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21.04.21

Ref: SY202079-00-SL10-5

Currie & Brown
Martin Havdahl
Level 10, 3 Spring Street
Sydney NSW 2000

Dear Martin,

Re: Hastings Secondary College - Port Macquarie Campus - Structural Design Certificate for SSDA

Project Name.	Hastings Secondary College - Port Macquarie Campus Lot 111 DP1270315, 16 Owen St, Port Macquarie

Northrop Consulting Engineers have been engaged by Currie & Brown to undertake a review of architectural drawings submitted as part of the state significant Development Application for the above site.

We confirm having reviewed:

- architectural drawings numbered 100000-810502, revision 05, dated 16/04/2021 and prepared by FJMT and,
- BCA Report, reference no. 20246-BCADDA R01, prepared by METROBC and dated 21st January 2021.
- SSDA BCA Compliance Statement, prepared by METROBC and dated 16th April 2021.

Our review was general and aimed to confirm that the building depicted in the architectural DA submission can be readily constructed.

In our opinion, the structural engineering design could be developed in accordance with the relevant requirements of the Building Code of Australia (NCC 2019) and relevant referenced standards.

Yours faithfully,

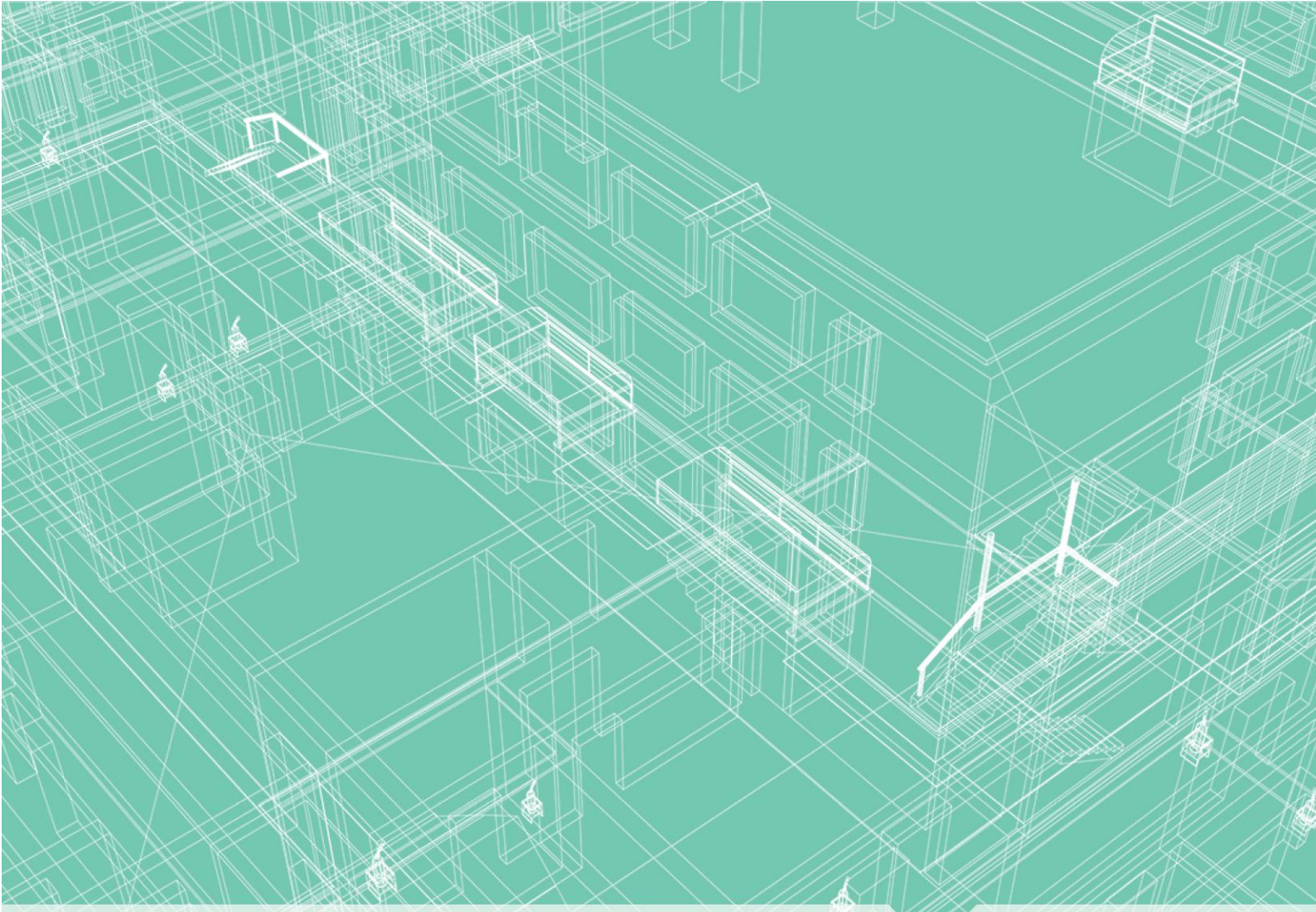
Bradley Whiting

Structural Engineer BE(Hons1) MIEAust CPEng NER

On behalf of Northrop Consulting Engineers Pty Ltd

Date	Rev	Issue	Author	Verifier

11.02.21	1	SSDA Certificate	B. Whiting	B. Whiting
05.03.21	2	SSDA Certificate	B. Whiting	B. Whiting
30.03.21	3	SSDA Certificate	B. Whiting	B. Whiting
16.04.21	4	SSDA Certificate	B. Whiting	B. Whiting
21.04.21	5	SSDA Certificate	B. Whiting	B. Whiting



NOISE & VIBRATION IMPACT ASSESSMENT FOR SSDA (SSD-11920082)

HASTINGS SECONDARY COLLEGE – PORT MACQUARIE CAMPUS

JHA

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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 – Port Macquarie Campus
Description	Noise & Vibration Impact Assessment for SSDA
Key Contact	Mathew McGrory

Prepared By

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Authorised	Tom Hamer

Revision History

Issued To	Revision and Date					
Currie & Brown	REV	P1	A	B	C	D
	DATE	22/02/2021	26/03/2021	06/04/2021	16/04/2021	20/04/2021
	REV	E	F			
	DATE	21/04/2021	14/05/2021			
	REV					
	DATE					

CONTENTS

1 INTRODUCTION

JHA Consulting Engineers has been commissioned by School Infrastructure NSW (SINSW) on behalf of the Department of Education (DOE) to prepare a noise and vibration impact assessment to accompany a development application (DA) 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 relate 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.

1.1 OVERVIEW

This Noise and Vibration Impact Assessment accompanies an Environmental Impact Statement in support of State Significant Development Application (SSD-11920082) for the site. The proposed development seeks consent for the following works at the site:

- Demolition of demountable spaces, landscape and removal of internal and external walls.
- Refurbishment of existing buildings B and L.
- Construction of new CAPA building and PCYC building.
- Associated landscaping.

It shall be noted that the upgrade of the school will not increase the students and staff population.

This report shall be read in conjunction with the Architectural design drawings and other consultant design reports submitted as part of the application. The objectives of this acoustic assessment are:

- Identify noise sensitive receivers that will potentially be affected by the operation and construction of the proposed development.
- 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 for the following noise emissions:
  - Mechanical plant from the development to the surrounding receivers.
  - Public address and school bell systems.
  - Activities within the PCYC building.
  - Construction works.
- Determine whether the relevant criteria can be achieved based on the proposed operations and construction methods. 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.

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

- Architectural drawings of the proposed development prepared by FJMT Architects
- Noise data collected on site through the use of noise loggers and a hand held spectrum analyser.
- Traffic Report prepared by Ason Group.

This document and related work has 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 RESPONSE TO SEARS

The acoustic report is required by the Secretary's Environmental Assessment Requirements (SEARs) for SSD-11920082. This table identifies the relevant SEARs and corresponding reference/s within this report.

SEARs Item	*Report Reference*
10. Noise and Vibration • *Provide a noise and vibration impact assessment that:*	
o *Includes a quantitative assessment of the main noise and vibration generating sources during demolition, site preparation, bulk excavation and construction.*	
o *Details the proposed construction hours and provides details of, and justification for, instances where it is expected that works would be carried out outside standard construction hours.*	
o *Includes a quantitative assessment of the main sources of operational noise, including consideration of any public-address system, school bell, mechanical services (e.g. air conditioning plant), use of any school hall for concerts etc. (both during and outside school hours) and any out of hours community use of school facilities.*	Section 5 and 6
o *Outlines measures to minimise and mitigate the potential noise impacts on nearby sensitive receivers.*	
o *Considers sources of external noise intrusion in proximity to the site (including, road rail and aviation operations) and identifies building performance requirements for the proposed development to achieve appropriate internal amenity standards.*	
o *Demonstrates that the assessment has been prepared in accordance with polices and guidelines relevant to the context of the site and the nature of the proposed development.*	
Relevant Policies and Guidelines: • *NSW EPA Noise Policy for Industry (2017).* • *Interim Construction Noise Guideline (DECC).* • *Assessing Vibration: A Technical Guideline 2006.* • *Australian Standard 2363 Acoustics – Measurement of noise from helicopter operations.*	Section 4

Table 1: SEARs and relevant references.

2 DESCRIPTION OF THE PROPOSAL

2.1 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.

