follows

Monday–Friday – 6pm – 7pm

Saturday – 1pm – 4pm

The proposed hours of work for the project for specific construction activities such as rock breaking, rock hammering, sheet piling, pile driving and similar activities, which align to Condition C8 of SSD-11920082, are as follows:

Monday–Friday – 9am – 12pm & 2pm – 5pm

Saturday – 9am – 12pm

1.2.2 KEY PERSONNEL CONTACT DETAILS

The emergency contact details (24 hours 7 days a week) for key project personnel are included in the table below to satisfy Condition B14(a)ii) of SSD-11920082

Role	Name	Contact Details
Site Manager	Steve Ross	0477 765 640 steve.ross@fkg.com.au
Project Manager	Josh Pointon	0418 640 888 Josh.pointon@fkg.com.au

1.3 EMP Inter-relationship with other Documents

The Environmental Management Plan (CEMP) forms part of FKG's Environmental Management and interfaces with the company's Quality & WHS Management Systems. The following plans referenced within this EMP form part of the overall management of the project and contribute to the environmental management procedures:

Project Site Induction – Ensures all workers onsite are aware of the Environmental Management Plan & also trains all workers onsite on the requirements for controlling: dust & windblown debris, dirt & debris on public roads, protection of stormwater drains, tool & equipment washout, chemical spills, noise disturbance, waste collection & disposal, rubbish & food scraps & excess concrete.

Project Risk Assessment – Identifies what subcontractor onsite are impacted by or the risk of; air quality/dust, archaeology & cultural heritage, chemical spill, flora & fauna, littering, noise disturbance, stormwater contamination & watercourse pollution each month. This will be monitored through task observations scheduled for each month.

Noise & Vibration Management Plan – Identifies mitigation methods to minimise the risk of noise & vibration to the workers onsite and the surrounding properties.

Traffic & Pedestrian Management Plan – Summarises how construction and pedestrian traffic will be managed on the project to minimise the impact on the existing facility and the neighbours surrounding to the project.

Site Layout Plan – Identifies the location of sediment controls, access routes, truck washout, location of site bins, spill kits, concrete washout.

Emergency Preparedness & Response Plan – Outlines the process to manage emergencies inclusive of the following environmental emergencies; asbestos exposure, water pollution, fire, major fuel spill & chemical spill

1.4 Policy & Objectives

The FKG Environmental Policy Statement provides the framework for the development of this EMP (refer Appendix K) and details the company's commitment protect the environment and minimise the environmental impact of FKG's activities.

The objective of the Environmental Management Plan is to:

- Satisfy Client requirements related to environmental performance, set out in the Specification for the Works.
- Incorporate and provide mitigation strategies for environmental issues arising from site activities and as detailed in the Hastings Secondary College Upgrade Works Environmental impact assessment document (Environmental Impact Statement SSD -11920082)
- Complete construction in accordance with State and Federal Law (refer section 7 – References)
- Encourage best practice environmental management through planning, commitment and continuous improvement
- Prevent and minimize adverse impacts on the environment
- Identify the potential for, and respond to, environmental incidents and emergency situations and take corrective actions
- Identify and control possible environmental hazards with the works and FKG activities
- Identify and protect any special environmental characteristics of the site including cultural heritage significance
- Define roles and responsibilities and allocate the necessary resources
- Ensure environmental training and awareness programmes are provided to employees and subcontractors
- Establish mechanisms to monitor, evaluate and report progress

The FKG Environment Policy commits the company to achieve the Daily Mission of "No Harm to the Environment"

A copy of the Environment Policy is contained within the EMP (refer Appendix K) and displayed at the project / site office / induction sheds. FKG recognises this implementation will involve effective training of personnel to ensure they fully understand their responsibilities to comply with and monitor the management system. In addition, all site workers are consulted on FKG environmental policies & procedures through the following mechanisms: site inductions, site notice board, site inspections, prestart meetings, subcontractor meetings, team meetings, and toolbox talks.

1.5 Site Plan

Areas to be constructed or altered as part of the SSD-11920082 are highlighted in orange and yellow in the plan below.

1.6 Targets

OBJECTIVE #1: COMPLY WITH ALL ENVIRONMENTAL LEGISLATION

KPI: Number of identified breaches of State or Commonwealth Environmental legislation

Target: Nil for duration of project.

Responsibility: FKG & Subcontractors

OBJECTIVE #2: MINIMISE IMPACTS ON THE ENVIRONMENT

KPI: Number of significant environmental incidents causing serious harm to the environment

Target: Nil for duration of project.

Responsibility: FKG & Subcontractors

OBJECTIVE #3: CONDUCT SCHEDULED ENVIRONMENTAL SITE INSPECTIONS

KPI: Schedule and undertake regular site inspections

Target: > 90% of scheduled HSE inspections

Responsibility: FKG Site Manager

1.7 Environmental Planning

In accordance with the contractual requirements, applicable legislation, and in keeping with proper environmental practices, FK Gardner & Sons has instituted a management system which is reflective of observes the requirements, as set out in ISO 14001:2015.

1.7.1 ENVIRONMENTAL ASPECTS & IMPACT

All activities that are covered under the SSD-11920082 Stage 1 works being built by FK Gardner & Sons, are identified in the “Project HSE Risk Assessment” (refer Appendix A). For each activity the environmental impacts are identified as they relate to the following environmental elements:

- Location and Land Use
- Noise & Vibration
- Traffic and Access
- Air Quality
- Soils, Erosion and Water Quality
- Cultural Heritage
- Site Contamination
- Waste Management

Environmental impacts are detailed in the “Project Risk Assessment” and assessed for significance by using the Risk Matrix. Each identified potential impact is rated (Risk rating) in relation to its predicted likelihood and consequence.

1.7.2 WORK METHOD STATEMENTS

For each activity rated as a significant risk to the environment, a further Risk assessment is undertaken with the additional controls identified and contained within a Work Method Statement. This document details the; steps involved, hazards, control measures and persons responsible associated with the higher risk activity. A Toolbox talk is then completed with the relevant workers that will be completing the task to ensure that they comply with the Work Method Statement.

1.7.3 LEGAL COMPLIANCE AND OTHER REQUIREMENTS

FKG has developed a procedure ("Legislation Standards and Codes of Practice"), availableon BASE to identify legal and other requirements that are applicable to the Hastings Secondary College Upgrade and to ensure the accessibility of the information. The procedure shall be referenced and is applicable to those activities and functions that have the potential to interact with the environment.

Furthermore (URL) links are supplied on BASE to regulatory body websites and relevant NSW legislation relevant to environmental Aspects and management of the same.

1.8 Roles and Responsibilities

FK Gardner & Sons will collaborate with the project team to provide the following in ensuring we areachieving sustainable environmental management for the duration of the project:

- Engagement with project stakeholders including consultants and contractors
- Notifications and communications with adjacent property occupants and owners advising of the Works
- Formal notices of road closures and related matters
- Conveying enquiries and complaints regarding the works (including but not limited to traffic, dust and noise) to the client
- Liaising with key stakeholders and local authorities regarding the works
- Environmental issues related to the works

A summary of the roles and responsibility of each stakeholder with regards to environmentalmanagement for the project is summarised below:

- **Client Representative (Currie + Brown)** – provides a medium of communication between the client and the contractor and is responsible for all community consultation and communication
- **Contractor (FKG)** – responsible for delivering the project in accordance with the relevant legislation, including the enforcement of the CEMP for its subcontractors and suppliers.
- **Consultants/Engineers** – provide expert knowledge into the generation of aspects of the CEMP in linewith industry standards and the relevant legislations.
- **Subcontractor/Suppliers** – responsible to abiding by the requirements of the CEMP when carrying out their contract works.

1.9 Environmental Hold Points

The below hold points are directly correlated to the environmental management of the Hastings Secondary College PMC project site:

C19(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.

C23: Prior written approval of Council must be obtained to connect or discharge site stormwater to Council's stormwater drainage system or street gutter

C26: Unexpected Finds Protocol – Aboriginal Heritage, In the event that surface disturbance identifies a new Aboriginal object works shall only recommence with the written approval of Planning Secretary

C27: Unexpected Finds Protocol – Historic Heritage, In the event that surface disturbance identifies archaeological relics works shall only recommence with the written approval of Planning Secretary

2 Implementation

2.1 Environmental Awareness

All FKG and S/C employees shall receive an induction into the project in accordance with the Site Inductionprocedure including completing the Site Induction Record Form (Lucidity online document).

The induction shall include the requirements for the conduct of activities which have the potential for significant environmental impacts on the project which shall be outlined in the project specific Site Induction Handbook.

This document applies to all FKG and S/C employees, environmental awareness is the responsibility of every person working on and associated with the project.

2.2 Environmental Impacts of Subcontractor Activities

The environmental impacts of subcontractor activities shall be assessed during the S/C pre-award meeting in accordance with pre-award meeting procedure and the project HSE risk assessment. The general structure of the environmental management of the following risks is contained within this section of the report under the following structure:

Likely Impacts – outlines the impacts of the environmental issues that have been assessed in theenvironmental risk register

Mitigation Strategies – outline the procedures/actions that will be taken to minimise the possibility of theimpacts outlined above from occurring.

2.3 Environmental Risk Register

Environmental Risk Register Summary & Responsibilities (reviewed in accordance with the EIS for SSD-11920082)		
Environmental Issue	Risk to Project	Responsible Personnel
Traffic & Access During construction there will be impacts to traffic on public roads surrounding the project from construction vehicles and deliveries for site.	Low	PM / SM
Noise & Vibration Construction of the development may result in short term impacts during the project due to the use of heavy machinery, drilling and plant as	Low	PM / SM

well as construction personnel and vehicle movements.		
Air Quality During the earthworks stage of the project, there is a risk of poor air quality generated by the constructions works.	Low	SM
Aboriginal Heritage It is unlikely that construction works will impact any undisturbed aboriginal artefacts given that the ACHA noted that there was a very low risk of impacting Aboriginal archaeological material	Low	PM / SM
Soils, Erosion, & Water Quality There is a risk of soil leaving the site and potentially contaminating the stormwater system in the short-term during the earthworks stage of the project.	Low	SM

2.4 Sub-Plan Risks Safeguard / Mitigations Register

Sub-Plan Risks Safeguard / Mitigations Register (reviewed in accordance with the EIS for SSD-11920082)			
Actions	**Person/s Responsible**	**Timing / Frequency**	**Document Source**
Traffic & Access • No on-site parking for construction contractors • Site induction should include permitted access routes to and from the construction site for all vehicles, as well as standard environmental, work, health, and safety (WHS), driver protocols and emergency procedures. • Authorised traffic controllers to be present throughout the demolition, and certain construction stages of the project. • Forward in – forward out travel direction for construction vehicles. • Supervised traffic control will be required where two-way flow is restricted over any length of the roadway, depending on the number of truck movements required and would be managed outside of peak hour vehicle and pedestrian activity.	Project Manager / Site Manager	Ongoing throughout Weekly HSE Inspections	EIS Section 7 CPTMSP Section 5.0

Noise & Vibration • A Construction Noise Management Plan, to be implemented by the Contractor, will be prepared that clearly identifies the strategies to be put in place to minimise potentially adverse noise impacts upon the surrounding community (including the school). • The SINSW Comms department will inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels andduration, as well as contact details. • Continuous noisy works will be scheduled outside of school classroom hours (i.e. recess and lunch breaks, after 2:30pm) • The quietest feasible construction equipment will be selected. • Provision of respite periods will be utilised, particularly on Saturdays. • Plant Noise Audit – Noise emission levels of all critical items of mobile plant and equipment will be checked for compliance with noise limits appropriate to those items prior to the equipment going into service. Tothis end, testing will be established with the Contractor. • Operator Instruction – Operators will be trained to raise their awareness of potentialnoise problems and to increase their use of techniques to minimise noise emission. • Equipment Selection – All fixed plant at the work sites will be appropriately selected, andwhere necessary, fitted with attenuators, acoustical enclosures and other noise attenuation measures to ensure that the total noise emission from each work site complies with EPA guidelines. • Carrying out loading and unloading awayfrom noise sensitive areas. • Noise monitoring, if required, will be performed by an acoustical consultant directly engaged by the contractor.	Project Manager / Site Manager	Ongoing throughout Weekly HSE Inspections	EIS Section 7 CNVMSP Section 7 – Noise and Vibration Control
Air Quality • All plant and machinery involved in the works will be regularly serviced and checkedfor exhaust emissions and catalytic converters. Refer to CEMP Section 3.3.	Project Manager / Site Manager	As required	3.3 Air Quality & Dust Control

Aboriginal Heritage • The ACHA provides mitigation measures for the unlikely event that Aboriginal artefacts were to be found. Site contractors will be briefed on the protection of Aboriginal heritage objects and an induction on identification of artefacts will take place once approval is sought and construction begins. • FKG Unexpected Finds Procedure	Site Manager	As required	Section 3.5
Soils, Erosion, & Water Quality • Sediment diverting measures such as sandbags and fabric filters will to used tominimise sediment reaching Council's stormwater drainage networks. • Reduce pollution to downstream areas andreceiving waters; • Reduce land degradation; • All plant and machinery involved in the works will be regularly serviced and checkedfor exhaust emissions and catalytic converters. • Haulage trucks entering and leaving site willhave their loads covered appropriately. • Weather conditions will be continuallymonitored for factors such as wind. • Wherever practical, a wet process for concrete sawing, coring and grinding will beimplemented. • Where not practical to use a wet process forconcrete sawing or grinding direct dust extraction, a dust vacuum will be used. • Materials on site are to be stockpiled andstored appropriately. • The use of soil stockpiles is to be limited but where required, they will be watered down. • Stormwater pits are to be covered withgeotextile fabric and sandbags.	Project Manager / Site Manager	As required	Appendix J
Contamination • Refer to CEMP Section 3.6	Site Manager Contractor	As required	CEMP 3.6 Site Contamination

Waste • A spillage kit (dry absorbent material – sand,saw dust or oil absorber) shall be on site andits location communicated. A licensed wastedisposal contractor will carry out transport and disposal of spillage. • The discovery of unexpected hazardous materials or contamination will be dealt with in accordance with Council, the NSW EPA and WorkCover requirements, in consultation with the project team as required. Use the avoid, reuse, reduce, recycle principles • Minimisation of recurring packagingmaterials • Returning packaging to the supplier • Separation of recycling of materials off site • Audit and monitor the correct usage of bins • Audit and monitor the Waste Contractor	Project Manager Site Manager Waste Contractor Sub-contractors	As required	Appendix G Waste Management Strategies Appendix N Hazardous Materials Management Plan

3 Specific Environmental Issues

3.1 Noise and Vibration

Although the EIS assessment of noise impact is low, this can only be achieved by the diligent use of the below mitigation strategies.

3.1.1 LIKELY IMPACTS

Construction of the proposed development will result in short term noise impacts during the construction period. The predicted noise levels during the construction phase have been identified in the project Construction Noise & Vibration Management Plan along with associated mitigation strategies that are to be adopted to minimise these impacts (refer Appendix F for the Construction Noise & Vibration Management Plan) in accordance with Condition B14(e), and B16(a)-(g), of SSD 11920082.

3.1.2 MITIGATION STRATEGIES

The following mitigation strategies listed have been developed to control the level of noise and vibration that affect the relevant stakeholders:

Site construction noise will be managed in accordance Construction Noise and Vibration Management Plan (CNVMP) developed for this project. The CNVMP is based on the proposed construction methodology, activities, durations and equipment type and numbers.

Keep the community informed in relation to noise intensive activities in the immediate area. Refer to Communication Engagement Plan which is in accordance with Condition B16(d) of SSD 11920082.

Provide consultation where prolonged or consecutive periods of construction works are planned. Construction activities shall be restricted to the hours dictated in the consent SSD 11920082.

The consent approval stipulates working times to minimise the impact on the community being generally Monday to Friday 7am-6pm, Saturday 8am-1pm, no work on Sundays or public holidays.

Any noise complaint received will be investigated as soon as practicable. Any practicable and feasible measures to minimise noise will be identified and implemented if required. In accordance with Condition B16(f) of SSD 11920082.

All possible steps to be taken to silence construction equipment where possible.

Optimum siting of work areas, vehicle and plant parking areas, materials stockpiles and equipment storage areas in locations where potential acoustical impacts will be minimised.

All plant and machinery used for the project shall be well maintained.

Ensure workers and contractors are regularly trained (such as toolbox talks) to use equipment in ways to minimise noise

For more detailed mitigation strategies related to specific work phases and the relevant mitigation strategies to be adopted, refer to the CNVMP (Appendix A.6).

3.2 Traffic & Access

3.2.1 LIKELY IMPACTS

Construction of the new site facilities shall see some increase in traffic in the local area. The increased traffic is not predicted to have an impact on local traffic flow and only a minor inconvenience to local road users is expected. Construction vehicle routes have been developed with the intention of minimising the impact of construction traffic on the local streets in the immediate vicinity. Access to site is to be primarily via Owen Street. In accordance with Condition B14(d), B15(a)-(c), and B19(a)-(d) of the SSD 11920082, the management of construction traffic developed as a result of these works in summarised in the Construction Traffic Management Plan (refer Appendix H).

In accordance with SSD 11920082 Condition B20, there is no provision for on-site parking. A construction worker transportation strategy will be provided to the certifier prior to the commencement of works.

3.2.2 MITIGATION STRATEGIES

Follow the Construction Traffic Management Plan (TMP) based on the detailed construction methodology and use of specific heavy vehicles and construction plant. The Traffic Management

Plan is to include measures to minimise traffic impacts ensure public safety and is to be prepared in accordance with:

Traffic Control at Work Sites Manual (RTA, 2010)

Australian Standard 1742.3 - 2002 Traffic Control Devices for Works on Roads.

The TMP will detail hours of operation, heavy vehicle volumes (numbers) and routes, construction staff parking, loading / unloading areas and site access arrangements, all temporary warning, guidance and information signage, and appropriate traffic control devices

Notify surrounding land owners at least one week in advance of the works with all vehicles accessing the sites will use the designated access roads

All roads will be kept clean and free of dust and mud. Where material is tracked onto sealed road, it will be removed so that road pavements are kept safe and trafficable

All vehicles transporting spoil onsite will be covered and filled to maximum capacity to minimise vehicle movements as required

All roads, kerbs, gutters and footpaths damaged as a result of construction are to be restored to their pre-construction condition. A dilapidation report will be carried prior to construction

A dedicated vehicle wash-down area will be established on site

All traffic shall comply with all applicable traffic laws and regulations including speed limits. All construction vehicles shall comply with the speed limits set for the roads accessing the site

Construction activities shall be restricted to the hours dictated in the consent SSD 11920082.

The consent approval stipulates working times to minimise the impact on the community being generally Monday to Friday 7am-6pm, Saturday 8am-1pm, no work on Sundays or public holidays.

3.3 Air Quality & Dust Control

3.3.1 LIKELY IMPACTS

The main impact of air quality during construction is expected to arise from the generation of airborne localised dust associated with earthworks. Given the proximity to of neighbouring properties and existing buildings, there is the potential for impact by dust, particularly during windy conditions.

3.3.2 MITIGATION STRATEGIES

Construction vehicles and equipment to be suitably serviced prior to commencement of construction activities and all necessary maintenance to be undertaken during the construction period to meet EPA air quality requirements and Comply with Conditions C20 & C21 of SSD-11920082.

Excessive use of vehicles and powered construction equipment will be minimised where possible All construction machinery will be turned off when not in use to minimise emissions where possible. Construction contractors to monitor dust generation progressively.

Dust suppression methods will be adopted where required (i.e. on windy days when earthworks and vehicle movements are generating dust). Examples of dust suppression methods include:

- Water carts
- Localised use of water to supress excavation activities as they are occurring to suppress dust Covering stockpiles
- Any stockpiled spoil/fill will be protected to minimise dust generation to avoid sediment moving offsite. Vehicles transporting spoil from the site to be covered.
- The burning of waste materials will not be permitted on site

3.4 Soil, Erosion & Water Quality

In accordance with condition B14(g) & B18(a-f) of SSD 11920082, repeated in part as follows; the Construction Environmental Management Plan (CEMP) which must include a Construction Soil and Water Management Sub-Plan.

3.4.1 LIKELY IMPACTS

Earthworks and general ground disturbances associated with the site works may result in sediment and other materials leaving the site via wind or water movement. This may have the potential to result in the water pollution such as turbidity and nutrient inputs, should sediment wash into stormwater or natural drainage lines.

Aspects of the site identified as potentially impacting on water quality includes: Excavation for foundations and site levelling;

Stockpiling and transportation of excess spoil; and General construction waste entering drainage lines

3.4.2 MITIGATION STRATEGIES

Construction is to be undertaken in accordance with the CSWMSP, which is in accordance to Condition B18 of SSD 11920082.

All erosion and sediment control devices shall be properly maintained for the duration of the work. All structures are to be inspected after rain events and sediment to be removed

Any temporary stockpiles should be stabilised using sediment fencing or similar.

All fuels and other hazardous liquids shall be stored at designated construction compounds

All chemicals used for construction shall be stored and used in accordance with the relevant Safety Data Sheets.

An emergency spill kit shall be kept at the construction compound.

Workers are to be made aware of the provisions of Section 120 of the POEO Act with regards to water pollution

Notification to the EPA in accordance with Part 5.7 of the POEO Act is to be undertaken where a pollution incident occurs

All construction vehicles and equipment are to be maintained in designated areas away from watercourses.

Construction vehicles shall be appropriately cleaned of any soil or mud prior to leaving each works site at dedicated wash down bays

“Clean” stormwater shall be diverted around the site where possible

All existing stormwater pits and drains subject to FKG construction works will be silt protected with geo- fabric and/or granular socks. Drains will be monitored and maintained by FKG

Stockpiles to be established at FKG approved locations

Sediment fences shall be installed at required locations at the perimeter of the site Stormwater shall be diverted to retention basins

The location and details of permanent controls shall be included on the Site Layout Plan. Erosion and sediment controls shall be inspected as part of the Site HSE Inspection

3.5 Archaeology & Cultural Heritage

3.5.1 LIKELY IMPACTS

There is a low possibility of encountering culturally significant indigenous artefacts as determined by the Aboriginal Archaeological Assessment that has been completed for the area. If the proposed works would disturb any undisturbed Aboriginal objects or sites of historical relics, the following mitigation strategies will be adopted. The following Mitigation Strategies are in accordance with Conditions B14(c), C26 & C27 of SSD-11920082.

3.5.2 MITIGATION STRATEGIES

All workers (including contractors) should be made aware that it is il\ to harm an Aboriginal object or historic relics, and if a potential Aboriginal object or historic relic is encountered during activities, then all work at the site will cease and the OEH will be contacted to advise on the appropriate course of action to allow the Bripai People to record and collect the identified item(s).

All workers (including contractors) should be inducted concerning Aboriginal cultural heritage values

In the event that known or suspected Aboriginal skeletal remains are encountered during the activity, the following procedure will be followed:

- All work in the immediate vicinity will cease
- The find will be immediately reported to the work supervisor who will immediately advise the environment manager or other nominated senior staff member
- The environment manager or other nominated senior staff member will promptly notify the police and the state coroner (as required for all human remains discoveries)
- The environment manager or other nominated senior staff member will contact the OEH for advice on identification of the skeletal material as aboriginal and management of the material
- If the skeletal material is of aboriginal ancestral remains, the local aboriginal land council will be contacted and consultative arrangements will be made to discuss ongoing care of the remains
- The project team will take all necessary measures to protect the artefacts from being damaged or destroyed
- Works will not re-commence in the area until a written instruction from the superintendent is received

3.6 Site Contamination

In accordance with the “During Construction” Waste Storage and Processing section of the SSD-11920082 waste will be managed in accordance with those Conditions C28, C29, C30, C31 & C32.

3.6.1 CONTAMINATED SOIL RISK ASSESSMENT

In accordance with Condition B25 of the SSD 11920082, FKG is required to provide a Hazardous Materials Management Plan (refer to **Appendix N**) to the certifier prior to the commencement of construction which addresses the recommendations in the Hazardous Building Materials Report for Hastings Secondary College - Port Macquarie Campus by Douglas Partners, dated April 2021.

3.6.2 IDENTIFICATION OF CONTAMINATED SOIL

During construction, it shall be necessary to monitor soil contamination levels, dust levels and water runoff quality, to ensure that health and environmental standards are not compromised. This is especially important as contaminated soil may be excavated and transported around the site.

Upon discovery of contaminated soil, the FKG Site Manager shall arrange for works to be ceased immediately in the area and contact the Superintendent for further directions.

Contaminated waste shall be collected, contained, stored, handled and disposed of in accordance with relevant legislation and codes of practice.

3.6.3 RISK OF EXPOSURE

It is important to minimise the risk of exposure of construction personnel to soil contaminants by adopting appropriate site controls and industrial hygiene practices. Site controls may include:

Defining certain areas as contaminated and restricting access to them; Appropriate signage

Training construction employees in industrial hygiene procedures

Keeping non-essential motor vehicles such as personal cars out of contaminated areas; Regular medical checks of construction personnel who are exposed to contaminated soils

Keeping stockpiles of contaminated material watered down to minimise dust generation in accordance with any water restriction requirements and ensure that runoff is not generated from excessive watering

Covering truck loads with tarpaulins and watering material when loading and unloading; Wheel washes for trucks and vehicle leaving the contaminated areas

Regular road sweeping and cleaning

Dust monitoring and adjustment of construction programs to accommodate high risk periods when conditions are windy or very dry; and

Monitoring of concentrations of volatiles. Industrial hygiene practices may include:

- Wearing long sleeved shirts and trousers or overalls to minimise dermal exposure
- Wearing gloves when handling soils
- Washing hands and faces before eating, drinking or smoking; Leaving overalls at site for laundering/disposal
- Showering and washing facilities
- Wearing respiratory equipment during times of high dust or volatile emissions

3.6.4 GROUNDWATER MANAGEMENT

The contamination investigation conducted by EIS concluded that groundwater is not considered to pose a risk to the site. This was based on boreholes that were completed in the investigation that only encountered groundwater on the north-western corner of the proposed PCYC. Furthermore, the unexpected finds protocols outlined in Section 3.6.8 will be adopted in the event that groundwater is encountered on site.

3.6.5 RELEASE OF CONTAMINANTS TO SOIL AND GROUNDWATER

Water spraying of stockpiles and of soils being loaded and unloaded from trucks, covering of truck loads with tarpaulins and other measures described in the previous section would minimise the potential for dust to be generated

If heavily contaminated soil is placed in contact with clean soils, contaminants could be mobilized by rainwater or chemical / physical reactions and affect the clean soils to a limited extent

Similarly, there is a risk that contaminated soil is not clearly differentiated from clean soil and that mistakes could occur which cause the materials to be mixed or wrongly handled or disposed of

This shall be overcome by implementing a material tracking system for all contaminated soils and ensuring that construction staff are trained how to use the system

This shall involve documenting areas containing contaminated soil and putting signage near stockpiles that indicated the type of material present and its contamination status

It shall also require supervision and documentation of all movements of contaminated materials around the site

Avoiding contact between stormwater and contaminated soils is difficult to achieve if larger areas of a site are being exposed within a short period, because it does not allow for minimizing the amount of soil that is uncovered or placed in temporary stockpiles

Therefore, it is necessary to manage stormwater in such a way that it does not mobilize contaminants and transfer them to clean areas

This may be achieved by:

- Covering stockpiles of contaminated soil
- Placing stockpiles of contaminated soil on bitumen or other sealed areas
- Installation of adequate bunding or other approved method to contain runoff
- Collecting stormwater run-off from stockpile areas
- Analytical testing of collected stormwater prior to its release

Erosion and sediment control procedures in accordance with the relevant Code of Practice may also be applied, but with the additional objective of keeping water that is exposed to contaminated soils separate from water that has only come into contact with clean soils.

Groundwater could potentially be impacted by contaminants mobilized from stockpiled contaminated soil or by buried material.

Minimising runoff from stockpiles, as outlined above would reduce the risk to groundwater.

3.6.6 HEAVY METAL CONTAMINATION

Any suspicious industrial wastes encountered will be immediately isolated to enable these assumptions to be confirmed by analytical testing. WSP and Douglas Partners have both confirmed that there is naturally occurring high levels of Chromium onsite. Further testing has confirmed that the levels of Hexavalent Chromium (CrIV) is below the threshold for offsite disposal of all disturbed material.

3.6.7 MITIGATION STRATEGIES

In the event that unexpected conditions are encountered during development work or between sampling locations which may pose a contamination risk, all works should stop and an environmental consultant shall be engaged to inspect the site and address the issue.

3.6.8 UNEXPECTED FINDS

In accordance with Conditions B14(b-c), C26 & C27 of the SSD 11920082, unexpected finds protocols must be included within the CEMP to outline the process to be followed in the event that unexpected contamination and/or Aboriginal/non-Aboriginal heritage is found through the duration of the project. Unexpected Find shall be addressed in compliance with the FKG's Unexpected Finds protocol listed below:

Unexpected Finds Protocols – General including aboriginal and non-aboriginal items

- Immediately cease work and contact site manager
- Site Foreman to construct temporary barricading to prevent worker access to the unexpected substance(s) and install appropriate stormwater/sediment controls
- Site foreman to contact Client and arrange inspection by the Aboriginal Cultural Heritage consultant
- Aboriginal Cultural Heritage consultant to undertake detailed inspection and sampling & analysis
- If the findings assessed are presenting to be of Aboriginal Cultural Heritage significance, following steps should be in accordance with the Aboriginal Cultural Heritage consultant's direction and works must cease until further notice.
- If the findings assessed are not presenting to be of Aboriginal Cultural Heritage significance, Site foreman to remove safety barricades and controls and continue work
- Aboriginal Cultural Heritage consultant to supervise remediation and undertake validation/clearance as per the remediation/validation/clearance plan
- Site Foreman to remove barricades and controls and continue work.
- Aboriginal Cultural Heritage consultant to submit assessment/validation/clearance to site foreman for distribution to Client and appropriate regulatory authorities.

Unexpected Finds Protocol – Asbestos and contamination

If asbestos is detected in unexpected areas prior to, or during, site development works the following 'Unexpected Finds Protocol' will apply:

- Upon discovery of suspected asbestos containing material, the site manager is to be notified and the affected area closed off by the use of barrier tape and warning signs.
- An Occupational Hygienist is to be notified to inspect the area and confirm the presence of asbestos and to determine the extent of remediation works to be undertaken. A report detailing this information would be compiled by the Occupational Hygienist and provided to the Principal (or their representative) and the site manager.
- If the impacted soil is to be disposed off-site, it should be classified in accordance with the DECCW's Waste Classification Guidelines (2008) and disposed of, as a minimum, as asbestos contaminated waste to a suitably licensed landfill. In dry and windy conditions the stockpile would be lightly wetted and covered with plastic sheet whilst awaiting disposal.
- All work associated with asbestos in soil would be undertaken by a contractor holding a class ASA Licence. WorkCover must be notified 7 days in advance of any asbestos works.
- Monitoring for airborne asbestos fibres is to be carried out during the soil excavation in asbestos contaminated materials.
- Documentary evidence (weighbridge dockets) of correct disposal is to be provided to the Principal (or their representative).

- At the completion of the excavation, a clearance inspection is to be carried out and written certification is to be provided by an Occupational Hygienist that the area is safe to be accessed and worked. If required, the filling material remaining in the inspected area can be covered/sealed by an appropriate physical barrier layer of non-asbestos containing material prior to sign–off.
- Validation samples would be collected from the remedial excavation to confirm the complete removal of the asbestos containing materials.
- The sampling locations should be surveyed using a sub-meter DGPS.
- Details are to be recorded in the site record system.
- Following clearance by an Occupational Hygienist, the area may be reopened for further excavation or construction work.

3.7 Waste Management

In accordance with Condition B12(e) of SSD 8873789, the Construction Waste Management Plan (CWMP) has been completed for the project and is contained within (Appendix G). The CWMP contains detailed information regarding the types and disposal of different waste types throughout the project. The Waste Management Plan addresses the way that waste will be addressed throughout the construction process with reference to the unexpected finds protocols that are to be adopted in the event that an unexpected find is encountered.

In accordance with Condition B17 the waste classification for the project is contained within Appendix N. Detailed information regarding the treatment and allocation of waste for the duration of the project is contained within the CWMP. Waste will be managed during construction in accordance with Conditions 27-32.

3.7.1 WASTE REDUCTION

It is likely that some excess building materials will be produced due to the construction work such as miscellaneous waste associated with packaging and transport of plant and equipment and various other manufactured items forming part of the augmentation works. Waste generated as a result of construction will be minimised, recycled, reused or recovered, where practical.

FKG has accepted the challenge to reduce waste on construction projects, particularly in materials transferred to landfill.

The strategy for reducing the waste on the project will be made up of three strategies as detailed below in order of priority. The prime objective is to keep the amount of materials transferred to landfill from this project to the minimum possible amount.

Reduce the amount of waste material produced on the project by ensuring that only enough materials required to perform the works are ordered.

Any excess materials from particular work areas are to be retained and incorporated into other work areas where practical.

3.7.2 WASTE GENERATION – FILL MATERIAL

All excavated materials that are site won and will be retained on site. All other waste will be taken off site to be recycled and the waste facilities' sorting yard.

3.7.3 NON-RECYCLABLE WASTE

Non-recyclable waste will be disposed of at an EPA approved landfill or transfer station.

3.7.4 WASTE COLLECTION & DISPOSAL

Appropriate waste bins are to be provided by FKG and made available to all S/C

All S/C shall be directed to place waste in the bins provided. This shall be included in the Site Induction. Waste collection points are nominated on the Site Layout Plan.

Waste Collection & Disposal is in accordance with Condition B15(b) of SSD 8873789.

3.7.5 WASTE REPORTING

Waste generation is monitored by FKG on monthly basis to ensure that the company's waste reduction objectives are achieved. Waste disposal quantities are monitored monthly by FKG to ensure compliance.

3.7.6 CONCRETE WASTE & WASHOUT

Concrete trucks and pumps shall be washed out at designated locations as shown on the site layout plan. Washout of concrete pumps and AGI's in other areas will not be permitted.

Washout shall be captured using membranes or other suitable means and allowed to set. Waste shall be placed in bins for disposal with site waste.

Excess concrete shall be returned to the concrete plant for disposal or re-use.

3.8 Fuel & Chemical Spills

Response to major fuel spills shall be implemented in accordance with the fuel spill procedure in the Emergency Response Plan. The requirements for storage of large fuel and chemical quantities are not expected for this project.

A spill kit shall be located adjacent to fuel and chemical storage and dispensing areas.

3.9 Hazardous Materials

Hazardous materials shall be controlled in accordance with Hazardous Materials procedure.

3.10 External Lighting

In accordance with condition B11 of SSD-11920082, the new external lighting to the proposed upgrade works complies with both AS1158.3.1:2005 & AS4282-2019 – Control of the Obstructive Effects of Outdoor Lighting. Refer to **Appendix M** for Certification of the Outdoor Lighting from the Electrical Engineer – JHA.

3.11 Community Consultation and Complaints Handling

In accordance with condition B14(a)v) of SSD-11920082, community consultation and complaints handling is primarily the responsibility of the Client. FK Gardner & Sons will provide assistance where possible to ensure that the client is complying with the requirements of Community Communication Strategy, developed for the upgrade works at Hastings Secondary College. Please refer to the CCS for the SINSW Hastings Secondary College.

3.11.1 COMMUNITY CONSULTATION

Community consultation is primarily the responsibility of the client. FKG will ensure that the relevant strategies/outcomes are incorporated within the relevant management plans and construction process where possible. The main channels that the client is planning on conducting consultation is through the following:

- Community information phone line Community contact cards
- Door knocks
- Face-to-face meetings/briefings Fact sheets
- Information Booths Project updates
- Project Reference Group Website
- Works notifications Letterbox drops
- The above have been extracted from Table 3 of the Community Communication Strategy which will fulfil the requirements of Condition B9.

3.11.2 COMPLAINTS HANDLING

The primary form of assistance that FKG will provide is through the complaints handling process. During the project delivery phase, a complaint defined as in regard to construction impacts – such as – safety, dust, noise, traffic, congestion, loss of parking, contamination, loss of amenity, hours of work, property damage, property access, service disruption, conduct or behaviour of construction workers or other environmental impacts. If a complaint is made directly to FKG, it will be redirected to the following SINSW communication channels through the provision of business cards containing the following information in accordance with the Community Communication Strategy Condition B9.

Phone: 1300 482 651

Email: schoolinfrastructure@det.nsw.edu.au

Upon receipt of the complaint from the Project Director, FKG will endeavour to close out the complaint in a timely manner. The complaint will be logged to ensure that the impact of future construction works that may impact the community in a similar manner are minimised.

4 Consultation, Communication and Reporting

4.1 Internal Site Communication and Consultation Mechanisms

Communication and consultation arrangements for environmental, health and safety performance on the Site must be via:

1. The Site-Specific Induction and Record – using the **Site Specific Induction Form & Site Rules**;
2. Pre-start meetings – recorded on the **Daily Pre-start & Site Attendance Record**;
3. Senior Management visits to Site - recorded on the **Daily Pre-start & Site Attendance Record**;
4. Toolbox Meetings - recorded on the **Toolbox Training Attendance Form**;
5. Subcontractors are required to undertake weekly toolbox talks with their work crews in presence of an FKG representative, with copies of the toolbox talk being submitted to FKG.
6. FKG may undertake toolbox talks for the following: the commencement of high risk works, new trade starting on site, to communicate safety alerts and outcomes from safety audits, emergency drill debriefs etc.
7. Specific HSE meetings are held in addition to subcontractor weekly toolbox talks. They focus on a specific safety topics that is relevant to Site and/or FKG. With the approval of the Project Manager, these meetings may take the form of a Site Safety & Environmental BBQ.
8. Internal scheduled system audits.
9. Project specific audits.
10. Construction Safety Group / Safety Committee meetings.

In addition to the above requirements, any site-specific requirements in relation to Consultation and Communication shall be recorded within the **PRR**.

4.2 Site Noticeboards

Site EHS Noticeboards must be positioned in a conspicuous location (in Site office, lunchroom) and must be kept up to date by the Site Supervisor, with older items removed as instructed to retain active interest in the board. The Site Noticeboard must display the following documents:

1. **Workplace Health and Safety, Environmental and Quality Policies**
2. Environmental, Health and Safety Alerts
3. Safety and Environmental Objectives and Targets (monthly extract from the **Monthly Project Review**)
4. Nominated Workplace Health and EHS Advisor
5. Nominated WHSRs (where appointed)
6. **Event Action Guide & Diagram**
7. Employee Assistance Scheme Contact Details
8. **Site Safety Group Meeting Agenda & Minutes** (as applicable)

4.3 Incident, Dangerous Occurrence, Non-Conformance and Hazard Trends – Reporting, Investigation & Close Out

Emergency Preparedness & Response Planning Management Procedure identifies the immediate response protocols to be adopted in an emergency situation.

All incidents, dangerous occurrences, non-conformances and hazard trends must be reported, investigated and closed out as detailed in **Incident, NCR and Hazard Trend Management Procedure** and the **Incident Reporting & Categorisation.**

Incidents and immediate actions taken must be reported on Lucidity, which generates a notification to Senior Management.

Where the need for a detailed investigation is identified, this must be conducted using **Lucidity** in accordance with **Lucidity - Incident Module Procedure** and **Incident, NCR and Hazard Trend Management Procedure**.

The Site Supervisor or attending management and EHS Advisors (including, where applicable, the EHS Advisor) must ensure that any non-conformances identified on the Site are reported on **Lucidity**.

Where further corrective actions are required from an incident / non-conformance, these must be allocated, monitored and closed out on Lucidity.

All Non-Conformance Reports issued for the Site are automatically registered on Lucidity, which is reviewed on a monthly basis.

Incident and NCR Registers as well as hazard trends are available on Lucidity / QSE Dashboards and reflected within the **Monthly Project Review**.

All workers on Site must be encouraged to actively identify and report any observed hazards.

The effectiveness of the hazard identification, risk assessment and risk control processes, as well as evidence of the development of hazard trends must be reviewed at a Project level using the Site specific PRR, with current data inserted into the **Monthly Project Review** from the QSE Dashboard.

5 MONITORING AND REVIEW

5.1 Monitoring of Project Objectives, Targets and Risks

5.1.1 PROJECT MONTHLY REVIEW

The achievement of the safety objectives and targets on the Project must be reviewed throughout the life of the Project on a monthly basis using **Monthly Project Review** and the QSE Dashboard.

The **Project Manager** must collate and submit the **Monthly Project Review** meeting report and the QSE Dashboard to the **GMC** on a monthly basis.

A consolidated summary of performance against all Project quality, safety and environmental objectives and targets must also be discussed on a monthly basis at the monthly Construction Management Meeting.

5.1.2 PRR MONTHLY REVIEW

The **Project Manager**, in consultation with the **Project Team**, must ensure the **PRR** is reviewed on a monthly basis to ensure it adequately addresses project risks.

Project-specific risks identified that require changes to the Project specific controls are to be detailed on the **PRR** in the month for which the activity is to occur, with an action set to ensure that the new controls are communicated and implemented.

The monthly review of the **PRR** is to include emergency scenarios associated with high risk works applicable to the project.

Where changes are made to the **PRR** Senior Management and the **Project Team** must approve the changes.

The relevant sections reviewed must be communicated to the relevant subcontractors who must revise their **SWMS** where required.

Where the frequency of review is deemed to be other than monthly it must be recorded within the **PRR** with an allocated action assigned.

5.2 Environmental / Health Surveillance and Monitoring

5.2.1 GENERAL REQUIREMENTS

Should environmental monitoring be identified as required for any reason, this must be detailed in the **PRR**. The applicable **Safe Work Method Statement** must also detail this requirement, including any health monitoring (if required), the type of monitoring must also be included. Personal protective equipment which is identified for use for monitoring must be specified on the **Safe Work Method Statement**.

The frequency of which environmental inspections are to be undertaken is to be determined within the **PRR**.

If a separate Sediment & Erosion Control Plan (SECP) is provided for the project, the requirements are to be fulfilled, should no SECP be provided, the **Project Team** are to comply with **Erosion and Sediment Control Procedure**.

Calibration and inspection of monitoring equipment must be in accordance with the manufacturer's and legislative requirements.

5.2.2 Hazardous Work - Respirable Crystalline Silica

All interactions for the project that produce Respirable Crystalline Silica (RCS) must have adequate controls in place to eliminate or significantly reduce exposure.

All persons working with or in the vicinity of RCS must wear appropriate Respiratory Protective Equipment (RPE) for which they have a current fit test certificate.

RPE must, where practical, be used in conjunction with an engineering control(s). The controls to be applied must be documented in the **SWMS** for the task being undertaken.

Housekeeping – dry sweeping dust and debris can generate high levels of airborne RCS and other respirable dust. Suitable respiratory protection must be used when dry sweeping. Dry sweeping should be avoided where possible, particularly in indoor environments and areas with little or no ventilation. Alternative methods include:

1. wet sweeping
2. hosing down/wiping/mopping of surfaces
3. vacuuming up dust and debris containing silica using an M or H-class vacuum cleaner
4. using ride-on floor cleaners (HEPA filtered or water scrubbing)

Waste disposal – you can reduce dust associated with waste by:

1. bagging waste material such as debris and empty cement bags before putting them into the bin or skip.
2. locating bins and skips outdoors where possible
3. using water misting systems to keep waste materials damp where possible.

5.2.3 Hazardous Work – Lead

Lead work undertaken at FKG projects must be subcontracted to suitably licenced and qualified contractors. Any works associated with lead are to be identified within the **PRR**.

Where lead risk work is identified the Statutory Authority must be notified in writing within 7 days prior to work commencing, using the statutory reporting form: **Notification relating to lead risk work**. A copy of the notice given to the regulator must be kept while the lead risk work is carried out at the workplace and it must be readily accessible to any Worker likely to be exposed to lead and the Worker's health and safety representative.

Subcontractor **Safe Work Method Statements** must include the controls to be applied for the task being undertaken.

5.2.4 Hazardous Material and Waste Monitoring

The **Hazardous Chemical Risk Assessment and Training Record** must identify any requirements for environmental or health monitoring.

The **Site Supervisor** must ensure that the monitoring requirements are implemented and undertaken in accordance with the manufacturer's recommendations.

Contaminated waste generated from the Site must be kept to a minimum.

Sustainable waste management is observed by all projects by monitoring the percentage of waste diverted from landfill for the project, with values entered on the **Environmental Inspection Checklist** (on Lucidity).

5.2.5 Where tracking of waste is required (i.e. fire ant material, contaminated soil, regulated waste, asbestos, etc)

The Site Supervisor must ensure that all waste is managed in accordance with the **Waste Management Procedure** and where required, recorded on **Waste Materials Tracking Log**.

5.2.6 Noise Monitoring

Noise monitoring must be undertaken where a preliminary assessment of noise indicates that a noise assessment should be undertaken, or it is suspected that the level of protection of selected protective devices is not sufficient to adequately protect Workers. Noise is to be managed in accordance with the requirements identified within the **Noise Management Procedure.**

If a noise assessment or manufacturer's recommendation on noise output of equipment exceeds the equivalent 85 dB(A) exposure over an 8-hour period ($L_{Aeq,8h}$), noise exposure levels should be reduced to at or below the national standard whenever practicable. If the national standard cannot be met, all practicable noise controls must be implemented to reduce noise levels and Worker exposure to noise.

Controlling exposure to excessive noise must take into consideration when determining the Hierarchy of Controls (as defined in the **Noise Management Procedure**).

Where personal protective equipment is to be used to reduce the noise levels experienced by Workers to the 75 – 80 dB(A) range, this must be in accordance with the following table:

Table 3: PPE Requirements for Noise Exposure

Class	$L_{Aeq,8h}$ dB(A)	SLC 80 Range
1	less than 90	10 to 13
2	90 to less than 95	14 to 17
3	95 to less than 100	18 to 21
4	100 to less than 105	22 to 25
5	105 to less than 110	26 or greater

5.3 Site Inspection / External Audits

A weekly inspection must be performed by the **Site Supervisor** or their delegate using **Weekly Site Inspection** (on Lucidity), with all associated documents (**Daily Pre-start & Site Attendance** etc) being collated and attached to it. Attachments can be added via scanning or photo.

Environmental inspections using **Environmental Inspection Checklist** must be performed as risk assessed within the **PRR**.

Any deficiencies identified during the inspection must have an action and a responsible person assigned through the **Weekly Site Inspection** or **Environmental Inspection Checklist** in Lucidity.

Actions are to be monitored within Lucidity, with actions from previous weekly inspections required to be confirmed as closed out prior to the next weekly inspection.

External Audits will be completed by an Independent Auditor and any actions / NCRs will be closed out by the Site Team in the appropriate time frames. Audits programs will be determined by the conditions of consent (Refer Condition A22).

.

5.4 Task Observation

The **Task Observation Checklist** is used to formally observe work practices and monitor the effectiveness of controls implemented on **Safe Work Method Statements**, and where necessary additional controls implemented as specified within **Risk Management within the CDMS OM.**

Task Observation Checklist must be allocated as part of the review of the **PRR**.

Any **Task Observation** is to be undertaken with the subcontractor supervisor / nominated personnel present, and is to include a review of surrounding area where the task/activity is being undertaken (e.g. access to the work area).

The **PRR** must identify the name of the trade that the TOC / audit is being undertaken on.

Feedback is provided immediately following a **Task Observation** identifying both safe and unsafe behaviours. The names of the workers participating in the task and behavioural observation are recorded on the Task and Behavioural within the **Task Observation**.

Workers involved in the observation shall be given the opportunity to ask questions to clarify their understanding of the outcomes of the **Task Observation**.

6 EMERGENCY PREPAREDNESS AND RESPONSE

The **Project Manager** must ensure that during the **Project Commencement Meeting** that all potential emergency situations are identified, and site-specific emergency procedures are documented and reviewed as detailed in the **Event Action Guide and Diagram**.

The **PRR** is to include scheduled actions that relate to the emergency scenarios applicable to the project, as identified within the Emergency Preparedness and Response Plan

The monthly review of the **PRR** is to include the scheduling of the emergency drills, with the outcomes of the drills to be debriefed with the workers recorded on the **High-Risk Activity Audit – Emergency / Evacuation Drill Observation Checklist**.

Any feedback from the emergency scenario drills undertaken is to be considered during the **PRR Master Template** risk review.

7 REFERENCES

Environmental Planning and Assessment Act 1979 No 203

Environmental Planning and Assessment Regulation 2000

Protection of the Environment Operations Act 1997 (NSW)

Protection of the Environment Operations (General) Regulation 2009

ISO 14001; 2015 Environmental management systems - Requirements with guidance for use

NSW Government Environmental Management System Guidelines (edition 3 - August 2013)

Appendix A: Current Project Risk Register

Current Project Risk Registers including Emergency Response Classification – Templates are available on Lucidity

Risks

Filters applied:

Classification:	EHS
Project:	21026 HSC Port Macquarie Campus
Owner:	Josh Pointon

Risk Group	Risk ID	Classification	Risk category one	Activities	Means of Control	PCBU Reference Documents	Risk score (U) (Raw Risk)	Legal and Other References	Guidance	Risk score (C) (Residual Risk)	Applicable Trades
EHS	793	EHS	Falls over 2m (inc. falling objects) - involves a risk of a person falling more than 2m	Scaffold install to Block T and TAS Structural Steel installation Brickwork Roof & Gutter installation	4. Engineering	CEHSMP SWMS Site Specific Induction VOC Procedure	E-18	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	• A fall prevention device must be designed/engineered, with no further adjustment possible by workers using the device. • A 'temporary work platform' is used to provide a working area for the duration of the job. (ie.scaffolds, elevating work platforms, mast climbers, workboxes etc) • Guard rails must be top rail 900mm to 1100 mm above the working surface and a mid-rail and a toe board. • Roof edge protection system to be designed/engineered and rails are joined by a minimum overlapping 300mm. • Safety mesh is designed to prevent internal falls through a roof and must be installed as per manufacturers specifications. • A handover certificate to be supplied before an person is allowed access on the roof. • A fall restraint system is the approved system when working from a harness. • Anchor points should be tested and approved by a competent person before use. • A catch platform is a temporary platform located below a work area to catch a worker in the event of a fall, not for work purposes. • The platform should be of robust construction and designed to withstand the maximum potential impact load. • Scaffolding components may be used to construct fixed and mobile catch platforms. • A person conducting a business or undertaking who proposes to excavate a trench at least 1.5m deep, must minimise the risk to any person arising from the collapse of the trench by ensuring that all sides of the trench are adequately supported by one or more of the following: shoring by shielding or other comparable means (e.g. boxing), benching or battering.	H-14	Scaffolder Bricklayer Rigger
EHS	795	EHS	Environmental - noise	Demolition of retaining wall and stairs Excavation and Earthworks	5. Administration	CEHSMP SWMS Site Specific Induction	H-13	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	• Manufacturers/suppliers and importers must give purchasers and other potential users the information they need to safely use the plant, including the results of any calculations, analysis or testing carried out. • Information must include the noise emission values of the plant, the operating conditions of the plant when the noise emission is measured and the methods used to measure the noise emission. • This information will help purchasers choose plant with low noise levels. The testing information that should be supplied to the purchaser • Where relevant information on test procedures is contained in a test standard or a test report, reference to the standard or the report should be included. Information should be provided on peak noise levels, where relevant, as well as on continuous noise levels. Where there is a selection of noise measurement results available, the preferred measurement is the sound pressure level at the operator's position. • The potential for noise to be hazardous is not always obvious. Hazard identification is a way of finding out which work activities have the potential to contribute to hearing loss or other harm caused by noise. • Whether the exposure standard of 85 dB(A) averaged over eight hours is exceeded depends on the level of noise involved and how long workers are exposed to it. • Peak noise levels greater than 140 dB(C) usually occur with impact or explosive noise such as sledge-hammering. Any exposure above this peak can create almost instant damage to hearing.	M-9	HTS Group Freeman Civil
EHS	796	EHS	Environmental - Waste	ACM in soil ACM in soffit sheets Lead Dust in Insulation Lead Dust glued to floor	5. Administration	CEHSMP SWMS Site Specific Induction	H-13	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	• In planning a construction project, it is important to understand what excess materials are likely to be generated and then focus on how the generation of those excess materials can either be avoided or the material can be diverted from landfill. • The objective for projects is to; Minimise the amount of waste generated as part of the project, Maximise the amount of material which is sent for reuse, recycling or reprocessing, Minimise the amount of material sent to landfill. • Waste streams: identify which waste streams (types) are likely to be generated and estimate the approximate amounts of material • 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 • On-site: understand how the waste management system will work on-site, including bin placement (segregation) and access • Clearly assign and communicate responsibilities: ensure that those involved in the construction are aware of their responsibilities in relation to the construction waste. • Engage and educate personnel: be clear about how the various elements of the waste management will be implemented and ensure personnel have an opportunity to provide feedback on what is/isn't working • Monitor: ensure onsite waste management is occuring • Evaluate: once the project is complete, evaluate your estimates in the plan against the actual data for waste generated and consider feedback from personnel.	M-9	HTS Group completing the demolition

EHS	794	EHS	Environmental - heritage	Spotter during excavation works	5. Administration	CEHSMP SWMS Site Specific Induction	E-23	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	The Aboriginal Cultural Heritage Act 2003 (ACH Act) binds all persons, including the State, and is intended to provide effective recognition, protection and conservation of Aboriginal cultural heritage. The following fundamental principles underlie the Act's main purpose: • the recognition, protection and conservation of Aboriginal cultural heritage should be based on respect for Aboriginal cultural and traditional practices; • Aboriginal people should be recognised as the primary guardians, keepers and knowledge holders of Aboriginal cultural heritage; • it is important to respect, preserve and maintain knowledge, innovations and practices of Aboriginal communities and to promote understanding of Aboriginal cultural heritage; • activities involved in recognition, protection and conservation of Aboriginal cultural heritage are important because they allow Aboriginal people to reaffirm their obligations to "law and country"; • there is a need to establish timely and efficient processes for the management of activities that may harm Aboriginal cultural heritage Unexpected Finds; Action to be taken in the event of a suspected Cultural Heritage Find • Works within the immediate vicinity is to cease and a buffer zone around the area is to be established. The buffer area is to be determined by the PM in consultation with the Environmental Representative, to ensure that further disturbance of the find is prevented. • Works may continue outside of the buffer zone provided further impacts can be avoided. • The exact location and details of the find are to be recorded, and the find is to be reported immediately to the site's Project Manager and Environmental Representative. • Police must be notified immediately if the find is of skeletal remains. • Project personnel are not to disturb the suspected find in any way. If possible photographs should be taken from outside the buffer zone showing the position of the find in relation to work area. •The PM/Environmental Representative on site is to report the discovery to the Client Representative. •Work activities shall not recommence within the buffer zone until clearance has been given in writing by the Client Representative or other authorised person(s). If directed, the local Aboriginal Party will need to be contacted to attend the site and provide advice and agreement as to how best to manage, avoid or minimise harm to the find. •All terms of agreement reached with the relevant Aboriginal Party for the area must be recorded, documented and signed by both parties. In the event an agreement cannot be reached, a Cultural Heritage Management Plan may be required – contact the FKG Environment Department for further detail	H-13	HTS Group
EHS	797	EHS	Environmental - (Habitat) Flora and Fauna	Tree Removal	5. Administration	CEHSMP SWMS Site Specific Induction	H-13	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	Site obligations to; • Minimise disturbance or removal of flora and fauna habitat. • Prevent damage or disturbance to vegetation communities, particularly endangered ecological communities. • Prevent damage or disturbance of protected or threatened flora species by avoid negative impact to sensitive areas. • Prevent disturbance, injury or mortality of protected or threatened fauna species. • Prevent disturbance impacts on retained native vegetation due to locating site compounds, workers, machinery or stockpiles. • Manage and monitor Vegetation removal and grubbing that could increase risk of soil erosion. • Increased sedimentation controls preventing site runoff from cleared areas. • Retain and enhance existing flora and fauna habitat wherever possible. • Appropriately manage the spread of weeds and plant pathogens. • Managing Potential hazardous chemical spillages on site which could affect water quality. • Ensure due Dillignece is undertaken for Fire Ant Management.	M-9	Aborist
EHS	799	EHS	Environmental - Dust & water runoff (Site Containment)	Installation of sediment controls	4. Engineering	CEHSMP SWMS Site Specific Induction	H-13	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	Construction disturbs soil and creates dust and debris. Run-off from a construction site travels down the gutters and drains to creeks and canals and eventually ends up in a river, lake or the sea. The three cornerstones of best-practice 'erosion and sediment control' (ESC) are drainage control, erosion control, and sediment control: • Drainage control measures aim to prevent or reduce soil erosion caused by concentrated flows (including the management of Grill and gully erosion), and to appropriately manage the movement of 'clean' and 'dirty' water through the site. • Erosion control measures aim to prevent or reduce soil erosion caused by raindrop impact and sheet flow (i.e. the control of splash and sheet erosion). • Sediment control measures aim to trap and retain sediment displaced by up-slope erosion processes. • Best practice sediment control measures cannot, on their own, provide adequate protection of downstream environments. Therefore, appropriate drainage and erosion control measures must also be applied at all times, especially on clayey soils. Desirable environmental protection is only achieved when all three control measures are working in a coordinated manner during each stage of the construction process. • Dust control measures apply to any construction site where there is the potential for air and water pollution from dust traveling across the landscape or through the air. Dust control includes practices used to reduce or prevent the surface and air transport of dust during construction. • Water is the most used alternative, due to its low cost of implementation and excellent results. Water should be applied at least three times a day or more, depending on the atmospheric conditions. Also, you should be aware of the quantity of water applied and prevent excess water that can cause erosion problems. A water truck is driven on-site spraying water over the affected areas preventing dust from airborne. • Mulch and vegetation may be applied to protect exposed soil from both wind and water erosion. Although this method is "green" friendly, watering your vegetation needs proper coordination as it might bring erosion problems as well. When applied, this technique can reduce wind erosion by up to 80%. Hydro-seeding is one of the dust control methods preferred by construction projects. • Polymers as Dust Control can be an effective practice for areas that do not receive vehicle traffic. Dry applied polymers must be initially watered for activation to be effective for dust control. This method bonds the individual soil particles together, and when it dries, it forms a flexible "crust" that strengthens the surface of the soil. It has been determined that the effectiveness of this solution ranges from 70-90%. • Barriers, A board fence, wind fence, sediment fence, or similar barrier can control air currents and blow soil. All of these fences are normally constructed of wood. Perennial grass and stands of existing trees may also serve as wind barriers. Barriers prevent erosion by obstructing the wind near the ground and preventing the soil from	M-9	HTS Group FKG
EHS	802	EHS	Tilt up panels - involves tilt-up or precast concrete;	No use of tilt up panels	4. Engineering	CEHSMP SWMS Site Specific Induction VOC Procedure	E-18	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	• The total design of the panel erection system should be overseen by engineer/s. This includes the design of the panels, the temporary bracing systems and securing of panels prior to removal of braces. • An appropriate system that verifies compliance with the design such as audits will assist to verify; correct grade of concrete, appropiate cure time for concrete panels prior to lifting, correct type and number of concrete inserts to manufacturer's specifications, installation of reinforcement steel in accordance with the drawings and panel braces in accordance with the engineer's and manufacturer's specifications. • The "Panel lifting and temporary bracing checklist" applies both to the safety of the lifting system used by the panel erectors and to the integrity of the temporary bracing system. • A lift plan must be prepared prior to lifting tilt-up or pre-cast panels. • The crane capacity must be adequate for the largest panel mass, radius and boom length that is used. • The use of mobile plant close to panel braces can be extremely hazardous due to the risk of the braces being struck and panels collapsing. In this situation controls must be implemented to prevent parts of the crane and the suspended load from contacting the braces and panels. • The engineer may need to endorse the procedure for brace removal and connecting the panels to the building's structural steel, particularly if the steel structure is not complete prior to removal of the braces. • Only persons directly involved with the erection of panels should be located in the area while lifting is taking place and such persons should follow the SWMS controls and avoid being in a position where they could be struck in the event of a crane or panel falling over.	H-14	N/A

EHS	803	EHS	Contaminated Atmosphere (inc COVID-19) - is carried out in an area that may have a contaminated or flammable atmosphere;	All works onsite - COVID-19	4. Engineering	CEHSMP SWMS Site Specific Induction VOC Procedure COVID-19 Management Plan	E-18	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	• All PCBU`s must ensure that no person at the workplace is exposed to a substance or mixture in an airborne concentration that exceeds the exposure standard for the substance or mixture. • Some hazards that have exposure standards, such as noise and airborne contaminants, may require scientific testing or measurement by a competent person to accurately assess the risk and to check that the relevant exposure standard is not being exceeded (for example, by using gas detectors to analyse oxygen levels in confined spaces). • A PCBU where reasonably practicable must eliminate a substance which gives rise to a harmful atmospheric contaminate or replace by one which, while offering suitable technical and engineering properties, has been established to be harmless, ideally, or less harmful than the offending substance.(i.e paint solvents, construction dust containing fibres (ACM)or (Silica Dust). • Work involving asbestos-contaminated soil is not prohibited as long as a competent person has determined the soil does not contain any visible ACM or friable asbestos. The management of naturally occurring asbestos (NOA) that stays in its natural state is not prohibited if managed in accordance with an asbestos management plan. • Conducting hot work on containers such as drums, tanks and pipes that have not been properly decontaminated is a common ignition scenario resulting in fatalities. A hot work permit system is a system designed to eliminate or minimise risks from these activities, by controlling when and how hot work is undertaken in these areas. Ventilation systems help to maintain adequate oxygen levels and dilute flammable gases, fumes and certain dusts. • A (SWMS) for high risk construction work must be prepared before works involving any processing that may release respirable crystalline silica dust is undertaken, for example cutting, grinding, trimming, sanding, drilling or polishing. • Workers muat be trainined in Proper use of respirators, including the requirement for fit testing. • Operations and materials that can produce respirable crystalline silica dust (wet or dry) exposures • Engineering controls and safe work practices used to protect workers • The importance of proper equipment control and maintenance • Housekeeping procedures	H-14	All trades
EHS	804	EHS	Asbestos involves, or is likely to involve, the disturbance of asbestos; or	ACM removal of spoil, eave sheets & window gaskets	3. Isolate	CEHSMP SWMS Site Specific Induction VOC Procedure	E-18	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	• A (PCBU) carrying out work at a workplace, should obtain the current asbestos register and identify any asbestos or ACM that they have management or control of. • The (PC) with control of the workplace should be advised if any asbestos or ACM is identified and not included in the asbestos register for the workplace. • If workers consider that the work they are about to do will disturb asbestos, they should talk to the (PC). • A (PCBU) must not carry out or direct or allow a worker to carry out work involving asbestos if that work involves, removing, storing, handling, treating, disposing of or disturbing asbestos or ACM. • Once asbestos has been identified or assumed, all requirements for managing asbestos must be followed until the material is tested (NATA-accredited laboratory) and confirmed ACM. • All identified or assumed asbestos must be clearly indicated. Labels must be used to identify the material as containing asbestos. However, signs may be more appropriate to use. • The asbestos register is a document that lists all identified (or assumed) asbestos in a workplace. The asbestos register must record any asbestos or ACM that has been identified or is likely to be present at the workplace. • This would include the date on which the asbestos or ACM was identified, the location, type and condition of the asbestos. The register should be reviewed at least once every five years to ensure it is kept up to date. • An asbestos management plan provided by the competent ticketed Asbestos removalist sets out how asbestos or ACM at the workplace will be managed, for example what, when and how it is going to be removed safely. • Asbestos waste must be transported and disposed of in accordance with the relevant state or territory Environment Protection Authority (EPA) requirements. Asbestos waste can only be disposed of at a site licensed by the EPA and it must never be disposed of in the general waste system.	H-14	HTS Group
EHS	805	EHS	Demolition - involves demolition of an element of a structure that is load-bearing or otherwise related to the physical integrity of the structure;	Demolition of Retaining Wall and Stairs	4. Engineering	CEHSMP SWMS Site specific Induction VOC Procedure	E-18	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	• A PCBU must not instruct personnel to demolish or dismantle a structure or part of a structure that is loadbearing or otherwise related to the physical integrity of the structure, that is at least 6m in height. • But does not include: the dismantling of formwork, falsework, scaffolding or other structures designed or used to provide support, access or containment during construction work the removal of power, light or telecommunication poles. • A PCBU who proposes to carry out any of the following demolition work must ensure that written notice is given to the regulator at least 5 days before the work commences. • A PCBU must not direct or allow a worker to carry out demolition work unless the person holds a current high risk licence to carry out demolition work. • A person holding a licence to carry out demolition work must ensure that a person nominated to supervise the demolition work is readily available to a worker carrying out demolition work whenever the work is being carried out. • The PCBU must provide a SWMS and a demolition management plan to the PC for review and approval. • The PCBU who carries out demolition or refurbishment at a workplace must obtain a copy of the asbestos register from the person with management or control of the workplace, before the person commences the demolition or refurbishment. • If the presence of asbestos or ACM is identified it must be removed by a licenced Asbestos removalist before demolition commences.	H-14	Demo Contractor - for Building T Slab - HTS
EHS	806	EHS	Principle Contractor Responsibilities - amenities, access/egress, emergency evacuation, sharps,etc	Site Setup to be in accordance with the COP - FKG	5. Administration	CEHSMP Site Specific Induction	H-13	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	• The principal contractor has a range of duties in relation to a construction project including: preparing and reviewing a WHS management plan, obtaining SWMS before any high risk construction work commences, putting in place arrangements to manage the work environment including falls, facilities, first aid, an emergency plan and traffic management, installing signs showing the principal contactor's name, contact details and location of any site office and securing the construction workplace. • Workplace and facilities should be cleaned on a daily or weekly basis. Dining rooms should have 1m² of clear space for each person likely to use the dining room at any one time. The clear space is calculated free of any furniture, fittings or obstructions such as pillars. This means that the size of a dining room for 10 workers should be 10 m² plus additional space for dining furniture, appliances and fittings such as sinks. • Toilets should be provided in the following ratios; for males -closet pan(s) 1 per 20 males and urinals 1 per 25 males. For females - closet pan(s) 1 per 15 females. • A cleaning schedule for the facilities such as dining areas, toilets and hand basins should be implemented to maintain good hygiene standards. • Sufficient lighting to be provided in all access ways allowing safe movement around the workplace. All PCBU`s must supply task lighting. • Clean drinking water to be provided and positioned where it is easily accessed to workers. • Workers should have access to shelter when taking breaks, and to protect them in adverse weather conditions. • A PCBU must prepare a emergency plan for the workplace that provides for emergency procedures for anticpated scenarios, including an effective response plan to an emergency scenario. • Testing, including how often the emergency procedures need to occur, are to be scheduled as an identified action within the PRR.	M-9	FKG

EHS	807	EHS	Artificial extremes of temperature - is carried out in an area in which there are artificial extremes of temperature;	FKG to monitor extremes of temperature and instruct rest breaks accordingly	5. Administration	CEHSMP HR SWMS Working at height certificate Scaffolding HR licence Site Specific Induction VOC Procedure	H-13	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	Working in heat presents risks to workers health and safety that must be managed to as low as reasonably practicable. • Heat illnesses occurs when heat produced by the body (work activity, illness, etc.), and that absorbed from the environment (air temperature, humidity, air movement, radiant heat), exceeds the body's ability to disperse this heat. As a result, core body temperature rises above standard limits, and the individual begins to dehydrate as they sweat to cool down. As this scenario progresses, the individual will start to experience the signs and symptoms of heat illness. Though not recognised and treated early, symptoms may be mild initially, though can rapidly progress to a life-threatening condition. Minimise Heat Exposure; Individuals vary widely in their response to a similar task, in similar climatic / work environment conditions. As such, an emphasis should be placed on the self-paced approach; individuals are well trained in recognising heat stress and implementing appropriate controls for working in heat, enabling self-pacing of work rates and work-rest cycles. In the development of controls to manage the risks of working in heat, the Hierarchy of Controls must be utilised (Elimination, Substitution, Engineering, Administrative and PPE) Responding to health illness; Move to cool location / provide shade. Cool & loosen clothing, fan. Give water to drink if conscious and not nauseated. Victim must lie flat except when drinking. Refer to medical clinic / medical response	M-9	All trades
EHS	808	EHS	Temporary support (Formwork) - involves structural alterations or repairs that require temporary support to prevent collapse;	Formwork to CAPA	4. Engineering	CEHSMP SWMS Site Specific Induction VOC Procedure	E-18	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	Formwork: • Hazards associated with work including the erection, alteration and/or dismantling of formwork include: formwork collapse (before, during and after placement of concrete), falls from heights, slips and trips, falling objects, noise, dust and manual tasks. • Foundations Formwork must be erected on a stable base to prevent the risk of collapse. • Suspended slabs must be able to safely support loads that may be applied by the concrete pour, workers and crane lifted loads. • The principal contractor is responsible for providing all information on ground conditions to the engineer. The following documentation must be available for inspection on site: • Certification of maximum loads from stacked materials that the formwork assembly can withstand, • Specifications for the concrete and when formwork can be removed, • Back propping details (plans and elevations including tying in). • Drawings for the formwork design. The drawings must be signed by an engineer or be accompanied by a certification letter that lists the drawing numbers and drawing revision numbers. A (SWMS) for the erection and stripping operation needs to identify; • the formwork system, tasks, activities and components • the way the manufacturer or designer of the formwork system intended the system to be erected,installed, used, moved, altered or dismantled • control measures to minimise exposure to the risks, correct use of controls, and how to ensure they are kept in full working order • safe working procedures, including the use of mechanical aids and devices, where appropriate • any special safety information needed such as safety precautions for working under certain conditions • The number of persons in the stripping crew. • The sequence of stripping activities and how the frames and other supports should be removed (that is, how far U-heads are to be lowered). • Whether the support system is to be completely removed in a zone prior to removal of the formwork deck or whether the supports are to be lowered slightly but still remain under the formply while it is being removed. • When back-propping is required or only part of the support system is to be removed, how the structural members are to remain in place and the type and layout of members that will replace the formwork system. • Any other special requirements involved in the stripping and or building process (e.g. checking of back-propping after post-tensioning).	H-14	Masta Formwork
EHS	809	EHS	Temporary support (Scaffold) - involves structural alterations or repairs that require temporary support to prevent collapse;	Scaffolding to each building / work area	4. Engineering	CEHSMP SWMS Site Specific Induction VOC Procedure	E-18	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	Scaffold; • Only the person responsible for the erection, can alter or dismantle a temporary structure that has been erected to support a platform and from which a person or object could fall more than 4m from the platform or the structure. • Regular inspection of new and re-used equipment should be undertaken to ensure defects and structural damage is detected. • A scaffold plan should be prepared and provided by the PCBU doing scaffold work. • The scaffold plan should include a site layout plan and detail the elevations and sections of the scaffold. • The scaffold plan should address the following issues: basis of design, foundations (including ground conditions and loadings), supporting structure, access and egress, tying, bracing, type of scaffold, edge protection. • The Scaffolding SWMS should identify hazards which can exist including; work near powerlines, mobile plant and traffic, mixing and matching scaffold components, falls from heights, falling objects, scaffold collapse and manual tasks. • The work should be planned so as to avoid excavating service trenches under, through or adjacent to scaffolds. • The scaffolder should provide the PCBU with a handover certificate which is kept on site until the scaffold has been dismantled. • The scaffold handover certificate should never be signed by the PCBU until a complete inspection is undertaken. • Only a competent person is allowed to make scaffold alterations and scaffold alterations are in accordance with the scaffold plan including the alterations do not compromise the structural integrity of the scaffold.	H-14	Thomas Scaffolding
EHS	810	EHS	Hazardous Manual Tasks - over exertion manual actvities due to lack of planning	Manual Handling of Reo Cages	4. Engineering	CEHSMP HR SWMS Site Specific Induction VOC Procedure	H-13	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	A hazardous manual task means a task that requires a person to lift, lower, push, pull, carry or otherwise move, hold or restrain any person or thing involving the following: repetitive or sustained force, high or sudden force, repetitive movement, sustained or awkward posture and exposure to vibration. A musculoskeletal disorder means an injury to, or disease of, the musculoskeletal system, whether occurring suddenly or over time. It does not include an injury caused by crushing, entrapment (such as fractures and dislocations) or cutting resulting from the plant's mechanical operation. A PCBU must manage the risk of a musculoskeletal disorder associated with a hazardous manual task by; • identify hazards that could give rise to the risk. • eliminate the risk so far as is reasonably practicable. • if not reasonably practicable to eliminate the risk, minimise the risk by implementing control measures in accordance with the hierarchy of control. • maintain the control measure so that it remains effective. • review risk control measures.	M-9	DeMartin Gasparini

EHS	812 EHS	Mobile Plant (Cranes) - is carried out in an area at a workplace in which there is any movement of powered mobile plant; or	Structural Steel Erection Roof installation General material handling	4. Engineering	CEHSMP HR SWMS Site Specific Induction VOC Procedure	E-18	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	Cranes; • The PCBU has a duty to coordinate the lifting, communication to all other PCBUs and ensuring Ground bearing capacity report is within the crane limits. • A crane PCBU must ensure that only persons with the appropriate mobile crane licence class, High risk licence and a VOC can operate on site. • The PCBU must supply evidence of the, Operating manual, maintenance records, Logbook, annual inspection, 10 yearly inspection, road safe certificate and SWMS. • The crane load charts should have a bold line or shaded area dividing the chart. The divided segments shows which capacities are limited by structural strength, and which are limited by stability. Ratings above the line are based on structural strength, while the ratings below the line are based on the stability of the crane. If a crane is overloaded in the structural area of the load chart, a structural or mechanical component of the crane may fail. However, if the crane is overloaded in the stability area of the load chart, the crane may overturn. • Lifting devices that should be checked include: the lifting gear is tagged and all relevant information listed (e.g. relevant information for a chain sling is grade of chain, SWL, manufacturer, chain size and Australian Standard marking), lifting hooks are provided with operable safety latches, shackles used as terminal fittings are prevented from unscrewing (e.g. mousing or similar), lifting eyes and inserts are compatible and the same proprietary brand. • All lifting gear, including hooks and material boxes, should be periodically inspected for damage and wear. The period between inspections shall depend on the severity of use. In the case of chain lifting slings and material boxes, a formal documented inspection should be completed at intervals not exceeding 12 months. Documented maintenance records for the lifting gear should be available on site. • During set up the out riggers must be fully extended, No short legging with the correct size timbers/Pads positoned under the outrigger below the counterweight when the crane is positioned on soft ground • A lift plan to be provide if required by the Principal Contractor	H-14	Structural Steel - Motion Group Roofing - Hogan Plumbing
EHS	811 EHS	Mobile Plant (Tower Cranes) - is carried out in an area at a workplace in which there is any movement of powered mobile plant;	No Tower Crane Onsite	4. Engineering	CEHSMP HR SWMS Site Specific Induction VOC Procedure	E-18	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	Tower Crane; • The PCBU has duty to ensure that the construction or commissioning of the crane is completed by a competent person and ensuring that maintenance, inspection and testing of the crane is carried out by a competent person as documented within the SWMS. • Tower cranes - an application for a certificate of registrable plant design must be accompanied by a design verification statement, representational drawings of the crane. • Footings and foundations for a tower crane installation must be designed by an engineer in accordance with engineering principles or relevant technical standards. • Load charts, identify what the crane is able to lift safely. The load chart is specified for the crane by the crane manufacturer. The lifting capacities specified on a load chart must never be exceeded, except during testing of the crane, by a competent person, under controlled conditions or in emergency situations. • Counterweights must be secured to the crane in the manner specified by the crane manufacturer. • Crane ties play a critical part in ensuring the stability of a tower crane as the height of the crane increases. Crane ties must be secured to the supporting structure at set intervals in accordance with the instructions specified by the crane manufacturer and the designer of the crane installation. • Limiting and indicating devices must be fitted to tower cranes. The purpose of limiting devices is to stop a specific crane motion before the crane moves out of its limits into an unsafe situation. A rated capacity limiter prevents overloading of the crane by stopping all relevant crane functions when an overload is detected. • Motion limiting devices must be fitted to tower cranes to prevent motion out of their service limits. These devices cause braking, including deceleration where appropriate and stopping. • A radius indicator must be fitted on all tower cranes. A radius indicator displays the radius of the suspended load generally measured from the centre of the slew ring. The working radius should be displayed in metres and be accurate to +10 per cent and -3 per cent of the actual radius. • Before setting up a tower crane, the PCBU should conduct an inspection to identify the presence of overhead powerlines that may pose a risk. Failure to erect or dismantle tower cranes in accordance with the crane designer's or crane manufacturer's instructions may result in injury to persons from crane collapse, falls from heights, falling objects. The most effective way to eliminate any risk of electric shock is by turning off the power. The person conducting a business or undertaking (PCBU), principal contractor (PC) or the crane owner should discuss options for de-energising or re-routing the electricity supply with the relevant electricity entity. • The maintenance, inspection and testing must be carried out in accordance with the manufacturer's recommendations, or by the competent person's recommendations. • An independent third party should carry out inspections and tests of tower cranes prior to commissioning and	H-14	N/A
EHS	815 EHS	Road / Traffic - is carried out on, in or adjacent to a road, railway, shipping lane or other traffic corridor that is in use by traffic other than pedestrians;	Civil Concrete Pours Steel Installation	4. Engineering	CEHSMP HR SWMS Site Specific Induction VOC Procedure	E-18	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	A PCBU to provide a safe workplace for workers and plant under their control including safe travelling conditions for road users (via TMP). • All traffic controllers are appropriately trained in accordance with, the provisions of the MUTCD Part 3. • All workers should complete the site-specific induction for the workplace and sign their approved SWMS before work commences. • All signs, speed restrictions, turning vehicles including traffic control devices, protective barriers are erected as per the Traffic Management Plan (TMP). • The public must be warned of adverse conditions, and to guard, delineate where necessary, illuminate work, which may pose a hazard to road users. • Persons required to design a traffic management plan (TMP) and associated traffic guidance schemes should be trained in temporary traffic management planning and the application of the MUTCD Part 3. Chain of Responsibility All drivers of outgoing loads with a GVM = or > 4.5 tonnes are to conform with their identified controls as established via the process identified within the Chain of Responsibility - Construction.	H-14	HTS Concrete Sub S/Steel Sub

EHS	813	EHS	Mobile Plant (Concrete Boom Pumps) - is carried out in an area at a workplace in which there is any movement of powered mobile plant;	Concrete Pumping	4. Engineering	CEHSMP HR SWMS Site Specific Induction VOC Procedure	E-18	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	Concrete Boom Pumps; Effective planning will help identify ways to protect people who are: directly involved in the concrete pumping work, A SWMS must be reviewed and approved before carrying out the concreting pumping activity Some issues to be considered when planning for concrete pumping operations include: • Existing power supply, consideration of proximity to overhead powerlines, eliminating electrical risks if possible or using appropriate control measures to minimise risks such as "exclusion zones" or "Safety observer" • The concrete placing boom manufacturer may specify instructions for operating near power lines which should be followed when planning concrete pumping operations • Determining concrete pumping requirements, including concrete pump selection, concrete delivery and site access, at the project design stage • Determining traffic control requirements • Ensuring that an emergency plan has been prepared for the workplace. • When cranes and concrete placing booms operate on adjacent sites and share the same air space, negotiations should be conducted between worksites to formulate systems of work to ensure sufficient clearances are maintained between different plant. • The owner of concrete pumping equipment should ensure the design, maintenance records and all inspection reports for the plant are available and signed off before deployment of the concrete pumping plant for use. • The owner of concrete pumping equipment should also ensure that the pads and/or timbers supplied with the concrete pumping equipment will adequately support the plant • Operators of concrete placing booms must hold the high-risk work licence Licence to operate a concrete placing boom • The concrete pump operator is not to carry out the task of the line hand located at the end of the concrete delivery line. • The site 'pump washout area' must comply with environmental protection legislation and local authority requirements When handling the concrete delivery hose there should be one line hand for every 10 metres of workable hose where the pipe diameter is 76.2 millimetres (three inches) or more and every 20 metres of workable hose where the pipe diameter is less than 76.2 millimetres (three inches) • The distance of any part of the outrigger support timbers from an excavation should be at least equal to the depth of the excavation (1:1 rule). • The ground bearing capacity must be greater than the maximum pressure applied by the mobile plant •Short legging refers to when one or more of the outrigger legs is only partially extended or deployed - this	H-14	DeMartin Gasparini
EHS	817	EHS	Hazardous Chemicals - is carried out on or near chemical, fuel or refrigerant lines;	A/Con Refrigerant Lines	5. Administration	CEHSMP SWMS Site Specific Induction VOC Procedure	E-18	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	All PCBU's must maintain; • A current hazardous chemical register, containing safety data sheets (SDS) within five year period. • Must be reasonable accessable to all workers on site. • Correct storage/labelling of containers and pipework, using warning placards and displaying of safety signs. • Stability and support of containers for hazardous chemical storage on site. • Provision of information, training, instruction and supervision to workers. • Provision of a spill kit for hazardous chemicals.	H-14	Oxley Air
EHS	814	EHS	Mobile Plant (General) - is carried out in an area at a workplace in which there is any movement of powered mobile plant	Cut and Filling of Earthworks onsite	4. Engineering	CEHSMP HR SWMS Site Specific Induction VOC Procedure	E-18	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	Plant Activities include any machinery, equipment, appliance, container, implement and tool, and consists of any component or anything fitted or connected to any of those things. • A PCBU with management of plant must; • Manage the health and safety risks associated with plant, ensure the plant is only used for the purpose for which it is designed, ensure safety features, warning devices, guarding, operational controls, emergency stops are used per instructions. • Operators must be competent, (acquired through training, qualification Tickets and VOC`s by a RTO or by a internal process). • PCBU must control the interaction between Plant and pedestrians. • The PCBU undertaking work with the plant must provide a SWMS for the intended actvity to be undertaken. • Operating manuals, instructional material provided by the manufacturer should be kept with the plant. • Plant risk assessment, maintenance/service records must be provided by owner or hired company. • Hired plant must be inspected and maintained by the supplier according to the manufacturer's specifications. • Ensure checking the logbook and maintenance manual, including the manufacturer's information about the purpose of the plant and its proper use. Planning excavation work - Excavation Planning involves identifying the hazards, assessing the risks and determining appropriate control measures in consultation with all relevant persons involved in the work, including the principal contractor, excavation contractor, designers and mobile plant operators. Structural or geotechnical engineers may also need to be consulted at this stage. Consultation should include discussions on the: nature and condition of the ground and working environment, nature of the work and other activities that may affect health and safety, static and dynamic loads near the excavation, interaction with other trades, site access, management of surrounding vehicular traffic and ground vibration, type of equipment used for excavation work, public safety, existing services and their location (below and above ground), the length of time the excavation is to remain open, provision of adequate controls, procedures to deal with emergencies. Lasers must be designed, constructed and installed so that no person is exposed to accidental irradiation. Lasers that are capable of producing hazardous diffuse reflections or that may constitute a fire hazard, being laser classes 3B and 4, must not be used in construction work. Any worker operating lasers must be trained in the use of the equipment. A PCBU must display signage to alert other trades that lasers are in use.	H-14	HTS Group
EHS	818	EHS	Pressurised Gas - is carried out on or near pressurised gas distribution mains or piping;	No planned use of Pressurised gas	4. Engineering	CEHSMP HR SWMS Site Specific Induction VOC Procedure	E-18	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	• The most common type of pressure vessel used is an air receiver for the storage of compressed air. Other types of pressure equipment include: accumulators, autoclaves, steam boilers, hot water boilers, chiller/refrigeration equipment, gas storage vessels, pressure piping, oil/fuel filters and vacuum trucks. • A pressure vessel is a container or vessel that holds a fluid, either a gas or liquid, which is subject to internal or external pressure. • Pressure vessels includes the interconnected parts and components, valves, gauges and other fittings up to the first point of connection to the pipework. • If a piece of pressure equipment fails and bursts violently apart, the results can be devastating to people in its vicinity.Parts of the equipment could also be propelled over great distances, causing injury and damage to people and buildings hundreds of metres away. The need to assess the levels of risk when working with pressure equipment. The level of risk from the failure of pressure systems and equipment depends on a number of factors including: • the pressure in the system • the type of liquid or gas and its properties • the suitability of the equipment and pipework that contains it • the age and condition of the equipment • the complexity and control of its operation • the prevailing conditions (eg a process carried out at high temperature) • the skills, knowledge and experience of the people who maintain, test and operate the pressure equipment and systems • To reduce the risks there should be a maintenance programme for the system as a whole. It should take into account the system and equipment age, its uses and the environment in which it is being used	H-14	N/A