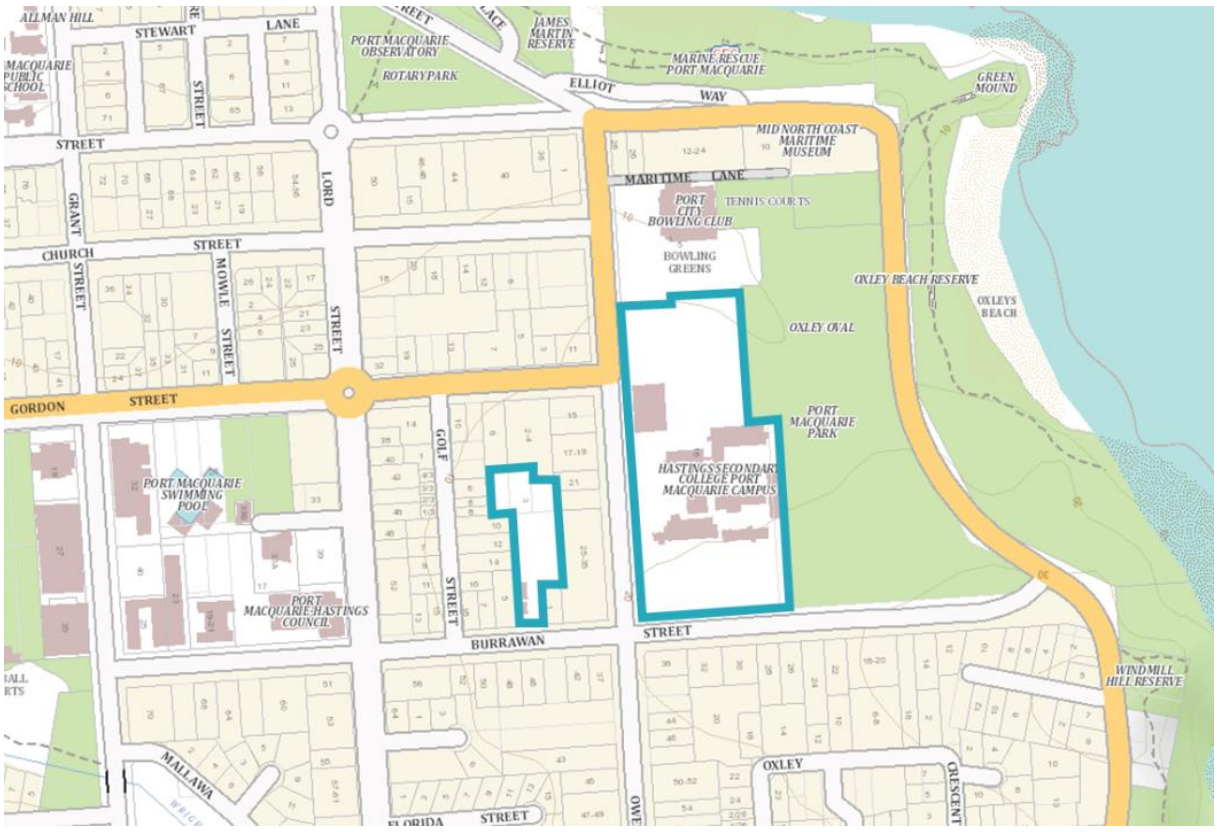


Figure 1: Map showing location of the Site.

2.2 PROPOSED WORKS

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.

2.3 SURROUNDING RECEIVERS

A summary of the nearest noise sensitive receivers surrounding the site is shown in Table 2, including approximate distances from the buildings with noise sources to the receiver boundaries, noting the type of noise receiver.

ID	*Sensitive Receiver*	*Receiver Type*	*Distance (m)*
1	Port City Bowling Club	Active Recreational	6
2	Oxley Oval	Active Recreational	50
3	28 Burrawan Street	Medium Residential (R3)	140
4	29 Owen Street	General Residential (R1)	30
5	1 Gordon Street	Medium Residential (R3)	30

Table 2: Nearest sensitive receivers surrounding the site location.

Figure 2 shows the location of the Hastings Secondary College site and the nearest noise sensitive receivers as described in table above.

Figure 2: Aerial view of the site showing location of Hastings Secondary College and nearest noise sensitive receivers.

It is noted that if noise impacts associated with the proposed development are controlled at the nearest noise sensitive receivers, then compliance with the recommended noise criteria at all noise sensitive receivers will 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 3.

Location	Date and Time	Parameter	Sound Pressure Level, dB re 20µPa								
			Overall dB(A)	Octave Band Centre Frequency, 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 3: 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 4 , together with the ambient noise levels (L_{Aeq}) measured for each period. Traffic noise monitoring results are shown in Table 5 below.

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 4: Results of long-term noise monitoring.

Location	Period, dB(A)		Noisiest 1 Hour Period, dB(A)	
	Day $L_{Aeq,15h}$	Night $L_{Aeq,9h}$	Day $L_{Aeq,1h}$	Night $L_{Aeq,1h}$
L1	60	56	66	59

Table 5: Results of long-term traffic noise monitoring.

4 RELEVANT NOISE STANDARDS AND GUIDELINES

4.1 STANDARDS AND GUIDELINES

The following standards and guidelines are considered relevant to the project and have been referenced in developing the project noise level criteria.

- Regulatory Framework
  - Environmental Planning and Assessment (EP&A) Act 1979.
  - Protection of the Environmental Operations (POEO) Act 1997.
- Planning
  - Port Macquarie-Hastings Council Local Environmental Plan (PMH-LEP) 2011.
  - Port Macquarie-Hastings Council Development Control Plan (PMH-DCP) 2013.
- Noise Emissions and Intrusions
  - NSW EPA Noise Policy for Industry (NPI) 2017.
  - Educational Establishments and Child Care Facilities State Environmental Planning Policy (ESEPP) 2017.
  - NSW Department of Education. Educational Facilities Standards and Guidelines (EFSG) – Section DG11.
  - NSW Department of Planning, Development Near Rail Corridors or Busy Roads – Interim Guideline 2008.
- Demolition and Construction Noise and Vibration
  - NSW DECCW Interim Construction Noise Guideline (ICNG) 2009.
  - NSW DEC Assessing Vibration: A Technical Guideline 2006.
  - Australian Standard AS 2436:2010 '*Acoustics – Guide to Noise Control on Construction, Maintenance & Demolition Sites*'.

4.2 REGULATORY FRAMEWORK

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 use 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).

The Protection of the Environment Operations (POEO) Act 1997 has the objective of protecting, restoring and enhancing the quality of 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.

..."

4.3 PLANNING FRAMEWORK

Relevant planning documents of Port Macquarie-Hastings Council Legislation have been reviewed for any noise requirement or criteria.

The Port Macquarie-Hasting Local Environmental Plan (PMH-LEP 2011) sets the land zoning for the site and surrounds as per land zoning map 6300_COM_LZN_013FA_010_20180419. The site boundary and approximate proposed development site location are shown in Figure 4.

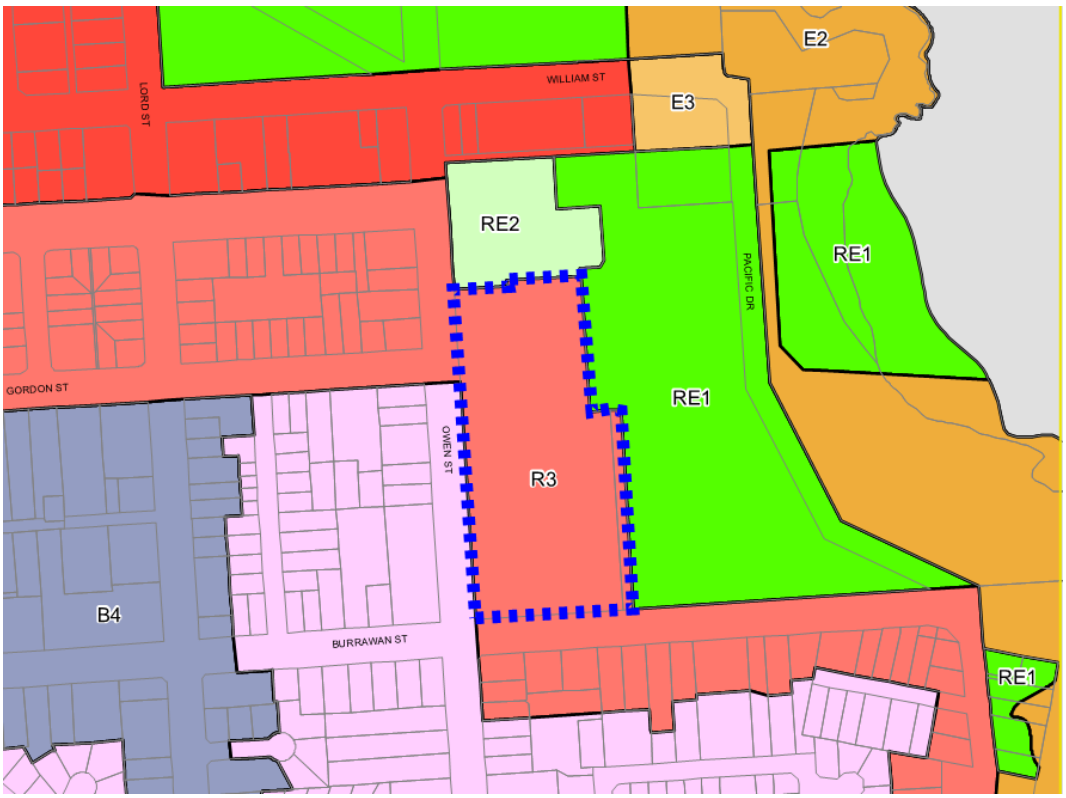


Figure 4: PMH-LEP 2011 land zoning map with the site boundary and location of proposed development.

The Port Macquarie-Hastings Council Development Control Plan (PMH-DCP 2013) has been reviewed and no information that is relevant to the development has been found.

4.4 NOISE EMISSIONS AND INTRUSIVE NOISE

4.4.1 NSW EPA NOISE POLICY FOR INDUSTRY

The NSW EPA Noise Policy for Industry (NPI) 2017 assesses noise from industrial noise sources - scheduled under the POEO. Mechanical noise from the development shall be addressed following the recommendations in the NSW NPI. The use of the noise monitoring procedures and background noise assessment methodology are commonly recommended by other relevant guidelines.

The assessment is carried out based on the existing ambient and background noise levels addressing the following:

- Intrusiveness Criteria, to control intrusive noise into nearby sensitive receivers.
- Amenity Criteria, to maintain the noise level amenity for particular land uses.

These criteria are established for each assessment period (day, evening and night) and the more stringent of the two criteria sets the Project Noise Trigger Level (PNTL).

4.4.1.1 Intrusiveness Criteria

The NSW NPI defines the intrusiveness criteria as follows:

"The intrusiveness of an industrial noise source may generally be considered acceptable if the level of noise from the source (represented by the L_{Aeq} descriptor), measured over a 15 minute period, and does not exceed the background noise level by more than 5dB when beyond a minimum threshold."

Based on the intrusiveness criteria definition and the estimated background noise levels on site, Table 6 shows the intrusiveness criteria for the noise sensitive receivers.

Indicative Noise Amenity Area	*Period*	*Rating Background Level $L_{A90,period}$ dB(A)*	*Intrusiveness Criteria $L_{Aeq,15min}$ dB(A)*
Medium Density Residential (R3) and General Residential (R1)	Day	45	50
	Evening	39	44
	Night	38	43

Table 6: Determination of the intrusiveness criteria for residential noise sensitive receivers.

4.4.1.2 Amenity Criteria

The NSW NPI states the following to define the amenity criteria:

"To limit continuing increases in noise levels from application of the intrusiveness level alone, the ambient noise level within an area from all industrial noise sources combined should remain below the recommended amenity noise levels specified in Table 2.2 where feasible and reasonable. The recommended amenity noise levels will protect against noise impacts such as speech interference, community annoyance and some sleep disturbance."

Based on the land zoning of the noise sensitive receivers plus amenity criteria definition, Table 7 shows the amenity criteria for the noise sensitive receivers.

Indicative Noise Amenity Area	*Period*	*Amenity Noise Level $L_{Aeq,period}$ dB(A)*	*Adjusted Amenity Criteria $L_{Aeq,15min}$ dB(A)*
Medium Density Residential (R3)	Day	55	53 (55-5+3)
	Evening	45	43 (45-5+3)
	Night	40	38 (40-5+3)
General Residential (R1)	Day	60	58 (60-5+3)
	Evening	50	48 (50-5+3)
	Night	45	43 (45-5+3)
Active Recreation (RE1)	When in use	55	53 (55-5+3)

Table 7: Determination of amenity criteria for noise sensitive receivers.

4.4.1.3 Project Noise Trigger Levels

The PNTL's are shown in Table 8 and have been obtained in accordance with the requirements of the NSW NPI. These shall be assessed to the most affected point on or within the noise sensitive receiver boundary.

Indicative Noise Amenity Area	*Period*	*Intrusiveness Criteria, $L_{Aeq,15min}$ dB(A)*	*Amenity Criteria, $L_{Aeq,15min}$ dB(A)*
Medium Density Residential (R3)	Day	50	53
	Evening	44	43
	Night	43	38
General Residential (R1)	Day	50	58
	Evening	44	48
	Night	43	43
Active Recreation (RE1)	When in use		55

Table 8: Determination of PNTL's (light grey highlight) for noise sensitive receivers.

4.4.2 EDUCATIONAL ESTABLISHMENTS AND CHILD CARE FACILITIES

Under the Schedule 2 Schools of the EECCF SEPP, Clause 6 establishes the following:

"A new building or (if the development is an alteration or addition to an existing building for the purpose of changing its use) an existing building that is to be used for the purpose of a school or school-based child care must be designed so as not to emit noise exceeding an L_{Aeq} of 5dB(A) above background noise when measured at any lot boundary."

This noise level criterion will be applied for operating hours of the development – day-time and evening time period. Based on the long-term unattended noise results of background noise levels, following table shows the noise level criteria for operational noise.

Period	*Measured Rating Background Level (RBL), L_{A90} dB(A)*	*Operational Noise Level Criteria, L_{Aeq} dB(A)*
Day (7am-6pm)	45	50
Evening (6pm-10pm)	39	44

Table 9: Operational Noise Level Criteria.

4.4.3 EFSG DG11

The design of the school shall ensure that noise emissions associated with operational events of completed buildings are controlled to achieve appropriate levels at neighbouring noise sensitive receivers.

At the same time, the total noise level within the spaces will be a result of the combination of external noise intrusion and background noise from the building services. The EFSG DG11 provides internal noise levels that should be achieved within educational facilities which are required to be met. Therefore, the criteria outlined in EFSG DG11 have been adopted for this project.

4.5 TRANSPORT NOISE

4.5.1 NSW ROAD NOISE POLICY

The NSW Road Noise Policy (RNP) establishes criteria for traffic noise from:

- Existing roads,
- New road projects,
- Road development projects,
- New traffic generated by developments.

For existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level should be limited up to 2.0dB above the existing noise levels. An increase of up to 2.0dB represents a minor impact that is considered barely perceptible to the average person.

4.5.2 DEVELOPMENT NEAR RAIL CORRIDORS OR BUSY ROADS – INTERIM GUIDELINE

The guideline details the application of clauses 85, 86, 87, 102 and 103 of the Infrastructure State Environmental Planning Policy (SEPP) which is required to be used when a development is adjacent to a rail corridor, a freeway, a toll-way, a transit-way or a road with an Annual Average Daily Traffic volume (AADT) of more than 40,000 vehicles.

At this stage, as per NSW Roads & Maritime Services traffic volume data, roads surrounding the campus have an AADT lower than 40,000 vehicles. Also the campus is not adjacent to a rail corridor. Therefore, we understand that NSW DoP *'Development near Rail Corridors and Busy Roads – Interim Guideline'* guideline does not apply to the project.

4.5.3 HELICOPTER NOISE

The Australian Standard 2363:1999 *'Acoustics – Measurement of noise from helicopter operations'* has been included in the relevant policies and guidelines from the SEARs. This standard provides methods for the measurement of noise from existing or proposed helicopter landing sites and helicopter overflights.

The nearest helicopter landing site is the Port Macquarie Hospital (≈4.3km) to the Southwest. Based on the distance between the site and the helicopter landing site plus the helicopter flying paths, we understand that helicopter noise will not impact in the proposed development and therefore, neither a helicopter noise assessment nor the standard apply to the project.

4.5.4 AIRCRAFT NOISE

As per information obtained from Port Macquarie Airport Master Plan 2010, it can be confirmed that the proposed development is located outside the Australian Noise Exposure Forecast (ANEF) contours. Therefore, as per AS 2021:2015 *'Acoustics – Aircraft Noise Intrusion – Building Sitting and Construction'*, the building site is considered acceptable and there is no requirement to carry out an aircraft noise assessment. Appendix B contains the Port Macquarie Airport ANEF contours.

4.6 CONSTRUCTION NOISE AND VIBRATION

4.6.1 NOISE CRITERIA

The DECC's Interim Construction Noise Guideline (ICNG) suggests construction Noise Management Levels (NML) that may minimise the likelihood of annoyance being caused to noise sensitive receivers depending on the works. Table 10 contains the NML's details for residential receivers as per ICNG.

Time of Day	*NML $L_{Aeq,15min}$*	*How to Apply*
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.
Outside Recommended Standard Hours	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 10: ICNG construction airborne noise criteria for residential receivers surrounding the construction site.

ICNG additionally suggests construction noise management levels for noise sensitive land other than residential surrounding construction sites. Refer to Table 11 for the noise management levels of non-residential receivers.

Land use	*Management level, $L_{Aeq\ (15min)}$ (applies when properties are being used)*
Classrooms at schools and other educational institutions	Internal noise level 45dB(A)
Active recreation areas	External noise level 65dB(A)

Table 11: ICNG construction airborne noise criteria for sensitive receivers surrounding the construction site.

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 receivers. The ground-borne noise levels presented below from the ICNG are for residential receivers 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 with doors and windows closed.

4.6.2 VIBRATION CRITERIA

4.6.2.1 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 address vibration induced damage to structures or structure-borne noise effects. Vibration and its associated effects are usually classified as continuous (with magnitudes varying or remaining constant with time), impulsive (such as shocks) or intermittent (with the magnitude of each event being either constant or varying with time). Vibration criteria for continuous and impulsive vibration are presented in Table 12 below, in terms of vibration velocity levels.

Place	*Time*	*r.m.s. velocity, mm/s [dB ref 10^{-9}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]
Educational	When in use	0.40 [112 dB]	0.80 [118 dB]	13.00 [142 dB]	26.00 [148 dB]

Table 12: Continuous and impulsive vibration criteria applicable to the site

When assessing intermittent vibration comprising a number of events, the Vibration Dose Value (VDV) it is recommended to be used. Table 13 shows the acceptable VDV values for intermittent vibration.

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

Table 13: Intermittent vibration criteria applicable to the site.

4.6.2.2 Structural Building Damage

Ground vibration from construction activities can damage surrounding buildings or structures. For occupied buildings, the vibration criteria given in previous section for Human Comfort shall generally form the limiting vibration criteria for the Project.

For unoccupied buildings, or during periods where the buildings are unoccupied, the vibration criteria for building damage suggested by German Standard DIN 4150.3:1993 '*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 4150.3:1993 and BS 7385.2:1993 are presented in Table 14 and Table 15 respectively.

Structural type	*r.m.s. velocity, mm/s*			
	Foundation			*Plane of floor uppermost full storey*
	Less than 10Hz	*10 to 50Hz*	*50 to 100Hz*	*Frequency mixture*
Dwellings or similar	5	5 to 15	15 to 20	15
Particularly sensitive	3	3 to 8	8 to 10	8

Table 14: DIN 4150.3:1993 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 15: BS 7385.2:1993 Guideline values of vibration velocity for evaluating cosmetic damage.

5 OPERATIONAL NOISE EMISSIONS ASSESSMENT

Noise break-out from the proposed development has the potential to impact on existing noise sensitive receivers. For the purpose of this noise impact assessment, the noise sources are assumed as follows:

- Noise emissions from mechanical plant.
- Noise emissions from recess and lunch bells, public address systems.
- Noise emissions from use of PCYC building.
- Noise impact of traffic generated by the development.