EHS	816	EHS	Electrical (all services) - is carried out on or near energised electrical installations or services;	Project Team to populate	4. Engineering	CEHSMP SWMS Site Specific Induction VOC Procedure	E-18	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	An electric shock may be received by direct or indirect contact, tracking through or across a medium, or by arcing. A PCBU should manage the risks to health and safety associated with electrical risks at the workplace by; • ensuring workers comply with any reasonable instruction SWMS relating to electrical safety at the workplace. • Ensuring power circuits are protected by the appropriate rated fuse or circuit breaker to prevent overloading. • If a circuit keeps overloading, don't increase the fuse rating as this creates a fire risk due to overheating. Instead ensure the circuit is not re-energised until the reason for the operation has been determined by a competent person. • Ensuring that leads, including cord extension sets and flexible cables, are arranged so they will not be damaged. For example, avoid running leads across the floor or ground, through doorways and over sharp edges, and use lead stands or insulated cable hangers to keep leads off the ground. In construction, cable protection ramps are used to protect cables. • Not using leads and tools in damp or wet conditions unless they are designed for those conditions. • Ensuring circuits where portable electrical equipment can be connected are protected by appropriate safety switches (as required by the ES Regulation) that are properly tested and maintained. • If safety switches, circuit breakers or other over current protective devices including fuses are triggered into operation, ensuring circuits are not re-energised until the reason for the operation has been determined by a competent person. • Ensuring safety switches are effective by regular testing. A PCBU should implement a SWMS of work to deal with potentially unsafe electrical equipment at the workplace. This could include: • requiring workers (if competent to do so) to undertake a check of the physical condition of the electrical equipment, including the lead and plug connections, prior to commencing use • taking the electrical equipment out of service if in doubt as to safety, including at any time during use • putting reporting arrangements in place to ensure, so far as is reasonably practicable, that supervisors are advised if a worker takes electrical equipment out of service for safety reasons. • Electrical work (whether energised or de-energised) must only be carried out by a person if the person is the holder of an appropriate electrical licence authorising the work; or the person is otherwise authorised to perform the work under the ES Act. • Even if the electricity supply is believed to have been isolated, it must be assumed that all conductors and electrical components are energised until they have been proven de-energised. • The safe work principle 'TEST FOR 'DEAD' BEFORE YOU TOUCH' must be applied at all times. • work on low voltage electrical equipment or circuits, ensure that the correct point of isolation is identified, an	H-14	Carter and Osborne
EHS	819	EHS	Confined Space - is carried out in or near a confined space;	No expected confined spaces on project	4. Engineering	CEHSMP SWMS Site Specific Induction VOC Procedure	E-18	BASE QLD - WHS Laws & Compliance, • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2011 • Code of practice construction NSW - WHS Laws & Compliance • Work Health and Safety Act 2011 • Work Health and Safety Regulation 2017 Australian Standards - SAI Global	• Works within an enclosed or partially enclosed space that is not designed or intended primarily to be occupied by a person or is likely to be a risk from an atmosphere that does not have a safe oxygen level, or contaminants, including airborne gases, vapours and dusts, that may cause injury from fire or explosion, or harmful concentrations of any airborne contaminants, or - engulfment. (e.g excavations/ trenches). • If entering a confined, then a SWMS for working inside the space must be implemented. • A confined space entry permit provides a formal check to ensure all elements of a safe system of work. • The identified hazards will help determine what controls are needed to minimise any risk • Air monitoring in a confined space should be carried out by a competent person using a calibrated gas detector. • Consideration should be given to whether the proposed work will introduce any new hazards • Ignition sources must not be introduced into a space that contains a flammable atmosphere. • Only a competent trained, ticketed person is allowed to work in a confined space • Entry kit applies, tripods, harnesses and rescue winches which must be tagged, engineered and within service. • A communication system is needed to enable communication between people inside and outside the confined space. • A standby person (high-risk ticket) must be assigned to monitor the wellbeing of those inside the space and initiate appropriate emergency procedures when necessary. • Signage must be erected to prevent entry of persons not involved in the work.	H-14	N/A
IR	820	IR	Workforce Alignment	Workforce alignment	5. Administration	WRMP CEHSMP	E-18	FK Gardner & Sons Group - Enterprise Agreement 2018	FKG and Subcontractor workforces are working together to achieve business goals. FKG will continue to communicate its business changes and developments and project wins at site level. FKG will also continue to practice open communication and easily accessible support for site staff and subcontractors.	H-14	All workers
IR	821	IR	Induction / Training	Security, mobilisation and induction procedures.	5. Administration	WRMP CEHSMP Project Site Personnel Competency Analysis Project Appointment Letter (if applicable)	E-18	WHS Act 2011	Site staff are adequately inducted and informed on site security and mobilisation procedures. All site staff participate in the mandatory FKG site inductions before they can deploy to site. Once at site staff participate in an on-site induction with the Safety Advisor that covers all site procedures (including security and mobilisation).	H-14	All workers
IR	822	IR	Right of Entry	Right of Entry disruptions.	5. Administration	WRMP CEHSMP Industrial Relations Policy Right of Entry Flow Chart	E-18	Fair Work Act 2009 WHS Act 2011	FKG will provide training to Site Supervisors with regard to the right of entry process, to ensure correct management and minimal disruptions.	H-14	All workers
IR	823	IR	IR Conflict	Conflict resolution / lost time through Industrial Action.	5. Administration	WRMP CEHSMP Dispute Resolution Procedure Complaint Handling Policy	E-18	Fair Work Act 2009	Protected Industrial Action. FKG will remain diligent to resolve any IR issues before they escalate to Fair Work Commission for a protected action ballot by continuing to practice open communication to all site personal and retaining easy accessibility for site staff to escalate concerns through Supervisors, PMs and HR representatives.	H-14	All workers
IR	824	IR	Legislation Compliance	Breach of Industrial instruments, the Building Code 2016 and IR Legislation.	5. Administration	WRMP CEHSMP Industrial Relations Policy	E-18	Fair Work Act 2009 FK Gardner & Sons Group - Enterprise Agreement 2018 Building Code 2016	FKG operate and will continue to operate within the required guidelines of all applicable industrial instruments. This is evident in our history of zero IR action or FWC claims. FKG have member access to the AI Group which provide external IR support and clarification as and when needed.	H-14	All workers
IR	826	IR	FKG Enterprise Agreement (EA)	Industrial instruments that insulate the Project from Protected Action.	5. Administration	WRMP CEHSMP Project Appointment Letter (if applicable)	E-18	Fair Work Act 2009 WHS Act 2011 FK Gardner & Sons Group - Enterprise Agreement 2018	All labour for the project will be engaged under the FK Gardner & Sons Group – Enterprise Agreement 2018.	H-14	All workers
IR	825	IR	Recruitment	Recruiting and retaining a suitable workforce.	5. Administration	WRMP CEHSMP Recruitment Management Procedure	E-18	Fair Work Act 2009 FK Gardner & Sons Group - Enterprise Agreement 2018	FKG will be providing all project management resources for the project. FKG do not employ for project needs. When we employ, it is with the intention that the employee will remain with FKG and be deployed to future projects as and when needed. This has resulted in FKG having a large, reliable and flexible work force. In addition to permanent staff we have multiple agencies / labour hire companies which with whom we can engage casual employees who can also be deployed to site as needed. FKG also have a large database of candidates that have approached the business looking for opportunities who can be contacted should the need arise.	H-14	All workers

QA	827 QA	Cladding	CeramaPanel	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules) Lessons Learned # 18 Moisture damage Lessons Learned # 59 Portal cladding	E-18	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS 1170 Structural design actions AS 1170.2 2011 Wind actions AS 1530.1 Combustibility test for materials AS 1530.3 Simultaneous determination of ignitability, flame propagation, heat release and smoke release AS 1530.4 Fire-resistance tests for elements of construction AS 1562 Design and installation of sheet roof and wall cladding. AS 1562.1 Metal	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	Bright Ceilings
QA	828 QA	Concrete	All concrete pours	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules) Lessons Learned (LL) # 03 Leaks ins suspended slabs LL # 17 Concrete fall and steps LL # 23 Pit failure LL # 31 Balcony threshold LL # 47 Slab delamination LL # 56 Sports floor delamination	E-18	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS 3600 Concrete structures AS 1379 Specification and supply of concrete AS 3610 Formwork	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	De Martin Gasparini
QA	829 QA	Glazed balustrades	No glazed balustrades	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules)	E-18	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS 1288 Glass in buildings - Selection and installation AS/NZS 2208 1996 Safety glazing materials in buildings AS 1657 Fixed platforms, walkways, stairways and ladders - Design, construction and installation	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	N/A
QA	830 QA	Inground services	Electrical & Comms Hydraulic & Civil	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules) Lessons Learned (LL) # 01 DA LL # 19 Nonconforming pipe material LL # 22 Fire water leak LL # 39 Drainage falls	E-18	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS3500.1 Plumbing & drainage Water services AS3500.2 Sanitary plumbing & drainage AS3500.3 Plumbing & drainage stormwater drainage AS/NZS 3000 Electrical installation wiring rules	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	Cater & Osborne Hogan Plumbing

QA	831 QA	Light steel framing	Frames to TAS Building	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules)	E-18	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS/NZS 4600 Cold-formed steel structures	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	Bright Ceilings
QA	832 QA	Masonry	Masonry Construction	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules) Lessons Learned # 16 Poor blockwork construction Lessons Learned # 57 Failure of lift pit	E-18	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS 3700 Masonry structures AS/NZS 4455 Masonry units, pavers, flags and segmental retaining wall units AS/NZS 4455.1 Masonry units AS 1316 Masonry cement AS/NZS 2699 Built-in components for masonry construction AS/NZS 2699.1 Wall ties AS/NZS 2699.2 Connectors and accessories AS/NZS 2699.3 Lintels and shelf angles (durability requirements) AS/NZS 2904 Damp-proof courses and flashings	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	Masonry Construction
QA	833 QA	Partitions	Ceilings and Partitions	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules) Lessons Learned # 05 Leaks in plasterboard walls Lessons Learned # 48 Wall framing	E-18	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS 5637 Determination of fire hazard properties AS 5637.1 Wall and ceiling linings AS/NZS 2589 Gypsum linings - Application and finishing	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	Bright Ceilings
QA	834 QA	Resilient finishes	Vinyl Flooring	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules) Lessons Learned (LL) # 04 Screed under floor covering LL # 12 Floor prep LL # 44 Vinyl discoloration LL # 45 Paint through vinyl	E-18	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS/NZS 3661 Slip resistance of pedestrian surfaces AS 4586 Slip resistance classification of new pedestrian surface material AS 1884 Floor coverings - Resilient sheet and tiles - Installation practices	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	All Floors

QA	835 QA	Roof & roof drainage	New Roof or Replace Roof	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules) Lessons Learned (LL) # 15 Poor roof application LL # 25 Roof drainage failure LL # 43 Roofing QA LL # 55 Gutters overflow	E-18	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS 1562 Design and installation of sheet roof and wall cladding AS 1562.1 Metal AS 1657 Fixed platforms, walkways, stairways and ladders – Design, construction and installation AS 2904 Damp-proof courses and flashings AS/NZS 3500.3 Stormwater drainage AS/NZS 4389 Roof safety mesh	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	Hogan Plumbing
QA	836 QA	Structural steelwork erection	Structural Steel installation	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules)	E-18	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS 5131 Structural steelwork fabrication and erection AS 4100 Structural steel	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	Motion Group
QA	837 QA	Structural steelwork surface treatment	Galvanising only	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules)	E-18	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS 5131 Structural steelwork fabrication and erection AS/NZS 4680 Hot dip galvanising AS 1627 Metal finishing – Preparation and pretreatment of surfaces AS 3750.9 Paints for steel structures – organic zinc-rich primer	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	Motion Group
QA	838 QA	Suspended ceiling	Suspended ceilings throughout project	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules) Lessons Learned # 27 Soffit failure Lessons Learned # 50 Defective soffit installation	E-18	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS/NZS 2785 Suspended ceilings - Design and installation	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	Bright Ceilings

QA	839 QA	Tiling	Tiling to wet areas	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules) Lessons Learned # 35 Defective tiling work	E-18	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS/NZS 3661 Slip resistance of pedestrian surfaces AS 4586 Slip resistance classification of new pedestrian surface material AS 3958 Ceramic tiles AS 3958.1 Guide to the installation of ceramic tiles AS 3972 General purpose and blended cements	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	TBC
QA	840 QA	Timber trusses	n/a	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules)	E-18	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS 4707 Chain of custody for certified wood and forest product.	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	N/A
QA	841 QA	Waterproofing	Waterproofing Retaining Walls Waterproofing we areas	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules) Lessons Learned (LL) # 36 Wet area waterproofing LL # 46 Planters LL # 49 Poor waterproofing details LL # 57 Failure of lift pit membrane	E-18	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS 4654 Waterproofing membrane systems for exterior use-Above ground level AS 4654.1 2012 Materials AS 4654.2 2012 Design and installation AS/NZS 4858 Wet area membrane	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	Tiler - TBC Retaining Walls - NJD Corp
QA	842 QA	Windows & glazing	Windows and Glazed Doors	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules)	E-18	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS 1288 Glass in buildings - Selection and installation AS 2047 1999 Windows in buildings - Selection and installation AS/NZS 2208 1996 Safety glazing materials in buildings AS 4145 Locksets and hardware for doors and windows AS 4145.2 Mechanical locksets for doors and windows in buildings	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	G. James

QA	843	QA	Civil works (earthwork, drainage, subbase, base, road surfacing)	Civil Earthworks	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules) Lessons Learned # 14 Defective subgrade Lessons Learned # 28 Erosion & sediment control	E-18	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA Must check (as applicable): - Transport & Mains Road specification - Local Council specification	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	HTS Group
QA	844	QA	Services (fuel, electrical, mechanical, hydraulic, fire etc.)	Electrical & Comms Hydraulic and Gas	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules) Lessons Learned (LL) # 01 DA LL # 02 Drip trays LL # 10 Fire during construction LL # 19 Nonconforming pipe material LL # 22 Fire water leak LL # 39 Drainage falls LL # 58 Mould LL # 60 MSB condensation	E-18	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS/NZS 3000 Electrical installation wiring rules AS3500.1 Plumbing & drainage Water services AS3500.2 Sanitary plumbing & drainage AS3500.3 Plumbing & drainage stormwater drainage AS3500.5 Plumbing & drainage heated water services AS 5601 Gas installation AS 4041 Pressure piping AS 1851 Routine service of fire protection systems & equipment AS 2441 Installation of fire hose reels AS 1324 series (Air filters) AS 3666 series (Air-handling and water systems of buildings AS 4254 series (Ductwork for air-handling systems in buildings AS/NZS 4766 series (Liquid chilling packages) AS/NZS 5149 series (Refrigeration systems and heat pumps)	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	Carter & Osborne Hogan Plumbing
QA	845	QA	Tilt panels (casting, lifting & brace removal)	N/A	5. Administration	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA - Code of Practice AS 3600 Concrete structures AS 1379 Specification and supply of concrete AS 3610 Formwork Tilt-up and pre-cast construction Code of Practice AS/NZS 1170.2 Structural design actions - Wind actions	E-18	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	N/A
QA	846	QA	Carpet	Carpet Tiles	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules)	E-23	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS/NZS 2455 Textile floor coverings – Installation practice AS/NZS 2455.1 2007 General AS/NZS 2455.2 2007 Carpet tiles Fire hazard properties: - Critical radiant flux: To AS ISO 9239.1. - Smoke development rate: To AS ISO 9239.1.	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-15	All Floors

QA	847 QA	Doors & hardware	Doors and frames install	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules) Lessons Learned # 41 External doors	E-19	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS 4145 Locksets and hardware for doors and windows AS 1288 Glass in buildings - Selection and installation AS 5007 Powered doors for pedestrian access and egress AS 4145 Locksets and hardware for doors and windows AS 4145.2 Mechanical locksets for doors and windows in buildings	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-15	North Eastern Doors and Frames
QA	848 QA	Joinery	Joinery	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules)	E-19	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS/NZS 1859 Reconstituted wood-based panels specification AS/NZS 2270 Plywood and blockboard for interior use AS/NZS 2271 Plywood and blockboard for exterior use AS/NZS 2924.1 Classifications and specifications	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	Resicom
QA	849 QA	Render	No render on Project	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules) Lessons Learned # 30 Render delamination Lessons Learned # 53 Render delamination	E-20	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA SAA HB 161 2005 Guide to Plastering.	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	N/A
QA	850 QA	Roof access safety system	Roof Safety System	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules) Lessons Learned # 21 Nonconforming safety anchors	E-21	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS/NZS 1891 Fall Arrest Systems AS 2626 Safety Belt & Harnesses AS/NZS 5532 Manufacturing Requirements for Single Point Anchor Device	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	TBC

QA	851 QA	Shotcrete	Shotcrete to shoring walls	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules)	E-22	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS 3600 Concrete structures AS 1379 Specification and supply of concrete	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	Concreter - TBC
QA	852 QA	Structural steelwork fabrication	Structural steelwork fabrication operations	5. Administration	PQMP •Quality Checklist •Subcontractor's ITPs/checklists •Scope of Work •Project Documentation (drawings; specification; schedules) Lessons Learned # 20 Steelwork QA records	E-18	BASE Australian Standards - SAI Global Standards - NCC - BCA - PCA AS 5131 Structural steelwork fabrication and erection AS/NZS 1554.1 Structural steel welding AS 4100 Structural steel	1.The Project Team Identifies ITP requirement for project (based on Project scope, specifications & drawings; Contract; Client's expectations and ensure they are High Risk Works – if the contract or client has requirements for doing Non-High Risk Works, then that should be addressed with the client to try and remove the requirement.) 2.The Project Team to undertake a risk review of all trades ITP's with the "ITP Checklist" with the following outputs: a. Trades with acceptable ITP's = SC ITPA b. Trades with not acceptable ITP's = SC ITPB c. SC ITPA are to submit their ITP's via Aconex d. SC ITPB do not submit ITP's, the Project Team manage their ITP's 3.The Project Team undertake a review of the FKG ITP's that pertain to any SC ITPA, and refine (reduce) it be reflective of the critical items only 4.The Project Team review the PRR with reference to the programme and schedule actions (ITP's (i.e. both A & B) to be undertaken by the Project Team members) for the upcoming activities. 5.The Project Team undertake the actions, with the filing of ITP's as follows: a. SC ITPA are filed as follows: i. Folder created to reflect the work lot ii. Both completed FKG ITP (extracted from Lucidity via bulk download) and the completed trades acceptable ITP are placed in the folder iii. The folder is uploaded to Aconex as a document. b. SC ITPB are filed in Lucidity. 6.The PQMP must reflect the above including a schedule of the ITP's for the project and the locations that they would be filed.	H-14	Motion Group

Appendix B: Erosion and Sediment Control Plan

Part A: INTRODUCTION

1. PURPOSE

This procedure provides construction site personnel with general guidelines on the selection of appropriate construction phase drainage, erosion and sediment controls in situations where an Erosion and Sediment Control Plan (ESCP) does not exist for the Project, or where additional information is required to address the current site conditions. It provides details relevant to typical erosion and sediment control measures available for use on site to mitigate the risk of erosion, soils loss, sedimentation and pollution to the surrounding environment.

The procedure includes details of the physical structures and devices from which the control measures may be compiled, and the circumstances in which they could be used. Details regarding the methods for installation are also included.

The measures outlined in this procedure are to be implemented on site where appropriate to support compliance with the **Project EHS Management Plan** / **Construction Environmental Management Plan** and relevant legislative requirements.

The final implementation of erosion and sedimentation controls will be determined by on-site conditions prior to the commencement of each section of works. As far as practical, these controls should be implemented before starting any earthworks.

2. SCOPE / EXCLUSIONS

All onsite activities that FKG control or during FKG scope of works may have the potential to create erosion and subsequently sedimentation and all personnel involved in site activities including Sub-contractors.

3. INTERNAL REFERENCE DOCUMENTS

- **Project EHS Management Plan** / **Construction Environmental Management Plan**
- **ENV P11 Dewatering Procedure**
- **ENV06 Environmental Inspection Checklist**
- **ENV10 Water Quality Sampling Form**
- **ENV12 Dewatering Approval Form**

4. EXTERNAL REFERENCE DOCUMENTS

- Environmental Protection Act 1994
- Landcom, (2004). Soils and Construction Volume 1 Managing Urban Stormwater (4th Edition). New South Wales Government (the Blue Book)
- IECA (2008) Best Practice Erosion and Sediment Control Guidelines

5. DEFINITIONS

Disturbance	Construction activities which could create erosion or sediment, examples: earthworks, removal of vegetation and/or grasses, stripping of soils, stockpiles and excavations
Drainage	Method used to channel stormwater around a construction site
Sediment Control	A practice or device designed to control disturbed soils from leaving a construction site
Silt Fence	A temporary sediment control device using geotextile fabric and posts
Rumble Pad/ Grid	A structure consisting of prefabricated metal or constructed of course aggregate used to remove soil from vehicles entering and departing a construction site

Table of Contents

Part A: INTRODUCTION 1
1. PURPOSE 1
2. SCOPE / EXCLUSIONS 1
3. INTERNAL REFERENCE DOCUMENTS 1
4. EXTERNAL REFERENCE DOCUMENTS 1
5. DEFINITIONS 1
6. ESC Key Principles 4
6.1. Impacts of soil erosion and sediment runoff 4
6.2. Types of Erosion 5
6.2.1. Raindrop impact 5
6.2.2. Sheet erosion 5
6.2.3. Rill erosion 5
6.2.4. Chemical-induced erosion (dispersive/sodic soils) 5
Part B: GENERAL 4
7. Site Management 6
7.1. Set-up of site office 6
7.2. Control of sub-contractors 6
7.3. Stockpiles 6
7.4. Concrete wash-out points 6
7.5. Waste management 6
7.6. Litter control 6
7.7. Site inspections 6
7.8. Water quality testing 7
7.9. On-site storage of emergency materials 7
7.10. Maintenance of control measures 7
7.11. Clean-up of spills 7
8. Soil Management 7
8.1. Timing of earthworks 7
8.2. Location of stockpiles 7
8.3. Management of subsoils 7
8.4. Topsoil management 8
9. Stockpile Management 8
9.1. Topsoil Stockpiles 8
9.2. Location of stockpiles 8
9.3. Diversion of up-slope runoff 8
9.4. Erosion control measures 9
9.5. Sediment control measures 9
10. Management of Dispersive Soils 9
10.1. Stabilisation of earth batters 9
10.2. Stabilisation of open drains 9
10.3. Prevention of tunnel erosion 9
10.4. Treatment of soil prior to seeding 9
Part C: DRAINAGE CONTROL MEASURES 10
11. Management of Site Drainage 10
11.1. Primary drainage control measures 10
11.2. Drainage across a slope – Catch Drains 10
11.3. Drainage across a slope – Flow diversion banks and berms 11
11.4. Drainage Outlet Structures 12
11.5. Velocity Control Structures 13
11.6. Channel and chute linings 14
11.7. Temporary Watercourse Crossings 15
11.8. Works in and around watercourses 15
Part D: EROSION CONTROL MEASURES 17
12. Erosion control selection 17
12.1. Hydromulching 17
12.2. Temporary seeding (TS) 17
12.3. Compost blankets (CBT) 17

12.4. Open mesh-type blankets 17
12.5. Cellular confinement systems 17
12.6. Soil binders (SBS) 18
12.7. Water trucks 18
12.8. Revegetation (R) 18
Part E: SEDIMENT CONTROL MEASURES 19
13. Sediment Control default classification 19
13.1. Entry / Exit sediment controls 19
13.2. Stockpile sediment controls 20
13.3. Inlet sediment traps 21
13.4. Kerb inlet sediment traps 21
13.5. Field (drop) inlet sediment traps 21
13.6. Sediment controls for sheet flow conditions 22
13.7. Sediment controls for minor concentrated flow 23
13.8. Type 2 sediment controls for concentrated flows 24
13.9. Sediment Basins (Type C – dry basins) 25
13.10. Type D/F Sediment Basins 26
13.11. Sediment Basin Spillways 27
13.12. Dewatering 28
Part F: GLOSSARY 29

6. ESC Key Principles

The three cornerstones of best-practice 'erosion and sediment control' (ESC) are *drainage control*, *erosion control*, and *sediment control*:

- Drainage control measures aim to prevent or reduce soil erosion caused by concentrated flows (including the management of rill and gully erosion), and to appropriately manage the movement of 'clean' and 'dirty' water through the site.
- Erosion control measures aim to prevent or reduce soil erosion caused by raindrop impact and sheet flow (i.e. the control of splash and sheet erosion).
- Sediment control measures aim to trap and retain sediment displaced by up-slope erosion processes.

It is noted that on most work sites, best practice *sediment* control measures cannot, on their own, provide adequate protection of downstream environments. Therefore, appropriate drainage and erosion control measures must also be applied at all times, especially on clayey soils. Desirable environmental protection is only achieved when all three control measures are working in a coordinated manner during each stage of the construction process.

A key aspect of ESC identifies that there is almost always an exception to every rule and guideline. The fact that a control measure is observed to work well on one site does not mean that it will work well on all sites. Similarly, the fact that a control measure has repeatedly failed within one region does not mean that the technique will not be useful within another region. Also, no rule or recommendation should be allowed to overrule the application of unique, site-specific solutions, where such solutions can be demonstrated to satisfy the environmental objectives and the specified performance standards.

Stormwater is managed to achieve the following objectives:

- Protect downstream water quality
- Minimise the potential for erosion and subsequent sedimentation
- Provide adequate and appropriate drainage and pollution control measures will be installed to treat run-off from disturbed areas of the site.
- Prevent soil materials and sediment from entering drainage systems

Where practicable, these objectives will be implemented using the following principals

- Groundcover will be established to the maximum extent possible to prevent erosion
- Storm water will be diverted around the work areas.
- Run-off velocities will be minimised to reduce erosion.
- Isolate uncontaminated water from off-site.
- Treat contaminated water before it reaches waterways.
- Direct all run-off from disturbed site areas through control structures.

6.1. Impacts of soil erosion and sediment runoff

Soil materials, sediment, and turbidity are categorised as "pollution", as is any material that will change the physical, biological or chemical conditions of the water. Activities that expose areas of bare earth, causing the potential for erosion, and thereby contamination of receiving bodies, include:

- Cut and fill bulk earthwork activities (including stockpiles);
- Vegetation removal;
- Topsoil stripping;
- Demolition; and
- Service relocation.

Potential impacts include:

- Blockage of stormwater pipes and culverts
- Damage to completed works, causing maintenance, re-work and defect rectification
- Sedimentation & turbidity of waterways & wetlands
- Damage to aquatic and marine ecological communities (fish habitats, reefs, seagrass, etc)

It is recognised that there are many factors such as unexpected ground conditions, surface level deviations from design plans, ongoing changes to construction planning, etc, which may result in requirements for run-off controls to vary from original plans.

The primary goal during construction is to minimise the length of time an area is disturbed. This will be achieved by sequencing of site-clearing and rehabilitation works to minimise exposure time. This will be done in conjunction with the development of site-specific control structures.

6.2. Types of Erosion

6.2.1. Raindrop impact

- Raindrops can exert significant force upon impact with the ground.
- The resulting soil erosion is often difficult to detect and consequently is often ignored.
- Raindrop impact erosion is a major cause of the release of fine, clay-sized particles resulting in highly turbid (brown) runoff.
- It would not be unseasonable for raindrop impact erosion to cause the release of 1 to 2 cm of soil during the construction phase

6.2.2. Sheet erosion

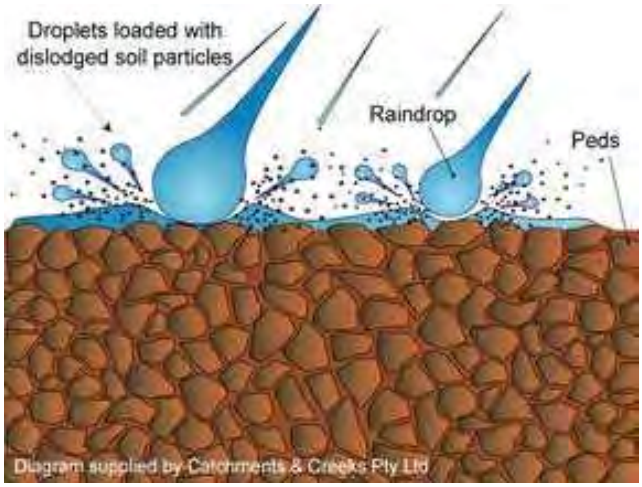
- Sheet erosion is the removal of an even layer of surface soil through the actions of raindrop impact and stormwater runoff.
- Sheet erosion is likely to occur if stormwater runoff flows over open soil at a speed greater than walking pace.
- After a distance of around 10 m, sheet erosion is likely to change into 'rill erosion'.
- It should be noted that 1 cm of soil loss represents the loss of 100 cubic metres of soil per hectare.

6.2.3. Rill erosion

- A 'rill' is an individual eroded channel in the soil that is less than 300 mm deep.
- Rill erosion is typically caused by high velocity concentrated flows (i.e. water flowing at a brisk walking pace or faster).
- Rilling can also result from soil dispersion (see below).
- Along with flow velocity, soil compaction and soil chemistry can also influence the degree of rilling.

6.2.4. Chemical-induced erosion (dispersive/sodic soils)

- Soil chemistry can have a significant influence over the severity and extent of soil erosion.
- If a soil is 'dispersive' then it is likely to be highly unstable when wet, resulting in severe, deep rilling (or 'fluting' shown left), tunnel erosion and/or gully erosion.
- As a general guide, if the soil erosion is significantly deeper than its width, then soil chemistry is likely to be a contributing factor to the soil erosion



7. Site Management

7.1. Set-up of site office

- Limit site entry to the minimum number of locations.
- Stabilise all site entry and exit points.
- Locate the site office as close as possible to the site entrance to minimise the distance visitors need to travel through the site.
- Wherever practical, ensure roof water from buildings and sheds will not cause unnecessary erosion or soil wetness, especially within common traffic areas

7.2. Control of sub-contractors

- Assess the need for site signage to help:
    - minimise damage to the site's erosion and sediment control measures
    - minimise damage to buffer zones and retained vegetation
    - remind site personnel of the importance of appropriate environmental management within the site
- The need for signs will vary from location to location depending on site conditions and environmental risks.

7.3. Stockpiles

- Establish all necessary stockpile areas.
- Assess the need for:
    - drainage controls up-slope of stockpiles e.g. if drainage area > 1500 m2
    - erosion controls on stockpiles, such as mulch, soil binders, or tarps
    - sediment controls down-slope of stockpiles (e.g. sediment fence)
- Where appropriate, install boundary fencing to reduce unauthorised dumping of earth and rubbish on the site.

7.4. Concrete wash-out points

- If significant concreting is to occur on the site, then establish a concrete disposal area(s) enclosed by permeable, earth filter-banks, or other appropriate filter systems.
- Ensure these areas are well signed so that contractors and delivery drivers will be able to identify their location.

7.5. Waste management

- Establish waste collection areas.
- Control pollutant runoff from these areas.
- Ensure appropriate storage of chemical and fuels (e.g. AS1940: The storage and handling of flammable and combustible liquids).
- Where necessary, establish drip pans, or similar (e.g. filter cloth sheeting) in vehicle maintenance areas to control pollution runoff from road surfacing equipment and the like.

7.6. Litter control

- Ensure responsible environmental management procedures are followed at all times, including controlling the handling of all potential contaminants, such as:
    - litter concrete/cement oil and fuel
    - sand, soil and sediment organic mulches, and fertilisers
- Remind all workers that waste management, housekeeping and pollution control is every ones responsibility.

7.7. Site inspections

- Nominate the officer(s) responsible for on- site erosion and sediment control measures.
- Undertake routine inspections as per the Project **EHSMP**.

7.8. Water quality testing

- Typical water quality objectives are:
  - 50 mg/L of total suspended sediment
  - a turbidity level no greater than 10% above that of the receiving water
  - water pH in the range 6.5 to 8.5
- Identify an appropriately trained person to collect all water samples.
- Water quality monitoring is to be recorded using **ENV10 Water Quality Sampling Form**

7.9. On-site storage of emergency materials

- Stockpile all necessary materials to establish and maintain the site's erosion and sediment control (ESC) measures.
- Maintain adequate supplies of emergency ESC materials such as: straw bales, wire, stakes, sediment fence fabric, filter cloth, wire mesh, and clean aggregate.

7.10. Maintenance of control measures

- Ensure all erosion and sediment control measures are maintained in proper working order at all times.
- Ensure all materials, whether solid or liquid, removed from ESC devices during maintenance are disposed of in a manner that does not cause ongoing soil erosion or environmental harm.
- Ensure appropriate written records are kept on the site's monitoring and maintenance activities.

7.11. Clean-up of spills

- Ensure sufficient materials exist on-site, or within work vehicles, to clean-up accidental sediment spills and the like.
- The clean-up equipment and materials required for a site will need to be assessed on a case-by-case basis based on the assessed environmental risk.
- Spills are to be managed in accordance with **ENVP08 Spills Management Procedure**

8. Soil Management

8.1. Timing of earthworks

- Ensure earthworks are avoided during those periods when rainfall is either occurring or the soil is saturated.
- Working the soil when it is too wet can: damage the soil structure
- reduce the soil's drainage properties increase erosion and sediment runoff
- Working the soil when it is too dry can: damage the soil structure
- adversely affect site revegetation increase the risk of dust problems

8.2. Location of stockpiles

- Ensure that excavated material is not stockpiled in locations where it could cause harm, or be washed into a gutter, drain or water body, such as:
- within an overland flow path adjacent to stream banks
- within the canopy drip zone of protected trees

8.3. Management of subsoils

- Ensure exposed subsoils are suitably covered as soon as practical.
- Non-dispersive subsoils should be covered with:
  - a suitable layer of topsoil if the area is to be revegetated, or
  - mulch or a suitable chemical soil binder if final earthworks and/or construction is delayed for an extended period

- Dispersive subsoils should be covered with a non-dispersive soil before placement of final surface material.

8.4. Topsoil management

- Ensure topsoil is preserved for reuse on the site wherever possible.
- The practice of removing topsoil from a site should be avoided unless the soil is contaminated or otherwise cannot provide a long-term benefit to the site.
- Ensure that the stripping and respreading of topsoil is stages such that the duration of exposure of the subsoil is appropriate for the site's erosion risk.

9. Stockpile Management

9.1. Topsoil Stockpiles

Table 1 - General Recommendations for topsoil stockpiles

Condition of topsoil	Recommended stockpiling requirements
Topsoil containing valuable plant seed content that needs to be preserved for re- establishment.	Upper 50 mm of soil stockpiled separately in mounds 1.0 to 1.5 m high. Topsoil more than 50mm below the surface stockpiled in mounds no higher than 1.5 to 3m. The duration of stockpiling should be the minimum practical, but ideally less than 12 months.
Imported topsoil, or in-situ topsoil containing minimal desirable or undesirable seed content.	Maximum desirable stockpile height of 2 m. The duration of stockpiling should be the minimum practical, but ideally less than 12 months.
Topsoil containing significant undesirable seed content.	Ideally replace soil with alternative local topsoil free of weed seed content—seek expert advice. Depending on expert advice, stripped topsoil maybe appropriately treated to prevent germination of weed seed content, covered with clear plastic sheeting to help burn-off the weed seed content, or buried under a minimum 100 mm of soil.
Topsoil containing weed seed of a declared noxious or otherwise highly undesirable plant species.	Suitably bury the topsoil on-site or remove the soil from the site for further treatment (in accordance with local and State laws). Stripped soil must **not** be transported off-site without appropriate warnings and identification.
Previously disturbed sites where the surface soils consist of a mixture of topsoil and dispersive subsoil.	Mix the soil with gypsum, lime or other appropriate ameliorants prior to stockpiling in either high or low mounds according to required protection of seed content. Choice of chemical treatment of the dispersive soil depends on desired pH adjustments—seek expert advice.

9.2. Location of stockpiles

- Ensure that sand/soil/earth stockpiles are not located in a position where the material could cause harm or be washed into a gutter, drain or water body, such as:
    - on a road pavement
    - within an overland flow path adjacent to stream banks
    - within the canopy drip zone of protected trees (long-term stockpiles)

9.3. Diversion of up-slope runoff

- Ensure, where necessary, a Flow Diversion Bank or Catch Drain is placed up-slope of a stockpile to direct excessive overland flow around the stockpile.
- Flow diversion around sand/soil/earth stockpiles is generally considered necessary when rainfall is possible and the up-slope catchment area exceeds 1500 m2.

9.4. Erosion control measures

- Ensure that long-term stockpiles of material containing some degree of clayey matter (e.g. most soils, but not necessarily imported sand) are:
    - ideally covered with an impervious cover (not always practical)
    - covered with mulch or temporary vegetation (grass) if not located within the drainage catchment of a sediment basin
- Ensure appropriate dust controls exist for all stockpiles.

9.5. Sediment control measures

- Ensure an appropriate sediment control system is located down-slope of sand/soil earth stockpiles, such as:
    - Filter Fence or composite Sediment Fence for clayey soils
    - Woven Sediment Fence for washed sand

10. Management of Dispersive Soils

10.1. Stabilisation of earth batters

- Dispersive soils are highly susceptible to deep, narrow rilling (fluting) on slopes and along the invert of drains.
- Dispersive soils must be treated (with gypsum or the like), or buried under a minimum 100 mm layer of non-dispersive soil before placing any vegetation or erosion control measures.
- Thicker capping with non-dispersive soil may be required on steep slopes and in areas where there is likely to be future soil disturbance such as on creek banks.

10.2. Stabilisation of open drains

- Avoid cutting drainage channels into dispersive soils.
- Avoid the use of Check Dams within any drain that cuts into dispersive soils.
- The use of Check Dams only extends the duration of water ponding, and thus the risk of erosion. Instead, line the drain with a non-dispersive soil and then revegetate as appropriate.

10.3. Prevention of tunnel erosion

- Dispersive soils are highly susceptible to tunnel erosion.
- Sealing dispersive soils with concrete can result in tunnel erosion forming under the concrete.
- Similarly, tunnel erosion can form under rock and rock mattress channel linings

10.4. Treatment of soil prior to seeding

- Do not directly seed dispersive soils. A well-established grass root system cannot prevent the release of clay particles from the soil, and the inevitable failure of the grassed surface.
- Instead, treat the soil with gypsum (or the like), and/or cover the dispersive soils with a minimum 100 to 300 mm of non- dispersive soil depending on the land slope and the likely degree of future soil disturbance.

11. Management of Site Drainage

- Appropriate drainage controls must be applied to every construction site. These controls may consist of components of the permanent drainage system, plus temporary drainage measures that are required to be functional only during the construction phase.
- Each site is different and thus the required drainage control measures must be assessed on a site-by-site basis based on the anticipated catchment and weather conditions.
- On complex sites, a Drainage Plan (or similar) should be prepared by a drainage/ stormwater engineer.
- In all cases, it is important to ensure that stormwater is not unlawfully diverted or released into neighbouring properties or allowed to cause erosion at discharge points.

11.1. Primary drainage control measures

Firstly, assess the benefits and practicality of diverting up-slope runoff around any given soil disturbance. This may require large sites to be viewed as a series of adjoining sub-catchments. Drainage options include Flow Diversion Banks (possibly formed from the stripped topsoil), and excavated Catch Drains.

If the subsoils are known to be dispersive or highly erodible, then avoid cutting drains into these soils. Instead, use Flow Diversion Banks to redirect water across the slope.

Secondly, choose an appropriate gradient and channel lining for each drain. Low gradient drains can often be left with an open soil surface. If flow velocities are expected to be high, then either control the water velocity with the use of Check Dams or select an appropriate channel lining.

Thirdly, consider how best to move stormwater down any steep slopes. Drainage options include Slope Drains for minor flows, and suitably lined drainage Chutes. Alternatively, a Level Spreader can be used to release the water as 'sheet' flow down the slope.

Fourthly, if the site contains a major sediment trap such as a Sediment Basin (SB), then consider how best to direct the maximum quantity of sediment-laden water to these sediment traps. Drainage options include the use of Catch Drains, Flow Diversion Banks, or for large catchments, formally designed Diversion Channels.

Finally, ensure that stormwater is not unlawfully diverted or released into neighbouring properties, or allowed to cause erosion at discharge points.

11.2. Drainage across a slope – Catch Drains

- Use of Catch Drains
    - Catch drains are used for the collection of sheet runoff and the diversion of such runoff across a slope or around a soil disturbance.
    - They can also be used to collect 'dirty' water and carry it to a sediment trap.
    - These drains are best used on erosion- resistant, non-dispersive soils.
- Construction of Catch Drains
    - Catch drains can be constructed with or without an adjoining down-slope bank.
    - Large catch drains are usually formed by pushing the excavated soil down the slope to form an adjoining flow diversion bank.
    - Catch drains can be earth-lined (low gradient drains only), or lined with erosion control mats, grass, or rocks.
    - Application of a channel lining, however, must not be allowed to reduce the required flow capacity or dimensions of the drain.

Figure 1 – Plastic-lined catch drain

Figure 2 - Severe erosion from a catch drain cut into dispersive soils

- Problems of dispersive soils
    - Drains cut into dispersive soils can result in severe erosion problems and the loss of large quantities of sediment.
    - If a drain is required to be cut into dispersive soils, then the drain must be lined with a non-dispersive soil (minimum 100 mm thick), even if the drain is to be lined with rock, grass, or erosion control mats.

11.3. Drainage across a slope – Flow diversion banks and berms

- Flow Control Berms
    - Flow control berms are used for the collection and diversion of minor flows from relatively small catchment areas.
    - They can also be used to direct minor flows to drainage channels and chutes (as shown left).
    - Berms can be highly susceptible to traffic damage and flow leaks.
    - Berms can be formed from sandbags (left), compost, or compacted earth.

Figure 3 -Flow Control Berm

- Flow Diversion Banks
    - Flow diversion banks are typically used for the diversion of flows when in-situ subsoils are dispersive or otherwise highly erodible.
    - They may be formed from the stripped topsoil as an alternative to stockpiling

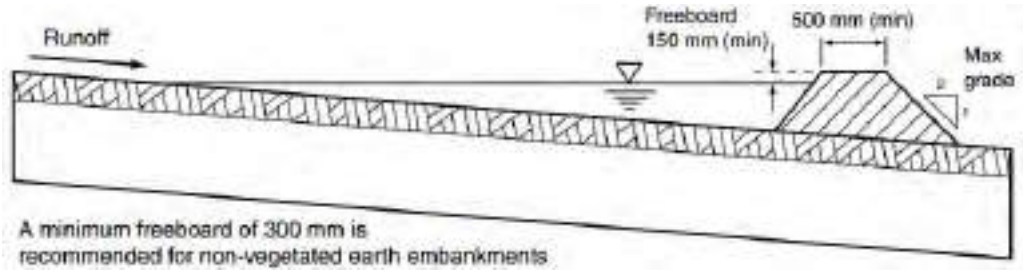


Figure 4 - Typical Profile, Flow Diversion Bank

Table 2 - Typical dimensions of flow diversion structures

Parameter	Earth banks	Compost berms	Sandbag berms
Height (min)	500 mm	300 mm (450 mm)	N/A
Top width (min)	500 mm	100 mm (100 mm)	N/A
Base width (min)	2500 mm	600 mm (900 mm)	N/A
Side slope (max)	2:1 (H:V)	1:1 (H:V)	N/A
Hydraulic freeboard	150 mm (300 mm)	100 mm	50 mm

11.4. Drainage Outlet Structures

- Level spreaders (LS)
    - Level spreaders are used at the end of Flow Diversion Banks and Catch Drains to discharge minor flows down stable, grassed slopes, or into bushland.
    - They can also be used to discharge road runoff into grassland or bushland

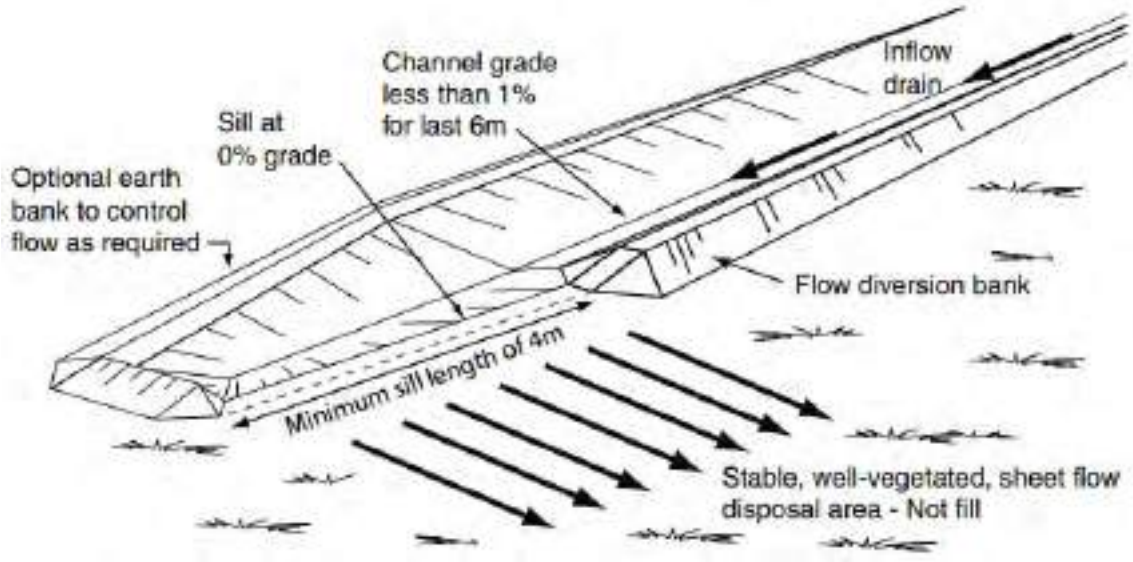


Figure 5 - Level Spreader

- Outlet structures (OS)
    - Outlet structures are used at the end of temporary Chutes and Slope Drains to dissipate flow energy and control scour.
    - They can also be used as a permanent energy dissipater on pipe and culvert outlets.
    - The final size and shape of the outlet structure may need to be modified to match the size and surface conditions of the receiving channel.

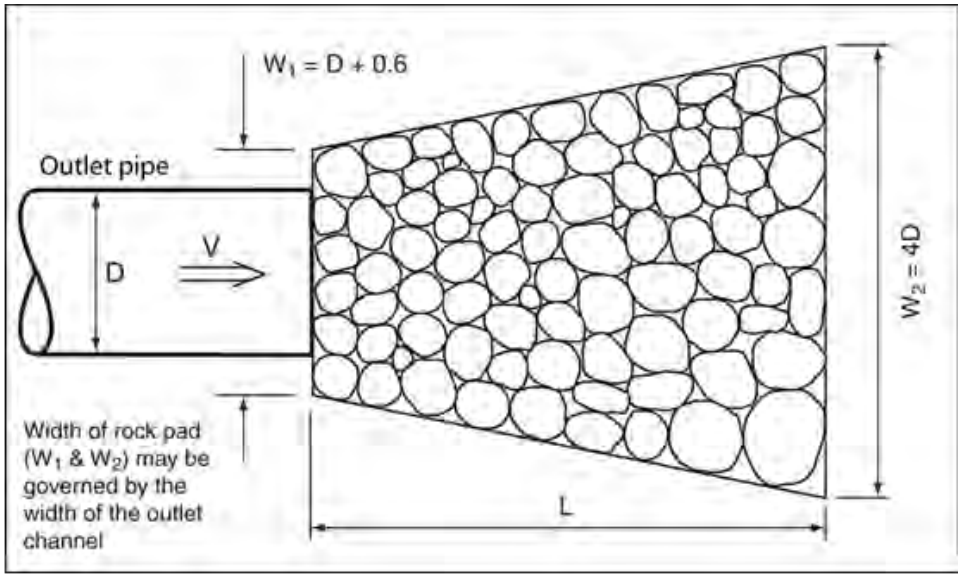


Figure 6 - Typical layout, rock pad for pipe outlet

11.5. Velocity Control Structures

- Fibre rolls (FCD)
  - Fibre rolls consist of small-diameter, biodegradable straw-filled logs.
  - They can be used as check dams in wide, shallow drains so long as the logs can be anchored to prevent movement.
  - Best used in locations where it is desirable to allow the log to integrate into the vegetation, such as in vegetated channels; however, some products contain a plastic mesh that may represent an wildlife/ environmental risk
- Sandbag check dams (SBC)
  - Sandbag check dams are typically used in drains less than 500 mm deep, with a gradient less than 10%.
  - These check dams are typically small (in height) and therefore less likely to divert water out of the drain compared to rock check dams.
  - Sandbag check dams can also be used as a temporary (supplementary) sediment trap.

Figure 7 - Fibre (Coir) rolls

Figure 8 - Sand bag check dams

- Rock check dams (RCD)
  - Rock check dams should only be used in drains at least 500 mm deep, with a gradient less than 10%.
  - They should only be used in locations where it is known that they will be removed once a suitable grass cover has been established within the drain.
  - Can also act as minor sediment traps.

- Rock check dams can be used as a permanent velocity-control device and/or sediment trap in non-vegetated, earth- lined drains (check with road authority).

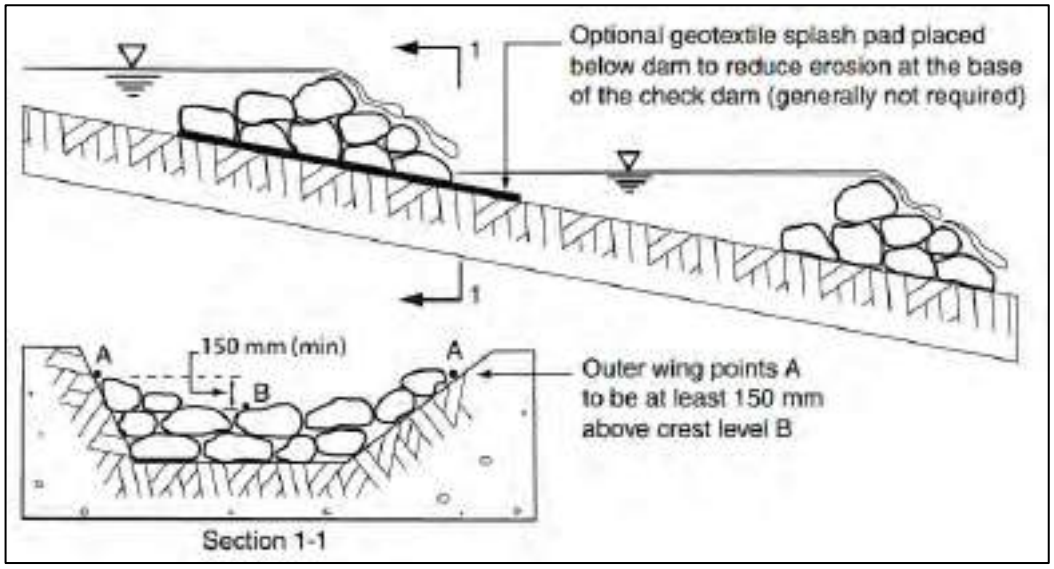


Figure 9 - Layout and profile, rock check dams

11.6. Channel and chute linings

- Geotextile linings (GEO)
  - Used to provide temporary scour protection in low to medium velocity drains.
  - Heavy-duty filter cloth can be used to form temporary drainage chutes down steep batters.
  - Sheets of plastic can also be used to form short, temporary drainage chutes down earth batters, but must be used with caution.
- Jute & coir mesh
  - Jute or coir mesh is a form of erosion control mat used to provide temporary scour protection in low to medium velocity drains.
  - These products are generally preferred in natural environments and bushland areas.
  - Overall erosion control and channel revegetation can be improved by:
    - placing the mesh over a mulch layer, or
    - spraying the mats with an anionic bitumen emulsion or other suitable tackifier (e.g. in table drains)
- Turfing (T)
  - Turf can be used for the lining of low velocity Chutes, Catch Drains and Diversion Channels.
  - If high velocity flows are likely within the first two weeks, then the turf should be anchored with wooden pegs.
  - Metal staples (commonly used to anchor erosion control blankets) should not be used (for reasons on pedestrian safety).
  - It is important to ensure that water entering the turfed area is not diverted along the outer edge of the turf.

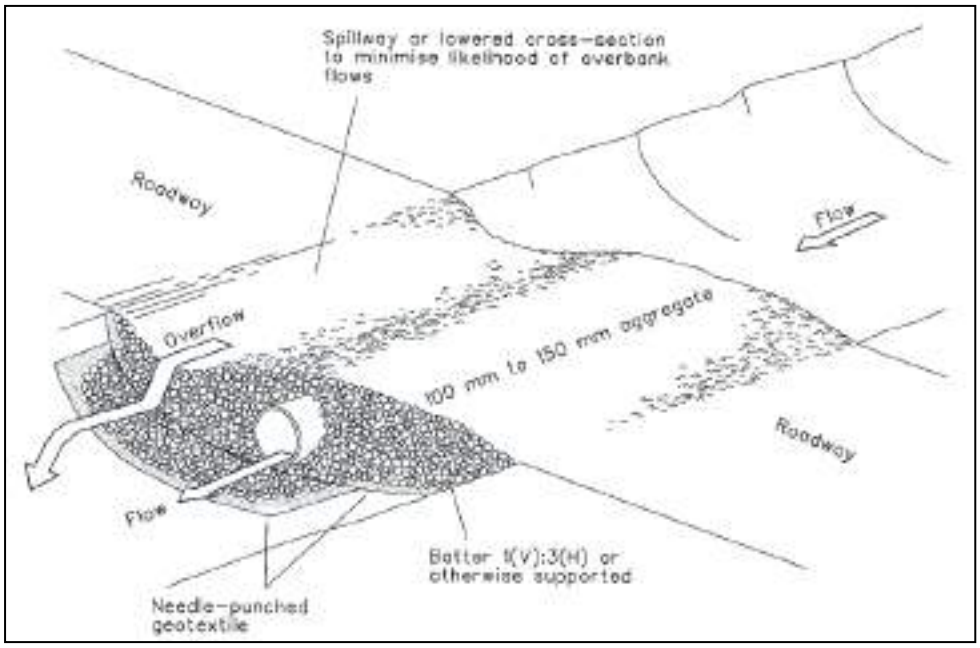
- Reinforced grass (TRM)
  - Pre-grown reinforced grass can be used for the lining of high-velocity, permanent drains and chutes.
  - Also used to line grassed bywash spillways for dams and Sediment Basins.
  - Particular attention (i.e. placement and anchorage) should be given to the crest, toe and sides of the mat during installation to avoid the potential for future erosion and/or uplifting.

Figure 10 - Jute mesh

Figure 11 - Turf lining

11.7. Temporary Watercourse Crossings

- Temporary culvert crossings (TCC)
  - Temporary culvert crossings are typically used on wide stream crossings.
  - They are best used when fish passage is not critical; however, suitable fish passage can be achieved through appropriate design.
  - Recycled steel pipes (left) are most commonly used.



11.8. Works in and around watercourses

- Basic principles
  - A site-specific **ESC Plan** should be developed for any works undertaken within or adjacent a watercourse
  - Ensure all necessary government approvals are obtained prior to any disturbance of a watercourse.
  - To the maximum degree practical, minimise disturbance to the riparian vegetation each side of the watercourse.
  - Minimise the number of temporary watercourse crossings.

- Take all reasonable and practical measures to avoid the operation of construction equipment within the main channel of the stream.

- Isolation of disturbances from stream flow
  - Wherever practical, priority should be given to the use of instream flow diversion systems that successfully isolate all soil disturbances from stream flow.
  - Isolation barriers can be formed from sediment fence fabric (flow depth < 0.8 m), floating silt curtains (depth > 0.8 m), large water-filled rubber dams, and sheet piling.
- Instream sediment control measures
  - The use of instream sediment control measures should only be used as a last resort, and only when it is not practical to divert dry weather flows around all disturbances.
  - Instream sediment control measures usually require the incorporation of 'filtration' systems such as Filter Tubes.
  - Instream sediment control measures must not be used during periods of essential fish migration – seek expert advice.

Figure 12 - Instream isolation barrier

12. Erosion control selection

The appropriate application of erosion control products typically related to the slope of the land and the expected shear stress resulting from stormwater runoff down the slope. Table 3 provides a general guide to the application of various erosion control measures.

Table 3 - Typical application of erosion control to slopes

Flat land (flatter than 1 in 10)	Mild slopes (1 in 10 – 1 in 4)	Steep slopes (steeper than 1 in 4)
Erosion Control Blankets Gravelling Mulching Revegetation Rock Mulching Soil Binder Turfing	Bonded Fibre Matrix Compost Blankets Erosion Control Blankets, Mats and Mesh Mulching well anchored Revegetation Rock Mulching Turfing	Bonded Fibre Matrix Cellular Confinement Systems Compost Blankets Erosion Control Blankets, Mats and Mesh Revegetation Rock Armouring Turfing

12.1. Hydromulching

- Hydromulching can be used for grass establishment and the protection of newly seeded areas.
- Best used on slopes <10% and slopes with a vertical fall of less than 3 m.

12.2. Temporary seeding (TS)

- In certain situations, a rapid and complete cover of 'annual grasses' can act as an effective, well-anchored mulch on embankments, batters and table drains.
- Even if the grass is allowed to die-off immediately after establishment (left), the surface can still provide effective erosion control, thus avoiding the need for ongoing watering.
- Can be a useful technique in rural and semi-arid areas.

12.3. Compost blankets (CBT)

- Compost blankets are typically used in association with the revegetation of steep slopes using grasses and/or other plants.
- Particularly useful when the slope is too steep for the placement of topsoil, or when insufficient topsoil exists on the site.
- Can be expensive, but usually highly successful.

12.4. Open mesh-type blankets

- A 'mesh' is an open weave blanket made from rope-like strands such a hessian (jute) or coir rope.
- Typical design life in dry environments of 12 to 24 months.
- Jute blankets have a service life similar to that of a hessian bag placed on the ground (i.e. approximately 3 months).
- Coir blankets (made from coconut fibres) have a service life similar to that of a common domestic doormat placed directly on the ground.

12.5. Cellular confinement systems

- Cellular confinement systems can be used to stabilise low to medium velocity Chutes.
- The pockets may be filled with sand, small rocks (gravel), or vegetated (soil & grass) to form a temporary or permanent chute.
- Typical uses include:

- containment of topsoil or rock mulch on medium to steep slopes
- control of erosion on non-vegetated medium to steep slopes such as bridge abutments and heavily shaded areas

- These products can also used to form temporary construction access across 'dry', sandy streambeds (i.e. a temporary ford crossing).

12.6. Soil binders (SBS)

- Soil binders are typically used for dust control of unsealed roads and exposed area (e.g stockpiles).
- Selection of product depends on the potential environmental impacts, trafficability and longevity.
- Usually best to trial various measures and learn from experience.

12.7. Water trucks

- Water trucks can be used for dust control of unsealed roads and access tracks.
- Dust levels can also be controlled by minimising site traffic and the movement of traffic outside designated areas.
- The addition of wetting agents and polymer binders (Soil Binders) to the water can decrease both the water usage and the required application frequency.

12.8. Revegetation (R)

- The best way to control soil erosion is to promptly revegetate all disturbed areas.
- This technique includes turfing and temporary seeding.
- At least 70% ground cover (combined plant and mulch) is considered necessary to provide a satisfactory level of erosion control.

Figure 13 - Hydromulch

Figure 14 - Jute Blanket

Figure 15 - Water cart application of soil binder

13. Sediment Control default classification

The IECA 2008 Guideline provides default classifications for a range of sediment control techniques (Type 1, 2 and 3), as detailed below in Table 4.

The selection of suitable Types of control for the site is determined by the estimated soil loss rate for, or the erosivity/average rainfall for the site. Refer to the IECA 2008 Guideline for further details.

Table 4 - Default Classification of sediment control techniques

Type 1	Type 2	Type 3
Sheet flow treatment techniques		
Buffer Zone capable of infiltrating 100% of stormwater runoff or process water * Infiltration basin or sand filter bed capable of infiltrating 100% of flow	Buffer Zone * capable of infiltrating the majority of flows from design storms Compost/Mulch Berm	Buffer Zone * Filter Fence Modular Sediment Trap Sediment Fence
Concentrated flow treatment techniques		
Sediment Basin * (sized in accordance with design standard)	Block & Aggregate Drop Inlet Protection Excavated Sediment Trap with Type 2 outlet Filter Sock Filter Tube Dam Mesh & Aggregate Drop Inlet Protection Rock & Aggregate Drop Inlet Protection Rock Filter Dam Sediment Trench * Sediment Weir	Coarse Sediment Trap Excavated Drop Inlet Protection * Excavated Sediment Trap with Type 3 outlet Fabric Drop Inlet Protection Fabric Wrap Field Inlet Sediment Trap Modular Sediment Trap Straw Bale Barrier U-Shaped Sediment Trap
De-watering sediment control techniques (selection not based on soil loss rate)		
Type F/D Sediment Basin Stilling Pond	Filter Bag or Filter Tube Filter Pond Filter Tube Dam Portable Sediment Tank * Settling Pond * Sump Pit	Compost Berm * Filter Fence * Grass Filter Bed * Hydrocyclone * Portable Sediment Tank * Sediment Fence
Instream sediment control techniques (selection not based on soil loss rate)		
Pump sediment-laden water to an off-stream Type F or Type D Sediment Basin or high filtration system	Filter Tube Barrier Modular Sediment Barrier* Rock Filter Dam Sediment Weir	Modular Sediment Barrier* Sediment Filter Cage

13.1. Entry / Exit sediment controls

- Rock pads
    - Suitable for all soil types.

- The critical design parameter is the total void spacing between the rocks.
- Minimum 10 m length for single dwelling building sites, and 15 m for construction sites.
- Generally perform better than Vibration Grids during wet weather.
- Drainage controls (e.g. cross bank) may need to be incorporated into the rock pad to direct sediment-laden runoff to an appropriate sediment trap.

- Vibration grids
  - Vibration grids are best suited to sandy soils.
  - Can also be used in clayey soil regions to control sediment movement from heavy construction traffic during dry weather.
  - A rock pad must extend from the vibration grid to the sealed road surface.

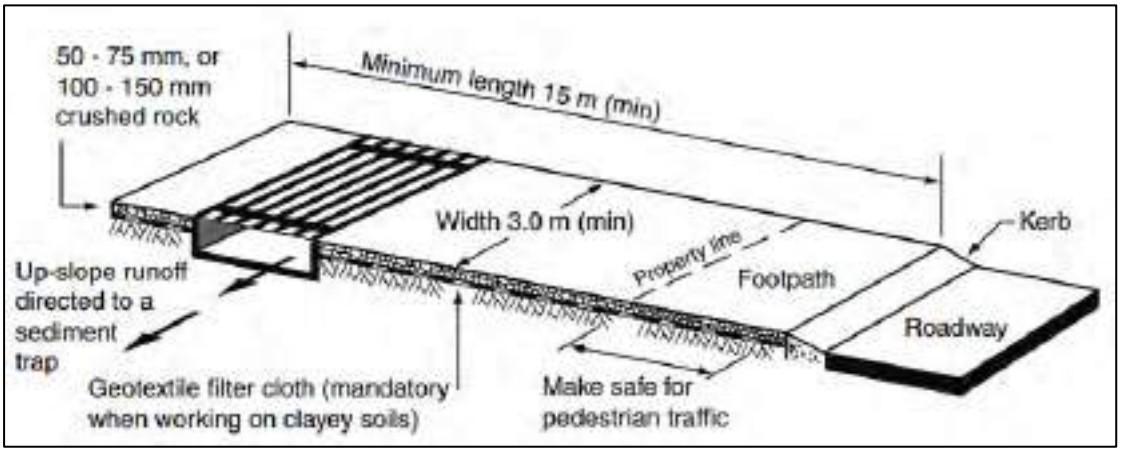


Figure 16 - Typical layout of rock pad with vibration grid

13.2. Stockpile sediment controls

- Sediment fence (SF)
  - Sediment fences formed from a composite (non-woven) fabric are generally preferred down-slope of stockpiles containing clayey material instead of the traditional, woven sediment fence fabric.
  - Woven fabric sediment fences (left) are best used for sandy soils and stockpiles located up-slope of a suitably grassed buffer zone that will allow for the infiltration of stormwater runoff from the stockpile
- Compost berms (CB) & mulch berms (MB)
  - Compost berms (either free standing or contained within a sock) are generally preferred down-slope of stockpiles containing clayey material instead of the traditional, woven sediment fence fabric.
  - Typically used down-slope of stockpiles that are:
    - not located within the catchment area of a suitable Type 1 or Type 2 sediment trap, or
    - located adjacent permanent drainage channels or waterways

Figure 17 - Mulch berm stockpile control

Figure 18 - Sediment fence stockpile control

13.3. Inlet sediment traps

Selection criteria for the use of inlet sediment traps:

1. **Safety first** – do not use any sediment control system if that system represents a risk to persons or property.
2. **Flooding risk** – any adopted control must not result in flooding of neighbouring properties. A spill-through weir, or the like, may need to be incorporated into the sediment trap to control the depth and extent of ponding.

13.4. Kerb inlet sediment traps

- A supplementary sediment trap.
- Used as a minor sediment trap constructed around kerb inlets located at sag points along a roadway.
- As a general rule, the filter sock must not be allowed to fully block the kerb inlet.
- Exceptions apply only when:
  - there is no risk of causing flooding of adjacent properties; and
  - where there is a suitable flow bypass system, such as a stable overland flow path

13.5. Field (drop) inlet sediment traps

- Fabric wrap inlet protection
  - Very small catchment areas.
  - Most commonly used on building sites. Formation of the excavated pit is critical
- Filter sock drop inlet protection
  - A Type 3 sediment trap.
  - Filter socks (including straw or compost- filled Fibre Rolls, and Compost Berms) are only suitable for small catchments.
  - Fibre (straw) filled socks are mostly suited to sandy soils.
  - Compost berms or compost-filled socks work best in clayey soil areas.
  - Compost-filled socks can adsorb some dissolved and fine particulate matter.
- Excavated drop inlet protection
  - Excavated drop inlet protection is used in locations where water ponding around the stormwater inlet is not allowed to reach a level significantly higher than the existing ground level.
  - Safety issues may require the excavated pit to be surrounded by appropriate safety fencing.
- Fabric drop inlet protection
  - A Type 3 sediment trap.
  - Fabric drop inlet protection is best used on sandy soils.
  - Suitable for relatively small catchment areas.
  - Maximum spacing of support posts is 1 m (photo left is a poor example).
  - A spill-through weir normally needs to be incorporated into one side of the sediment trap to control the depth of ponding

- Mesh & aggregate inlet protection (MA)
    - A Type 2 or 3 sediment trap.
    - Mesh & aggregate drop inlet protection is suitable for small to medium catchments.
    - The depth of ponding upstream of the field inlet is governed by the height of the aggregate filter placed around the wire mesh.
    - In clayey soils, filter cloth may be placed over the aggregate to improve the removal of fine sediments (as per Rock Filter Dams).

Figure 19 - Kerb Inlet sediment trap

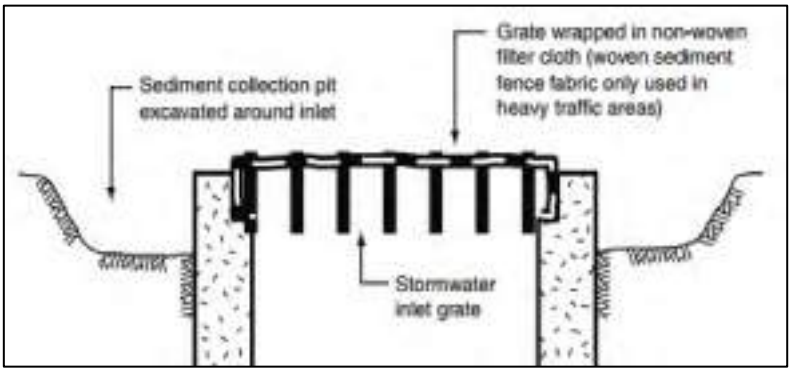


Figure 20 - Fabric wrap drop inlet protection

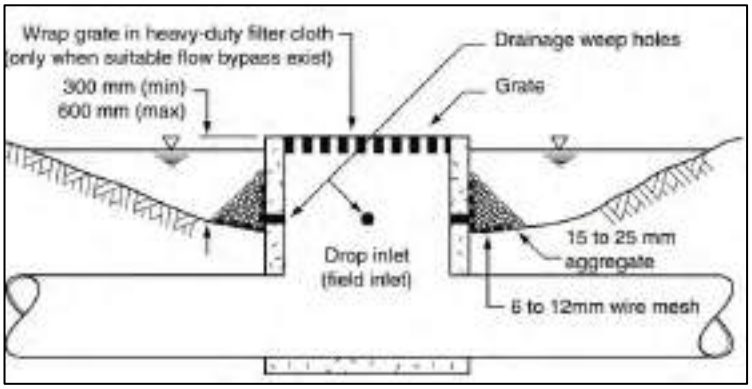


Figure 21 - Excavated drop inlet protection

Figure 22 - Fabric drop inlet protection

13.6. Sediment controls for sheet flow conditions

- Fibre rolls (Coir logs)
    - A supplementary sediment trap. Sheet flow conditions only.
    - Fibre rolls are best used as a supplementary sediment trap on sandy soils.
    - Suitable for minor flows only.
    - These systems are highly susceptible to damage by construction traffic, and thus generally cannot be relied upon as an effective sediment trap.
- Grass filter strips (GFS)
    - A supplementary sediment trap. Sheet flow conditions only.
    - Grass filter trips are mostly suited to sandy soils.
    - Can act as a supplementary sediment trap if placed around impervious surfaces, or placed along the contour at regular intervals (max. 2 m vertical fall) down earth banks.
    - Can be used as a drainage control technique to help maintain sheet flow
- Mulch berms (MB)
    - A Type 2 sediment trap.
    - Mulch berms are suitable for all soil types.

- The mulch must be produced through the use of tube grinders or the like, but not by chipping. The mulch needs to be very fibrous with the woody splinters allowing good interlocking. The mulch should not appear as clean cut (i.e. chipped by blades).
- Mulch and compost berms can act as both a drainage control system, and a sediment control system.

- Woven sediment fence
  - A Type 3 sediment trap. Sheet flow conditions only.
  - Woven fabrics (left) are generally suitable for all soil types, but sediment capture is limited to the coarser sediment fraction.
  - The traditional woven fabrics are generally preferred on long-term construction sites that are likely to experience several storm events.
  - Support post must be placed at a maximum 2 m spacing unless the fence has a top wire (anchored at 1m spacing), or a wire mesh backing, in which case a 3 m spacing of support post is allowed.
  - A spill-through weir can be used to reduce hydraulic pressures in large catchments
  - Ideally installed along the contour.
  - Sediment fences must incorporate regular 'returns', generally at a maximum 20 m spacing, but can be less as the slope along the fence increases.

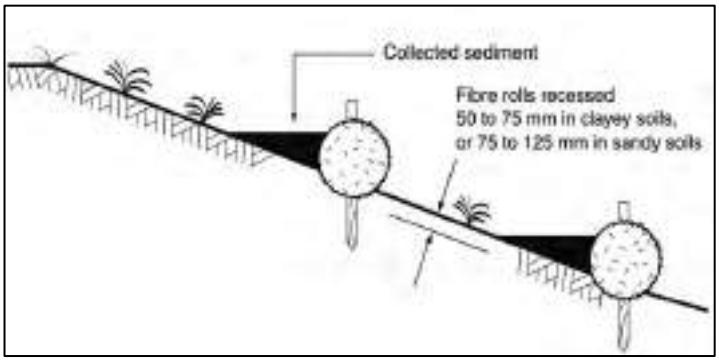


Figure 23 - Fibre roll (coir log) installation

Figure 24 - Mulch berm

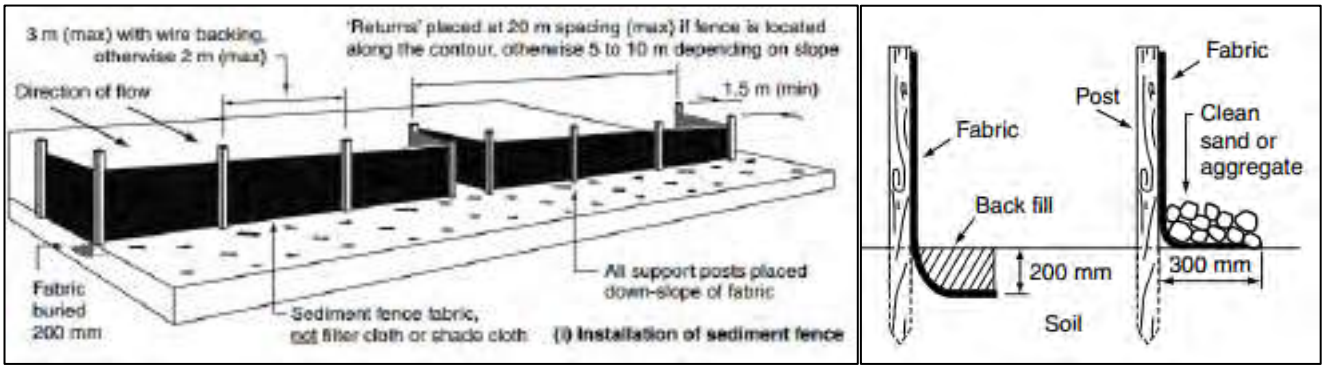


Figure 25 - Sediment fence typical installation

13.7. Sediment controls for minor concentrated flow

- Check dam sediment traps
  - A supplementary sediment trap.
  - Check dams can be used as minor sediment traps to supplement the site's primary sediment control system.
  - Typically used in table drains during the revegetation phase.
  - Check dams may be constructed from rock, sand bags, or compost-filled socks.
  - Compost-filled socks can adsorb some dissolved and fine particulate matter

- U-shaped sediment traps
    - A Type 3 sediment trap.
    - U-shaped sediment traps are commonly used as a coarse sediment trap (Type 3) within table drains having a medium to steep gradient.
    - The sediment fence must be constructed in a U-shape, not formed in a gradual arc, or placed straight across the drain.
    - In drains with a medium gradient, a spill- through weir is usually required to prevent flow bypassing.
    - The width of the sediment trap is usually determined by the width of an excavator or backhoe bucket used for sediment removal.
    - Filter tubes can be integrated into a U- Shaped Sediment Trap to increase the effective hydraulic capacity and to improve the treatment of low-flows.
    - On low-gradient drains, preference may need to be given to a Check Dam Sediment Trap.
    - Spill-through weirs are only effective if the weir crest is at least 300 mm high, and the crest is below the ground level at the end of the wing walls (below).

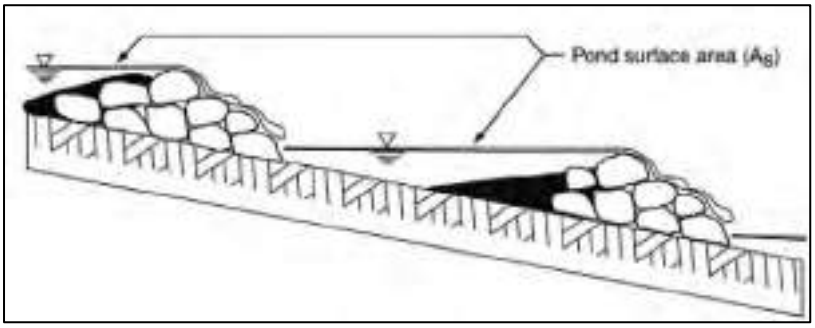


Figure 26 - Check dam sediment trap

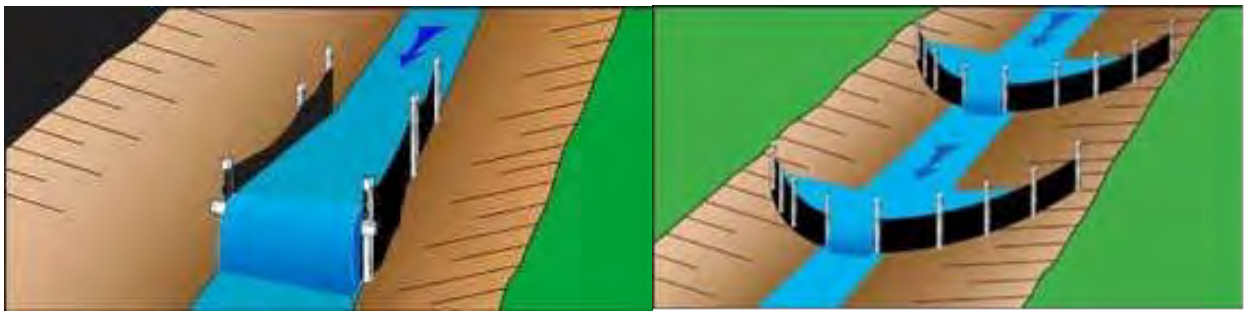


Figure 27 - U-shaped sediment traps

13.8. Type 2 sediment controls for concentrated flows

Selection criteria for the use of sediment traps within drainage channels:

1. **Safety first** – do not use any sediment control system if that system represents a risk to persons or property.
2. **Flooding risk** – any sediment control system must not result in flooding of neighbouring properties. A flow bypass system may need to be incorporated into the sediment trap to control the depth and extent of ponding.
3. **Soil type** – aggregate-based filtration systems are best used in sandy soil regions and for long-term installations. Geotextile filters (filter cloth) are generally required in clayey soil areas, for short term installations.

- Rock filter dam - geotextile filter
    - A Type 2 sediment trap
    - Rock filter dams are used in locations where it is impractical to construct a formal Sediment Basin.
    - The critical design parameter is the surface area of the settling pond, which must be maximised.
    - The incorporation of filter cloth is the preferred construction technique if the removal of fine-grained sediment is critical.

- Excavated sediment trap
    - A Type 2 or 3 sediment trap
    - Excavated sediment traps are often combined with Rock Filter Dams.
    - Caution; placing an excavated pit immediately up-slope of an 'aggregate filter' may reduce the filtration performance of the rock filter dam.
- Placing an excavated pit immediately up- slope of an 'geotextile filter' will help to reduce blockage of the filter, and thus should extend the effective operation life of the sediment trap.

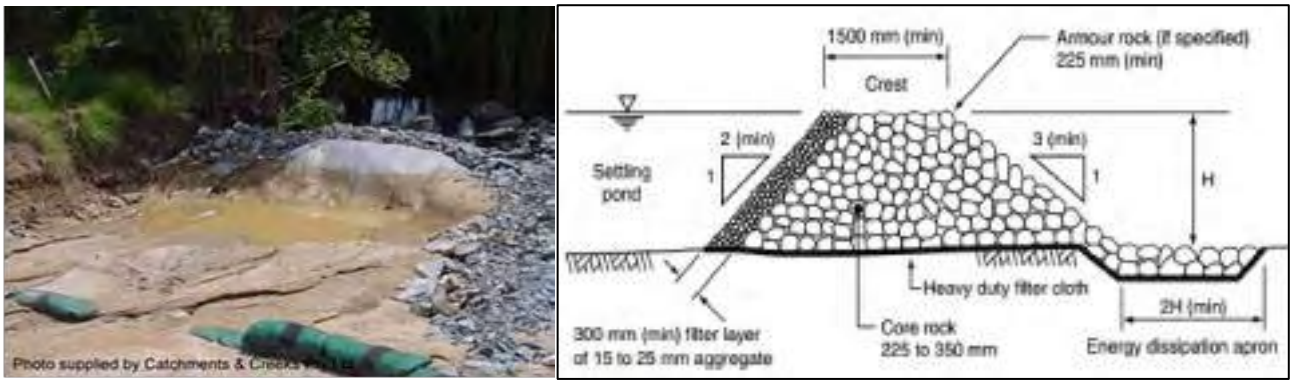


Figure 28 - Rock filter dam

13.9. Sediment Basins (Type C – dry basins)

- A Type 1 sediment trap
- Type C basins are best suited to coarse- grained soils.
- Used when a major (Type 1) sediment trap is required when working in areas containing coarse-grained, good settling soils.
- Sediment basins are generally required if the soil disturbance exceeds 0.25 ha
- Internal baffles help to control water flow and improve settlement characteristics.

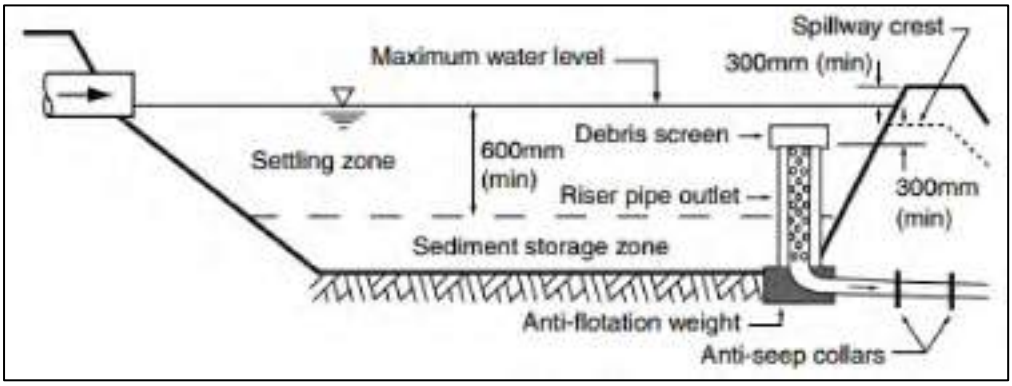


Figure 29 - Type C Sediment Basin

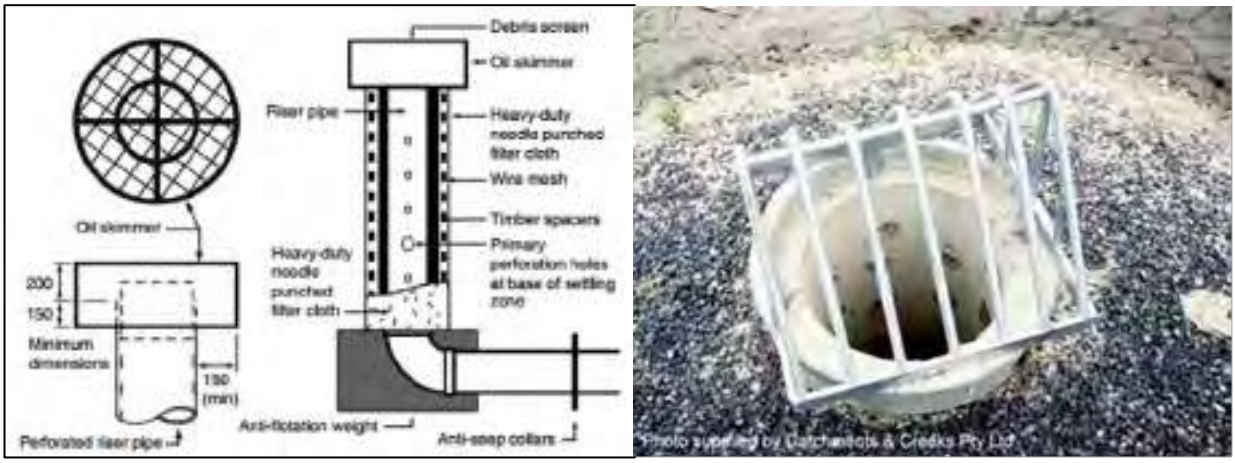


Figure 30 - Riser pipe system for Type C basins

13.10. Type D/F Sediment Basins

- Use of Type F & D sediment basins
  - Type F (fine soils) and Type D (dispersive soils) basins are best suited to fine- grained and/or dispersive soils.
  - Used when a major (Type 1) sediment trap is required when working in areas containing fine-grained, dispersive or poor settling soils.
  - These basins can also be used when regular de-watering operations are required.
  - Sediment basins are generally required if the soil disturbance exceeds 0.25 ha
- Operation of Type F & D basins
  - Type F and Type D basins are operated in a 'wet' mode, and thus are often referred to as wet basins.
  - Water must be retained within the basin and treated (flocculated) until the required water quality (usually 50 mg/L TSS) is achieved.
  - The basins must be de-watered as soon as practical such that the basins are (ideally) empty prior to the next storm event.
  - Basin de-watering is normally achieved through the use of pumps.
  - It is important to ensure that the pump's intake pipe does not rest or come into close contact with the settled sediment

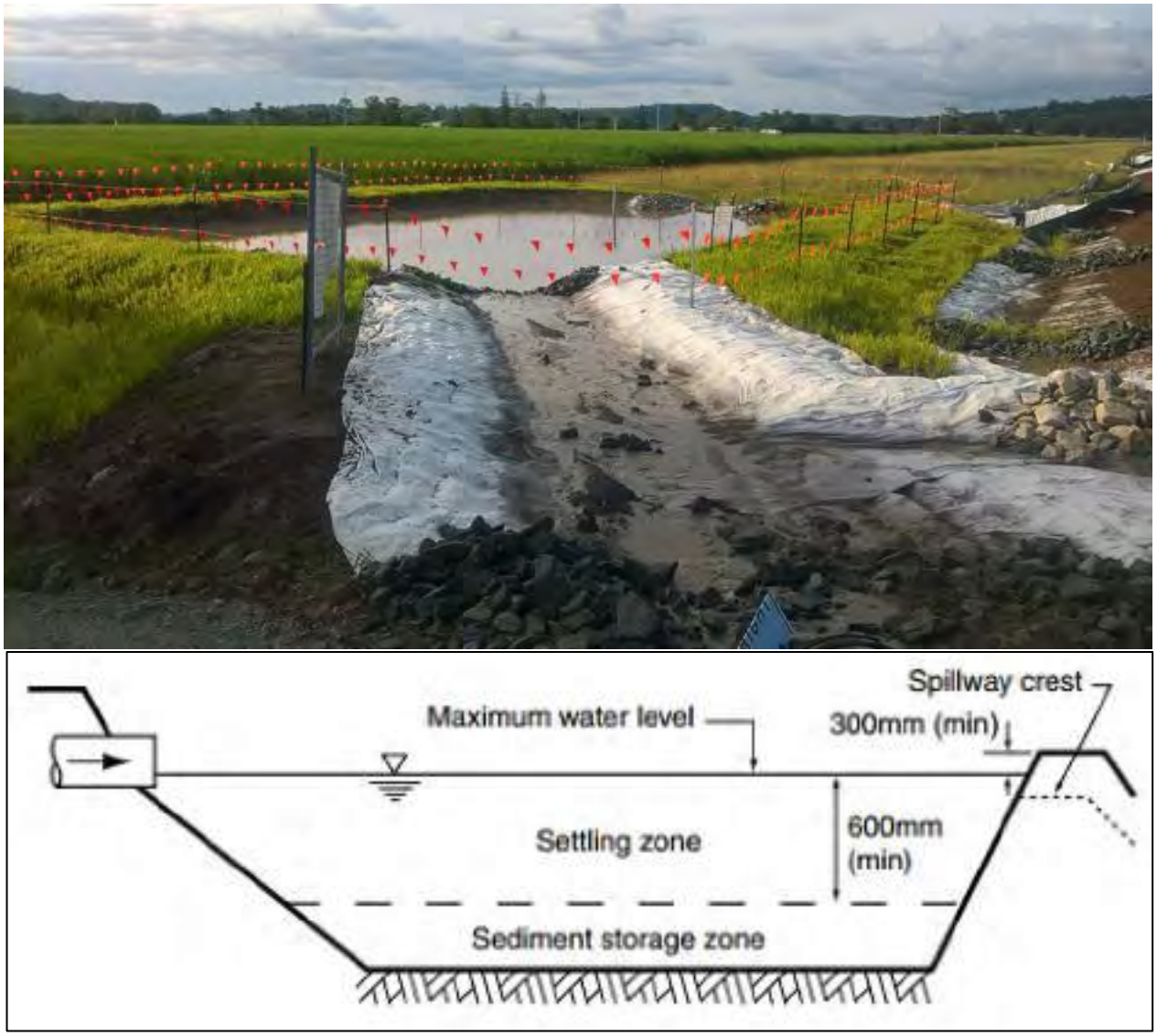


Figure 31 - Type D/F Sediment Basin

13.11. Sediment Basin Spillways

- Function of a basin spillway
  - All sediment basins, not fully recessed below natural ground level, will required the construction of a formally designed emergency spillway.
  - The spillway must have a well-defined channel profile that fully contains the nominated design storm peak discharge.
  - A suitable energy dissipater will be required at the base of the spillway.
  - Spillways are **critical engineering structures** that need to be designed by suitably qualified persons.
- Preferred location of spillways
  - Ideally, the emergency spillway should be constructed in virgin soil (i.e. around the fill embankment).
  - Controlling leakage at spillway crest
  - For rock and rock mattress lined spillways, it is important to control seepage flows through the rocks located across the crest of the spillway. Seepage control is required so that the settling pond can achieve its required maximum water level prior to discharging down the spillway.
  - Concrete capping of the spillway crest can be used to control excess seepage flows.
  - Failure to control seepage flows may result in the basin failing to achieve the required treatment standard.
- Preferred crest profile
  - It is important to ensure that the spillway crest has sufficient depth and width to fully contain the nominated design storm peak discharge.

- The spillway crest normally requires a greater depth, but equal width, to that of the downstream face of the spillway.

Figure 32 - Sediment Basin Spillway

13.12. Dewatering

Refer to **ENV P11 Dewatering Procedure** for details relevant to the testing, treatment and dewatering of sediment basins, excavations and other ponded waters on site requiring discharge.

Water quality sampling is to be recorded using **ENV10 Water Quality Sampling Form**

No construction water is to be discharged from site without approval. Approval to dewater is to be sought using the **ENV12 Dewatering Approval Form**.

AHD Australian Height Datum. A common datum used in land survey.

Base flow Underlying stream flow rate that cannot be directly attributed to storm events, and is present during part or all of dry periods.

Clay Soil particles less than 0.002 mm in equivalent diameter. When used as a soil texture group such soil contains at least 35% clay and no more than 40% silt.

Clayey soil A soil that contains at least 20% clay. These are fine-grained soils that readily form a clod when compressed in the hand, feel very smooth and sticky when wet, and are very difficult to shovel or break-up when compacted.

Clay loam A soil texture group representing a well-graded soil composed of approximately equal parts by weight of clay, silt and sand [when dispersed].

Clean water Water that either enters the property from an external source and has not been further contaminated by sediment within the property; or water that has originated from the site and is of such quality that it either does not need to be treated in order to achieve the required water quality standard, or would not be further improved if it was to pass through the type of sediment trap specified for the sub- catchment.

Contaminant Toxic substances within the environment that represent a health hazard to biota.

Cross bank A raised embankment, in a form similar to a traffic 'speed bump', with low vertical curvature placed diagonally across an unsealed road or track to collect and divert stormwater runoff off the track to a table drain or suitable discharge point.

Cross drain A drain of various forms that collect the flow of water down a track and divert it across the track surface. The capacity of the drain is defined by its cross section. Cross drains are designed to handle smaller flows than cross banks, but larger flows than can be controlled by crossfall drainage.

Dirty water Water not classified as clean water.

Dispersive / Dispersible soil A structurally unstable soil that readily disperses into its constituent particles (clay, silt and sand) when placed in water. Moderately to highly dispersible soils are normally highly erodible and are likely to be susceptible to tunnel erosion. Most sodic soils are dispersible, but not all dispersible soils may be classified as sodic. Some dispersible soils are resistant to erosion unless mechanically disturbed.

Drainage control measure Any system, procedure or material employed to: prevent or minimise soil erosion caused by 'concentrated' overland flow (including the management of rill and gully erosion); divert flow around or through a work site or soil disturbance; or divert 'clean' water away from a sediment trap; to appropriately manage the movement of 'clean' and 'dirty' water through a work site.

Drop inlet An inlet to a sub-surface drainage system located within an open area where the water falls vertically into the connecting chamber. Known also as a 'field inlet'.

Dry basin A sediment basin that is free draining, and thus begins to de-water soon after water enters the basin.

Environmental harm Any adverse effect, or potential adverse effect (whether temporary or permanent) on an environmental value.

Environmental risk The potential of an activity to cause harm, whether material, serious, reversible or irreversible, to an environmental value. It includes potential nuisance caused to a property or person.

Erosion and sediment control (ESC) The application of structural and non structural measures to control stormwater drainage, soil erosion and sediment runoff during the construction and building phases of land development. Some measures often being retained as part of the permanent site rehabilitation and stormwater management practices.

Erosion and Sediment Control Plan (ESCP) A site plan, or set of plans, including diagrams and explanatory notes, that demonstrate proposed measures to control stormwater drainage, soil erosion, and sediment runoff during the conduction/building, site stabilisation, and maintenance phases of a construction, building or other soil disturbance activity.

Erosion control measure A system, procedure or material used to prevent or reduce the effects of erosion on soil and other granular material. Within this document, erosion control measures primarily refer to those measures that can aid in the control of raindrop impact and sheet erosion.

Field inlet An inlet to a sub-surface drainage system located within an open area where the water falls vertically into the connecting chamber. Known also as a 'drop inlet'.

Flocculation The process by which colloidal or very fine clay particles, that repel one another when suspended in water, come together into larger masses or loose 'flocs' which eventually settle out of suspension

Gravel A mixture of coarse mineral particles larger than 2 mm but less than 75 mm in equivalent diameter.

Instream Any area between the banks of a constructed drainage channel, watercourse or waterway.

Instream works Any construction, building or land-disturbing activities conducted between the banks of a constructed drainage channel, watercourse or waterway.

Loam A medium-textured soil of approximate composition 10 to 25% clay, 25 to 50% silt, and less than 50% sand when dispersed. Such a soil is typically well-graded.

On-grade kerb inlet Stormwater inlet formed into the kerb of a roadway where the roadway has a positive longitudinal grade (i.e. water approaches the inlet from only one direction).

Problematic soil Any soil type of condition that potentially could result in significant short-term or ongoing environmental harm if disturbed, even if current best practice construction and ESC procedures are adopted during the disturbance. Such soil conditions are likely to include highly dispersive soils (ESP >15%) and actual or potential acid sulfate soils.

It should be noted that 'soils' are not in themselves a 'problem' or 'problematic'. The problem only arises through disturbance or management of the soil.

Proper working order Means taking all reasonable and practicable measures to sustain all ESC measures in a condition that: will best achieve the site's required environmental protection, including specified water quality objectives for all discharged water (principal objective); is in accordance with the specified operational standard for each ESC measure, where such a standard is consistent with the site's required environmental protection including specified water quality objectives for all discharged water, or where such a standard is not specified, is consistent with current best practice for each individual ESC measure; and prevents or minimises safety risks.

Regulatory authority Any local or regional external authority—whether government or non-government, including local governments and the State Government—that has a legal interest in the regulation or management of either the activity in question, or the land on which the activity is occurring, or is proposed to occur.

Return (sediment fence) That part of a sediment fence that is turned up a slope to either prevent water flowing along the fence, or flowing around the end of the fence.

Riparian zone That part of the landscape adjacent to streams that exert a direct influence on streams or lake margins and on the water and aquatic ecosystems contained within them. Riparian zones include both the stream banks and a

variable sized belt of land alongside the banks. Riparian zones have been defined in a legal context in some States as a fixed width along designated rivers and streams.

Sag kerb inlet Stormwater inlet formed into the kerb of a roadway where the roadway has a zero longitudinal grade (i.e. stormwater approaches the inlet from both directions).

Sand A soil separate consisting of particles between 0.02 and 2.0 mm in equivalent diameter when dispersed. Fine sand is defined as particles between 0.02 and 0.2 mm, and coarse sand as those between 0.2 and 2.0 mm.

Sandy soil A soil that contains at least 50% sand. These are coarse-grained soils that are easy to shovel and break-up when compacted. It is very difficult to form a clod when sandy soils are compressed in the hand.

Sediment Any clay, silt, sand, gravel, soil, mud, cement, fine-ceramic waste, or combination thereof, transported from its area of origin.

Sediment control measure Any system, procedure or material used to filter, trap or settle sediment from sediment-laden waters

Settling pond 1. That portion of a sediment basin in which sediment-laden water ponds and sedimentation occurs. 2. A sediment trap typically used in de-watering operations to settle sediment from sediment-laden water. A settling pond differs from a Stilling Pond in that it incorporates an outlet structure that allows the pond to freely drain.

Sheet flow Water flowing at a thin, near-uniform depth that is significantly less than the width of flow.

Short-term stockpile On a building site it is a stockpile that is located on-site or off-site for less than 24 hours. On a construction site it is a stockpile that is located on-site or off-site for less than 30 days.

Significant rainfall Unless otherwise defined, rainfall that is sufficient to cause runoff given a specific soil type and soil moisture condition.

Silt Silt is a soil separate consisting of particles between 0.002 and 0.02 mm in equivalent diameter i.e., intermediate between clay and fine sand sized particles.

Spill-through weir A level weir installed in a sediment fence, U-shaped sediment trap, or other sediment trap to control the maximum water levels within the trap specifically to reduce the risk of undesirable flooding and/or to reduce the risk of hydraulic failure of the device.

Table drain The side drain of a road adjacent to the shoulders, and comprising part of the formation.

TSS Total suspended solids, usually reported in units of mg/L

Turbidity A measure of the clarity of water. Commonly measured in terms of Nephelometric Turbidity Units (NTU).

Type 1, Type 2, Type 3 sediment traps A classification system used to rank sediment control measures based on their ability to trap a specified grain size.

- **Type 1** sediment traps are designed to collect sediment particles less than 0.045mm in size. These sediment traps include sediment basins and some of the more sophisticated filtration systems used in de-watering operations.
- **Type 2** sediment containment systems are designed to capture sediments down to a particle size of between 0.045 and 0.14 mm. Type 2 sediment traps include rock filter dams, sediment weirs and filter ponds.
- **Type 3** sediment containment systems are primarily designed to trap sediment particles larger than 0.14 mm. These systems include sediment fences, grass buffer zones, and certain stormwater inlet protection systems.

Type C soil A soil that contains a significant proportion of coarse- grained particles (less than 33% finer than 0.02 mm) and will settle relatively quickly without the need for flocculation.

Type D soil A soil that contains a significant proportion (>10%) of fine (<0.005 mm) 'dispersible' materials that will never settle unless flocculated or coagulated. That is, where the percentage of clay plus half the percentage of silt (roughly the fraction <0.005 mm) multiplied by the dispersion percentage is equal to or greater than 10.

Type F soil A soil that contains a significant proportion of fine-grained particles (33% or more finer than 0.02 mm) and require extended settlement periods to achieve efficient settlement that may or may not benefit from chemical flocculation.

Up-slope Any location or activity that exists within the higher part of a slope relative to a reference point on the slope. Ordinarily used in reference to overland flow paths or other areas primarily subjected to sheet flow. When referring to drainage lines, channels and watercourses, the term 'upstream' is normally used.

Upstream Any location or activity that exists within, or moves towards, the higher part of a channel or watercourse relative to a reference point within the channel or watercourse. Ordinarily used in reference to drainage lines, channels and watercourses. When referring to overland flow paths or other areas primarily subjected to sheet flow, the term 'up-slope' is normally used.

Watercourse Any natural or constructed drainage channel with well-defined bed and banks, including constructed drainage channels of a natural appearance, creeks and rivers.

Waterway Any natural or constructed drainage line, watercourse with well-defined bed and banks, including creeks and rivers, and any water body including lakes, wetlands, estuaries, bays and oceans.

Windrow A ridge of soil that may build up along the edge of a track during its construction or maintenance. Windrows can be used to direct road/track runoff to a stable outlet, in which case it is called a 'windrow drain'.

Appendix C: Contaminated, Acid Sulphate & Sodic Soil CP

1. PURPOSE

This plan has been developed to outline how the FK Gardner and Sons Group will address contaminated, acid sulphate or sodic soil, if these soils are identified on a Project.

2. SCOPE / EXCLUSIONS

All FK Gardner and Sons Group employees, contractors and subcontractors are required to adhere to the guidelines in this management plan.

3. INTERNAL RFERENCE DOCUMENTS

- **CG01 Legal Compliance Register**
- **Risk Register (Lucidity)**
- **ENV05 Waste Material Tracking Log**
- **ENV06 Environmental Inspection Checklist**
- **WHS01 Environmental Health & Safety Incident & Injury Report**
- **WHS47 Design Risk Assessment**

4. EXTERNAL REFERENCE DOCUMENTS

Contaminated Land Register
Department of Environment and Heritage Protection (EHP)
Environmental Management Register (EMR)
Environmental Protection Act 1994
Queensland Acid Sulphate Soil Technical Manual – Soil Management Guidelines Version 3.8
Soil Conservation Act 1986

5. DEFINITIONS

Acid Sulphate Soil (ASS)	Soil that contains high levels of iron sulphides which, when exposed to oxygen, produces sulphuric acid (battery acid)
Contaminated Land / Soil	Land contaminated by a hazardous substance e.g. fuel, oil etc
Sodic Soil	Soils with an exchangeable sodium percentage (ESP) of 6% or more

6. PROCEDURE

6.1. General

Under the Environmental Protection Act 1994, polluters of a site are primarily responsible for any contaminated soils which are caused by their activities.

Options for dealing with contaminated soil include:

- On-site remediation (preferred option)
- Disposal to landfill (prior agreement of landfill operator necessary)

The Project Manager will ensure that all appropriate letters of agreement, permits, tests and test analysis are obtained before beginning work on all sites where contamination is suspected.

6.2. Non-contaminated site

The Project Manager shall ensure that the project site is not contaminated through the construction works by:

- Sourcing fill material from known suppliers / locations that are free from contaminates;
- Keeping a tracking record of all bulk earth removed offsite - **ENV05 Waste Material Tracking Log**; and
- Ensuring all potential contaminates on site are correctly stored and handled.

6.3. Acid Sulphate Soils

Identification of Acid Sulphate Soils

Acid Sulphate Soils are commonly found in coastal wetland areas, although inland 'fresh water' ASS do exist where a sulphur rich environment is present. Generally, the formation of PASS occurs when seawater or sulphate rich water mixes with organic matter and sediment containing iron oxides in waterlogged conditions with low levels of oxygen.

When the water level drops, or the earth is disturbed (i.e. through excavation), the bacteria and Iron Sulphide present in the soil rapidly reacts to the now oxygen rich environment producing Actual Acid Sulphate Soil (AASS), which has a pH of less than 4* and is a mixture of several chemicals and bacteria but most significantly, sulphuric acid and often Jarosite which is a basic hydrous sulphate of potassium and iron and is also detrimental to the environment.

The acidity released by AASS can leach into waterways resulting in massive damage to the environment, ecology, human health and can also have economic effects with the acid weakening concrete and steel structures (i.e. bridges/dams). The acid can also solubilise aluminium and other heavy metals in the surrounding soil which then move into ground water and other bodies of water forming a toxic brew.

(*With 14 being the most Alkaline, 7 being Neutral and 0 being the most Acidic a soil with a pH of 4 is 10 times more acidic than soil with a pH of 7 and 1000 more acidic than soil with a pH of 14.)

Management of Acid Sulphate Soils
In the event that acid sulphate is found to be present, the Project Manager shall determine the most appropriate management options taking into consideration:

- the physical and chemical characteristics of the acid sulphate soil;
- hydrological circumstances; and
- the environmental sensitivity of the site.

Management options include:

- Avoid disturbing the soil.
- Minimise the disturbance of the soil by redesigning the earthworks.
- Neutralisation of acid sulphate soils (e.g.: treatment with Aglime at specified rates).
- Monitoring of soil and water, before, during and after disturbance to assess likely impacts.
- Disposing of ASS to an Environmental Protection Agency approved site or a registered landfill licensed to accept the soil.
- Disposal of untreated ASS underwater to prevent possible oxidation and production of acids.

Links and References
An Introduction to Acid Sulphate Soil
Published by the National Heritage Trust and the Australian Seafood Industry Council. A fairly in depth, but easy to understand, guide on how/where ASS will occur, identification, effects on the environment and industry and guidance on the management of ASS. (Link: http://www.environment.gov.au/archive/coasts/cass/pubs/acidsulfate.pdf)
Queensland Government.
Brief outline Acid sulphate soils including identifying and managing

Link: https://www.qld.gov.au/environment/land/soil/acid-sulfate

Soils Mapping.
Link: https://www.qld.gov.au/environment/land/soil/soil-data

CSIRO
National Acid Sulfate Soils Atlas.
Link: http://www.asris.csiro.au/themes/AcidSulfateSoils.html

6.4. Sodic Soils

Identification of Sodic Soil
Sodicity affects nearly a third of all soils in Australia, causing poor water infiltration, surface crusting, erosion and waterlogging.

Sodic soils are soils that contain a large amount of sodium ions (sodium atoms with a positive charge) attached to clay particles. This occurs where soluble sodium salts, such as sodium chloride, sulphate and carbonate, have broken down, so that the chlorine, sulphate and carbonate have leached away, leaving behind sodium.

When there is excess sodium attached to clay particles, the soil swells and the clay particles disperse when in contact with water, rather than sticking together, causing the soil structure to slump and collapse. Tiny particles of dispersed clay then block soil pores and cracks.

Sodic can occur at any depth in the soil. Soils affected by sodicity are often alkaline (pH above 8.5), which further restricts the growth of plants.

Management of Sodic Soil
The presence of Sodic Soil below the site surface may affect the drainage of the site as sodium present in the soil attaches itself to clay particles which may swell preventing water from soaking through and draining away.

High levels of Sodium in the surface layer of the soil may lead to accelerated erosion of the site.

The Project Manager shall confirm if the site has Sodic Soil. Tests to confirm the PH level of the soil shall be conducted on both the topsoil and the subsoil layers.

Sodic soils may be treated by:
- Capping, using a mixture of gypsum, top soil and grass seed
- Treating with gypsum.

Links and References
Simple testing methods are outlined in the online document Department of Primary Industries Victorian Resources Online. (Link:http://www.dpi.vic.gov.au/dpi/vro/vrosite.nsf/pages/sodic_soils)

Rates of Gypsum application are detailed at Department of Primary Industries Victorian Resources Online. (Link:http://www.dpi.vic.gov.au/dpi/vro/vrosite.nsf/pages/sodic_soils)

Maps showing the dispersion of Sodic Soil in Australia may be found at Department of Primary Industries Victorian Resources Online. (Link:http://www.dpi.vic.gov.au/dpi/vro/vrosite.nsf/pages/sodic_soils)

Maps of Queensland's Sodic Soil areas may be found at What is a Sodic Soil? Identification and management options for construction sites and disturbed lands. (An article by SR Raine and BJ Loch). Link: http://www.usq.edu.au/users/raine/index_files/Raine&Loch_WhatIsASodicSoil_2003.pdf

What is a Sodic Soil? Identification and management options for construction sites and disturbed lands. (An article by SR Raine and BJ Loch). Link: http://www.usq.edu.au/users/raine/index_files/Raine&Loch_WhatIsASodicSoil_2003.pdf

6.4. Contaminated Soils – Registered Site
In the event that the site is listed on the Environmental Management Register or the Contaminated Soil Register, the Project Manager shall determine the most appropriate management options, taking into consideration:
- The degree and type of contamination; and
- The likely effects of the contamination on the surrounding environment.

Management options include:
- On-site remediation where appropriate;
- Disposal of contaminated soil through approved, licensed disposal sites.
- Managing any stockpiled contaminated soil to minimise the risk to the environment – **ENV06 Environmental Inspection Checklist.**

Where disposal is the required option, the Project Manager shall ensure that a Disposal permit is sourced prior to the disposal of soil from a Registered Site.

Application for Disposal Permits should be lodged with the Department of Environment and Resource Management.

7. REPORTING
The Site Supervisor maintains the sites Environmental Health & Safety through weekly checks using **ENV06 Environmental Inspection Checklist** and through maintaining **ENV05 Waste Material Tracking Log.**

In the event of contamination issue which has not been controlled as per the above procedure, the site Site Supervisor shall complete an Incident report within Lucidity

Appendix D: ISO14001 - Certificate

eQual assurance

CERTIFICATE OF CONFIDENCE

This is to certify that

FK Gardner & Sons P/L

275 McDougall Street, Toowoomba QLD 4350, Australia
Suite 2, Level 1, 34 Aplin Street, Cairns QLD 4870, Australia
Unit 2/458 Flinders Street, Townsville QLD 4810, Australia
Unit 1/11 Sturt Street, Parkhurst QLD 4702, Australia
Suite 8, Level 2, 335 Wharf Road, Newcastle NSW 2300, Australia
106 Newmarket Road, Windsor QLD 4030, Australia

conforms to the requirements of

ISO 14001:2015

Environmental management systems

The design, development and construction of projects relating to retail, industrial, mining, commercial and domestic construction, civil engineering of earthworks, road, water and bridge construction, subdivision and infrastructure works, and the implementation of traffic management plans and guidance schemes including operational traffic control.

Certificate number:	FKGQ02-CCEE01	**Certified date:**	9 November 2010
Approval date:	21 June 2021	**Expiry date:**	8 November 2022

Robert Howell
DipMgt
Assurance Manager
Equal Assurance

ISO 14001 certified Equal Assurance

JAS-ANZ

IAF

Equal Assurance Pty Ltd as trustee for The Equal Assurance Trust.
45/44 Kings Park Road, West Perth WA 6005, AUSTRALIA

Appendix E: Water Management Control Plan

1. PURPOSE

This plan identifies the process used to minimise the impact the commercial activities which the FKG Group (FKG) may have on the sustainable use of, and protection from degradation of water courses, lakes, springs, overland flows, groundwater aquifers and other natural ecosystems associated with these water courses.

2. SCOPE / EXCLUSIONS

This document outlines the measures used for the control of water on site and for the use of water on site.

Procedures for controlling the effects of water flowing through and/or off site and other causes of erosion (eg wind) are outlined in **ENV P01 Erosion and Sediment Control Management Procedure.**

All onsite activities that the FKG control or during the FKG scope of works may have the potential to impact upon the use and quality of water on site.

All FKG personnel and subcontractors are required to adhere to the guidelines in this Water Management Control Plan.

3. INTERNAL REFERENCE DOCUMENTS

CG01 Legal Compliance Register

Risk Register (Lucidity)

ENV06 Environmental Inspection Checklist

ENV P01 Erosion & Sediment Control Management Procedure

WHS01 Environmental Health & Safety Incident & Injury Report

WHS47 Design Risk Assessment

4. EXTERNAL REFERENCE DOCUMENTS

Environmental Protection (Water) Policy 2009

5. DEFINITIONS

Groundwater	Water from the water table, an artesian or sub-artesian aquifer.
Overland flow water	Water, including floodwater, flowing over land, other than in a watercourse or lake, after having fallen as rain or after rising to the surface naturally from underground.
Surface water	Water in a natural spring, lake, or watercourse

6. PROCEDURE

6.1. General

Those undertaking activities for, or on behalf of the FKG, must understand the water balance involved in their activities and

- Manage water extraction and usage
- Minimise water waste

6.2. Protection of Surface and Groundwater

Sites used for water extraction shall consider:

- Client designated fill points
- Avoiding disturbance to landscapes and wetlands with significant aesthetic, cultural, tourism environmental and/or wilderness value.
- Utilisation of existing infrastructure or facilities.
- The tenure of the land and the rights of legitimate land users.

During the planning process the project manager shall obtain the necessary approvals, licences, permits and certificates required by statutory authorities, other regulatory bodies and client representatives prior to extracting or interfering with surface and/or groundwater.

6.3. Groundwater Extraction

Where groundwater is extracted for use in processing, production or utilities, the Project Manager shall ensure that accurate logs of the quantity and quality of extracted water shall are maintained to comply with client and/or regulatory requirements.

The following shall be considered during the monitoring process:

- Compliance with allowable and planned extraction rates
- Ongoing sustainable yield of source taking into account proposed and existing bores
- Volume of water extracted
- Aquifer drawdown
- Quality of water extracted based on routine sampling

The quantity of water extracted (including for camp usage, road building and dust suppression) shall be managed to minimise usage and potential degradation of waters and/or land.

6.4. Recycled Water

Water should be recycled wherever practicable to reduce raw water consumption and minimise waste disposal.

Potential sources of recycled water include:

- Produced formation water
- Process water
- “Grey” water from showers, kitchens, laundries, etc
- Wash-down water (vehicles, equipment and workshop washing)
- Treated water from Waste Water Treatment Plant

Potential uses for recycled water include:

- Dust suppression (roads, plant)
- Process water
- Firefighting water
- Irrigation of gardens, sports fields and rehabilitation areas
- Wash down water (vehicles, equipment and workshop washing)
- Maintenance of wetlands during dry periods

7. DEWATERING

Dewatering is the removal and treatment of collected water from foundations, pits and trenches as part of project related construction activities.

Water which has been treated to an acceptable level will generally be discharged into the environment. However, at no time will discharged waters be allowed to adversely impact on the environment or be released directly to a water course or drain.

Several different methods are available for dewatering including water for irrigation of revegetated areas or dust suppression, vacuum trucks, or filtration and treatment (flocculation).

Project location, proximity to sensitive areas, budget and time constraints will determine the likely method for dewatering. The most likely methods used will be filtration and flocculation.

Water to be released must be free of hydrocarbon odours, scums or slicks, sediments, waste materials or other visible contaminates. In acid sulphate soil areas, pH of water must also be checked to ensure that the pH of the water is within target

levels. Water must not be released within close proximity to a building, service or structure and must not cause scouring at the release point.

7.1. Selection of Dewatering Method – Field Test

To determine the method of handling discharge water, fill a 500mm soft drink bottle with the water in question and hold it up to the light.

- If you can see through the bottle, use the filtration method to discharge the water.
- If you cannot see through the water you will need to treat the water using the flocculation method.

It is the responsibility of the Project Manager / Site Supervisor to determine the method of discharge used during dewatering of the site.

Clean surface water may be discharged to a suitable area without the need for filtration. A suitable method of dissipation such as a section of rock, sediment fence or geofabric may be required at the discharge point to prevent scouring.

7.2. Filtration Method

This method should be used when the levels of suspended sediment are minimal.

a. Update the WMS to identify and manage the dewatering process. DO NOT dewater until the hazards are sufficiently controlled.

b. The discharge area should be stable and well vegetated and away from the work areas. Water flowing into the discharge area must be filtered via a sediment fence, geofabric sock or other filtration device. Ensure the inlet is suspended above the mud or silt in the bottom of the water column.

c. Once pumping begins look for changes in colour, turbidity and viscosity as indicators of suspended sediment in the water being discharged. Dewatering should be stopped if evidence of suspended sediment is present.

d. When dewatering has finished remove the filtration device when sufficiently dry. Only slight ground staining should be evident.

7.3. Flocculation Method

This method should be used when levels of suspended sediment are high or when working next to sensitive areas. Potential downstream impacts must be assessed as part of the WMS and a MSDS for the selected flocculent filed on site.

a. Update the WMS to identify and manage the dewatering process. DO NOT dewater until the hazards are sufficiently controlled.

b. Excavate a settling pit below and away from the work area with enough capacity to contain the expected quantity of water to be discharged. It is possible to use an existing excavation for this purpose if it is sufficient depth.

c. Ensure the inlet is suspended above the mud or silt in the bottom of the watering column. Anchor the discharge hose to ensure the water is pumped continuously into the settling pit. Monitor the incoming water level and cease dewatering if close to overflowing. All pits must be barricaded to prevent injury.

d. Add the flocculent to the pit as it is filling to assist with the mixing. The flocculent must be thoroughly mixed through the water. Gypsum is likely to be the most suitable flocculent. Application rates will vary depending on the soil type but will range from 3kg to 10kg per 10,000 litres. Allow to settle for at least 3 days to ensure all sediment settles prior to dewatering.

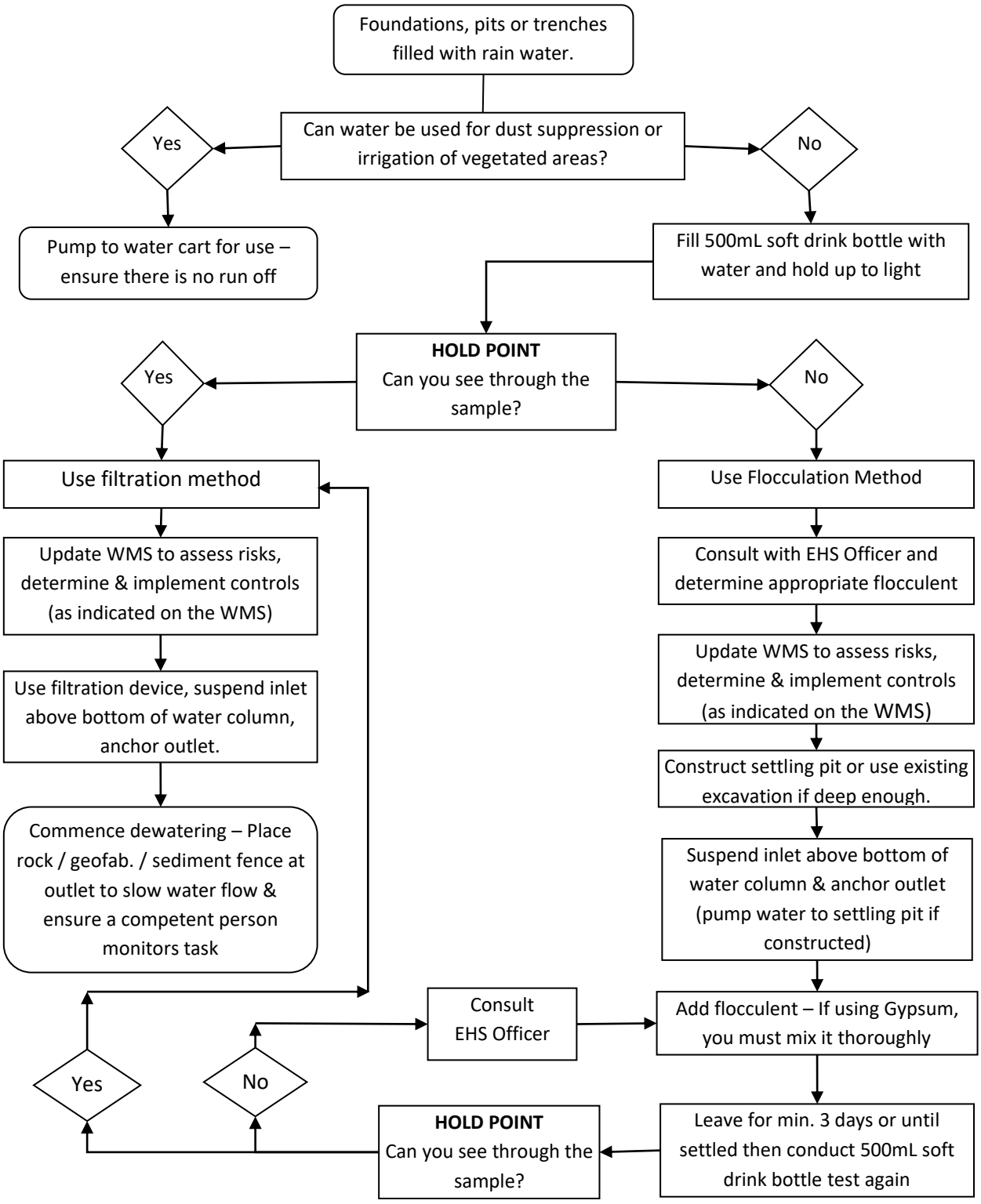
e. Once dewatering is complete backfill pits. Remove any sediment fencing or containment devices that are no longer required.

7.4. Work Instructions

In addition to the above instructions all employees are required to observe the following:

- Carry out sampling to determine the nature and concentration of the contaminant in water know to contain harmful pollutants and use an alternative form of disposal.
- Dewatering directly into a drain, culvert, gutter, creek, stream or river is to be avoided at all times.
- Discharging water within close proximity to a building, service or structure is to be avoided at all times.
- Ensure the discharge waters are released through a filtration device into a stable and well vegetated area to prevent scouring (avoid dispersive soils, disturbed areas, fill batters and steep slopes)
- Ensure adequate controls are in place before beginning to discharge water.
- Waters accumulated in Acid Sulphate Soils / Potential Acid Sulphate Soils should be tested and treated as appropriate before discharging.

Dewatering Process



8. REPORTING

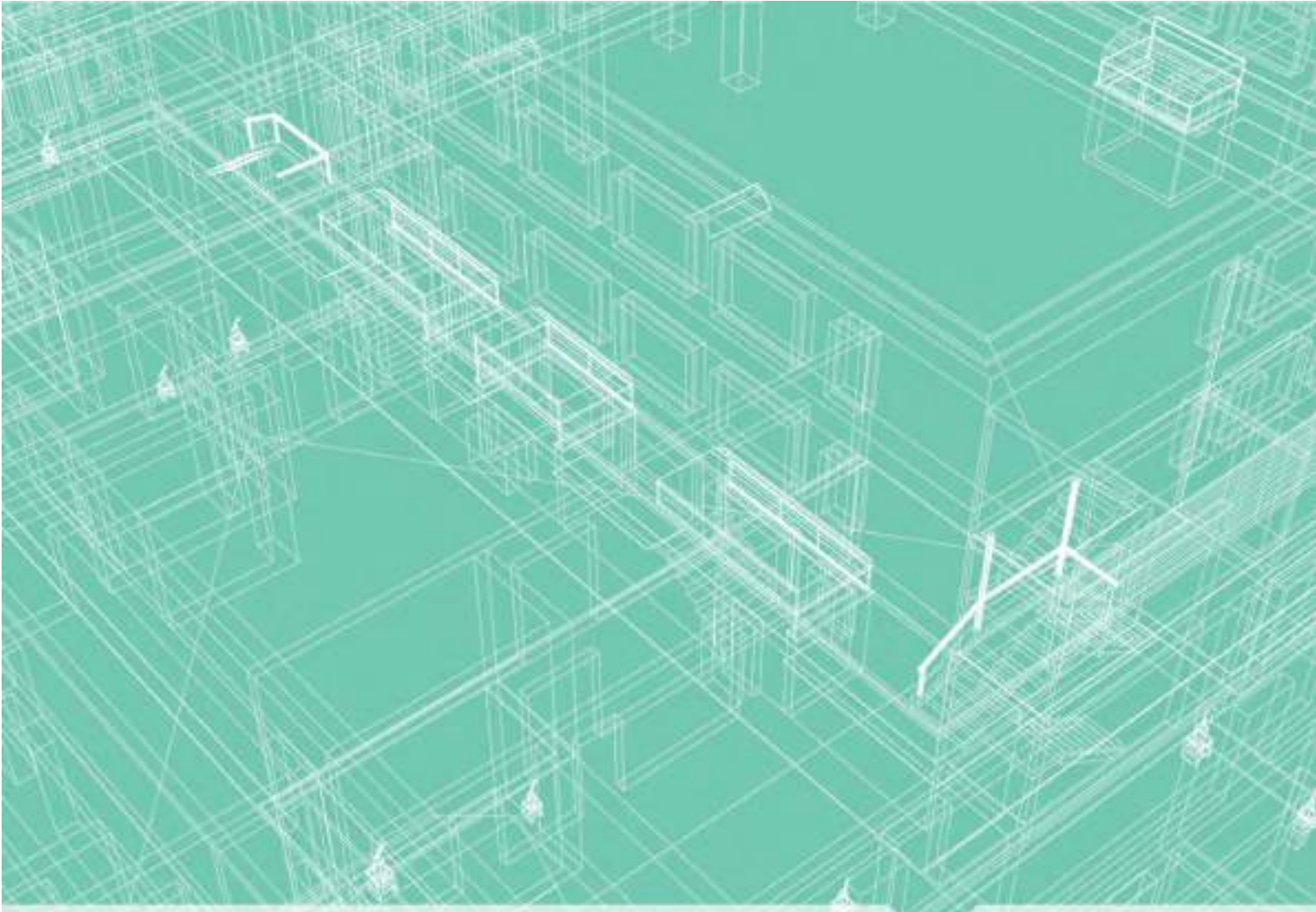
Water use and management is considered during the Design phase of a project - **WHS47 Design Risk Assessment** is completed, and issued, by the designer prior to handing the project over for construction.

EHS PRA Environmental Health & Safety Project Risk Assessment is completed by the Project Manager prior to the commencement of the project.

The site Supervisor monitors the use of water on site through **ENV06 Environmental Inspection Checklist.**

The Lucidity Incident Module is utilised by the Site Supervisor in the event of an environmental issue arising.

Appendix F: Noise and Vibration Management Plan



CONSTRUCTION NOISE AND VIBRATION MANAGEMENT PLAN

HASTINGS SECONDARY COLLEGE UPGRADE
PORT MACQUARIE CAMPUS

JHA

JHASERVICES.COM

This report is prepared for the nominated recipient only and relates to the specific scope of work and agreement between JHA and the client (the recipient). It is not to be used or relied upon by any third party for any purpose.

DOCUMENT CONTROL SHEET

Project Number	200360
Project Name	Hastings Secondary College Upgrade – Port Macquarie Campus
Description	Construction Noise and Vibration Management Plan
Key Contact	Bill Rushworth

Prepared By

Company	JHA
Address	Level 23, 101 Miller Street, North Sydney NSW 2060
Phone	61-2-9437 1000
Email	@jhaengineers.com.au
Website	www.jhaservices.com
Author	Dean Hunter and Jorge Reverter (MAAS)
Checked	Jorge Reverter
Authorised	Tom Hamer

Revision History

Issued To	Revision and Date						
FK Gardner & Sons	REV	P1	A	B	C		
	DATE	29/10/2021	02/11/2021	06/12/2021	25/02/2022		
	REV						
	DATE						

CONTENTS

1 INTRODUCTION 5

1.1 Overview 5

1.2 Purpose of the CNVMP 5

1.3 Noise and Vibration Issues 6

1.4 Responsibilities 6

2 DESCRIPTION OF THE PROPOSAL 7

2.1 Site Details 7

2.2 Noise Sensitive Receiver Details 8

3 SITE MEASUREMENTS 9

3.1 General 9

3.2 Short-term Noise Monitoring 9

3.3 Long-term Noise Monitoring 10

4 NOISE AND VIBRATION CRITERIA 12

4.1 Relevant Codes and Standards 12

4.2 Regulatory Framework 12

4.2.1 Environmental Planning and Assessment (EP&A) Act 1979 12

4.2.2 Protection of the Environmental Operations (POEO) Act 1997 12

4.3 State Significant Development Coditions of consent 13

4.4 NSW Interim Construction Noise Guideline 14

4.5 Vibration Criteria 15

4.5.1 Human Comfort 15

4.5.2 Structural Building Damage 16

5 CONSTRUCTION ACTIVITIES 18

5.1 Description of Works 18

5.2 Proposed Construction Working Hours 18

5.3 Typical Equipment and Noise Levels 18

6 CONSTRUCTION NOISE AND VIBRATION ASSESSMENT 20

6.1 Assessment Methodology 20

6.2 Noise Assessment 20

6.2.1 Demolition 20

6.2.2 Earthworks 22

6.2.3 Structure 23

6.2.4 façade 24

6.2.5 Fitout 25
6.2.6 Landscaping 27
6.3 Vibration Assessment 28
7 NOISE AND VIBRATION CONTROLS 29
7.1 Respite Periods 29
7.2 General Controls for Noise and Vibration 29
7.2.1 Noise 29
7.2.2 Vibration 30
7.3 Universal Work Practices 30
7.4 Community Communication 31
7.5 Managing Noise Levels and Maintenance Program for Plant and Equipment 33
7.6 Works Timing Restrictions and Scheduling 34
7.7 Additional Noise and Vibration Controls 34
7.8 Monitoring Program 35
7.9 Workers Training and Awareness 36
7.10 Occupational Health and Safety 37
7.11 Construction Traffic Routes 37
8 CONCLUSIONS 38
APPENDIX A: LONG TERM NOISE MONITORING 39

1 INTRODUCTION

1.1 OVERVIEW

JHA Consulting Engineers has been engaged by FK Gardner & Sons to provide a Construction Noise and Vibration Management Plan (CNVMP) for the proposed construction works at Hastings Secondary College (Port Macquarie Campus), previously known as Port Macquarie High School.

The proposed works include:

- Demolition works to accommodate new works;
- Upgrade to school entry;
- Construction of new two (2) storey Creative and Performing Arts (CAPA) building;
- Construction of new Shared Multi-Sport Facility (SMSF);
- Partial refurbishment of Building L;
- Refurbishment and alteration to Building B;
- Removal of Building S and demountable buildings;
- New lift connections, covered outdoor learning area (COLA) and covered walkways;
- Associated earthworks, landscaping, stormwater works, service upgrades; and
- Tree removal / tree safety works.

The following documentation has been used for the preparation of this report:

- Noise data collected on site through the use of noise loggers;
- Noise & Vibration Impact Assessment for SSDA, JHA Engineers;
- Architectural Drawings, FJMT Architects.

This document and related work have been prepared following JHA Consulting Engineers Quality and Environmental Management Systems, which are based on AS/NZS ISO 9001:2015 and ISO 14001:2015.

1.2 PURPOSE OF THE CNVMP

The purpose of this CNVMP is to ensure that noise and vibration impacts due to Construction activities are appropriately managed in accordance with relevant legislation and standards, plus protection of nearby sensitive Noise Catchment Areas (NCA's). The objectives of this acoustic assessment are:

- Address SSD Condition of Consent B16 – Construction Noise and Vibration Management Plan.
- Identify NCA's that will potentially be affected by the works.
- Carry out noise surveys to determine existing ambient and background noise levels on site.
- Establish the appropriate noise level and vibration criteria in accordance with the relevant standards, guidelines and legislation.
- Determine whether the relevant criteria can be achieved based on assumed construction works and plant for the noise assessments. Where applicable, provide recommendations for any necessary acoustic control measures that will need to be incorporated into the development or use in order to ensure with the assessment criteria.
- Provide recommendations for Construction Noise and Vibration Planning.

This CNVMP identifies the Contractor's obligations and the requirements to manage noise and vibration during construction such that the necessary allowances within the construction costs, programmes and work methodologies can be made. Relevant legislation, guidelines and standards are identified in this CNVMP.

1.3 NOISE AND VIBRATION ISSUES

This CNVMP addresses all stages from construction works associated with the proposed development. The construction works will contribute noise and vibration emissions to the surrounding environment. Typically, this will comprise of continuous and intermittent noise and vibration from on-site construction equipment and plant equipment.

Construction noise associated with the project may include airborne and ground-borne noise impacts as follows:

- Airborne Noise: Proposed construction works will generate noise that will propagate through the air. Airborne noise generated by external construction activities is likely to impact on surrounding sensitive NCA's.
- Ground-borne noise and vibration impacts: Construction and piling works have the potential to generate noise and vibration that propagates through the ground and building structural elements which is then radiated by vibrating wall and floor surfaces of nearby sensitive NCA's.

1.4 RESPONSIBILITIES

The main Contractor must be responsible for ensuring that the noise and vibration from activities carried out on site are minimised as far as practical.

The Contractor is responsible for:

- Ensuring that any site noise and vibration plus any complaints, are monitored, investigated, managed and controlled in accordance with the recommendations provided in this plan.
- Ensuring procurement documents specify any particular requirements in relation to the management of noise and vibration.
- Ensuring all works are undertaken in accordance with the requirements of the contract documents and this plan.
- Ensuring all project personnel and sub-contractors employed are aware of their responsibilities in regard to the management of noise and vibration during construction and assume the responsibilities assigned to them within the plan.
- Monitoring and managing noise and vibration impacts on sensitive NCA's, in accordance with the requirements of the relevant guidelines and standards.
- Consulting with the occupants of surrounding buildings to inform them of the nature of the construction works, to determine any specific noise and vibration sensitivity they may have and to negotiate respite times during noisier works.

2 DESCRIPTION OF THE PROPOSAL

2.1 SITE DETAILS

The site is located approximately 1.2km south east of the Port Macquarie town centre, with access from Oxley Highway (Gordon Street) via Owen Street to the centre, William Street via Owen Street to the north and Burrawan Street via Owen Street to the south. A Maintenance access road exists to the east of the site along Burrawan Street.

The site is located at 16 Owen Street, Port Macquarie and is legally known as Lot 111 in DP 1270315. The Port Macquarie Campus site is located within a coastal setting (east), with residential (single two storey and residential flat buildings) located to the west and south and Port Macquarie Bowling Club to the north. The surrounding street network provides on-street parking. Maintenance vehicular access is located off Burrawan Street.

Figure below shows the site boundary and surrounding areas.

Figure 1: Map showing location of site.

2.2 NOISE SENSITIVE RECEIVER DETAILS

A summary of the nearest noise sensitive receivers, grouped into NCA's, surrounding the site is shown in Table 1, including approximate distances from the site to the NCA's boundaries, noting also the type of receiver within the NCA's.

Noise Catchment ID	*Identifier*	*Receiver Type*	*Building Type*	*Distances from boundaries (m)*
1	Port City Bowling Club	Active Recreational	Multi-storey sporting clubhouse	10
2	Oxley Oval	Active Recreational	--	50
3	28-36 Burrawan Street	Residential	Single and Multi-storey residential buildings	140
4	15-35 Owen Street	Residential	Single and Multi-storey residential buildings	30
5	5-11 Owen Street	Residential	Multi-storey residential building	30

Table 1: NCA's surrounding the site and the approximate distances from boundaries.

Figure 2 shows the location of the Hastings Secondary College site (yellow shading with dotted red outline) and the NCA's as described in Table 1 above. Residential NCA's are shown in blue shading and Active Recreation NCA's are shown in orange.

Figure 2: Aerial view of the site and surrounding NCA's.

It is noted that if noise and vibration impacts associated with the proposed development are controlled at the nearest sensitive NCA's, then compliance with the recommended criteria at all NCA's should be achieved.

3 SITE MEASUREMENTS

3.1 GENERAL

Attended and unattended noise surveys were conducted in the locations shown in Figure 3 to establish the ambient and background noise levels of the site and surrounds. JHA Consulting Engineers carried out the noise surveys, in accordance with the method described in the *'AS/NZS 1055:2018 Description and measurement of environmental noise'*.

Figure 3: Noise survey locations and boundary of the site.

3.2 SHORT-TERM NOISE MONITORING

Short-term noise monitoring was carried out to obtain representative third-octave band noise levels of the site. On Tuesday 8th December 2020, short-term noise measurements were carried out during day-time. Short-term noise measurements were carried out with a NTi XL-2 hand-held Sound Level Meter (SLM) (Serial Number A2A-13742-E0). The calibration of the SLM was checked before and after each use and no deviations were recorded.

The SLM microphone was mounted 1.5 metres above the ground and a windshield was used to protect the microphone. Measurements were undertaken in the free-field – i.e. more than 3 metres away from any building façade or vertical reflective surface. Weather conditions were calm and dry during the attended noise monitoring.

From observations during the noise survey, it is noted that ambient noise levels are dominated by low activity of students in the school grounds and low traffic flows.

A summary of the results of the short-term noise monitoring are shown in Table 2.

Location	Date and Time	Parameter	Sound Pressure Level, dB re 20µPa								
			Overall dB(A)	Octave Band Centre FrequeNCAy, Hz							
				63	125	250	500	1k	2k	4k	8k
S1	08/12/2020 10:33am – 10:48am	$L_{90,15min}$	49	54	51	45	43	45	41	32	26
		$L_{eq,15min}$	53	60	59	53	47	49	46	37	34
		$L_{10,15min}$	54	63	60	53	48	51	46	38	37
S2	08/12/2020 10:59am – 11:14am	$L_{90,15min}$	49	55	52	47	44	44	41	35	29
		$L_{eq,15min}$	62	69	62	63	60	57	54	49	42
		$L_{10,15min}$	63	68	63	61	60	59	55	50	43
S3	08/12/2020 11:20am – 11:35am	$L_{90,15min}$	48	54	49	44	42	43	39	36	29
		$L_{eq,15min}$	57	62	58	55	53	54	49	46	39
		$L_{10,15min}$	60	64	60	58	55	57	51	46	39
S4	08/12/2020 11:37am – 11:52am	$L_{90,15min}$	49	56	53	48	44	44	40	35	26
		$L_{eq,15min}$	59	65	65	58	55	56	51	44	38
		$L_{10,15min}$	63	67	65	61	58	59	54	48	39

Table 2: Results of short-term noise monitoring.

3.3 LONG-TERM NOISE MONITORING

Long-term noise monitoring was carried out from Tuesday 8th December to Tuesday 15th December 2020 with a Rion NL-52 noise logger (Serial Number 00175549). The noise logger recorded L_{A1}, L_{A10}, L_{Aeq} and L_{A90} noise parameters at 15-minute intervals during the measurement period. The calibration of the noise logger was checked before and after use and no deviations were recorded.

The noise logger was located on the proposed development site – facing Owen Street – as shown in Figure 3. The location was secured and is considered to be representative of the typical ambient and background noise levels plus traffic noise levels along Owen Street.

The noise logger microphone was mounted 1.5 metres above the ground and a windshield was used to protect the microphone. Weather conditions were monitored during the unattended noise monitoring period.

The detailed results of the long-term noise monitoring are presented graphically in Appendix A. As stated in the NSW NPI, any data likely to be affected by rain, wind or other extraneous noise has been excluded from the calculations (shaded in the Appendix A graphs).

The Ambient Background Levels (ABLs) have been established in general accordance with the methodology described in the NSW NPI, i.e. 10th percentile background noise level (L_{A90}) for each period of each day of the ambient noise survey. The median of these levels is then presented as the RBLs (Rating Background Levels) for each assessment period.

These RBLs are shown in Table 3, together with the ambient noise levels (L_{Aeq}) measured for each period.

Location	Rating Background Levels, dB(A)			L_{Aeq} Ambient Noise Levels, dB(A)		
	Day 7am-6pm	Evening 6pm-10pm	Night 10pm-7am	Day 7am-6pm	Evening 6pm-10pm	Night 10pm-7am
L1	46	39	38	58	55	50

Table 3: Results of long-term noise monitoring.

4 NOISE AND VIBRATION CRITERIA

4.1 RELEVANT CODES AND STANDARDS

In preparing this CNVMP, the following documentation including legislation, codes, standards and guidelines have been considered:

- Regulatory Framework:
  - Environmental Planning and Assessment (EP&A) Act 1979.
  - Protection of the Environmental Operations (POEO) Act 1997.
- State Significant Development Conditions of Consent.
- Construction Noise and Vibration:
  - NSW Department of Environment and Climate Change (DECC) *'Interim Construction Noise Guideline'* (ICNG) 2009.
  - NSW DECC Assessing Vibration: A Technical Guideline 2006.
  - NSW Transport Roads & Maritime Services (RMS) *'Construction Noise and Vibration Guideline'* 2016.
  - Australian Standard AS 2436:2010 *'Acoustics – Guide to Noise Control on Construction, Maintenance & Demolition Sites'*.
  - British Standards Institution BS 6472:2008 *'Evaluation of human exposure to vibration in buildings (1 to 80 Hz)'*.
  - British Standards Institution BS 7385.2:1993 *'Evaluation and Measurement for Vibration in Buildings. Guide to Damage Levels from Ground-borne Vibration'*.

4.2 REGULATORY FRAMEWORK

4.2.1 ENVIRONMENTAL PLANNING AND ASSESSMENT (EP&A) ACT 1979

The Environmental Planning and Assessment Act 1979 (EP&A Act) provides the regulatory framework for the protection of the environment in NSW. The EP&A Act is relevantly about planning matters and ensuring that "environmental impact" associated with the proposed development is properly considered and reasonable before granting development consent to develop.

The assessment of "environmental impact" relies upon the identification of acceptable noise criteria which may be defined in a Development Control Plan, or derived from principles using guidelines like NSW EPA Noise Policy for Industry (NPI 2017) or Noise Guide for Local Government (NGLG 2013).

4.2.2 PROTECTION OF THE ENVIRONMENTAL OPERATIONS (POEO) ACT 1997

The Protection of the Environment Operations (POEO) Act 1997 has the objective to protect, restore and enhance the quality of the NSW environment. Abatement of noise pollution is underpinned by the definition of *"offensive noise"* as follows:

"...

(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 is likely to be harmful to) a person who is outside the premises 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.

..."

Noise Guide for Local Government (NGLG) 2013, provides a consideration checklist to determine an *"offensive noise"*.

4.3 STATE SIGNIFICANT DEVELOPMENT CODITIONS OF CONSENT

This CNVMP has been prepared to address SSD Condition of Consent B16. This condition states the following:

"B16 – Construction Noise and Vibration Management Sub-Plan.

The Construction Noise and Vibration Management Sub-Plan must address, but not 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 B17(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 B17(d)."*

4.4 NSW INTERIM CONSTRUCTION NOISE GUIDELINE

The ICNG suggest construction noise management levels that may minimise the likelihood of annoyance being caused to noise sensitive residential NCA's depending on the duration of works. The management levels for long-term duration works are as follows for residential NCA's.

Time of Day	*NML $L_{Aeq,15min}$*	*How to Apply*
ICNG Criteria for Recommended Standard Hours: Mon-Fri 7am-6pm Sat 8am-1pm No work on Sundays or public holidays	Noise affected: RBL + 10dB	The noise affected level represents the point above which there may be some community reaction to noise. ▪ Where predicted or measured $L_{Aeq,15min}$ is greater that the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. ▪ The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected: 75dB(A)	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 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. 2. If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
ICNGC Criteria for Outside Recommended Standard Hours *Refer to approved hours from the Consent Conditions*	Noise affected: RBL + 5dB	▪ A strong justification would typically be required for work outside the recommended standard hours. ▪ The proponent should apply all feasible and reasonable work practices to meet the noise affected level. ▪ Where all feasible and reasonable practices have been applied and noise is more than 5dB(A) above the noise affected level, the proponent should negotiate with the community.

Table 4: ICNG construction airborne noise criteria for residential NCA's surrounding the construction site.

In order to establish the airborne construction noise criteria, noise levels from the unattended noise monitoring have been used for the NCA's– refer to Section 2. Table 5 below summarises the airborne construction noise criteria for most affected noise catchment areas surrounding the development site.

Sensitive NCA		*Airborne Construction Noise Criteria, L_{Aeq} dB(A)*	
		Within Standard Hours	*Outside Standard Hours*
Residential	Noise affected / External	56	51
	Highly noise affected / External	75	NA
Active Recreation	When in use	65	NA

Table 5: ICNG construction airborne noise criteria for NCA's surrounding the site.

Where reference is made to an internal noise level, an external noise level 10dB above the internal noise levels are applied which should achieve the internal noise level where a window is adequately opened to provide natural ventilation.

The ICNG recommends internal ground-borne noise maximum levels at residences affected by nearby construction activities. Ground-borne noise is noise generated by vibration transmitted through the ground into a structure and can be more noticeable than airborne noise for some sensitive NCA's. The ground-borne noise levels presented below from the ICNG are for residential NCA's during evening and night-time periods only, as the objective is to protect the amenity and sleep of people when they are at home.

- Evening: $L_{Aeq,15min}$ 40dB(A) (internal)
- Night: $L_{Aeq,15min}$ 35dB(A) (internal)

The internal noise levels are assessed at the centre of the most affected habitable room. No assessments of ground borne noise have been conducted as no out of hours work is proposed to occur during evening time and night time.

4.5 VIBRATION CRITERIA

There are two items that shall be considered in the assessment of vibration impacts from construction works. These include vibration impacts in terms of human comfort and building damage.

4.5.1 HUMAN COMFORT

The Department of Environment and Climate Change (DECC) developed the document *'Assessing Vibration: A Technical Guideline'* in February 2006 to assist in preventing people from exposure to excessive vibration levels within buildings. It is based on the guidelines contained in BS 6472.1:2008 *'Guide to evaluation of human exposure to vibration in buildings – Vibration sources other than blasting'*. The guideline does not however address vibration induced damage to structures or structure-borne noise effects.

Vibration and its associated effects are usually classified as follows:

- *Continuous vibration*. An uninterrupted vibration for a defined period. This type of vibration is assessed on the basis of weighted root-mean-squared (rms) acceleration values.
- *Impulsive vibration*. A vibration which has a rapid build up to a peak followed by a damped decay that may or may not involve several cycles of vibration (depending on the frequency and damping).
- *Intermittent vibration*. An interrupted periodic vibration of continuous or repeated periods of impulsive vibration, or continuous vibration that varies significantly in amplitude. This type of vibration is assessed on the basis of Vibration Dose Values (VDV).

Vibration criteria for continuous and impulsive vibration are presented in Table 6, in terms of vibration velocity levels. The values are assessed for the most critical frequency range (higher than 8 Hz assuming sinusoidal motion). When assessing intermittent vibration comprising a number of events, it is recommended that the Vibration Dose Value (VDV) is used Table 7 shows the acceptable VDV values for intermittent vibration.

NCA Type	Time	RMS velocity, mm/s [dB ref 10^{-6}mm/s]			
		Continuous Vibration		Impulsive Vibration	
		Preferred	Maximum	Preferred	Maximum
Residences	Day-time	0.20 [106 dB]	0.40 [112 dB]	6.00 [136 dB]	12.00 [142 dB]
	Night-time	0.14 [103 dB]	0.28 [109 dB]	2.00 [126 dB]	4.00 [132 dB]
Offices, schools, educational and worship	When in use	0.40 [112 dB]	0.80 [118 dB]	13.00 [142 dB]	26.00 [148 dB]

Table 6: Continuous and impulsive vibration criteria applicable to the site. Note: Day-time is 07:00am to 10:00pm and night-time is 10:00pm to 07:00am.

Place	Time	Vibration Dose Values, $m/s^{1.75}$	
		Preferred	Maximum
Residences	Day-time	0.20	0.40
	Night-time	0.13	0.26
Offices, schools, educational and worship	When in use	0.40	0.80

Table 7: Intermittent vibration criteria applicable to the site.

4.5.2 STRUCTURAL BUILDING DAMAGE

4.5.2.1 Structural Building Damage

Ground vibration from construction activities can damage surrounding buildings or structures. For unoccupied buildings, or during periods where the buildings are unoccupied, the vibration criteria for building damage suggested by German Standard DIN 4150.3:2016 *'Structural Vibration – Effects of Vibration on Structures'* and British Standard BS 7385.2:1993 *'Evaluation and Measurement for Vibration in Buildings'* are to be adopted. Guideline values from DIN 4150.3:2016 and BS 7385.2:1993 are presented in Table 8 and Table 9 respectively.

Structural type	RMS velocity, mm/s			
	Foundation			Plane of floor uppermost full storey
	Less than 10Hz	10 to 50Hz	50 to 100Hz	Frequency mixture
Buildings used for commercial purpose, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
Particularly sensitive	3	3 to 8	8 to 10	8

Table 8: DIN 4150.3:2016 Guideline values of vibration velocity for evaluating the effects of short-term vibration.

Structural type	*Peak particle velocity, mm/s*	
	4 to 15Hz	*15Hz and above*
Unreinforced or light framed structures Residential or light commercial type buildings	15mm/s @ 4Hz increasing to 20mm/s @ 15Hz	20mm/s @ 15Hz increasing to 50mm/s @ 40Hz and above

Table 9: BS 7385.2:1993 Guideline values of vibration velocity for evaluating cosmetic damage.

5 CONSTRUCTION ACTIVITIES

A construction noise and vibration impact assessment has been carried out as per the provided construction plant for all the phases of construction work. The Contractor will be responsible for preparing a Works Plan and Schedule which include all relevant noise and vibration information.

5.1 DESCRIPTION OF WORKS

Refer to Table 10 for the assumed stages of work that have been assessed, and which typical construction plant and equipment will be used during these stages.

Stage of Works	*Plant and Construction Equipment in use*
Demolition	Excavator with hammer attachment, concrete saw, Excavator with bucket, 25t truck, front end loader
Earthworks	Excavator with bucket, bored piling rig, Truck (>20tonne), front end loader
Structure	Concrete pump, concrete agitators & mobile crane, hand tools, angle grinder
Façade	Mobile crane, electric hand-tools
Fitout	Mobile crane, electric hand-tools
Landscaping	Concrete pump, concrete agitator, small excavator with buckets, delivery truck

Table 10: Stages of work and associated construction plant.

5.2 PROPOSED CONSTRUCTION WORKING HOURS

The following construction hours as per DECC ICNG are proposed as follows:

- Monday to Friday: 7am to 6pm.
- Saturday: 8am to 1pm.
- Sundays and Public Holidays: No excavation or construction works.

It is recommended that high noise level works – piling, rock hammering, braking, etc – shall only occur during the periods of the SSD Condition C8 hours - 9am to 12pm and 2pm to 5pm.

Deliveries will be scheduled and distributed to ensure avoidance of congestion to surrounding roads networks and within the precinct. Materials handling will be conducted within the construction site perimeter reducing any impacts on traffic flows within the area, when feasible.

5.3 TYPICAL EQUIPMENT AND NOISE LEVELS

In accordance with the information provided and in order to assess potential noise and vibration impacts during works from a quantitative point of view, the construction noise sources for the works occurring during the project and the associated equipment noise levels have been assumed and are listed in Table 11.

These levels are based on the databases published by Australian Standard 2436:2010 '*Guide to Noise Control on Construction, Maintenance & Demolition Sites*', Roads and Maritime Services '*Construction Noise and Vibration Guideline*' and the UK Department for Environmental, Food and Rural Affairs (DEFRA).

Stage of works	*Item*	*Typical Sound Power Level L_{Aeq} (dB ref 1pW)*	*Typical Sound Pressure Level L_{Aeq} at 10m (dB ref 20μPa)*
Demolition	30t Excavator	113	85
	Truck (>25tonne)	111	83
	Front end loader	113	85
	Excavator Rock breaker	118	90
	Demolition Saw	117	89
Earthworks	30t Excavator	113	85
	Truck (>20tonne)	107	79
	Bored Piling Rig	111	83
	Front end loader	113	85
Structure	Concrete pump	108	80
	Concrete agitator	109	76
	Mobile Crane	104	76
	Electric Hand-Tools	102	74
	Angle grinders	102	74
Façade	Electric Hand-Tools	102	74
	Mobile Crane	104	76
Fitout	Mobile Crane	104	76
	Electric Hand-Tools	102	74
Landscaping	Delivery Truck	107	79
	Concrete pump	108	80
	Concrete agitator	109	76
	8t Excavator	108	80

Table 11: Anticipated maximum airborne noise levels for equipment / plant used during the different stages of the works.

6 CONSTRUCTION NOISE AND VIBRATION ASSESSMENT

A construction noise and vibration assessment has been carried out based on typical plant and machinery expected throughout the works associated as per Section 5.

6.1 ASSESSMENT METHODOLOGY

An assessment of the likely noise and vibration impacts of the assumed stage of works on the most affected noise sensitive receivers surrounding the site has been carried out. The assessment has been considered the following:

- Typical construction activities considered in the noise impact are detailed in Section 5.1.
- Proposed construction hours as per Section 5.2.
- Typical noise source levels considered in the noise impact are detailed in Section 5.3.
- Project specific noise and vibration criteria at sensitive NCA's as outlined in Section 4.
- A typical 3m high solid hoarding is installed on the boundary of the work sites.
- The predictions consider continuous operation of the construction plant over the 15-minute assessment period plus a range of distances from the site boundaries.

It should be noted that the predicted noise levels generated during the construction works may vary depending on many factors including:

- Final selection of plant and equipment which could differ from the plant presented in Table 11.
- Exact location of equipment and plant on site – relative to the noise catchment areas.
- Shielding of noise provided by structures and hoardings on and around the site.
- Reflections provided by existing structures on and around the site.

6.2 NOISE ASSESSMENT

Refer to Sections below for the predicted noise levels for the stages of work as detailed in Table 10. These levels are typically representative of the worst case 15 minutes that would be expected. The predicted noise levels at noise sensitive receiver locations are calculated to 1.5m above ground level, at the most affected point externally of each noise catchment area that has been identified as the most affected.

The ICNG requires, and it is usual practice, to predict the reasonable worst-case noise level. For construction-type activities this will typically be when plant is operating close to an assessment location. However, it shall be considered that on larger construction sites (such as this one) where plant moves around, noise will not be at the reasonable worst-case noise level throughout the entire duration of the activity: it will be lower when the plant is further away. Therefore, it can be stated that noise levels will be lower at times throughout the construction activity

6.2.1 DEMOLITION

Demolition works will take place on various locations within the site. Figure 4 shows the approximate location of demolition works on site and the nearest NCA's.

Table 12 shows the predicted range of sound pressure levels at the boundary of the nearest NCA's areas due to the assumed construction plant for the demolition works. Allowances have been made for distances attenuation, shielding and reflections.

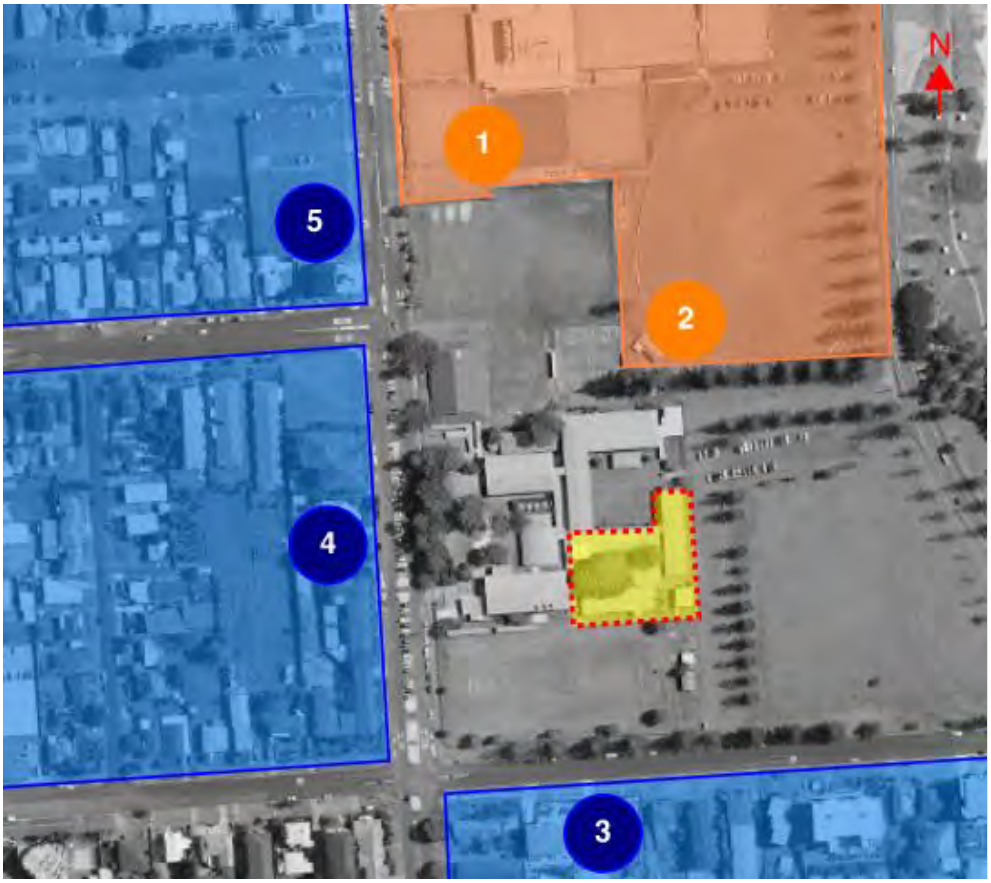


Figure 4: Demolition works (yellow shading with red dotted outline) on site and nearest NCA's.

Item	Typical Noise Level L_{WA} dB	Predicted Noise Levels $L_{Aeq,15min}$, dB(A) (ref. 20μPa)				
		NCA 1	NCA 2	NCA 3	NCA 4	NCA 5
30t Excavator	113	57-58	69-75	59-62	62-66	58-60
Truck (>25tonne)	111	55-56	67-73	57-60	60-64	56-59
Front end loader	113	57-58	69-75	59-62	62-66	58-60
Excavator Rock breaker	118	60-61	72-78	62-65	65-69	61-64
Demolition Saw	117	56-58	68-75	59-62	61-65	57-60

Table 12: Predicted airborne noise levels for equipment used during demolition works at the nearest NCA's areas.

Results show that predicted construction noise levels are expected to exceed all the NMLs, except for NCA 1 – Bowling Club. All construction activities within the demolition stage are expected to cause exceedances of the NML's (orange font) for NCA 2 to NCA 5.

The predicted exceedance of the NMLs in the surrounding NCA's areas triggers the proponent to apply all reasonable and feasible work practices to minimise the noise as much as possible, and community consultation, as per the requirements of the ICNG. Refer to Section 7 for details.

The excavator with rock breaker attachment is predicted to exceed the Highly Affected Noise Level of 75dB(A) to NCA 2. This predicted exceedance of the Highly Affected Noise level triggers the proponent to apply time mitigation practices – i.e respite periods – to minimise noise when this plant is in use, and use community consultation, as per the requirements of the ICNG. Refer to Section 7 for details.

6.2.2 EARTHWORKS

Earthworks works will take place on various locations within the site. Figure 5 shows the approximate location of earth-works on site and the NCA's.

Table 13 shows the predicted range of sound pressure levels at the boundary of the nearest NCA's areas due to the assumed construction plant for the earth works. Allowances have been made for distances attenuation, shielding and reflections.

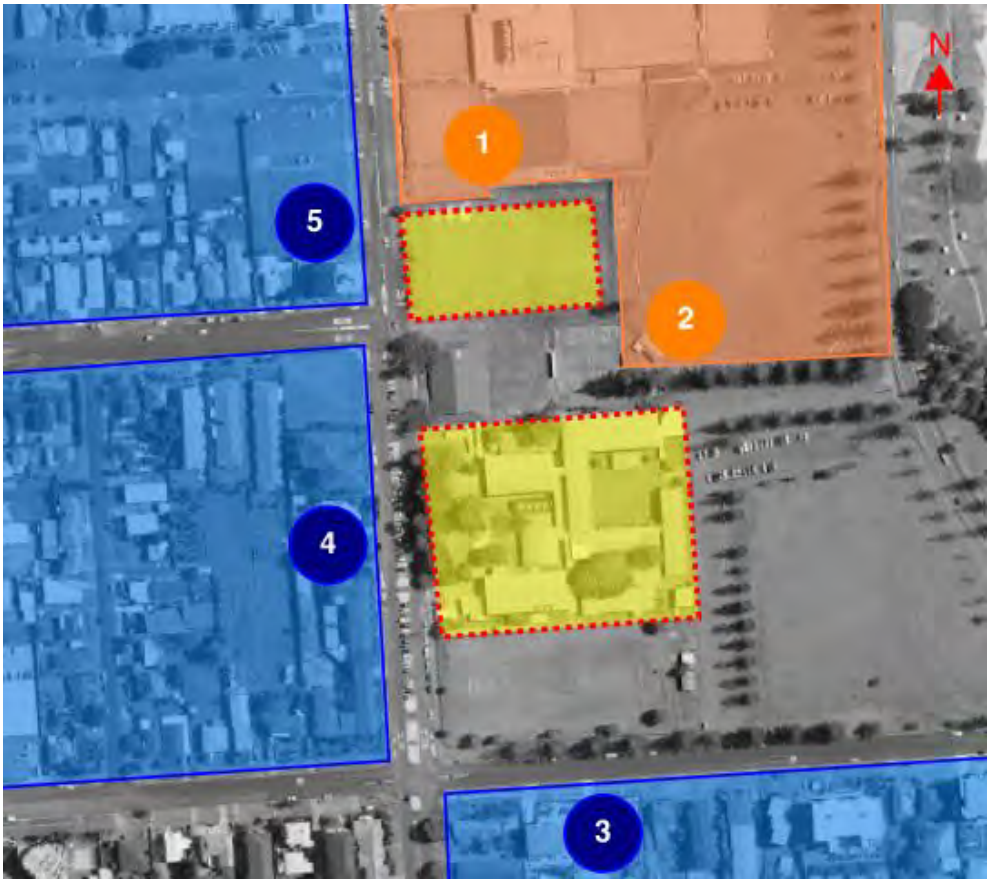


Figure 5: Earth-works onsite (yellow shadow with dotted red line) and nearest NCA's.

Item	*Typical Noise Level L_{WA} dB*	*Predicted Noise Levels $L_{Aeq,15min}$, dB(A) (re. 20μPa)*				
		NCA 1	*NCA 2*	*NCA 3*	*NCA 4*	*NCA 5*
30t Excavator	113	64-75	64-75	59-63	62-64	61-64
Truck (>20tonne)	107	55-66	55-66	50-53	51-55	52-55
Bored Piling Rig	111	64-75	64-75	59-62	62-64	60-64
Front end loader	113	64-75	64-75	59-62	62-64	61-64

Table 13: Predicted airborne noise levels for equipment used during eathworks at the nearest noise catchment areas.

Results show that predicted construction noise levels are expected to exceed the NML's of all NCA's, particularly when construction activities will take place in close proximity to the boundary. The noise emissions from the 20 tonne truck are not predicted to exceed the NML of the residential NCA's.

The predicted exceedance of the NMLs in the surrounding NCA's triggers the proponent to apply all reasonable and feasible work practices to minimise the noise as much as possible, and community consultation, as per the requirements of the ICNG. Refer to Section 7 for details.

6.2.3 STRUCTURE

Structural works will take place in various locations within the site. Figure 6 shows the approximate location of structural works on site and the nearest NCA's.

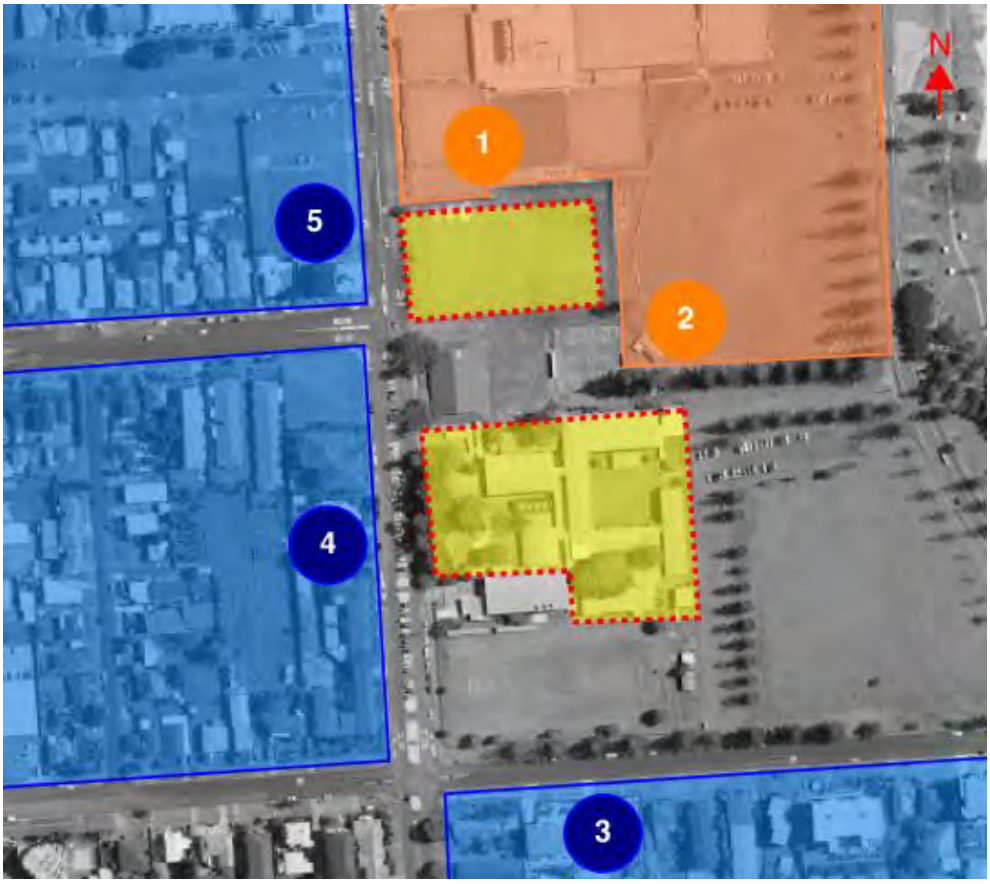


Figure 6: Structural works onsite (yellow shadow with dotted red line) and NCA's.

Table 14 shows the predicted range of sound pressure levels at the boundary of the nearest NCA's areas due to the assumed construction plant for the structural works. Allowances have been made for distances attenuation, shielding and reflections.

Item	Typical Noise Level L_{WA} dB	Predicted Noise Levels $L_{Aeq,15min}$, dB(A) (re. 20µPa)				
		NCA 1	NCA 2	NCA 3	NCA 4	NCA 5
Concrete pump	108	61-72	61-72	56-59	59-61	61-64
Concrete agitator	109	63-74	63-74	58-61	61-63	60-63
Mobile Crane	104	55-66	55-66	50-53	53-55	52-55
Electric Hand-Tools	102	53-64	53-64	48-51	51-53	50-53
Angle grinders	102	53-64	53-64	48-51	51-53	50-53

Table 14: Predicted airborne noise levels for equipment used during structural construction works at the nearest NCA's.

Results show that predicted construction noise levels are expected to exceed the NMLs, in all catchment areas for certain construction plant – i.e. Concrete pump, concrete agitator and mobile crane.

The predicted exceedance of the NMLs in the surrounding NCA's triggers the proponent to apply all reasonable and feasible work practices to minimise the noise as much as possible, and community consultation, as per the requirements of the ICNG. Refer to Section 7 for details.

6.2.4 FAÇADE

Façade works will take place in various locations within the site Figure 7 shows the approximate location of façade works on site the NCA's.

Table 15 shows the predicted range of sound pressure levels at the boundary of the nearest NCA's areas due to the assumed construction plant for the façade works. Allowances have been made for distances attenuation, shielding and reflections.

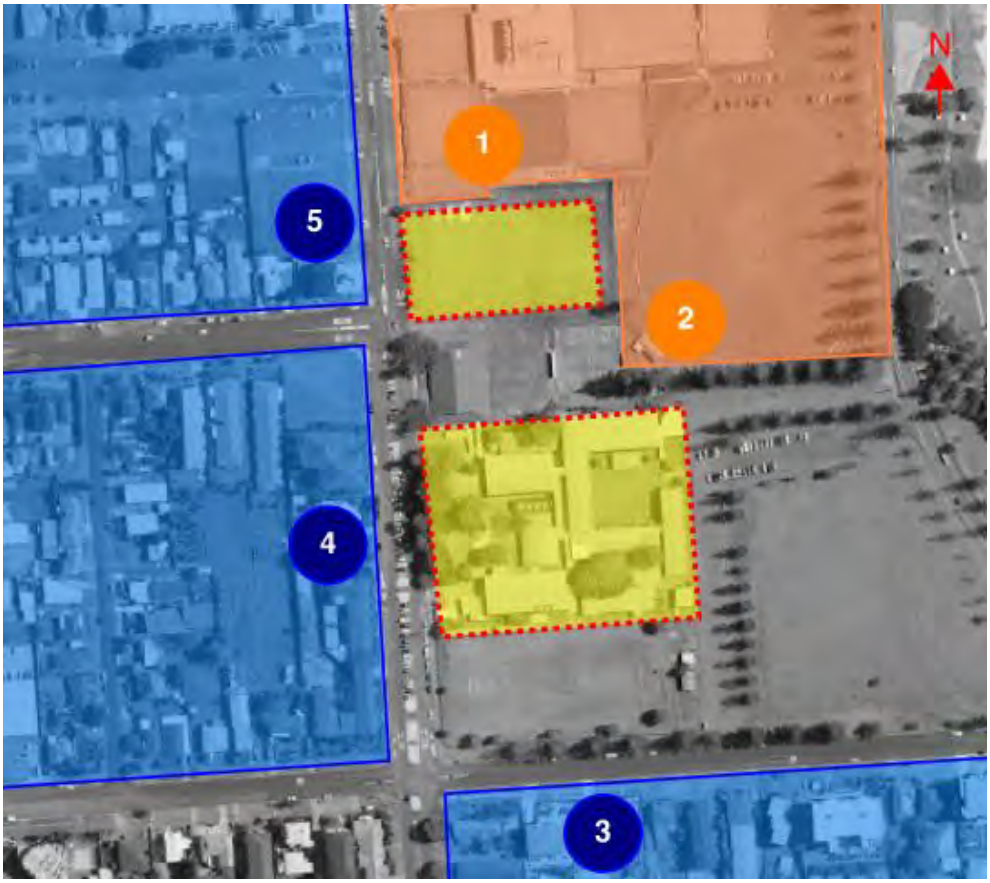


Figure 7: Façade works onsite (yellow shadow with dotted red line) and NCA's.

Item	*Typical Noise Level L_{WA} dB*	*Predicted Noise Levels $L_{Aeq,15min}$, dB(A) (re. 20µPa)*				
		NCA 1	*NCA 2*	*NCA 3*	*NCA 4*	*NCA 5*
Electric Hand-Tools	102	53-64	53-64	48-51	51-53	50-53
Mobile Crane	104	55-66	55-66	50-53	53-55	52-55

Table 15: Predicted airborne noise levels for façade construction works at the nearest NCA's.

Results show that predicted noise levels from the mobile crane are expected exceedances to slightly exceed the NML of NCA 1 and NCA 2 by 1dB when at close distances. These exceedances are considered negligible and therefore, no action is required.

6.2.5 FITOUT

Fitout works will take place in various locations within the site. It should be noted that some plant will be used within buildings and, therefore, their noise emissions will be attenuated by the shell of the façade. In this stage of works the hand tools have been modelled within an enclosed building and have been attenuated accordingly. Figure 8 shows the approximate location of fitout works on site and the nearest NCA's.