Each of these noise sources has been considered in the noise impact assessment. The noise impact assessments have also considered the following:

- Noise levels have been considered as continuous over assessment time period to provide the worst-case scenario.
- Distance attenuation, building reflections and directivity.
- Worst-case time period assessment.

5.1 EXTERNAL MECHANICAL PLANT

Noise from proposed development mechanical plant rooms should be controlled to ensure external noise emissions are not intrusive and do not impact on the amenity of the noise sensitive receivers.

At this stage, mechanical plant selections have not been made; therefore, it is not possible to undertake a detailed assessment of the mechanical plant noise emissions.

Noise controls will need to be incorporated with the design of the mechanical plant rooms to ensure that the cumulative noise levels from plant to the nearest noise sensitive receivers meets the NSW NPI noise level criteria – refer to Section 4.4.1.

Usual design noise controls that may need to be implemented will typically include, but are not limited to:

- Strategic location and selection of mechanical plant to ensure the cumulative noise levels at the receiver boundaries are met.
- Selection of appropriate quiet plant.
- Acoustic noise control measures to be put in place to minimise noise impacts such as:
  - In-duct attenuation
  - Noise enclosures as required
  - Sound absorptive panels
  - Acoustic louvres as required
  - Noise barriers as required

Acoustic assessment of all mechanical plant shall continue during the detailed design phase of the project in order to confirm any noise control measures to achieve the relevant noise criteria at the nearest noise sensitive receivers.

5.2 PUBLIC ADDRESS AND SCHOOL BELL SYSTEMS

Noise from proposed development public address and school bell systems should be controlled to ensure external noise emissions are not intrusive and do not impact on the amenity of noise sensitive receivers.

At this stage, public address and school bell systems selections have been not made; therefore, it is not possible to undertake a detailed assessment of the public address and school bell noise emissions.

The EPA notes numerous reports of community concern arising from inadequate design and installation as well as inappropriate use of school public address and bell systems. EPA considers that appropriate design, installation and use of those systems can both:

- Meet the proponent's objectives of proper administration of the school and ensuring safety of students, staff and visitors, and
- Avoid interfering unreasonably with the comfort and repose of occupants of nearby residences.

The Public Address and School Bell Systems shall be designed, installed and operated such that the systems does not interfere unreasonably with the comfort and repose of occupants of nearby residences. It is anticipated that the noise impact to the nearest sensitive receivers will be negligible if following measures are implemented:

- Low-powered horn-type speakers shall be located and orientated to provide a good coverage of the school areas whilst being directly away from residences and near sensitive receivers. System coverage shall be reviewed during the detailed design phase.
- Speakers shall be mounted with a downward angle and as close to the floor as possible.
- The noise level of the systems shall be adjusted on site so they will be clearly audible on the school site without being excessive. The systems shall initially be set sot that the noise at nearby residences and sensitive receivers do not exceed noise level criteria.
- Once the appropriate noise level has been determined on site, the systems shall be limited to these noise levels so that staff cannot increase the noise levels.
- The systems shall be set so that it only occurs on school days.

5.3 PCYC ACTIVITIES

Activities within the PCYC building could potentially have a noise impact to the nearest noise sensitive receivers. The PCYC building will comprise:

- Police Citizens Youth Club (PCYC).
- Multipurpose Sporting Courts.
- Gymnasium.
- Multipurpose Rooms.
- Meeting Rooms.
- Ancillary Spaces.

The PCYC facilities will be used by students during school hours for activities such as indoor sport and fitness. Also they will be used by community groups during school hours and outside of school hours. Operating hours of the PCYC premises are from 6am to 10pm, 7 days per week.

To assess the potential noise impacts at the nearest noise sensitive receivers from indoor activities within PCYC, the following worst-case operation noise sources have been assumed during evening time:

- Indoor sport games with spectators in Multipurpose Sporting Courts.
- Dance / Disco event in Multipurpose Rooms.

It shall be noted that noise leakage via natural ventilation openings will be critical. Therefore, the sound insulation rating for natural ventilation openings is required to match that for the façade / roof. Attenuated air intakes (at low level in the façade) and outlets (at roof level) are required to achieve this sound insulation rating.

The following assumptions have been made for the assessments:

- All noisy activities in the Multipurpose Sporting Courts and Multipurpose Rooms will commence after 7am and will end by 10pm.
- Noise levels have been considered as continuous over a 15-minute assessment period to provide a worst-case scenario.
- The noise assessment has considered the proposed layout as shown on the architectural drawings.
- Building shielding and distance attenuation.
- Nearest residential noise sensitive receiver is 1 Gordon Street which is approximately at 30m to the west.

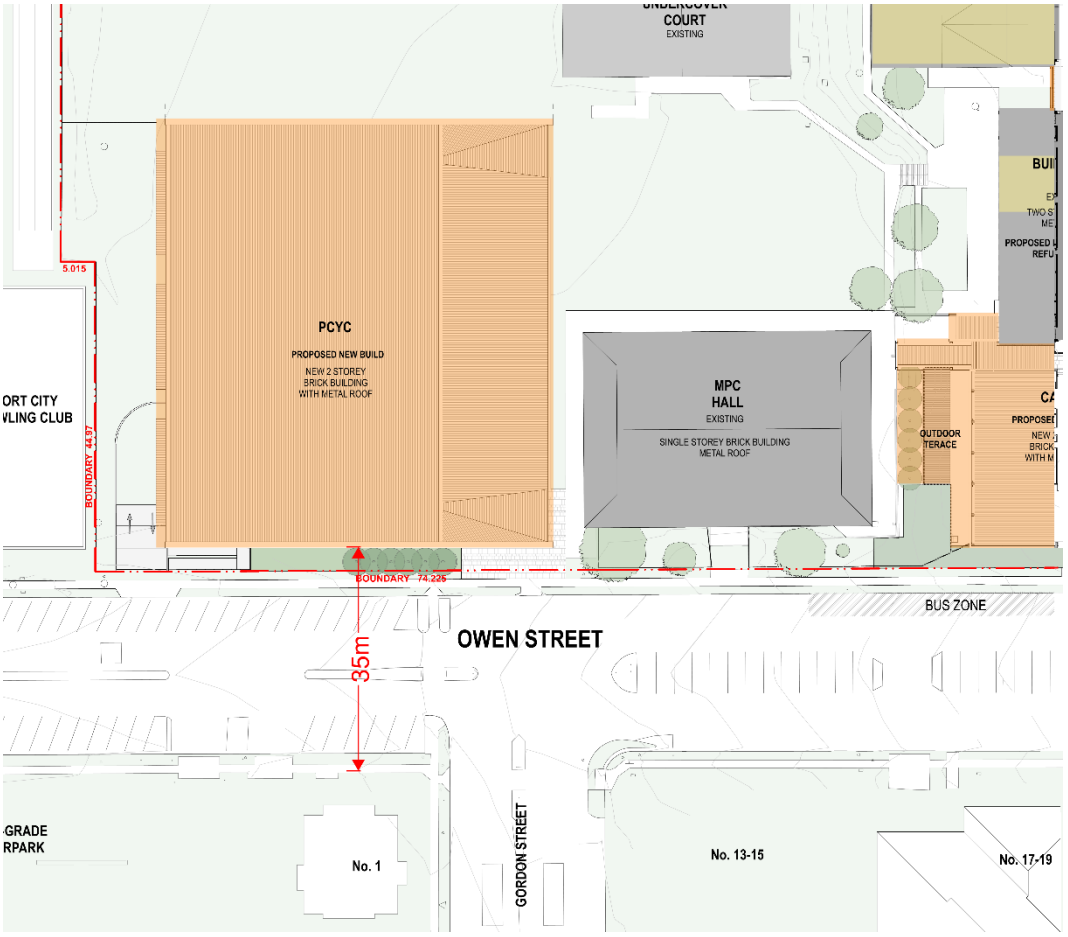


Figure 5: PCYC Building and distance to boundary of nearest residential noise sensitive receiver.

Noise break-out from indoor sport games with spectators in the Multipurpose Sporting Courts is assessed at the nearest residential receiver. At this stage, the PCYC building western façade comprises a combination of masonry and glazing, being the glazing the weakest component. The roof is metal roof sheeting.

Calculation	*Sound Pressure Level*
Reverberant Internal Noise Level of indoor sport games $L_{Aeq,15min}$, dB(A)	84
Building fabric sound reduction, dB	-30
Distance attenuation, dB	-31
Predicted noise level at nearest receiver, $L_{Aeq,15min}$ dB(A)	23
Noise Level Criteria (Evening-time), $L_{Aeq,15min}$ dB(A)	44 / Yes

Table 16: Predicted noise levels from Multipurpose Sporting Courts during indoor games with spectators.

Given the result of the assessments above, operational noise from the Multipurpose Sporting Courts is expected to meet the required criteria during the evening time (6pm – 10pm) at residential receivers if windows and doors are closed.

At this stage, Multipurpose Rooms are located in the upper level facing south and there is direct line-of-sight with nearby residential receivers. The building fabric comprises a combination of mostly glazing with cladding and the roof is metal roof sheeting.