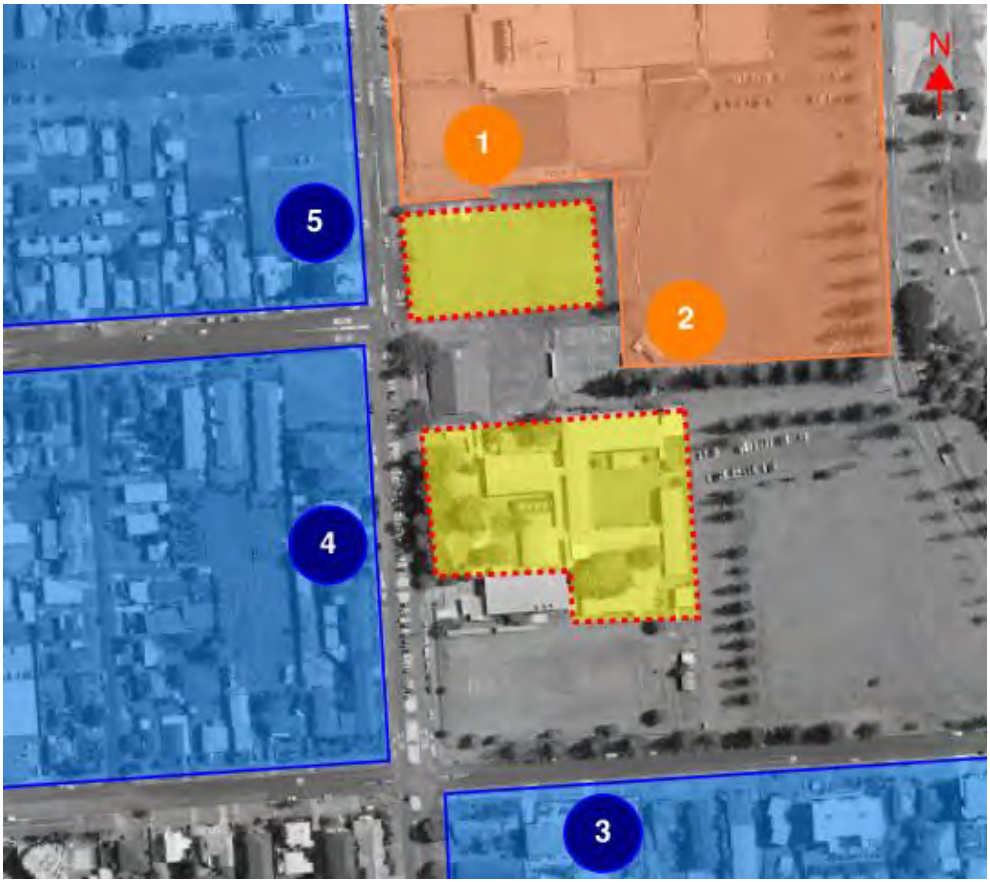


Figure 8: Fitout works onsite (yellow shadow with dotted red line) and NCA's.

Table 16 shows the predicted range of sound pressure levels at the boundary of the nearest noise catchment areas due to the assumed construction plant for the fitout works. Allowances have been made for distances attenuation, shielding and reflections.

Item	*Typical Noise Level L_{WA} dB*	*Predicted Noise Levels $L_{Aeq,15min}$, dB(A) (re. 20µPa)*				
		NCA 1	*NCA 2*	*NCA 3*	*NCA 4*	*NCA 5*
Electric Hand-Tools	102	53-64	53-64	48-51	51-53	50-53
Mobile Crane	104	55-66	55-66	50-53	53-55	52-55

Table 16: Predicted airborne noise levels for fitout construction works at the nearest noise catchment areas.

Results show that predicted noise levels from the mobile crane are expected exceedances to slightly exceed the NML of NCA 1 and NCA 2 by 1dB when at close distances. These exceedances are considered negligible and therefore, no action is required.

6.2.6 LANDSCAPING

Landscaping works will take place in various locations within the site. Figure 9 shows the approximate location of landscaping works on site and the nearest NCA's.

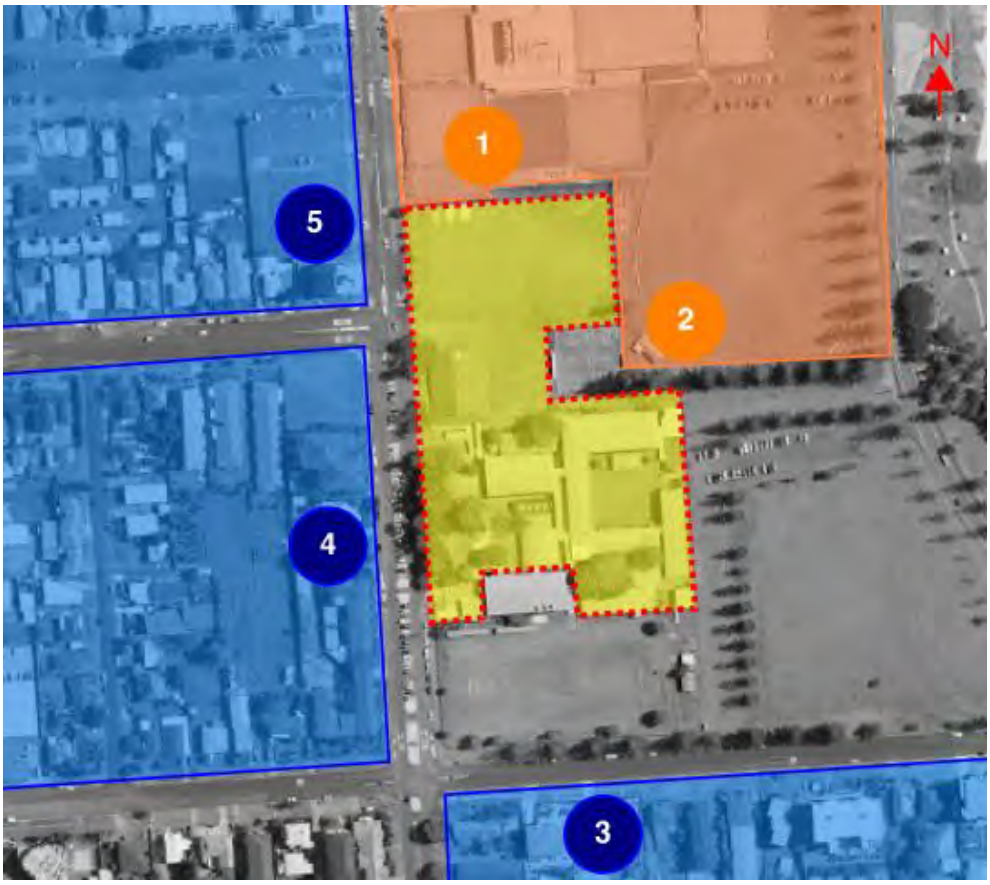


Figure 9: Landscaping works onsite (yellow shadow with dotted red line) and NCA's.

Table 17 shows the predicted range of sound pressure levels at the boundary of the nearest noise catchment areas due to the assumed construction plant for the landscaping works. Allowances have been made for distances attenuation, shielding and reflections.

Item	*Typical Noise Level L_{WA} dB*	*Predicted Noise Levels $L_{Aeq,15min}$, dB(A) (re. 20µPa)*				
		NCA 1	*NCA 2*	*NCA 3*	*NCA 4*	*NCA 5*
Delivery Truck	107	58-69	58-69	53-56	56-58	55-58
Concrete pump	108	61-72	61-72	56-59	59-61	58-61
Concrete agitator	109	61-72	61-72	56-59	59-61	58-61
8t Excavator	108	59-70	59-70	54-57	57-59	56-59

Table 17: Predicted airborne noise levels for landscaping construction works at the nearest NCA's.

Results show that predicted construction noise levels have NML exceedances when in close proximity to NCA's. The predicted exceedance of the NMLs in the surrounding NCA's triggers the proponent to apply all reasonable and feasible work practices to minimise the noise as much as possible, and community consultation, as per the requirements of the ICNG. Refer to Section 7 for details.

6.3 VIBRATION ASSESSMENT

The vibration intensive plant used during the construction works may impact in adjacent sensitive NCA's. In order to assess the construction vibration impact due to heavy construction plant, the NSW RMS *'Construction Noise and Vibration Guideline'* provides safe working distances for vibration intensive plant and are quoted for both 'cosmetic' damage (in accordance with BS 7385.2:1993) and human comfort (in accordance with DEC's *'Assessing Vibration: A Technical Guideline'*). The recommended safe working distances are provided in Table 18.

Plant Item	*Description*	*Cosmetic Damage*	*Human Response*
Vibratory Roller	200 kN (Typically 4-6 tonnes)	12m	40m
	300 kN (Typically 7-13 tonnes)	15m	100m
Medium Hydraulic Hammer	12–18 t excavator	7m	23m
Large Hydraulic Hammer	18-34 t excavator	22m	73m
Jackhammer	Hand held	1m	Avoid contact with structure

Table 18: Recommended minimum working distances for vibration intensive plant from sensitive NCA's.

The minimum working distances are indicative and will vary depending on the particular item of plant and local geotechnical conditions. They apply to cosmetic damage of typical buildings under typical geotechnical conditions.

All work, particularly piling is to be conducted in accordance with the safe working distances. Where sheet piling is within 20m of a building, vibratory piling should be considered, and attended vibration measurements conducted in order to verify levels.

In relation to human comfort (response), the minimum working distances in Table 18 relate to intermittent vibration (VDV parameter) as for most construction activities, vibration emissions are intermittent in nature. Where the predicted vibration levels will exceed the human comfort objectives, the procedures Section 7.3.2 are to be followed in order to mitigate the potential impacts at sensitive NCA's.

If the contractor has concerns for the disruptions at the nearest sensitive NCA's due to vibration intensive plant use, it is recommended that prior to the commencement of the works, to undertake a preliminary vibration survey on each key vibration generating activity / equipment.

7 NOISE AND VIBRATION CONTROLS

This section of the Construction Noise and Vibration Planning provides general practices to be implemented and provides the criteria together with best noise and vibration control practices to be observed during the proposed works associated.

Any noise from construction activities to be carried out on site must not result in *'offensive noise'* to any noise sensitive NCA. To this end, the Contractor employed to undertake the construction works is responsible for ensuring that any site noise and, in particular, any complaints shall be monitored, investigated, managed and controlled.

7.1 RESPITE PERIODS

Respite periods will be implemented into the work methodology in order to reduce the impact onto the surrounding NCA's, as detailed in Section 7.7. The following general respite periods should be applied during these phases of demolition and excavation, primarily due to the use of rock breakers and excavators:

- The use of rock breakers or piling equipment is only permitted between 9am-12pm and 2pm-5pm.
- Rock breaking and excavation will not occur for more than 3 hours continuously, and at least a 2 hour respite period in between.

7.2 GENERAL CONTROLS FOR NOISE AND VIBRATION

According to ICNG and AS 2436:2010 *'Guide to Noise Control on Construction, Maintenance & Demolition Sites'*, the following techniques could be applied to minimise the spread of noise and vibration to the nearest sensitive NCA's. These mitigation measures will be implemented as required to keep noise levels acceptable.

7.2.1 NOISE

If a process that generates significant noise levels cannot be avoided, the amount of noise reaching the NCA should be minimised. Two ways of achieving this are to either increase the distances between the noise source and the NCA or to introduce noise reduction measures such as screens (which will be used for early works).

Physical methods to reduce the transmission of noise between the site works and residences, or other sensitive land uses, are generally suited to works where there is longer-term exposure to the noise. Practices that will reduce noise from the site include:

Restrict areas in which mobile plant can operate so that it is away from residences and other sensitive land uses at particular times.

Reducing the line-of-sight noise transmission to residences or other sensitive land uses using temporary barriers (stockpiles, shipping containers and transportable site offices can be effective barriers).

- Constructing barriers that are part of the project design early in the project to introduce the mitigation of site noise.
- Installing purpose built noise barriers, acoustic sheds and enclosures.

7.2.2 VIBRATION

Vibration can be more difficult to control than noise, and there are few generalisations that can be made about its control. It should be kept in mind that vibration may cause disturbance by causing structures to vibrate and radiate noise in addition to perceptible movement. Impulsive vibration can, in some cases, provide a trigger mechanism that could result in the failure of building components that had previously been in a stable state.

During the demolition works, some vibrations (transmitted through the existing structures nearby the demolition sites) are expected, being more of a concern for the surrounding NCA's.

It can also trigger annoyance being elevated into action by occupants of exposed buildings, and should therefore be included in the planning of communication with impacted communities. It should be remembered that failures, sometimes catastrophic, can occur as a result of conditions not directly connected with the transmission of vibrations, e.g. the removal of supports from retaining structures to facilitate site access.

Where site activities may affect existing structures, a thorough engineering appraisal should be made at the planning stage.

General principles of seeking minimal vibration at receiving structures should be followed in the first instance. Predictions of vibration levels likely to occur at sensitive NCA's are recommended when they are relatively close, depending on the magnitude of the source of the vibration or the distances associated. Relatively simple prediction methods are available in texts, codes of practice or other standards, however it is preferable to measure and assess site transmission and propagation characteristics between source and NCA locations.

Guidance for measures available for the mitigation of vibration transmitted can be sought in more detailed standards, such as BS 5228.2:2009 *'Code of practice for noise and vibration control on construction and open sites. Vibration'* or policy documents, such as the NSW DEC *'Assessing Vibration: A technical guideline'*.

Identifying the strategy best suited to the control of vibration follows a similar approach to that of noise avoidance, control at the source, control along the propagation path, control at the NCA's, or a combination of these. It is noted that vibration sources can include stationary plants (pumps and compressors), portable plants (jackhammers and pavement vibrators), mobile plants, pile-drivers, tunneling machines and activities, and blasting, amongst others. Unusual ground conditions, such as a high water-table, can also cause a difference to expected or predicted results, especially when considering the noise propagated from piling.

7.3 UNIVERSAL WORK PRACTICES

To minimise construction noise complaints due to preventable activities at any time of the day, the following work practices will be considered and implemented to ensure noise levels are kept to acceptable levels:

- Regularly train workers and contractors (such as a toolbox talks) to use equipment in ways to minimise noise.
- Ensure site managers periodically check the site and nearby residences and other sensitive land use for noise problems so that solutions can be quickly applied.

- Include in tenders, employment contracts, subcontractor agreements and work method statements clauses that require minimisation of noise and compliance with directions from management to minimise noise.
- Avoid the use of radios or stereos outdoors where neighbours can be affected.
- Avoid shouting, and minimise talking loudly and slamming vehicle doors.
- Keep truck drivers informed of designated vehicle routes, parking locations, acceptable delivery hours or other relevant practices.
- Develop a one-page summary of approval or consent conditions that relate to relevant work practices, and pin it to a noticeboard so that all site operators can quickly reference noise information.
- Workers may at times need to discuss or negotiate practices with their managers.

For work practices outside of construction hours, the following shall be considered:

- Avoid the use of equipment which generates impulsive noise.
- Minimise the need for reversing or movement alarms.
- Avoid dropping materials from a height.
- Avoid metal-to-metal contact on equipment.
- Schedule truck movements to avoid residential streets if possible.
- Avoid mobile plant clustering near residences and other sensitive land uses.
- Ensure periods of respite are provided in the case of unavoidable maximum noise level events.

7.4 COMMUNITY COMMUNICATION STRATEGY & CONSULTATION

Community consultation and complaints handling is primarily the responsibility of the Client. FK Gardner & Sons will provide assistance where possible to ensure that the client is complying with the requirements of Community Communication Strategy, developed for the upgrade works at Hastings Secondary College. Please refer to the CCS for the SINSW Hastings Secondary College.

Consultation with both Port Macquarie Hastings Council and the local Community. As a condition of consent for the SSD SINSW consulted with the local community to develop strategies for managing high noise generating works. Details were provided on how the project proposed to minimise or manage the impact on nearby properties. One response was received from the community (which is addressed at the end of this plan) and PMHC had no comments on the CVNMSP.

The Managing Construction Impacts notice of consultation was issued to the affected neighbours on 16th December and were requested to provide feedback on or before the 23rd December 2021. The letter that was issued can be referenced at the back of the CVNMP.

7.5 MANAGING NOISE LEVELS AND MAINTENANCE PROGRAM FOR PLANT AND EQUIPMENT

In terms of both cost and results, controlling noise at the source is one of the most effective methods of minimising the noise impacts from any construction activities. Recommendations for managing noise levels from plant and equipment are as follows:

- Use quieter methods (wherever possible)
  - Examine and implement, where feasible and reasonable, alternatives to rock-breaking work methods, such as hydraulic splitters for rock and concrete, hydraulic jaw crushers, chemical rock and concrete splitting, and controlled blasting such as penetrating cone fracture. The suitability of alternative methods should be considered on a case-by-case basis.
  - Use alternatives to diesel and petrol engines and pneumatic units, such as hydraulic or electric controlled units where feasible and reasonable. Where there is no electricity supply, use an electrical generator located away from residences.
- Use quieter equipment (wherever possible)
  - Examine different types of machines that perform the same function and compare the noise level data to select the least noisy machine. For example, rubber wheeled tractors can be less noisy than steel tracked tractors.
  - Noise labels are required by NSW legislation for pavement breakers, mobile compressors, chainsaws and mobile garbage compactors. These noise labels can be used to assist in selecting less noisy plant.
  - Pneumatic equipment is traditionally a problem – select super silenced compressors, silenced jackhammers and damped bits where possible.
  - When renting, select quieter items of plant and equipment where feasible and reasonable.
  - When purchasing, select, where feasible and reasonable, the most effective mufflers, enclosures and low-noise tool bits and blades. Always seek the manufacturer's advice before making modifications to plant to reduce noise.
- Operate plant in a quiet and efficient manner
  - Reduce throttle setting and turn off equipment when not being used.
  - Examine and implement, where feasible and reasonable, the option of reducing noise from metal chutes and bins by placing damping material in the bin.

The Contractor will prepare and implement a regular plant and equipment use and Maintenance program. This is to ensure that 'noisy' equipment or tools are not used. This program should ensure that the contractor will:

- Regularly inspect and maintain equipment to ensure it is in good working order. Also check the condition of mufflers.
- Equipment must not be operated until it is maintained or repaired, where Maintenance or repair would address the annoying character of noise identified.
- For machines with enclosures, check that doors and door seals are in good working order and that the doors close properly against the seals.
- Return any hired equipment that is causing noise that is not typical for the equipment – the increased noise may indicate the need for repair.
- Ensure air lines on pneumatic equipment do not leak.

7.6 WORKS TIMING RESTRICTIONS AND SCHEDULING

Works will be only carried out during periods specified by the approved Construction Hours. Scheduling noisy work during periods when people are least affected reduces noise impact on those. Recommendations for work scheduling are as follows:

- Provide respite periods.
- Schedule activities to minimise noise impacts.
  - Organise work to be undertaken during the recommended standard hours where possible.
  - When works outside the recommended standard hours are planned, avoid scheduling on Sundays or public holidays.
  - Schedule work when neighbours are not present (for example, commercial neighbours).
  - Schedule noisy activities around times of high background noise (local road traffic or when other local noise sources are active) where possible to provide masking or to reduce the amount that the construction noise intrudes above the background.
  - Consult with affected neighbours about scheduling activities to minimise noise impacts.
- Organise deliveries and access.
  - Nominate an off-site truck parking area, away from residences, for trucks arriving prior to gates opening.
  - Amalgamated loads can lead to less noise and congestion in nearby streets.
  - 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.
  - Inform, and consult where possible, the potentially noise-affected residences or other sensitive land uses of designated access routes to and from site, and make drivers aware of nominated vehicle routes.
  - Provide on-site parking for staff and on-site truck waiting areas away from residences and other sensitive land uses. Truck waiting areas may require walls to minimise noise.
  - Schedule deliveries to nominated hours only.

7.7 ADDITIONAL NOISE AND VIBRATION CONTROLS

As there will likely be times/situations when construction works are likely to exceed stated criteria at the nearest NCA's, particularly when works occur in the areas closer to the NCA's. Therefore, all feasible and reasonable noise control measures should be considered.

If, during construction, an item of equipment exceeds either the noise criteria at any location or the equipment noise level limits, the following noise control measures, together with construction best practices presented in this Section shall be considered to minimise the noise and vibration impacts of the project on the surrounding noise catchment areas.

- Schedule noisy activities to occur outside of the most sensitive times of the day for each nominated NCA. For example, the residential NCA's are likely to be more sensitive to noise before 8am and after 6pm.
- Consider implementing equipment specific temporary screening for noisy equipment, or other noise control measures recommended in Appendix C of AS2436:2010. This is most likely to apply to noisier hand-held items such as jack-hammers and circular saws.

- Locate specific activities such as carpentry areas (use of circular saws, etc.) to internal spaces or where shielding is provided by existing structures or temporary screening.
- Limit the number of trucks and heavy vehicles on site at any given time through scheduling deliveries at differing times.
- Traffic rules should be prepared to minimise the noise impact on the community.
- When loading and unloading trucks, adopt best practice noise management strategies to avoid materials being dropped from height.
- Avoid unnecessary idling of trucks and equipment, limit to maximum 5 minutes.
- Ensure that any miscellaneous equipment (extraction fans, hand tools, etc.) not specifically identified in this plan incorporates silencing/shielding equipment as required to meet the noise criteria.

If the measured construction vibration levels exceed the appropriate criteria during the works, one or more of the following measures should be taken:

- Modifications to construction equipment used.
- Modifications to methods of construction.
- Rescheduling of activities to less sensitive times.

If the measures given cannot be implemented or have no effect on noise or vibration levels or impact generated, a review of the criteria should be undertaken and the noise and vibration strategy amended.

7.8 MONITORING PROGRAM

Noise and vibration levels are recommended to be monitored from time to time to ensure that noise generated as a result of remediation and construction activities does not disturb the nearby noise and vibration sensitive receivers. Monitoring will occur weekly on any noisy day using hand held receivers.

Monitoring will be in the form of regular checks by FKG and the results will be forwarded to the Client Project Manager Currie & Brown. FKG will also monitor noise in response to any complaints received.

Where noise and vibration criteria are being exceeded or in response to valid complaints, noise and / or vibration monitoring should be undertaken. This would be performed inside the premises of the affected property and on site adjacent to the affected NCA's.

Monitoring is to be undertaken by an experienced noise and vibration monitoring professional or an acoustic consultant. The results of any noise or vibration monitoring are to be provided to the relevant party or person in a timely manner allowing the builder to address the issue and respond to the complaints.

Noise and vibration monitoring can take two forms:

- Short-term monitoring: Short-term monitoring consists of attended monitoring when critical stages of the construction are occurring. This normally provides real-time assistance and guidance to the sub-contractor on site letting them know when the noise and vibration criteria are exceeded allowing the selection of alternative method on construction or equipment selection in order to minimise noise and vibration impacts.
- Long-term monitoring: Similarly long-term monitoring uses noise and vibration loggers providing real-time alerts to the builder / site manager when the noise and vibration criteria are exceeded. Typically, the noise and vibration loggers stay on site for a period of several months for the critical construction stages of the project. Sometimes the period of construction noise and vibration monitoring is dictated by the local authorities through the Conditions of Consent if applicable.

Both methodologies are complementary and normally used simultaneously providing a significant of amount of data via the long-term monitoring but also providing information on the sources of noise and vibration generating exceedances via the short-term or attended monitoring.

The following may be included in a noise monitoring report:

- The type of monitoring conducted (for example, at a particular project stage or following complaints) and a brief statement of the measurement method.
- The noise / vibration conditions on the consent / license, or the relevant noise management objectives.
- Descriptions of the nearest affected residences and other sensitive land uses or, in the case of complaints, description of the complainant location and complaint.
- Plan or diagram showing the location of the monitoring and the noise generating works.
- Description of the instrumentation used.
- Name and relevant qualifications or professional memberships of monitoring personnel.
- The weather conditions during monitoring.
- The time(s) and duration(s) of monitoring, including dates – in the case of complaints.
- A clear description of the construction activities taking place during the monitoring.
- The results of monitoring at each monitoring location, including a comparison with the consent conditions or relevant noise management objectives.
- A clear statement outlining the project's compliance or non-compliance with the conditions or objectives.
- Where the monitored level is higher than the conditions or objectives, the reasons for non-compliance should be stated, strategies for minimising noise identified and stated, and the appropriate actions to implement the strategies.

7.9 WORKERS TRAINING AND AWARENESS

The Contractor shall provide all project personnel and subcontractors with training on the environmental obligations through project inductions, toolbox talks, and through Safety Works Methods (SWMs).

All Project work personnel and subcontractors shall undergo a general project induction prior to commencing work. This should include a noise component to reinforce the importance of noise issues and the measures that will be implemented to protect the environment.

All inductions shall be carried out by the site manager, or his designate in the site office as appropriate. During the induction, each contractor / worker shall be taken around the site to ensure they are fully aware of the exclusion zones and site specific environment.

Site inductions and daily SWMs and toolbox talks will highlight the specific environmental requirements and activities being undertaken at each work area which will include relevant noise management matters.

7.10 OCCUPATIONAL HEALTH AND SAFETY

In addition to potential noise and vibration impacts on the community and structures, construction noise and vibration can also have an adverse impact upon the health of workers. It is important that Contractors adopt noise management strategies to prevent or minimise worker exposure to excessive noise and vibration. Such measures will also assist in reducing noise and vibration impacts on the surrounding community.

The National Occupational Health and Safety Commission (NOHSC) recommends a maximum acceptable workplace noise exposure level of 85dB(A) ($L_{Aeq,8h}$) for an eight hour time period.

Personnel involved in operations should be issued with ear plugs or ear muffs which must be used whenever noise levels interfere with normal speech when individuals are standing at a distance of 1m from each other, or when the $L_{Aeq,8hr}$ exceeds 85dB(A).

Signs should be erected and made visible at the entry to all areas where noise levels will exceed 85dB(A).

7.11 CONSTRUCTION TRAFFIC ROUTES

The contractor shall establish and implement traffic routes for deliveries to the site, which minimise the noise impact on surrounding noise catchment areas as best possible.

8 CONCLUSIONS

A noise assessment has been carried out for the proposed construction works associated with the Hastings Secondary College (Port Macquarie Campus), previously known as Port Macquarie High School. This report addresses the Condition of Consent B16 of the State Significant Development.

In particular, this report identifies the Contractor's obligations and the requirements to manage noise and vibration during construction such that Contractor can make the necessary allowances within the construction costs, programmes and work methodologies.

The responsibilities of all stakeholders are identified and a framework for the management of noise and vibration during construction works is provided.

This report establishes relevant noise level criteria, details the acoustic assessment and provides comments and recommendations for the proposed development.

Potential construction noise and vibration impacts on the surroundings have been presented in this report and recommendations based on the relevant guidelines are provided. It is expected that the predicted exceedance of the NMLs in the surrounding NCA's triggers the proponent to apply all reasonable and feasible work practices to minimise the noise as much as possible, and community consultation, as per the requirements of the NSW ICNG. Refer to Section 6 for details.

For each of these work stages and associated plant, and assuming that in fact are exceeding the noise level criteria, then the noise control measures presented in Section 7 shall be considered and implemented wherever reasonable and feasible in order to minimise any potential noise impact. Operation time restrictions shall be applied to 'noisy' construction plant to minimise noise impact to the nearest sensitive NCA's.

The information presented in this report shall be reviewed if any modifications to selection of equipment / machinery, construction methodologies and modifications to the works construction program.

Based on the information presented in this report, relevant objectives will be satisfied and therefore approval is recommended to be granted.

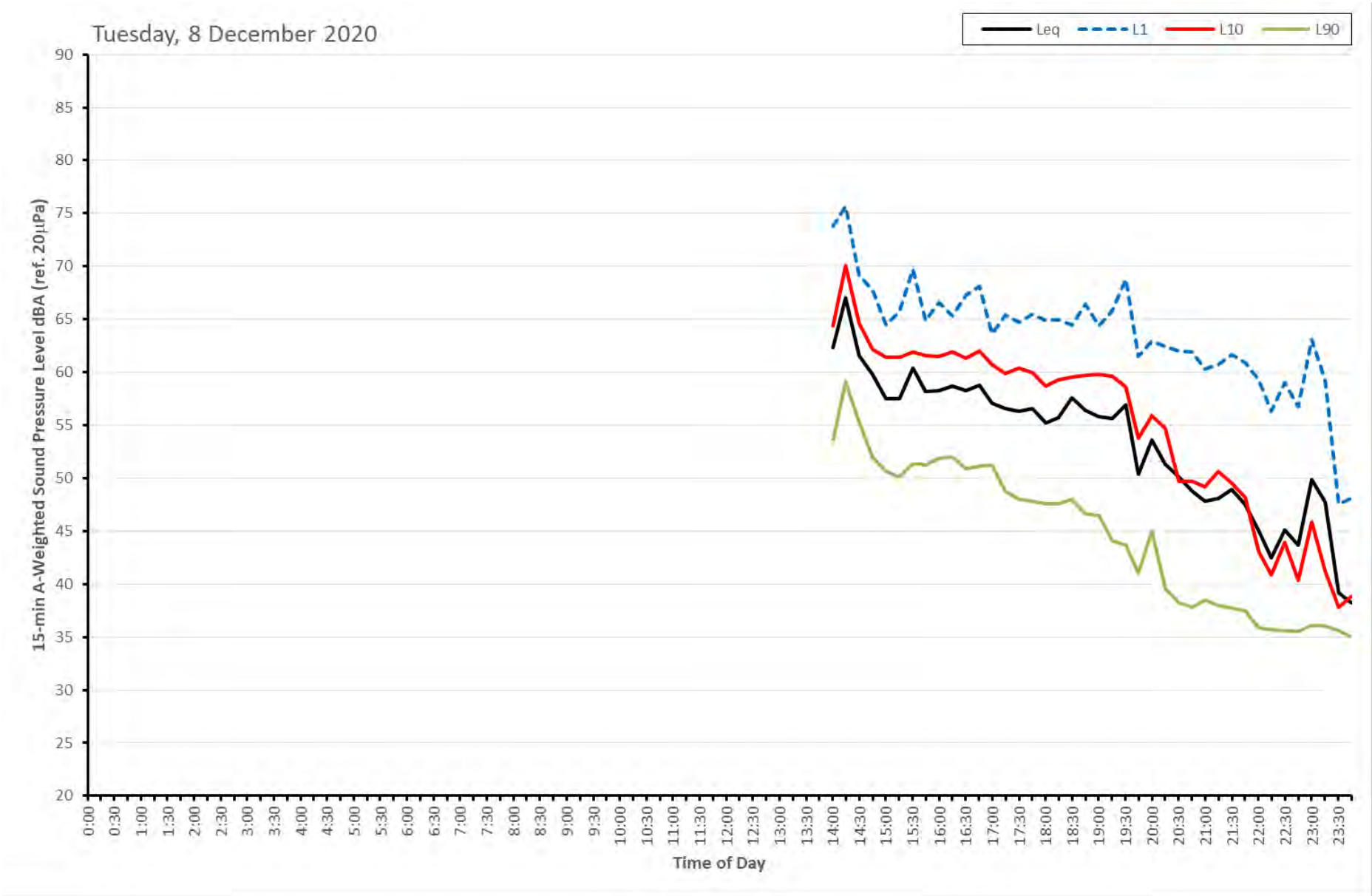
APPENDIX A: LONG TERM NOISE MONITORING

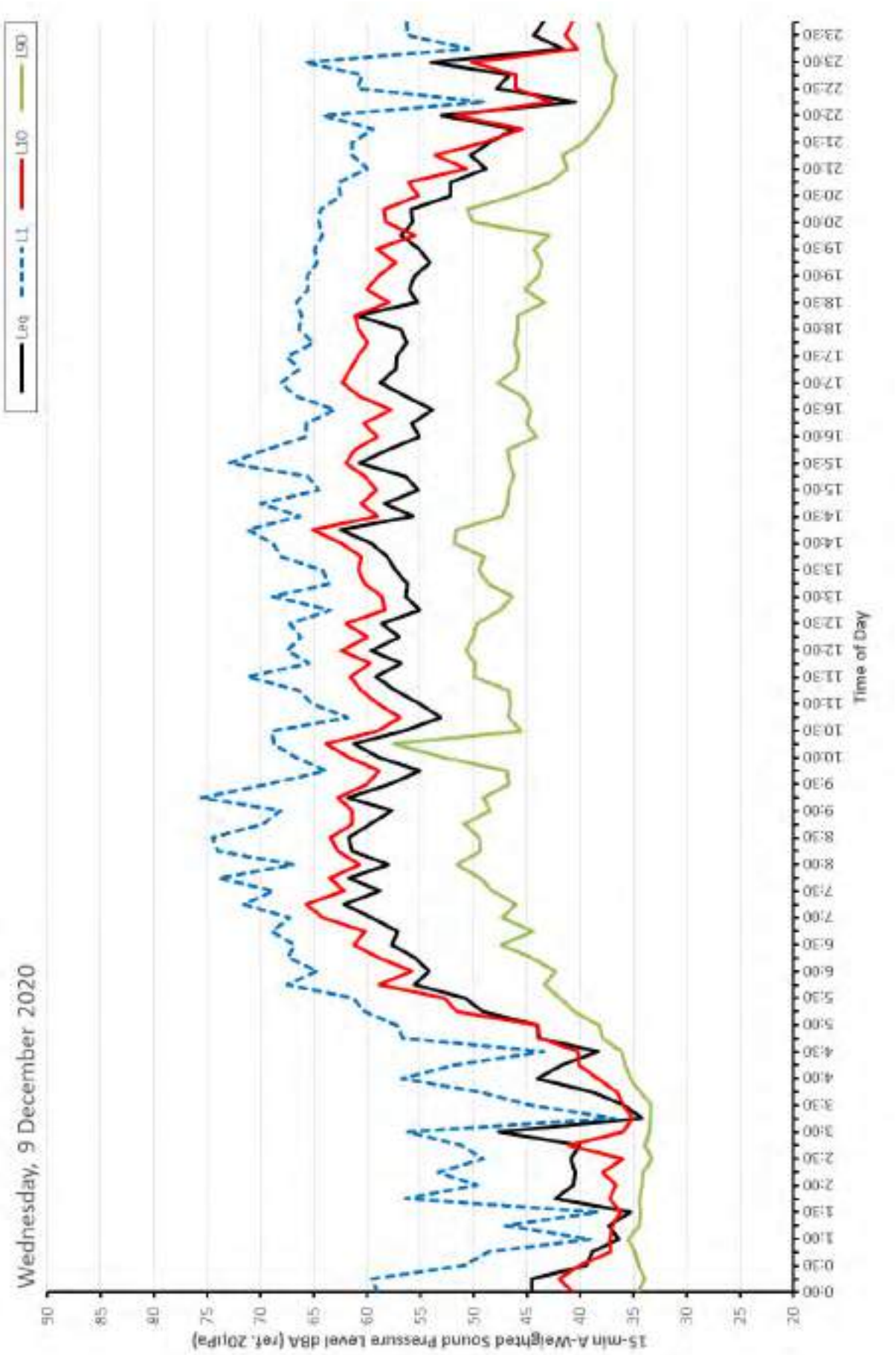
L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time. This measure is commonly referred to as the maximum noise level.

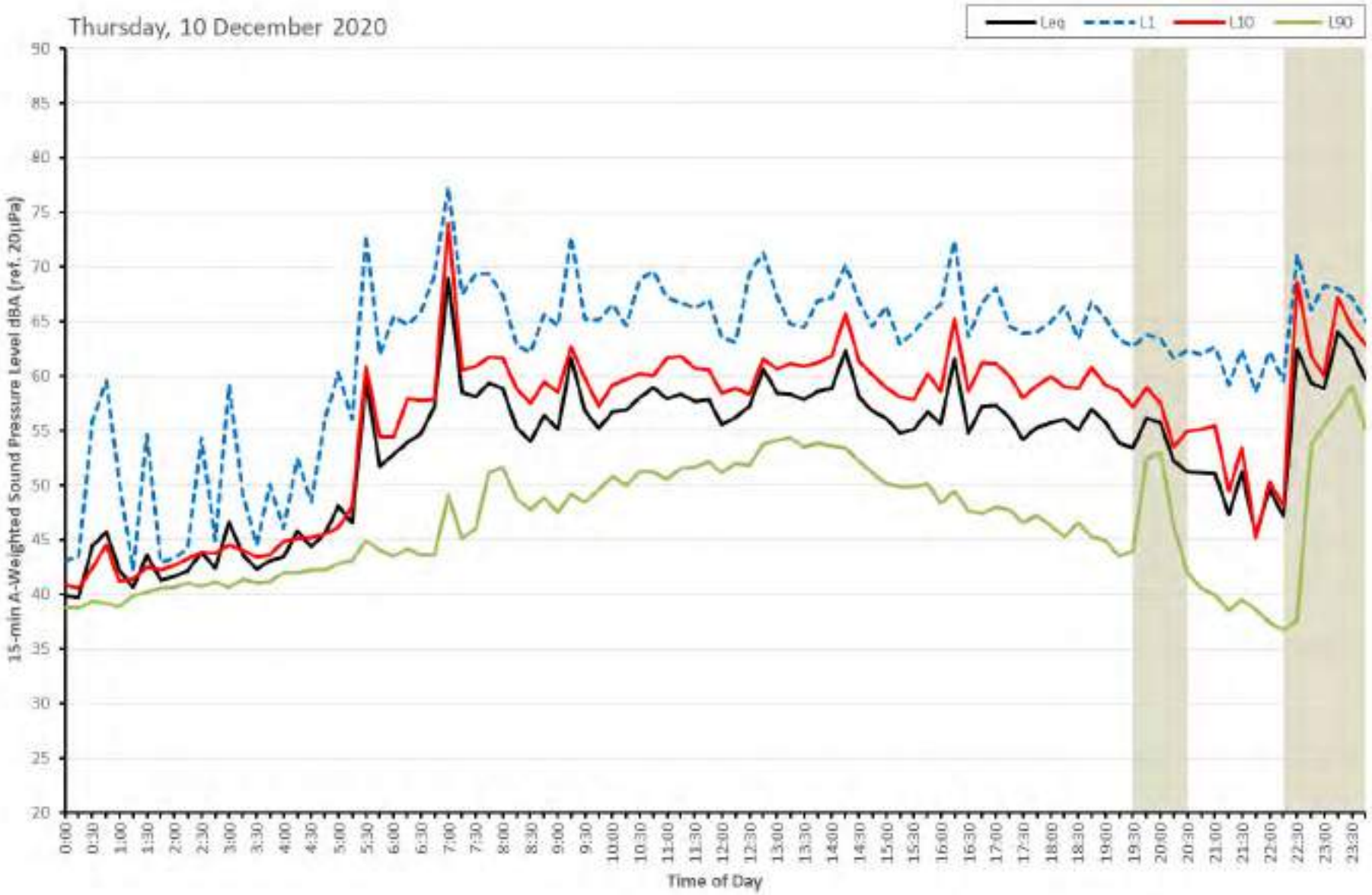
L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise. This measure is commonly referred to as the average maximum noise level.

L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

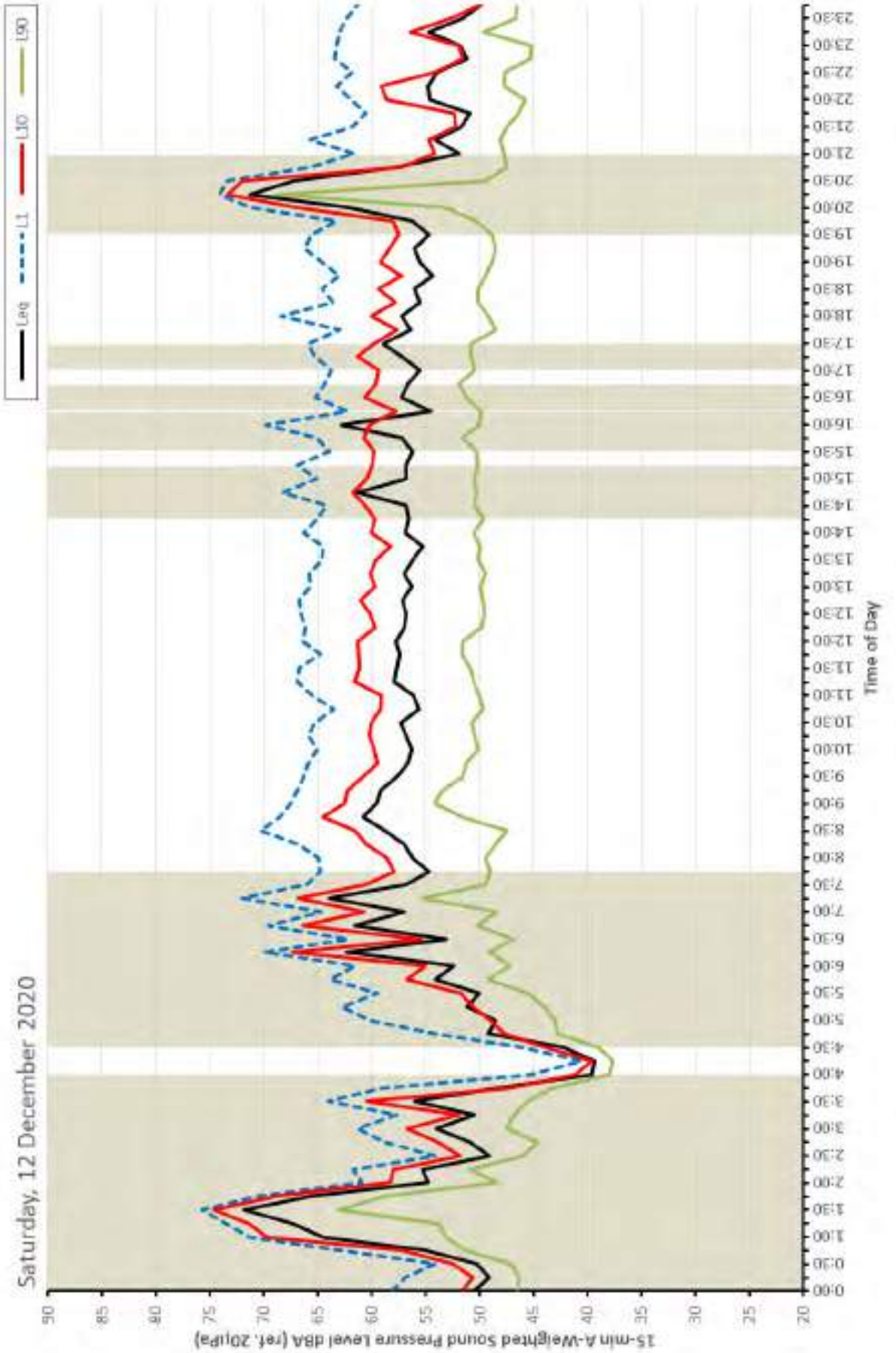
L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

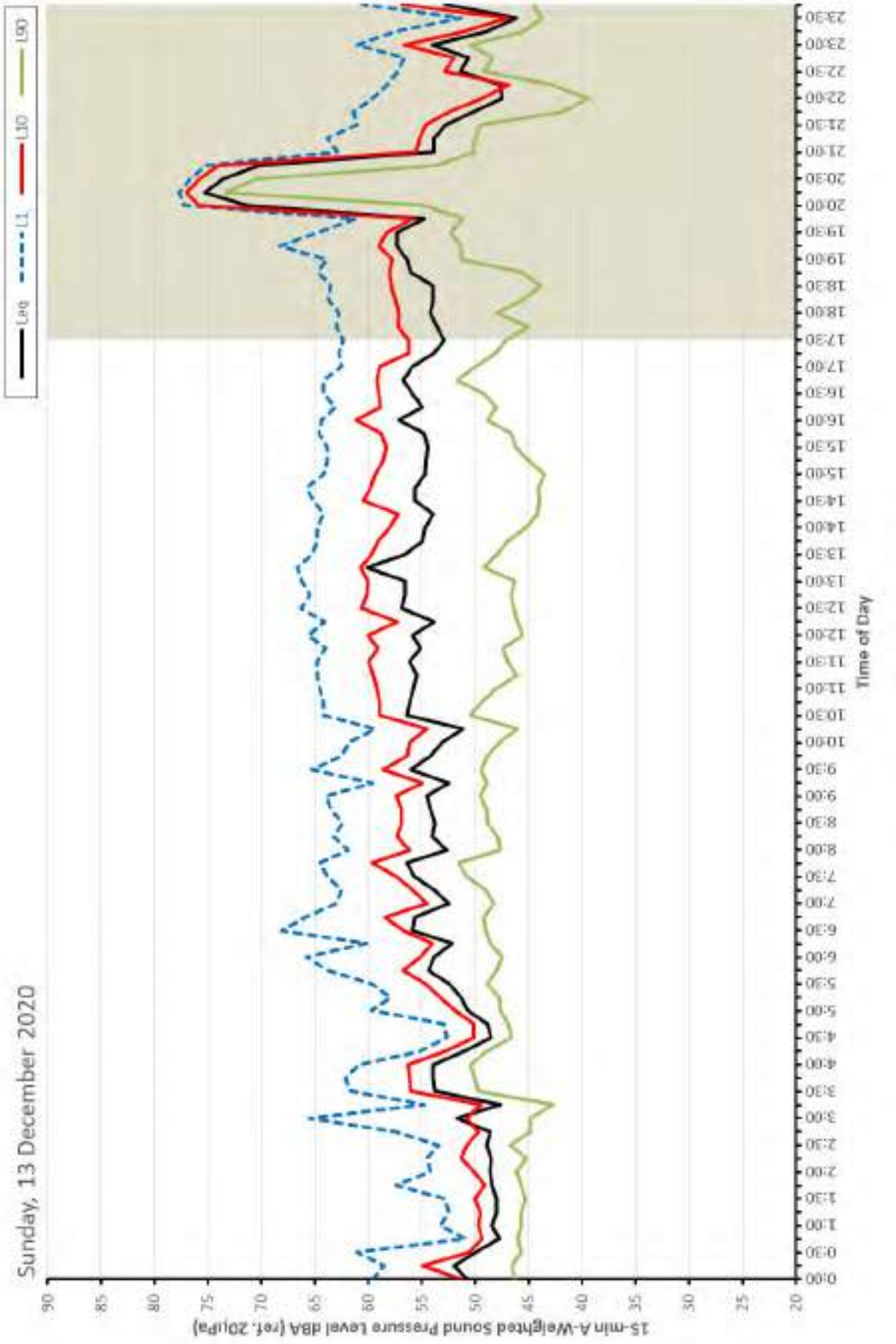

Tuesday, 8 December 2020
Leq
L1
L10
L90
15-min A-Weighted Sound Pressure Level dBA (ref. 20µPa)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
0:00
0:30
1:00
1:30
2:00
2:30
3:00
3:30
4:00
4:30
5:00
5:30
6:00
6:30
7:00
7:30
8:00
8:30
9:00
9:30
10:00
10:30
11:00
11:30
12:00
12:30
13:00
13:30
14:00
14:30
15:00
15:30
16:00
16:30
17:00
17:30
18:00
18:30
19:00
19:30
20:00
20:30
21:00
21:30
22:00
22:30
23:00
23:30
Time of Day

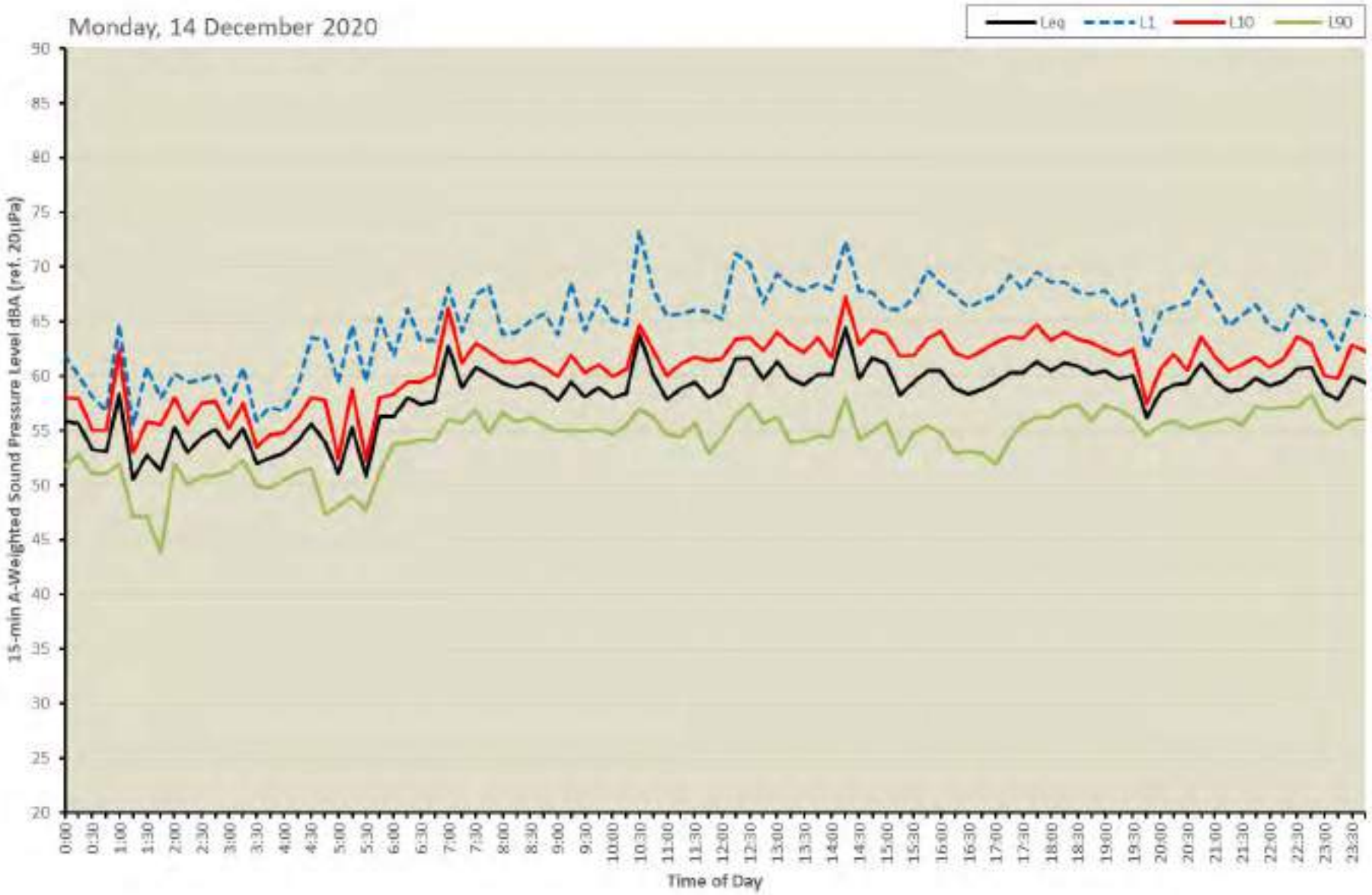

Wednesday, 9 December 2020
Leq
L1
L10
L90
15-min A-Weighted Sound Pressure Level dBA (ref: 20µPa)
Time of Day


Thursday, 10 December 2020
Leq
L1
L10
L90
15-min A-Weighted Sound Pressure Level dBA (ref. 20µPa)
Time of Day

Friday, 11 December 2020
15-min A-Weighted Sound Pressure Level dBA (ref. 20µPa)
Time of Day
Leq
L1
L10
L90


Saturday, 12 December 2020
15-min A-Weighted Sound Pressure Level dBA (ref. 20µPa)
Time of Day
LAeq
L1
L10
L90


Leq
L1
L10
L90
Sunday, 13 December 2020
15-min A-Weighted Sound Pressure Level dBA (ref. 20µPa)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
Time of Day
0:00
0:30
1:00
1:30
2:00
2:30
3:00
3:30
4:00
4:30
5:00
5:30
6:00
6:30
7:00
7:30
8:00
8:30
9:00
9:30
10:00
10:30
11:00
11:30
12:00
12:30
13:00
13:30
14:00
14:30
15:00
15:30
16:00
16:30
17:00
17:30
18:00
18:30
19:00
19:30
20:00
20:30
21:00
21:30
22:00
22:30
23:00
23:30


Monday, 14 December 2020
Leq
L1
L10
L90
15-min A-Weighted Sound Pressure Level dBA (ref. 20µPa)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
0:00
0:30
1:00
1:30
2:00
2:30
3:00
3:30
4:00
4:30
5:00
5:30
6:00
6:30
7:00
7:30
8:00
8:30
9:00
9:30
10:00
10:30
11:00
11:30
12:00
12:30
13:00
13:30
14:00
14:30
15:00
15:30
16:00
16:30
17:00
17:30
18:00
18:30
19:00
19:30
20:00
20:30
21:00
21:30
22:00
22:30
23:00
23:30
Time of Day

Tuesday, 15 December 2020
15-min A-Weighted Sound Pressure Level dBA (ref. 20µPa)
Time of Day
Leq
L1
L10
L90

JORGE REVERTER | ACOUSTIC GROUP MANAGER

Jorge is a Senior Acoustic Engineer with over 20 years of comprehensive experience in the acoustic consultancy field in Australia and Spain.

His experience includes a broad spectrum of acoustics projects covering: transport infrastructures, land planning, room acoustics, building acoustics, noise and vibration control for building services, environmental noise control and assessments, programming and computer modelling.

QUALIFICATIONS

BEng. Telecommunications - Acoustics, 1999. Universitat Politecnica Valencia (Spain)

MSc. Occupational Health and Safety, 2008. Universitat Jaume I (Spain)

AFFILIATIONS

Member of Australian Acoustical Society (MAAS)

KEY PROJECT EXPERIENCE

- Ultimo Public School
- Riverina Conservatorium of Music.
- University of Wollongong Electron Microscope, Wollongong.
- University of Sydney F07 Carslaw Extension LEES1, Sydney.
- UTS Central Project, Sydney.
- UNSW COFA, Paddington.
- Australian National University RSPE, Canberra.
- University of New South Wales - Myers Studio, Fig Tree Lane, COFA Recording Studios.
- St. Andrew's College (UoS), Sydney.
- Santa Sophia Catholic School, Box Hill.
- Science Technology Engineering & Mathematic School (STEM), Sydney Science Park.
- Munro Park Amphitheatre, Cairns.
- Armengol Theatre, Bellpuig (Spain).
- Palau de la Musica, Barcelona (Spain) – Concert Hall.
- Girona Auditorium and Exhibition Centre, Girona (Spain).
- Sydney Opera House. Forecourt waterproofing plus DT and JST Staging Equipment replacement.
- IESE, Barcelona (Spain).
- PLC Alpha Omega, Croydon.
- St. Rita's College, Brisbane.
- St. Marks Catholic College, Stanhope Gardens.
- Clancy Catholic College, West Hoxton.
- St. Anthony of Padua, Austral.
- Monaro High School, Cooma.
- St Patrick's, Sutherland.
- Darcy Road Public School, Wentworthville.
- TAFE Meadowbank.
- TAFE Design CLP.
- Hurstville Marist College.
- Hastings Secondary College Upgrade.
- Edmondson Park Public School.
- Mosman High School Upgrade, Mosman
- Hyatt Regency at 161 Sussex Street.
- Australian Film, Television and Radio School Teaching Spaces.
- NSW Health Infrastructure RAIR.
- High Court of Australia.
- PCYC Northern Beaches, Dee Why.
- Royal Commission into Institutional Responses to Child Abuse.
- East Sydney Community and Arts Centre.
- NSW Police Stations: Belmont, Toronto, Morriset, Taree, Queanbeyan, Broken Hill, Parramatta.

Hastings Secondary College
Port Macquarie Campus

16 December 2021

We are upgrading Hastings Secondary College to support the student community. Hastings Secondary College comprises of the Port Macquarie Campus (PMC) and Westport Campus (WPC). The upgrade will involve work at both campuses.

The State Significant Development (SSD) application for Stages 2 and 3 of the PMC upgrade has been approved by the Department of Planning, Industry and Environment (DPIE). The Conditions of Approval can be found on the DPIE major projects website: www.planningportal.nsw.gov.au/major-projects/project/40801

Stage 2 of the PMC upgrade will deliver new and upgraded learning spaces, new Creative and Performing Arts (CAPA) building and a redeveloped school entry. Stage 3 is a new shared use multi-sports facility in partnership with Police Citizens Youth Clubs (PCYC) NSW.

Managing construction impacts: Port Macquarie Campus Stage 2 and 3 works

As part of the consent to undertake these works, the project is required to develop a Construction Noise and Vibration Management Sub-Plan to outline how it will manage any impacts on nearby properties and residents. These impacts include noise, vibration and vehicle movements.

Your feedback is sought on how we propose to manage the high noise and vibration generating works listed in the table below. Please provide your feedback by Thursday 23 December 2021 via email at schoolinfrastructure@det.nsw.edu.au or phone 1300 482 651.

Activity	How we propose to minimise or manage the impact on nearby properties
General	▪ Construction works, including the delivery of materials to and from the site, will take place between the approved work hours: o between 7 am and 6 pm Monday to Friday o between 8 am and 1 pm on Saturdays. ▪ We may also carry out work where noise levels do not exceed the existing background noise level plus 5dB between 6 pm and 7 pm Monday to Friday and between 1 pm and 4 pm Saturdays. ▪ Under the consent, no work is permitted to be carried out on Sundays or public holidays unless approved by the Department of Industry, Planning and Environment. ▪ We will provide advance notice if any work is approved to take place outside of the above hours. ▪ Noise levels on site will be managed in accordance with the noise control guidelines outlined in the Environment Protection Authority's Environmental Noise Control Manual for construction and demolition works. ▪ We will provide advance notice of work to the local community, particularly when we anticipate high noise generating works. ▪ Trucks will be well maintained and only use approved truck routes to and from the site (including entry and exit via Owen St). Truck drivers will be kept informed of parking locations, acceptable delivery hours or other relevant practices.

For more information contact:

School Infrastructure NSW
Email: schoolinfrastructure@det.nsw.edu.au
Phone: 1300 482 651
www.schoolinfrastructure.nsw.gov.au

NSW GOVERNMENT

	▪ A one-page summary of the consent conditions will be developed for the site noticeboard for workers to quickly reference this information.
Construction	Measures for managing high noise generating works. Proposed actions: ▪ Plant and equipment will be set up/orientated to direct noise away from the closest receivers/residents. ▪ Regular reinforcement and briefings to workers on-site about the need to minimise noise and vibration will occur. ▪ If rock breaking, rock hammering, sheet piling, and pile driving activities are required, impacts will be managed through equipment selection, and respite periods. These activities will be strictly limited to approved hours: o 9 am to 12 pm, Monday to Friday o 2 pm to 5 pm, Monday to Friday o 9 am to 12 pm, Saturday. ▪ Work will occur within approved standard work hours, unless otherwise notified. ▪ In close proximity of sensitive receiver residents, machines will not be used simultaneously. ▪ Workers and contractors are regularly trained to use equipment in ways to minimise noise
Construction	Measures to ensure road safety and network efficiency during construction. Proposed actions: ▪ Construction vehicles will not arrive at the site or surrounding residential precincts outside of approved construction hours. ▪ Construction vehicles will be well maintained and will be required to observe speed limits. ▪ Trucks will only use approved truck routes to and from the site. ▪ We will provide advance notice of any works that will impact access to residents or change local traffic conditions.
Construction	Mechanism for the community to discuss or provide feedback regarding construction impacts. Proposed actions: The community and information phone line and email address will be available throughout the project and for a minimum of 12 months following the completion of the project. Phone: 1300 482 651 Email: schoolinfrastrucutre@det.nsw.edu.au

Consultation with Community on Construction Noise and Vibration Management Plans for SSDA-11920082

During SINSW's Consultation with the community, a local resident made the following suggestions in relation to the Noise and Vibration Management for SSDA-11920082 works.

The resident's suggestions are as follows:

1. The Pacific Drive (back) entrance to the School be used as the primary entry for trucks / heavy machinery
2. That trucks/heavy machinery do not sit idling with engines on for longer than 2 minutes (turn off engines)
3. That no work is conducted before 9:am including work preparation activities or past 11am Saturday (ie only work between 9am and 11am at most)

FKG Comment on the following:

1. The Pacific Drive entrance to the School cannot be used as there is no access from that entrance to the works to be undertaken for the SSD-11920082. Furthermore FKG are aiming to limit the interaction with the school staff and students for primarily safety reasons. Access from Owen Street has been carefully considered throughout the entire SSDA process and is the most appropriate.
2. FKG understand that trucks / heavy machinery can be intrusive for local residents. In considering this suggestion, FKG have adjusted the CNVMP to incorporate a maximum idling time of 5 minutes.
3. Work on Saturday will be strictly in accordance with the SSD Conditions C4 and C5. FKG will aim to limit works on Saturday's but a restriction to a two hour window is untenable.

Response is on behalf of FKG's Project Manager – Josh Pointon

NEWCASTLE
P 0746 200 500 E info@fkg.com.au
Suite 8, 335 Wharf Road, Newcastle, NSW 2300
PO Box 838, Newcastle, NSW 2300

Appendix G: Construction Waste Management Plan

Hastings Secondary College, Port Macquarie Campus, Port Macquarie

Secondary School Development

CONSTRUCTION & DEMOLITION WASTE MANAGEMENT PLAN

21/04/2021
Revision F

Architect

FJMT Studio
Level 5, 70 King Street, Sydney NSW 2000
www.fjmtstudio.com
T 02 9251 7077 • **E** fjmt@fjmtstudio.com

ELEPHANTS FOOT RECYCLING SOLUTIONS • ABN 70 001 378 294
44-46 Gibson Ave Padstow NSW 2211
www.elephantsfoot.com.au

T +612 9780 3500 • **F** +612 9707 2588
E info@elephantsfoot.com.au

SCOPE

A Waste Management Plan (WMP) is to be submitted with all development applications for new and change-of-use developments that will generate construction, demolition and operational waste.

This WMP applies only to the **construction** and **demolition** phases of the proposed development. The requirements outlined in this WMP must be implemented on site during construction and demolition and may be subject to review upon any change to the design. Construction and demolition waste management requirements will also be subject to review as part of the Construction Management Plan.

The waste management for the **operational** phase of the development is not addressed in this report. An operational WMP will need to be provided separately. Elephants Foot Recycling Solutions (EFRS) can supply this if necessary.

REVISION REFERENCE

Revision	Date	Prepared by	Reviewed by	Description	Signed
A	19/02/2021	J Parker	A Armstrong	Draft	
B	8/03/2021	J Parker	A Armstrong	Amendment	
C	9/03/2021	J Parker	A Armstrong	Amendment	
D	7/04/2021	J Parker	A Armstrong	Final	
E	20/04/2021	J Parker	A Armstrong	Amendment	
F	21/04/2021	J Parker	A Armstrong	Amendment	

Please note: all waste generated during demolition & construction will NOT remain on site for incorporation into the final works. All waste generated will be taken to a sorting yard and recycled accordingly. All references to re-use on site within this document should be taken as recycled or re-used off site.

CONTENTS

1 INTRODUCTION 1
1.1 Background 1
1.2 Location/Site Description 1
1.3 Proposed Development 1
1.4 Legislation and Guidance 2
1.5 Waste Diversion Targets 2
1.6 Report Objectives 2
1.7 Limitations 3
1.8 Port Macquarie-Hastings Council 4
2 GENERAL WASTE MANAGEMENT PROVISIONS 5
2.1 Stakeholder Roles and Responsibilities 5
2.2 Monitoring and Reporting 6
2.3 Opportunities for Reuse and Recycling 7
2.4 Management of Hazardous Waste Materials 8
2.5 Management of Excavation Waste 8
3 SITE SPECIFIC WASTE MANAGEMENT PROVISIONS 9
3.1 Demolition Waste Volumes and Management 9
3.2 Construction Waste Volumes and Management 11
3.3 Recycling Directory 13
3.4 Site-Specific Operational Measures 14
3.5 Location and Design of Waste Management Facilities 16
3.6 Architectural Plans 19

LIST OF TABLES

Table 1: Stakeholder Roles and Responsibilities 5
Table 2: Potential Reuse/Recycling Options for Construction Materials 7
Table 3: Demolition Waste Conversion 9
Table 4: Demolition Waste Management 10
Table 5: Construction Waste Conversion 11
Table 6: Construction Waste Management 12

1 INTRODUCTION

1.1 Background

EFRS has been commissioned by School Infrastructure NSW (SINSW) on behalf of the Department of Education (DOE) to prepare a Construction and Demolition Waste Management Plan to accompany a State Significant Development Application (SSDA) to the NSW Department of Planning, Industry and Environment (DPIE) for proposed upgrades to Hastings Secondary College (Port Macquarie Campus), previously known as Port Macquarie High School.

Hastings Secondary College consists of two campuses, being Westport and Port Macquarie. This report has been prepared for proposed works at the Port Macquarie Campus, which consists of two properties, the main campus and the Ag Plot.

The works subject to this proposal are to be carried out on the main Port Macquarie campus which is located at 16 Owen Street, Port Macquarie (the site). The site has a secondary street frontage to Burrawan Street and adjoins Oxley Oval along the eastern boundary.

On 23 December 2020, the Secretary of the DPIE issued Secretary's Environmental Assessment Requirements (SEARs) for SSD Application No. 11920082. This report has been prepared in accordance with the SEARs requirements.

1.2 Location/Site Description

The site is located approximately 1.2km south east of the Port Macquarie town centre, with access from Oxley Highway (Gordon Street) via Owen Street to the centre, William Street via Owen Street to the north and Burrawan Street via Owen Street to the south. A maintenance access road exists to the east of the site along Burrawan Street.

The site is located at 16 Owen Street, Port Macquarie and is legally known as Lot 111 in DP 1270315. The Port Macquarie Campus site is located within a coastal setting (east), with residential (single two storey and residential flat buildings) located to the west and south and Port Macquarie Bowling Club to the north. The surrounding street network provides on-street parking. Maintenance vehicular access is located off Burrawan Street.

No Natural watercourses are mapped as traversing the site. Scattered vegetation is located throughout the site, with a small area of vegetation concentrated towards the pedestrian access area.

The Port Macquarie Campus site is gently sloping downwards in three general 'platforms' towards the north, with distinct views out towards the ocean and the Hastings River. It also has a distinct view line to the row of Norfolk pine trees along the coastline. The siting of the campus provides many opportunities for ongoing cultural connection to Country. Current built form has an established language of two (2) story, face brick, low pitched metal roof buildings.

1.3 Proposed Development

The upgrades will support high-quality educational outcomes to meet the needs of students within the local community and deliver innovative learning and teaching spaces as follows:

- Demolition works to accommodate new works;
- Upgrade to school entry;
- Construction of new two (2) storey Creative and Performing Arts (CAPA) building;
- Construction of new Police Citizens Youth Club (PCYC);
- Partial refurbishment of Building L;
- Refurbishment and alteration to Building B;
- Removal of Building S and demountable buildings;

- New lift connections, covered outdoor learning area (COLA) and covered walkways;
- Associated earthworks, landscaping, stormwater works, service upgrades; and
- Tree removal/ tree safety works.

No change to current staff or student numbers is proposed.

1.4 Legislation and Guidance

Information provided in this WMP comes from a wide range of construction and demolition waste management guidance at the local, state, and federal levels. The primary sources of guidance include:

- Port Macquarie-Hastings Council *Developments, Public Place & Events Waste Minimisation and Management Policy* (2020)
- Australian Government, Department of Sustainability, Environment, Water, Population and Communities. *Construction and Demolition Waste Guide – Recycling and Re-use Across the Supply Chain*. (2014, November)
- NSW Waste Avoidance and Resource Recovery (WARR) Strategy 2014-2021
- NSW Waste Classification Guidelines (2014)
- Australia's National Waste Policy (2018)

1.5 Waste Diversion Targets

To quantify and measure this sustainable approach to waste management, the NSW WARR Strategy 2014-2021 outlines specific targets in order to clarify the state's long-term goals and priorities. These targets were supported by industry, community, state, and local governments during the Strategy's consultation phase, and include:

- Increasing construction and demolition recycling rates to 80%
- Increasing waste diverted from landfill to 75%
- Reducing litter by 40%

Reduce illegal dumping incidents by 30%

1.6 Report Objectives

Throughout this report, EFRS aims to encourage the following waste management practices for the duration of the demolition and construction stages of the development:

- Re-use of excavated material on-site and disposal of any excess to an approved site;
- Green waste mulched and re-used on-site as appropriate, or recycled off-site;
- Bricks, tiles and concrete re-used on-site as appropriate, or recycled off-site;
- Plasterboard waste returned to supplier for recycling;
- Framing timber re-used on site or recycled off-site;
- Windows, doors and joinery recycled off-site;
- All asbestos, hazardous and/or intractable wastes are to be disposed of in accordance with WorkCover Authority and EPA requirements;
- Plumbing, fittings and metal elements recycled off site;
- Ordering accurate quantities of materials and prefabrication of materials where possible;
- Re-use of formwork;
- Careful source separation of off-cuts to facilitate re-use, resale or recycling.

1.7 Limitations

This report has been prepared by EFRS for the sole purpose of providing a Construction and Demolition Waste Management Plan (C&D WMP) to support a development application. The report is provided with the following limitations:

- This report is for the sole use of the New South Wales Department of Education (including their officers, employees and advisers) and should not be used or relied upon by any other party without prior written consent from EFRS;
- Drawings, estimates and information contained in this report have been prepared by analysing information, plans and documents supplied by the client, or nominated third parties. Any assumptions based on the information contained in the report are outside the control of EFRS;
- The calculations presented in the report are estimates only. The amount of waste generated will be dependent on the approach taken by site management, including the levels of training and education offered to site staff and the actions and attitudes of staff themselves.
- The site manager will make adjustments as required based on actual waste volumes (e.g. if waste volumes are greater than estimated, then waste storage capacity and collection frequencies will increase accordingly) and increase the amount of waste storage and collection frequency accordingly;
- The report has been prepared with all due care and attention; however, no assurance or representation is made that the WMP reflects the actual outcome. EFRS will not be liable to for any plans or outcomes that are not suitable for purpose, whether as a result of incorrect or unsuitable information or otherwise;
- EFRS offer no warranty or representation of accuracy or reliability of the WMP unless specifically stated;
- Examples of equipment provided in this report should be reviewed by the appropriate equipment supplier who will assess the correct equipment for supply. Reference to any other business or product besides EFRS and EFRS equipment is for information purposes only, and is not officially endorsed or recommended by EFRS.

1.8 Port Macquarie-Hastings Council

The garbage and recycling generated at this development will be guided by the services and acceptance criteria of Port Macquarie-Hastings Council. All waste facilities and equipment are to be designed and constructed to be in compliance with the Port Macquarie-Hastings Council *Developments, Public Place & Events Waste Minimisation and Management Policy* (2020), council advice, Australian Standards and statutory requirements.

Council sets-out the following objectives for the management of waste on construction sites:

- Reduce waste to landfill.
- Maximise source separation of general waste, recycling and food and garden organics.
- Embed circular economy principles by supporting the minimisation of waste and promoting the continual use of resources.
- Establish standard provisions for determining waste management requirements in developments.
- Ensure developments are designed with adequate storage, access and management of waste.

2 GENERAL WASTE MANAGEMENT PROVISIONS

2.1 Stakeholder Roles and Responsibilities

All stakeholders have a responsibility for their own environmental performance and compliance with all legislation.

The Construction Contractor will be responsible for implementing this WMP, although site staff have a responsibility to ensure their own compliance at all times. Where possible, an Environmental Management Representative (EMR) should also be appointed for the project to help ensure compliance. The following table demonstrates the primary roles and responsibilities of the respective stakeholders:

Table 1: Stakeholder Roles and Responsibilities

Roles	Responsibilities
Construction Site Management	• Organising waste collections as required; • Organising replacement or maintenance requirements for bins; • Investigating and ensuring prompt clean-up of illegally dumped waste materials; • Notify the Principal Certifying Authority (Council) of the appointment of waste removal, transport or disposal contractors for waste tracking purposes; • Ensuring waste related equipment is well maintained; • Accurate calculations ensuring only the required amount of materials are ordered; • Ensuring segregation of materials to maximise reuse and recycling; • Routine checking of waste sorting and storage areas for cleanliness, hygiene, contamination and OH&S issues; • Ensuring that all monitoring and audit results are well documented and carried out as specified in the WMP; • Ensuring effective signage, communication and education is provided to site staff/contractors; • Providing staff/contractors with equipment manuals, training, health and safety procedures, risk assessments, and PPE to control hazards associated with all waste management activities; • Assessing any manual handling risks and prepare a manual handling control plan for waste and bin transfers;
Site Staff/Contractors	• Ensuring adequate separation and disposal of waste streams in compliance with the WMP; • Abiding by all relevant OH&S legislation, regulations, and guidelines; • Attending training and inductions as required; • Cleaning and transporting of bins as required; • Daily visual inspections of waste storage areas; • Organising, maintaining and cleaning the waste storage areas;
Environmental Management Representative (EMR)	• Approaching and establishing the local commercial reuse of materials where reuse on-site is not practical; • Establishing separate skips and recycling bins for effective waste segregation and recycling purposes; • Ensuring staff and contractors are aware of site requirements; • Provision of training of the requirements of the WMP and specific waste management strategies adopted for the development; • Contaminated waste management and approval of off-site waste transport, disposal locations and checking licensing requirements; • Arranging assessment of suspicious potentially contaminated materials, hazardous materials and liquid waste; • Monitoring, inspection and reporting requirements.
Waste Collection Contractors	• Provide a reliable and appropriate waste collection service; • Provide feedback to construction site management regarding contamination of waste streams; • Work with construction site management to customise waste systems where possible.

2.2 Monitoring and Reporting

It is recommended that the following measures be taken to improve demolition and construction waste management in future and to provide more reliable waste generation figures:

- Compare projected waste quantities with actual waste quantities produced.
- Conduct waste audits of current projects (where feasible).
- Note waste generated and disposal methods.
- Look at past waste disposal receipts.
- Record this information to help in waste estimations for future waste management plans.

Records of waste volumes recycled, reused or contractor removed are to be maintained. Additionally, dockets/receipts verifying recycling/disposal in accordance with the WMP must be kept and presented to Council or the EPA if and when required.

Daily visual inspections of waste storage areas will be undertaken by site personnel and inspection checklists/logs recorded for reporting to the Site Manager on a weekly basis or as required. These inspections will be used to identify and rectify any resource and waste management issues.

Waste audits are to be carried out by the Building Contractor to gauge the effectiveness and efficiency of waste segregation procedures and recycling/reuse initiatives. Where audits show that the above procedures are not carried out effectively, additional staff training should be undertaken and signage re-examined.

All environmental incidents are to be dealt with promptly to minimise potential impacts. An incident register must be maintained on-site at all times and should include the contact details of the 24-hour EPA Pollution line. Likely incidents to occur during the construction and demolition stage of the development may involve fuel or chemical spills, seepage or mishandling of hazardous waste, or unlicensed discharge of pollutants to environment.

2.3 Opportunities for Reuse and Recycling

There are many opportunities to reduce the volume of waste generated during demolition and construction. Adaptive reuse of building materials should be encouraged, with significant consideration given to methods of reusing or recycling materials onsite as well as sourcing used or recycled materials from elsewhere to be used on site.

The site should facilitate reuse and recycling by 'deconstruction', whereby various materials are carefully dismantled and sorted. Any unwanted reusable materials can be taken to a second-hand building centre, reducing waste disposal costs.

Materials that are individually wrapped should also be avoided where possible, with preference given for materials that can be delivered in returnable packaging such as timber pallets.

The table below gives examples of potential reuse and recycling options for the materials likely to be used/generated in construction and demolition at this development:

Table 2: Potential Reuse/Recycling Options for Construction Materials

Material	Reuse/Recycling Potential
Asphalt	Hot in-place recycling or reprocessed into Reclaimed Asphalt Pavement (RAP).
Bricks	Cleaned and/or rendered for reuse, crushed for fill, sold or provided to a recycled materials yard
Cardboard Packaging	Recycled at a paper/cardboard recycling facility
Carpet	Cleaned and reused for the same purpose, reused in landscaping or garages/sheds, recycled at an appropriate processing facility
Concrete, Masonry, Spoil	Reused on-site as fill, levelling or crushed for road base
Doors, Windows, Fittings	Reused in new or existing buildings or sent to second-hand supplier
Glass	Recycled at a glass recycling facility, aggregate for concrete production, crushed for termite barrier, reused as glazing
Green Waste (Organics)	Mulched, composted for reuse, trees chipped for use in landscaping or removed carefully and reused onsite or sold
Hardwood Beams	Reused as floorboards, fencing, furniture or sent to second-hand timber supplier
Insulation Material	Reprocessed to remove impurities and reused for the same purpose or as off-cuts, compressed for ceiling tile manufacture
Metal, Steel/Copper Pipe	Recycled at a metal recycling facility, melted into secondary materials for structural steel, roofing, piping etc. copper sold for re-use
Other Timber	Reused in formwork, ground into mulch for garden or sent to second-hand timber supplier
Plasterboard	Crushed for reuse in manufacture of new plasterboard, returned to supplier or used in landscaping
Plastics	Reused as secondary materials for playgrounds, park benches etc.
Roof Tiles	Cleaned and reused, crushed for reuse for landscaping and driveways or sold or provided to a recycled materials yard
Soil	Stockpiled onsite for reuse as fill
Synthetic & Recycled Rubber	Reused for the same purpose or reprocessed for use in manufacture/construction of safety barriers, speed humps
Topsoil	Stockpiled onsite for reuse in landscaped areas

2.4 Management of Hazardous Waste Materials

For the purpose of this report, hazardous waste materials include any waste that poses a hazard or potential harm to human health or the environment, particularly asbestos waste and asbestos containing material (ACM).

During the construction phase of the development, there must be a commitment to engage qualified and certified contractors to remove all contaminated/hazardous materials (e.g. asbestos) and dispose of all contaminated/hazardous waste at an appropriately licenced facility, where applicable.

In the event that any contaminated or hazardous materials are unexpectedly uncovered during demolition or excavation works, the Site Manager is to stop work immediately and contact the relevant hazardous waste contractor prior to further works being undertaken in the area.

The following general mitigation measures will apply:

- Contaminated material stockpiled on site will be minimised as far as possible and should be stored on HDPE liner, in a bunded location which is protected from inclement weather;
- Sediment fences should be installed around the base of stockpiles and the stockpiles should be covered. Where excavated material requires validations, samples should be taken for NATA laboratory testing as per the requirements of the contamination assessment prior to restoration works, backfilling exercises and disposal;
- Any trucks carrying contaminated materials should be securely and completely covered immediately after loading the materials (to prevent windblown emissions and spillage) and must be licensed by the NSW Environmental Protection Authority (EPA);
- Decontamination of all equipment prior to demobilisation from the site is important so that contaminated materials are not spread off-site.

2.5 Management of Excavation Waste

For the purpose of this report, excavation waste consists of any unwanted material generated from excavation activities such as a reduced level dig, site preparation and levelling and the excavation of foundations, basements, tunnels and service trenches. This will typically consist of soil and rock.

All excavated material generated on this site may be re-used in the landscaping or used on other sites as fill material, provided no contamination is present. If sandstone is found to be present, this may be sold or incorporated into the building design.

The following measures and safeguards will apply to the development for excavated material:

- Wherever practical, excavation material will be reused as part of the development;
- Excavation material that is not natural (virgin) material will be transported to an approved landfill site or off-site recycling depot;
- A waste classification assessment of the fill material should be undertaken prior to it being acceptable for waste disposal purposes;
- Transportation routes for excavation material removed from site will be identified and used.

3 SITE SPECIFIC WASTE MANAGEMENT PROVISIONS

3.1 Demolition Waste Volumes and Management

The demolition stage of the development provides the greatest opportunity for waste minimisation and resource recovery. The first thing that should be considered is whether it is possible to reuse existing buildings or parts of buildings for the proposed use. With careful on-site sorting and storage and by staging work programs it is possible to reuse many materials, either on or off-site.

Where possible, materials will be reused, such as crushing concrete for use as clean fill. However, the majority of the components of the building will either be reused for the same purpose or disposed of offsite.

A demolition contractor will be engaged during this phase of the project. The contractor will be responsible for ensuring all demolition activities are planned and undertaken in accordance with relevant waste minimisation policies and DA requirements.

The table below illustrates the anticipated volumes of materials generated at this development during the demolition stage. Volumes have been advised by our client.

Table 3: Demolition Waste Conversion

Material	Volume (m3)	*Tonnes (t)	**Appx. Percentage Recovered
Excavation Material	750	750	99.8%
Green waste	443	66.5	80%
Bricks	84	100.8	100%
Tiles	N/A	N/A	100%
Concrete	500	750	100%
Timber	4	0.8	33%
Plasterboard	N/A	N/A	50%
Metals	27	13.5	100%
Asbestos	N/A	N/A	0%
Other waste	N/A	N/A	0%
Totals	1808	1681.5	

**The conversion of materials from volume to tonnes is based on the information provided in a consultation paper published by WA Department of Water and Environmental Regulation <https://www.der.wa.gov.au/images/documents/our-work/consultation/current-consultation/Consultation%20Sheet%20-Approved%20method%20for%20recyclers.pdf>*

***The percentage of recycled demolition waste is estimated by BINGO, and is based on the average quantities of materials received and recovered at their facilities.*

The table below illustrates how the demolition materials will be managed and estimates percentage of materials diverted from landfill.

Table 4: Demolition Waste Management

			How Waste will be Managed			
Type of Material	**Less than 10m³**	**Estimated Tonnage**	**Reuse On-Site**	**Recycle**	**Landfill**	**Estimated Tonnage of Material Diverted from Landfill**
Excavation Material	☐	**750**	☐	☐	☐	**748.1**
Green Waste	☐	**66.5**	☐	☐	☐	**53.2**
Bricks	☐	**100.8**	☐	☐	☐	**100.8**
Tiles	☐	**N/A**	☐	☐	☐	**N/A**
Concrete	☐	**750**	☐	☐	☐	**750**
Timber	☒	**0.8**	☐	☐	☐	**0.3**
Plasterboard	☐	**N/A**	☐	☐	☐	**N/A**
Metals	☐	**13.5**	☐	☐	☐	**13.5**
Asbestos	☐	**N/A**	☐	☐	☐	**N/A**
Other Waste	☐	**N/A**	☐	☐	☐	**N/A**
Total		**1681.5**	**Total**			**1665.8**
Total Diversion of Waste from Landfill (Minimum 80%)						**99.1%**

3.2 Construction Waste Volumes and Management

Waste generated during the construction stage of the development will be managed by the principal contractor and sub-contractors, with materials being reused and recycled wherever possible. Where neither reuse nor recycling are possible, waste will be disposed of as general waste at a licensed landfill site.

Recyclable material generated during construction will largely consist of off-cuts and discarded bricks, timber, steel, concrete, tiles, plasterboard, and piping, as well as packaging materials.

It is important to note that source separation of waste on-site may offer cost savings when compared to the disposal of mixed waste at landfill sites. Further cost savings may be achieved through the use of reusable and recycled-content materials and by reusing materials salvaged from the demolition stage of the development.

The table below illustrates the anticipated volumes of materials generated at this development during the construction stage. Volumes have been advised by our client.

Table 5: Construction Waste Conversion

Material	Volume (m3)	*Tonnes (t)	**Approx. Percentage Recovered
Excavation Material	N/A	N/A	99.8%
Green waste	N/A	N/A	80%
Bricks	20.1	24.1	100%
Tiles	1.8	1.8	100%
Concrete	106.9	160.4	100%
Timber	1.6	0.3	33%
Plasterboard	22	4.4	50%
Metals	2.5	1.3	100%
Asbestos	N/A	N/A	0%
Other waste	N/A	N/A	0%
Totals	154.86	192.2	

**The conversion of materials from volume to tonnes is based on the information provided in a consultation paper published by WA Department of Water and Environmental Regulation <https://www.der.wa.gov.au/images/documents/our-work/consultation/current-consultation/Consultation%20Sheet%20-Approved%20method%20for%20recyclers.pdf>*

***The percentage of recycled waste is estimated by BINGO, and is based on the average quantities of materials received and recovered at their facilities.*

The table below illustrates how the construction materials will be managed and estimates percentage of materials diverted from landfill.

Table 6: Construction Waste Management

			How Waste will be Managed			
Type of Material	**Less than 10m³**	**Estimated Tonnage**	**Reuse On-Site**	**Recycle**	**Landfill**	**Estimated Tonnage of Material Diverted from Landfill**
Excavation Material	☐	**N/A**	☐	☐	☐	**N/A**
Green Waste	☐	**N/A**	☐	☐	☐	**N/A**
Bricks	☐	**24.1**	☐	☒	☐	**24.1**
Tiles	☒	**1.8**	☐	☒	☐	**1.8**
Concrete	☐	**160.4**	☐	☒	☐	**160.4**
Timber	☒	**0.3**	☐	☒	☒	**0.1**
Plasterboard	☐	**4.4**	☐	☒	☒	**2.2**
Metals	☒	**1.3**	☐	☒	☐	**1.3**
Asbestos	☐	**N/A**	☐	☐	☐	**N/A**
Other	☐	**N/A**	☐	☐	☐	**N/A**
Total		**192.2**	**Total**			**189.8**
Total Diversion of Waste from Landfill (Minimum 80%)						**98.7%**

3.3 Recycling Directory

Construction and demolition materials removed from site will need to be managed in accordance with the provisions of current legislation and may include segregation by material type classification in accordance with NSW EPA (2014) *Waste Classification Guidelines, Part 1: Classifying Waste* and disposal at facilities appropriately licensed to receive the particular materials.

Please find the below recommendations for recycling drop off locations for all materials likely to be generated at this development. Only the nearest locations are provided. See www.businessrecycling.com.au for additional locations:

	Business Name	Suburb	Distance (km)
Excavation Material	JR Richards & Sons	Port Macquarie	7.2
	Kempsey Shire Council Waste Management Centre	Kempsey	30.5
Green waste	JR Richards & Sons	Port Macquarie	7.2
	Kempsey Shire Council Waste Management Centre	Kempsey	30.5
Bricks	JR Richards & Sons	Port Macquarie	7.2
	Kempsey Shire Council Waste Management Centre	Kempsey	30.5
Tiles	JR Richards & Sons	Port Macquarie	7.2
	Kempsey Shire Council Waste Management Centre	Kempsey	30.5
Concrete	JR Richards & Sons	Port Macquarie	7.2
	Kempsey Shire Council Waste Management Centre	Kempsey	30.5
Timber	Remondis Australia Pty Ltd	Port Macquarie	3.4
	JR Richards & Sons	Port Macquarie	7.2
	Kempsey Shire Council Waste Management Centre	Kempsey	30.5
Plasterboard	JR Richards & Sons	Port Macquarie	7.2
Metals	Remondis Australia Pty Ltd	Port Macquarie	3.4
	Matthews Metal Management	Port Macquarie	6.4
	Willing & Able Foundation Ltd.	Port Macquarie	6.5

3.4 Site-Specific Operational Measures

Training/Site Inductions

All staff employed during the demolition and construction stages of the development must undertake site-specific induction training regarding the procedures for waste management. Employees of the head contractor will undertake a specific induction outlining their duties and how they are to enforce the waste management procedures.

Induction training will include the following at a minimum:

- Legal obligations;
- Emergency response procedures on site;
- Waste storage locations and separation of waste;
- Litter management in transit and on site;
- The implications of poor waste management practices;
- Correct use of general-purpose spill kits;
- Responsibility and reporting (including identification of personnel responsible for waste management and individual responsibilities).

Materials Selection and Ordering

- Selection of all materials will be undertaken by architectural designers;
- Prefabrication of materials off-site where possible;
- Materials requirements are to be accurately calculated to minimise waste from over-ordering;
- Materials ordering process is to aim at minimisation of materials packaging;
- Material Safety Data Sheets (MSDS) are to accompany all materials delivered to site, where required, to ensure that safe handling and storage procedures are implemented.

Waste Avoidance Opportunities

- Limiting unnecessary excavation;
- Selection of construction materials taking into consideration to their long lifespan and potential for reuse;
- Ordering materials to size and ordering pre-cut and prefabricated materials;
- Reuse of formwork;
- Planned work staging;
- Use of naturally ventilating buildings to reduce ductwork;
- Reducing packaging waste on-site by returning packaging to suppliers where possible, purchasing in bulk and requesting cardboard or metal drums rather than plastics;
- Requesting metal straps rather than shrink wrap and using returnable packaging such as pallets and reels;
- Reduction of PVC use;
- Use of low VOC (volatile organic compounds) paints, floor coverings and adhesives;
- Use of fittings and furnishings that have been recycled or incorporate recycled materials;
- the use of building materials, fittings and furnishings with consideration to their longevity, adaptation, disassembly, reuse and recycling potential.

Site Procedures

- Excavated materials will be used onsite where possible;
- Green waste will be mulched and reused in landscaping either onsite or offsite;
- Concrete, tiles and bricks will be reused or recycled offsite;
- Steel will be recycled offsite; all other metals will be recycled where economically viable;

- Framing timber will be reused on-site or recycled off-site;
- Windows, doors and joinery will be recycled off-site where possible;
- Plumbing, fittings and joinery will be recycled off-site where possible;
- Plasterboard will be re-used in landscaping on-site or returned to the supplier for recycling where possible;
- All used crates will be stored for reuse unless damaged;
- All glass that can be economically recycling will be;
- All solid waste timber, brick, concrete, rock, plasterboard and other materials that cannot be reused or recycled will be taken to an appropriate facility for treatment to recover further resources or for disposal to landfill in an approved manner;
- All asbestos, hazardous and/or intractable wastes are to be disposed of in accordance with WorkCover Authority and EPA requirements;
- Provision for the collection of batteries, fluorescent tubes, smoke detectors and other recyclable resources will be provided on site;
- Beverage container recycling will be provided on-site for employee use;
- All waste and recycling will be disposed of via council approved systems.

3.5 Location and Design of Waste Management Facilities

General Requirements

All waste management facilities onsite should:

- Be conveniently located to enable easy access for on-site movement and collection;
- Be incorporated with other loading/unloading facilities;
- Have sufficient space for the quantity of waste generated and careful source separation of recyclable materials;
- Have sufficient space to contain any on-site treatment facilities, such as compaction equipment;
- Have adequate weather protection and, where required, be enclosed or undercover;
- Be secure and lockable;
- Be well-ventilated and drained to the sewer;
- Be clearly sign-marked to ensure appropriate use.

Waste and Recycling Receptacles

A sufficient quantity of skip bins should be provided for the separate storage of each type of construction material generated on site. This will assist in maximising source separation and resource recovery, while reducing the costs and quantity of materials disposed of at landfill.

The size of the receptacles should be appropriate to the nature of waste generated and the available storage area. In general, the following options would be acceptable:

Source: Aussie Bins

If the developer chooses to adopt a traditional waste management strategy, whereby waste is deposited into comingled skip bins to be sorted offsite, two skip bin areas at either end of the site would be considered sufficient for purpose. However, if the site is to pursue source separation, dedicated skips for the following materials are recommended:

- Timber;
- Plasterboard;
- Concrete;
- Bricks;
- Scrap metal;
- General waste.

Separate receptacles for the safe disposal of hazardous waste types (i.e. light bulbs, batteries, etc) will also be provided where applicable. Where possible, additional bins will be provided in common areas for the collection of commingled recyclables such as beverage containers (glass, plastic, aluminium), paper products, recyclables food containers, etc. Specialised bins for cigarette butts should also be provided.

Safety and Signage

The following safety measures should be considered for the waste storage area:

- Location should not interfere with sight lines of drivers entering or leaving the site;
- Skip bins should be clearly visible and located in well-lit areas;
- Safe paths of travel should be designated using reflective tape, barriers and cones;
- Skip bins must be secured and must not be over-filled to reduce risk of injury through bins moving and falling objects.

Standard signage will be installed in all waste areas, with all skip bins colour coded and labelled appropriately on all sides to allow clear identification of the type of waste to be deposited into each bin.

Refer to the EPA's website for standard construction waste and recycling signs:

www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm

Space and Siting Requirements

The waste storage areas will be located at site entrances off Owen Street and Burrawan Street to enable easy access and allow sufficient space for the required skip bins and servicing requirements. The storage areas will also be flexible in order to cater for change of use throughout demolition and construction works.

Where space is restricted, dedicated stockpile areas will be allocated onsite, with regular transfers to the dedicated skip bins for sorting and collections.

The position of the designated waste holding areas onsite may change according to building works and the progression of the development. Access, visual amenity and WHS will always be integral to the selection of waste storage area locations. Any stockpile locations will take into account slope and drainage factors to avoid contamination of stormwater drains during rain events.

Servicing and Transport

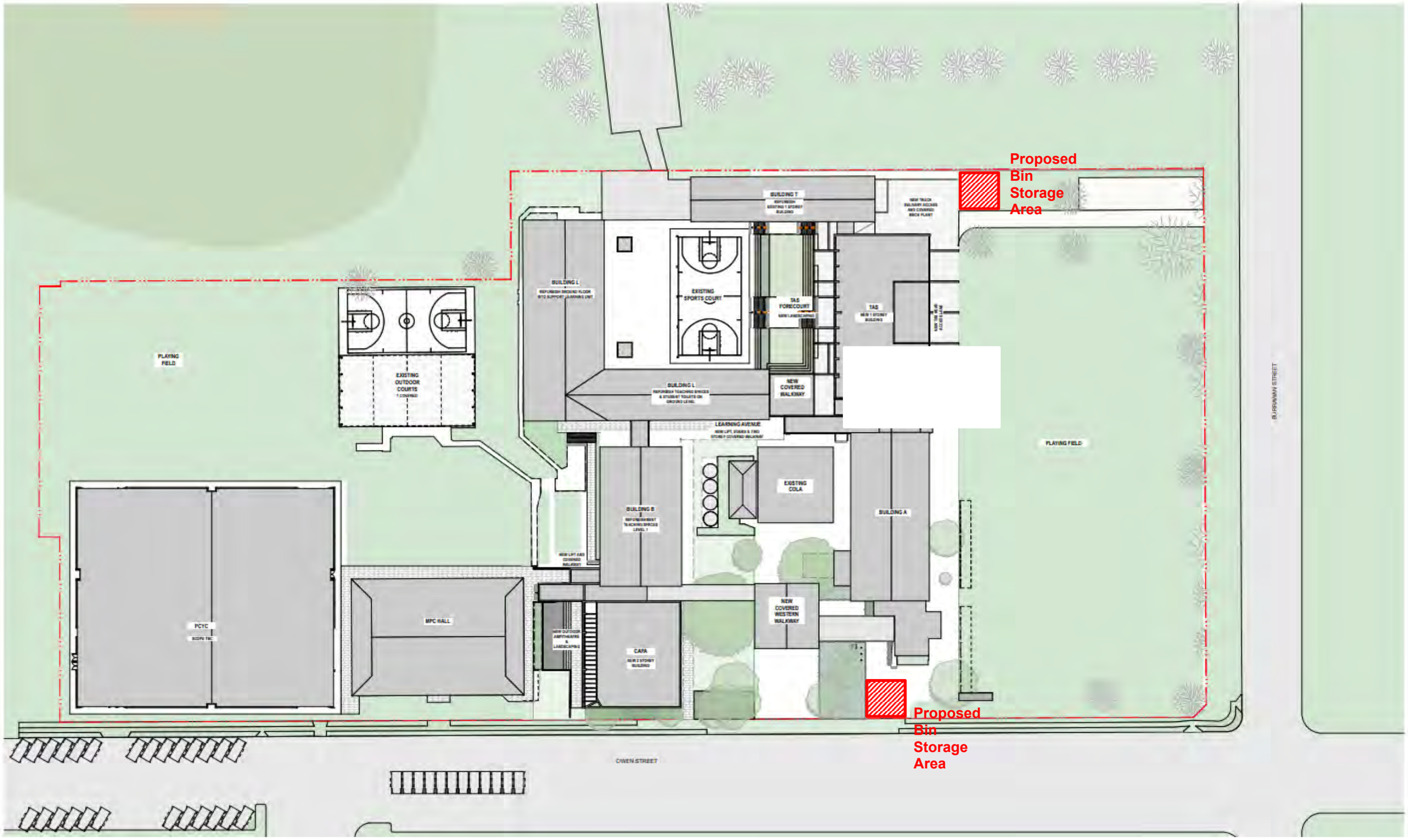
The frequency of waste removal from site will be determined by the volume of materials deposited into the dedicated skip bins. Skip bins will be monitored on a daily basis by the Construction Site Manager to ensure they do not overflow. If skip bins are reaching capacity, removal and replacement should be organised for within 24 hours.

All skip bins leaving the site will be covered with a suitable tarpaulin to reduce spillage of waste while in transit.

All waste collection for construction works will be conducted between approved hours as per Council requirements (typically between 7am and 7pm Monday to Friday, and between 7am and 1pm on Saturdays). All waste generated on site will be transported to an approved and appropriately licensed resource recovery facility and/or landfill site.

3.6 Architectural Plans

Proposal



Source: FJMT Studio, Drawing No. 120010, Rev.06, 29/01/21 – Site Plan – Proposed Plan

Appendix H: Construction Traffic & Pedestrian Sub Plan

ttpa TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994

Suite 502, Level 5, 262 Victoria Avenue
Chatswood NSW 2067
T (02) 9411 5660 | F (02) 9904 6822
E info@ttpa.com.au | ttpa.com.au

Hastings Secondary College Port Macquarie Campus Upgrade
16 Owen Street, Port Macquarie
Construction Traffic and Pedestrian Management Sub-Plan

Date: Dec 2021
Issue: AFC
Ref: 706AK/2020

Table of Contents

1.0 INTRODUCTION 4

2.0 PROPOSED DEVELOPMENT 6

2.1 Site, Context, and Existing Use 6
2.2 Proposed Development 6

3.0 EXISTING AND FUTURE ROAD NETWORK AND TRAFFIC CONDITIONS 8

3.1 Existing Road Network 8
3.2 Traffic Controls 9
3.3 Parking Controls 10
3.4 Traffic Conditions 10
3.4 Transport Services 11
3.5 Walking Facilities 12
3.6 Cycling Facilities 13

4.0 PROPOSED CONSTRUCTION SCHEME 15

4.1 Construction Program 15
4.2 Construction Workers 15
4.3 Construction Hours 16
4.4 Vehicle Site Access 17
4.5 Works Zone 17
4.6 Cranage and Materials Handling 18

5.0 CONSTRUCTION TRAFFIC MANAGEMENT PLANNING 19

5.1 Vehicle Access and Internal Circulation 19
5.2 Pedestrian Access 19
5.3 Construction Vehicles 20
5.4 Construction Traffic Haulage Route 20
5.5 Other General Requirements for Trucks 21
5.6 Occupational Health and Safety 21
5.7 Emergency Vehicle Access 22
5.8 Workers' Site Induction 22
5.9 Traffic Control Plan 23
5.10 Contact Details 23

6.0 CONSTRUCTION TRAFFIC IMPACT ASSESSMENT 24

6.1 Impact on General Traffic 24
6.2 Impact on Public Transport Services 24
6.3 Impact on Pedestrians and Cyclists 25

6.4 Impact on On-Street Parking 25
6.5 Traffic Movements in Adjoining Council Areas 26
6.6 Consultation, Communication and Liaison 26
6.7 Site Inspections and Record-Keeping 27

List of Figures

Figure 1 Location
Figure 2 Site
Figure 3 Road Network
Figure 4 Traffic Controls
Figure 5 Truck Routes

List of Appendices

Appendix A Approved Architectural Plans
Appendix B Public Transport Provisions
Appendix C Turning Path Assessments
Appendix D Traffic Control Plans

1.0 Introduction

This report has been prepared to accompany a State Significant Development Application (SSDA-11920082) to the Department of Planning, Industry and Environment (DPIE) for the proposed upgrades to Hastings Secondary College - Port Macquarie Campus (Figure 1).

This report has been prepared in satisfaction of Consent Condition no. B14(d), B15, B21 and C9, for submission of a Construction Pedestrian and Traffic Management Sub-Plan (CPTMSP) as part of the Construction Certificate documentation as follows:

Construction Environmental Management Plan

B14. Prior to the commencement of construction, the Applicant must submit a Construction Environmental Management Plan (CEMP) to the Certifier and provide a copy to the Planning Secretary. The CEMP must include, but not be limited to, the following:

(d) Construction Traffic and Pedestrian Management Sub-Plan (see condition B15);

Construction Traffic Management Plan (CTPMSP)

B15: The Construction Traffic Management Plan (CTPMSP) must be prepared to achieve the objective of ensuring safety and efficiency of the road network and address, but not be limited to, the following:

a) be prepared by a suitably qualified and experienced person(s)
b) be prepared in consultation with Council and TfNSW;
c) detail:
- *(i) measures to ensure road safety and network efficiency during construction in consideration of potential impacts on general traffic, cyclists and pedestrians and bus services;*
- *(ii) measures to ensure the safety of vehicles and pedestrians accessing adjoining properties where shared vehicle and pedestrian access occurs;*
- *(iii) detail heavy vehicle routes, access and parking arrangements;*
- *(iv) 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, in accordance with the latest version of AS 2890.2; and*
- *(v) arrangements to ensure that construction vehicles enter and leave the site in a forward direction unless in specific exceptional circumstances under the supervision of accredited traffic controller(s).*

Construction Parking

B20. Prior to the commencement of construction, the Applicant must provide sufficient parking facilities off-site, including for heavy vehicles and for site personnel, to ensure that construction traffic associated with the development does not impact public and residential streets or public parking facilities.

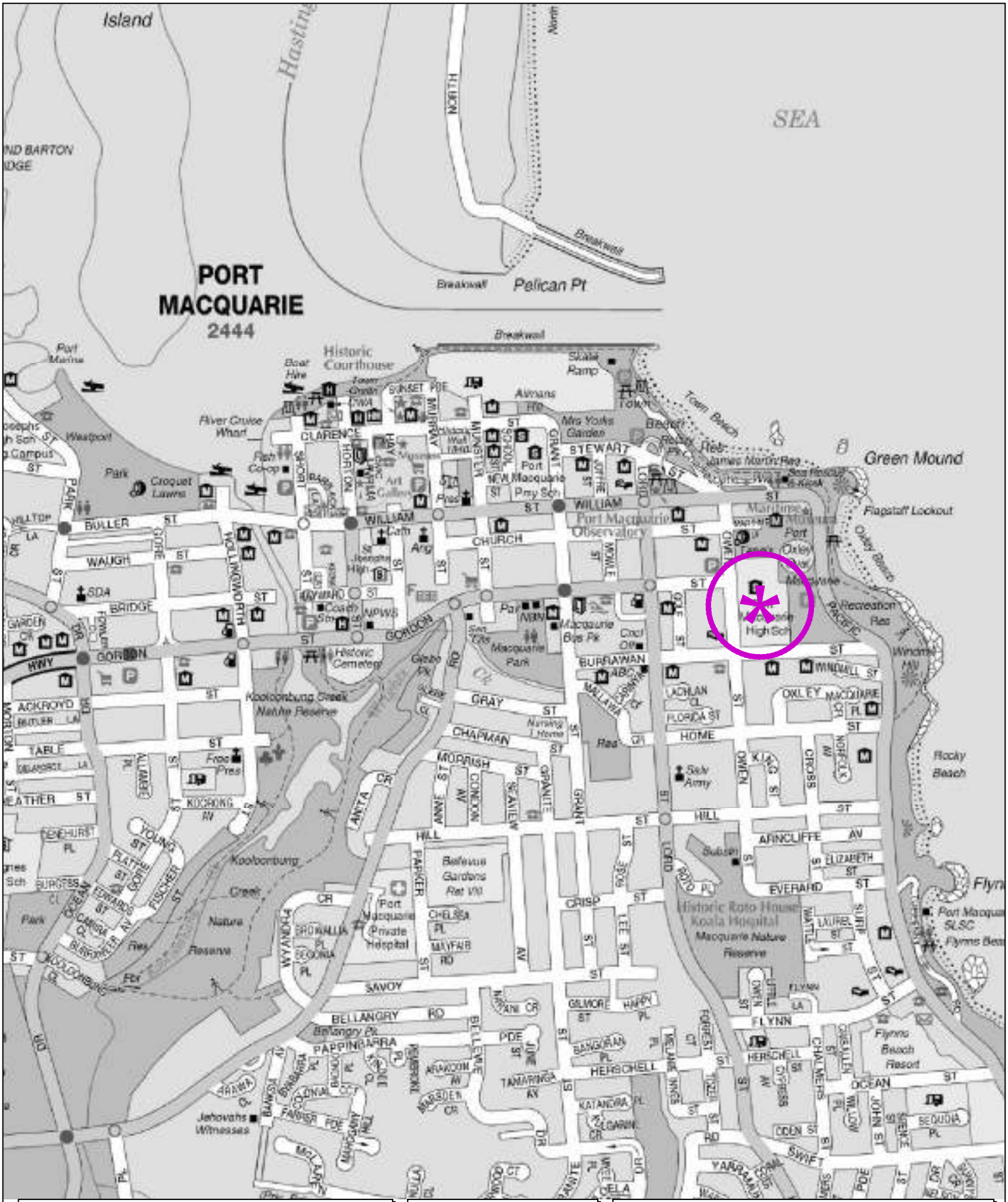
Construction Traffic

C9. All construction 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 or an approved on-street work zone before stopping.

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

Chenlong You
Certificate No: 0052080417
Expiry Date: 16/07/2022

The CTPMSP has also been reviewed and checked by a suitably qualified and experienced civil (traffic) engineer, Meg Kong, with 14 years of professional experience. Meg has completed CTPMSP for more than 300 sites in NSW.



N

LOCATION

FIG 1

2.0 Proposed Development

2.1 Site, Context, and Existing Use

The site (Figure 2) is located at 16 Owen Street, Port Macquarie (Lot 111 in DP 1270315), within the Port Macquarie-Hastings Council Local Government Area (LGA).

The site forms a roughly rectangular shape and covers an area of some 3.5ha. The site has frontages along Owen Street, Burrawan Street and Pacific Drive, with the northern boundary adjoining Oxley Oval.

The current surrounding land uses comprise:

- Port Macquarie Bowling Club to the north
- Oxley Oval adjoining to the north
- the residential single two-storey and residential flat properties to the south and west

2.2 Proposed Development

It is proposed to undertake the following upgrades to Hastings Secondary College Port Macquarie Campus:

- demolition works
- upgraded school entry
- construction of a new two-storey Creative and Performing Arts (CAPA) building
- construction of a new Police Citizens Youth Club (PCYC) building
- construction of new Technological & Applied Studies (TAS) building
- partial refurbishment of Building L
- refurbishment and alteration to Building B
- removal of Building S
- refurbishment of Block T for General Learning & Staff Spaces

- removal of demountable buildings
- new lift connections, covered outdoor learning area (COLA) and covered walkways
- associated earthworks, landscaping, stormwater works and service upgrades
- tree removal and tree safety works
- regrade of existing driveway from Burrawan Street

Details of the proposed development scheme are provided on the architectural plans prepared by Francis-Jones Morehen Thorp (fjmt), reproduced in part in Appendix A.


Stewart St
William St
Church St
Pacific Dr
Gordon St
SITE
Owen St
Pacific Dr
Burrawan St
Burrawan St
Oxley Cres

N

SITE

FIG 2

3.0 Existing and Future Road Network and Traffic Conditions

3.1 Existing Road Network

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

- *Pacific Highway* – a State Highway (HW 10) and arterial route linking between Sydney and Brisbane. The road generally runs in a north-south direction and has 2 lanes of traffic in each direction.

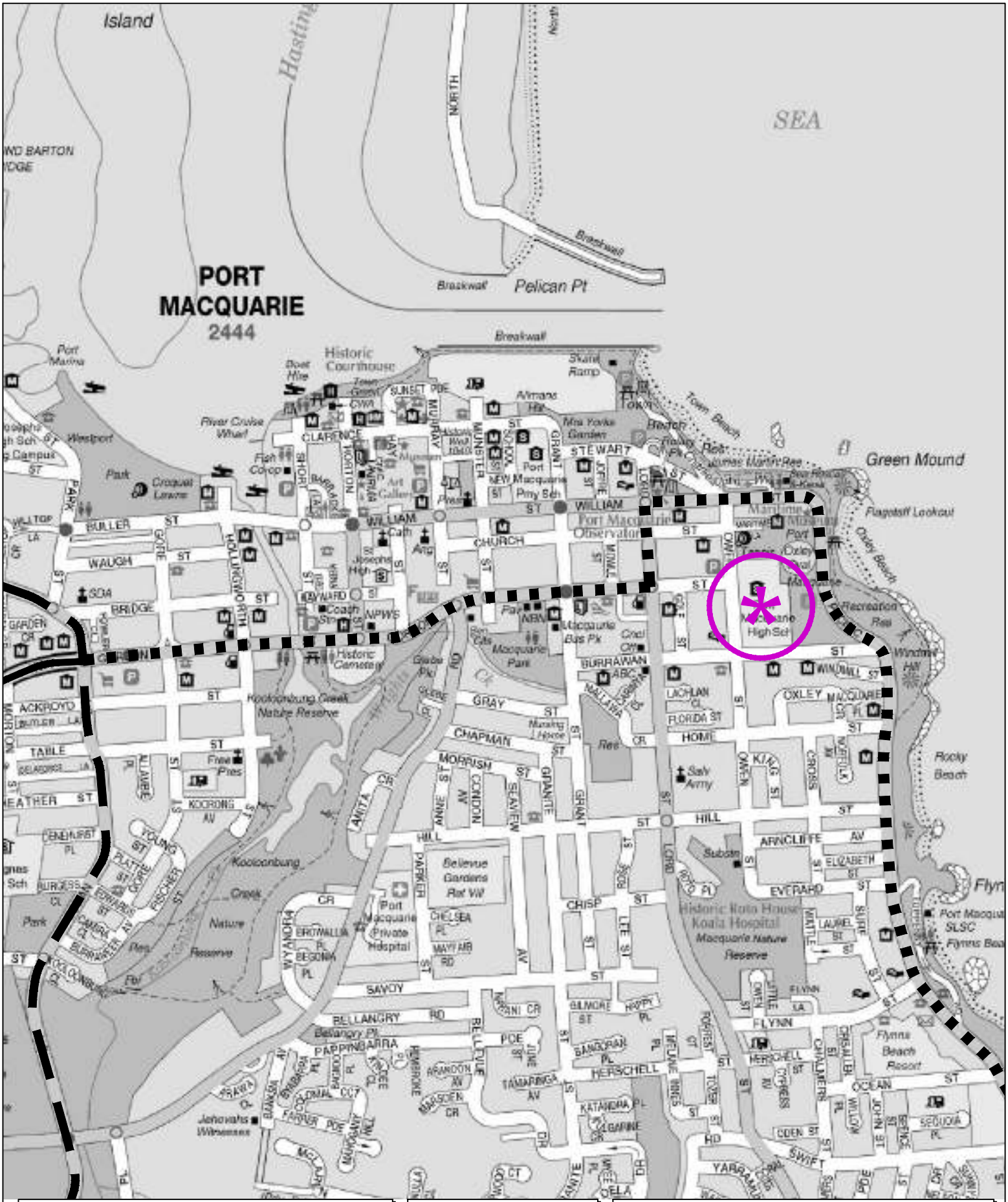
- *Oxley Highway* – a State Highway (HW 11) and arterial route located west of the site providing connections from the Pacific Highway to Port Macquarie via Gordon Street. The road generally runs in an east-west direction and has 2 lanes of traffic in each direction.

- *Hastings River Drive/Ocean Drive* – a sub-arterial route located to the west of the site generally aligned in the north-south direction with 2 lanes of traffic in each direction. The road provides connections between Winery Drive and Dennis Bridge to the north and Pacific Highway to the south.

- *Pacific Drive* – a collector road generally aligned in the north-south direction along the coastline with 1 lane in each direction connecting William Street to the north and Ocean Drive to the south.

- *Lord Street* – a local road generally aligned in the north-south direction located to the west of the site. In the vicinity of the site, Lord Street provides 2 lanes in each direction linking Stewart Street and William Street to the north and Kennedy Drive to the south.

- *Gordon Street* – a collector road generally aligned in an east-west direction located directly to the west of the site. Gordon Street provides 2 lanes in each direction linking Oxley Highway to the west and Owen Street to the east.



LEGEND

- ARTERIAL
- SUB-ARTERIAL
- COLLECTOR

N

ROAD NETWORK

FIG 3

- *Owen Street* - a collector road aligned in the north-south direction providing connections between William Street to the north and Everard Street to the south.

- *Burrawan Street* - a local road aligned in the east-west direction providing connections between Lord Street to the west and Pacific Drive to the east.

3.2 Traffic Controls

The existing traffic controls in the vicinity of the site (Figure 4) include:

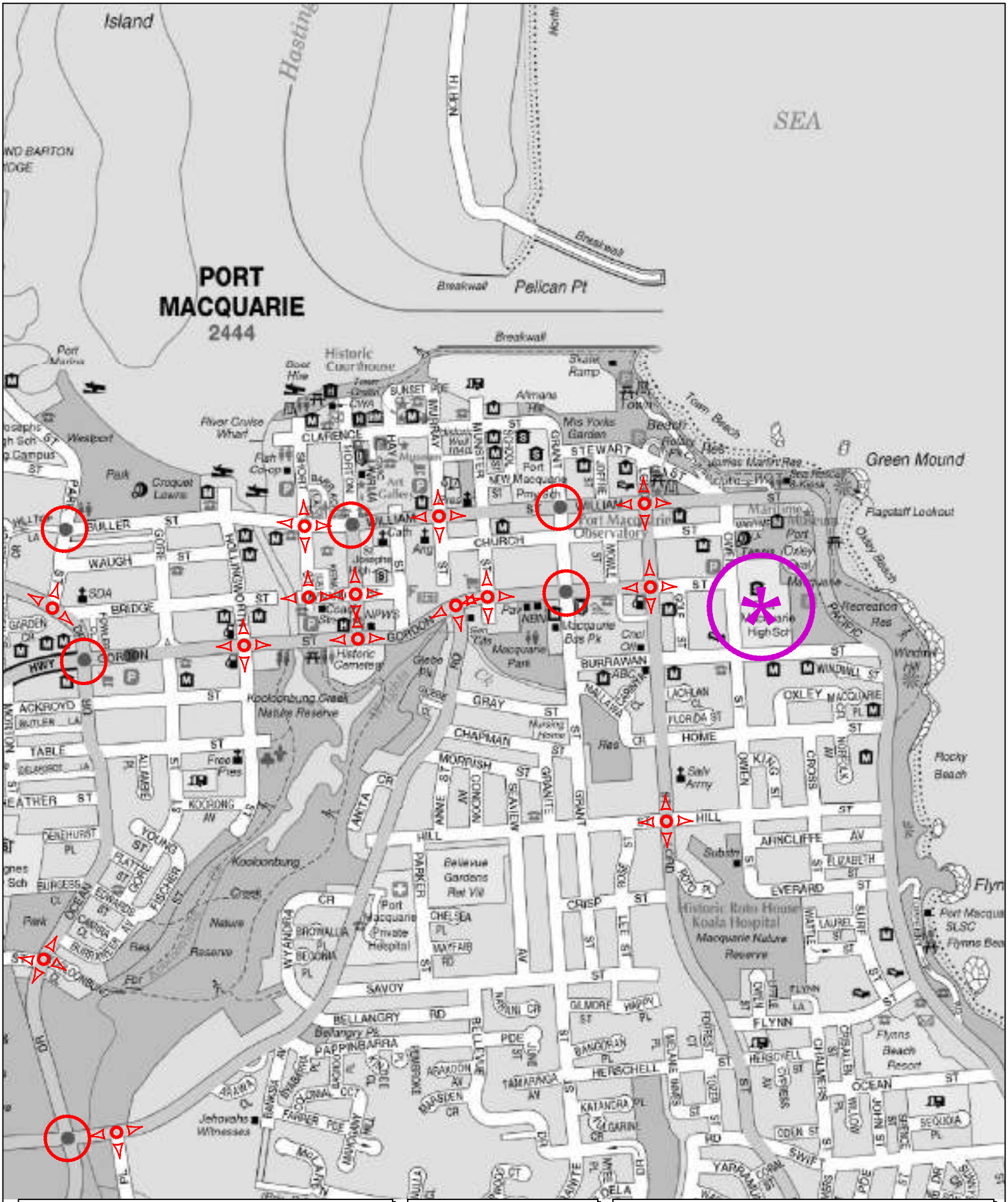
- the traffic control signals along:
  - Gordon Street/Oxley Highway at the intersections with Grant Street, Hastings River Drive/Ocean Drive and Findlay Drive
  - William Street at the intersections with Grant Street and Horton Street

- the roundabouts along:
  - Gordon Street at the intersections of Lord Street, Munster Street, Lake Road, Horton Street and Hollingworth Street
  - William Street at the intersections of Lord Street, Murray Street and Short Street

- the 40kmph “High Pedestrian Activity” and School speed zone restrictions on Owen Street between William Street and Burrawan Street

- the 40kmph School speed zone restriction on
  - William Street between Grant Street and Munster Street
  - Grant Street between Stewart Street and William Street
  - Oxley Highway 250m to the east of the Widderson Street/Oxley Highway intersection
  - Burrawan Street along the school site boundary

- the 50kmph speed restriction on:
  - Gordon Street between Lord Street and Owen Street



LEGEND

- TRAFFIC SIGNAL CONTROL
- ROUNDABOUT

N

TRAFFIC CONTROLS

FIG 4

- William Street between Lord Street and Owen Street
- the surrounding road network, including Burrawan Street (outside of the school zone)

- ❖ the 60kmph speed restriction on Gordon Street between Oxley Highway and Lord Street

3.3 Parking Controls

- ❖ the unrestricted angled parking along Owen Street between William Street and Gordon Street
- ❖ the unrestricted kerbside parking along the local roads, including Owen Street
- ❖ the unrestricted central median carpark along Owen Street
- ❖ the bus zone and No Parking zone between 7.30 am and 9.00 am and between 1.30 pm and 3.00 pm along the Owen Street site frontage

3.4 Traffic Conditions

TTM, on behalf of Ason Group, carried out AM and PM peak period traffic movement surveys on a weekday on the 3 February 2021 between 7:00 am – 9:00 am and 2:00 pm – 4:00 pm to coincide with the starting and finishing periods of the School. The surveys were undertaken at both the intersections of Owen Street/ Gordon Street and Owen Street/ Burrawan St. The outcomes of the surveys are summarised in the following figure:

AM Peak Hour (07:45 – 08:45)	PM Peak Hour (14:00 – 15:00)
	

AM Peak Hour (07:45 – 08:45)	PM Peak Hour (14:00 – 15:00)
	

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

	Level of Service	
	AM Peak	**PM Peak**
Owen Street/ Gordon St	A	A
Owen Street/ Burrawan St	A	A

The traffic modelling indicates the nearby key intersections currently operate satisfactorily at the level of service A during the assessed peak hours.

3.4 Transport Services

Public Bus

The site is within 250 metres (4-minute walk) to the nearby bus stop along Lord Street. These stops are currently serviced by route no. 329, providing services to Settlement City Shopping Centre to Waniora Parkway.

Additional bus stops are located on Lord Street within 600m to the southwest of the site. These stops are serviced by the following routes:

- 322 - Lighthouse Plaza to Port Macquarie via Shelly Beach

- 334 - Lighthouse Plaza to Port Macquarie
- 334K - Kendall to Port Macquarie via Laurieton

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

School Bus

Busways provides for 10 and 13 school bus services during the AM and PM periods, respectively. The AM bus services depart between 6:26 am and 7:43 am, while the PM bus services depart the school between 2.40 pm and 3.17 pm. These buses set down and pick up students from the existing 75m long bus zone on the eastern side of Owen Street, south of Gordon Street. Bus bay to be temporarily relocated south by approximately sixty metres.

3.5 Walking Facilities

Footpaths are provided on both sides of Owen Street and the southern side of Burrawan Street between Owen Street and the school's gate on the south-eastern corner of the site. The existing pedestrian infrastructure is illustrated in the Pedestrian Access Mobility Plan map shown in the following figure.

3.6 Cycling Facilities

Council provides a number of on- and off-street bike paths, which connect to the regional cycling network. There is currently no cycling infrastructure on Owen Street and Burrawan Street along the site's boundary. The nearest bicycle routes are located

along Lords Street and Gordon Street and Pacific Drive. The existing provision for bicycle paths in the vicinity of the site are shown in the Port Macquarie-Hastings Bike Plan and RMS Cycleway Finder maps.

4.0 Proposed Construction Scheme

4.1 Construction Program

The project is to be carried out over the course of 14 months with the following breakdown:

- Stage 1 (1 month): Site Establishment and Demolition
- Stage 2 (11 months): Construction

4.2 Construction Workers

It is anticipated that there will be an average of 30 workers and a maximum of 60 workers on-site during the construction stage.

Workers will be instructed that at no times will there be parking available on Owen St. All Workers and Personnel associated with the project will be directed to park in the adjacent side streets

Notwithstanding the above, workers will be encouraged at all times to utilise the public transport system which exists in the vicinity of the site or to carpool wherever possible.

A tool drop-off and storage facility would be provided within the site boundary near the site access. This would allow tradespeople to drop off and store their tools and machinery, allowing them to use public transport or carpool to/ from the site on a daily basis.

Workers will also be informed of appropriate tool/ equipment drop-off and storage arrangements made within site sheds and amenities provided on-site. Bus schedules will be provided to all workers during site induction to demonstrate alternative modes of transport available.

Workers will be directed not to use on-street parking in the vicinity of the site (including works zone). FKG would take appropriate action if informed of this activity occurring. This will be incorporated into the site induction program.

4.3 Construction Hours

The hours of construction activity (including the delivery of materials to and from the site) will be:

7 am -6 pm	Monday to Friday
8 am -1 pm	Saturday
No work	Sunday and public holidays

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

9 am-12 pm, 2 pm-5 pm	Monday to Friday
9am - 12pm	Saturday

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, they may be undertaken:

(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
(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 the above construction activities will be provided to affected residents prior to the commencement of the activities or as soon as is practical afterwards.

4.4 Vehicle Site Access

Vehicle access to the construction site is proposed via the existing driveway along Burrawan Street.

4.5 Works Zone

The following works zone would be required to accommodate trucks for the delivery of construction materials/ equipment, as well as any construction-related works that cannot be undertaken on-site:

- Stage 1: 40m works zone on the eastern side of Owen Street north of Burrawan Street

The works zone would not be used for private kerbside parking by builders, tradesmen and visitors associated with the site.

The works zone will be in operation during the following times:

- Monday to Friday: 9.00 am – 1.30 pm
- Saturday: 7.00 am – 5.00 pm.

The proposed works zone would occupy the unrestricted parallel parking spaces on Owen Street, maintaining the one-way traffic southbound flow on Owen Street.

A separate application has been made to the Council to organise appropriate approvals for the proposed works zones prior to the start of works, as well as the parking and traffic changes.

4.6 Cranage and Materials Handling

Mobile cranes will be utilised within the site for materials handling. Materials will be loaded/unloaded between the on-site loading area and works zones using forklifts or trolleys (for light materials).

On-site plant, materials handling/storage areas, spoil bin and laydown areas will be located on-site, while the worker sheds and amenities will be located on the south-eastern side of the site.

5.0 Construction Traffic Management Planning

5.1 Vehicle Access and Internal Circulation

The largest vehicle that will use the site access along Burrawan Street and the works zones along Owen Street will be a 19-metre semi. Accesses into the site will be generally left forward-in and right forward-out along Owen Street, with the occasional 19m semis reversing in from Owen Street and right-out on departure.

The use of 19 metre semis will be limited to major plant deliveries only, these will include deliveries of 30 tonne excavator and piling rig.

Sufficient manoeuvring and marshalling areas have been provided on-site to ensure general construction vehicles can enter and exit in a forward direction without marshalling on the public roads.

General construction vehicles entering and exiting the site will be completed under the management of trained on-site personnel.

Major deliveries by semis will reverse into the site under the management of on-site accredited traffic controllers at the site access point.

5.2 Pedestrian Access

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

Pedestrian activities are currently removed from the construction area by the erected hoarding/site fencing.

Trucks entering and leaving site will have a spotter / TC either side of the vehicle gate.

5.3 Construction Vehicles

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

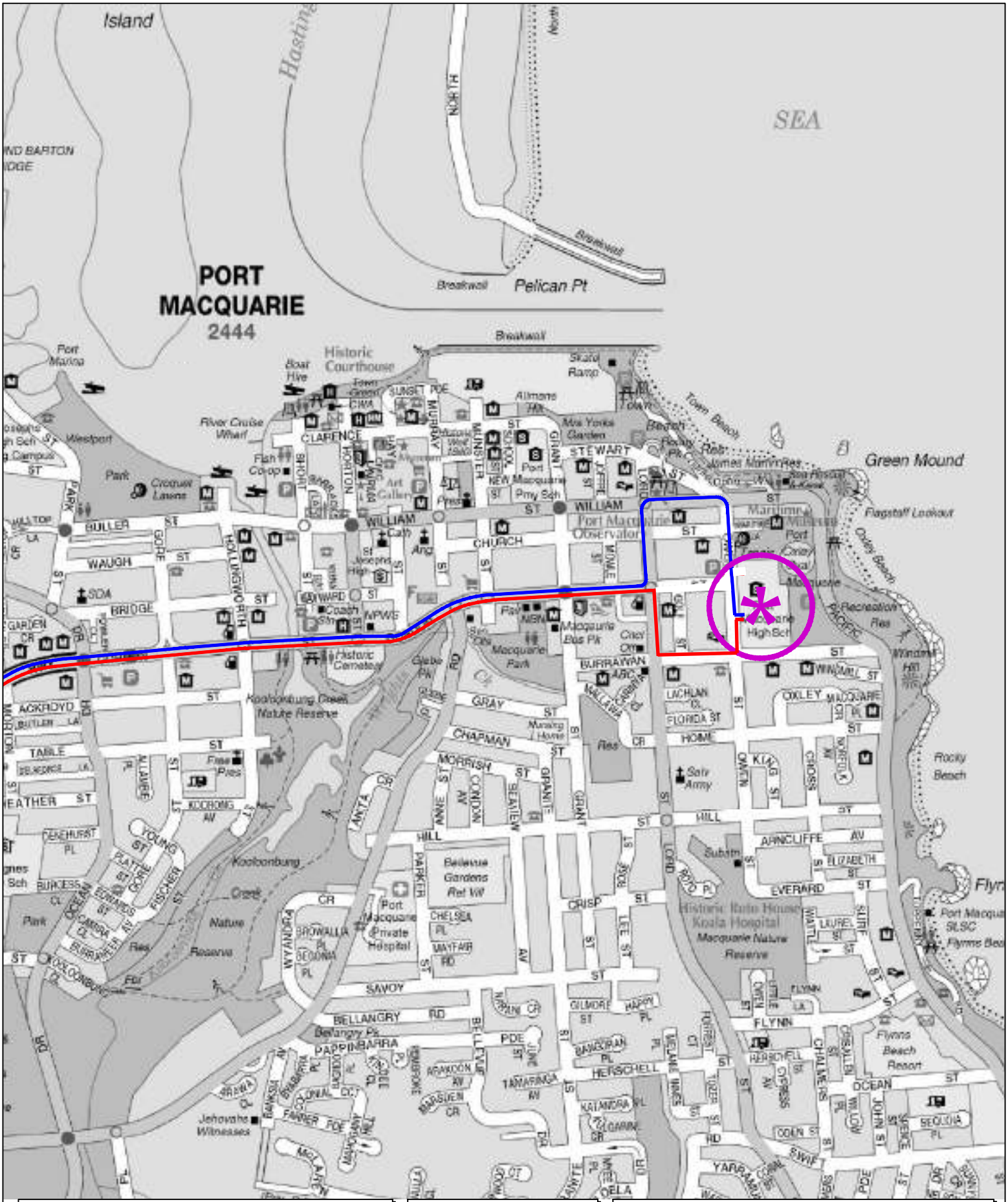
Articulated vehicles	19m
Truck and Dog Trailer	18.1m
Heavy rigid vehicles (HRV)	12.5m
Medium rigid vehicles (HRV)	8.8m
Small rigid vehicles (SRV)	6.4m
Bin trucks	10.2m
Mobile cranes	18.5m
Concrete trucks	8m
Single bogie	10.5m
Concrete pump truck	8.8m
Small utility vehicle/Van	5.2m
Glass lifter (façade installation)	4.3m

Swept path analysis was completed for 12.5m heavy rigid vehicles, 18.1m truck and dog trailers and 19-metre semis expected to access the site and works zones, provided in Appendix C of this report.

5.4 Construction Traffic Haulage Route

Generally, construction vehicles will have origins and destinations from a wide variety of locations throughout the North Coast. 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 Gordon Street, William Street and Owen Street, with access to/from Oxley Highway and Pacific Highway, as indicated in Figure 5. Truck drivers will be advised of the designated truck routes to/



LEGEND

ARRIVAL

DEPARTURE

TRUCK ROUTES

FIG 5

from the site. No queuing or marshalling of trucks will be permitted on public roads in the vicinity of the site.

5.5 Other General Requirements for Trucks

All 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 from 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 will 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 the 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 zones/on-site loading areas. 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/Sydney Buses approval prior to the event.

5.6 Occupational Health and Safety

Any workers required to undertake works or traffic control within the public domain should 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 site, which is within the bounds of the construction site.

Emergency protocols on the site would indicate a requirement for the traffic controller and on-site personnel to assist with emergency access from Owen Street and Burrawan Street. All truck movements to the site 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 construction activities should be parked wholly within the site and the approved on-street works zones. These vehicles enter the site/works zones prior to stopping. All site staff related to the works are to park in a designated off-street parking area.

Timetables for all bus routes servicing the site will also be provided for the perusal of workers at various locations within the site (e.g., meal rooms).

5.9 Traffic Control Plan

The Traffic Control Plan (TCP) presents the principles of traffic management, with the detailed information for work site operations is contained in the Roads and Maritime Services Traffic Control at Work Sites Technical Manual Version 6.0 dated 14 September 2020. The control of traffic at work sites must be undertaken with reference to Workcover requirements and FKG's Workplace Health and Safety Manuals. The TCP prepared by a Certified Traffic Controller (under RMS regulations) in accordance with Australian Standards 1742.3 are provided in Appendix D.

5.10 Contact Details

The contact details for the day-to-day activities on the site will be:

Steve Ross
Site Manager - Construction
FKG Group
0477 765 640

6.0 Construction Traffic Impact Assessment

6.1 Impact on General Traffic

As articulated in the preceding section, the construction works will involve a variety of construction vehicles ranging between a semi-trailer (which is subject to a separate permit) 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 40 vehicles (80 movements) per day, which would occur outside of peak traffic periods when possible - AM (7.00 am-9.00 am) and PM (1.30 pm-3.00 pm and 4.00 pm to 6 pm) to minimise traffic (bus and traffic flow) impacts and associated road network delays.

Construction truck drivers will be reminded that there should be no idling on and the use of Owen Street and Burrawan Street as marshalling areas.

With the above measures, it is not expected that this level of traffic movement would create any adverse road safety and network efficiency impacts on the surrounding road network and general traffic, cyclists and pedestrians and bus services.

6.2 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, which are designed to accommodate heavy vehicle movements. As such, the impacts on public transport services will be minimal on the approach/departure routes.

Access to/from the bus zones by buses on Owen Street will be maintained at all times.

6.3 Impact on Pedestrians and Cyclists

During construction, pedestrian movements along Owen Street and Burrawan Street will be maintained at all times.

Either of A-Class hoarding and site security fencing will be erected around the perimeter of the site. On-site personnel &/or traffic controllers will be present during construction hours to manage construction vehicle entry and exit and pedestrian movements at the site access, noting that pedestrian priority would be given. Outside of construction hours, gates will 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 on-site personnel &/or traffic controllers, with trucks escorted between the access gate and the road.

Given that there are no cycling routes along the frontage roads of the site, there will be no direct impact on the cyclists.

To minimise disruption to pedestrian and cyclist movements, it is advised that truck movements are managed, wherever possible, to occur outside of peak school and commuting periods.

6.4 Impact on On-Street Parking

The proposed works zones would result in the temporary loss of approximately 10 unrestricted on-street parking spaces on the eastern side of Owen Street.

The removal of the on-street spaces is not anticipated to have an adverse impact on parking in the area due to the availability of other on-street parking at the nearby local roads. The unrestricted parking would be maintained outside the works zone 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

With the recent social restrictions introduced, School Infrastructure NSW has introduced virtual information sessions for school communities and other stakeholders to continue community engagement throughout all stages of the 190 new and upgraded school projects across NSW, including Hastings Secondary College, Port Macquarie.

The relevant stakeholders and future coordination/liaison requirements will comprise the following:

- the Hastings Secondary College, Port Macquarie students, staff and families
- the surrounding residents
- Port Macquarie-Hastings Council
- Port Macquarie Bowling Club

Following consultation with the stakeholders, construction-related traffic issues would be:

- monitored
- mitigated via the Community Consultation Strategy and regular meetings with key stakeholders held throughout the project.

Furthermore, ongoing communication is also to be undertaken so that the CPTMSP is kept up.

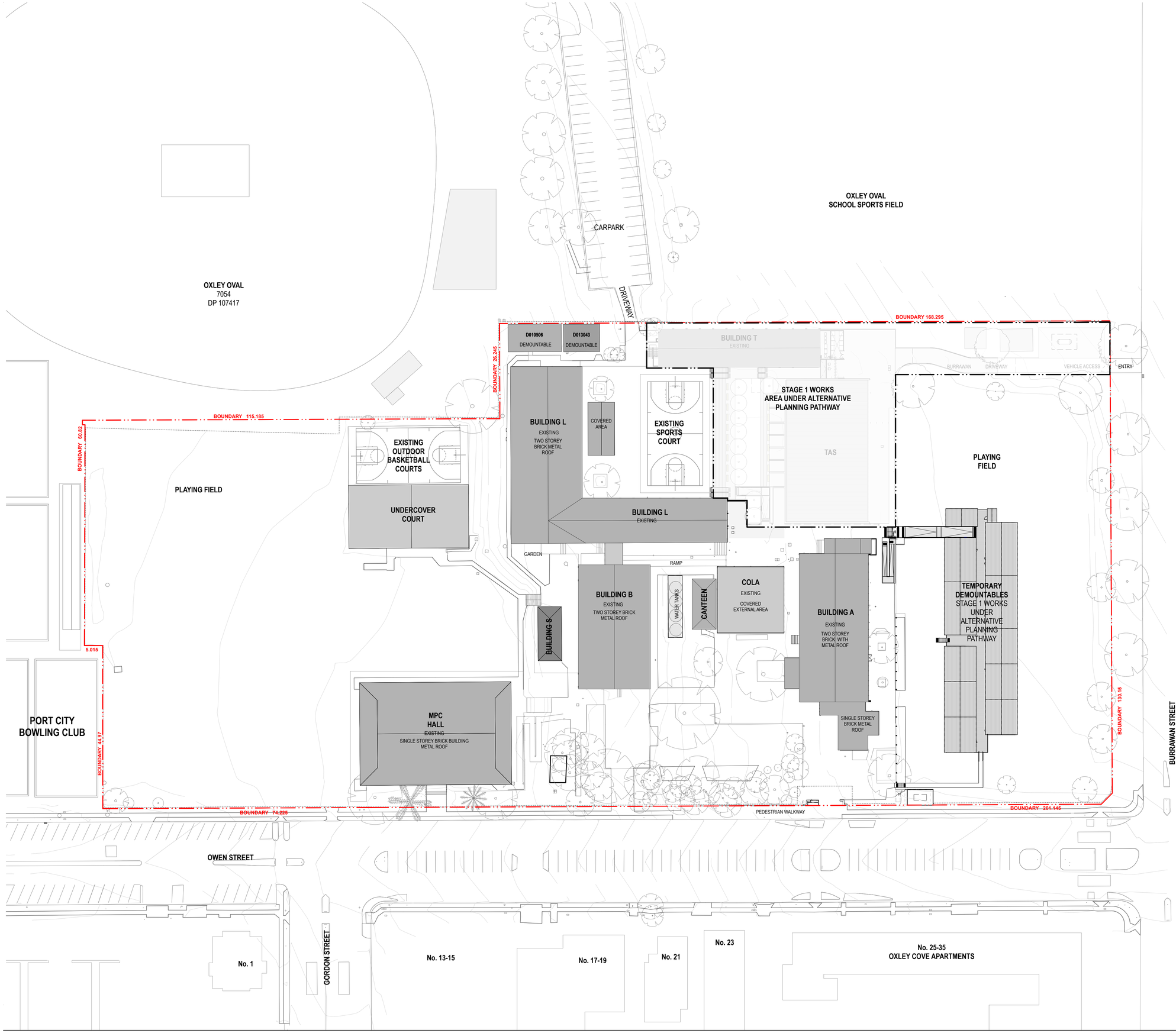
FKG Group would also maintain regular contact with all stakeholders to communicate upcoming works and potential impacts.

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 FKG Group. A daily inspection before the start of the construction activity should 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.

Appendix A

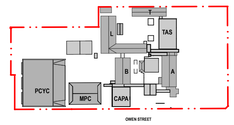
Approved Architectural Plans



GENERAL NOTES

- ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR BEFORE PROCEEDING WITH THE WORK.
- ALL LEVELS RELATIVE TO 'AUSTRALIAN HEIGHT DATUM'.
- DO NOT SCALE DRAWINGS. USE FIGURED DIMENSIONS ONLY.

keyplan



legend

- BOUNDARY LINE
- AREA UNDER ALTERNATIVE PLANNING PATHWAY

TOTAL SITE AREA = 34518.1m²

No. 18-20
No. 22
No. 24
No. 26
No. 28
No. 32
No. 34
No. 36

rev	date	name	by	chk
05	14/4/21	SSDA	MJ	
04	26/3/21	SSDA	KT	
03	19/3/21	SSDA - Consultant Background Issue	AD	
02	23/2/21	Draft SSDA 02	KT	
01	12/2/21	Draft SSDA	MJ	

fjmt studio architecture interiors landscape urban community
sydney melbourne uk
Level 5, 70 King Street t +61 2 9251 7077 w fjmtstudio.com

project
Hastings Schools Port Macquarie
Hastings Secondary College
Port Macquarie NSW 2444

title
Site
Site Plan - Existing

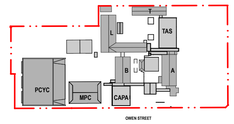
scale	1:500 @ A1	first issued	12/2/21
project code		sheet no.	revision
HSPM		SSDA-120000	05

0 5 10 20m

GENERAL NOTES

- ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR BEFORE PROCEEDING WITH THE WORK.
- ALL LEVELS RELATIVE TO 'AUSTRALIAN HEIGHT DATUM'.
- DO NOT SCALE DRAWINGS. USE FIGURED DIMENSIONS ONLY.

keyplan



legend

- BOUNDARY LINE
- AREA UNDER ALTERNATIVE PLANNING PATHWAY
- PROPOSED REFURBISHMENT
- NEW CONSTRUCTION
- EXISTING TREES
- PROPOSED TREES

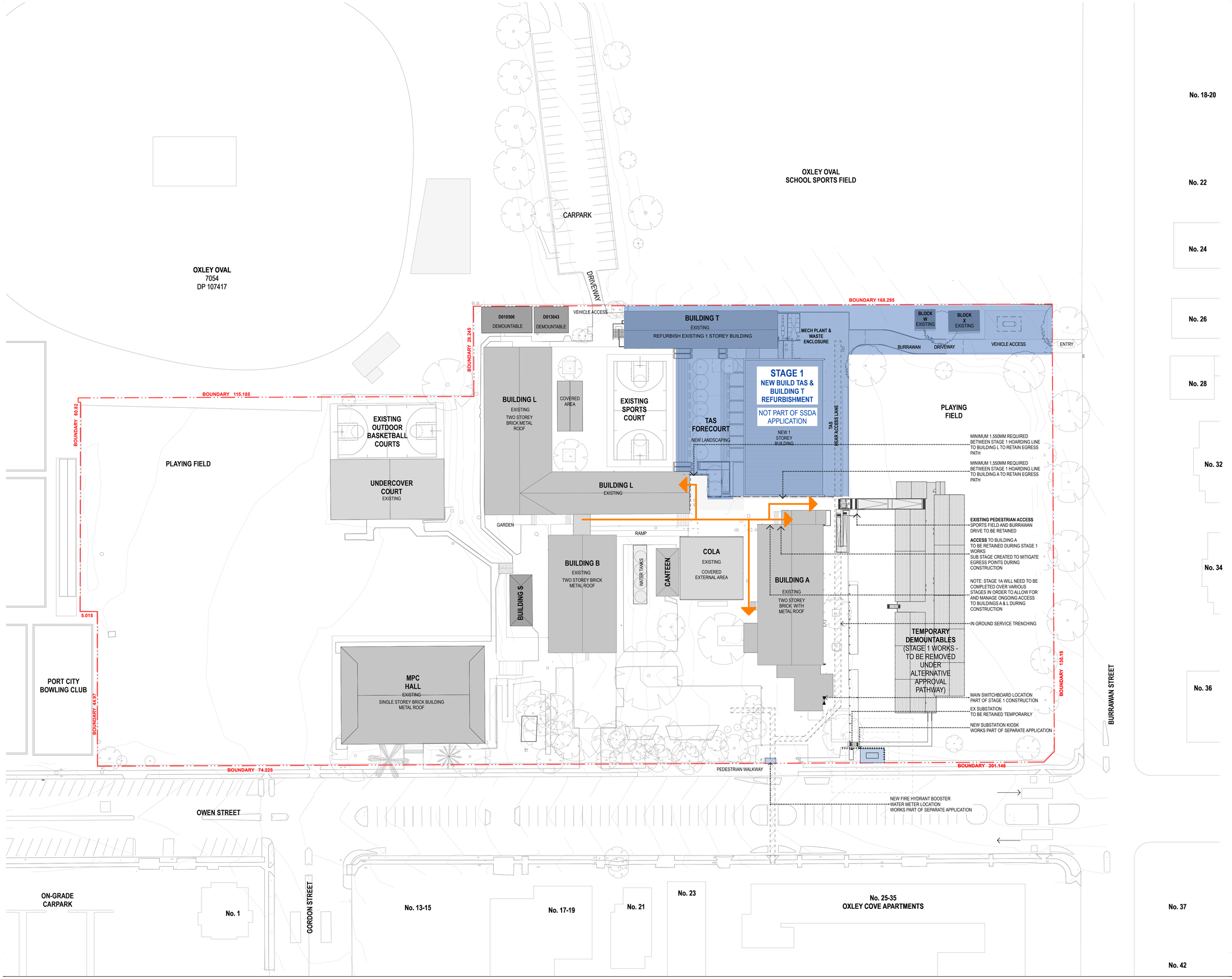
rev	date	name	by	chk
05	14/4/21	SSDA	MJ	
04	26/3/21	SSDA	KT	
03	19/3/21	SSDA - Consultant Background Issue	AD	
02	23/2/21	Draft SSDA 02	KT	
01	12/2/21	Draft SSDA	MJ	

fjmt studio architecture interiors landscape urban community
sydney melbourne uk
Level 5, 70 King Street t +61 2 9251 7077 w fjmtstudio.com

project
Hastings Schools Port Macquarie
Hastings Secondary College
Port Macquarie NSW 2444

title
Site
Site Plan - Proposed

scale	1:500 @ A1	first issued	12/2/21
project code		sheet no.	revision
HSPM		SSDA-120010	05

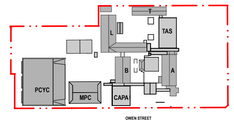


0 5 10 20m

GENERAL NOTES

- ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR BEFORE PROCEEDING WITH THE WORK.
- ALL LEVELS RELATIVE TO 'AUSTRALIAN HEIGHT DATUM'.
- DO NOT SCALE DRAWINGS. USE FIGURED DIMENSIONS ONLY.

keyplan



legend

BOUNDARY LINE

STAGING LEGEND

- EXISTING EGRESS PATHS TO BE RETAINED DURING CONSTRUCTION
- NEW TEMPORARY EGRESS PATH
- NEW TEMPORARY EGRESS PATH ZONE
- DEMOUNTABLE REMOVED
- **STAGE 1** (PART OF SEPERATE DEVELOPMENT APPLICATION)
- **STAGE 2** - CAPA & ENTRY CANOPY
- **STAGE 3** - BUILDING B REFURBISHMENT & NEW NORTH SOUTH LINK
- **STAGE 4** - BLOCK L REFURBISHMENT
- **STAGE 5** - PCYC

NOTES

HOARDING LINE LOCATIONS ARE INDICATIVE ONLY AND ARE LOCATED TO RETAIN ALL EXISTING EGRESS POINTS AS NOTED.

A MINIMUM OF 1,550MM WIDTH IS REQUIRED TO RETAIN EXISTING CONNECTIONS BETWEEN STAGE 5 HOARDING AND EXISTING BUILDINGS.

rev	date	name	by	chk
04	14/4/21	SSDA	MJ	
03	26/3/21	SSDA	KT	
02	23/2/21	Draft SSDA 02	KT	
01	12/2/21	Draft SSDA	MJ	

fjmt studio architecture interiors landscape urban community
sydney melbourne uk
Level 5, 70 King Street t +61 2 9251 7077 w fjmtstudio.com

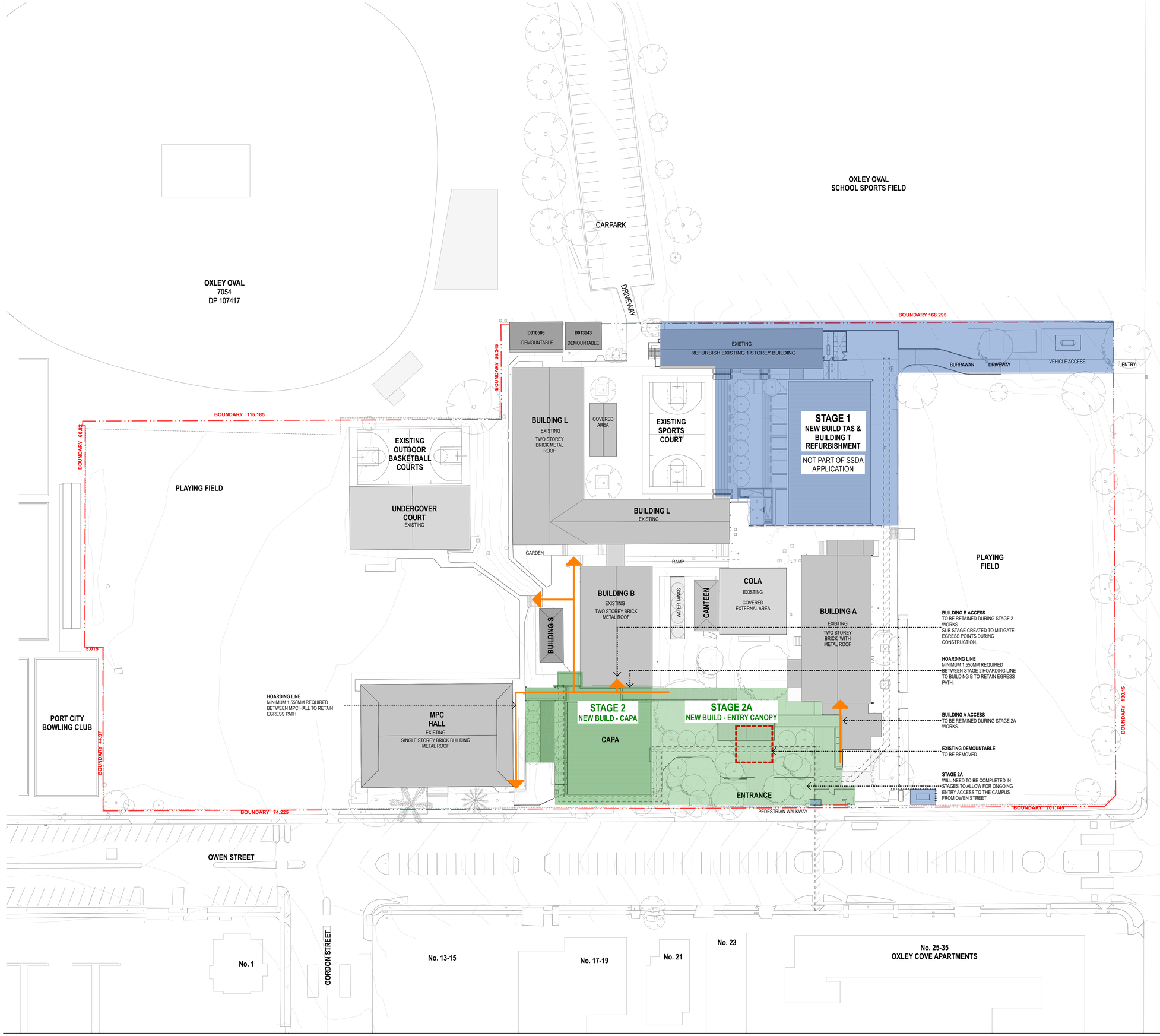
project

Hastings Schools Port Macquarie
Hastings Secondary College
Port Macquarie NSW 2444

title

Staging Plans
Staging Plan Port Macquarie Campus - Stage 1

scale	1:500 @ A1	first issued	12/2/21
project code		sheet no.	revision
HSPM		SSDA-121301	04

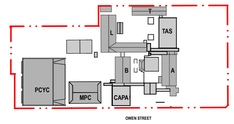


0 5 10 20m

GENERAL NOTES

- ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR BEFORE PROCEEDING WITH THE WORK.
- ALL LEVELS RELATIVE TO 'AUSTRALIAN HEIGHT DATUM'.
- DO NOT SCALE DRAWINGS. USE FIGURED DIMENSIONS ONLY.

keyplan



legend

BOUNDARY LINE

STAGING LEGEND

- EXISTING EGRESS PATHS TO BE RETAINED DURING CONSTRUCTION
- NEW TEMPORARY EGRESS PATH
- NEW TEMPORARY EGRESS PATH ZONE
- DEMOUNTABLE REMOVED
- **STAGE 1** (PART OF SEPERATE DEVELOPMENT APPLICATION)
- **STAGE 2** - CAPA & ENTRY CANOPY
- **STAGE 3** - BUILDING B REFURBISHMENT & NEW NORTH SOUTH LINK
- **STAGE 4** - BLOCK L REFURBISHMENT
- **STAGE 5** - PCYC

NOTES

HOARDING LINE LOCATIONS ARE INDICATIVE ONLY AND ARE LOCATED TO RETAIN ALL EXISTING EGRESS POINTS AS NOTED.

A MINIMUM OF 1,550MM WIDTH IS REQUIRED TO RETAIN EXISTING CONNECTIONS BETWEEN STAGE 5 HOARDING AND EXISTING BUILDINGS.

rev	date	name	by	chk
04	14/4/21	SSDA	MJ	
03	26/3/21	SSDA	KT	
02	23/2/21	Draft SSDA 02	KT	
01	12/2/21	Draft SSDA	MJ	

fjmt studio architecture interiors landscape urban community
sydney melbourne uk
Level 5, 70 King Street t +61 2 9251 7077 w fjmtstudio.com

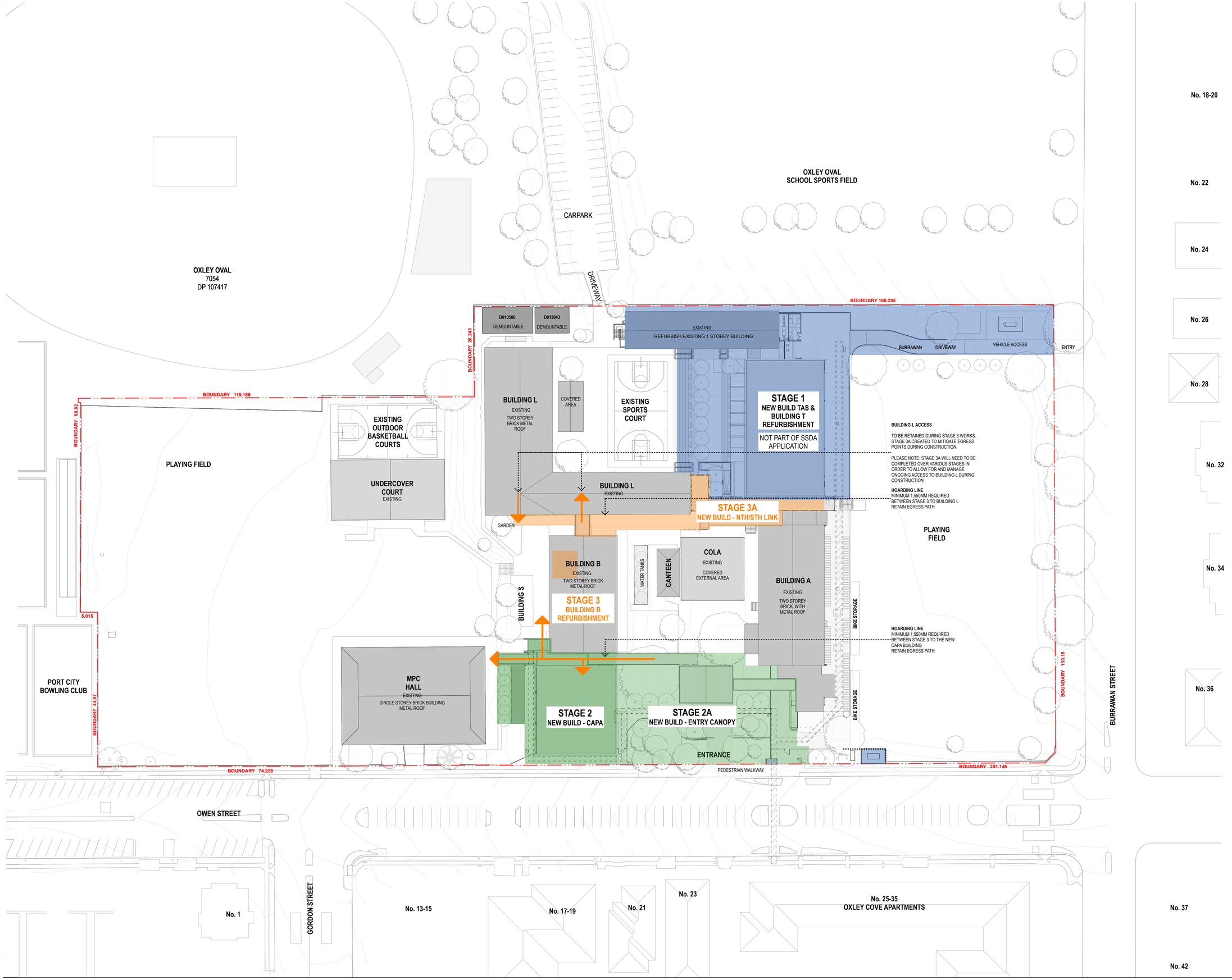
project

Hastings Schools Port Macquarie
Hastings Secondary College
Port Macquarie NSW 2444

title

Staging Plans
Staging Plan Port Macquarie Campus - Stage 2

scale	1:500 @ A1	first issued	12/2/21
project code		sheet no.	revision
HSPM		SSDA-121302	04

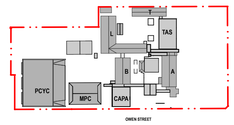


0 5 10 20m

GENERAL NOTES

- ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR BEFORE PROCEEDING WITH THE WORK.
- ALL LEVELS RELATIVE TO 'AUSTRALIAN HEIGHT DATUM'.
- DO NOT SCALE DRAWINGS. USE FIGURED DIMENSIONS ONLY.

legend



BOUNDARY LINE

STAGING LEGEND

- EXISTING EGRESS PATHS TO BE RETAINED DURING CONSTRUCTION
- NEW TEMPORARY EGRESS PATH
- NEW TEMPORARY EGRESS PATH ZONE
- DEMOUNTABLE REMOVED
- **STAGE 1** (PART OF SEPERATE DEVELOPMENT APPLICATION)
- **STAGE 2** - CAPA & ENTRY CANOPY
- **STAGE 3** - BUILDING B REFURBISHMENT & NEW NORTH SOUTH LINK
- **STAGE 4** - BLOCK L REFURBISHMENT
- **STAGE 5** - PCYC

NOTES

HOARDING LINE LOCATIONS ARE INDICATIVE ONLY AND ARE LOCATED TO RETAIN ALL EXISTING EGRESS POINTS AS NOTED.

A MINIMUM OF 1,550MM WIDTH IS REQUIRED TO RETAIN EXISTING CONNECTIONS BETWEEN STAGE 5 HOARDING AND EXISTING BUILDINGS.

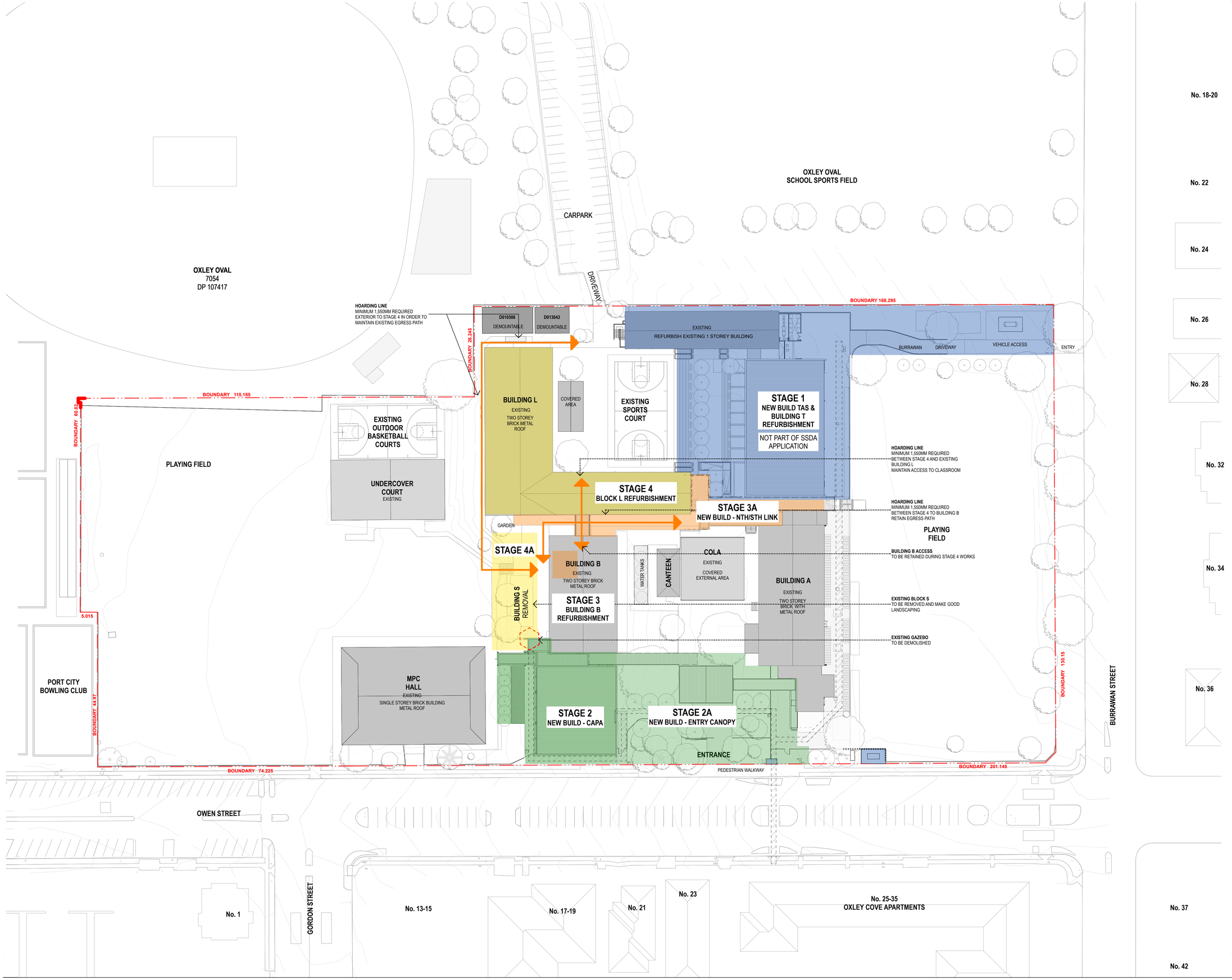
rev	date	name	by	chk
04	14/4/21	SSDA	MJ	
03	26/3/21	SSDA	KT	
02	23/2/21	Draft SSDA 02	KT	
01	12/2/21	Draft SSDA	MJ	

fjmt studio architecture interiors landscape urban community
sydney melbourne uk
Level 5, 70 King Street t +61 2 9251 7077 w fjmtstudio.com

project
Hastings Schools Port Macquarie
Hastings Secondary College
Port Macquarie NSW 2444

title
Staging Plans
Staging Plan Port Macquarie Campus - Stage 3

scale	1:500 @ A1	first issued	12/2/21
project code		sheet no.	revision
HSPM		SSDA-121303	04

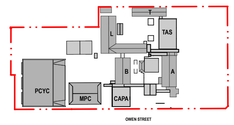


0 5 10 20m

GENERAL NOTES

- ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR BEFORE PROCEEDING WITH THE WORK.
- ALL LEVELS RELATIVE TO 'AUSTRALIAN HEIGHT DATUM'.
- DO NOT SCALE DRAWINGS. USE FIGURED DIMENSIONS ONLY.

keyplan



legend

BOUNDARY LINE

STAGING LEGEND

- EXISTING EGRESS PATHS TO BE RETAINED DURING CONSTRUCTION
- NEW TEMPORARY EGRESS PATH
- NEW TEMPORARY EGRESS PATH ZONE
- DEMOUNTABLE REMOVED
- **STAGE 1** (PART OF SEPERATE DEVELOPMENT APPLICATION)
- **STAGE 2** - CAPA & ENTRY CANOPY
- **STAGE 3** - BUILDING B REFURBISHMENT & NEW NORTH SOUTH LINK
- **STAGE 4** - BLOCK L REFURBISHMENT
- **STAGE 5** - PCYC

NOTES

HOARDING LINE LOCATIONS ARE INDICATIVE ONLY AND ARE LOCATED TO RETAIN ALL EXISTING EGRESS POINTS AS NOTED.

A MINIMUM OF 1,550MM WIDTH IS REQUIRED TO RETAIN EXISTING CONNECTIONS BETWEEN STAGE 5 HOARDING AND EXISTING BUILDINGS.

rev	date	name	by	chk
04	14/4/21	SSDA	MJ	
03	26/3/21	SSDA	KT	
02	23/2/21	Draft SSDA 02	KT	
01	12/2/21	Draft SSDA	MJ	

fjmt studio architecture interiors landscape urban community
sydney melbourne uk
Level 5, 70 King Street t +61 2 9251 7077 w fjmtstudio.com

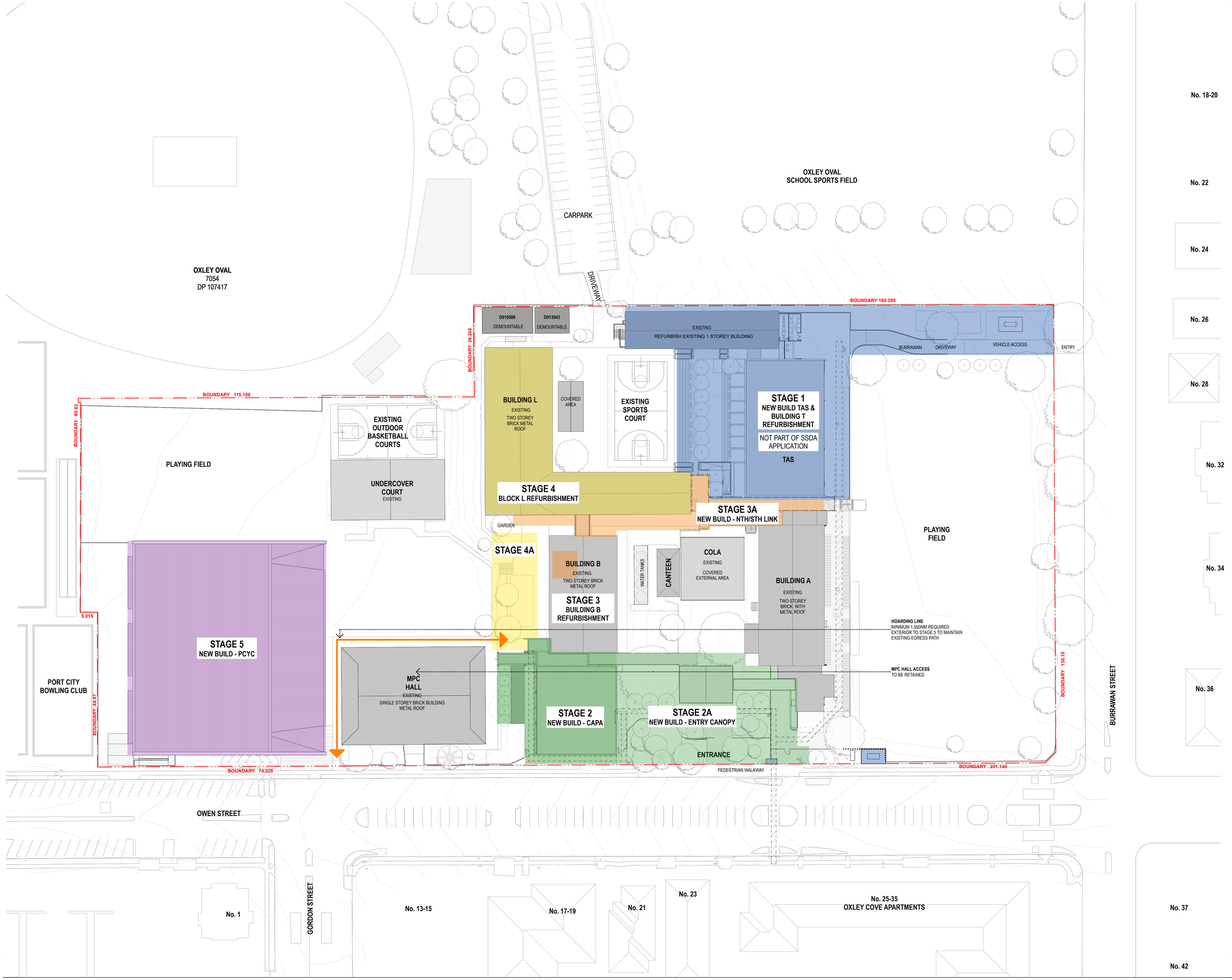
project

Hastings Schools Port Macquarie
Hastings Secondary College
Port Macquarie NSW 2444

title

Staging Plans
Staging Plan Port Macquarie Campus - Stage 4

scale	1:500 @ A1	first issued	12/2/21
project code		sheet no.	revision
HSPM		SSDA-121304	04

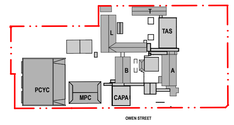


0 5 10 20m

GENERAL NOTES

- ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR BEFORE PROCEEDING WITH THE WORK.
- ALL LEVELS RELATIVE TO 'AUSTRALIAN HEIGHT DATUM'.
- DO NOT SCALE DRAWINGS. USE FIGURED DIMENSIONS ONLY.

keyplan



legend

BOUNDARY LINE

STAGING LEGEND

- EXISTING EGRESS PATHS TO BE RETAINED DURING CONSTRUCTION
- NEW TEMPORARY EGRESS PATH
- NEW TEMPORARY EGRESS PATH ZONE
- DEMOUNTABLE REMOVED
- **STAGE 1** (PART OF SEPERATE DEVELOPMENT APPLICATION)
- **STAGE 2** - CAPA & ENTRY CANOPY
- **STAGE 3** - BUILDING B REFURBISHMENT & NEW NORTH SOUTH LINK
- **STAGE 4** - BLOCK L REFURBISHMENT
- **STAGE 5** - PCYC

NOTES

HOARDING LINE LOCATIONS ARE INDICATIVE ONLY AND ARE LOCATED TO RETAIN ALL EXISTING EGRESS POINTS AS NOTED.

A MINIMUM OF 1,550MM WIDTH IS REQUIRED TO RETAIN EXISTING CONNECTIONS BETWEEN STAGE 5 HOARDING AND EXISTING BUILDINGS.

rev	date	name	by	chk
04	14/4/21	SSDA	MJ	
03	26/3/21	SSDA	KT	
02	23/2/21	Draft SSDA 02	KT	
01	12/2/21	Draft SSDA	MJ	

fjmt studio architecture interiors landscape urban community
sydney melbourne uk
Level 5, 70 King Street t +61 2 9251 7077 w fjmtstudio.com

project

Hastings Schools Port Macquarie
Hastings Secondary College
Port Macquarie NSW 2444

title

Staging Plans
Staging Plan Port Macquarie Campus - Stage 5

scale	1:500 @ A1	first issued	12/2/21
project code		sheet no.	revision
HSPM		SSDA-121305	04

Appendix B

Public Transport Provisions

322 Lighthouse Plaza to Port Macquarie via Shelly Beach

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 at **transportnsw.info**

Trip planning

You can plan your trip using the Trip Planner or Departures at **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
- 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 Busways Port Macquarie.

Fares

Contact Busways Port Macquarie for ticket options. You cannot use Opal on this service.

Explanation of definitions and symbols

♿	Wheelchair Accessible
H	School Holidays only
S	School Days only
D	Diverts to Oxley Hwy & Widderson St (TAFE and University of Newcastle).
F	Friday only

NSW GOVERNMENT | Transport

322 Port Macquarie to Lighthouse Plaza via Shelly Beach

Valid from: 18 Feb 2020

Creation date: 09 July 2021
NOTE: Information is correct on date of download.