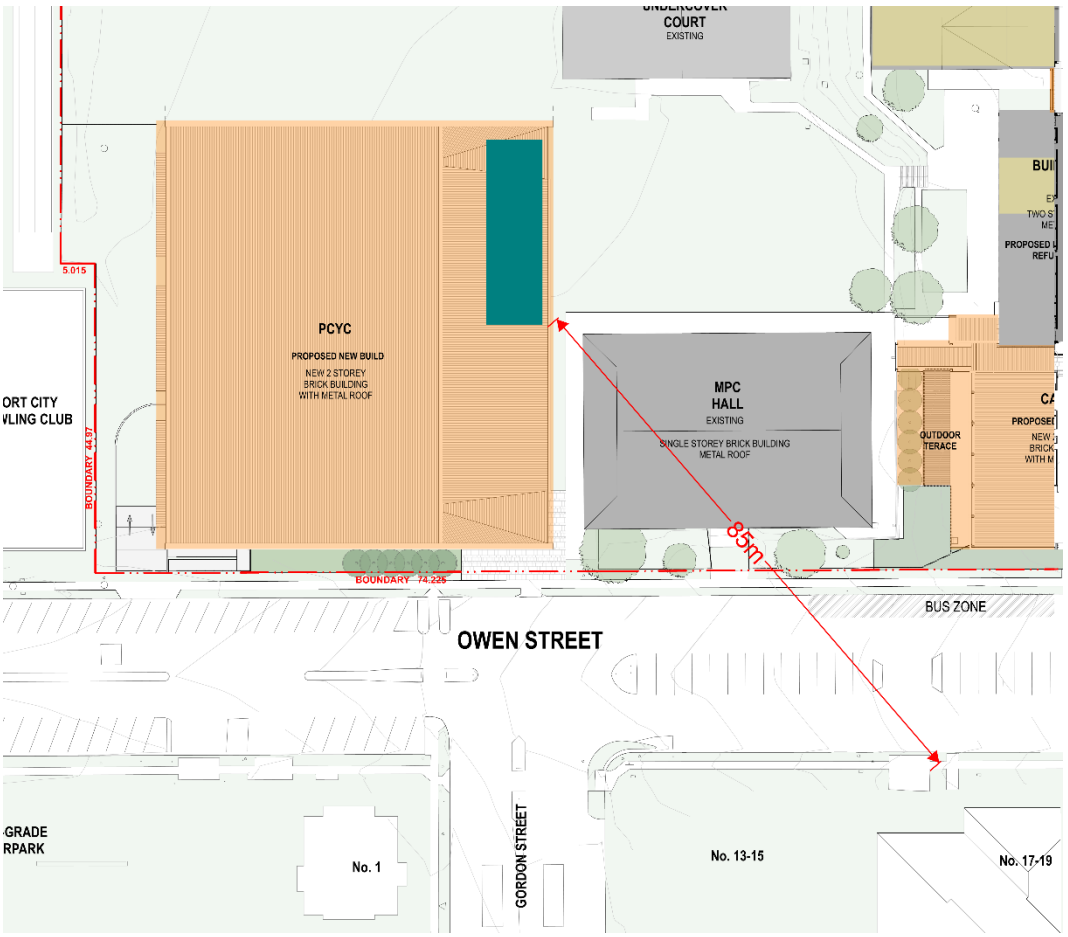


Figure 6: PCYC Building with location of Multipurpose Rooms plus distance to boundary of nearest residential noise sensitive receiver.

Noise impact assessment of noise break-out from Dance / Disco events in Multipurpose Rooms is presented in Table 17.

Calculation	*Sound Pressure Level*
Reverberant Internal Noise Level of dance / disco event $L_{Aeq,15min}$, dB(A)	94
Building fabric sound reduction, dB	-30
Distance attenuation, dB	-39
Predicted noise level at nearest receiver, $L_{Aeq,15min}$ dB(A)	25
Noise Level Criteria (Evening-time), $L_{Aeq,15min}$ dB(A)	44 / Yes

Table 17: Predicted noise levels from Multipurpose Rooms during Disco / Dance events.

Given the result of the assessments above, operational noise from Dance / Disco events in the Multipurpose Rooms is expected to meet the required criteria during the evening time (6pm – 10pm) at residential receivers if windows are closed.

Acoustic design of the building fabric and ventilation openings of the PCYC building will need to be considered throughout the detailed design stage in order to meet the noise level criteria in the nearest noise sensitive receivers.

5.4 TRAFFIC NOISE GENERATED

A traffic generation noise assessment has been undertaken in order to determine the potential noise impact of traffic generated by the PCYC, as there will not be an increase in the student and staff population.

As noted in Section 4.5.1, when considering land use development and the impact on sensitive land uses, the NSW RNP states that an increase up to 2.0dB in relation to existing noise levels is anticipated to be insignificant.

Based on the traffic report prepared by Ason Group, the additional vehicle trips from the PCYC post development are presented in Table 18.

	Existing	*Post development*	*dB*
PM Peak Traffic Flow (vehicles/hour)	481	585	0.85

Table 18: Predicted traffic noise level increase for the roads around the PCYC (2021 – post development).

Based on the assessment shown above, traffic generated as a result of the proposed school development is not expected to exceed the criteria of 2.0dB increase based as per the NSW RNP.

6 NOISE INTRUSSION ASSESSMENT

Traffic noise from Owen Street will affect the proposed development. In order to meet the EFSG DG11 internal noise levels requirements, JHA has carried out a review of traffic noise impacts with the following assumptions:

- Noise levels are based on measurement data for the worst-case 1-hour noise level – refer to Table 5.
- Internal noise levels are predicted based on levels incident at the façade of each space, which are based on unattended results.
- Attenuation provided by the façade construction, with the weakest elements being external glazing.
- Internal noise levels have been considered for two scenarios:
  - Windows closed.
  - Windows opened sufficiently to provide cross ventilation, where it is understood that the open area requirements for natural ventilation (5% of floor area) will be provided.

From the assessment, JHA has identified that achieving internal noise levels in accordance with EFSG DG11 will typically require the following:

- Windows to be kept closed where required.
- External glazing will be designed to control traffic noise intrusion as required.

Acoustic design of the glazing and building fabric of the relevant buildings will need to be considered throughout the detailed design stage in order to ensure the requirements of EFSG DG11 are achieved.

7 CONSTRUCTION NOISE AND VIBRATION PLANNING

Currently the project is at an early design stage and a detailed construction program is not yet full defined. This section of the Construction Noise and Vibration Planning provides general recommendations only and provides applicable criteria together with best noise and vibration control practices to be observed during the construction of the proposed development.

This preliminary advice in relation to construction noise and vibration management shall form the basis for the Contractor's Construction Noise and Vibration Management Plan (CNVMP).

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

7.1 RELEVANT STANDARDS FOR CONSTRUCTION NOISE AND VIBRATION CRITERIA

Section 4.6 of this report contains the relevant legislation, codes and standards plus construction noise and vibration criteria for this project.

7.2 WORKING HOURS

The following construction hours are proposed as follows:

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

7.3 PRELIMINARY CONSTRUCTION NOISE AND VIBRATION ASSESSMENT

At this stage, there is no information regarding construction plant / equipment plus work activities / duration. Therefore, a preliminary construction noise and vibration assessment has been carried out in order to identify the likely potential impact of various generic construction plant / equipment on sensitive receivers surrounding the site. The Contractor will be responsible for preparing a Works Plan and Schedule which include all relevant noise and vibration information, plus a CNVMP.

7.3.1 NOISE

The key noise sources on site during demolition and construction stages will be from heavy plant / equipment such as excavators, bulldozers, hand held pneumatic tools, grinders, etc. It is anticipated that the key construction activities to occur are as follows:

- Site establishment.
- Demolition, excavation, foundation and piling.
- Structure, façade and fit-out works.
- Landscaping.

A detailed noise assessment shall be carried out for the CNVMP when details for the construction plant, equipment plus activities and duration will be known.

Assumed noise levels are based on the database published by the UK Department for Environmental, Food and Rural Affairs (DEFRA) & Australian Standard AS2436:2010 *'Guide to Noise Control on Construction, Maintenance & Demolition Sites'* for a 15-minute period.

The expected construction noise sources and the predicted noise levels at the nearest residential receivers are shown below in Table 19.

Item	*Typical Power Noise Level L_{A10} (dB ref 1pW)*	*Typical Noise Level $L_{A10,15m}$ at 7m (dB ref 20μPa)*	*Predicted Noise Level $L_{Aeq,15m}$ at nearest residential receiver*	*Complies with Highly Noise Affected Criteria?*
Angle grinders	104	76	58 – 66	Yes
Truck (>20 tonne)	108	80	62 – 70	Yes
Circular saw	115	87	69 – 77	No
Piling rig	120	92	74 – 82	No
10-40tn Excavator	117	89	71 – 79	No
40-50tn Mobile crane	111	83	65 – 73	Yes
Concrete pump	114	86	68 – 76	No
Concrete truck	110	82	64 – 72	Yes
Drill	94	66	48 – 56	Yes

Table 19: Anticipated airborne noise levels for equipment / plant used during construction works.

Based on the results of the preliminary assessment as shown above, the noise associated with the normal construction works is expected to exceed the noise limits for highly noise affected receivers within standard hours. This assessment is based on typical noise levels associated with construction sites and machinery.

Nevertheless, compliance with the relevant construction noise criteria can be achieved through specific noise mitigation measures. These noise mitigation measures are to be provided in a detailed CNVMP and prepared by a qualified acoustic consultant prior to Construction Certificate.

7.3.2 VIBRATION

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 for typical construction plant are provided in Table 20.

Plant Item	*Description*	*Cosmetic Damage*	*Human Response*
Small Hydraulic Hammer	5-12 tonne	2m	7m
Medium Hydraulic Hammer	12-18 tonne	7m	23m
Large Hydraulic Hammer	18-34 tonne	22m	73m
Vibratory Pile Driver	Sheet piles	2-20m	20m
Pile Boring	<800mm	2m	N/A
Jackhammer	Hand held	1m	Avoid Contact with Structure

Table 20: Recommended minimum working distances for vibration intensive plant from sensitive receivers.

If Contractor has concerns for the disruptions at nearest sensitive receivers 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.

The preliminary vibration survey and assessment will determine whether the vibration levels might exceed the relevant criteria then vibration mitigation and management measures will need to be put in place to ensure vibration impacts are minimised as far possible.

7.4 CONTROL ELEMENTS

In order to meet the noise and vibration requirements of the site, the Contractor will be required to engage a qualified acoustic consultant to assist in the compilation of a CNVMP, and undertake noise and vibration monitoring for the duration of the project.

7.4.1 GENERAL CONTROL ELEMENTS

As a general rule, minimising noise and vibration should be applied as universal work practice at any time of day, but especially for any construction works to be undertaken at critical times outside normal daytime or weekday periods. Therefore, it is recommended that noisy construction works will not be undertaken between 6am and 7am in order to minimise any sleep disturbance to the nearest residential receivers.

It is noted that the reduction of noise and vibration at the source and the control of the transmission path between the construction site and the receiver(s) are the preferred options for noise minimisation. Providing treatments at the affected receivers should only be considered as a last resort. Construction noise and vibration shall be managed by implementing the strategies listed below:

- *Plant and equipment*. In terms of both cost and results, controlling noise and vibration at the sources is one of the most effective methods of minimising the impacts from any work site activities. Work practices that will reduce noise and vibration at the source include:
  - Employing quieter techniques for all high noise activities such as rock breaking, concrete sawing, and using power and pneumatic tools.
  - Use quieter plant and equipment based on the optimal power and size to most efficiently perform the required tasks.
  - Selecting plant and equipment with low vibration generation characteristics.
  - Operate plant in a quietest and most effective manner.
  - Where appropriate, limit the operating noise of equipment.

  - Regularly inspecting and maintain plant and equipment to minimise noise and vibration level increases, to ensure that all noise and vibration reduction devices are operating effectively.
- *On site noise management.* Practices that will reduce noise from the site include:
  - Maximising the distance between noise activities and noise sensitive receivers. Strategically locate equipment and plant.
  - Undertaking noisy fabrication work off-site where possible.
  - Avoid the use of reversing beeping alarms or provide for alternative systems, such as broadband reversing alarms, particularly during night or out-of-hours works.
  - Maintaining any pre-existing barriers or walls on a demolition or excavation site as long as possible to provide optimum sound propagation control.
  - Constructing barriers that are part of the project design early in the project to afford mitigation against site noise.
  - Using temporary site building and material stockpiles as noise barriers. These can often be created using site earthworks and may be included as a part of final landscape design.
  - Installing purpose built noise barriers, acoustic sheds and enclosures.
- *Work scheduling.* Scheduling work during periods when people are least affected is an important way of reducing adverse impacts. The following scheduling aspects may reduce impacts:
  - Provide respite periods, including restricting very noisy activities to daytime, restricting the number of nights that after-hours work is conducted near residences, or by determining any specific requirements, particularly those needed for noise sensitive receivers.
  - Scheduling activities to minimise impacts by undertaking all possible work during hours that will least adversely affect sensitive receivers and by avoiding conflicts with other scheduled events.
  - Scheduling work to coincide with non-sensitive periods.
  - Scheduling noisy activities to coincide with high levels of neighbourhood noise so that noise from the activities is partially masked and not as intrusive.
  - Planning deliveries and access to the site to occur quietly and efficiently and organising parking only within designated areas located away from sensitive receivers.
  - Optimising the number of deliveries to the site by amalgamating loads where possible and scheduling arrivals within designated hours.
  - Designating, designing and maintaining access routes to the site to minimise impacts.
  - Including contract conditions that include penalties for non-compliance with reasonable instructions by the principal to minimise noise or arrange suitable scheduling.
- *Consultation, notification and complaints handling.*
  - Provide information to neighbours before and during construction.
  - Maintain good communication between the community and Project staff.
  - Have a documented complaints process and keep register of any complaints.
  - Give complaints a fair hearing and provide for a quick response.
  - Implement all feasible and reasonable measures to address the source of complaint. Implementation of all reasonable and feasible mitigation measures for all works will ensure that any adverse noise impacts to surrounding receivers are minimised when noise goals cannot be met due to safety or space constraints.

7.4.2 ADDITIONAL NOISE AND VIBRATION CONTROL MEASURES

If, during construction, an item of equipment exceeds ether the noise criteria at any location or the equipment noise level limits, the following noise control measures, together with construction best practices, shall be considered to minimise the noise impacts on the neighbourhood.

- Schedule noisy activities to occur outside of the most sensitive times of the day for each nominated receiver.
- Consider implementing equipment-specific screening or other noise control measures recommended in Appendix C of AS 2436:2010.
- Limit the number of trucks on site at the commencement of site activities to the minimum required by the loading facilities on site.
- When loading trucks, adopt best practice noise management strategies to avoid materials being dropped from height into dump trucks.
- Avoid unnecessary idling of trucks and equipment.
- 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.

Implementation of all reasonable and feasible mitigation measures for all internal and underground works will ensure that any adverse noise impacts to surrounding residential, commercial and recreational receivers are minimised when noise goals cannot be met due to safety or space constraints.

8 SUMMARY AND CONCLUSIONS

A noise and vibration impact assessment has been carried out for the Hastings Secondary College upgrade at Port Macquarie, NSW. This report forms part of the documentation package submitted to the Department of Planning as part of the State Significant Development Application (SSD-11920082).

This acoustic report establishes relevant noise level criteria, details the acoustic assessment and provides comments and recommendations for the proposed development. Ambient and background noise surveys have been undertaken at the existing site to establish the appropriate noise criteria in accordance with the relevant guidelines.

The noise assessment has adopted methodology from relevant guidelines, standards and legislation to assess noise impact. The noise impacts have been predicted at the nearest noise sensitive receiver boundaries.

At this stage, mechanical plant selections have not been made. Therefore, a detailed noise assessment has not been able to be carried out. Recommendations have been provided to minimise the impact of external noise emissions associated with the mechanical plant of the proposed development to the nearest sensitive receivers.

At this stage, public address and school bell systems have not been selected. Therefore, recommendations have been provided to minimise the impact of external noise emissions associated with the public address and school bell systems of the proposed development to the nearest sensitive receivers.

Operational noise from the PCYC building is expected to meet the required criteria during the evening time (6pm – 10pm) at the nearest noise sensitive receivers with windows and doors closed. Acoustic design of the building fabric shall be continued during the detailed design stage to confirm that noise levels will met during the operation of the PCYC building.

Traffic generation noise has been assessed, and it is expected to meet the established noise level criteria.

External noise impact from traffic noise is expected to be insignificant. Therefore, traffic noise intrusion levels are not expected to exceed the established noise criteria within the premises.

A preliminary construction noise assessment has been carried out. Based on the results of the preliminary assessment, the noise associated with the normal construction works is expected to exceed the noise limits for standard hours in accordance with the ICNG Guideline.

In order to minimise any potential construction noise and vibration impacts on the nearest residential receivers, recommendations have been provided based on the relevant guidelines. If, during any construction work, equipment exceeds the established noise and / or vibration level criteria at any sensitive receiver, the additional noise and vibration control measures shall be considered to minimise the noise and vibration impacts.

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

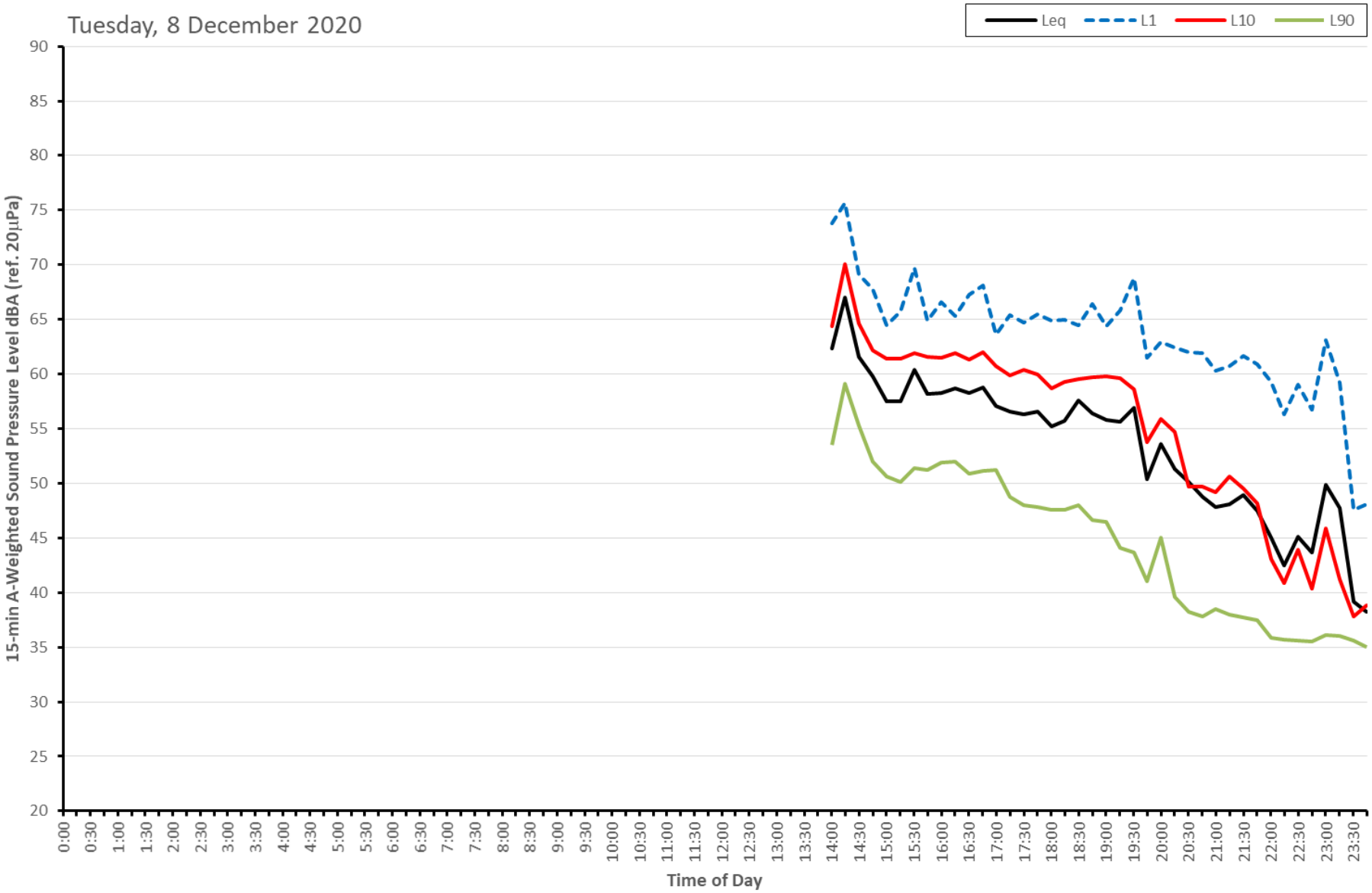
APPENDIX A: LONG-TERM NOISE MONITORING RESULTS

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.