Monday to Friday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Day Restrictions		**H**	**S**						
Settlement City Shopping Centre, Port Macquarie	07:18	08:18	08:21	08:48	10:15	11:15	12:15	13:15	14:15
Clarence St before Hay St, Port Macquarie	07:24	08:24	08:28	08:54	10:22	11:22	12:22	13:22	14:22
The Salvation Army Church, Lord St, Port Macquarie	07:26	08:26	08:32	08:56	10:25	11:25	12:25	13:25	14:25
Pacific Dr at Flynn St, Port Macquarie	07:29	08:29	08:35	08:59	10:28	11:28	12:28	13:28	14:28
Pacific Dr after Shelly Beach Rd, Port Macquarie	07:32	08:32	08:38	09:02	10:32	11:32	12:32	13:32	14:32
Bangalay Dr at Burrawong Dr, Port Macquarie	07:35	08:35	08:41	09:05	10:35	11:35	12:35	13:35	14:35
Matthew Flinders Dr at Glen St, Port Macquarie	07:41	08:41	08:47	09:11	10:41	11:41	12:41	13:41	14:41
Light House Plaza, Emerald Dr, Port Macquarie	07:45	08:45	08:51	09:15	10:45	11:45	12:45	13:45	14:45

Monday to Friday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Day Restrictions	**H**	**S**							**F**
Settlement City Shopping Centre, Port Macquarie	**D** 15:15	**D** 15:23	16:15	17:15	18:15	19:15	20:15	21:15	22:15
Clarence St before Hay St, Port Macquarie	15:22	15:32	16:22	17:22	18:21	19:21	20:21	21:21	22:21
The Salvation Army Church, Lord St, Port Macquarie	15:25	15:35	16:25	17:25	18:23	19:23	20:23	21:23	22:23
Pacific Dr at Flynn St, Port Macquarie	15:28	15:38	16:28	17:28	18:26	19:26	20:26	21:26	22:26
Pacific Dr after Shelly Beach Rd, Port Macquarie	15:32	15:42	16:32	17:32	18:29	19:29	20:29	21:29	22:29
Bangalay Dr at Burrawong Dr, Port Macquarie	15:36	15:45	16:36	17:36	18:32	19:32	20:32	21:32	22:32
Matthew Flinders Dr at Glen St, Port Macquarie	15:42	15:51	16:42	17:42	18:38	19:38	20:38	21:38	22:38
Light House Plaza, Emerald Dr, Port Macquarie	15:47	15:55	16:47	17:47	18:46	07:46	20:46	21:46	22:46

Saturday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Settlement City Shopping Centre, Port Macquarie	08:15	09:15	10:15	11:15	12:15	13:15	14:15	15:15	16:15
Clarence St before Hay St, Port Macquarie	08:22	09:22	10:22	11:22	12:22	13:22	14:22	15:22	16:22
The Salvation Army Church, Lord St, Port Macquarie	08:26	09:26	10:26	11:26	12:26	13:26	14:26	15:26	16:26
Pacific Dr at Flynn St, Port Macquarie	08:29	09:29	10:29	11:29	12:29	13:29	14:29	15:29	16:29
Pacific Dr after Shelly Beach Rd, Port Macquarie	08:32	09:32	10:32	11:32	12:32	13:32	14:32	15:32	16:32
Bangalay Dr at Burrawong Dr, Port Macquarie	08:35	09:35	10:35	11:35	12:35	13:35	14:35	15:35	16:35
Matthew Flinders Dr at Glen St, Port Macquarie	08:41	09:41	10:41	11:41	12:41	13:41	14:41	15:41	16:41
Light House Plaza, Emerald Dr, Port Macquarie	08:45	09:45	10:45	11:45	12:45	13:45	14:45	15:45	16:45

Saturday	♿	♿	♿	♿	♿	♿
Settlement City Shopping Centre, Port Macquarie	17:15	18:15	19:15	20:15	21:15	22:15
Clarence St before Hay St, Port Macquarie	17:22	18:21	19:21	20:21	21:21	22:21
The Salvation Army Church, Lord St, Port Macquarie	17:26	18:23	19:23	20:23	21:23	22:23
Pacific Dr at Flynn St, Port Macquarie	17:29	18:26	19:26	20:26	21:26	22:26
Pacific Dr after Shelly Beach Rd, Port Macquarie	17:32	18:29	19:29	20:29	21:29	22:29
Bangalay Dr at Burrawong Dr, Port Macquarie	17:35	18:32	19:32	20:32	21:32	22:32
Matthew Flinders Dr at Glen St, Port Macquarie	17:41	18:38	19:38	20:38	21:38	22:38
Light House Plaza, Emerald Dr, Port Macquarie	17:45	18:46	19:46	20:46	21:46	22:46

Sunday & Public Holidays	♿	♿	♿	♿	♿	♿	♿	♿	♿
Settlement City Shopping Centre, Port Macquarie	08:17	09:17	10:17	11:17	12:17	13:17	14:17	15:17	16:17
Clarence St before Hay St, Port Macquarie	08:23	09:23	10:23	11:23	12:23	13:23	14:23	15:23	16:23
The Salvation Army Church, Lord St, Port Macquarie	08:25	09:25	10:25	11:25	12:25	13:25	14:25	15:25	16:25
Pacific Dr at Flynn St, Port Macquarie	08:28	09:28	10:28	11:28	12:28	13:28	14:28	15:28	16:28
Pacific Dr after Shelly Beach Rd, Port Macquarie	08:31	09:31	10:31	11:31	12:31	13:31	14:31	15:31	16:31
Bangalay Dr at Burrawong Dr, Port Macquarie	08:34	09:34	10:34	11:34	12:34	13:34	14:34	15:34	16:34
Matthew Flinders Dr at Glen St, Port Macquarie	08:40	09:40	10:40	11:40	12:40	13:40	14:40	15:40	16:40
Light House Plaza, Emerald Dr, Port Macquarie	08:44	09:44	10:44	11:44	12:44	13:44	14:44	15:44	16:47

322 Port Macquarie to Lighthouse Plaza via Shelly Beach

Sunday & Public Holidays	
Settlement City Shopping Centre, Port Macquarie	18:17
Clarence St before Hay St, Port Macquarie	18:23
The Salvation Army Church, Lord St, Port Macquarie	18:25
Pacific Dr at Flynn St, Port Macquarie	18:28
Pacific Dr after Shelly Beach Rd, Port Macquarie	18:31
Bangalay Dr at Burrawong Dr, Port Macquarie	18:34
Matthew Flinders Dr at Glen St, Port Macquarie	18:40
Light House Plaza, Emerald Dr, Port Macquarie	18:47

322 Lighthouse Plaza to Port Macquarie via Shelly Beach

Monday to Friday	♿		♿	♿	♿	♿	♿	♿	♿
Day Restrictions			**S**	**H**					
Light House Plaza, Emerald Dr, Port Macquarie	06:56	07:23	07:43	07:48	08:16	08:54	09:24	09:54	10:54
Matthew Flinders Dr at Glen St, Port Macquarie	06:58	07:25	07:47	07:52	08:20	08:57	09:27	09:57	10:57
Bangalay Dr at Burrawong Dr, Port Macquarie	07:03	07:30	07:53	07:58	08:26	09:03	09:33	10:03	11:03
Pacific Dr after Shelly Beach Rd, Port Macquarie	07:07	07:34	07:57	08:02	08:30	09:07	09:37	10:07	11:07
Pacific Dr before Flynn St, Port Macquarie	07:11	07:38	08:02	08:07	08:35	09:11	09:41	10:11	11:11
Lord St after Hill St, Port Macquarie	07:15	07:42	08:07	08:12	08:40	09:15	09:45	10:15	11:15
Clarence St after Hay St, Port Macquarie	07:19	07:46	**D**08:13	**D**08:18	08:49	09:19	09:49	10:19	11:19
Settlement City Shopping Centre, Port Macquarie	07:32	08:05	08:26	08:31	08:57	09:27	09:57	10:32	11:27

Monday to Friday	♿	♿	♿	♿	♿	♿	♿	♿
Light House Plaza, Emerald Dr, Port Macquarie	11:54	12:54	13:54	14:51	15:56	16:56	17:56	18:56
Matthew Flinders Dr at Glen St, Port Macquarie	11:57	12:57	13:57	14:54	15:58	16:58	17:58	18:58
Bangalay Dr at Burrawong Dr, Port Macquarie	12:03	13:03	14:03	15:00	16:03	17:03	18:03	19:03
Pacific Dr after Shelly Beach Rd, Port Macquarie	12:07	13:07	14:07	15:04	16:07	17:07	18:07	19:07
Pacific Dr before Flynn St, Port Macquarie	12:11	13:11	14:11	15:08	16:11	17:11	18:11	19:11
Lord St after Hill St, Port Macquarie	12:15	13:15	14:15	15:12	16:15	17:15	18:15	19:15
Clarence St after Hay St, Port Macquarie	12:19	13:19	14:19	15:19	16:19	17:19	18:19	19:19
Settlement City Shopping Centre, Port Macquarie	12:32	13:32	14:32	15:32	16:34	17:33	18:33	19:27

Saturday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Light House Plaza, Emerald Dr, Port Macquarie	07:54	08:54	09:54	10:54	11:54	12:54	13:54	14:54	15:54
Matthew Flinders Dr at Glen St, Port Macquarie	07:57	08:57	09:57	10:57	11:57	12:57	13:57	14:57	15:57
Bangalay Dr at Burrawong Dr, Port Macquarie	08:03	09:03	10:03	11:03	12:03	13:03	14:03	15:03	16:03
Pacific Dr after Shelly Beach Rd, Port Macquarie	08:07	09:07	10:07	11:07	12:07	13:07	14:07	15:07	16:07
Pacific Dr before Flynn St, Port Macquarie	08:11	09:11	10:11	11:11	12:11	13:11	14:11	15:11	16:11
Lord St after Hill St, Port Macquarie	08:15	09:15	10:15	11:15	12:15	13:15	14:15	15:15	16:15
Clarence St after Hay St, Port Macquarie	08:19	09:19	10:19	11:19	12:19	13:19	14:19	15:19	16:19
Settlement City Shopping Centre, Port Macquarie	08:32	09:27	10:32	11:27	12:32	13:32	14:32	15:32	16:32

Saturday	♿
Light House Plaza, Emerald Dr, Port Macquarie	16:54
Matthew Flinders Dr at Glen St, Port Macquarie	16:57
Bangalay Dr at Burrawong Dr, Port Macquarie	17:03
Pacific Dr after Shelly Beach Rd, Port Macquarie	17:07
Pacific Dr before Flynn St, Port Macquarie	17:11
Lord St after Hill St, Port Macquarie	17:15
Clarence St after Hay St, Port Macquarie	17:19
Settlement City Shopping Centre, Port Macquarie	17:32

Sunday & Public Holidays	♿	♿	♿	♿	♿	♿	♿	♿
Light House Plaza, Emerald Dr, Port Macquarie	08:49	09:49	10:49	11:49	12:49	13:49	14:49	15:49
Matthew Flinders Dr at Glen St, Port Macquarie	08:51	09:51	10:51	11:51	12:51	13:51	14:51	15:51
Bangalay Dr at Burrawong Dr, Port Macquarie	08:56	09:56	10:56	11:56	12:56	13:56	14:56	15:56
Pacific Dr after Shelly Beach Rd, Port Macquarie	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00
Pacific Dr before Flynn St, Port Macquarie	09:04	10:04	11:04	12:04	13:04	14:04	15:04	16:04
Lord St after Hill St, Port Macquarie	09:08	10:08	11:08	12:08	13:08	14:08	15:08	16:08
Clarence St after Hay St, Port Macquarie	09:12	10:12	11:12	12:12	13:12	14:12	15:12	16:12
Settlement City Shopping Centre, Port Macquarie	09:25	10:20	11:25	12:20	13:25	14:20	15:25	16:20

329 Settlement City Shopping Centre to Waniora Pkwy at Koala St (Loop Service)

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 at **transportnsw.info**

Trip planning

You can plan your trip using the Trip Planner or Departures at **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
- 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 Busways Port Macquarie.

Fares

Contact Busways Port Macquarie for ticket options. You cannot use Opal on this service.

NSW GOVERNMENT | Transport

329 Settlement City Shopping Centre to Waniora Pkwy at Koala St (Loop Service)

Valid from: 24 Feb 2020

Creation date: 09 July 2021
NOTE: Information is correct on date of download.

Monday to Friday		
Settlement City Shopping Centre, Port Macquarie	-	14:05
Clarence St before Hay St, Port Macquarie	-	14:15
Yarranabee Rd at Teraglin Rd, Port Macquarie	10:32	14:22
Waniora Pkwy at Koala St, Port Macquarie	10:34	14:24
Tasman Rd at Mitchell Cct, Port Macquarie	10:36	14:26
Bowden Rd opp Cattle Brook Rd, Port Macquarie	10:38	14:28
Granite St after Bellevue Dr, Port Macquarie	10:40	14:30
Lake Rd opp Port Macquarie Private Hospital, Port Macquarie	10:44	14:34
Hayward St at Keena La, Port Macquarie	10:48	14:40
Settlement City Shopping Centre, Port Macquarie	10:58	14:50

334K Kendall to Port Macquarie via Laurieton

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 at **transportnsw.info**

Trip planning

You can plan your trip using the Trip Planner or Departures at **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
- 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 Busways Port Macquarie.

Fares

Contact Busways Port Macquarie for ticket options. You cannot use Opal on this service.

Explanation of definitions and symbols

♿	Wheelchair Accessible
R	Diverts on Request
S	School Days only
H	School Holidays only
Q	Bus extends to Laurieton on request only.

NSW GOVERNMENT | Transport

334K Port Macquarie to Kendall via Laurieton

Valid from: 19 July 2020

Creation date: 09 July 2021
NOTE: Information is correct on date of download.

Monday to Friday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Day Restrictions						S	H		
Settlement City Shopping Centre, Port Macquarie	05:58	08:26	10:24	12:24	14:24	15:24	15:24	16:24	17:24
Clarence St before Hay St, Port Macquarie	06:04	08:35	10:33	12:33	14:36	15:34	15:33	16:33	17:33
Port Macquarie Private Hospital, Lake Rd, Port Macquarie	06:07	08:38	10:36	12:36	14:39	15:38	15:36	16:36	17:36
Lord St after Hill St, Port Macquarie	06:10	08:41	10:40	12:40	14:42	15:41	15:40	16:40	17:40
Kennedy Dr after Allunga Ave, Port Macquarie	06:13	08:44	10:43	12:43	14:46	15:43	15:43	16:43	17:43
Livingstone Rd before Wiruna Rd, Port Macquarie	06:17	08:48	10:47	12:47	14:50	15:48	15:48	16:48	17:48
Ocean Dr at Matthew Flinders Dr, Port Macquarie	06:22	08:53	10:52	12:52	14:55	15:51	15:54	16:54	17:54
Ocean Dr opp Lake Cathie Village Centre, Lake Cathie	06:29	09:01	11:00	13:00	15:03	16:02	16:02	17:02	18:02
Ocean Dr opp Graham St, Bonny Hills	06:36	09:09	11:08	13:08	15:10	16:10	16:10	17:10	18:10
The Parade opp North Haven Bowling Club, North Haven	06:44	09:18	11:17	13:17	15:17	16:19	16:19	17:19	18:19
Bold St before Tunis St, Laurieton	06:51	09:25	11:25	13:25	15:25	16:27	16:27	17:27	18:27
Ocean Dr before Captain Cook Bicentennial Dr, West Haven	06:54	09:28	11:28	13:28	15:29	16:30	16:30	17:30	18:30
Lakewood Shopping Centre, Sirius Dr, Lakewood	06:57	09:32	11:32	13:32	15:33	16:34	16:34	17:34	18:34
Kendall Station, Kendall	R07:05	R09:41	–	–	–	–	–	R17:43	–
Comboyne St opp Kendall War Memorial, Kendall	07:07	09:43	11:43	13:43	15:48	16:47	16:45	17:45	18:45

Monday to Friday	♿
Settlement City Shopping Centre, Port Macquarie	19:24
Clarence St before Hay St, Port Macquarie	19:33
Port Macquarie Private Hospital, Lake Rd, Port Macquarie	19:36
Lord St after Hill St, Port Macquarie	19:40
Kennedy Dr after Allunga Ave, Port Macquarie	19:43
Livingstone Rd before Wiruna Rd, Port Macquarie	19:47
Ocean Dr at Matthew Flinders Dr, Port Macquarie	19:52
Ocean Dr opp Lake Cathie Village Centre, Lake Cathie	20:00
Ocean Dr opp Graham St, Bonny Hills	20:08
The Parade opp North Haven Bowling Club, North Haven	20:17
Bold St before Tunis St, Laurieton	20:25
Ocean Dr before Captain Cook Bicentennial Dr, West Haven	20:28
Lakewood Shopping Centre, Sirius Dr, Lakewood	20:32
Kendall Station, Kendall	20:41
Comboyne St opp Kendall War Memorial, Kendall	20:43

334K Port Macquarie to Kendall via Laurieton

Saturday	♿	♿	♿	♿	♿	♿
Settlement City Shopping Centre, Port Macquarie	07:24	10:24	12:24	15:24	17:24	19:24
Clarence St before Hay St, Port Macquarie	07:33	10:33	12:33	15:33	17:33	19:33
Port Macquarie Private Hospital, Lake Rd, Port Macquarie	07:36	10:36	12:36	15:36	17:36	19:36
Lord St after Hill St, Port Macquarie	07:40	10:40	12:40	15:40	17:40	19:40
Kennedy Dr after Allunga Ave, Port Macquarie	07:43	10:43	12:43	15:43	17:43	19:43
Livingstone Rd before Wiruna Rd, Port Macquarie	07:47	10:47	12:47	15:47	17:47	19:47
Ocean Dr at Matthew Flinders Dr, Port Macquarie	07:52	10:52	12:52	15:52	17:52	19:52
Ocean Dr opp Lake Cathie Village Centre, Lake Cathie	08:00	11:00	13:00	16:00	18:00	20:00
Ocean Dr opp Graham St, Bonny Hills	08:08	11:08	13:08	16:08	18:08	20:08
The Parade opp North Haven Bowling Club, North Haven	08:17	11:17	13:17	16:17	18:17	20:17
Bold St before Tunis St, Laurieton	08:25	11:25	13:25	16:25	18:25	20:25
Ocean Dr before Captain Cook Bicentennial Dr, West Haven	08:28	11:28	13:28	16:28	18:28	20:28
Lakewood Shopping Centre, Sirius Dr, Lakewood	08:32	11:32	13:32	16:32	18:32	20:32
Kendall Station, Kendall	–	–	–	–	–	20:41
Comboyne St opp Kendall War Memorial, Kendall	08:43	11:43	13:43	16:43	18:43	20:43

Sunday & Public Holidays	♿	♿	♿	♿	♿
Settlement City Shopping Centre, Port Macquarie	09:21	11:21	13:21	15:21	17:21
Clarence St before Hay St, Port Macquarie	09:27	11:27	13:27	15:27	17:27
Port Macquarie Private Hospital, Lake Rd, Port Macquarie	09:30	11:30	13:30	15:30	17:30
Lord St after Hill St, Port Macquarie	09:34	11:34	13:34	15:34	17:34
Kennedy Dr after Allunga Ave, Port Macquarie	09:37	11:37	13:37	15:37	17:37
Livingstone Rd before Wiruna Rd, Port Macquarie	09:41	11:41	13:41	15:41	17:41
Ocean Dr at Matthew Flinders Dr, Port Macquarie	09:46	11:46	13:46	15:46	17:46
Ocean Dr opp Lake Cathie Village Centre, Lake Cathie	09:53	11:53	13:53	15:53	17:53
Ocean Dr opp Graham St, Bonny Hills	10:00	12:00	14:00	16:00	18:00
The Parade opp North Haven Bowling Club, North Haven	10:08	12:08	14:08	16:08	18:08
Bold St before Tunis St, Laurieton	10:15	12:15	14:15	16:15	18:15
Ocean Dr before Captain Cook Bicentennial Dr, West Haven	10:17	12:17	14:17	16:17	18:17
Lakewood Shopping Centre, Sirius Dr, Lakewood	10:21	12:21	14:21	16:21	18:21
Comboyne St opp Kendall War Memorial, Kendall	10:32	12:32	14:32	16:32	18:32

334K Kendall to Port Macquarie via Laurieton

Monday to Friday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Comboyne St opp Kendall War Memorial, Kendall	06:34	07:15	08:55	09:55	11:55	13:55	15:45	16:57	17:47
Kendall Station, Kendall	–	–	–	–	–	13:57	15:47	–	–
Lakewood Shopping Centre, Sirius Dr, Lakewood	06:41	07:22	09:03	10:03	12:03	14:03	15:57	17:05	17:54
Ocean Dr at The Gateway, West Haven	06:45	07:26	09:08	10:08	12:08	14:08	16:03	17:10	**Q**17:59
Bold St before Tunis St, Laurieton	06:50	07:31	09:13	10:13	12:13	14:13	16:08	17:15	**Q**18:04
North Haven Bowling Club, The Parade, North Haven	06:55	07:36	09:19	10:19	12:19	14:19	16:14	17:21	-
Ocean Dr at Graham St, Bonny Hills	07:04	07:46	09:28	10:28	12:28	14:28	16:23	17:30	-
Lake Cathie Village Centre, Ocean Dr, Lake Cathie	07:12	07:58	09:36	10:36	12:36	14:36	16:36	17:38	-
Ocean Dr after Emerald Dr, Port Macquarie	07:22	08:08	09:46	10:46	12:46	14:46	16:48	17:48	-
Livingstone Rd after Portsea Pl, Port Macquarie	07:24	08:11	09:49	10:49	12:49	14:49	16:51	17:50	-
Kennedy Dr opp Allunga Ave, Port Macquarie	07:26	08:16	09:53	10:53	12:53	14:53	16:55	17:53	-
Lord St before Hill St, Port Macquarie	07:29	08:19	09:56	10:56	12:56	14:56	16:58	17:56	-
Lake Rd opp Port Macquarie Private Hospital, Port Macquarie	–	08:23	09:58	10:58	12:58	14:58	17:00	17:58	-
Clarence St after Hay St, Port Macquarie	–	08:31	10:07	11:07	13:07	15:07	17:07	18:07	-
Settlement City Shopping Centre, Port Macquarie	07:46	08:42	10:15	11:15	13:15	15:15	17:15	18:15	-
Clarence St before Hay St, Port Macquarie	07:54	-	-	-	-	-	-	-	-

Monday to Friday	♿	♿
Comboyne St opp Kendall War Memorial, Kendall	18:47	20:57
Kendall Station, Kendall	18:49	20:59
Lakewood Shopping Centre, Sirius Dr, Lakewood	18:54	21:04
Ocean Dr at The Gateway, West Haven	**Q**18:59	21:10
Bold St before Tunis St, Laurieton	**Q**19:04	21:15
North Haven Bowling Club, The Parade, North Haven	-	21:21
Ocean Dr at Graham St, Bonny Hills	-	21:30
Lake Cathie Village Centre, Ocean Dr, Lake Cathie	-	21:38
Ocean Dr after Emerald Dr, Port Macquarie	-	21:48
Livingstone Rd after Portsea Pl, Port Macquarie	-	21:50
Kennedy Dr opp Allunga Ave, Port Macquarie	-	21:53
Lord St before Hill St, Port Macquarie	-	21:56
Lake Rd opp Port Macquarie Private Hospital, Port Macquarie	-	21:58
Clarence St after Hay St, Port Macquarie	-	22:07
Settlement City Shopping Centre, Port Macquarie	-	22:14

Saturday	♿	♿	♿	♿	♿	♿	♿
Comboyne St opp Kendall War Memorial, Kendall	06:55	08:55	11:55	13:55	16:47	18:47	20:57
Kendall Station, Kendall	–	–	–	13:57	–	18:49	20:59
Lakewood Shopping Centre, Sirius Dr, Lakewood	07:03	09:03	12:03	14:03	16:54	18:54	21:04
Ocean Dr at The Gateway, West Haven	07:08	09:08	12:08	14:08	17:00	19:00	21:10
Bold St before Tunis St, Laurieton	07:13	09:13	12:13	14:13	17:05	19:05	21:15
North Haven Bowling Club, The Parade, North Haven	07:19	09:19	12:19	14:19	17:11	19:11	21:21
Ocean Dr at Graham St, Bonny Hills	07:28	09:28	12:28	14:28	17:20	19:20	21:30
Lake Cathie Village Centre, Ocean Dr, Lake Cathie	07:36	09:36	12:36	14:36	17:28	19:28	21:38
Ocean Dr after Emerald Dr, Port Macquarie	07:46	09:46	12:46	14:46	17:38	19:38	21:48
Livingstone Rd after Portsea Pl, Port Macquarie	07:49	09:49	12:49	14:49	17:40	19:40	21:50
Kennedy Dr opp Allunga Ave, Port Macquarie	07:53	09:53	12:53	14:53	17:43	19:43	21:53
Lord St before Hill St, Port Macquarie	07:56	09:56	12:56	14:56	17:46	19:46	21:56
Lake Rd opp Port Macquarie Private Hospital, Port Macquarie	07:58	09:58	12:58	14:58	17:48	19:48	21:58
Clarence St after Hay St, Port Macquarie	08:07	10:07	13:07	15:07	17:55	19:55	22:05
Settlement City Shopping Centre, Port Macquarie	08:15	10:15	13:15	15:15	18:02	20:02	22:12

334K Kendall to Port Macquarie via Laurieton

Sunday & Public Holidays	♿	♿	♿	♿	♿	♿
Comboyne St opp Kendall War Memorial, Kendall	08:12	10:34	12:34	14:12	16:34	18:34
Kendall Station, Kendall	–	–	–	14:14	16:36	18:36
Lakewood Shopping Centre, Sirius Dr, Lakewood	08:19	10:41	12:41	14:19	16:41	18:41
Ocean Dr at The Gateway, West Haven	08:23	10:45	12:45	14:23	16:45	18:45
Bold St before Tunis St, Laurieton	08:27	10:49	12:49	14:27	16:49	18:49
North Haven Bowling Club, The Parade, North Haven	08:32	10:54	12:54	14:32	16:54	18:54
Ocean Dr at Graham St, Bonny Hills	08:40	11:02	13:02	14:40	17:02	19:02
Lake Cathie Village Centre, Ocean Dr, Lake Cathie	08:48	11:10	13:10	14:48	17:10	19:10
Ocean Dr after Emerald Dr, Port Macquarie	08:58	11:20	13:20	14:58	17:20	19:20
Livingstone Rd after Portsea Pl, Port Macquarie	09:01	11:23	13:23	15:01	17:23	19:23
Kennedy Dr opp Allunga Ave, Port Macquarie	09:05	11:27	13:27	15:05	17:27	19:27
Lord St before Hill St, Port Macquarie	09:08	11:30	13:30	15:08	17:30	19:30
Lake Rd opp Port Macquarie Private Hospital, Port Macquarie	09:10	11:32	13:32	15:10	17:32	19:32
Clarence St after Hay St, Port Macquarie	09:17	11:39	13:39	15:17	17:39	19:39
Settlement City Shopping Centre, Port Macquarie	09:25	11:47	13:47	15:25	17:47	19:47

334 Lighthouse Plaza to Port Macquarie

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 at **transportnsw.info**

Trip planning

You can plan your trip using the Trip Planner or Departures at **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
- 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 Busways Port Macquarie.

Fares

Contact Busways Port Macquarie for ticket options. You cannot use Opal on this service.

Explanation of definitions and symbols

♿	Wheelchair Accessible
S	School Days only
H	School Holidays only

NSW GOVERNMENT | Transport

334 Port Macquarie to Lighthouse Plaza

Valid from: 20 July 2020

Creation date: 09 July 2021
NOTE: Information is correct on date of download.

Monday to Friday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Settlement City Shopping Centre, Port Macquarie	06:33	07:18	07:49	08:44	09:24	09:44	11:24	13:24	18:24
Clarence St before Hay St, Port Macquarie	06:39	07:24	07:55	08:53	09:33	09:50	11:33	13:33	18:33
Port Macquarie Private Hospital, Lake Rd, Port Macquarie	06:42	07:27	07:58	08:56	09:36	09:53	11:36	13:36	18:36
Lord St after Hill St, Port Macquarie	06:45	07:30	08:01	09:00	09:40	09:56	11:40	13:40	18:40
Kennedy Dr after Allunga Ave, Port Macquarie	06:48	07:33	08:04	09:03	09:43	09:59	11:43	13:43	18:43
Livingstone Rd before Wiruna Rd, Port Macquarie	06:52	07:37	08:08	09:07	09:47	10:03	11:47	13:47	18:47
Ocean Dr at Matthew Flinders Dr, Port Macquarie	06:55	07:42	08:13	09:12	09:52	10:08	11:52	13:52	18:52

Saturday	♿	♿	♿	♿	♿	♿
Settlement City Shopping Centre, Port Macquarie	08:24	09:24	11:24	13:24	14:24	16:24
Clarence St before Hay St, Port Macquarie	08:33	09:33	11:33	13:33	14:33	16:33
Port Macquarie Private Hospital, Lake Rd, Port Macquarie	08:36	09:36	11:36	13:36	14:36	16:36
Lord St after Hill St, Port Macquarie	08:40	09:40	11:40	13:40	14:40	16:40
Kennedy Dr after Allunga Ave, Port Macquarie	08:43	09:43	11:43	13:43	14:43	16:43
Livingstone Rd before Wiruna Rd, Port Macquarie	08:47	09:47	11:47	13:47	14:47	16:47
Ocean Dr at Matthew Flinders Dr, Port Macquarie	08:52	09:52	11:52	13:52	14:52	16:52

Sunday & Public Holidays	♿	♿	♿	♿
Settlement City Shopping Centre, Port Macquarie	10:21	12:21	14:21	16:21
Clarence St before Hay St, Port Macquarie	10:27	12:27	14:27	16:27
Port Macquarie Private Hospital, Lake Rd, Port Macquarie	10:30	12:30	14:30	16:30
Lord St after Hill St, Port Macquarie	10:34	12:34	14:34	16:34
Kennedy Dr after Allunga Ave, Port Macquarie	10:37	12:37	14:37	16:37
Livingstone Rd before Wiruna Rd, Port Macquarie	10:41	12:41	14:41	16:41
Ocean Dr at Matthew Flinders Dr, Port Macquarie	10:46	12:46	14:46	16:46

334 Lighthouse Plaza to Port Macquarie

Monday to Friday	♿		♿	♿	♿	♿	♿	♿
Day Restrictions		**S**				**H**	**S**	
Ocean Dr after Emerald Dr, Port Macquarie	06:49	08:30	09:16	11:46	13:46	15:48	15:58	18:48
Livingstone Rd after Portsea Pl, Port Macquarie	06:51	08:35	09:19	11:49	13:49	15:51	16:00	18:50
Kennedy Dr opp Allunga Ave, Port Macquarie	06:54	08:40	09:23	11:53	13:53	15:55	16:03	18:53
Lord St before Hill St, Port Macquarie	06:57	08:43	09:26	11:56	13:56	15:58	16:06	18:56
Lake Rd opp Port Macquarie Private Hospital, Port Macquarie	06:59	08:47	09:28	11:58	13:58	16:00	16:08	18:58
Clarence St after Hay St, Port Macquarie	07:08	08:57	09:37	12:07	14:07	16:07	16:13	19:07
Settlement City Shopping Centre, Port Macquarie	07:15	09:05	09:45	12:15	14:15	16:20	16:20	19:14

Saturday	♿	♿	♿	♿	♿	♿
Ocean Dr after Emerald Dr, Port Macquarie	08:46	10:46	11:46	13:46	15:46	16:46
Livingstone Rd after Portsea Pl, Port Macquarie	08:49	10:49	11:49	13:49	15:49	16:49
Kennedy Dr opp Allunga Ave, Port Macquarie	08:53	10:53	11:53	13:53	15:53	16:53
Lord St before Hill St, Port Macquarie	08:56	10:56	11:56	13:56	15:56	16:56
Lake Rd opp Port Macquarie Private Hospital, Port Macquarie	08:58	10:58	11:58	13:58	15:58	16:58
Clarence St after Hay St, Port Macquarie	09:07	11:07	12:07	14:07	16:07	17:07
Settlement City Shopping Centre, Port Macquarie	09:15	11:15	12:15	14:15	16:15	17:15

Sunday & Public Holidays	♿	♿	♿
Ocean Dr after Emerald Dr, Port Macquarie	10:58	12:58	16:58
Livingstone Rd after Portsea Pl, Port Macquarie	11:01	13:01	17:01
Kennedy Dr opp Allunga Ave, Port Macquarie	11:05	13:05	17:05
Lord St before Hill St, Port Macquarie	11:08	13:08	17:08
Lake Rd opp Port Macquarie Private Hospital, Port Macquarie	11:10	13:10	17:10
Clarence St after Hay St, Port Macquarie	11:17	13:17	17:17
Settlement City Shopping Centre, Port Macquarie	11:25	13:25	17:25

Appendix C

Turning Path Assessments

LEGEND:

- WORK SITE (CLASS A HOARDING)
- WORKS ZONE
- SITE ACCESS
- SIGN

T1-5

T2-25

WK-3(R1) ON SIDE ROAD

50.0

50.0

50.0

50.0

20.0

GORDON STREET

OWEN STREET

PEDESTRIANS WATCH YOUR STEP T8-1

ON-SITE TRAINED PERSONNEL TO MANAGE PEDESTRIAN ACTIVITIES

WORK SITE STAGE 3 AND 4

WORK SITE STAGE 4

WORK SITE STAGE 3

NOTES:

1. ALL SIGNS SHALL BE MINIMUM SIZE A.
2. ALL SIGNS SHALL BE CLASS 1 RETROREFLECTIVE.
3. LOCATION OF SIGNS SHALL BE CONFIRMED ON-SITE TO ENSURE APPROPRIATE VISIBILITY.
4. ALL TRAFFIC CONTROL PLANS SHALL BE IMPLEMENTED IN ACCORDANCE WITH THE TfNSW "TRAFFIC CONTROL AT WORK SITES" MANUAL, VER 6 (TfNSW 2020) 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 PLANS SHALL BE SET UP BY A PERSON HOLDING AN "IMPLEMENT TRAFFIC MANAGEMENT PLANS" TICKET AND THE TfNSW 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. ENSURE A COPY OF THE TCP IS KEPT ON-SITE. THE ACCREDITTED PERSONNEL SHALL 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 AMENDMENTS 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 A WORK ZONE 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 SHALL 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" SHALL BE AVAILABLE FOR REFERENCE AND IMPLEMENTATION AS REQUIRED ON-SITE.
8. ALL WORKERS WILL BE CONFINED TO THE DEDICATED WORKS AREA SHOWN ON THE PLAN.
9. 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 WHEN THE WORKSITE IS LEFT UNATTENDED.
10. TRAFFIC CONTROLLERS ARE NOT REQUIRED AT THE ACCESS FULL TIME, WHEN CONDITIONS BE MODIFIED AND TRAFFIC CONTROLLERS REQUIRED, THEY ARE TO BE SUITABLY ACCREDITED TO AUSTRALIAN STANDARDS AND TfNSW ACCREDITATION AS REQUIRED. WHEN REQUIRED T1-34 AND T1-10 SIGNS ARE TO BE SET UP IN ACCORDANCE TO AUSTRALIAN STANDARDS AND TfNSW REQUIREMENTS.
11. NOT ALL DIMENSIONS SHOWN ARE TO SCALE.
12. ALL SIGNAGE SHALL BE CLEAN, CLEARLY VISIBLE AND NOT OBSCURED.
13. ALL SIGNS SHALL BE COVERED OR REMOVED WHEN WORKERS ARE NOT ON SITE.
14. ALL WORKERS MUST ADHERE TO THE APPLICABLE SAFE WORK DISTANCE AS DESCRIBED IN AS1742.3:2009.
15. ALL DISTANCES BETWEEN SIGNS SHALL 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: 0052080417 (EXPIRY DATE: 16/07/2022)
PREPARE A WORK ZONE TMP CARD
CHENLONG YOU

HASTINGS SECONDARY COLLEGE
16 OWEN STREET, PORT MACQUARIE - CONSTRUCTION TRAFFIC MANAGEMENT PLAN
STAGE 3 AND 4 WORKS
TRAFFIC GUIDANCE SCHEME

DRAWING REF NO. 20M706AK-MD-01-P1

SHEET NO. 03 OF 08

ISSUE DATE 7 JULY 2021

DESIGNED BY S.YOU

REVIEWED BY M.KONG

SCALE A3 0 10 20 1:1000

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY.
THE EXACT LOCATIONS SHALL BE PROVEN ON SITE.
ALL EXISTING SERVICES SHOWN ARE NOT GUARANTEED.

ttpa TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994
Address: Level 5, Suite 502 / 282 Victoria Ave, Chatswood NSW 2067
P: 02 9411 5660 E: info@ttpa.com.au W: www.ttpa.com.au

WORK SITE STAGE 1

BURRAWAN STREET

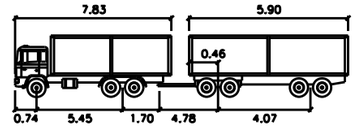
TRUCK n DOG 18.1

TRUCK n DOG 18.1

TRUCK n DOG 18.1

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY



TRUCK n DOG 18.1

meters

First Unit Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 36.9
First Unit Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

HASTINGS SECONDARY COLLEGE
16 OWEN STREET, PORT MACQUARIE - CONSTRUCTION TRAFFIC MANAGEMENT PLAN
STAGE 1 WORKS
SWEPT PATH ASSESSMENT

DRAWING REF NO. 20M706AK-MD-01-P1 SHEET NO. 04 OF 08 ISSUE DATE 7 JULY 2021

DESIGNED BY S.YOU REVIEWED BY M.KONG

SCALE A3 0 5 10 1:500

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY.
THE EXACT LOCATIONS SHALL BE PROVEN ON SITE.
ALL EXISTING SERVICES SHOWN ARE NOT GUARANTEED.

ttpa TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994
Address: Level 5, Suite 502 / 282 Victoria Ave, Chatswood NSW 2067
P: 02 9411 5660 E: info@ttpa.com.au W: www.ttpa.com.au

WORK SITE STAGE 1

WORK SITE STAGE 1

PM S 19M
ACCROSS 2013 (Au)

PM S 19M
ACCROSS 2013 (Au)

PM S 19M
ACCROSS 2013 (Au)

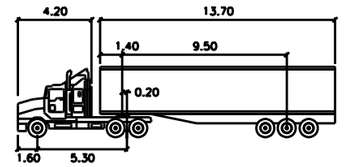
PM S 19M
ACCROSS 2013 (Au)

BURRAWAN STREET

BURRAWAN STREET

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY



PM S 19M

	meters		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.8
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

\\ttpa_nas\FFPA_DATA\WORK\20M\MSC\706 - MEG MISC\706AK - HASTINGS SECONDARY COLLEGE, PORT MACQUARIE\DRAWINGS_CAD\20M706AK-MD-01-P1.dgn

Plot by sherlock

HASTINGS SECONDARY COLLEGE
16 OWEN STREET, PORT MACQUARIE - CONSTRUCTION TRAFFIC MANAGEMENT PLAN
STAGE 1 WORKS
SWEPT PATH ASSESSMENT

DRAWING REF NO. 20M706AK-MD-01-P1 SHEET NO. 05 OF 08 ISSUE DATE 7 JULY 2021

DESIGNED BY S.YOU REVIEWED BY M.KONG

SCALE A3 0 5 10 1:500

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY.
THE EXACT LOCATIONS SHALL BE PROVEN ON SITE.
ALL EXISTING SERVICES SHOWN ARE NOT GUARANTEED.

ttpa TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994
Address: Level 5, Suite 502 / 282 Victoria Ave, Chatswood NSW 2067
P: 02 9411 5660 E: info@ttpa.com.au W: www.ttpa.com.au

WORK SITE STAGE 1

SU TRUCK
AS2890#2 2013 (4m)

SU TRUCK
AS2890#2 2013 (4m)

SU TRUCK
AS2890#2 2013 (4m)

BURRAWAN STREET

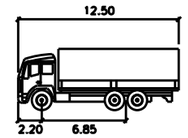
WORK SITE STAGE 1

SU TRUCK
AS2890#2 2013 (4m)

BURRAWAN STREET

SWEPT PATH KEY:

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY



SU TRUCK

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.6

\\ttpa_nas\FPPA_DATA\WORK20\M\MSC\706 - MEG MSC\706AK - HASTINGS SECONDARY COLLEGE, PORT MACQUARIE\DRAWINGS_CAD\20M706AK-MD-01-P1.dgn

Plot by sherlock

HASTINGS SECONDARY COLLEGE
16 OWEN STREET, PORT MACQUARIE - CONSTRUCTION TRAFFIC MANAGEMENT PLAN
STAGE 1 WORKS
SWEPT PATH ASSESSMENT

DRAWING REF NO. 20M706AK-MD-01-P1

SHEET NO. 06 OF 08

ISSUE DATE 7 JULY 2021

DESIGNED BY S.YOU

REVIEWED BY M.KONG

SCALE A3

0 5 10

1:500

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY.
THE EXACT LOCATIONS SHALL BE PROVEN ON SITE.
ALL EXISTING SERVICES SHOWN ARE NOT GUARANTEED.

ttpa TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994
Address: Level 5, Suite 502 / 282 Victoria Ave, Chatswood NSW 2067
P: 02 9411 5660 E: info@ttpa.com.au W: www.ttpa.com.au

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

PM S 19M

	meters		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.8
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

HASTINGS SECONDARY COLLEGE
16 OWEN STREET, PORT MACQUARIE - CONSTRUCTION TRAFFIC MANAGEMENT PLAN
STAGE 2 WORKS
SWEPT PATH ASSESSMENT

DRAWING REF NO. 20M706AK-MD-01-P1 SHEET NO. 07 OF 08 ISSUE DATE 7 JULY 2021

DESIGNED BY S.YOU REVIEWED BY M.KONG

SCALE A3 0 5 10 1:500

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY. THE EXACT LOCATIONS SHALL BE PROVEN ON SITE. ALL EXISTING SERVICES SHOWN ARE NOT GUARANTEED.

ttpa TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994
Address: Level 5, Suite 502 / 282 Victoria Ave, Chatswood NSW 2067
P: 02 9411 5660 E: info@ttpa.com.au W: www.ttpa.com.au

Plot by sherlock
\\ttpa_nas\FPPA_DATA\WORK\20\MISC\706 - MEG MISC\706AK - HASTINGS SECONDARY COLLEGE, PORT MACQUARIE\DRAWINGS_CAD\20M706AK-MD-01-P1.dgn

Appendix C

Traffic Control Plans

LEGEND:

- WORK SITE (CLASS A HOARDING)
- WORKS ZONE
- SITE ACCESS
- SIGN
- TRAFFIC CONTROLLER

NOTES:

1. ALL SIGNS SHALL BE MINIMUM SIZE A.
2. ALL SIGNS SHALL BE CLASS 1 RETROREFLECTIVE.
3. LOCATION OF SIGNS SHALL BE CONFIRMED ON-SITE TO ENSURE APPROPRIATE VISIBILITY.
4. ALL SIGNAGE SHALL BE CLEAN, CLEARLY VISIBLE AND NOT OBSCURED.
5. ALL TRAFFIC CONTROL PLANS SHALL BE IMPLEMENTED IN ACCORDANCE WITH THE TfNSW "TRAFFIC CONTROL AT WORK SITES" MANUAL, VER 6 (TfNSW 2020) AND AUSTRALIAN STANDARDS AS1742.3:2009 MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, PART 3: TRAFFIC CONTROL DEVICES FOR WORKS ON ROADS.
6. THIS TRAFFIC CONTROL PLAN SHALL BE SET UP BY A PERSON HOLDING AN "IMPLEMENT TRAFFIC MANAGEMENT PLAN" TICKET AND THE TfNSW TRAFFIC CONTROL AT WORK SITES CHECKLIST SHALL BE COMPLETED PRIOR TO IMPLEMENTATION.
7. THE ACCREDITTED PERSONNEL SHALL IMPLEMENT THE APPROVED TCP BEFORE ANY PHYSICAL WORK COMMENCES. ENSURE A COPY OF THE TCP IS KEPT ON-SITE. THE ACCREDITTED PERSONNEL SHALL 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 AMENDMENTS MADE TO THE PLAN MUST BE MARKED ON THE PLAN AND INITIALLED BY THE ACCREDITTED PERSONNEL.
8. IT IS THE RESPONSIBILITY OF AN ACCREDITTED PERSONNEL WITH A 'PREPARE A WORK ZONE 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 SHALL 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" SHALL 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. 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 WHEN THE WORKSITE IS LEFT UNATTENDED.
11. WHEN TRAFFIC CONTROLLER/S ARE NOT ON SITE, TRAFFIC CONTROLLER (T1-34) AND PREPARE TO STOP (T1-18) SIGNS SHALL BE COVERED OR REMOVED .
12. ROADWORK SIGNS SHALL BE COVERED OR REMOVED WHEN WORKERS ARE NOT ON SITE.
13. NOT ALL DIMENSIONS SHOWN ARE TO SCALE.
14. ALL WORKERS MUST ADHERE TO THE APPLICABLE SAFE WORK DISTANCE AS DESCRIBED IN AS1742.3:2009.
15. ALL DISTANCES BETWEEN SIGNS SHALL 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: 0052080417 (EXPIRY DATE: 16/07/2022)
PREPARE A WORK ZONE TMP CARD
CHENLONG YOU

WORK SITE STAGE 1

OWEN STREET

BURRAWAN STREET

T1-5 · PREPARE TO STOP T1-18 · T2-25 · T1-34 · PEDESTRIANS WATCH YOUR STEP T8-1

35.0 · 35.0 · 35.0 · 50.0 · 50.0 · 50.0

ON-SITE TRAINED PERSONNEL TO MANAGE PEDESTRIAN ACTIVITIES

HASTINGS SECONDARY COLLEGE
16 OWEN STREET, PORT MACQUARIE - CONSTRUCTION TRAFFIC MANAGEMENT PLAN
STAGE 1 WORKS
TRAFFIC GUIDANCE SCHEME

DRAWING REF NO. 20M706AK-MD-01-P1 · SHEET NO. 01 OF 08 · ISSUE DATE 7 JULY 2021

DESIGNED BY S.YOU · REVIEWED BY M.KONG

SCALE A3 · 0 10 20 · 1:1000

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY.
THE EXACT LOCATIONS SHALL BE PROVEN ON SITE.
ALL EXISTING SERVICES SHOWN ARE NOT GUARANTEED.

ttpa TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994
Address: Level 5, Suite 502 / 282 Victoria Ave, Chatswood NSW 2067
P: 02 9411 5660 E: info@ttpa.com.au W: www.ttpa.com.au

LEGEND:

- WORK SITE (CLASS A HOARDING)
- WORKS ZONE
- SITE ACCESS
- SIGN

GORDON STREET

OWEN STREET

W8-3(R) ON SIDE ROAD

T1-5

T1-5

50.0

T2-25

50.0

T8-1 PEDESTRIANS WATCH YOUR STEP

WORK SITE STAGE 2

40.0

ON-SITE TRAINED PERSONNEL TO MANAGE PEDESTRIAN ACTIVITIES

T8-1 PEDESTRIANS WATCH YOUR STEP

NOTES:

1. ALL SIGNS SHALL BE MINIMUM SIZE A.
2. ALL SIGNS SHALL BE CLASS 1 RETROREFLECTIVE.
3. LOCATION OF SIGNS SHALL BE CONFIRMED ON-SITE TO ENSURE APPROPRIATE VISIBILITY.
4. ALL TRAFFIC CONTROL PLANS SHALL BE IMPLEMENTED IN ACCORDANCE WITH THE TfNSW "TRAFFIC CONTROL AT WORK SITES" MANUAL, VER 6 (TfNSW 2020) 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 PLANS SHALL BE SET UP BY A PERSON HOLDING AN "IMPLEMENT TRAFFIC MANAGEMENT PLANS" TICKET AND THE TfNSW 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. ENSURE A COPY OF THE TCP IS KEPT ON-SITE. THE ACCREDITTED PERSONNEL SHALL 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 AMENDMENTS 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 A WORK ZONE 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 SHALL 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" SHALL BE AVAILABLE FOR REFERENCE AND IMPLEMENTATION AS REQUIRED ON-SITE.
8. ALL WORKERS WILL BE CONFINED TO THE DEDICATED WORKS AREA SHOWN ON THE PLAN.
9. 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 WHEN THE WORKSITE IS LEFT UNATTENDED.
10. TRAFFIC CONTROLLERS ARE NOT REQUIRED AT THE ACCESS FULL TIME, WHEN CONDITIONS BE MODIFIED AND TRAFFIC CONTROLLERS REQUIRED, THEY ARE TO BE SUITABLY ACCREDITED TO AUSTRALIAN STANDARDS AND TfNSW ACCREDITATION AS REQUIRED. WHEN REQUIRED T1-34 AND T1-10 SIGNS ARE TO BE SET UP IN ACCORDANCE TO AUSTRALIAN STANDARDS AND TfNSW REQUIREMENTS.
11. NOT ALL DIMENSIONS SHOWN ARE TO SCALE.
12. ALL SIGNAGE SHALL BE CLEAN, CLEARLY VISIBLE AND NOT OBSCURED.
13. ALL SIGNS SHALL BE COVERED OR REMOVED WHEN WORKERS ARE NOT ON SITE.
14. ALL WORKERS MUST ADHERE TO THE APPLICABLE SAFE WORK DISTANCE AS DESCRIBED IN AS1742.3:2009.
15. ALL DISTANCES BETWEEN SIGNS SHALL 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: 0052080417 (EXPIRY DATE: 16/07/2022)
PREPARE A WORK ZONE TMP CARD
CHENLONG YOU

HASTINGS SECONDARY COLLEGE
16 OWEN STREET, PORT MACQUARIE - CONSTRUCTION TRAFFIC MANAGEMENT PLAN
STAGE 2 WORKS
TRAFFIC GUIDANCE SCHEME

DRAWING REF NO. 20M706AK-MD-01-P1

SHEET NO. 02 OF 08

ISSUE DATE 7 JULY 2021

DESIGNED BY S.YOU

REVIEWED BY M.KONG

SCALE A3 0 10 20 1:1000

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY.
THE EXACT LOCATIONS SHALL BE PROVEN ON SITE.
ALL EXISTING SERVICES SHOWN ARE NOT GUARANTEED.

ttpa TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994
Address: Level 5, Suite 502 / 282 Victoria Ave, Chatswood NSW 2067
P: 02 9411 5660 E: info@ttpa.com.au W: www.ttpa.com.au

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** meg@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 16 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.

- BSc. Civil Engineering, Purdue University, USA
- MSc. Civil Engineering, Purdue University, USA
- Design Practitioner Registration Number: DEP0000127
- Professional Engineer Registration Number: PRE0000121
- Engineers Australia Member no.7489101.
- Australia Institute of Traffic Planning member no.99993784
- 14 years of traffic engineering and transport planning experience
- completed 1,200+ projects in NSW

RELEVANT SCHOOL DEVELOPMENT EXPERIENCE

- 1Girraween Public School
- 58 Dalmeny Drive, Prestons (Siena Primary School)
- Brookvale Public School
- Cheltenham Girls High School
- Darcy Road Public School
- Darlington Public School
- Girraween Public School
- Kent Road Public School
- Killara And Ku-ring-gai High Schools
- Medowie Christian School
- Monaro High School, Cooma
- North Sydney Public School
- Samuel Gilbert Public School, Ridgecrop Drive, Castle Hill
- Siena Primary School
- The French School Sydney
- Wahroonga Adventist School, Fox Valley Road, Wahroonga

Appendix I: Driver Code of Conduct

Driver Code of Conduct

This Driver Code of Conduct applies to all personnel and any other person conducting business for NSW Department of Education whether a direct employee of FK Gardner & Sons or employed by another organisation providing service or working with FK Gardner & Sons.

Drivers Code of Conduct

Safe Driving Policy for the Hastings Secondary College Upgrade Works.

Objectives of the Drivers Code of Conduct

- Minimise conflict with other road users
- Minimise road traffic noise
- Ensure all traffic use specified routes

Code of Conduct

- All vehicle operators accessing the site must:
- Take reasonable care for his or her own personal health and safety.
- Not adversely, by way of actions or otherwise, impact on the health and safety of other persons.
- Notify their employer if they are not fit for duty prior to commencing their shift.
- Obey all applicable road rules and laws at all times
- In the event an emergency vehicle behind your vehicle, pull over and allow the emergency vehicle to pass immediately.
- Obey the applicable driving hours in accordance with legislation and take all reasonable steps to manage their fatigue and not drive with high levels of drowsiness.
- Obey all on-site signposted speed limits and comply with directions of traffic control supervisors in relation to movements in and around temporary or fixed work areas.
- Ensure all loads are safely restrained, as necessary.
- Operate their vehicles in a safe and professional manner, with consideration for all other road users.
- Hold a current Australian State or Territory issued driver's licence.
- Notify their employer or operator immediately should the status or conditions of their driver's license change in any way.
- Comply with other applicable workplace policies, including a zero tolerance of driving while under the influence of alcohol and/or illicit drugs.
- Not use mobile phones when driving a vehicle or operating equipment. If the use of a mobile device is required, the driver shall pull over in a safe and legal location prior to the use of any mobile device.
- Advise management of any situations in which you know, or think may, present a threat to workplace health and safety.
- Drive according to prevailing conditions (such as during inclement weather) and reduce speed, if necessary.
- Have necessary identification documentation at hand and ready to present to security staff on entry and departure from the site, as necessary, to avoid unnecessary delays to other vehicles.

Crash or Incident Procedure

- Stop your vehicle as close as possible to the scene, making sure you are not hindering traffic. Ensure your own safety first, then help any injured people and seek assistance immediately if required.

- Ensure the following information is noted:
  - Details of the other vehicles and registration numbers
  - Names and addresses of the other vehicle drivers
  - Names and addresses of witnesses
  - Insurers details
- Give the following information to the involved parties:
  - Name, address, and company details
  - If the damaged vehicle is not occupied, provide a note with your contact details for the owner to contact the company.
- Ensure that the police are contacted should the following circumstances occur:
  - If there is a disagreement over the cause of the crash.
  - If there are injuries.
  - If you damage property other than your own.
  - As soon as reasonably practical, report all details gathered to your manager.

Truck Routes

- The truck routes for the project are noted as follows
  - Enter site from Gordon Street and onto Owen Street
  - Exit Site from Owen St, heading south to Burrawan Street

Minimise Conflict with Other Road Users

- By utilising the truck routes as detailed above and observing all road rules, there will be minimal conflict with other road users

Minimise Road Traffic Noise

- Truck drivers will obey all road speed limits.
- Trucks are also required to turn off their engines if they will be idling for more than 5 minutes.

Appendix J: Construction Soil & Water Mgnt Sub-plan

NORTHROP

CIVIL ENGINEERING REPORT: SOIL & WATER MANAGEMENT PLAN

Hasting Secondary College - CAPA

Owens St & Burrawan St, Port Macquarie NSW

PREPARED FOR
FKG Group
8/335 Wharf Rd
Newcastle NSW 2300

Ref: S202097-CR01
Rev: 1

Date: 16.12.21

Civil Engineering Report: Soil & Water Management Plan

Revision Schedule

Date	Revision	Issue	Prepared By	Approved By
16.12.2021	1	Final	B.Stokes	B.Stokes

Northrop Consulting Engineers Pty Ltd

ACN 064 775 088 | ABN 81 094 433 100

Level 2, 3 Horwood Place, Parramatta NSW 2150

02 9241 4188 | sydney@northrop.com.au | www.northrop.com.au

Table of Contents

1. General 3
   1.1 Introduction 3
   1.2 Related Reports and Documents 3
   1.3 The Development 3
2. Erosion and Sediment Control 4
   2.1 Sediment Basin 4
   2.2 Sediment and Erosion Control Measures 4
   2.3 Wet Weather Management 4
3. Further Commentary 6
   3.1 SSD Conditions 6

Appendix A – Soil & Water Management Plans 8

Appendix B – Sediment Basin Calculations 9

Appendix C – CV 10

Appendix D - Consultation Record 11

1. General

1.1 Introduction

Northrop Consulting Engineers Pty Ltd (Northrop) have been engaged by FKG Group to prepare the Civil Engineering design and documentation in support of a Construction Certificate for the proposed Hastings Secondary College – CAPA development at the corner of Owens St & Burrawan St, Port Macquarie.

This report covers the works shown as the Northrop Drawing Package required for the development of the site including:

- Erosion and Sediment control.

1.2 Related Reports and Documents

This report is to be read in conjunction with the following reports and documents:

1. Detailed Design Phase Civil Documentation prepared by Northrop:
   - 202097.C11.11A Specification Notes
   - 202097.C12.01C Sediment and Soil Erosion Control Plan
   - 202097.C12.11B Sediment and Soil Erosion Control Details
2. NSW Department of Housing Manual, “Managing Urban Stormwater Soil & Construction” 2004 (Blue Book)

1.3 The Development

1.3.1 Site Surrounds

The upgrade to the Hasting Secondary College in Port Macquarie is within the Port Macquarie Hastings Local Government Area (LGA). The site is located at the corner of Owen St and Burrawan St and legally described as Lot 111 in Deposited Plan (DP) 1270315. It has an area of approximately 4,000sqm and is bound by the existing buildings to the north, Owens St to the west, existing buildings to the south and existing buildings to the east.

Levels in the south portion of the site are approx. RL 19.50m AHD adjacent the existing building A. They then fall to a depression in the northwest to approx. RL 13.50m AHD at an approximate grade of 5%. This corresponds to approximately 6m difference in elevation.

1.3.2 Proposed Development

The upgrade to the Hastings Secondary College includes a new CAPA facility including associated landscape and entry works. *The works comprise:*

1. Site preparation and excavation.
2. Land use for the purpose of a college.
3. Construction of new building including:
   - A proposed building on the western portion of the site primarily addressing Owens St.
4. Landscaping and public domains works including tree planting, creation of various assembly, play and learning zones.
5. Primary pedestrian entrance from Owen St; and
6. Other ancillary infrastructure and utilities works.

2. Erosion and Sediment Control

The objectives of the erosion and sediment control for the development site are to ensure:

- Adequate erosion and sediment control measures are applied prior to the commencement of construction and are maintained throughout construction; and

As part of the works, the erosion and sedimentation control will be constructed in accordance with Council requirements and “Managing Urban Stormwater Soil & Construction” 2004 (Blue Book) prepared by Landcom, prior to any earthworks commencing on site.

2.1 Sediment Basin

Calculations have been undertaken to size a temporary sediment basin to capture site runoff during construction. Calculations to determine the concept design basin size have been based on available geotechnical information regarding soil types and using the Soils and Construction Volume 1 Manual.

To ensure the sediment basin is working effectively it will be maintained throughout the construction works. Maintenance includes ensuring adequate settlement times or flocculation and pumping of clean water to reach the minimum storage volume at the lower level of the settling zone. The settling zone will be identified by pegs to clearly show the level at which design storage capacity is available.

The pumped water from the sediment basin can be reused for dust control during construction.

Overflow weirs are to be provided to control overflows for rainfall events in excess of the design criteria.

2.2 Sediment and Erosion Control Measures

Prior to any earthworks commencing on site, sediment and erosion control measure shall be implemented generally in accordance with the Construction Certificate drawings and the “Blue Book”. The measures shown on the drawings are intended to be a minimum treatment only as the contractor will be required to modify and stage the erosion and sedimentation control measures to suit the construction program, sequencing, and techniques. These measures will include:

- A temporary site security/safety fence is to be constructed around the site, the site office area and the proposed sediment basin.
- Sediment fencing provided downstream of disturbed areas, including any topsoil stockpiles.
- Dust control measures including covering stockpiles, installing fence hessian and watering exposed areas.
- Placement of hay bales or mesh and gravel inlet filters around and along proposed catch drains and around stormwater inlets pits; and
- Maintenance of the existing sediment basin as noted above in Section 2.1;
- Stabilised site access at the construction vehicle entry/exits.
- Ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site.

Any stockpiled material, including topsoil, shall be located as far away as possible from any associated natural watercourses or temporary overland flow paths. Sediment fences shall be installed to the downstream side of stockpiles and any embankment formation. All stockpiles and embankment formations shall be stabilised by hydroseeding or hydro mulching on formation.

2.3 Wet Weather Management

In circumstances of heavy rain sufficient to affect site access and ground conditions the Site Manager should complete a site inspection before work commences. The inspection needs to focus on.

- The suitability of pedestrian access to the amenities and into the construction work areas

- The suitability of access for plant and equipment
- The suitability of ground conditions for plant and equipment to operate
- Nominate the construction zones suitable for work to commence
- Actions to remediate those areas not suitable for work to commence (de-water; prepare ground conditions and access ways etc.)

It is noted that the storage of equipment during wet weather will be placed in areas to not prohibit or disrupt operation of the sediment and soil erosion control measures.

3. Further Commentary

3.1 SSD Conditions (Condition B18 of SSD-11920082)

The Minister for Planning and Open Spaces has provided Conditions of Consent for the proposed development at Owens St & Burrawan St, Port Macquarie. Conditions associated with the Construction Soil and Water Management Plan have been provided below with further commentary for consideration by School Infrastructure NSW and the Certifying Authority.

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.

(Northrop) Please refer to the CV of the designer provided in Appendix C.

(b) Measures to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site.

(Northrop) A stabilised site access is to be provided with washdown facilities for vehicle access and egress at Owens St.

(c) Describe all erosion and sediment controls to be implemented during construction; including as a minimum, measures in accordance with the publication Managing Urban Stormwater: Soils & Construction (4th edition, Landcom 2004) commonly referred to as the 'Blue Book'.

(Northrop) Please refer to Section 2 of this report and associated Civil Engineering drawings as listed:

- 202097.C11.11A Specification Notes
- 202097.C12.01C Sediment and Soil Erosion Control Plan
- 202097.C12.11B Sediment and Soil Erosion Control Details

(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).

Please refer to section 2.3 of the report.

(e) detail all off-Site flows from the Site; and

Once stormwater is collected in the sediment basins and flocculated, clean water is to be discharged to existing site stormwater infrastructure within the development site or to the public stormwater drainage system in Owens St away from the site.

(f) describe the measures that must be implemented to manage stormwater and flood flows for small and large sized events, including, but not limited to, 1 in 5-year ARI

Please refer to Section 2 of this report and associated Civil Engineering drawings as listed:

- 202097.C11.11A Specification Notes
- 202097.C12.01C Sediment and Soil Erosion Control Plan
- 202097.C12.11B Sediment and Soil Erosion Control Details

The erosion and sediment control plans have been designed in accordance with the requirements of NSW Department of Housing Manual, "Managing Urban Stormwater Soil &

Construction" 2004 (Blue Book) and Council's Development Control Plan 2008 Part 1 General Controls for all Developments Section 8. Erosion and Sediment Control.

Surface flows generated during storm events up to the 1 in 10-year storm event are directed over land or within the constructed pit and pipe network to the sediment basin. Stormwater runoff that has accumulated in the basin is to be flocculated prior to discharge to the existing stormwater system.

Storm events greater than the 1 in 10 year will still experience flows being directed to the sediment basin however the site will likely become overwhelmed as temporary control measures are not typically sized to cater for such events in the Blue Book requirements. Stormwater will likely overtop the basin and spill to areas downstream of the works to Owens St.

Appendix A – Soil & Water Management Plans

NOTE: ALL CIVIL ENGINEERING CONSTRUCTION WORKS TO BE CARRIED OUT IN ACCORDANCE WITH PORT MACQUARIE-HASTINGS COUNCIL DEVELOPMENT GUIDELINES .THE AFOREMENTIONED GUIDELINES INCLUSIVE OF ALL SPECIFICATIONS TAKE PRECEDENCE OVER NOTES PROVIDED BELOW.

ACCESS AND SAFETY

1. THE CONTRACTOR SHALL COMPLY WITH ALL STATUTORY AND INDUSTRIAL REQUIREMENTS FOR PROVISION OF A SAFE WORKING ENVIRONMENT INCLUDING TRAFFIC CONTROL.
2. THE CONTRACTOR SHALL PROVIDE TRAFFIC MANAGEMENT PLANS FOR THE PROPOSED WORKS COMPLETED BY A SUITABLY QUALIFIED PERSON AND APPROVED BY COUNCIL / REGULATORY AUTHORITY. WORK IS NOT TO COMMENCE ON SITE PRIOR TO APPROVAL OF TRAFFIC MANAGEMENT SCHEME.
3. THE CONTRACTOR SHALL ENSURE THAT AT ALL TIMES ACCESS TO BUILDINGS ADJACENT THE WORKS IS NOT DISRUPTED.
4. WHERE NECESSARY THE CONTRACTOR SHALL PROVIDE SAFE PASSAGE OF VEHICLES AND/OR PEDESTRIANS THROUGH OR BY THE SITE.
5. THE CONTRACTOR SHALL ENSURE PUBLIC ACCESS EXTERNAL TO THE SITE IS IN ACCORDANCE WITH COUNCILS / AUTHORITY / SITE MANAGERS REQUIREMENTS.

TREE PROTECTION

1. REFER TO LANDSCAPE / ARCHITECTS/NORTHROPS PLAN FOR TREES TO BE RETAINED AND PROTECTED.
2. ANY EXISTING/PROPOSED TREES WHICH FORM PART OF THE FINAL LANDSCAPING PLAN SHALL BE PROTECTED FROM CONSTRUCTION ACTIVITIES BY;
   - 2.1. PROTECTING THEM WITH BARRIER FENCING OR SIMILAR MATERIALS INSTALLED OUTSIDE THE DRIP LINE.
   - 2.2. ENSURING THAT NOTHING IS NAILED TO ANY PART OF THE TREE.
   - 2.3. CARE IS TAKEN NOT TO CUT ROOTS UNNECESSARILY. COUNCILS AND/OR INDEPENDENT ARBORISTS TO BE CONSULTED WHERE TREE ROOTS ARE TO BE REMOVED AND/OR CUT.

SEDIMENT AND SOIL EROSION

1. THE SEDIMENT & EROSION CONTROL PLAN PRESENTS CONCEPTS ONLY. THE CONTRACTOR SHALL AT ALL TIMES BE RESPONSIBLE FOR THE ESTABLISHMENT & MANAGEMENT OF A DETAILED SCHEME MEETING COUNCILS AND OTHER REGULATORY AUTHORITY REQUIREMENTS AND MAKE PAYMENT OF ALL FEES.
2. THE CONTRACTOR SHALL INSTIGATE ALL SEDIMENT AND EROSION CONTROL MEASURES IN ACCORDANCE WITH STATUTORY REQUIREMENTS AND IN PARTICULAR THE 'BLUE BOOK' (MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION), PRODUCED BY THE DEPARTMENT OF HOUSING AND COUNCILS POLICIES. THESE MEASURES ARE TO BE INSPECTED AND MAINTAINED ON A DAILY BASIS.
3. THE CONTRACTOR SHALL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE LOCATED AS INSTRUCTED IN THE DRAWINGS AND ADHERE TO ALL REGULATORY AUTHORITY REQUIREMENTS.
4. THE CONTRACTOR SHALL INFORM ALL SUB CONTRACTORS OF THEIR RESPONSIBILITIES IN MINIMISING THE POTENTIAL FOR SOIL EROSION AND POLLUTION TO DOWNSTREAM LANDS AND WATERWAYS.
5. WHERE PRACTICAL, THE SOIL EROSION HAZARD ON THE SITE SHALL BE KEPT AS LOW AS POSSIBLE. TO THIS END, WORKS SHOULD BE UNDERTAKEN IN THE FOLLOWING SEQUENCE;
   - 5.1. CONSTRUCT TEMPORARY STABILISED SITE ACCESS INCLUSIVE OF SHAKE DOWN / WASH PAD.
   - 5.2. INSTALL ALL TEMPORARY SEDIMENT FENCES AND BARRIER FENCES. WHERE FENCES ADJACENT EACH OTHER, THE SEDIMENT FENCE CAN BE INCORPORATED INTO THE BARRIER FENCE.
   - 5.3. INSTALL SEDIMENT CONTROL MEASURES AS OUTLINED ON THE APPROVED PLANS.
6. UNDERTAKE SITE DEVELOPMENT WORKS SO THAT LAND DISTURBANCE IS CONFINED TO AREAS OF MINIMUM WORKABLE SIZE.
7. AT ALL TIMES AND IN PARTICULAR DURING WINDY AND DRY WEATHER, LARGE UNPROTECTED AREAS WILL BE STABILISED / KEPT MOIST (NOT WET) TO KEEP DUST UNDER CONTROL ENSURING CONFORMITY TO REGULATORY AUTHORITY REQUIREMENTS.
8. ANY SAND USED IN THE CONCRETE CURING PROCESS (SPREAD OVER THE SURFACE) SHALL BE REMOVED AS SOON AS POSSIBLE AND WITHIN 10 WORKING DAYS FROM PLACEMENT.
9. WATER SHALL BE PREVENTED FROM ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS THE CATCHMENT AREA HAS BEEN STABILISED AND/OR ANY LIKELY SEDIMENT BEEN FILTERED OUT.
10. TEMPORARY SOIL AND WATER MANAGEMENT STRUCTURES SHALL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE STABILISED / REHABILITATED.
11. ALLOW FOR GRASS STABILISATION OF EXPOSED AREAS, OPEN CHANNELS AND ROCK BATTERS DURING ALL PHASES OF CONSTRUCTION.
12. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED TO ENSURE THAT THEY OPERATE EFFECTIVELY. REPAIRS AND/OR MAINTENANCE SHALL BE UNDERTAKEN REGULARLY AND AS REQUIRED, PARTICULARLY FOLLOWING RAIN EVENTS.
13. RECEPTORS FOR CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS AND LITTER SHALL BE DISPOSED OF IN ACCORDANCE WITH REGULATORY AUTHORITY REQUIREMENTS. CONTRACTOR TO PAY ALL FEES AND PROVIDE EVIDENCE OF SAFE DISPOSAL.
14. IF A TEMPORARY SEDIMENT BASIN IS REQUIRED, ENSURE SAFE BATTER SLOPES IN ACCORDANCE WITH THE GEOTECHNICAL REPORT. MAINTAIN ADEQUATE STORAGE VOLUME IN ACCORDANCE WITH PLANS. TEMPORARY PUMP 'CLEAN FLOCCULATED' WATER TO AUTHORITIES STORMWATER SYSTEM. ENSURE WHOLE DISTURBED SITE RUN-OFF IS DIRECTED TO TEMPORARY SEDIMENT BASIN.

EXISTING SERVICES

1. ALL UTILITY SERVICES INDICATED ON THE DRAWINGS ORIGINATE FROM SUPPLIED DATA OR DIAL BEFORE YOU DIG SEARCHES, THEREFORE THEIR ACCURACY AND COMPLETENESS IS NOT GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE AND CONFIRM THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY. NOTE SERVICE AUTHORITY REQUIREMENTS FOR LOCATING OF SERVICES PRIOR TO COMMENCEMENT OF WORKS.
2. CARE TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATIONS ARE TO BE UNDERTAKEN OVER COMMUNICATION, GAS OR ELECTRICAL SERVICES. HAND EXCAVATION ONLY IN THESE AREAS.
3. THE CONTRACTOR SHALL PROTECT AND MAINTAIN ALL EXISTING SERVICES THAT ARE TO BE RETAINED IN THE VICINITY OF THE PROPOSED WORKS. ANY AND ALL DAMAGE TO THESE SERVICES AS A RESULT OF THESE WORKS SHALL BE REPAIRED BY THE CONTRACTOR UNDER THE DIRECTION OF THE SUPERINTENDENT AT THE CONTRACTORS EXPENSE.
4. THE CONTRACTOR SHALL ALLOW IN THE PROGRAM FOR THE ADJUSTMENT (IF REQUIRED) OF EXISTING SERVICES IN AREAS AFFECTED BY WORKS.
5. THE CONTRACTOR SHALL ALLOW IN THE PROGRAM FOR THE CAPPING OFF, EXCAVATION AND REMOVAL (IF REQUIRED) OF EXISTING SERVICES IN AREAS AFFECTED BY WORKS UNLESS DIRECTED OTHERWISE ON THE DRAWINGS OR BY THE SUPERINTENDENT.
6. THE CONTRACTOR SHALL ENSURE THAT AT ALL TIMES SERVICES TO ALL BUILDINGS ARE NOT AFFECTED BY THE WORKS AND ARE MAINTAINED AND NOT DISRUPTED.
7. PRIOR TO COMMENCEMENT OF ANY WORKS THE CONTRACTOR SHALL GAIN APPROVAL OF THE PROGRAM FOR THE RELOCATION AND/OR CONSTRUCTION OF TEMPORARY SERVICES AND FOR ANY ASSOCIATED INTERRUPTION OF SUPPLY.
8. THE CONTRACTOR SHALL CONSTRUCT TEMPORARY SERVICES TO MAINTAIN EXISTING SUPPLY TO BUILDINGS REMAINING IN OPERATION DURING WORKS TO THE SATISFACTION AND APPROVAL OF THE SUPERINTENDENT. ONCE DIVERSION IS COMPLETE AND COMMISSIONED THE CONTRACTOR SHALL REMOVE ALL SUCH TEMPORARY SERVICES AND MAKE GOOD TO THE SATISFACTION OF THE SUPERINTENDENT.
9. THE CONTRACTOR IS TO ALLOW TO POTHOLE ANY SERVICES WITHIN A PUBLIC RESERVE WITHIN THE EXTENT OF WORKS (E.G. STORMWATER CROSSINGS).

EARTHWORKS

1. AT THE COMMENCEMENT OF FILLING OPERATIONS FOR BULK EARTHWORKS A GEOTECHNICAL ENGINEER IS TO VISIT THE SITE & CONFIRM THE SUITABILITY OF THE METHODOLOGY OF ACHIEVING THE REQUIRED COMPACTION EARTHWORKS REQUIREMENTS.
2. STRIP TOPSOIL, VEGETABLE MATTER AND RUBBLE TO EXPOSE NATURALLY OCCURRING MATERIAL AND STOCKPILE ON SITE AS DIRECTED BY THE SUPERINTENDENT.
3. WHERE FILLING IS REQUIRED TO ACHIEVE DESIGN SUBGRADE, PROOF ROLL EXPOSED NATURAL SURFACE WITH A MINIMUM OF TEN PASSES OF A VIBRATING ROLLER (MINIMUM STATIC WEIGHT OF 10 TONNES) IN THE PRESENCE OF THE SUPERINTENDENT OR CERTIFYING ENGINEER.
4. THE CONTRACTOR IS TO ALLOW FOR A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER TO PROVIDE ADVICE AND CERTIFICATION OF ANY WORKS ASSOCIATED WITH TREATING OR MANAGING UNSUITABLE GROUND CONDITIONS THROUGHOUT THE CONTRACT (e.g. STABILITY OF EXCAVATIONS, POOR SUBGRADE, THE EXISTING QUARRY AREA etc).
5. ALL SOFT, WET OR UNSUITABLE MATERIAL IS TO BE REMOVED AS DIRECTED BY THE SUPERINTENDENT AND REPLACED WITH APPROVED MATERIAL SATISFYING THE REQUIREMENTS BELOW.
6. PROVIDE CERTIFICATES VERIFYING THE QUALITY OF IMPORTED MATERIAL FOR THE SUPERINTENDENTS APPROVAL.
7. ALL FILL MATERIAL SHALL BE PLACED IN MAXIMUM 200mm THICK LAYERS (LOOSE) AND COMPACTED AT OPTIMUM MOISTURE CONTENT (+ OR - 2%) TO ACHIEVE A DRY DENSITY DETERMINED IN ACCORDANCE WITH AS1289.2.1.1, AS1289.5.7.1 AND AS1289.5.8.8 OF NOT LESS THAN THE FOLLOWING STANDARD MINIMUM DRY DENSITY;

LOCATION	COMPACTION REQUIREMENT
LANDSCAPED AREAS	98% SMDD
ROADS	100% SMDD (IN ACCORDANCE WITH COUNCIL SPECIFICATIONS)
PAVED AREAS	100% SMDD (IN ACCORDANCE WITH COUNCIL SPECIFICATIONS)

8. TESTING OF THE SUBGRADE SHALL BE CARRIED OUT BY AN APPROVED N.A.T.A. REGISTERED LABORATORY AT THE CONTRACTORS EXPENSE UNLESS AGREED DIFFERENTLY WITH THE PRINCIPAL.
9. ALLOW THE FOLLOWING COMPACTION TESTING BY N.A.T.A. REGISTERED LABORATORY FOR PLATFORMS AND FILL LAYERS IN ACCORDANCE WITH THE LATEST VERSION OF AS3798. (MINIMUM 3 TESTS PER LAYER) OR 1 TEST PER MATERIAL TYPE PER 2500sq.m OR 1 TEST.
10. WHERE TEST RESULTS ARE BELOW THE SPECIFIED COMPACTION, RECOMPACT (TYNING FIRST AS NECESSARY) AND RETEST UNTIL SPECIFIED COMPACTION STANDARDS ARE ACHIEVED, OTHERWISE SUBGRADE REPLACEMENT IS REQUIRED IF COMPACTION STANDARDS ARE NOT ACHIEVED.
11. ALLOW FOR EXCAVATION IN ALL MATERIALS AS FOUND U.N.O. NO ADDITIONAL PAYMENTS WILL BE MADE FOR EXCAVATION IN WET OR HARD GROUND.

EARTHWORKS (cont)

12. WHERE THERE IS INSUFFICIENT EXCAVATED MATERIAL SUITABLE FOR FILLING OR SUBGRADE REPLACEMENT, THE CONTRACTOR IS TO ALLOW TO IMPORT FILL. IMPORTED FILL SHALL COMPLY WITH THE FOLLOWING;
    - 12.1. BE OF VIRGIN EXCAVATED NATURAL MATERIAL OR
    - 12.2. CONTRACTOR TO PROVIDE EVIDENCE IMPORT IS SUITABLE FOR USE
    - 12.3. PLASTICITY INDEX BETWEEN 2-15% AND CBR > 8
    - 12.4. FREE FROM ORGANIC AND PERISHABLE MATTER
    - 12.5. MAXIMUM SIZE 50mm, PASSING 75 MICRON SIEVE (<25%)
13. THE CONTRACTOR SHALL PROGRAM THE EARTHWORKS OPERATION SO THAT THE WORKING AREAS ARE ADEQUATELY DRAINED DURING THE PERIOD OF CONSTRUCTION. THE SURFACE SHALL BE GRADED AND SEALED OFF TO REMOVE DEPRESSIONS, ROLLERS MARKS AND SIMILAR WHICH WOULD ALLOW WATER TO POND AND PENETRATE THE UNDERLYING MATERIAL. ANY DAMAGE RESULTING FROM THE CONTRACTOR NOT OBSERVING THESE REQUIREMENTS SHALL BE RECTIFIED AT THEIR COST.
14. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE AND MAINTAIN THE INTEGRITY OF ALL SERVICES, CONDUITS AND PIPES DURING CONSTRUCTION, SPECIFICALLY DURING THE BACKFILLING AND COMPACTION PROCEDURE. ANY AND ALL DAMAGE TO NEW OR EXISTING SERVICES AS A RESULT OF THESE WORKS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST.

DEEP EXCAVATIONS

15. PRIOR TO THE COMMENCEMENT OF EXCAVATION WORKS GREATER THAN 1.5m IN DEPTH, THE CONTRACTOR SHALL OBTAIN THE SERVICES OF A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER TO DETERMINE THE STABILITY OF MATERIAL BEING EXCAVATED AND BENCHING REQUIREMENTS / MINIMUM BATTER SLOPES.
16. THE CONTRACTOR MUST PROVIDE THE SUPERINTENDENT AND OR THE DESIGN ENGINEER WITH A COPY OF THE GEOTECHNICAL ENGINEERS REPORT PRIOR TO PRACTICAL COMPLETION.
17. THE CONTRACTOR IS TO PROVIDE SAFETY BARRIERS, FENCING AND THE LIKE IN ACCORDANCE WITH OH&S AND REGULATORY AUTHORITY REQUIREMENTS AND TO ENSURE THE WORK SITE IS SAFE AT ALL TIMES.

LANDSCAPING

1. REFER TO DRAWINGS BY OTHERS FOR DETAILS OF PROPOSED LANDSCAPING TREATMENT.
2. IF NO LANDSCAPING PLANS EXIST OR PLANS DO NOT SPECIFY GENERAL SURFACE STABILISATION THEN ALL DISTURBED SURFACE TO BE TEMPORARILY STABILISED WITH HYDROMULCH UPON COMPLETION OF WORKS. A 500mm STRIP OF TURF (CT2 COUCH) IS TO BE PLACED BEHIND ALL NEW KERB.

STORMWATER DRAINAGE

1. ALL PIPES SHALL BE CLASS 2 RUBBER-RING JOINTED RCP U.N.O. WHERE uPVC PIPES HAVE BEEN SPECIFIED, THE FOLLOWING CLASS PIPEWORK IS TO BE ADOPTED U.N.O. Ø100mm OR LESS TO BE CLASS 'SN10' AND ABOVE Ø100mm TO BE CLASS 'SN8'. CLASS 4 PIPES ARE TO BE USED WHERE COVER OVER THE PIPE IS BELOW 600mm AND BENEATH A TRAFFICABLE PAVEMENT.
2. uPVC STORMWATER LINES PASSING UNDER FLOOR SLABS TO BE CONCRETE ENCASED.
3. FRC PIPES EQUAL TO THAT OF THE STEEL REINFORCED CONCRETE PIPE CLASS SPECIFIED ON THE DRAWINGS MAY BE USED SUBJECT TO APPROVAL FROM THE SUPERINTENDENT.
4. ALL PIPE ARE TO BE LAID AT 1.0% MIN GRADE U.N.O.
5. COVERS
   - 5.1. USE HOT DIPPED GALVANISED COVERS AND GRATES COMPLYING WITH RELEVANT COUNCIL AND AUSTRALIAN STANDARDS.
   - 5.2. ALL COVERS AND GRATES TO BE POSITIONED IN A FRAME AND MANUFACTURED AS A UNIT.
   - 5.3. ALL COVERS AND GRATES TO BE FITTING WITH POSITIVE COVER LIFTING KEYS
   - 5.4. OBTAIN SUPERINTENDENTS APPROVAL FOR THE USE OF CAST IRON SOLID COVERS AND GRATES. CAST IRON SOLID COVERS (IF APPROVED) TO CONSIST OF CROSS-WEBBED, CELLULAR CONSTRUCTION WITH THE RIBS UPPERMOST TO ALLOW INFILLING WITH CONCRETE. INSTALL POSITIVE COVER LIFTING KEYS AND PLASTIC PLUGS.
   - 5.5. UNLESS DETAILED OR SPECIFIED OTHERWISE, COVERS AND GRATES TO BE CLASS 'D' IN VEHICULAR PAVEMENTS AND CLASS 'B' ELSEWHERE.
   - 5.6. ALL GRATED TRENCH DRAINS SHOULD BE 'CLASS D' CAST IRON WITHIN VEHICULAR PAVEMENTS AND CLASS 'B' HEEL SAFE WITHIN PEDESTRIAN PAVEMENTS.
6. ALL PIPE BENDS, JUNCTIONS, ETC ARE TO BE PROVIDED USING PURPOSE MADE FITTINGS OR STORMWATER PITS.
7. ALL CONNECTIONS TO EXISTING DRAINAGE STRUCTURES SHALL BE MADE IN A TRADESMAN-LIKE MANNER AND CEMENT RENDERED TO ENSURE A SMOOTH FINISH.
7. ENSURE PIPEWORK DOES NOT PROTRUDE BEYOND THE INSIDE FACE OF THE PIT WALL. PIPEWORK IS TO FINISH FLUSH WITH INTERNAL WALL (UNLESS OTHERWISE NOTED OR DETAILED). CONNECTION TO BE RENDERED AND MADE NEAT ON THE INSIDE FACE OF THE PIT
8. THE CONTRACTOR SHALL SUPPLY AND INSTALL ALL FITTINGS AND SPECIALS INCLUDING VARIOUS PIPE ADAPTORS TO ENSURE PROPER CONNECTION BETWEEN DISSIMILAR PIPEWORK.
9. U.N.O. MATERIAL USED FOR BEDDING OF PIPES SHALL BE APPROVED NON-COHESIVE GRANULAR MATERIAL HAVING HIGH PERMEABILITY AND HIGH STABILITY WHEN SATURATED AND FREE OF ORGANIC AND CLAY MATERIAL.
10. BEDDING SHALL BE U.N.O TYPE HS2 UNDER ROADS AND H2 UNDER GENERAL AREAS IN ACCORDANCE WITH CURRENT RELEVANT INDUSTRY STANDARDS AND GUIDELINES.
11. THE CONTRACTOR SHALL ENSURE AND PROTECT THE INTEGRITY OF ALL STORMWATER PIPES DURING CONSTRUCTION. ANY AND ALL DAMAGE TO THESE PIPES AS A RESULT OF THESE WORKS SHALL BE REPAIRED BY THE CONTRACTOR UNDER THE DIRECTION OF THE SUPERINTENDENT AND AT NO EXTRA COST TO THE CONTRACT.
12. NOTE THAT THE PIT COVER LEVEL NOMINATED IN GUTTERS ARE TO THE INVERT OF THE GUTTER WHICH ARE 40mm LOWER THAN THE PAVEMENT LEVEL AT LIP OF GUTTER. REFER KERB DETAILS FOR CONFIRMATION.

SUBSOIL DRAINAGE

13. Ø100mm SUBSOIL DRAINAGE LINES WITH NON-WOVEN GEOTEXTILE FILTER SOCK SURROUND SHALL BE CONNECTED TO A STORMWATER DRAINAGE PIT (AT MIN 1% LONGITUDINAL GRADE) AND PROVIDED IN THE FOLLOWING LOCATIONS;
    - 13.1. THE HIGH SIDE OF PROPOSED TRAFFICKED PAVEMENT AREAS.
    - 13.2. ALL PLANTER AND TREE BEDS PROPOSED ADJACENT TO PAVEMENT AREAS.
    - 13.3. BEHIND RETAINING WALLS (IN ACCORDANCE WITH RETAINING WALL DETAILS).
    - 13.4. UPSTREAM OF STORMWATER PITS
    - 13.5. BENEATH FLEXIBLE PAVEMENT ALONG A SAG PROFILE
    - 13.6. ALL OTHER AREAS SHOWN ON DRAWINGS.
    - 13.7. CONTRACTOR IS TO MAKE ALLOWANCE IN BOTH TENDER AND CONSTRUCTION COSTING TO ALLOW FOR SUBSURFACE DRAINAGE BEHIND ALL RETAINING WALLS / ABOVE LOCATIONS AND TO MAKE CONNECTION TO STORMWATER SYSTEM.
14. WHERE SUBSOIL DRAINAGE PASSES BENEATH BUILDINGS / PAVED AREAS AND/OR PAVEMENTS. CONTRACTOR TO ENSURE Ø100mm CLASS 'SN10' uPVC DRAINAGE LINE IS USED AND THAT PROPRIETARY FITTINGS ARE USED TO RECONNECT SUBSOIL DRAINAGE LINE.
15. THE CONTRACTOR SHALL INSTALL INSPECTION OPENINGS / CLEAROUTS TO ALL SUBSOIL DRAINAGE LINES AND DOWNPIPE LINES AS SPECIFIED ON DRAWINGS AND IN ACCORDANCE WITH COUNCIL SPECIFICATIONS. HOWEVER AS A MINIMUM THEY ARE TO BE PLACED AT MAXIMUM 30m CENTRES AND AT ALL UPSTREAM ENDPOINTS.
16. PROVIDE 3.0m LENGTH OF Ø100 SUBSOIL DRAINAGE LINE WRAPPED IN NON-WOVEN GEOTEXTILE FILTER FABRIC TO THE UPSTREAM SIDE OF STORMWATER PITS, LAID IN STORMWATER PIPE TRENCHES AND CONNECTED TO DRAINAGE PIT.
17. IN AREAS WHERE DUMPED / HAND PLACED ROCK IS USED AS A MEANS OF SCOUR PROTECTION, CONTRACTOR IS TO EXCAVATE A MINIMUM OF 100mm FROM PROPOSED SURFACE, LEVEL AND COMPACT SUBGRADE AS SPECIFIED. ROCK TO THEN BE PLACED ON GEOTEXTILE FILTER FABRIC A34.
18. THE CONTRACTR IS TO ENSURE THAT A MINIMUM 150mm CLEARANCE IS PROVIDED BETWEEN THE INTERNAL FACE OF PIPE AND ADJACENT INTERNAL PIT WALLS
19. WHERE TRENCHES ARE IN ROCK, THE PIPE SHALL BE BEDDED ON A MIN 50mm CONCRETE BED (OR 75mm THICK BED OF 12mm BLUE METAL) UNDER THE BARREL OF THE PIPE. THE PIPE COLLAR AT NO POINT SHALL BEAR ON THE ROCK. (E.G. CLEAN 5-12mm AGGREGATE)

PRECAST STORMWATER PITS

1. THE USE OF PRE-CAST STORMWATER DRAINAGE PITS IS NOT ACCEPTED WITHOUT CONFIRMATION BETWEEN NORTHROP ENGINEERS AND THE CONTRACTOR REGARDING QUALITY CONTROL AND CERTIFICATION OF FINISHES.
2. REFER MANUFACTURERS SPECIFICATIONS FOR INSTALLATION GUIDELINES.
3. PRECAST PIT TO BE PLACED ON MINIMUM 150mm THICK CONCRETE PAD AND BED MINIMUM 50mm WHILST CONCRETE IS STILL PARTIALLY WET.
4. ENSURE PENETRATION IS CORED THROUGH PIT FACE TO ALLOW CONNECTION AND IS NOT OVERSIZED.
5. ENSURE A SEALED FINISH AT PIPE CONNECTIONS BY HAND-APPLYING MINIMUM 150mm THICK CONCRETE AROUND PIPE AT THE EXTERNAL FACE OF THE PIT. ENSURE CONCRETE DOES NOT AFFECT THE INTEGRITY OF THE SUBSOIL DRAINAGE CONNECTED TO THE PIT.
6. ENSURE A SMOOTH SEALED FINISH AT PIPE CONNECTIONS BY HAND APPLYING CONCRETE AROUND THE PIPE ON THE INTERNAL FACE OF THE PIT TO FILL IN ANY VOIDS CREATED WHEN PENETRATION FOR THE PIPE WAS CORED.
7. ENSURE PIPEWORK DOES NOT PROTRUDE BEYOND THE INSIDE FACE OF THE PIT WALL. PIPEWORK IS TO FINISH FLUSH WITH INTERNAL WALL (UNLESS OTHERWISE NOTED OR DETAILED). CONNECTION TO BE RENDERED AND MADE NEAT ON THE INSIDE FACE OF THE PIT.
8. ENSURE THE OUTLET PIPE IS CONNECTED AT THE INVERT LEVEL OF THE PIT TO DRAIN. ALTERNATIVELY FILL THE BASE OF THE PIT WITH MASS CONCRETE (MIN 50mm THICK) OR APPROVED GROUTING COMPOUND (LESS THAN 50mm THICK) TO DRAIN.
9. PROVIDE CONCRETE BENCHING TO SIDES OF PIT TO SUIT PIPE DIAMETER. HEIGHT TO MATCH MINIMUM 1/3 PIPE DIAMETER.

RAINWATER REUSE

1. PROVIDE RAINWATER RE-USE SYSTEM TO SUPPLY WATER FOR IRRIGATION OR FOR OTHER USES AS NOTED.
2. GUTTER GUARD TO BE INSTALLED ON ALL EAVES GUTTERS.
3. PRESSURE PUMP / TAP TO BE PROVIDED FOR THE REUSE OF CAPTURED TANK WATER.
4. A PERMANENT SIGN IS TO BE LOCATED IN THE VICINITY OF THE TANK STATING THE WATER IS "NON POTABLE WATER" WITH APPROPRIATE HAZARD IDENTIFICATION.
5. ALL RAINWATER SERVICES SHALL BE CLEARLY LABELED "NON POTABLE WATER" WITH APPROPRIATE HAZARD IDENTIFICATION.
6. PIPEWORK USED FOR RAINWATER SERVICES SHALL BE COLOURED LILAC IN ACCORDANCE WITH AS1345.
7. ALL VALVES AND APERTURES SHALL BE CLEARLY AND PERMANENTLY LABELED WITH SAFETY SIGNS TO COMPLY WITH AS1319.
8. AN AIR GAP OR RPZD MUST BE INSTALLED TO ENSURE BACKFLOW PREVENTION (IF MAINS 'TOP UP' / BYPASS UTILISED)
9. RAINWATER TANK RETICULATION SYSTEM AND MAINS WATER BYPASS ARRANGEMENT TO BE INSTALLED IN ACCORDANCE WITH AS/NZS 3500.1.2-2003 AND THE NSW CODE OF PRACTICE - PLUMBING AND DRAINAGE.
10. A FIRST FLUSH FILTRATION DEVICE IS REQUIRED TO BYPASS THE FIRST 1mm OF RAINWATER.

SIGNAGE AND LINEMARKING

1. ALL SIGNAGE TO BE INSTALLED IN ACCORDANCE WITH AUSTRALIAN STANDARDS 1742 / RMS STANDARDS AND SPECIFICATIONS.
2. LINE MARKING AND PAINT SHALL BE IN ACCORDANCE WITH AS1742.3 AND RMS STANDARDS.
3. PAINT SHALL BE TYPE 3 CLASS 'A' AND THE COLOUR SHALL BE WHITE AND NOT SUBJECT TO DISCOLOURATION BY BITUMEN FROM ROAD SURFACE. ALL PAINT TO BE APPLIED BY MECHANICAL SPRAYER. LINE MARKING SHALL BE APPLIED AT A WET THICKNESS OF BETWEEN 0.35mm AND 0.40mm
4. PAINT SHALL BE APPLIED AT A WET THICKNESS OF BETWEEN 0.35mm AND 0.40mm.
5. CARPARK LINEMARKING TO BE 80mm WIDE.
6. WHEEL STOPS TO BE PROVIDED FOR PARKING SPOTS ADJACENT TO A WALL WITHIN 1.1m OF THE FACE OF KERB IN ACCORDANCE WITH AS1428.1
7. REFER TO AUSTROADS FOR REMOVAL OF LINEMARKING.

SITEWORKS

1. ALL WORKS TO BE IN ACCORDANCE WITH RELEVANT LOCAL COUNCIL / REGULATORY AUTHORITIES REQUIREMENTS, ALL SPECIFICATIONS AND AUSTRALIAN STANDARDS. CONFLICTS BETWEEN SAID DOCUMENTS SHALL BE REFERRED TO THE SUPERINTENDENT FOR DIRECTION.
2. THE CONTRACTOR IS TO REVIEW THE DRAWINGS PRIOR TO PRICING AND COMMENCEMENT AND REPORT ANY DISCREPANCIES TO NORTHROP
3. ANY PRODUCTS SPECIFIED OR USED TO BE VERIFIED BY THE CONTRACTOR AS BEING SAFE AND APPROPRIATE FOR USE. NORTHROP DO NOT TAKE ANY RESPONSIBILITY FOR THE USE OF UNSAFE PRODUCTS
4. THE CONTRACTOR IS TO DESIGN, OBTAIN APPROVALS AND CARRY OUT REQUIRED TEMPORARY TRAFFIC CONTROL PROCEDURES DURING CONSTRUCTION IN ACCORDANCE WITH ALL REGULATORY AUTHORITIES, INCLUSIVE OF LOCAL COUNCIL REGULATIONS AND REQUIREMENTS.
5. THE CONTRACTOR IS TO OBTAIN ALL AUTHORITY APPROVALS AS REQUIRED PRIOR TO COMMENCEMENT OF WORKS.
6. RESTORE ALL PAVED, COVERED, GRASSED AND LANDSCAPED AREAS TO THEIR ORIGINAL CONDITION OR AS DIRECTED BY THE SITE SUPERINTENDENT ON COMPLETION OF WORKS. WHERE PLANTING OF NEW GRASS IS NECESSARY REFER TO LANDSCAPE ARCHITECT AND / OR ARCHITECT DOCUMENTATION.
7. ON COMPLETION OF ANY TRENCHING WORKS, ALL DISTURBED AREAS SHALL BE RESTORED TO THEIR ORIGINAL CONDITION OR AS DIRECTED BY THE SITE SUPERINTENDENT, INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL, GRASSED AREAS AND ROAD PAVEMENTS.
8. THE CONTRACTOR SHALL ARRANGE ALL SURVEY SETOUT TO BE CARRIED OUT BY A REGISTERED SURVEYOR PRIOR TO COMMENCEMENT OF WORKS.THE CONTRACTOR IS TO ENSURE THAT SURVEY BOUNDARIES ARE DERIVED FROM A CADASTRAL SURVEY RATHER THAN A DETAIL SURVEY.
9. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING LEVELS ONSITE PRIOR TO LODGMENT OF TENDER AND ONSITE WORKS. THE PRICE AS TENDERED SHALL BE INCLUSIVE OF ALL WORKS SHOWN ON THE TENDER PROJECT DRAWINGS. ADDITIONAL PAYMENTS FOR WORKS SHOWN ON THE TENDER PROJECT DRAWINGS WILL NOT BE APPROVED.
10. DO NOT OBTAIN DIMENSIONS BY SCALING DRAWINGS.
11. IN CASE OF DOUBT OR DISCREPANCY REFER TO SUPERINTENDENT FOR CLARIFICATION OR CONFIRMATION PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
12. WHERE NEW WORKS ABUT EXISTING THE CONTRACTOR SHALL ENSURE THAT A SMOOTH EVEN PROFILE, FREE FROM ABRUPT CHANGES IS OBTAINED. MAKE SMOOTH TRANSITION TO EXISTING FEATURES AND MAKE GOOD WHERE JOINED.
13. TRENCHES THROUGH EXISTING ROAD AND CONCRETE PAVEMENTS SHALL BE SAWCUT TO FULL DEPTH OF CONCRETE AND A MIN 50mm IN BITUMINOUS PAVING.
14. ALL CIVIL ENGINEERING DESIGN HAS BEEN DOCUMENTED UNDER THE ASSUMPTION THAT ALL NECESSARY SITE CONTAMINATION REMEDIATION WORKS HAVE BEEN SATISFACTORILY COMPLETED (IF APPLICABLE) AND THAT THE SITE IS NOT AFFECTED BY ANY SOIL STRATA OR GROUNDWATER TABLE CONTAMINATION.
15. NOTES ON DETAILS PROVIDED TAKE PRECEDENCE OVER SPECIFICATION NOTES UNLESS IN CONTRADICTION WITH COUNCIL/AUTHORITY SPECIFICATIONS/DETAILS. CONTRACTOR TO CONSULT WITH NORTHROP FOR ANY DISCREPANCIES.
16. IF THE CONTRACTOR DISCOVERS HAZARDOUS/CONTAMINATED MATERIAL THE CONTRACTOR SHALL CONSULT WITH AN ENVIRONMENTAL SPECIALIST.
17. THE CONTRACTOR IS RESPONSIBLE FOR DEALING WITH COMMUNITY COMPLAINTS ASSOCIATED WITH THE WORKS UNDER THE CONTRACT AND TO COMPENSATE FOR/RECTIFY ANY DAMAGE REASONABLY CAUSED BY THE CONTRACTOR.
18. THE TERM 'MAKE GOOD' OR 'MAKE NEAT' IS IN REFERENCE TO THE SATISFACTION OF NORTHROP OR CERTIFYING ENGINEER. THE CONTRACTOR IS TO SEEK CLARIFICATION FROM NORTHROP OR THE CERTIFYING ENGINEER IF NECESSARY
19. TOLERANCES TO BE IN ACCORDANCE WITH COUNCIL/AUTHORITY REQUIREMENTS. IN ABSENCE OF COUNCIL/AUTHORITY SPECIFICATIONS THE FOLLOWING TOLERANCES APPLY:

xxx
xxx
xxx

SERVICE TRENCHES

20. SAWCUT EXISTING SURFACES PRIOR TO EXCAVATION. BACKFILL ALL TRENCHES UNDER EXISTING ROADS, PAVEMENTS AND PATHS WITH STABILISED SAND 5% CEMENT OR DGS40 MATERIAL (5% CEMENT) COMPACTED IN 200mm THICK LAYERS TO 98% MMDD TO UNDERSIDE OF PAVEMENT.
21. BACKFILL ALL TRENCHES NOT UNDER ROADS, PAVEMENTS, PATHS AND BUILDINGS WITH APPROVED EXCAVATED OR IMPORTED MATERIAL COMPACTED TO 95% SMDD.

DRAWN: L.MARTIN DESIGNED: B.STOKES JOB MANAGER: B.STOKES VERIFIER:

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	ISSUED FOR DESIGN DEVELOPMENT	L.M	-	B.S	29.11.21

CLIENT: NSW GOVERNMENT Education Public Schools (Trusted Supplier)

DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED

ARCHITECT: fjmt

ALL SETOUT TO ARCHITECT'S DRAWINGS, DIMENSIONS TO BE VERIFIED WITH THE ARCHITECT AND ON SITE BEFORE MAKING SHOP DRAWINGS OR COMMENCING WORK. NORTHROP ACCEPTS NO RESPONSIBILITY FOR THE USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSFERRED ELECTRONICALLY.

NORTHROP
Wollongong
Level 1, 57 Kembla Street, Wollongong NSW 2500
Ph (02) 4226 3333 Fax (02) 4226 3666
P.O. Box 863, Wollongong, NSW 2500
Email southcoast@northrop.com.au ABN 81 094 433 100

PROJECT: HASTINGS SECONDARY COLLEGE PORT MACQUARIE — PORT MACQUARIE CAMPUS

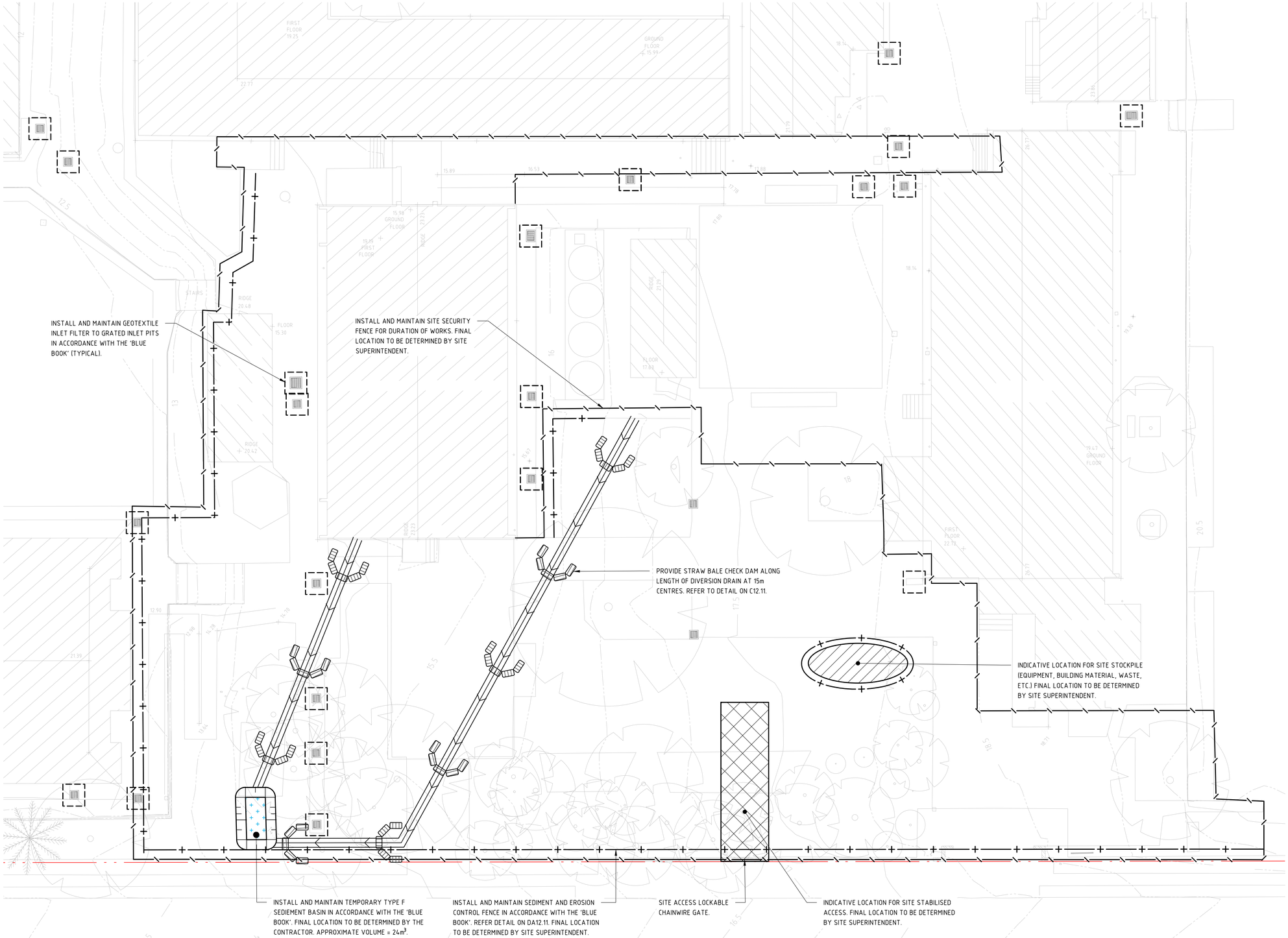
DRAWING TITLE: SPECIFICATION NOTES - SHEET 1

JOB NUMBER: 202097

DRAWING NUMBER: C11.11 REVISION: A

DRAWING SHEET SIZE = A1

Date : 16-12-21 11:38am Plotted By : lmartin Found : W:\#jobs\2020\202097 - SINSW Hastings Secondary College Upgrade\D-Drawings\C-Civil\202097-CAD\03-DD - CAPA\202097_C11.11_SPECIFICATION NOTES - SHEET 1.dwg



LEGEND

- BOUNDARY LINE
- EXISTING CONTOURS (0.5m INTERVALS)
- SEDIMENT FENCE
- SECURITY FENCE
- DROP INLET SEDIMENT TRAP
- STRAW BALE SEDIMENT FILTER
- DIVERSION DRAIN
- STABILISED SITE ACCESS
- STOCKPILE
- SEDIMENT BASIN

GENERAL NOTES:

1. REFER SPECIFICATIONS NOTES FOR SEDIMENT AND SOIL EROSION CONTROL GENERAL REQUIREMENTS.
2. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL / RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS.
3. ALL SEDIMENT AND SOIL EROSION CONTROL MEASURES TO BE INSTALLED IN ACCORDANCE WITH THE 'BLUE BOOK'. CONTRACTOR TO ENSURE THESE MEASURES ARE IN PLACE AND MAINTAINED AT ALL TIMES DURING CONSTRUCTION WORKS.
4. CONTRACTOR TO PROVIDE 'WIRE MESH AND GRAVEL SEDIMENT FILTER' TO ALL PAVED / ROAD AREAS (BOTH PROPOSED AND EXISTING) IN ACCORDANCE WITH THE 'BLUE BOOK'.
5. CONTRACTOR TO PROVIDE 'GEOTEXTILE INLET FILTER TRAPS' TO ALL STORMWATER DRAINAGE INLETS (BOTH PROPOSED AND EXISTING) IN ACCORDANCE WITH THE 'BLUE BOOK'
6. THE TOTAL DISTURBED AREA FOR EACH CATCHMENT IS LESS THAN 2500m², THEREFORE IN ACCORDANCE WITH THE 'BLUE BOOK', NO SEDIMENT BASIN IS REQUIRED.

DRAWN: L.MARTIN
DESIGNED: B.STOKES
JOB MANAGER: B.STOKES
VERIFIER: -

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	ISSUED FOR DESIGN DEVELOPMENT	L.M	-	B.S	29.11.21
B	RE-ISSUED FOR DESIGN DEVELOPMENT	L.M		B.S	14.12.21
C	RE-ISSUED FOR DESIGN DEVELOPMENT	L.M		B.S	16.12.21

CLIENT
NSW GOVERNMENT Education Public Schools (Trusted Supplier)
DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED

ARCHITECT
fjmt

ALL SETOUT TO ARCHITECT'S DRAWINGS, DIMENSIONS TO BE VERIFIED WITH THE ARCHITECT AND ON SITE BEFORE MAKING SHOP DRAWINGS OR COMMENCING WORK.
NORTHROP ACCEPTS NO RESPONSIBILITY FOR THE USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSFERRED ELECTRONICALLY.
SCALE 1:200@A1 (0 2 4 6 8 10m)

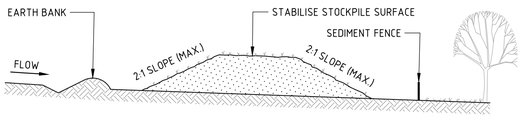
NORTHROP
Wollongong
Level 1, 57 Kembla Street, Wollongong NSW 2500
Ph (02) 4226 3333 Fax (02) 4226 3666
P.O. Box 863, Wollongong, NSW 2500
Email southcoast@northrop.com.au ABN 81 094 433 100

PROJECT
HASTINGS SECONDARY COLLEGE PORT MACQUARIE
PORT MACQUARIE CAMPUS

DRAWING TITLE
CONCEPT SEDIMENT AND EROSION CONTROL PLAN

JOB NUMBER **202097**
DRAWING NUMBER **C12.01**
REVISION **C**
DRAWING SHEET SIZE = A1

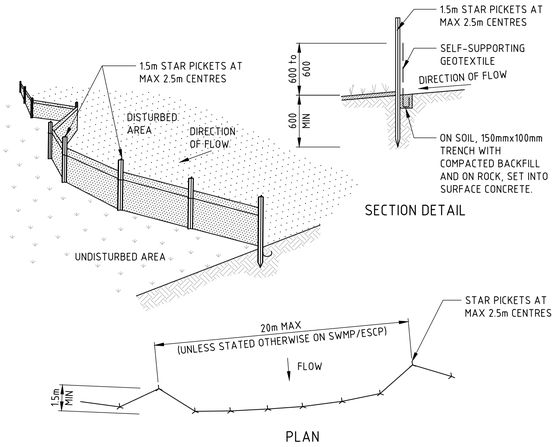
Date : 16-12-21 11:43am Plotted By : lmartin Found : C:\Users\lmartin\AppData\Local\Temp\AcPublish_24608\202097_C12.01_SEDIMENT AND EROSION CONTROL PLAN.dwg



CONSTRUCTION NOTES

1. PLACE STOCKPILES MORE THAN 2m (PREFERABLY 5m) FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2m IN HEIGHT.
4. WHERE THEY ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED ESCP OR SWMP TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS (STANDARD DRAWING 5-5) ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES (STANDARD DRAWING 6-8) 1 TO 2m DOWNSLOPE.

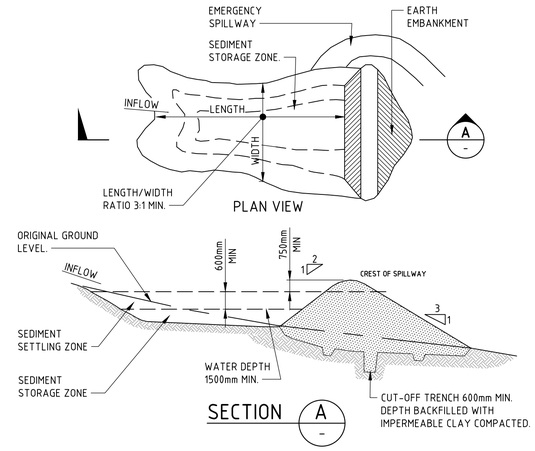
STOCKPILE



CONSTRUCTION NOTES

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5 METRE LONG STAR PICKETS INTO GROUND AT 2.5 METRE INTERVALS (MAX) AT THE DOWNSLOPE EDGE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.

SEDIMENT FENCE



CONSTRUCTION NOTES

1. REMOVE ALL VEGETATION AND TOPSOIL FROM UNDER THE DAM WALL AND FROM WITHIN THE STORAGE AREA.
2. CONSTRUCT A CUT-OFF TRENCH 500mm DEEP AND 1200mm WIDE ALONG THE CENTRELINE OF THE EMBANKMENT EXTENDING TO A POINT ON THE GULLY WALL LEVEL WITH THE RISER CREST.
3. MAINTAIN THE TRENCH FREE OF WATER AND RECOMPACT THE MATERIALS WITH EQUIPMENT AS SPECIFIED IN THE SWMP TO 95 PER CENT STANDARD PROCTOR DENSITY.
4. SELECT FILL FOLLOWING THE SWMP THAT IS FREE OF ROOTS, WOOD, ROCK, LARGE STONE OR FOREIGN MATERIAL.
5. PREPARE THE SITE UNDER THE EMBANKMENT BY RIPPING TO AT LEAST 100mm TO HELP BOND COMPACTED FILL TO THE EXISTING SUBSTRATE.
6. SPREAD THE FILL IN 100mm TO 150mm LAYERS AND COMPACT IT AT OPTIMUM MOISTURE CONTENT FOLLOWING THE SWMP.
7. CONSTRUCT THE EMERGENCY SPILLWAY.
8. REHABILITATE THE STRUCTURE FOLLOWING THE SWMP.

(APPLIES TO 'TYPE D' AND 'TYPE F' SOILS ONLY)

EARTH BASIN - WET

SEDIMENT BASIN CALCULATIONS

Site area	Sub-catchments						Remarks
Total catchment area (ha)							
Disturbed catchment area (ha)							

Soil analysis (enter sediment type if known, or laboratory particle size data)

Sediment Type (C, F or D) if known:							From Appendix C
% sand (fraction 0.02 to 2.00 mm)							Soil texture should be assessed through
% silt (fraction 0.002 to 0.02 mm)							mechanical dispersion only. Dispersing
% clay (fraction finer than 0.002 mm)							agents (e.g. Calgon) should not be used
Dispersion percentage							E.g. enter 10 for dispersion of 10%
% of whole soil dispersible							See Section 6.3.3(e). Auto-calculated
Soil Texture Group	F						Automatic calculation from above

Rainfall data

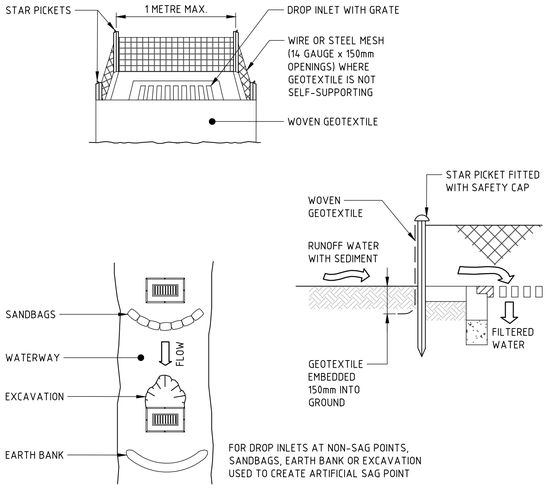
Design rainfall depth (days)							See Sections 6.3.4 (d) and (e)
Design rainfall depth (percentile)							See Sections 6.3.4 (f) and (g)
x-day, y-percentile rainfall event							See Section 6.3.4 (h)
Rainfall R-factor (if known)							See Appendix B
IFD: 2-year, 6-hour storm (if known)							See IFD chart for the site

RUSLE Factors

Rainfall erosivity (*R*-factor)	4000						Auto-filled from above
Soil erodibility (*K*-factor)							RUSLE LS factor calculated for a high rill/interrill ratio.
Slope length (m)							
Slope gradient (%)							
Length/gradient (*LS*-factor)	1.33						
Erosion control practice (*P*-factor)	1.3						
Ground cover (*C*-factor)	1						

Calculations

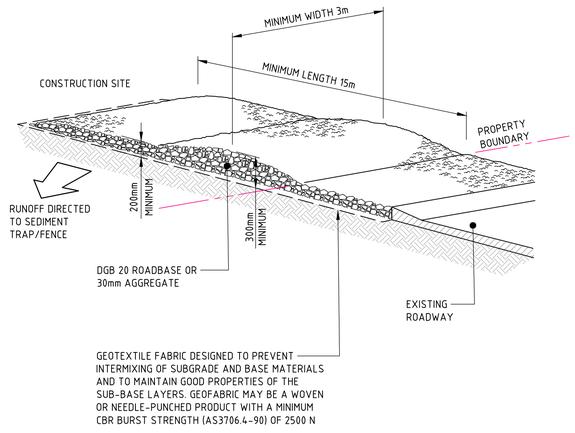
Soil loss (t/ha/yr)	434						
Soil Loss Class	4						See Section 4.4.2(b)
Soil loss (m^3/ha/yr)	334						
Sediment basin storage volume, m^3	24						See Sections 6.3.4(i) and 6.3.5 (e)



CONSTRUCTION NOTES

1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE OR STRAW BALES.
2. FOLLOW STANDARD DRAWING 6-7 AND STANDARD DRAWING 6-8 FOR INSTALLATION PROCEDURES FOR THE STRAW BALES OR GEOFABRIC. REDUCE THE PICKET SPACING TO 1 METRE CENTRES.
3. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
4. DO NOT COVER THE INLET WITH GEOTEXTILE UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.

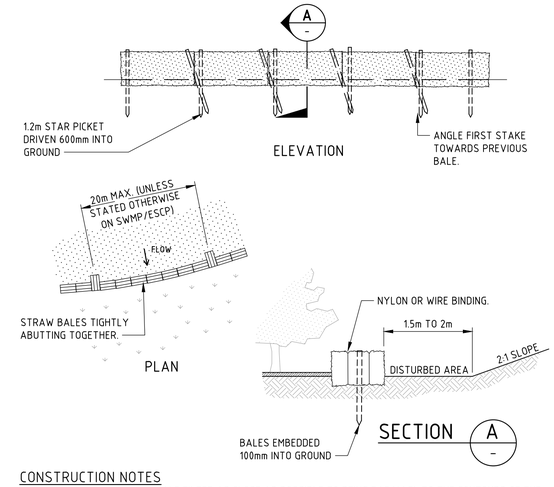
GEOTEXTILE INLET FILTER TRAPS



CONSTRUCTION NOTES

1. STRIP THE TOPSOIL, LEVEL THE SITE AND COMPACT THE SUBGRADE.
2. COVER THE AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
3. CONSTRUCT A 200mm THICK PAD OVER THE GEOTEXTILE USING ROAD BASE OR 30mm AGGREGATE.
4. ENSURE THE STRUCTURE IS AT LEAST 15 METRES LONG OR TO BUILDING ALIGNMENT AND AT LEAST 3 METRES WIDE.
5. WHERE A SEDIMENT FENCE JOINS ONTO THE STABILISED ACCESS, CONSTRUCT A HUMP IN THE STABILISED ACCESS TO DIVERT WATER TO THE SEDIMENT FENCE.

STABILISED SITE ACCESS



CONSTRUCTION NOTES

1. CONSTRUCT THE STRAW BALE FILTER AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE.
2. PLACE BALES LENGTHWISE IN A ROW WITH ENDS TIGHTLY ABUTTING. USE STRAW TO FILL ANY GAPS BETWEEN BALES. STRAWS ARE TO BE PLACED PARALLEL TO GROUND.
3. ENSURE THAT THE MAXIMUM HEIGHT OF THE FILTER IS ONE BALE.
4. EMBED EACH BALE IN THE GROUND 75mm TO 100mm AND ANCHOR WITH TWO 1.2 METRE STAR PICKETS OR STAKES. ANGLE THE FIRST STAR PICKET OR STAKE IN EACH BALE TOWARDS THE PREVIOUSLY LAID BALE. DRIVE THEM 600mm INTO THE GROUND AND, IF POSSIBLE, FLUSH WITH THE TOP OF THE BALES. WHERE STAR PICKETS ARE USED AND THEY PROTRUDE ABOVE THE BALES, ENSURE THEY ARE FITTED WITH SAFETY CAPS.
5. WHERE A STRAW BALE FILTER IS CONSTRUCTED DOWNSLOPE FROM A DISTURBED BATTER, ENSURE THE BALES ARE PLACED 1 TO 2 METRES DOWNSLOPE FROM THE TOE.
6. ESTABLISH A MAINTENANCE PROGRAM THAT ENSURES THE INTEGRITY OF THE BALES IS RETAINED - THEY COULD REQUIRE REPLACEMENT EACH TWO TO FOUR MONTHS.

STRAW BALE FILTER

NOT FOR CONSTRUCTION

VERIFIER: -
JOB MANAGER: B.STOKES
DESIGNED: B.STOKES
DRAWN: L.MARTIN

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	ISSUED FOR DESIGN DEVELOPMENT	L.M	-	B.S	29.11.21
B	RE-ISSUED FOR DESIGN DEVELOPMENT	L.M		B.S	16.12.21

CLIENT: NSW Government Trusted Supplier Education Public Schools

DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED

ARCHITECT: fjmt

THE COPYRIGHT OF THIS DRAWING REMAINS WITH NORTHROP CONSULTING ENGINEERS PTY LTD.

ALL SETOUT TO ARCHITECT'S DRAWINGS, DIMENSIONS TO BE VERIFIED WITH THE ARCHITECT AND ON SITE BEFORE MAKING SHOP DRAWINGS OR COMMENCING WORK.
NORTHROP ACCEPTS NO RESPONSIBILITY FOR THE USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSFERRED ELECTRONICALLY.

NOT TO SCALE

NORTHROP
Wollongong
Level 1, 57 Kembla Street, Wollongong NSW 2500
Ph (02) 4226 3333 Fax (02) 4226 3666
P.O. Box 863, Wollongong, NSW 2500
Email southcoast@northrop.com.au ABN 81 094 433 100

PROJECT: HASTINGS SECONDARY COLLEGE PORT MACQUARIE
PORT MACQUARIE CAMPUS

DRAWING TITLE: SEDIMENT AND EROSION CONTROL DETAILS

JOB NUMBER: 202097
DRAWING NUMBER: C12.11
REVISION: B
DRAWING SHEET SIZE = A1

Date: 16-12-21 11:37am Plotted By: lmartin Found: C:\Users\lmartin\AppData\Local\Temp\AcPublish_24608\202097_C12.11_SEDIMENT AND EROSION CONTROL DETAILS.dwg

Appendix B – Sediment Basin Calculations

SWMP Commentary, Detailed Calculations

Note: These "Detailed Calculation" spreadsheets relate only to high erosion hazard lands as identified in figure 4.6 or where the designer chooses to use the RUSLE to size sediment basins. The "Standard Calculation" spreadsheets should be used on low erosion hazard lands as identified by figure 4.6 and where the designer chooses not to run the RUSLE in calculations.

1. Site Data Sheet

Site Name: **Hastings Secondary College Port Macquarie Campus**

Site Location: **16 Owen St, Port Macquarie NSW 2444**

Precinct:

Description of Site: **Site is currently used for educational purposes.**

Site area	Sub-catchments						Remarks
	CAPA						
Total catchment area (ha)	0.818						
Disturbed catchment area (ha)	0.429						

Soil analysis (enter sediment type if known, or laboratory particle size data)

Sediment Type (C, F or D) if known:	F						From Appendix C
% sand (fraction 0.02 to 2.00 mm)							Soil texture should be assessed through mechanical dispersion only. Dispersing agents (e.g. Calgon) should not be used
% silt (fraction 0.002 to 0.02 mm)							
% clay (fraction finer than 0.002 mm)							
Dispersion percentage							E.g. enter 10 for dispersion of 10%
% of whole soil dispersible							See Section 6.3.3(e). Auto-calculated
Soil Texture Group	F						Automatic calculation from above

Rainfall data

Design rainfall depth (days)	5						See Sections 6.3.4 (d) and (e)
Design rainfall depth (percentile)	75						See Sections 6.3.4 (f) and (g)
x-day, y-percentile rainfall event	32						See Section 6.3.4 (h)
Rainfall R-factor (if known)	4000						See Appendix B
IFD: 2-year, 6-hour storm (if known)	11.8						See IFD chart for the site

RUSLE Factors

Rainfall erosivity (*R*-factor)	4000						Auto-filled from above
Soil erodibility (*K*-factor)	0.063						RUSLE LS factor calculated for a high rill/interrill ratio.
Slope length (m)	86						
Slope gradient (%)	5.3						
Length/gradient (*LS*-factor)	1.33						
Erosion control practice (*P*-factor)	1.3						
Ground cover (*C*-factor)	1						

Calculations

Soil loss (t/ha/yr)	434						
Soil Loss Class	4						See Section 4.4.2(b)
Soil loss (m^3/ha/yr)	334						
Sediment basin storage volume, m^3	24						See Sections 6.3.4(i) and 6.3.5 (e)

Appendix C – CV

Brendan Stokes

Civil Team Lead

BE (Civil) (Hons) MIE AUST CPEng APEC Engineer IntPE(Aus)

Brendan is the Civil Team Lead in the Wollongong office with over 16 years' experience in both the public and private sectors. He has a broad civil engineering experience covering stormwater drainage, water sensitive urban design, land development, commercial and residential developments.

Brendan's proactive and innovative approach ensures that he adds value to projects, whilst also striving to build collaborative and open relationships with clients and stakeholders to ensure projects are well coordinated and meet the desired objectives.

Project Experience

Public Domain and Open Spaces

- Channel 9 Studios, Willoughby.

Stormwater Drainage

- Menangle Park WCMP
- Claymore WCMP
- Queen Street, Campbelltown
- Nepean River Camden
- Badgally Road, Campbelltown
- Riparian Corridor Spring Farm, Camden
- Whitechapel Road, Ambarvale

- **Superintendency**
- Spring Farm NSW (Bulk earthworks & Civil)

- **Land Development**
- Claymore Urban Renewal, Claymore NSW
- Oran Park Development, Oran Park, NSW
- Harrington Grove, Harrington Park, NSW
- Catherine Park, Harrington Park, NSW
- Airds Urban Renewal, Airds, NSW
- Macarthur Gardens, Campbelltown, NSW
- Spring Farm, Camden, NSW
- Sanctuary Ponds, West Dapto, NSW
- Kembla Grange, West Dapto, NSW
- Menangle Park, Campbelltown, NSW

- **Roads and Traffic**
- Oran Park Drive, Oran Park
- Richardson Road, Spring Farm
- Liz Kernohan Drive, Spring Farm

Commercial / Industrial

- Stocklands, Smeaton Grange
- Blaxland Road, Telstra Depot

- **Residential**
- Heath Road, Leppington
- Heathcote Road, Menai
- Withers Road, Kellyville

Appendix D - Consultation Record

Appendix K: FKG Environmental Policy

ENVIRONMENTAL POLICY

Daily Mission: "No Harm to the Environment"

The FK Gardner & Sons Group ('FKG') has a genuine commitment to protect the environment and it strives to minimise the environmental impact of our activities by wherever possible, preventing pollution, responsibly managing waste generated through our activities and managing the work sites to prevent environmental degradation through erosion of land and sedimentation of creeks and waterways. Sustainability initiatives to reduce energy and material consumption.

FKG's goal is to provide maximum practicable protection to the environment, by meeting and at times exceeding legal obligations and other requirements to which the company subscribes.

To achieve this goal, our integrated management system incorporates environmental controls for all areas of operation, consistent with legislation and aimed at minimizing the impact our activities have on the environment.

To achieve our Daily Mission, the following commitments have been established for all employees of FKG to adhere to:

Responsibility Above Obligation

- Adhering to all relevant environmental legislation, codes of practice, external standards and other requirements to which FKG subscribe at all sites;
- Take all reasonable and practicable measures to prevent or minimise environmental harm.
- Investigate and report environmental incidents and instigate corrective and preventive actions as necessary;
- Ensure all environmental complaints are documented and addressed in an efficient manner;
- Reduce non-renewable consumption through implementation of renewable energy technologies.
- Through the use of online and videoconferencing technology reducing fuel consumption.
- Employees have a duty to immediately notify the employer of an event which may result in environmental harm; and
- The administering authority, client and landowner (or occupier of the land) must be notified within 24 hours of any significant or serious environmental harm.

Creativity Through Practicality

- Maintaining compliance with environmental management procedures used by FKG and our subcontractors
- Avoid, reduce or control the creation, emission or discharge of pollutants to reduce environmental impacts;
- To thoroughly plan, manage and control the work in order to ensure satisfactory completion of projects within the nominated time using best safety, environmental and quality practices.
- To review and continually improve the quality of services provided to our clients; and
- To constantly strive to create a stimulating environment for all employees, encouraging development of our specialised skills and corporate teamwork to meet the challenge of our marketplace.

Ability Plus Agility

- Identification and control of any potential environmental issues on all projects
- Ensure all site workers, including subcontractors, are aware of significant environmental aspects and controls relevant to each project as well as the consequences of departing from the required controls;
- Implementation of electronic means of records generation to reduce paper use and printing costs.
- Improve the knowledge and expertise of all employees regarding their environmental responsibilities
- Establish and monitor environmental performance indicators and targets;
- Maintain the frequency and scope of environmental performance monitoring by senior management;
- Regularly monitor and audit the implementation and effects of procedures and controls and report non-conformances; and
- Monitor and continually improve environmental performance.

All staff are responsible for the communication, enthusiastic promotion and implementation of this policy and are accountable to the Managing Director for the achievement of outcomes in accordance with this policy. Senior management shall also ensure that the intent of this policy and performance of the system against these objectives is reviewed on an annual basis and this policy is updated where required.

This Policy extends to FK Gardner & Sons Pty Ltd (ABN 99 010 136 053); FKG Civil Pty Ltd (ABN 65 123 436 751); FKG Air Pty Ltd (ABN 68 107 438 460); Ezyquip Hire Pty Ltd (ABN 39 129 600 308);Total Hydraulic Services Pty Ltd (ABN 65 112 902 253); Gardner Bros Pty Ltd (ABN 63 071 949 178), NRG Electrical (38 155 577 905) and other companies as amended from time to time.

Nicholas Gardner
Managing Director

Appendix L: FKG Evidence of Consultation

Consultation with Council on Management Plans for SSDA

Identified Party to Consult:	Port Macquarie-Hastings Council
Consultation type:	Email, phone calls
When is consultation required?	Prior to the commencement of construction
Why	To discuss any relevant input from Port Macquarie-Hastings Council (PMHC) as specified by SSD-11920082 for consultation and review of Management Plans
When was consultation held	Thursday 16th December 2021 (email FKG) Friday 17th December 2021 (phone FKG) Wednesday 22nd December 2021 (email FKG) Friday 24th December 2021 (email PMHC) Sunday 2nd January 2022 (email FKG) Friday 14th January 2022 (email FKG) Friday 14th January 2022 (email PMHC)
Identify persons and positions who were involved	Josh Pointon - Project Manager - FK Gardner & Sons Pty Ltd Dan Croft - Group Manager Development Services - PMHC Grant Burge - Development Engineering Coordinator – PMHC
Provide the details of the consultation	• Email Thread Attached
What specific matters were discussed?	• Council to review and comment on the Soil & Water Management Plan, Noise and Vibration Management Plan, and the Traffic Management Plan.
What matters were resolved?	Review was undertaken by Council with no issues and noted the documents were comprehensive
What matters are unresolved?	No
Any remaining points of disagreement?	No

Josh Pointon

From: Grant Burge <grant.burge@pmhc.nsw.gov.au>
Sent: Friday, 14 January 2022 2:54 PM
To: Josh Pointon
Cc: Dan Croft
Subject: RE: Hastings Secondary College - Council Consultation - SSDA 11920082

Hi Josh,
The TMP is also acceptable. I note that the works within the road reserve will require a S138 approval prior to being carried out.
Regards,
Grant

Grant Burge
Development Engineering Coordinator
Port Macquarie-Hastings Council

p (02) 6581 8071

From: Dan Croft <Dan.Croft@pmhc.nsw.gov.au>
Sent: Friday, 14 January 2022 2:29 PM
To: Grant Burge <grant.burge@pmhc.nsw.gov.au>
Subject: FW: Hastings Secondary College - Council Consultation - SSDA 11920082

Hi Grant, can you please run your eye over this and let Josh know if suitable and any requirements we may have (apologies for not sending earlier, I missed the reply e-mail). Thanks

Regards

Dan Croft
Group Manager Development Services

Community, Planning and Environment

PORT MACQUARIE HASTINGS COUNCIL

p (02) 6581 8628

m 0439 818 621

From: Josh Pointon <josh.pointon@fkg.com.au>
Sent: Friday, 14 January 2022 1:46 PM
To: Dan Croft <Dan.Croft@pmhc.nsw.gov.au>
Cc: Josh Pointon <josh.pointon@fkg.com.au>
Subject: RE: Hastings Secondary College - Council Consultation - SSDA 11920082

> You don't often get email from josh.pointon@fkg.com.au. Learn why this is important

Hi Dan,

Just following up to see if you have had an opportunity to look at this.

Kind regards,

JOSH POINTON
Project Manager

P 0746 200 500
M 0418 640 888
E josh.pointon@fkg.com.au

Please consider the environment before printing this email

From: Josh Pointon
Sent: Sunday, 2 January 2022 10:05 AM
To: Dan Croft <Dan.Croft@pmhc.nsw.gov.au>
Subject: RE: Hastings Secondary College - Council Consultation - SSDA 11920082

Hi Dan,

Thanks for your quick response to this. I have now attached the Traffic Management Plan.

Let me know if you have any questions.

Kind regards,

From: Dan Croft <Dan.Croft@pmhc.nsw.gov.au>
Sent: Friday, 24 December 2021 10:05 AM
To: Josh Pointon <josh.pointon@fkg.com.au>
Subject: FW: Hastings Secondary College - Council Consultation - SSDA 11920082

> You don't often get email from dan.croft@pmhc.nsw.gov.au. Learn why this is important

EXTERNAL EMAIL: This email was sent from outside the organisation – be cautious, particularly with links and attachments.

Hi Josh

Thanks for your e-mail. I have reviewed the Soil and Water Management Plan and the Construction Noise and Vibration Plan. Both plans are comprehensive and are supported from a Council staff perspective.

I note there was a reference to a traffic management plan in the covering letter however no plan was attached.

Please call if you would like to discuss further.

Regards

Dan Croft
Group Manager Development Services

Community, Planning and Environment

PORT MACQUARIE HASTINGS COUNCIL

p (02) 6581 8628
m 0439 818 621

From: Josh Pointon <josh.pointon@fkg.com.au>
Sent: Wednesday, 22 December 2021 1:37 PM
To: Council <council@pmhc.nsw.gov.au>
Cc: Luke Brazier <luke.brazier@fkg.com.au>; Patrick Elmore <patrick.elmore@fkg.com.au>; Samson Draganic <samson.draganic@fkg.com.au>
Subject: FW: Hastings Secondary College - Council Consultation - SSDA 11920082

Good afternoon,

As per the below and the attached, we wish to engage in consultation to fulfil the requirement of the State Significant Development.

If some could call or respond to my email it would be much appreciated.

Kind regards,
Josh

JOSH POINTON
Project Manager
Construction

P 0746 200 500
M 0418 640 888
E josh.pointon@fkg.com.au

Please consider the environment before printing this email

From: Josh Pointon
Sent: Thursday, 16 December 2021 1:57 PM
To: 'council@pmhc.nsw.gov.au' <council@pmhc.nsw.gov.au>
Cc: Luke Brazier <luke.brazier@fkg.com.au>; Patrick Elmore <patrick.elmore@fkg.com.au>; Samson Draganic <samson.draganic@fkg.com.au>
Subject: Hastings Secondary College - Council Consultation - SSDA 11920082

Good afternoon,

Please find attached Cover letter explaining our need to consult with council for both our Soil & Water Management Plan and our Noise and Vibration plan. Consultation is required to satisfy the conditions of consent for the SSDA 11920082.

If you could please forward onto the appropriate people to review and call me to discuss any items that you would like to review.

Kind regards,
Josh

We acknowledge the Birpai people, the traditional owners of the land in which we work and live, and pay our respects to Elders past, present and emerging. We extend our respect to all Aboriginal and Torres Strait Islander people who choose to call Port Macquarie-Hastings home.

We acknowledge the Birpai people, the traditional owners of the land in which we work and live, and pay our respects to Elders past, present and emerging. We extend our respect to all Aboriginal and Torres Strait Islander people who choose to call Port Macquarie-Hastings home.

DISCLAIMER - This electronic mail message is intended only for the addressee and may contain confidential information. If you are not the addressee, you are notified that any transmission, distribution or photocopying of this email is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of a mistaken delivery to you. The information contained in this email transmission may also be subject to the Government Information (Public Access) Act, 2009.

---

16 December 2021

Port Macquarie Hastings Council
17 Burrawan Street

Port Macquarie NSW 2444

By Email: council@pmhc.nsw.gov.au

To whom it may concern,

Project:	Hastings Secondary College – Upgrade Works
Contractor:	FK Gardner & Sons Pty Ltd
Principal:	School Infrastructure NSW – Dept of Education

Re: Consultation with Council on Management Plans for SSDA

In accordance with the State Significant Development #11920082, FKG as the Contractor is required to consult with council on the following Conditions / Management Plans:

- B15. The Construction Traffic and Pedestrian Management Sub-Plan (CTPMSP)
- B18. Construction Soil and Water Management Sub-Plan (CSWMSP)

I am happy to talk through any concerns or queries you have with these plans, my contact details are below.

Yours sincerely,

JOSH POINTON

Project Manager

P 0746 200 500

M 0418 640 888

E josh.pointon@fkg.com.au

Appendix M: Design certificate for Outdoor Lighting

JHA

ABN 48 612 666 172

Sydney | Brisbane | Melbourne

Level 23, 101 Miller St
North Sydney NSW 2060

PO Box 3
North Sydney NSW 2059
Ph (02) 94371000

12 January 2022

SINSW
c/- FKG
PO BOX 3278
NEWMARKET, QLD, 4051

CERTIFICATE OF DESIGN – ELECTRICAL SERVICES

JOB NO.: 200360
REVISION NO.: [B]

SUBJECT PREMISES: HASTINGS SECONDARY COLLEGE UPGRADE, PORT MACQUARIE CWC 1: CAPA AND NORTH SOUTH LINK

Pursuant to the provisions of Clause A5.2 of the Building Code of Australia, I hereby certify that the above design is in accordance with normal engineering practice, and meets the requirements of the Building Code of Australia and relevant Australian Standards. In particular, the design is in accordance with the following:

- Energy efficiency in compliance with BCA / NCC 2019 Amendment 1. Part J6
- AS3000-2018 Wiring Rules
- AS1680.0 -2009 Interior Lighting – Safe Movement
- AS1680.2.3 -2008 Interior and Workplace Lighting - Specific applications- Educational and training facilities
- AS2293.1 – 2018 Exit Signage and Emergency Lighting
- AS1158.3.1 – 2005 Lighting for roads and public spaces – Pedestrian Area
- AS4282 – 2019 Control of the obtrusive effects of outdoor lighting.

I am an appropriately qualified and competent person in this area and as such can certify that the design complies with the above and which are detailed on the following drawings:

DOCUMENT NUMBER	DRAWING NAME
PMC-JHA-EL-O-1001 [2]	Port Macquarie Campus Site Plan
PMC-JHA-EL-C-1110 [P5]	Port Macquarie Campus Capa - Ground Floor Lighting And Period Bell Layout
PMC-JHA-EL-C-1111 [P2]	Port Macquarie Campus Capa - Level 1 Lighting And Period Bell Layout
PMC-JHA-EL-C-1210 [P5]	Port Macquarie Campus Capa - Ground Floor Power, Communications Layout
PMC-JHA-EL-C-1211 [P5]	Port Macquarie Campus Capa - Level 1 Power, Communications Layout
PMC-JHA-EL-O-1010 [1]	Port Macquarie Campus Schematics And Details Sheet 1
PMC-JHA-EL-O-1160 [P2]	Port Macquarie Campus Nsl Building A-L Ground Floor Lighting And Period Bell Layout
PMC-JHA-EL-O-1161 [P2]	Port Macquarie Campus Nsl Building A-L Roof Level Lighting And Period Bell Layout
PMC-JHA-EL-O-1260 [P2]	Port Macquarie Campus Nsl Building A-L Ground Floor Power, Communications Layout
PMC-JHA-EL-O-1261 [P2]	Port Macquarie Campus Nsl Building A-L Roof Level Power, Communications Layout

I possess Indemnity Insurance to the satisfaction of the building owner or myprincipal.

Full Name of Designer:	Mathew MacIntyre
Qualifications:	Electrical Engineer
Address of Designer:	JHA Level 23, 101 Miller Street, NORTH SYDNEY NSW 2060
Business Telephone No:	(02) 9437 1000
Name of Employer:	JHA

Yours sincerely,

Mathew MacIntyre
Associate

Appendix N: Hazardous Materials Management Plan

Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Hazardous Materials Management Plan

Hastings Secondary College, Port Macquarie Campus
16 Owen Street, Port Macquarie NSW

Prepared for
FKG Group Pty Ltd

Project 206888.00
December 2021

Douglas Partners
Geotechnics | Environment | Groundwater

Document History

Document details

Project No.	206888.00	Document No.	R.001.Rev0
Document title	Hazardous Materials Management Plan Hastings Secondary College, Port Macquarie Campus		
Site address	16 Owen Street, Port Macquarie NSW		
Report prepared for	FKG Group Pty Ltd		
File name	206888.00.R.001.Rev0		

Document status and review

Revision	Prepared by	Reviewed by	Date issued
Revision 0	T.Kulmar	P. Gorman	23 December 2021

Distribution of copies

Revision	Electronic	Paper	Issued to
Revision 0	1	-	Josh Pointon; FKG Group Pty Ltd

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, photographic logs and Register have been checked and reviewed for errors, omissions and inaccuracies.

	Signature	Date
Author		23 December 2021
Reviewer		23 December 2021

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
96 Hermitage Road
West Ryde NSW 2114
PO Box 472
West Ryde NSW 1685
Phone (02) 9809 0666

Table of Contents

Page

1. Introduction 1
1.1 Scope 1
1.2 Purpose 1
2. Terms of Reference 1
3. Implementation 3
4. Site Details 3
4.1 General Description 3
4.2 Proposed Redevelopment 4
4.3 HAZMAT Status 4
4.4 Recommended Investigations 4
5. General Requirements 5
5.1 Appointment of Principal Contractor 5
5.2 Regulatory Compliance 5
5.3 Pre-Tender Site Inspection 6
5.4 Removal Method 6
5.5 Quantities 6
5.6 Notifications 7
5.7 Licences and Permits 7
5.8 Community Consultation 7
5.9 Employee Approval 7
5.10 Conditions of Operation 7
5.11 Security and Access 7
5.12 Identification of Services 8
5.13 Isolations 8
5.14 Contractor Amenities 8
5.15 Hours of Work 9
5.16 Scaffolding and Other Temporary Structures 9
5.17 Program of Work 9
5.18 Lighting 9
5.19 Noise Control 9

5.20 General Dust Control 10
5.21 Odour Control 10
5.22 Vibration Control 10
5.23 Smoking 11
5.24 Electrical Hazards 11
5.25 General Nuisance 11
5.26 Traffic Management 11
5.27 Stockpiles 11
5.28 Rubbish and Recyclables 12
5.29 Roads and Footpaths 12
5.30 Decontamination Facilities 12
5.31 Site Signage and Contract Numbers 13
5.32 Waste Classification and Disposal 13
6. Occupational Health and Safety 14
6.1 General Requirements 14
6.2 Safety Management Plan 14
6.3 Asbestos Removal Control Plan 14
6.4 Safe Work Method Statement 15
6.5 Review 15
6.6 Toolbox Talks 15
6.7 Project Specific WHS Issues 15
7. Inspection and Monitoring 16
7.1 Inspection by the Principal 16
7.2 Clearance Inspections 16
7.3 Air Monitoring 16
7.3.1 Asbestos Monitoring 17
7.3.2 SMF Monitoring 18
7.3.3 Lead Monitoring 18
7.3.4 PCB Monitoring 19
7.4 Material Sampling and Analysis 19
8. General Procedures for HAZMAT Removal 19
8.1 Pre-Work Requirements 19
8.2 Site Establishment 20
8.3 Asbestos Removal 21
8.3.1 General Procedure - Non-Friable Asbestos 21

8.3.2 General Procedure - Vinyl Flooring and Adhesives 23
8.3.3 General Procedure - Electrical Boards 24
8.3.4 General Procedure – Putties 24
8.4 SMF Removal 25
8.4.1 General Procedure 25
8.5 Lead Paint Removal 27
8.5.1 Additional Pre-Work Requirements 27
8.5.2 General Procedure 27
8.6 Lead Flashing Removal 29
8.6.1 General Procedure 29
8.7 PCB Removal 30
8.7.1 General Procedure 30
8.8 Lead Dust Removal 31
8.8.1 General Procedure 31
9. Supervision 32
10. Unexpected Finds 33
11. Limitations 34

Appendix A – About This Report
Site and Building Layout Plans
General Arrangement Plan - Building B Refurbishment Level 1 Plan
Appendix B – B00B - Register and Plates from DP (2020)
Appendix C – B00S - Register and Plates from DP (2020)

Hazardous Materials Management Plan
Hastings Secondary College, Port Macquarie Campus
16 Owen Street, Port Macquarie NSW

1. Introduction

1.1 Scope

Douglas Partners Pty Ltd (DP) was engaged by FKG Group Pty Ltd to develop a Hazardous Materials Management Plan (HMMP) for removal of hazardous building materials (HAZMAT) identified in Building B00S, and Level 1 of Building B00B, at Hastings Secondary College, Port Macquarie Campus, 16 Owen Street, Port Macquarie NSW (the Site).

This HMMP is based on DP's *Report on Hazardous Building Materials (HBM) Survey, Hastings Secondary College - Port Macquarie Campus, 16 Owen Street, Port Macquarie* report ref. 89754.01.R.002.Rev2 Port Macquarie, 21 April 2021 (DP, 2021) and is subject to the scope and limitations thereof.

1.2 Purpose

The purpose of this HMMP is to provide a general, technical work specification that:

- Identifies key regulatory requirements relating to HAZMAT removal; and
- Outlines the general procedures and controls required to minimise the risk of exposure and environmental contamination during HAZMAT removal.

2. Terms of Reference

The following terms of reference are used in this HMMP to identify the entities with primary responsibility for the HAZMAT removal work:

- Principal – the entity who engages the Contractor to conduct the HAZMAT removal work;
- Contractor - the licensed and experienced contractor engaged by the Principal to conduct the HAZMAT removal. The Contractor may be the Principal Contractor pursuant to the NSW Work Health and Safety (WHS) Act and NSW WHS Regulation; and
- Consultant – the licensed and qualified consultant that provides technical advice, monitoring and clearances in relation to the HAZMAT removal work conducted by the Contractor. The Consultant may include a Licensed Asbestos Assessor or Competent Person[1].

[1] A Competent Person is as defined under the WHS Regulation and includes a person who has acquired through training, qualification or experience the knowledge and skills to carry out the task.

Relevant details for the above entities are to be recorded in Table 1 below prior to HAZMAT removal commencing.

Table 1: Terms of Reference

Principal	
Entity Name	
Street Address	
Contact Person	
Phone	
Mobile	
Email	
Contractor	
Company Name	
Street Address	
Contact Person	
Phone	
Mobile	
Consultant	
Company Name	
Street Address	
Contact Person	
Phone	
Mobile	

3. Implementation

This HMMP shall be read and fully understood by the Principal, Contractor and Consultant and any other relevant parties involved in the proposed HAZMAT removal work.

The Contractor should undertake a site walkover with the Principal and Consultant prior to developing any proposal for HAZMAT removal, or undertaking any associated work, at the site. This will provide an opportunity to discuss the HMMP and any alternative removal methods that may offered by the Contractor. This HMMP may then be revised by the Consultant accordingly in consultation with the Principal. The Consultant and Principal are not obligated to accept any alternative removal method(s) that may be offered by the Contractor.

Should the requirements outlined in this HMMP conflict with the requirements of relevant legislation, standards, codes or guidelines then the more stringent requirement shall take precedence.

Any queries regarding implementation or interpretation of this HMMP should be directed to the Principal in the first instance. It is the responsibility of the Principal to respond to such queries and / or to refer queries to DP for clarification as required.

4. Site Details

4.1 General Description

The Site is located on the eastern side of Owen Street, between Burrawan Street and Maritime Lane, in Port Macquarie NSW. It has a secondary street frontage to Burrawan Street and adjoins Oxley Oval along the eastern boundary.

The Site comprises a high school campus containing around thirteen primary buildings plus shade structures, covered walkways and car park areas. The original school buildings are understood to have been constructed circa 1962 with various additional buildings constructed in 1966, 1985, 1998,1999, 1990's and 2000's. DP also understands that some buildings (e.g., B00C, B00T and BTAS) have been demolished since DP (2020) though demolition has not been ground-checked by DP.

Buildings currently remaining at the Site are understood to include:

- Building B00S which comprises a timber structure built circa 1962; and
- Building B00T which comprises a brick / block structure built circa 1962.

The abovementioned construction types and dates are as per the Department of Education (DoE) asbestos register for the school at the time of assessment in DP (2020).

A DoE site plan, and building layout plans for Buildings B00S and Building B00B, are attached in Appendix A for informative purposes.

4.2 Proposed Redevelopment

DP understands that:

- Level 1 of Building B00B is to undergo refurbishment as indicated on the attached *General Arrangement Plan - Building B Refurbishment Level 1 Plan* (General Arrangement Plan) provided by FKG; and
- Building B00S is to be demolished and will not be reinstated.

The General Arrangement Plan may be compared to the corresponding DoE plan for Level 1 of Building B00B in Appendix A. Notwithstanding this, the General Arrangement Plan did not form the basis of DP's scope of work in Building B00B during DP (2020). This HMMP is therefore limited accordingly.

4.3 HAZMAT Status

The current HAZMAT register (DP, 2020) includes a HAZMAT risk profile for Buildings B00B and B00S as summarised in Table 1 below. Copies of the HAZMAT registers for Buildings B00B and B00S contained in DP (2020) are provided in Appendices B and C respectively.

Table 1: Hazardous Building Materials (HAZMAT) Risk Profile

Building / Area	Non-Friable Asbestos	Friable Asbestos	SMF	Lead Paint	Lead Dust	PCB
B00B	✓	×	✓	✓	✓	✓
B00S	✓	×	✓	✓	×	✓

SMF = synthetic mineral fibre, PCB = polychlorinated biphenyls, ✓= identified or suspected present, × = not identified and / or not suspected present. Refer to the Register in Appendix B of DP (2021) for details / clarification.

4.4 Recommended Investigations

DP (2021) comprised a non-destructive, non-intrusive HAZMAT survey whereas a destructive / intrusive HAZMAT survey is warranted and recommended prior to building refurbishment or demolition work once the relevant buildings / areas have been permanently vacated. Such a survey is recommended to help ensure regulatory compliance and that, as far as reasonably practicable, all relevant HAZMAT have been identified.

Prior to building work (such as refurbishment and demolition work) any rooms or areas that were inaccessible during DP (2021) should be further assessed for HAZMAT by a Competent Person. This may be undertaken, for example, as part of a destructive / intrusive HAZMAT survey. Currently inaccessible areas should be taken to include any ceiling cavity in B00S though such cavities are understood to have a limited extent and accessibility due raked ceilings.

5. General Requirements

5.1 Appointment of Principal Contractor

The Principal Contractor shall be appointed pursuant to the NSW Work Health and Safety Act 2011 (WHS Act) and the NSW Work Health and Safety Regulation 2017 (WHS Regulation) (Clause 293).

5.2 Regulatory Compliance

All work shall comply with relevant legislation, standards, codes and guidelines. The regulatory framework that applies includes, but is not necessarily limited to, the following as in force from time to time:

- NSW Work Health and Safety Act 2011 (WHS Act);
- NSW Protection of the Environment Operations Act 1997 (POEO Act);
- NSW Waste Avoidance and Resource Recovery Act 2001 (WARR Act);
- NSW Environmentally Hazardous Chemicals Act 1985 (EHC Act);
- NSW Work Health and Safety Regulation 2017 (WHS Regulation);
- NSW Protection of the Environment Operations (Waste) Regulation 2014;
- NSW Protection of the Environment Operations (General) Regulation 2021;
- NSW Environmentally Hazardous Chemicals Regulation 2017 (EHC Regulation);
- Safe Work NSW *Code of Practice: How to Manage and Control Asbestos in the Workplace*;
- Safe Work NSW *Code of Practice: How to Safely Remove Asbestos*;
- SafeWork NSW *Code of Practice: Demolition Work*;
- National Occupational Health and Safety Commission (NOHSC) *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition* [NOHSC:3003(2005)];
- NOHSC *Guidance Note on the Membrane Filter Method for the Estimation of Airborne Synthetic Mineral Fibres* [NOHSC:3006(1989)];
- NSW EPA Polychlorinated Biphenyl (PCB) Chemical Control Order 1997;
- AS/NZS 4361.1 G*uide to hazardous paint management - Lead and other hazardous metallic pigments in industrial applications*;
- AS/NZS 4361.2 *Guide to hazardous paint management - Lead paint in residential, public and commercial buildings*;
- AS1319 *Safety signs for the occupational environment*;
- AS/NZS 1715 *Selection, use and maintenance of respiratory protective equipment*;
- AS/NZS 1716 *Respiratory protective devices*;
- AS 2601 *The demolition of structures*;

- AS 4260 *High efficiency particulate air (HEPA) filters – Classification, construction and performance*;
- AS/NZS 60335.2.69 *Household and Similar Electrical Appliances – Safety, Part 2.69; Particular requirements for wet and dry vacuum cleaners, including power brush, for commercial use;*
- NSW EPA *Waste Classification Guidelines, Part 1: Classifying Waste*, November 2014 (EPA, 2014);
- Safe Work Australia *Guide to Handling Refractory Ceramic Fibres*, December 2013;
- SafeWork NSW *Safe Management of Synthetic Mineral Fibres (SMF) – Glasswool and Rockwool* (information guide);
- WorkCover NSW *Code of Practice for the Safe Use of Synthetic Mineral Fibres*, 1993; and
- ANZECC *Polychlorinated Biphenyls Management Plan*, Revised Edition, April 2003.

In the case of conflict between this HMMP and any legislation, standard, code or guideline the more stringent requirement shall apply.

5.3 Pre-Tender Site Inspection

A pre-tender site inspection should be undertaken by the Contractor. The Contractor shall supply their own personal protective equipment (PPE) to inspect the site and dispose of any used PPE in an appropriate manner. The Contractor shall ensure that the site inspection does not result in exposure or environmental contamination.

5.4 Removal Method

The method used for HAZMAT removal shall at all times comply with this HMMP, the requirements of relevant legislation, standards, codes and guidelines (including those listed in Section 5.3) and the requirements of the relevant regulator(s) and authorities including SafeWork NSW.

5.5 Quantities

The Contractor shall inspect the site and satisfy themselves as to the nature and extent of the works, levels, quantities, dimensions, access etc. and will assume responsibility for same.

The Contractor is responsible for determining the quantities of HAZMAT that are to be removed. Any quantities and dimensions provided in this HMMP or DP (2020) are to be taken as a guide only and should not be relied upon.

5.6 Notifications

The Contractor shall make all necessary notifications required by the relevant authorities and legislation to undertake the HAZMAT removal work. This includes notifying SafeWork NSW of licensed asbestos removal work. The Contractor shall bear all costs associated with making these notifications and shall supply a copy of each notification to the Principal.

5.7 Licences and Permits

The Contractor shall obtain all necessary licences, permits and the like that are required by the relevant authorities and legislation to undertake the HAZMAT removal work. The Contractor shall bear all costs associated with obtaining and maintaining these licences and permits and shall supply a copy of each licence and permit to the Principal.

5.8 Community Consultation

The Contractor must ensure that appropriate community consultation is undertaken at all stages of the work, and that all relevant parties (including owners, controllers and occupants of neighbouring properties) are adequately notified of the HAZMAT removal works.

5.9 Employee Approval

The Principal has the right to review the licenses, training and experience records of all employees and subcontractors of the Contractor working in the HAZMAT removal area. The Contractor will supply these records to the Principal upon request.

Employees not approved by the Principal are not to be employed in HAZMAT removal, however they may be permitted to work on site as determined by the Principal.

5.10 Conditions of Operation

The Contractor shall comply with all the requirements of the relevant authorities, the Consultant and the Principal. The Contractor will not deviate from the procedures outlined in this HMMP, or make any decisions outside the scope of works described, without the written consent of the Consultant and Principal.

5.11 Security and Access

The Contractor shall be responsible for arranging and providing its own security control over the works and any materials, plant, equipment, tools etc. stored on the site.

The Contractor will provide relevant stakeholders with access to the site in accordance with legislation and the terms and conditions of their contract with the Principal.

The Contractor shall provide the Consultant with access to the areas under the Contractor's control for the purposes of conducting the Consultant's work in a timely and efficient manner.

The Contractor is responsible for obtaining access to the HAZMAT for the purposes of safe and complete removal. Any diagrams or drawings provided in this HMMP or DP (2020) are to be taken as a guide only and should not be relied upon.

Nothing in this clause shall relieve the Contractor of their responsibility for the care and execution of the works.

5.12 Identification of Services

The Contractor must take all actions required to satisfy themselves of the presence, location and type of relevant services, including all underground services, present at the site so as to ensure that relevant services are not disturbed or damaged during the works. The Contractor will be responsible for any damage to services arising from the activities of the Contractor or their subcontractor(s).

Any undue or preventable damage caused by the Contractor (or their subcontractors), shall be made good at the Contractor's expense to the satisfaction of the Principal.

Any undue and preventable damage caused by the Contractor, which is not rectified to the satisfaction of the Principal, will be rectified by the Principal and the associated costs deducted from the contract sum.

5.13 Isolations

The Contractor shall provide all isolations required to conduct the HAZMAT removal works in a safe and effective manner. This includes (but is not limited to) electrical, gas and water plant and services, fire alarm and control systems, security systems, data cabling as well as heating, ventilation and air conditioning plant and systems. All isolations are to be made by suitably licenced and experienced personnel in accordance with relevant legislation and standards including the WHS Act and Regulation.

5.14 Contractor Amenities

The Contractor shall provide all required amenities including lunch, toilet and change room facilities.

Amenities such as toilet, change areas and lunchroom facilities at the site may be made available subject to approval by the Principal.

5.15 Hours of Work

The hours of work are to comply with the development conditions of the local council authority and relevant legislation. All work, including movement of materials and equipment in and out of the site, shall be undertaken during compliant hours of work.

5.16 Scaffolding and Other Temporary Structures

The Contractor shall provide all scaffolding or other temporary structures required to complete HAZMAT removal in a safe manner. All scaffolding and temporary structures shall comply with the requirements of the relevant authority and legislation including those outlined in the WHS Regulation 2017.

5.17 Program of Work

The Contractor's Program of Work must be approved by the Principal. Following approval, the Principal will give the Contractor complete access to the site on the agreed commencement date.

5.18 Lighting

The Contractor must provide sufficient task lighting for the duration of the project. The Contractor shall ensure that sufficient lighting is provided to enable safe access, transit and egress at all relevant times.

5.19 Noise Control

The Contractor shall ensure compliance with legislated noise levels and the noise requirements of the local council authority. This includes ensuring that "offensive noise" as defined under the NSW Protection of the Environment Operations Act, 1997 is not created.

The Contractor shall also ensure that noise resulting from work is either eliminated or minimised to the extent that is reasonably practicable. In particular, all mechanical plant, equipment and the like used shall be fitted with all practical and reasonable noise attenuating devices and measures to minimise noise being transmitted from the site and shall be operated in an efficient manner, and be adequately maintained, to minimise the emission of noise.

Noisy work shall be planned and executed by the Contractor to incorporate adequate periods of respite where necessary.

The Contractor shall ensure that none of their employees or sub-contractors:

- Operate loud radios on or about the premises;
- Use language that may be offensive or excessively loud; and
- Bring pets of any kind (e.g. dogs etc.) onto the grounds.

5.20 General Dust Control

The Contractor must ensure that dust emissions are eliminated or, if elimination is not reasonably practicable, minimised to the extent reasonably practicable. This is to include the following as necessary:

- Use of dust suppressors on all relevant tools / equipment;
- Erection of dust screens around the perimeter of the site;
- Securely covering all loads entering or exiting the site;
- Use of water mist / spray to suppress dust;
- Minimising stockpile height;
- Covering stockpiles remaining in place more than 24 hours; and
- Keeping excavation and other relevant surfaces damp.

The Contractor shall ensure that:

- Vehicles do not track soil, mud or sediment onto any road outside the work site;
- Vehicle access to the site is stabilised to prevent the tracking of sediment onto the roads and footpath;
- Soil, earth, mud and similar materials are removed from roadways that adjoin the work site by sweeping, shovelling, or a means other than washing, on a daily basis or as required; and
- All loads are securely covered to prevent any dust or odour emissions during transportation.

5.21 Odour Control

The Contractor shall ensure compliance with the requirements of the local council authority. This includes ensuring that "offensive odour" as defined under the NSW Protection of the Environment Operations Act, 1997 is not created.

The Contractor shall also ensure that odour resulting from work is either eliminated or minimised to the extent that is reasonably practicable.

5.22 Vibration Control

The Contractor must ensure that vibration emissions during the work do not result in damage to any property or result in an unreasonable loss of amenity to nearby residents. The relevant provisions of the Protection of the Environment Operations Act, 1997 must be satisfied at all times.

5.23 Smoking

The Contractor will identify and/or install designed smoking areas as required. The location of the designated smoking areas must ensure safe work at the site and avoid any impact on surrounding properties.

5.24 Electrical Hazards

The Contractor is responsible for ensuring that all of their electrical equipment is tested, tagged and labelled in accordance with legislative requirements and Australian Standards and fitted with a Residual Current Device (RCD) where necessary.

5.25 General Nuisance

The Contractor will take all necessary precautions to prevent general nuisance from smoke, dust, rubbish and other causes.

5.26 Traffic Management

The Contractor must develop a Traffic Management Plan for the works and ensure that suitable traffic management is in place at all times for the duration of the works. This includes at the site entrance / exit points where heavy vehicles merge with local traffic.

All haulage routes for trucks transporting soil, materials, equipment or machinery to and from the site shall be selected to meet the following objectives:

- Compliance with all road traffic rules;
- Minimise disruption to the normal flow of traffic;
- Minimise noise, vibration and odour to adjacent premises;
- Must utilise State Roads and minimise use of local roads; and
- Vehicles to enter and exit the site in a forward direction.

5.27 Stockpiles

The Contractor must ensure that:

- No stockpiles are placed on footpaths or nature strips unless prior Council approval has been obtained;
- All stockpiles are placed away from drainage lines, gutters and stormwater pits or inlets;
- All stockpiles likely to generate dust or odours are suitably covered;

- All stockpiles of contaminated soil / fill are stored in a secure area and covered if remaining more than 24 hours and stockpile footprints are validated by the Consultant upon stockpile removal;
- All stockpiles must be placed on a level area as a low, elongated mound;
- Stockpiles are bunded as necessary to capture sediment in water runoff; and
- HAZMAT are not stockpiled but are packaged appropriately and placed in skip bins, trucks or other suitable receptacle for removal and disposal as soon as reasonably practicable.

5.28 Rubbish and Recyclables

The Contractor shall supply and install appropriate receptacles for the collection of general rubbish and recyclable materials generated during the work.

The Contractor shall remove general rubbish and recyclable materials on a regular basis and as necessary to ensure a clean and tidy work site and avoid any associated risk to health, safety and the environment.

5.29 Roads and Footpaths

The Contractor shall ensure that no damage beyond fair wear and tear is caused to roads and footpaths. Any damage caused by the Contractor beyond fair wear and tear will be rectified by the Principal and the associated costs deducted from the contract sum.

The Contractor will adequately maintain approaches to the site and keep these areas clear of mud and debris.

5.30 Decontamination Facilities

The Contractor shall supply appropriate decontamination facilities for all personnel, plant and equipment for the duration of the HAZMAT removal work and clearance process. The decontamination facilities will comply with the requirements of all relevant legislation, codes or practice, standards and guidelines.

All personnel will be required to use the decontamination facility for access to and egress from the HAZMAT removal area.

All wastewater generated by decontamination shall be presumed “contaminated” and shall be classified and disposed of in accordance with the NSW EPA Waste Classification Guidelines, Part 1: Classifying Waste, November 2014.

Personnel must not smoke, eat or drink in any part of the decontamination facilities or within the designated HAZMAT removal area.

The decontamination facilities shall be cleaned daily by personnel equipped with the appropriate PPE.

The decontamination facility will be deconstructed and the area remediated by the Contractor, and validated / cleared by the Consultant, at the completion of the HAZMAT works.

5.31 Site Signage and Contract Numbers

The Contractor is to ensure a sign displaying their contact details (including for outside working hours) is prominently displayed at site entrance(s) for the duration of the works.

5.32 Waste Classification and Disposal

All waste should be classified for disposal in accordance with relevant legislation and EPA (2014). All waste must be disposed at a waste collection facility that is licensed to receive the waste. All disposal receipts should be retained.

Asbestos waste is preclassified as Special Waste under EPA (2014) and shall be treated accordingly. Asbestos transporters and facilities receiving asbestos waste must report the movement of asbestos waste to the EPA. Entities involved with the transport or disposal of asbestos waste in NSW, or arranging the transport of asbestos waste in NSW, must use the EPA's online tool, WasteLocate.

Based on previous correspondence with the NSW EPA DP understands that EPA (2014) does not consider AS4361.1 or AS4361.2, including the definitions of lead / hazardous paints therein, for waste classification assessment. As such:

- These standards have no bearing on how waste is classified in NSW; and
- Waste classification of paints and other wastes containing lead should be carefully considered and an appropriate degree of liaison with the NSW EPA may be required to help ensure correct waste classification.

6. Occupational Health and Safety

6.1 General Requirements

The Contractor shall conduct the work in a safe manner and in accordance with the requirements of the WHS Act, the WHS Regulation and all relevant codes of practice, standards and guidelines.

All personnel required to work on the site must have completed a site-specific safety induction and must provide certification that they have completed a SafeWork NSW approved WHS induction for work in the construction industry (i.e. white card).

The Contractor shall promptly advise the Principal of:

- Any 'near-hit';
- All accidents involving death, personal injury or loss of time; and
- All incidents with accident potential such as equipment failure.

In addition to the above, the Contractor shall give such information as may be required by the Principal, if it is requested, and furnish a written report in the form directed.

The Contractor shall not at any time leave any work in an unsafe condition or in a condition which might cause damage to other existing work, plant, machinery or equipment, but shall continue that work until it is at a safe state.

The Contractor shall take every precaution to ensure the safety and protection at all times of all persons on or about the site, including all personnel employed on the work(s), personnel at adjacent sites and the general public, and to this end shall provide and maintain all facilities both necessary and proper to comply with the safety rules and regulations of any body or authority that have jurisdiction thereto.

6.2 Safety Management Plan

The Contractor must develop a project specific Safety Management Plan (SMP) for work and provide a copy of the SMP to the Principal. The SMP must comply with the NSW WHS Act 2011 and WHS Regulation 2017.

The Principal shall review the SMP and provide feedback to the Contractor. The Contractor shall update the SMP in accordance with the Principal's feedback, to the satisfaction of the Principal, prior to the Contractor commencing work at the site.

6.3 Asbestos Removal Control Plan

The Contractor must develop a project specific Asbestos Removal Control Plan (ARCP) for licensed asbestos removal work and provide a copy of the ARCP to the Principal. The ARCP must comply with the WHS Regulation and the SafeWork NSW *Code of Practice: How to Safely Remove Asbestos*.

The Principal shall review the ARCP and provide feedback to the Contractor. The Contractor shall update the ARCP in accordance with the Principal's feedback, to the satisfaction of the Principal, prior to the Contractor commencing work at the site.

6.4 Safe Work Method Statement

The Contractor must provide a Safe Work Method Statement (SWMS) to the Principal for each work activity the Contractor and their subcontractor(s) will conduct at the site.

The Principal shall review the SWMS and provide feedback to the Contractor. The Contractor shall update the SWMS in accordance with the Principal's feedback, to the satisfaction of the Principal, prior to the Contractor commencing work at the site.

All personnel conducting work at the site shall be inducted into, and sign, the relevant SWMS's before commencing work at the site.

6.5 Review

The Contractor shall maintain, review and update the SMP, ARCP and SWMS as required by the WHS Act and WHS Regulation. All updates shall be notified to the Principal and a copy of each update shall be provided to the Principal.

6.6 Toolbox Talks

The Contractor will conduct and maintain a record of daily toolbox talks undertaken throughout the project. The Contractor and their subcontractors will be required to attend the toolbox talks and all personnel in attendance shall sign the relevant attendance record(s).

6.7 Project Specific WHS Issues

The following WHS issues have been identified as potentially significant to the works:

- Exposure to HAZMAT (e.g. asbestos, lead, SMF and PCB);
- Mobile plant / vehicles (risk of personnel being hit / struck and general traffic management);
- Unauthorised site access;
- Uncontrolled building collapse;
- Work at heights;
- Manual handling;
- Noise and vibration;
- Dust;

- Energised services; and
- Slips / trips / falls.

The Contractor shall address the abovementioned issues, and any other relevant issues, in their SMP, ARCP and SWMS and shall implement suitable controls to manage pertinent risks at all times during the work.

The Contractor shall not take the above list as an exhaustive or definitive list of all relevant WHS issues that may apply to the work.

7. Inspection and Monitoring

7.1 Inspection by the Principal

The Principal and their nominated officers shall have the authority to enter the site and work areas at any time to inspect and check on the progress of the works. This may be performed at any time without notice to the Contractor. The Contractor shall provide access for such inspections in a timely manner subject to WHS requirements.

7.2 Clearance Inspections

The Contractor is to engage the Consultant to conduct clearance inspection(s) following completion of HAZMAT removal work and prior to normal re-occupation of these areas. The clearance inspection(s) must be performed by a suitably qualified and appropriately licenced Consultant who is independent of the Contractor.