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.

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.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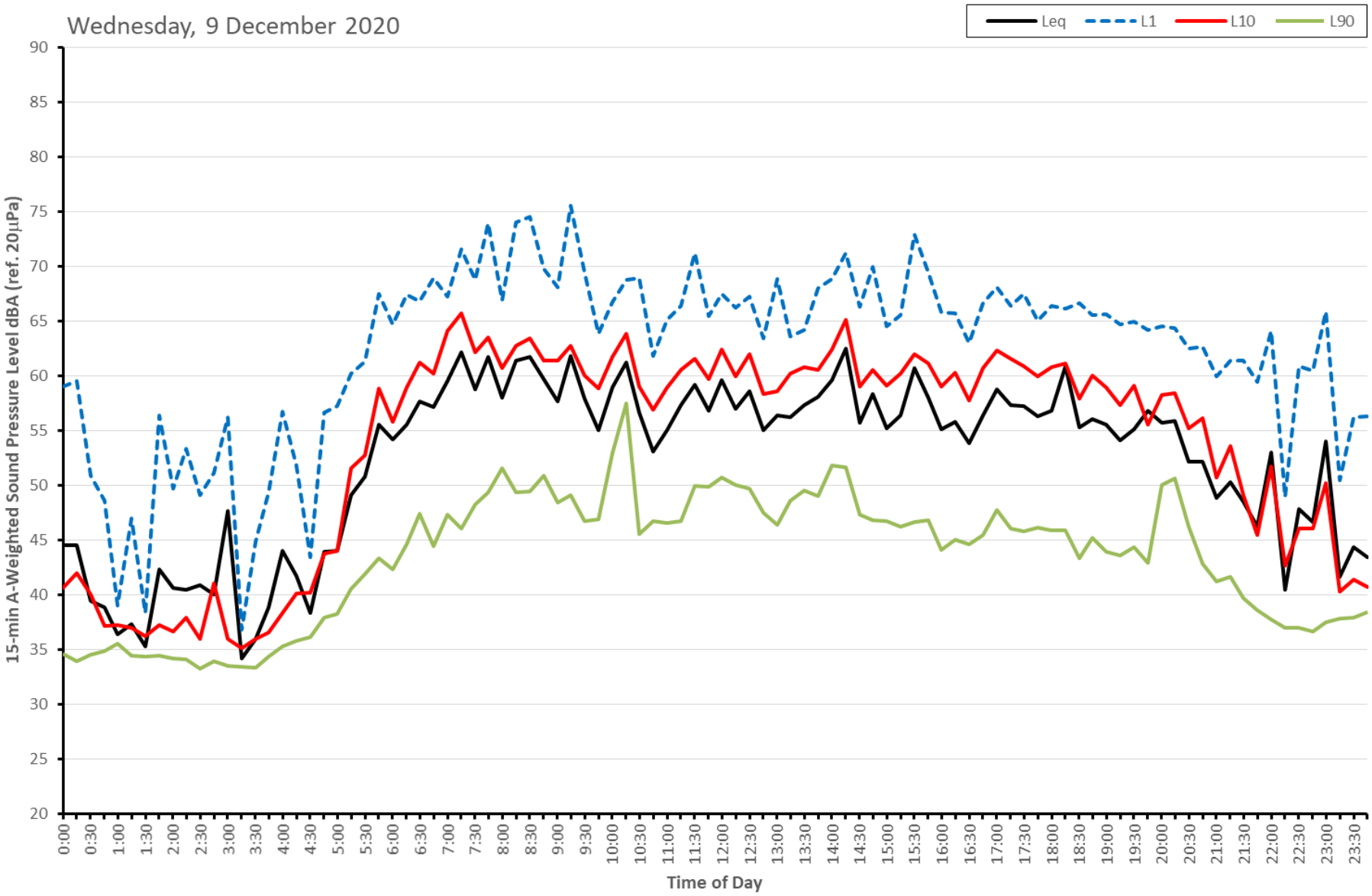
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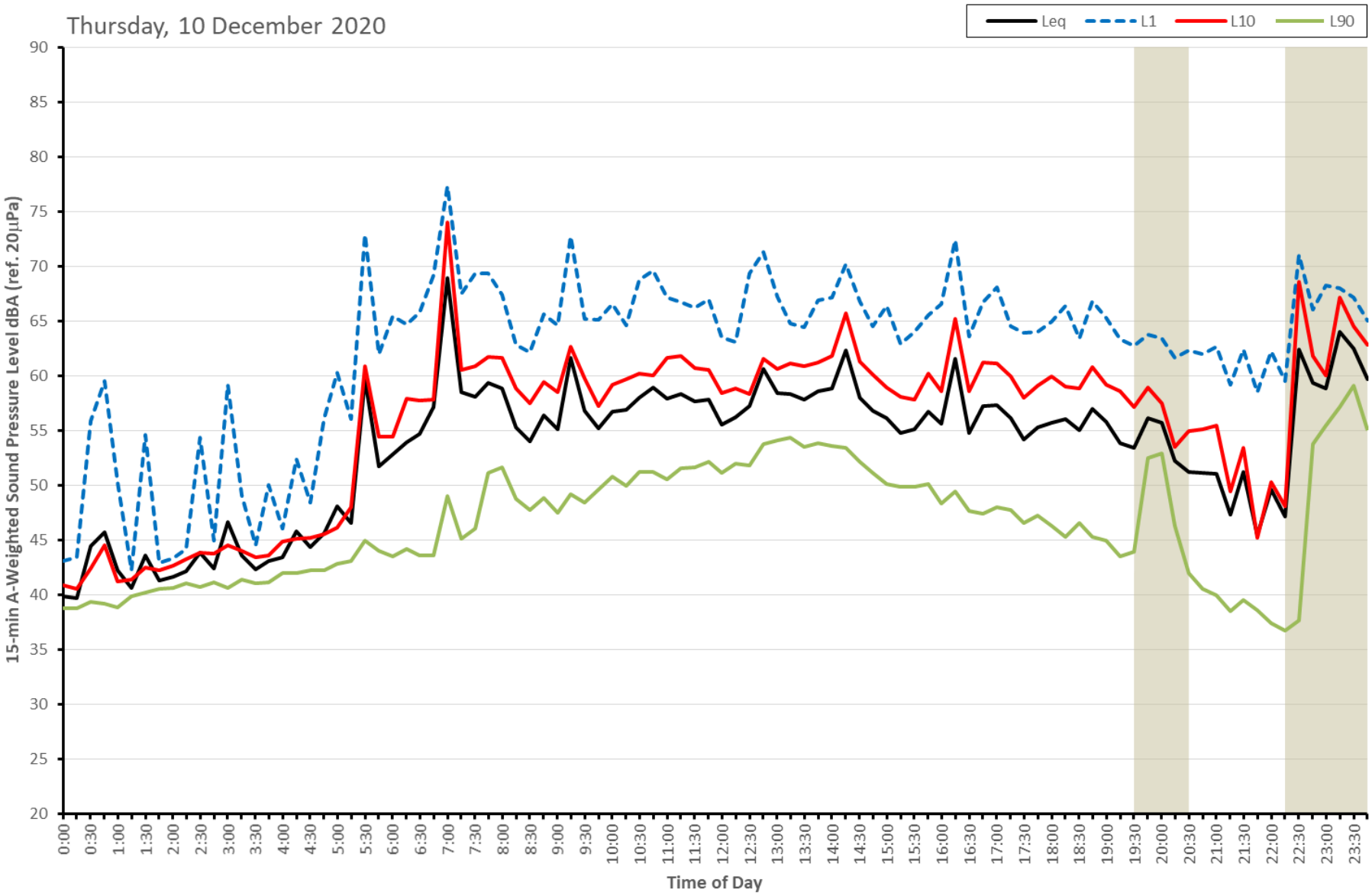
Thursday, 10 December 2020
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L10