Once the Contractor has completed demobilisation the Principal should arrange a final clearance inspection by the Consultant.

The Contractor is to be present during all clearance inspection(s) for the purposes of providing the Consultant with adequate safe access and immediately rectifying any minor issues identified by Consultant during the clearance inspection.

7.3 Air Monitoring

The Principal (or Contractor) is to engage the Consultant to conduct air monitoring in accordance with the requirements of the WHS Regulation and subordinate codes of practice and standards. Air monitoring programs may include:

- Background monitoring prior to HAZMAT removal work (to establish a baseline for comparison of future results);
- Control monitoring during HAZMAT removal work to assess the adequacy of the control measures in preventing environmental contamination and human exposure; and

- Clearance monitoring at the completion of HAZMAT removal work to assess the adequacy of the removal works undertaken and suitability of the removal area for re-occupation.

Air monitoring must also be carried out to determine the airborne concentration of a substance or mixture at the workplace to which an exposure standard applies if:

- It is not certain on reasonable grounds whether or not the airborne concentration of the substance or mixture at the workplace exceeds the relevant exposure standard, or
- Monitoring is necessary to determine whether there is a risk to health.

The air monitoring program (including type, frequency and duration of air monitoring) is to be determined by the Consultant in consultation with the Principal and Contractor.

7.3.1 Asbestos Monitoring

Asbestos monitoring is mandatory for friable asbestos removal and is recommended for the purposes of non-friable asbestos removal due to the sensitive nature of the site. Air monitoring for non-friable asbestos removal may also be a requirement of the NSW Department of Education Asbestos Management Plan applicable to NSW schools.

All asbestos monitoring shall be in accordance with the NOHSC *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres, 2nd Edition* [NOHSC:3003(2005)] and the SafeWork NSW *Code of Practice: How to Safely Remove Asbestos*. Samples are to be collected by the Consultant and analysed by a National Association of Testing Authorities (NATA) accredited laboratory that holds NATA accreditation for the relevant test methods.

The action levels specified in the SafeWork NSW *Code of Practice: How to Safely Remove Asbestos* will be applied to the airborne asbestos monitoring results obtained. These action levels are summarised in Table 2 below.

Table 3: Action Levels for Airborne Asbestos Monitoring

Action Level	Control	Action
< 0.01 f/mL	No new control measures necessary	Continue with control measures.
≥0.01 and ≤ 0.02 f/mL	Review	Review control measures.
	Investigate	Investigate the cause.
	Implement	Implement controls to eliminate or minimise exposure and prevent further release.
> 0.02 f/mL	Stop asbestos removal work	Stop asbestos removal work.
	Notify regulator (SafeWork NSW).	Notify the regulator (SafeWork NSW) by phone followed by written statement that work has ceased and the results of the air monitoring.
	Investigate the cause.	Conduct a thorough visual inspection of the asbestos removal enclosure and associated work site and equipment in consultation with all workers involved with the removal work.
	Implement controls to eliminate or minimise exposure and prevent further release.	Extend the isolated / barricaded area around the removal area as far as reasonably practicable until fibre levels are at or below 0.01 fibres/ml. Decontaminate relevant surrounding areas by vacuuming and wet wiping and seal any identified leaks in the enclosure. Smoke test the enclosure until it is satisfactorily sealed. Update site practices and procedures based on findings of investigation (refer preceding point).
	Do not recommence removal until further monitoring is conducted.	Do not recommence until fibre levels are at or below 0.01 fibres/ml.

7.3.2 SMF Monitoring

The Consultant shall determine the requirements, if any, for SMF monitoring in consultation with the Principal and the Contractor. Such monitoring may be required where reasonable concern exists over airborne SMF concentrations. Where SMF monitoring is determined to be necessary by the Consultant monitoring shall be conducted in accordance with the *Guidance Note on the Membrane Filter Method for the Estimation of Airborne Synthetic Mineral Fibres,* [NOHSC:3006(1989)]. Samples are to be collected by the Consultant and analysed by a NATA accredited laboratory that holds NATA accreditation for the relevant test method(s). Monitoring assessment criteria are to be determined by the Consultant.

7.3.3 Lead Monitoring

The Consultant shall determine the requirement, if any, for airborne lead monitoring in consultation with the Principal and the Contractor. Such monitoring may be required where reasonable concern exists over airborne lead concentrations, cross-contamination and / or for the purposes of lead clearance activities.

Airborne lead monitoring shall be undertaken in accordance with AS 3640-2009 *Workplace atmospheres - Method for sampling and gravimetric determination of inhalable dust* or other applicable method determined by the Consultant. Samples are to be collected by the Consultant and analysed by a NATA accredited laboratory that holds NATA accreditation for the relevant test methods. Monitoring assessment criteria are to be determined by the Consultant.

7.3.4 PCB Monitoring

The Consultant shall determine the requirement, if any, for airborne PCB monitoring in consultation with the Principal and the Contractor. PCB's do not vaporise readily at room temperature and therefore air monitoring for PCB's is generally not expected to be required. Monitoring may only become necessary in some specific, higher risk situations, such as when PCB may leak onto a hot surface in a confined space. The Consultant will determine the methods of PCB monitoring and associated sample analysis and the relevant assessment criteria.

7.4 Material Sampling and Analysis

Materials (e.g. settled dust, soil / fill, paints, fibre cement fragments etc.) may undergo field testing and / or be sampled and analysed by the Consultant for the purposes of assessing the adequacy of controls used during the HAZMAT removal works or for clearance purposes after HAZMAT removal. The Consultant will determine the field testing, sampling and analysis requirements. All samples will be analysed by a NATA accredited laboratory that holds NATA accreditation for the relevant test methods (where such accreditation exists).

8. General Procedures for HAZMAT Removal

8.1 Pre-Work Requirements

The Contractor must make all relevant notifications, and obtain all relevant permits, for the work prior to the commencement of the work. A copy of the notification(s) and permit(s) is to be provided to the Principal and also displayed in a prominent position at the site during the work.

All personnel employed by the Contractor are to be competent to undertake their assigned tasks and adequately inducted, trained, experienced and licenced in accordance with the requirements of the WHS Regulation and SafeWork NSW.

The Contractor is to be suitably qualified, experienced and licenced to conduct the work in accordance with the requirements of the WHS Regulation and SafeWork NSW.

In the case of asbestos removal / abatement the Contractor must hold:

- A Class A (friable) asbestos removal license for any friable asbestos removal work; and
- Either a Class A (friable) or Class B (non-friable) asbestos removal licence for non-friable asbestos removal work.

An appropriate trained and experienced supervisor is to be appointed by the Contractor for the work.

In the case of lead abatement / removal work, the Contractor must specifically ensure compliance is maintained with the WHS Regulation, Part 7.2 Lead and AS 4361.1 / AS 4361.2 where applicable. This requires determining whether the specific work processes to be adopted comprise a “lead process” or “lead risk work” as defined in the WHS Regulation, and adopting the applicable controls.

All waste should be assessed and classified for disposal in accordance with relevant legislation and subordinate instruments including NSW EPA (2014).

The Principal and Contractor are to ensure that an appropriate level of consultation has been conducted with relevant stakeholders and that relevant areas surrounding the asbestos removal area and associated work site, have been adequately vacated (if necessary) for the duration of the asbestos removal work.

8.2 Site Establishment

The Contractor shall:

- Ensure access is adequately restricted to the site and the HAZMAT removal area;
- Install appropriate warning signage;
- Install compliant decontamination facilities for personnel and equipment / plant;
  - In the case of asbestos removal work, decontamination facilities must comply with the WHS Regulation and SafeWork NSW *Code of Practice: How to Safely Remove Asbestos*;
  - In the case of SMF removal, decontamination facilities are to include general hand washing and facilities to wash and treat both skin and eye irritation;
- In the case of any other work that require enclosure, install an appropriate enclosure;
- Ensure all vents, windows, doors and any other openings / penetrations that might otherwise permit dispersal of contamination are sealed safely; and
- Ensure all relevant isolations have been made;
- Carry out the work with as few people present as possible. Ensure any non-essential personnel are excluded from the HAZMAT removal area;
- Ensure there is adequate safe access and lighting to conduct the work; and
- Ensure all portable electrical tools and equipment comply with AS / NZS 3012 *Electrical Installations – Construction and demolition sites*.

8.3 Asbestos Removal

8.3.1 General Procedure - Non-Friable Asbestos

The procedure below outlines the general approach to removal of non-friable asbestos. This procedure is provided as general guidance only. Reference should be made to the WHS Act, WHS Regulation and the SafeWork NSW Codes of Practice pertaining to asbestos (refer Section 5.2) for a more comprehensive guide to the requirements that apply to asbestos removal.

The Contractor shall ensure:

- Personnel involved in the removal of the asbestos wear, as a minimum, a P1 or P2 disposable facepiece respirator or a half-face cartridge-type respirator fitted with Class P1, P2 or P3 particulate filters, disposable coveralls, boot covers and appropriate gloves:
  - Disposable coveralls are to be rated type 5, category 3 (prEN ISO 13982–1) or equivalent and disposable boot covers are to be made of the same material;
  - Gumboots may be used as an alternative to boot covers if required but must only be worn in the asbestos removal area unless fully decontaminated using the decontamination unit / facilities provided; and
  - PPE complies with relevant Australian Standards including AS/NZS 1716 *Respiratory protective devices*.
- The Consultant undertakes air monitoring at the boundary of the asbestos removal area as required by Section 7.3;
- 200 micron thick polythene sheeting is installed below and around the asbestos material as necessary protect all relevant surfaces from cross-contamination and adequately contain any dust and debris generated. In certain specific cases, such as the removal of asbestos cement fragments from ground surfaces, installation of polythene sheeting may not be required;
- The asbestos materials are wet down with a fine water mist or PVA solution prior to removal. The use of high-pressure water spray and compressed air on asbestos or ACM is specifically prohibited under the WHS Regulation;
- The asbestos cement materials are removed as whole components and, if tools are required, these comprise non-powered hand tools that minimise disturbance of the asbestos;
- Tools and equipment that cause the release of asbestos, including power tools and brooms, are only used on asbestos if the equipment is enclosed and/or designed to capture or suppress asbestos fibres and/or the equipment is used in a way that is designed to capture or suppress asbestos fibres safely. In such a case, other controls including PPE may also be required based upon the results of a pre-work risk assessment and the SWMS adopted;
- Wetting down of all asbestos materials is maintained throughout the removal process with care taken to avoid generating uncontrolled runoff and slip hazards;
- Upon removal, the asbestos materials are double sealed in 200 micron thick asbestos waste bags or polythene sheeting for disposal. Waste bags should be filled no more than half full. Sealing should be achieved using heavy duty adhesive tape;

- At completion of bulk asbestos removal all surfaces in the asbestos work area are thoroughly decontaminated by vacuum to remove residual dust / debris. Wet-wiping techniques shall also be used to wipe clean non-porous surfaces:
  - Asbestos vacuum cleaners should comply with the Class H requirements in AS/NZS 60335.2.69.2017: *Household and similar electrical appliances – Safety: Particular requirements for wet and dry vacuum cleaners, including power brush, for commercial use*;
  - Filters for asbestos vacuum cleaners should conform to the requirements of AS4260-1997 *High Efficiency Particulate Air Filters (HEPA) – Classification, Construction and Performance* or its equivalent. Household vacuum cleaners must never be used where asbestos is or may be present, even if they have a HEPA filter;
  - Rags used in wet-wiping should only be used once, although they may be refolded to expose a clean surface. The rags should be used flat and should not be wadded. If a bucket of water is used, the rags should not be re-wetted in the bucket as this will contaminate the water. If the water is contaminated, it must be treated as asbestos waste; and
  - All vacuum bags, HEPA filters and rags used for wet-wiping are to be disposed of as asbestos waste;
- At the completion of asbestos removal all used PPE is double bagged in 200 micron thick asbestos waste bags for disposal. The asbestos waste bags are filled no more than half full and sealed using heavy duty adhesive tape;
- Asbestos waste is placed carefully into waste skips and/or trucks in a manner that minimises the risk of generating airborne dust. Asbestos is not to be dropped into skips/trucks;
- The skips/trucks receiving asbestos waste are double lined with 200 µm thick polythene sheeting and the asbestos waste sealed inside (e.g. with heavy duty adhesive tape);
- Trucks receiving asbestos waste are fitted with automatic retractable covers to cover the sealed load during transport;
- Truck drivers remain in a safe location during loading activities (e.g. outside the designated asbestos removal area). If truck drivers must remain within their cabin during loading then all windows must be wound up and air conditioning placed on re-cycle;
- If at any point during the work significant visible airborne dust is generated then work ceases and does not recommence until appropriate controls have been implemented to prevent recurrence;
- Transport and final disposal of asbestos waste material is carried out by the Contractor in a manner that prevents the liberation of asbestos dust into the atmosphere. Vehicles licensed for the transportation of asbestos waste shall only be used;
- All asbestos is disposed at a legally approved and licensed waste disposal facility;
- Copies of all tipping dockets are provided to the Principal;
- The asbestos removal area undergoes a clearance inspection conducted by a Competent Person who is independent from the Contractor to ensure asbestos materials have been removed to a satisfactory standard. The Competent Person should be accompanied by the Contractor at all times during clearance inspection in order to undertake any minor rectification work that may be required prior to clearance being issued;
- After a successful clearance inspection, all relevant surfaces within the asbestos work area are sprayed with PVA solution or similar binding agent;

- Air clearance monitoring is carried out inside the asbestos work area following successful completion of the visual inspection and drying of PVA;
- Upon receipt of the final air monitoring clearance results of <0.01 fibres/mL, a final clearance report is issued; and
- Upon receipt of the final clearance report normal re-occupation of the asbestos removal area can occur.

8.3.2 General Procedure - Vinyl Flooring and Adhesives

In addition to the general requirements for removal of non-friable asbestos above, the Contractor shall ensure that vinyl flooring materials and adhesives are removed as follows:

- A suitable tool (such as a scraper or wide blade) is placed between the tiles to lift the tile away from the floor, being careful to minimise breakage. A hammer or mallet can be used to tap the tool under firmly-adhered tiles to assist separating the tiles from the floor;
- Vinyl can be cut into strips prior to its removal to facilitate bagging, or it can be rolled into one roll and wrapped securely with plastic, making sure it is totally sealed;
- Dust is minimised by spraying fine water mist under tiles as they are lifted;
- A scraper is used to remove any adhesive that is left adhered to the floor after each tile has been removed and such adhesive is placed into the asbestos waste bags;
- If a heat source is used to soften the adhesive beneath a vinyl tile, care should be taken not to scorch or burn the tile. Burning or scorching vinyl tiles can result in the release of toxic decomposition products and generate a fire hazard. In some cases, the adhesive may contain asbestos;
- Tools and equipment that cause the release of asbestos are only used on asbestos if the equipment is enclosed and/or designed to capture or suppress asbestos fibres and/or the equipment is used in a way that is designed to capture or suppress asbestos fibres safely. In such a case, other controls including PPE may also be required based upon the results of a pre-work risk assessment and the SWMS adopted;
- Tiles and associated waste, including residual adhesive, are placed carefully into a 200 µm plastic waste bag or other suitable alternate waste container that is clearly labelled as asbestos waste; and
- Collect all debris, dispose of waste and conduct clearance according to the procedures described in Section 8.3.1.

Note that any asbestos millboard lining that may be discovered beneath vinyl sheeting or other floor coverings is considered friable asbestos and removal requires additional controls as outlined in the SafeWork NSW *Code of Practice: How to Safely Remove Asbestos*.

8.3.3 General Procedure - Electrical Boards

In addition to the general requirements for removal of non-friable asbestos above, the Contractor must ensure that adequate controls are implemented to address electrical risks including the risk of electrocution. Control may include:

- De-energising and removing electrical equipment from the asbestos removal work area. If the electrical equipment cannot be disconnected and removed it must be de-energised. The de-energised equipment is to be secured so it cannot be inadvertently re-energised;
- Labelling any electrical cabling or equipment remaining in the asbestos removal area and protecting it from mechanical damage and the ingress of water in accordance with AS/NZ 3000:2018: *Electrical installations (known as the Australian/New Zealand Wiring Rules)*;
- Ensuring a licensed electrician safely removes and reinstalls electrical cables and equipment.

8.3.4 General Procedure – Putties

Window sets that include asbestos-containing glazing putties should generally be removed and disposed as whole components where reasonably practicable to do so. This is due to the time and effort required to conduct and certify adequate removal of such putties and subject to any necessary cost / benefit analysis that may be required. Removal of the window sets as whole components should be undertaken in accordance with the general requirements for removal of non-friable asbestos outlined in Section 8.3.1.

Asbestos-containing putties were identified in expansion gaps in brick walls, and between window frames and sills, in Building B00B as indicated in the Register (refer Appendix B). These putties should be taken to potentially occur throughout Building B in general per DP (2021). The general procedure for removal of these putties may be influenced by the extent and nature of the proposed building work and the extent of putties which may be located in both accessible and inaccessible areas. As a precaution, and prior to any building work, consideration should be given to further assessing the extent of asbestos containing putties in the area(s) of proposed building work. Such assessment should be conducted by the Consultant in consultation with the Principal and Contractor.

Subject to the results of any further assessment by the Consultant it is envisaged that removal of putties, if required, may be undertaken in accordance with the general requirements for removal of non-friable asbestos outlined in Section 8.3.1 and the following considerations:

- Putty softening techniques, such as application of solvents or warming, may be used to improve removal efficiency. The effectiveness of such techniques should be trialled prior to extensive removal work however to confirm their suitability;
- Putties should preferably be gently scraped off the relevant substrate(s) with non-motorised hand tools where reasonably practicable to do so;
- Tools and equipment that cause the release of asbestos, including power tools, are only used on the putty if the equipment is enclosed and/or designed to capture or suppress asbestos fibres and/or the equipment is used in a way that is designed to capture or suppress asbestos fibres safely. In such a case, other controls including PPE may also be required based upon the results of a pre-work risk assessment and the SWMS adopted;
- Any removed sections of building substrate with adhered putty may be disposed wholly as asbestos waste to avoid the need for removal of the putty from the substrate. Care must be taken however

to ensure that disturbance of the putty is adequately minimised during removal of the building components; and

- Dampening of the putty and 'shadow vacuuming' should be considered, particularly if power tools are required for the removal, in order to avoid generating airborne dust.

8.4 SMF Removal

8.4.1 General Procedure

The procedure below outlines the general approach to SMF removal. This procedure is provided as general guidance only. Reference should be made to the WHS Act, WHS Regulation and other relevant documents listed in Section 5.2 for further details on the requirements that apply to SMF removal.

The Contractor shall ensure that:

- Personnel involved in the removal of the SMF wear, as a minimum, a P1 or P2 disposable facepiece respirator, disposable coveralls, goggles and gloves:
  - Disposable coveralls are to be rated type 5, category 3 (prEN ISO 13982–1) or equivalent and disposable boot covers are to be made of the same material;
  - Gumboots may be used as an alternative to boot covers if required but must only be worn in the SMF removal area unless adequately decontaminated using the decontamination unit/facilities provided;
  - PPE complies with relevant Australian Standards including AS/NZS 1716 Respiratory protective devices.
- The Consultant undertakes air monitoring at the boundary of the SMF removal area as required by Section 7.3;
- 200 micron thick polythene sheeting is installed below and around the SMF material as necessary to protect all relevant surfaces from cross-contamination and adequately contain any dust and debris generated;
- The SMF materials are removed manually in a manner that minimises disturbance of the SMF. Physical abrasion, including cutting, should be kept to a minimum;
- SMF removal is undertaken using wet methods if it is reasonably practicable to do so. If SMF must be removed in dry conditions there is minimal physical abrasion;
- SMF abrasion only occurs in circumstances where heat or other causes have made SMF attach itself to the substrate. If this occurs, additional controls may be required to maintain the risk of exposure and environmental contamination at an acceptable level;
- Upon removal, the SMF materials are sealed in 200 micron thick polythene waste bags or polythene sheeting for disposal. Waste bags should be filled no more than half full. Sealing should be achieved using heavy duty adhesive tape;

- All surfaces in the SMF removal area are thoroughly decontaminated by vacuum or wet-wiping to remove residual dust at the completion of the bulk removal process. Wet-wiping techniques may be used to wipe clean non-porous surfaces:
  - Vacuum cleaners should comply with the Class H requirements in AS/NZS 60335.2.69.2017: *Household and similar electrical appliances – Safety: Particular requirements for wet and dry vacuum cleaners, including power brush, for commercial use*;
  - Filters for the vacuum cleaners should conform to the requirements of AS4260-1997 *High Efficiency Particulate Air Filters (HEPA) – Classification, Construction and Performance* or its equivalent. Household vacuum cleaners must never be used even if they have a HEPA filter;
  - Rags used in wet-wiping should only be used once, although they may be refolded to expose a clean surface. The rags should be used flat and should not be wadded. If a bucket of water is used, the rags should not be re-wetted in the bucket as this will contaminate the water; and
  - All vacuum bags, HEPA filters and rags used for wet-wiping are to be disposed of as waste containing SMF;
- At the completion of SMF removal all used PPE is double bagged in 200 micron thick polythene waste bags for disposal. Waste bags should be filled no more than half full and sealed using heavy duty adhesive tape;
- Transport and final disposal of SMF waste material is carried out by the Contractor in a manner, which prevents the liberation of SMF dust into the atmosphere and is to a legally approved and licensed waste disposal facility;
- SMF waste is disposed of in the appropriate manner at an approved waste disposal facility. Permission to tip the SMF waste is to be obtained from the appropriate authority prior to the commencement of work. The Contractor must provide tipping dockets to the Principal;
- The SMF removal area is inspected by a Competent Person who is independent from the Contractor to ensure SMF materials have been removed to a satisfactory standard. The requirement to conduct any air monitoring will be determined by the Competent Person;
- The Competent Person is to be accompanied by the Contractor at all times during clearance inspection in order to undertake any minor rectification work that may be required prior to clearance being issued; and
- After clearance, all surfaces within the SMF Work Area are sprayed with PVA solution or similar binding agent.

Upon receipt of the acceptable final clearance results normal re-occupation of the SMF removal area can occur.

8.5 Lead Paint Removal

8.5.1 Additional Pre-Work Requirements

Prior to any removal work, the paint should be classified for disposal in accordance with relevant legislation and EPA (2014). It is noted that EPA (2014) does not consider AS4361.1 or AS4361.2, including the definition of lead paint therein, for waste classification assessment. As such:

- These standards have no bearing on how waste is classified in NSW; and
- Waste classification should be carefully considered and an appropriate degree of liaison with the NSW EPA may be required to help ensure correct waste classification.

The results of waste classification may impact the removal and disposal methods adopted, for example, based on classification results the paint may:

- Need to be removed and segregated from the substrate for appropriate disposal; or
- Remain attached to the building substrate and be disposed as relatively whole building components.

The Contractor must be suitably experienced and hold all relevant qualifications and licences to undertake the work in accordance with the requirements of the WHS Act, WHS Regulation and AS 4361.2 *Guide to Hazardous Paint Management - Lead Paint in Residential, Public and Commercial Buildings.*

8.5.2 General Procedure

The procedure below outlines the general approach to lead paint removal if such removal is necessary. This procedure is provided as general guidance only. Reference should be made to the WHS Act, WHS Regulation and other relevant documents listed in Section 5.2 for further details on the requirements that apply to lead paint removal.

The Contractor must ensure that:

- Personnel involved in the removal wear appropriate personal protective equipment which may include respiratory protection and disposable coveralls. Protective gloves should also be worn when handling lead paint;
- PPE is determined by conducting a risk assessment that is based on the specific activities and work methods being adopted;
- The Consultant undertakes air monitoring at the boundary of the lead paint removal area as required by Section 7.3;
- 200 micron thick polythene sheeting is installed below and around the SMF material as necessary to protect all relevant surfaces from cross-contamination and adequately contain any dust and debris generated;
- Any areas of lead paint in poor condition are stabilised (e.g. with a PVA solution) or removed using wet scraping methods. If wet sanding/scraping is required then care must be taken to control any water runoff and generation of dust and debris;

- If it has been determined that lead paint may remain attached to the building substrate for disposal then:
  - The lead painted materials in good condition shall be wet down with a fine water mist prior to removal. High-pressure water/solution shall not be used. Care must be taken to control any water runoff;
  - Lead painted building materials are removed as whole components without damage or disturbance of the lead paint;
- If removal of lead paint from the building substrate is required then:
  - The lead painted materials are removed using tools that minimise disturbance of the lead paint. Power tools, manually operated abrasive/cutting tools and work processes that involve heat should not be used directly on lead paint; and
  - The lead paint waste is bagged in 200 micron thick polythene waste bags.
- Wetting down of the painted construction materials should be maintained throughout the removal process with care taken to avoid generating free water;
- Upon removal, the lead paint waste is placed in a waste skip (or other appropriate receptacle) lined with 200 micron thick polythene sheeting for disposal. The waste should be sealed within the polythene sheeting using heavy duty adhesive tape prior to transport and disposal;
- All surfaces in the lead paint removal area are thoroughly decontaminated by vacuum to remove residual dust/debris at the completion of bulk lead paint removal. Wet-wiping techniques may be used to wipe clean non-porous surfaces;
  - Vacuum cleaners should comply with the Class H requirements in AS/NZS 60335.2.69.2017: *Household and similar electrical appliances – Safety: Particular requirements for wet and dry vacuum cleaners, including power brush, for commercial use*;
  - Filters for the vacuum cleaners should conform to the requirements of AS4260-1997 *High Efficiency Particulate Air Filters (HEPA) – Classification, Construction and Performance* or its equivalent. Household vacuum cleaners must never be used even if they have a HEPA filter;
  - Rags used in wet-wiping should only be used once, although they may be refolded to expose a clean surface. The rags should be used flat and should not be wadded. If a bucket of water is used, the rags should not be re-wetted in the bucket as this will contaminate the water; and
  - All vacuum bags, HEPA filters and rags used for wet-wiping are to be disposed of as waste containing SMF;
- At the completion of lead paint removal all used PPE is double bagged in 200 micron thick polythene waste bags for disposal. Waste bags will be filled no more than half full and sealed using heavy duty adhesive tape;
- Transport and final disposal of lead paint waste is carried out by the Contractor in a manner which prevents liberation of dust and debris;
- Lead paint waste is disposed of in the appropriate manner at a legally approved and licensed waste disposal facility. The Contractor must provide tipping dockets to the Principal;
- The lead paint removal area is inspected by the Consultant to ensure the lead paint has been removed to a satisfactory standard. The Consultant is to be accompanied by the Contractor at all

times during clearance inspection in order to undertake any minor rectification work that may be required by the Consultant prior to clearance being issued;

- After clearance by the Consultant, all relevant surfaces within the lead paint removal area are sprayed with PVA solution or similar binding agent; and
- Air clearance monitoring is carried out by the Consultant inside the lead paint removal area following successful completion of the visual inspection and drying of PVA.

Upon receipt of a written clearance from the Consultant normal re-occupation of the lead paint removal area can occur.

8.6 Lead Flashing Removal

8.6.1 General Procedure

The procedure below outlines the general approach to lead flashing removal. This procedure is provided as general guidance only. Reference should be made to the WHS Act, WHS Regulation and other relevant documents, including those listed in Section 5.2, for further details on the requirements that apply to lead flashing removal.

The Contractor shall ensure:

- Personnel involved in the removal wear appropriate personal protective equipment, such as disposable coveralls and protective gloves;
- The lead flashing materials are removed using tools that minimise disturbance of the lead flashing. Power tools, manually operated abrasive/cutting tools and work processes that involve heat should not be used directly on lead flashing;
- Upon removal, the lead flashing is placed in a 200 micron thick polythene waste bag for disposal. The waste bag should be sealed with heavy duty adhesive tape prior to transport and disposal;
- At the completion of lead flashing removal all used PPE is placed in 200 micron thick polythene waste bags for disposal. Waste bags shall be sealed using heavy duty adhesive tape;
- After handling lead flashing, even if gloves were worn, wash hands well in warm, soapy water before eating, drinking, smoking, handling food or drink, or using toilet facilities;
- Transport and final disposal of lead flashing is carried out by the Contractor in a manner, which will prevent the liberation of dust and debris;
- Lead flashing is disposed of in the appropriate manner and to a legally approved and licensed waste disposal facility. The Contractor shall provide tipping dockets to the Principal; and
- The lead flashing removal area is inspected by the Consultant to ensure the lead flashing has been removed to a satisfactory standard. The Consultant is to be accompanied by the Contractor at all times during clearance inspection in order to undertake any minor rectification work that may be required by the Consultant prior to clearance being issued.

Upon receipt of a written clearance from the Consultant normal re-occupation of the lead flashing removal area can occur.

8.7 PCB Removal

8.7.1 General Procedure

The procedure below outlines the general approach to PCB removal. This procedure is provided as general guidance only. Reference should be made to the WHS Act, WHS Regulation and other relevant documents listed in Section 5.2 (including the NSW EPA PCB Chemical Control Order 1997) for further details on the requirements that apply PCB removal.

The Contractor shall ensure:

- Care is taken when handling damaged, PCB-containing components to ensure that any further leakage/spillage does not occur;
- Persons handling damaged PCB-containing components take the following precautions:
  - Put on personal protective equipment and clothing before removing damaged or leaking components;
  - Wear gloves that are made of materials that are resistant to PCBs, such as Viton, polyethylene, polyvinyl alcohol (PVA), polytetrafluoroethylene (PTFE), butyl rubber, nitrile rubber, or neoprene. Mid-arm length gauntlets may be required. Do not use gloves made of polyvinyl chloride (PVC) or natural rubber (latex);
  - Wear disposable overalls made of Tyvek® or made of materials with similar chemical resistant properties;
  - When working with overhead equipment (e.g. ceiling-mounted fluorescent light fixtures), wear a full-face shield and appropriate hair protection;
  - Wash any non-disposable contaminated equipment with kerosene and collect the kerosene for disposal as a PCB-contaminated solvent; and
  - After handling PCBs, even if gloves were worn, wash hands well in warm, soapy water before eating, drinking, smoking, handling food or drink, or using toilet facilities.
- PCB containing equipment (capacitors, ballasts etc.) are placed in a polyethylene bag which is then sealed and placed in a sealable metal container. This container must be clearly marked with the details of the contents and must be maintained in good order (that is, no visible signs of damage or corrosion);
- If some of these materials are leaking, the sealable metal container is partially filled with an absorbent material, such as a commercial absorbent, kitty litter or a diatomaceous earth. The plastic wrapped leaking components can then be placed in the container;
- If PCBs cannot be transported immediately for disposal, all containers are stored in an area that prevents any discharge of the PCBs to the environment (no drains and the area must contain any leaks) and the area is secure from unauthorised entry;
- The containers are stored in a separate location, well away from any flammable liquids and from food storage and preparation areas;
- PCB containing material is disposed of as soon as possible. If PCBs are to be stored for an extended period, they should be raised off the floor to avoid corrosion of the bottom of the container; and

- PCB waste is disposed of at a facility that is legally permitted to accept the waste.

8.8 Lead Dust Removal

8.8.1 General Procedure

The procedure below outlines the general approach to lead dust removal. This procedure is provided as general guidance only. Reference should be made to the WHS Act 2011, WHS Regulation 2017 and other relevant documents listed in Section 5.2 for further details on the requirements that apply to lead dust removal.

The Contractor must ensure that:

- Personnel involved in the removal wear appropriate personal protective equipment, including respiratory protection and disposable coveralls where there is a risk of generating lead dust;
- The Consultant undertakes air monitoring at the boundary of the lead dust removal area as required by Section 7.3.3;
- Removal of lead in dust from ceiling cavities, if required, is undertaken with the ceiling and any other relevant enclosing elements of the building structure intact to help ensure containment;
- Any penetration or breach in the enclosing building structure that may permit dispersal of contamination should be sealed safely (e.g. with 200 micron thick plastic sheeting, suitable filling / repair compound);
- 200 micron thick polythene sheeting is installed below and around the lead dust removal area as otherwise required to ensure that all relevant surfaces and materials remain adequately protected from cross-contamination and that any dust or debris generated during removal is captured;
- Consideration should be given to maintaining the ceiling cavity dust in a damp condition with a low-pressure water spray to reduce generation of airborne dust during removal;
- All surfaces within the ceiling cavity are thoroughly decontaminated by vacuum to remove dust / debris:
  - Vacuum cleaners should comply with the Class H requirements in AS/NZS 60335.2.69 *Household and Similar Electrical Appliances – Safety, Part 2.69; Particular requirements for wet and dry vacuum cleaners, including power brush, for commercial use* or equivalent;
  - Vacuum cleaner filters should conform to the requirements of AS4260 *High efficiency particulate air (HEPA) filters – Classification, construction and performance* or equivalent; and
  - The vacuum cleaning unit and dust collection system should preferably remain external to the building (e.g. trailer mounted vacuum);
- Wet-wiping techniques are used to detail clean non-porous surfaces:
  - Rags used in wet-wiping should only be used once, although they may be refolded to expose a clean surface. The rags should be used flat and should not be wadded. If a bucket of water is used, the rags should not be re-wetted in the bucket as this will contaminate the water. If the water is contaminated, it must be treated as lead containing waste;

- Use of an appropriate detergent (which may include D-Lead for example) should be considered to help improve cleaning efficiency. Detergents should only be used for their intended purpose however, and in accordance with the manufacturer's / supplier's written instructions;
- Dust is not to be swept or shovelled into bags;
- Removal work progresses in a systematic and logical manner that minimises disturbance. This typically involves working outwards from the roof entry point towards the edge of the ceiling;
- If it is impracticable to decontaminate any particular items then these should be disposed;
- At the completion of lead dust removal all used PPE is double bagged in 200 micron thick polythene waste bags for disposal. Waste bags will be filled no more than half full and sealed using heavy duty adhesive tape;
- Transport and final disposal of the waste is carried out by the Contractor in a manner which prevents liberation of dust and debris;
- Waste is disposed of in the appropriate manner and to a legally approved and licensed waste disposal facility. The Contractor must provide tipping dockets to the Principal;
- The lead dust removal area is inspected, tested and sampled by the Consultant to ensure the lead dust has been removed to a satisfactory standard. The Consultant is to be accompanied by the Contractor at all times during clearance inspection in order to undertake and rectification work that may be required by the Consultant prior to clearance being issued;
- After clearance by the Consultant, all relevant surfaces within the lead dust removal area are sprayed with PVA solution or similar binding agent; and
- Air clearance monitoring is carried out by the Consultant inside the lead removal area following successful completion of the visual inspection and drying of PVA.

Upon receipt of a written clearance report from the Consultant normal re-occupation of the lead removal area can occur.

9. Supervision

General demolition work following HAZMAT removal should be closely supervised by Competent Person(s) to help ensure that:

- Any additional occurrences of HAZMAT are identified in a timely manner; and
- The associated risks of exposure and cross-contamination are limited accordingly.

Supervisory personnel should be adequately experienced in identifying potential HAZMAT during works of the general nature being conducted.

10. Unexpected Finds

In the case that HAZMAT are encountered unexpectedly the following procedure is to apply:

- Work in the area must cease immediately and access to the material must be appropriately restricted so as to ensure that the suspected HAZMAT is not disturbed;
- The suspected HAZMAT is to be assessed by a suitably qualified, experienced and, where necessary licensed, person:
  - In the case of friable asbestos the assessment is to be conducted by a Licensed Asbestos Assessor (LAA); and
  - In the case of non-friable asbestos, or other hazardous building material, the assessment is to be conducted by a Competent Person.
- The assessment is to comprise a visual inspection that is supplemented, where necessary, by sample collection and analysis, air monitoring, and other relevant assessment techniques;
- The nature and extent of the assessment, including any sampling/monitoring etc., is to be determined by the LAA or Competent Person conducting the assessment;
- The LAA or Competent Person is to confirm the controls required to ensure that the interim risk of exposure and environmental contamination is eliminated, or if it cannot be eliminated, that it is minimised to the extent reasonably practicable until such time as removal/remediation can take place. This may include, for example:
  - Further isolation (e.g. installation of temporary fencing, warning signage);
  - Wetting down and / or covering the material;
  - Confirmatory air monitoring; and
  - Regular re-inspections to assess the effectiveness of controls.
- The LAA or Competent Person is to confirm the requirements, if any, for removal / remediation of the HAZMAT and for clearance / validation. These requirements are to be formalised in a written report;
- Removal of the HAZMAT is to occur as soon as reasonably practicable and in accordance with the requirements determined by the LAA or Competent Person and any remediation / management plans applicable to the site;
- At the completion of removal / remediation a clearance / validation assessment is to be conducted by the LAA or Competent Person. The assessment is to comprise a visual inspection that is supplemented, where necessary, by sample collection and analysis, air monitoring, and / or other relevant assessment techniques;
- The nature and extent of the clearance / validation assessment, including any sample analysis / monitoring etc., is to be determined by the LAA or Competent Person conducting the assessment; and
- Upon receipt of a written clearance / validation report stating that the hazardous material has been adequately removed / remediated the area may be re-occupied.

11. Limitations

Douglas Partners (DP) has prepared this report (or services) for this project at Hastings Secondary College, Port Macquarie, in accordance with DP's proposal reference 206888.00.P.002.Rev0 of 16 December 2021 and DP's Conditions of Engagement. Any client purchase order (PO) related to the work is taken to be a request to proceed only and any the terms that may be attached, or referred to in such PO, does not apply to these services.

This report has been based on information contained in DP (2020) only and is therefore subject to the scope and limitations associated with DP (2020) which comprised a non-destructive, non-intrusive HAZMAT assessment. A destructive / intrusive HAZMAT assessment, that includes (but is not limited to) further consideration of previously inaccessible areas, is recommended to help ensure regulatory compliance and that, as far as reasonably practicable, all relevant HAZMAT have been identified.

This report is provided for the exclusive use of FKG Group Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents. This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

While work is undertaken in a professional manner the nature of HAZMAT, and the limitations of the method(s) used, mean that DP cannot guarantee that all HAZMAT or issues of concern have been identified or addressed in this report.

DP personnel are not experienced, licenced or accredited quantity surveyors. Any quantities quoted in this report are provided for general guidance only and should not be relied upon. The services of a licenced quantity surveyor should be engaged in order to determine reliable quantities.

The recommendations and conclusions contained in this report shall not abrogate a person of their responsibility to work in accordance with statutory requirements, codes of practice, standards, guidelines, safety data sheets, work instructions or industry best practice.

The assessment of atypical safety hazards arising from this advice is restricted to the environmental components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

Douglas Partners Pty Ltd

Appendix A

About This Report

Site and Building Layout Plans

General Arrangement Plan - Building B Refurbishment Level 1 Plan

About this Report

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole 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. They may not be the same at the time of construction as are indicated in the report; and
- 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 first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or 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 a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

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, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

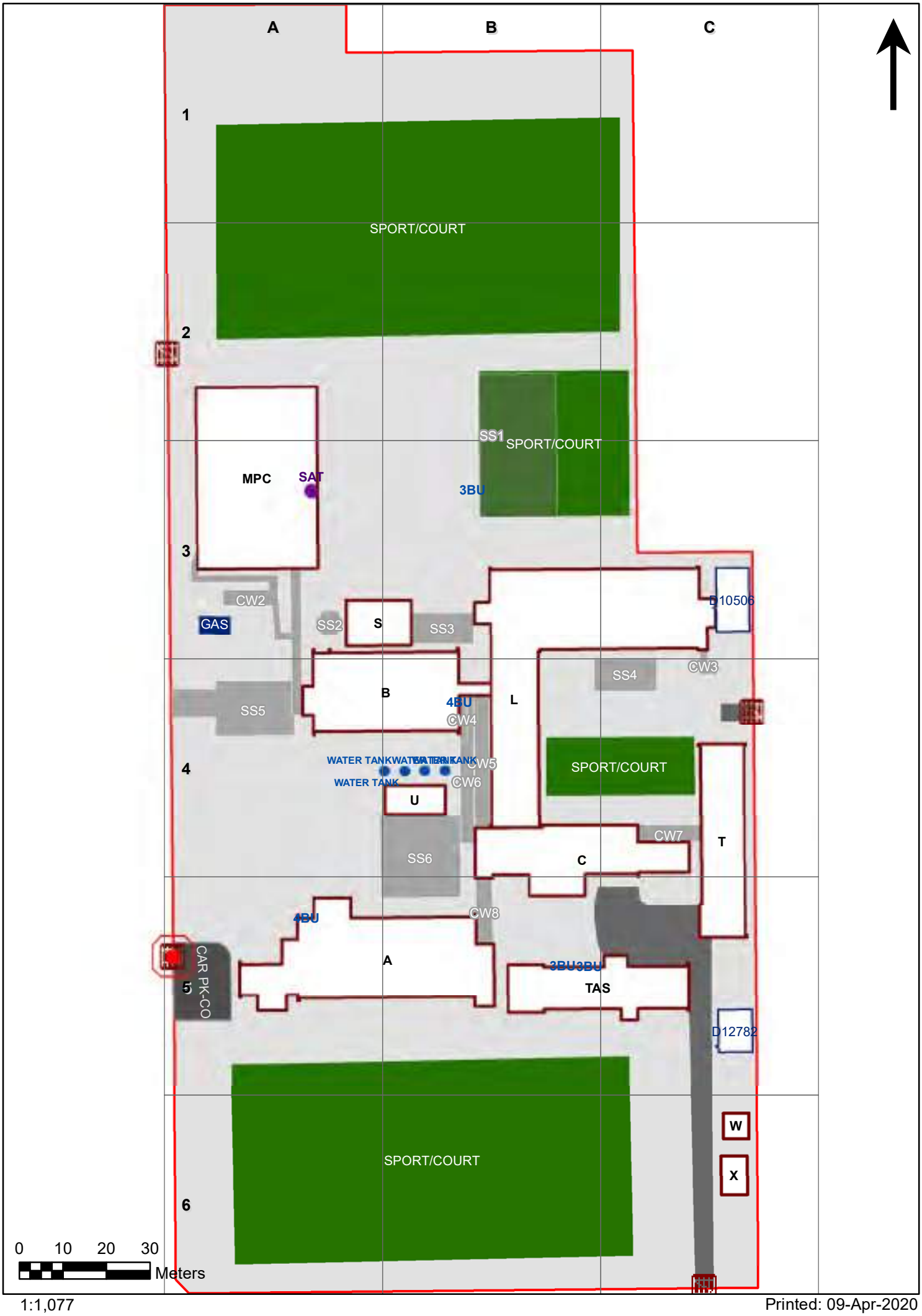
Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

8364 - Hastings Secondary College Port Macquarie Campus

Site Plan (12844)



1:1,077

Printed: 09-Apr-2020

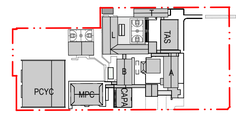
fjmtstudio

0 1 2 5m

General notes

- All dimensions and existing conditions shall be checked and verified by the contractor before proceeding with the work.
- All levels relative to 'Australian Height Datum'.
- Do not scale drawings.
- Use figured dimensions only.

Legend



rev	date	name	by	chk
01	14/12/21	For Information	SJP	

Hastings Schools Port Macquarie
Hastings Secondary College
Port Macquarie NSW 2444

General Arrangement Plans
General Arrangement Plan - Building B Refurbishment Level 1 Plan

Scale
1:100 @ A1

Project Code
HSPM

First Issued
21/08/2020

Sheet No.
B-20002

Rev
01

8364 - Hastings Secondary College Port Macquarie Campus

Art/Music (B00B) - Ground Floor (Room Function)

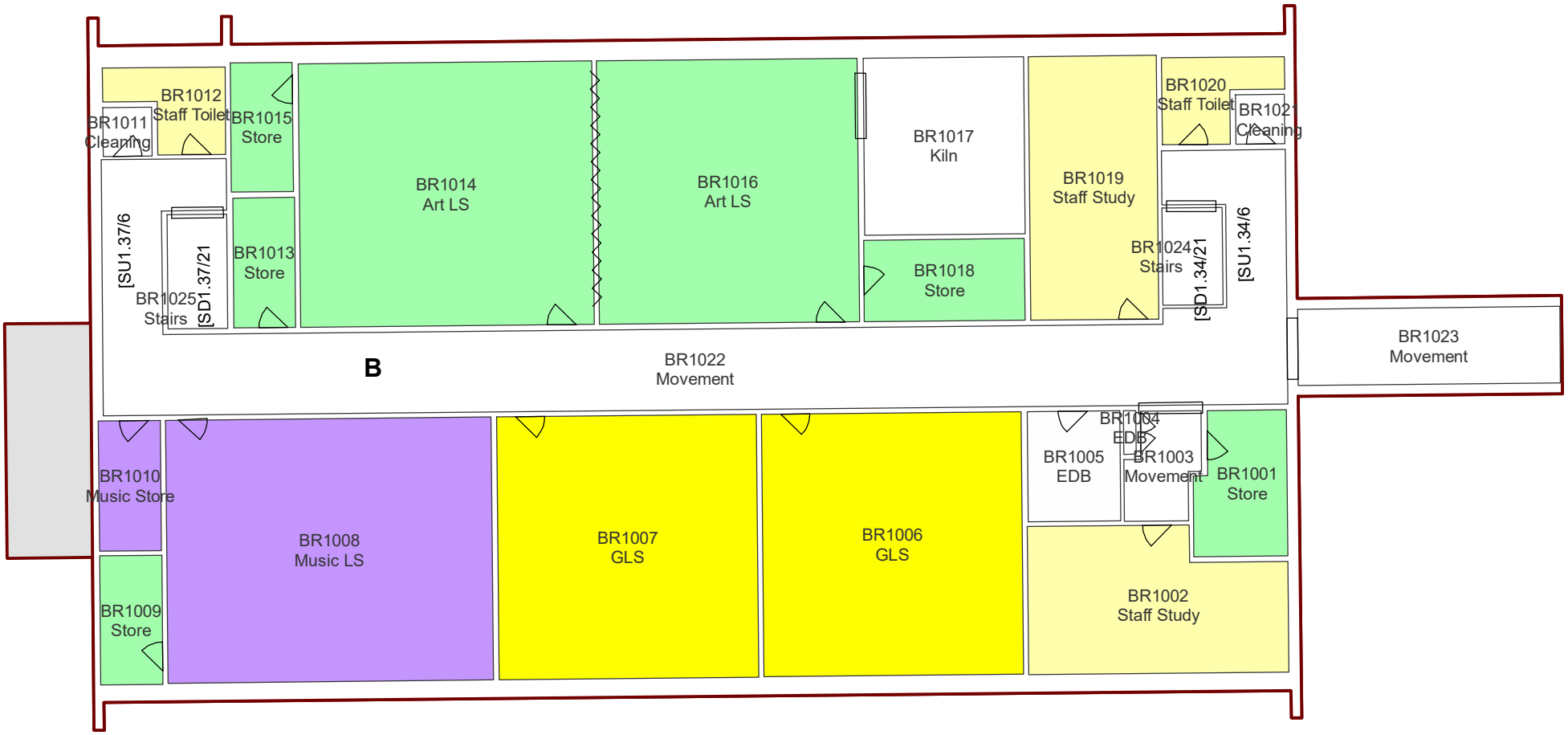
0 3.5 7 10.5 Meters

1:168

Printed: 14-Jul-2018

8364 - Hastings Secondary College Port Macquarie Campus

Art/Music (B00B) - 1st Floor (Room Function)



0 3.5 7 10.5

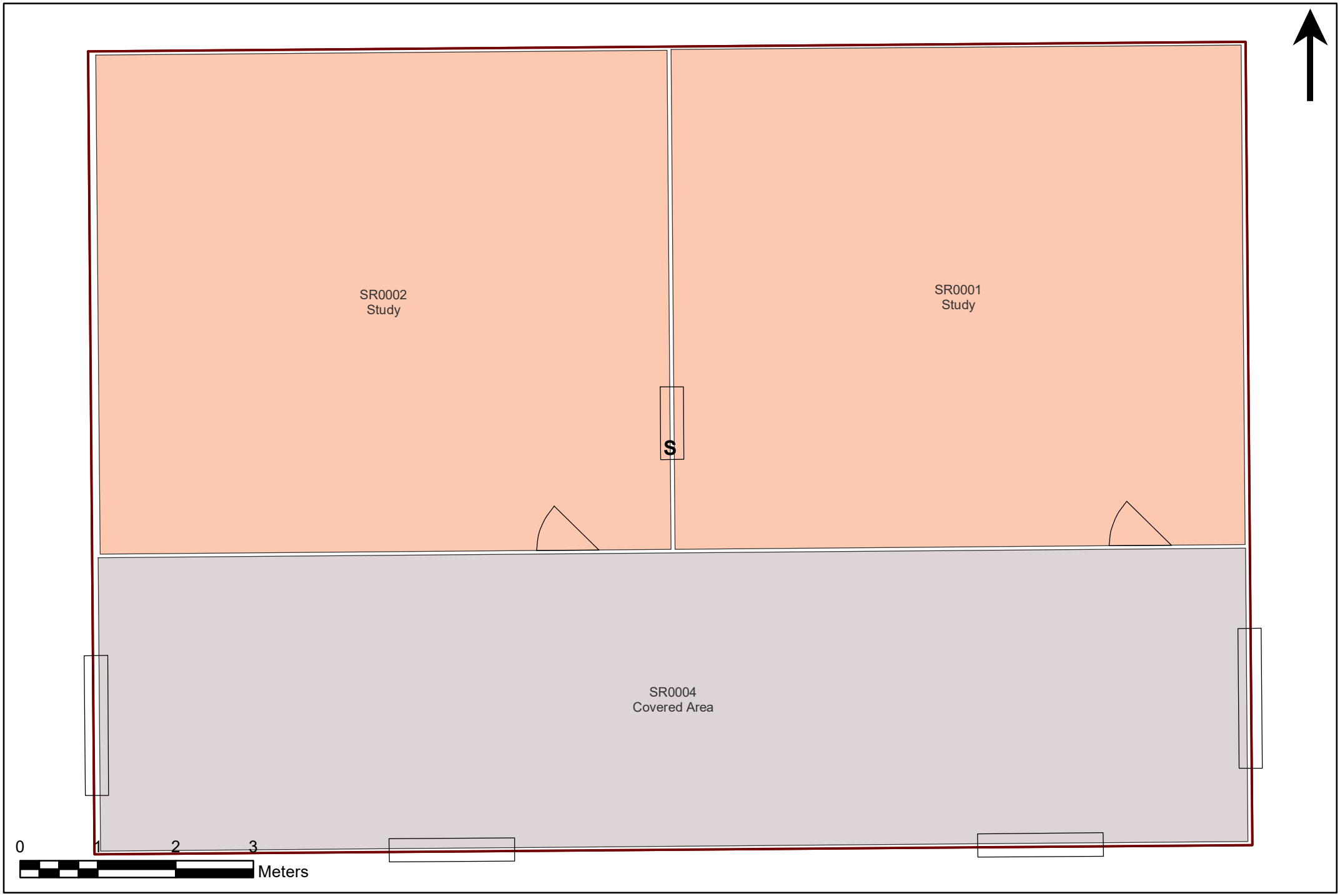
Meters

1:168

Printed: 14-Jul-2018

8364 - Hastings Secondary College Port Macquarie Campus

Pupil Facilities (B00S) - Ground Floor (Room Function)



1:61

Printed: 14-Jul-2018

Appendix B

B00B - Register and Plates from DP (2020)

DP Project No: 89754.01
Hazardous Building Materials (HBM) Register
Hastings Secondary College, Port Macquarie Campus

						Asbestos Risk Assessment									
Building	Room / Area	Material Location	Material Type	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority	Photo No.	Summary Comment/Recommendation
B00B	BR0019	ceiling	fibre cement sheet	not provided in DoE asbestos register	**asbestos detected by analysis**	1	1	2	1	2	1	8	Low	1	Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	BR0020 / BR1023	eaves	assumed fibre cement sheeting	N/A	**asbestos (assumed)**	1	1	1	0	1	0	4	Low	2	Inaccessible area/material (height) - hazardous material(s) assumed present as a precaution. Confirm status of hazardous material(s) when safe access available and prior to any disturbance.
B00B	BR1004	electrical panel	resinous board	not provided in DoE asbestos register	**asbestos (assumed)**	0	1	1	1	1	1	5	Low	N/A	Inaccessible area/material (keys) - hazardous material(s) assumed present as a precaution. Confirm status of hazardous material(s) when safe access available and prior to any disturbance.
B00B	BR1012	ceiling	fibre cement sheet	not provided in DoE asbestos register	**asbestos detected by analysis**	1	1	2	2	2	1	9	Low	N/A	Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	BR1020	ceiling	fibre cement sheeting	not provided in DoE asbestos register	**asbestos detected by analysis**	1	1	2	2	2	1	9	Low	3	Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	exterior	eave linings generally	fibre cement sheeting	not provided in DoE asbestos register	**asbestos detected by analysis**	1	1	1	0	1	0	4	Low	4	Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	exterior	northern façade, typical concrete paving, expansion gap	bitumastic	B00B-EXT-A01	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	exterior	northern facade, to end of window frames	glazing putty	B00B-EXT-A02	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	exterior	southern façade, typical concrete paving, expansion gap	bitumastic	B00B-EXT-A03	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	exterior	northern façade, expansion gap at base of brick wall	bitumastic	B00B-EXT-A04	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	exterior	southeast corner, wheelchair ramp, floor	fibre cement board	N/A	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR0001	ceiling	vermiculite	BR0001-A01	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR0002	ceiling	vermiculite	BR0002-A01	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR0002	between window frame and terrazzo sill	putty	BR0002-A02	**asbestos detected by analysis**	1	2	2	1	2	1	9	Low	similar to 5	Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	BR0003	ceiling	vermiculite	BR0003-A01	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.

DP Project No: 89754.01
Hazardous Building Materials (HBM) Register
Hastings Secondary College, Port Macquarie Campus

						Asbestos Risk Assessment									
Building	Room / Area	Material Location	Material Type	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority	Photo No.	Summary Comment/Recommendation
B00B	BR0003	window frame	glazing putty	BR0003-A02	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR0004	ceiling	vermiculite	BR0004-A01	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR0004	teacher's desk	moulded sink	refer BR0012-A05	**SMF (assumed)**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6	Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	BR0004	gas and water main cupboard	internal material(s)	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material (keys) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR0005	ceiling	vermiculite	BR0005-A02	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR0005	base of sink	bituminous lining	BR0005-A01	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR0006	ceiling	vermiculite	BR0006-A01	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR0008	interior of room	materials in general	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material (keys) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR0009	north and west wall, enclosed building boxes	internal material(s)	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7	Inaccessible area/material (requires intrusive inspection) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR0011	hot water unit	internal insulation	N/A	**SMF (assumed)**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	BR0012	north wall, enclosed T-shape building box	internal material(s)	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8	Inaccessible area/material (requires intrusive inspection) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR0012	ceiling	vermiculite	BR0012-A01	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR0012	window frame	glazing putty	BR0012-A02	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR0012	window sill, between terrazzo panels	putty	BR0012-A03	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR0012	windows, between window frame and terrazzo panels	putty	BR0012-A04	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR0012	teacher's desk	moulded sink	BR0012-A05	no asbestos detected by analysis, **SMF detected**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9	Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	BR0013	interior of room	materials in general	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material (keys) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR0013	ceiling	vermiculite	refer BR0012-A01	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material (keys) - assumed non-asbestos based on DoE asbestos register and analysis results for vermiculite samples obtained elsewhere in this building. Consider confirmatory sampling and analysis prior to disturbance.

DP Project No: 89754.01
Hazardous Building Materials (HBM) Register
Hastings Secondary College, Port Macquarie Campus

						Asbestos Risk Assessment									
Building	Room / Area	Material Location	Material Type	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority	Photo No.	Summary Comment/Recommendation
B00B	BR0014	interior of room	materials in general	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material (keys) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR0014	ceiling	vermiculite	refer BR0012-A01	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material (keys) - assumed non-asbestos based on DoE asbestos register and analysis results for vermiculite samples obtained elsewhere in this building. Consider confirmatory sampling and analysis prior to disturbance.
B00B	BR0015	interior of room	materials in general	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material (keys) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR0015	electrical panel	resinous board	not provided in DoE asbestos register	**asbestos (assumed)**	0	1	2	2	1	1	7	Low	N/A	Inaccessible area/material (keys) - Material assumed remain present based on DoE asbestos register. Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR0015	wall linings	fibre cement sheet	not provided in DoE asbestos register	**asbestos detected by analysis**	1	2	2	2	1	1	9	Low	N/A	Inaccessible area/material (keys) - Material assumed remain present based on DoE asbestos register. Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR0017	interior of room	materials in general	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material (keys) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR0018	ceiling	vermiculite	BR0018-A01	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR0019	door frame	glazing putty	BR0019-A01	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR0019	aluminium door frame, between frame and wall	putty	refer BR0020-A01	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR0019	portion of infill panels (type1)	fibre cement	BR0019-A02	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	refer 10	Proceed with caution due to use of mixed construction materials. Refer sample BR0019-A04 (asbestos detected by analysis).
B00B	BR0019	portion of infill panels (type 2)	fibre cement	BR0019-A03	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	refer 10	Proceed with caution due to use of mixed construction materials. Refer sample BR0019-A04 (asbestos detected by analysis).
B00B	BR0019	portion of infill panels (type 3)	fibre cement	BR0019-A04	**asbestos detected by analysis**	1	1	1	2	2	0	7	Low	10	Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	BR0020	aluminium door frame, between frame and wall	sealant	BR0020-A01	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR0020 / BR1023	exterior brick wall, expansion gap	grey putty	BR0020-A02	**asbestos detected by analysis**	0	3	2	2	2	0	9	Low	11	Remove any loose material/debris and consider sealing in-situ material in place. Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	BR1001	floor, below carpet	green/grey vinyl tiles with hessian reinforcement and fibrous backing (assumed)	refer BR1003-A01	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material (due storage and furnishings) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR1002	window frame	glazing putty	BR1002-A02	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.

DP Project No: 89754.01
Hazardous Building Materials (HBM) Register
Hastings Secondary College, Port Macquarie Campus

						Asbestos Risk Assessment									
Building	Room / Area	Material Location	Material Type	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority	Photo No.	Summary Comment/Recommendation
B00B	BR1002	building box adjacent to sink	internal material(s)	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material (requires intrusive inspection) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR1002	underside of sink	bituminous lining	BR1002-A01	**asbestos detected by analysis**	1	1	2	2	2	1	9	Low	12	Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	BR1002	floor, below carpet	green/grey vinyl tiles with hessian reinforcement and fibrous backing	refer BR1003-A01	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR1002	boiling water unit	internal insulation	N/A	**SMF (assumed)**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	BR1003	floor, below carpet	green/grey vinyl tiles with hessian reinforcement and fibrous backing	BR1003-A01	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR1004	interior of room	materials in general	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material (keys) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR1004	floor	vinyl tiles	not provided in DoE asbestos register	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR1005	interior of room	materials in general	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material (keys) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR1006	floor, below carpet	green/grey vinyl tiles with hessian reinforcement and fibrous backing	BR1006-A01	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR1006	window sill, between terrazzo panels	pointing	BR1006-A02	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR1006	window, between window frame and sill	pointing	BR1006-A03	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR1007	floor, below carpet	green/grey vinyl tiles with hessian reinforcement and fibrous backing	BR1007-A01	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR1008	floor, below carpet	green/grey vinyl tiles with hessian reinforcement and fibrous backing	BR1008-A01	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR1008	window frame	grey/white glazing putty	BR1008-A02	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR1008	window frame	pink glazing putty	BR1008-A03	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR1008	eastern wall, below pin board	wall	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material (requires intrusive inspection) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR1010	interior of room	materials in general	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material (keys) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance

DP Project No: 89754.01
Hazardous Building Materials (HBM) Register
Hastings Secondary College, Port Macquarie Campus

						Asbestos Risk Assessment									
Building	Room / Area	Material Location	Material Type	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority	Photo No.	Summary Comment/Recommendation
B00B	BR1011	ceiling	fibre cement sheet	refer BR1021-A01	**asbestos (assumed)**	1	1	2	2	1	1	8	Low	N/A	Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	BR1011	building box	internal material(s)	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material (requires intrusive inspection) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR1012	building boxes (x2)	internal material(s)	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material (requires intrusive inspection) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR1013	interior of room	materials in general	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material (keys) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR1014	floor	blue vinyl sheeting	refer BR1016-A01	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR1014	north wall, red building box	internal material(s)	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	13	Inaccessible area/material (requires intrusive inspection) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR1015	southwest corner, building box	internal material(s)	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14	Inaccessible area/material (requires intrusive inspection) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR1016	floor	blue vinyl sheeting	BR1016-A01	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR1016	south wall, building box	internal material(s)	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material (requires intrusive inspection) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR1016	north, storm water pipe	fibre cement pipe (3m)	not provided in DoE asbestos register	**asbestos detected by analysis**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Material reported in DoE asbestos register but not identified during this inspection. Proceed with caution.
B00B	BR1017	green kiln	insulation	BR1017-A01	no asbestos detected by analysis, **SMF detected**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	15	Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	BR1017	grey kiln	insulation	BR1017-A02	no asbestos detected by analysis, **SMF detected**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	15	Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	BR1018	interior of room	materials in general	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material (keys) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR1019	ceiling	vermiculite	BR1019-A01	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR1019	floor, below carpet	green/grey vinyl tiles with hessian reinforcement and fibrous backing	refer BR1006-A01	non asbestos (assumed)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR1019	boiling water unit	internal insulation	N/A	**SMF (assumed)**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	BR1020	toilet, building boxes (x2)	internal material(s)	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material (requires intrusive inspection) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance
B00B	BR1021	building box	internal material(s)	N/A	unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material (requires intrusive inspection) - Confirm status of hazardous material(s) when safe access available and prior to any disturbance

DP Project No: 89754.01
Hazardous Building Materials (HBM) Register
Hastings Secondary College, Port Macquarie Campus

						Asbestos Risk Assessment									
Building	Room / Area	Material Location	Material Type	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority	Photo No.	Summary Comment/Recommendation
B00B	BR1021	ceiling	fibre cement sheeting	BR1021-A01	**asbestos detected by analysis**	1	1	2	2	1	1	8	Low	16	Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	BR1021	top of ceiling	minor fibre cement sheeting debris	refer BR1021-A01	**asbestos (assumed)**	1	3	2	1	1	2	10	Moderate	17	Restrict access. Persons entering the area should undertake a risk assessment and implement suitable controls to prevent exposure. Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	BR1022	floor, below carpet	vinyl tile	BR1022-A01 & A02	**asbestos detected by analysis**	1	1	1	1	2	1	7	Low	18	Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	BR1023	typical window frame	glazing putty	BR1023-A01	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR1023	north end, door frame	glazing putty	BR1023-A02	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No asbestos/hazardous material identified.
B00B	BR1023	floor below vinyl sheeting	possible vinyl tile	not provided in DoE asbestos register	**asbestos detected by analysis**	1	1	1	1	2	1	7	Low	19	Inaccessible area/material (below vinyl sheeting) - hazardous material(s) assumed present as a precaution. Confirm status of hazardous material(s) when safe access available and prior to any disturbance.

DP Project No: 89754.01
Hazardous Building Materials (HBM) Register
Hastings Secondary College, Port Macquarie Campus

						Asbestos Risk Assessment									
Building	Room / Area	Material Location	Material Type	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority	Photo No.	Summary Comment/Recommendation
B00B	subfloor	ground surface	fibre cement fragment(s)	B00B-SF-A01	**asbestos detected by analysis**	1	3	3	1	0	2	10	Moderate	20	Restrict access. Persons entering the area should undertake a risk assessment and implement suitable controls to prevent exposure. Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	building subfloor	throughout	materials in general	N/A	access limited	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	21	Caution is advised due to limited access available throughout building subfloor (due services and clearance in cavity) and presence of substantial construction/demolition waste. Asbestos may be present in various forms such as fibre cement debris and fibre cement packing materials. Confirm status of hazardous material(s) when safe access available and prior to any disturbance.
B00B	building in general	brick walls, expansion gap(s)	putty	refer BR0020-A02	**asbestos (assumed)**	0	3	2	2	2	0	9	Low	similar 11	Remove any loose material/debris and consider sealing in-situ material in place. Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	building in general	interior, between window frames and terrazzo sill	putty	refer BR0002-A02	**may contain asbestos**	1	2	2	1	2	1	9	Low	similar 5	Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	BR0002	exterior door frame	white/cream, paint	spot test 1 and BR0002-LP01	non-lead paint (≤0.1% lead w/w)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Sample analysis did not indicate lead paint as defined under AS4361.2 - 2017. Notwithstanding this, caution is advised due to the limitations associated with paint sampling and due to spot-testing indicating the potential presence of lead.
B00B	BR0002	south wall	white/cream, paint	spot test 2 and BR0002-LP02	**lead paint (>0.1% lead w/w)**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Areas of damaged/flaking lead paint and any associated debris should be removed and the building surfaces adequately sealed (e.g. overpainted) by a suitably qualified and experienced contractor. Avoid disturbance and implement controls to prevent exposure and dispersal during building work (e.g. maintenance, refurbishment and demolition). Waste contaminated with lead (including lead paint waste) from educational institutions is pre-classified as general solid waste (non-putrescible) under the NSW EPA Waste Classification Guidelines.
B00B	BR1022	eastern stairwell, ceiling	white/cream paint	spot test 3	negative for lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No hazardous material identified.
B00B	BR1022	eastern stairwell, handrail	white paint	spot test 4	negative for lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No hazardous material identified.
B00B	BR0004	north wall	blue and underlying white paint	spot test 5	negative for lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No hazardous material identified.
B00B	BR0005	south wall	cream and underlying white paint	spot test 6	negative for lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No hazardous material identified.
B00B	BR1012	north wall	cream and underlying white paint	spot test 7	negative for lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No hazardous material identified.

DP Project No: 89754.01
Hazardous Building Materials (HBM) Register
Hastings Secondary College, Port Macquarie Campus

						Asbestos Risk Assessment									
Building	Room / Area	Material Location	Material Type	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority	Photo No.	Summary Comment/Recommendation
B00B	BR1025	eastern side, concrete	cream and underlying white paint	spot test 8	**positive for lead**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Areas of damaged/flaking lead paint and any associated debris should be removed and the building surfaces adequately sealed (e.g. overpainted) by a suitably qualified and experienced contractor. Avoid disturbance and implement controls to prevent exposure and dispersal during building work (e.g. maintenance, refurbishment and demolition). Waste contaminated with lead (including lead paint waste) from educational institutions is pre-classified as general solid waste (non-putrescible) under the NSW EPA Waste Classification Guidelines.
B00B	BR1025	handrail	white paint	spot test 9	negative for lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No hazardous material identified.
B00B	BR1014	doorframe	underlying white/cream paints	spot test 10	**positive for lead**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Areas of damaged/flaking lead paint and any associated debris should be removed and the building surfaces adequately sealed (e.g. overpainted) by a suitably qualified and experienced contractor. Avoid disturbance and implement controls to prevent exposure and dispersal during building work (e.g. maintenance, refurbishment and demolition). Waste contaminated with lead (including lead paint waste) from educational institutions is pre-classified as general solid waste (non-putrescible) under the NSW EPA Waste Classification Guidelines.
B00B	BR1016	north wall	cream paint	spot test 11	negative for lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No hazardous material identified.
B00B	BR1007	south wall	white and underlying grey paint	spot test 12	negative for lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No hazardous material identified.
B00B	exterior	northern façade, notice board	cream and underlying white paint	spot test 13 and B00B-EXT-LP01	**lead paint (>0.1% lead w/w)**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	22	Areas of damaged/flaking lead paint and any associated debris should be removed and the building surfaces adequately sealed (e.g. overpainted) by a suitably qualified and experienced contractor. Avoid disturbance and implement controls to prevent exposure and dispersal during building work (e.g. maintenance, refurbishment and demolition). Waste contaminated with lead (including lead paint waste) from educational institutions is pre-classified as general solid waste (non-putrescible) under the NSW EPA Waste Classification Guidelines.

DP Project No: 89754.01
Hazardous Building Materials (HBM) Register
Hastings Secondary College, Port Macquarie Campus

						Asbestos Risk Assessment									
Building	Room / Area	Material Location	Material Type	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority	Photo No.	Summary Comment/Recommendation
B00B	exterior	northern façade, timber seating	green and underlying cream paint	spot test 14 and B00B-EXT-LP02	**lead paint (>0.1% lead w/w)**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	23	Areas of damaged/flaking lead paint and any associated debris should be removed and the building surfaces adequately sealed (e.g. overpainted) by a suitably qualified and experienced contractor. Avoid disturbance and implement controls to prevent exposure and dispersal during building work (e.g. maintenance, refurbishment and demolition). Waste contaminated with lead (including lead paint waste) from educational institutions is pre-classified as general solid waste (non-putrescible) under the NSW EPA Waste Classification Guidelines.
B00B	exterior	northern façade, concrete slab	cream paint	spot test 15	negative for lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No hazardous material identified.
B00B	exterior	western façade, covered walkway, timber post	green paint	spot test 16	negative for lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No hazardous material identified.
B00B	rooms and areas in general	materials in general	paints	refer B00B-EXT-LP01, B00B-EXT- LP02 and BR0002-LP02	**may comprise lead paint (>0.1% lead w/w)**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	refer 22, 23	Areas of damaged/flaking lead paint and any associated debris should be removed and the building surfaces adequately sealed (e.g. overpainted) by a suitably qualified and experienced contractor. Avoid disturbance and implement controls to prevent exposure and dispersal during building work (e.g. maintenance, refurbishment and demolition). Waste contaminated with lead (including lead paint waste) from educational institutions is pre-classified as general solid waste (non-putrescible) under the NSW EPA Waste Classification Guidelines.
B00B	rooms and areas in general	fluorescent light fittings in general, capacitors	insulating oil	N/A	**PCB (assumed)**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	24	Inaccessible area/material - hazardous material(s)assumed present as a precaution. Confirm status of hazardous material(s) when safe access available and prior to any disturbance. Remove PCB containing capacitors prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	BR0021	ceiling cavity	settled dust/debris	BR0021-LD01	**elevated lead (≥0.5 mg/m2)**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Ensure access to building cavity is adequately restricted and entry is only made under controlled conditions. Remove contamination if reasonably practicable to do so and prior to any substantive disturbance. Implement appropriate controls to prevent exposure and dispersal during building work (e.g. maintenance, refurbishment and demolition work). Classify material(s) for disposal, when required, in accordance with the NSW EPA Waste Classification Guidelines.

DP Project No: 89754.01
Hazardous Building Materials (HBM) Register
Hastings Secondary College, Port Macquarie Campus

						Asbestos Risk Assessment									
Building	Room / Area	Material Location	Material Type	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority	Photo No.	Summary Comment/Recommendation
B00B	BR1011	ceiling cavity	settled dust/debris	BR1011-LD01	**elevated lead (≥0.5 mg/m2)**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Ensure access to building cavity is adequately restricted and entry is only made under controlled conditions. Remove contamination if reasonably practicable to do so and prior to any substantive disturbance. Implement appropriate controls to prevent exposure and dispersal during building work (e.g. maintenance, refurbishment and demolition work). Classify material(s) for disposal, when required, in accordance with the NSW EPA Waste Classification Guidelines.
B00B	throughout	ceiling cavities in general	settled dust/debris	refer BR1011-LD01 and BR0021-LD01	**elevated lead (assumed)**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Ensure access to building cavity is adequately restricted and entry is only made under controlled conditions. Remove contamination if reasonably practicable to do so and prior to any substantive disturbance. Implement appropriate controls to prevent exposure and dispersal during building work (e.g. maintenance, refurbishment and demolition work). Classify material(s) for disposal, when required, in accordance with the NSW EPA Waste Classification Guidelines.
B00B	rooms and areas in general	ceiling cavity	insulation materials (e.g. to roof and top of ceiling including perforated ceiling tiles)	N/A	**SMF (assumed)**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material - hazardous material(s)assumed present as a precaution. Confirm status of hazardous material(s) when safe access available and prior to any disturbance. Remove SMF prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	rooms and areas in general	sheeted and framed walls	insulation materials	N/A	**SMF (assumed)**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material - hazardous material(s)assumed present as a precaution. Confirm status of hazardous material(s) when safe access available and prior to any disturbance. Remove SMF prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00B	exterior	northern façade, notice board	flashing	spot test 17	**positive for lead**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	25	Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work). Classify material(s) for disposal, when required, in accordance with the NSW EPA Waste Classification Guidelines.
B00B	rooms and areas in general	throughout	flashing (where present)	refer spot test 17	**lead (assumed)**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	similar 25	Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work). Classify material(s) for disposal, when required, in accordance with the NSW EPA Waste Classification Guidelines.

Photograph 1: B00B, BR0019, ceiling, fibre cement sheet, asbestos detected by analysis.

Photograph 2: B00B, BR0020 / BR1023, eaves, assumed fibre cement sheeting, asbestos (assumed).

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Hazardous Building Materials (HBM) Register** **Hastings Secondary College, Port Macquarie Campus**	PROJECT: 89754.01 PLATE No: 1 REV: A
	CLIENT: NSW Department of Education	DATE: Mar-20

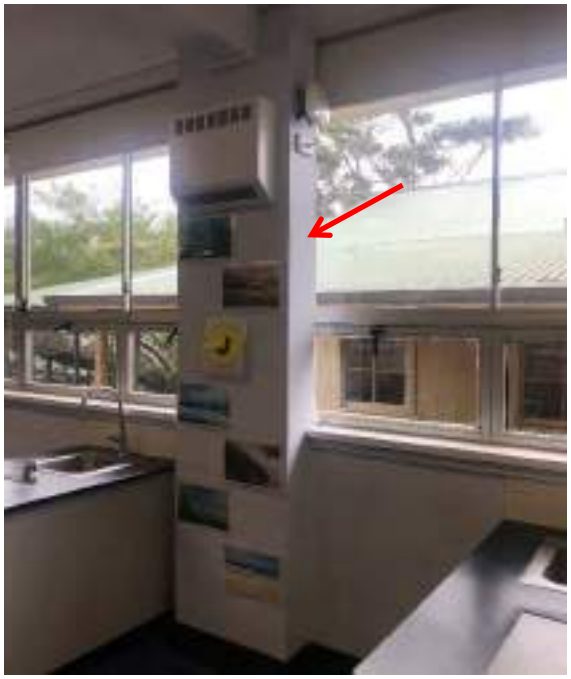
Photograph 3: B00B, BR1020, ceiling, fibre cement sheeting, asbestos detected by analysis.

Photograph 4: B00B, exterior, eave linings generally, fibre cement sheeting, asbestos detected by analysis.

Photograph 5: Photograph shown is similar to B00B, BR0002, between window frame and terrazzo sill, putty, asbestos detected by analysis.

Photograph 6: B00B, BR0004, teacher's desk, moulded sink, SMF (assumed).

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Hazardous Building Materials (HBM) Register** **Hastings Secondary College, Port Macquarie Campus**	PROJECT: 89754.01 PLATE No: 3 REV: A
	CLIENT: NSW Department of Education	DATE: Mar-20



Photograph 7: B00B, BR0009, north and west wall, enclosed building boxes, internal material(s), unknown.

Photograph 8: B00B, BR0012, north wall, enclosed T-shape building box, internal material(s), unknown.

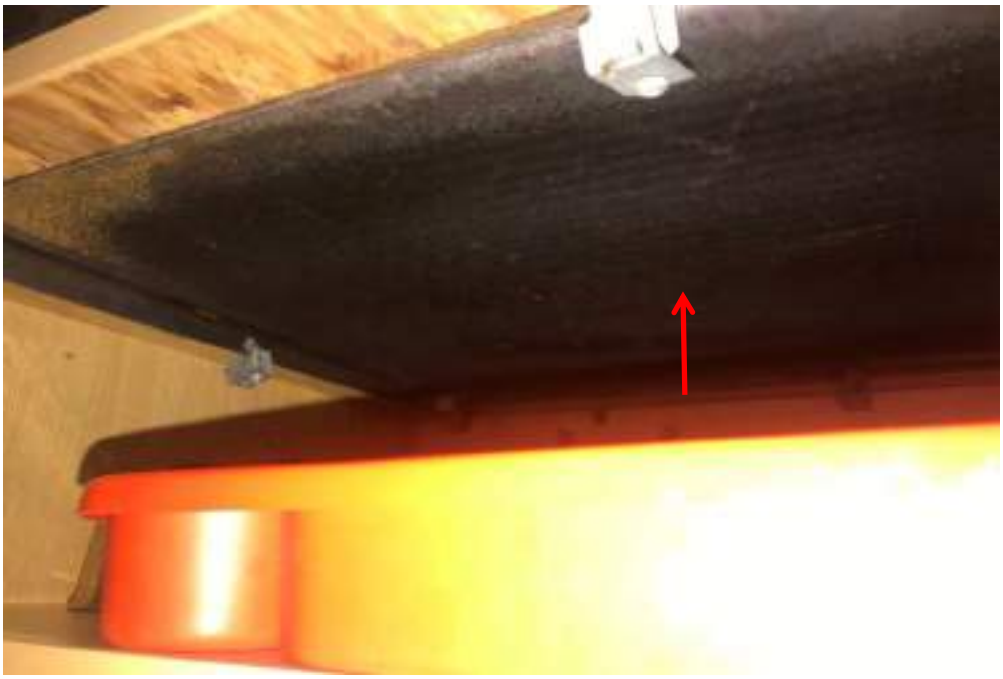
Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Hazardous Building Materials (HBM) Register** **Hastings Secondary College, Port Macquarie Campus**	PROJECT: 89754.01 PLATE No: 4 REV: A
	CLIENT: NSW Department of Education	DATE: Mar-20

Photograph 9: B00B, BR0012, teacher's desk, moulded sink, no asbestos detected by analysis, SMF detected.

Photograph 10: B00B, BR0019, portion of infill panels (type 3), fibre cement, asbestos detected by analysis.

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Hazardous Building Materials (HBM) Register** **Hastings Secondary College, Port Macquarie Campus**	PROJECT: 89754.01 PLATE No: 5 REV: A
	CLIENT: NSW Department of Education	DATE: Mar-20

Photograph 11: B00B, BR0020 / BR1023, exterior brick wall, expansion gap, grey putty, asbestos detected by analysis.



Photograph 12: B00B, BR1002, underside of sink, bituminous lining, asbestos detected by analysis.

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Hazardous Building Materials (HBM) Register** **Hastings Secondary College, Port Macquarie Campus** CLIENT: NSW Department of Education	PROJECT: 89754.01 PLATE No: 6 REV: A DATE: Mar-20

Photograph 13: B00B, BR1014, north wall, red building box, internal material(s), unknown.

Photograph 14: B00B, BR1015, southwest corner, building box, internal material(s), unknown.

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Hazardous Building Materials (HBM) Register** **Hastings Secondary College, Port Macquarie Campus**	PROJECT: 89754.01 PLATE No: 7 REV: A
	CLIENT: NSW Department of Education	DATE: Mar-20

Photograph 15: B00B, BR1017, green and grey kilns, insulation, no asbestos detected by analysis, SMF detected.

Photograph 16: B00B, BR1021, ceiling, fibre cement sheeting, asbestos detected by analysis.

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Hazardous Building Materials (HBM) Register** **Hastings Secondary College, Port Macquarie Campus**	PROJECT: 89754.01 PLATE No: 8 REV: A
	CLIENT: NSW Department of Education	DATE: Mar-20

Photograph 17: B00B, BR1021, top of ceiling, minor fibre cement sheeting debris, asbestos (assumed).

Photograph 18: B00B, BR1022, floor, below carpet, vinyl tile, asbestos detected by analysis.

Photograph 19: B00B, BR1023, floor below vinyl sheeting, possible vinyl tile containing asbestos, limited access for inspection.

Photograph 20: B00B, subfloor, ground surface, fibre cement fragment(s), asbestos detected by analysis.

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Hazardous Building Materials (HBM) Register** **Hastings Secondary College, Port Macquarie Campus**	PROJECT: 89754.01 PLATE No: 10 REV: A
	CLIENT: NSW Department of Education	DATE: Mar-20

Photograph 21: B00B, building subfloor, throughout, materials in general, access limited.

Photograph 22: B00B, exterior, northern façade, notice board, cream and underlying white paint, lead paint (>0.1% lead w/w).

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Hazardous Building Materials (HBM) Register** **Hastings Secondary College, Port Macquarie Campus**	PROJECT: 89754.01 PLATE No: 11 REV: A
	CLIENT: NSW Department of Education	DATE: Mar-20

Photograph 23: B00B, exterior, northern façade, timber seating, green and underlying cream paint, lead paint (>0.1% lead w/w).

Photograph 24: B00B, rooms and areas in general, fluorescent light fittings in general, capacitors, insulating oil, PCB (assumed).

Photograph 25: B00B, exterior, northern façade, notice board, flashing, positive for lead.

Appendix C

B00S - Register and Plates from DP (2020)

DP Project No: 89754.01
Hazardous Building Materials (HBM) Register
Hastings Secondary College, Port Macquarie Campus

						Asbestos Risk Assessment									
Building	Room / Area	Material Location	Material Type	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority	Photo No.	Summary Comment/Recommendation
B00S	exterior	eave linings	fibre cement	not provided in DoE asbestos register	**asbestos detected by analysis**	1	2	2	1	2	0	8	Low	N/A	Inaccessible due to current building/construction works which may include removal of eave linings. Material assumed to remain present as a precaution. Reinspect condition on a regular basis. Remove material prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00S	subfloor	packing to accessible brick pier	fibre cement	SR0002-EXT-A01	no asbestos detected by analysis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	No asbestos/hazardous materials identified.
B00S	subfloor	packing to brick piers generally	fibre cement	N/A	**may contain asbestos**	1	3	2	1	0	2	9	Low	similar 1	Inaccessible area/material - hazardous material(s)assumed present as a precaution. Confirm status of hazardous material(s) when safe access available and prior to any disturbance.
B00S	SR0002	walls throughout	undercoat paints	spot test 1	**positive for lead**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2	Areas of damaged/flaking lead paint and any associated debris should be removed and the building surfaces adequately sealed (e.g. overpainted) by a suitably qualified and experienced contractor. Avoid disturbance and implement controls to prevent exposure and dispersal during building work (e.g. maintenance, refurbishment and demolition). Waste contaminated with lead (including lead paint waste) from educational institutions is pre-classified as general solid waste (non-putrescible) under the NSW EPA Waste Classification Guidelines.
B00S	exterior	walls	white paint	spot test 2	**positive for lead**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Areas of damaged/flaking lead paint and any associated debris should be removed and the building surfaces adequately sealed (e.g. overpainted) by a suitably qualified and experienced contractor. Avoid disturbance and implement controls to prevent exposure and dispersal during building work (e.g. maintenance, refurbishment and demolition). Waste contaminated with lead (including lead paint waste) from educational institutions is pre-classified as general solid waste (non-putrescible) under the NSW EPA Waste Classification Guidelines.
B00S	rooms and areas in general	materials in general	paints	refer spot test 1 and 2	**may comprise lead paint (>0.1% lead w/w)**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Areas of damaged/flaking lead paint and any associated debris should be removed and the building surfaces adequately sealed (e.g. overpainted) by a suitably qualified and experienced contractor. Avoid disturbance and implement controls to prevent exposure and dispersal during building work (e.g. maintenance, refurbishment and demolition). Waste contaminated with lead (including lead paint waste) from educational institutions is pre-classified as general solid waste (non-putrescible) under the NSW EPA Waste Classification Guidelines.

DP Project No: 89754.01
Hazardous Building Materials (HBM) Register
Hastings Secondary College, Port Macquarie Campus

						Asbestos Risk Assessment									
Building	Room / Area	Material Location	Material Type	Sample No.	Material Status	Friability	Condition	Treatment	Accessibility	Activity	Ventilation	Risk Score	Action Priority	Photo No.	Summary Comment/Recommendation
B00S	rooms and areas in general	fluorescent light fittings in general, capacitors	insulating oil	N/A	**PCB (assumed)**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material - hazardous material(s)assumed present as a precaution. Confirm status of hazardous material(s) when safe access available and prior to any disturbance. Remove PCB containing capacitors prior to any significant disturbance (e.g. renovation, demolition or maintenance work).
B00S	rooms and areas in general	sheeted and framed walls	possible insulation materials	N/A	**SMF (assumed)**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Inaccessible area/material - hazardous material(s)assumed present as a precaution. Confirm status of hazardous material(s) when safe access available and prior to any disturbance. Remove SMF prior to any significant disturbance (e.g. renovation, demolition or maintenance work).

Photograph 1: B00S, subfloor, packing to accessible brick pier, fibre cement, no asbestos detected by analysis.

Photograph 2: B00S, SR0002, walls throughout, undercoat paints, positive for lead.

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Hazardous Building Materials (HBM) Register** **Hastings Secondary College, Port Macquarie Campus**	PROJECT: 89754.01 PLATE No: 1 REV: A
	CLIENT: NSW Department of Education	DATE: Mar-20