L90
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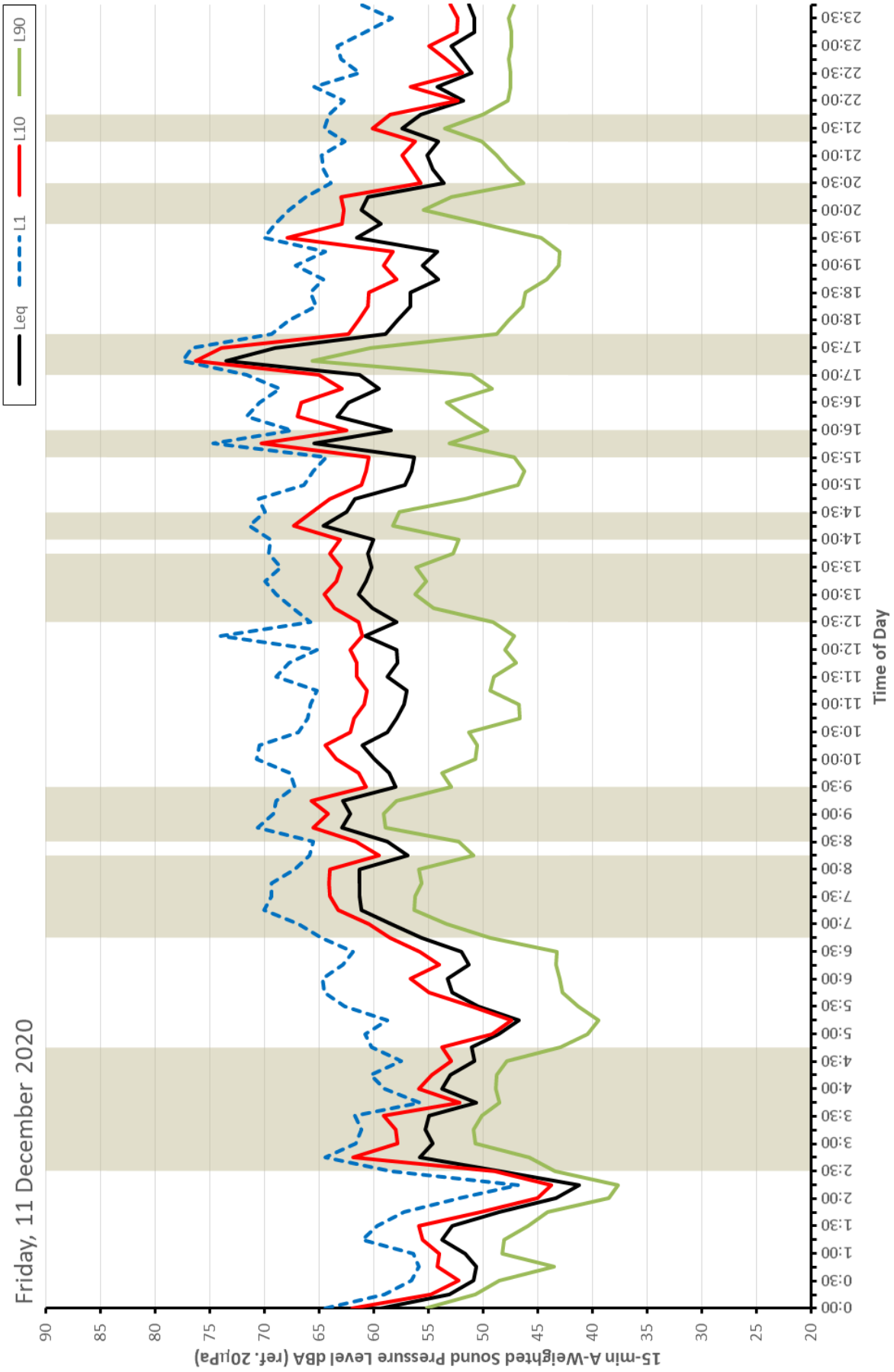
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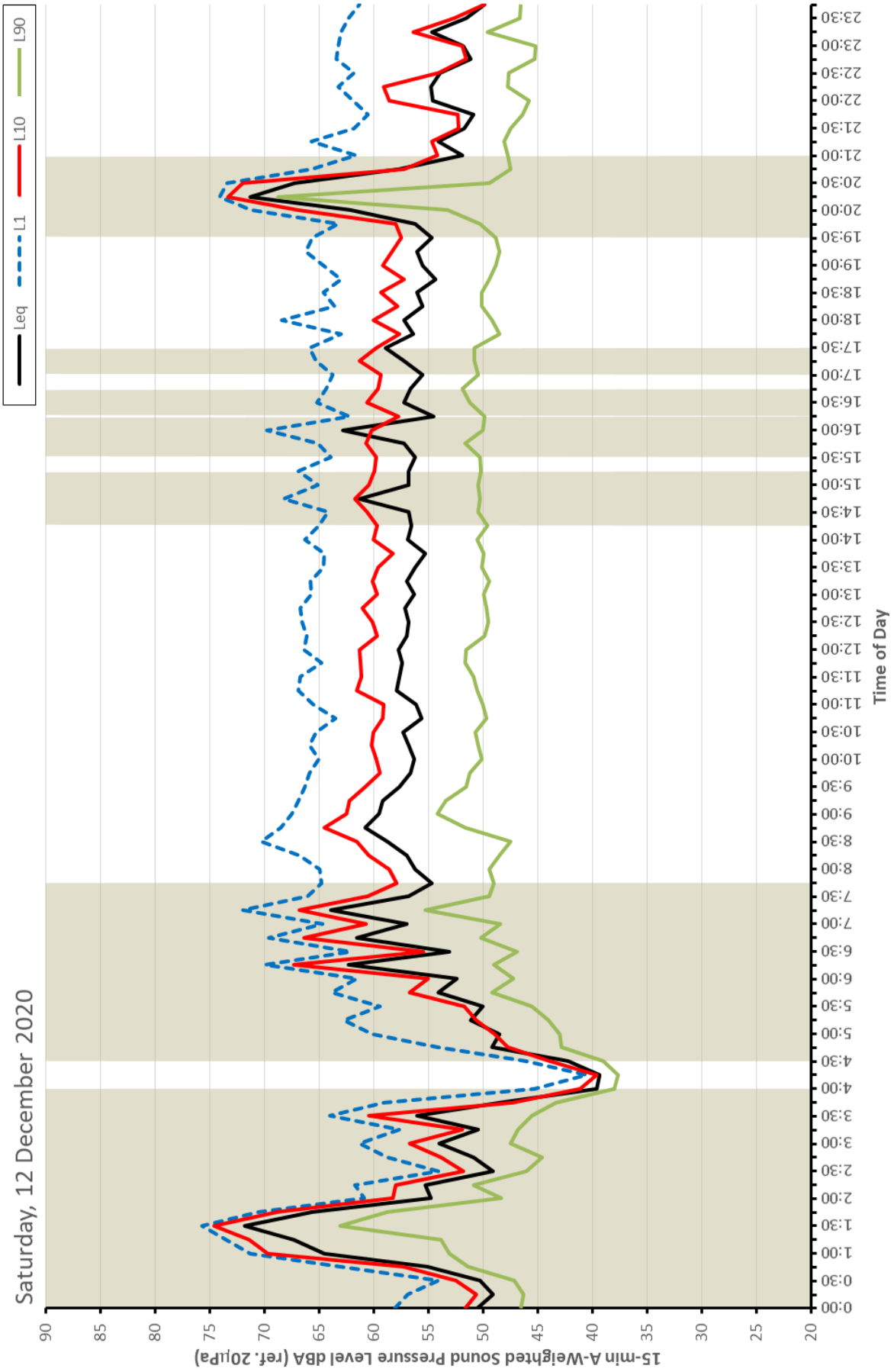
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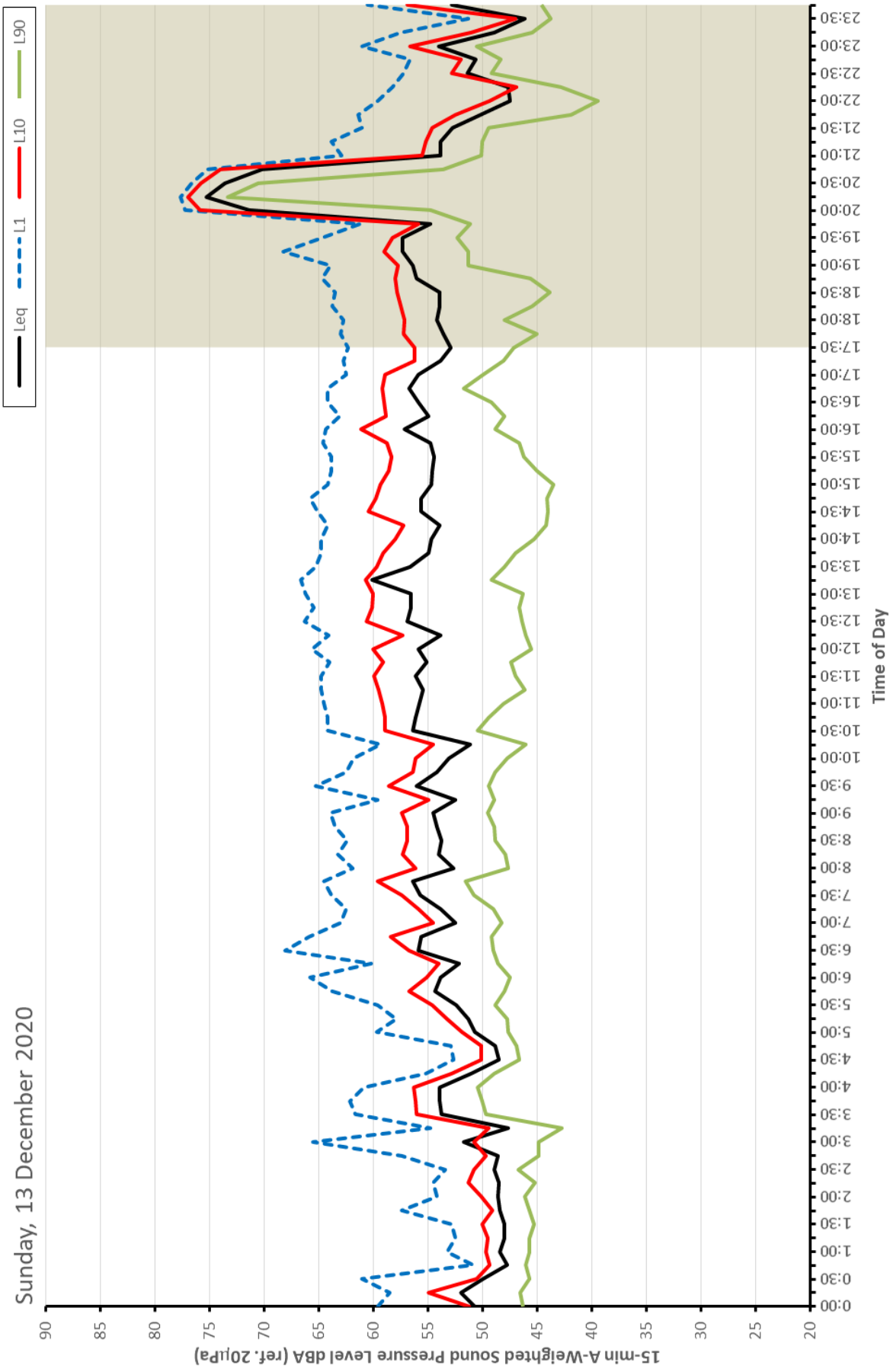
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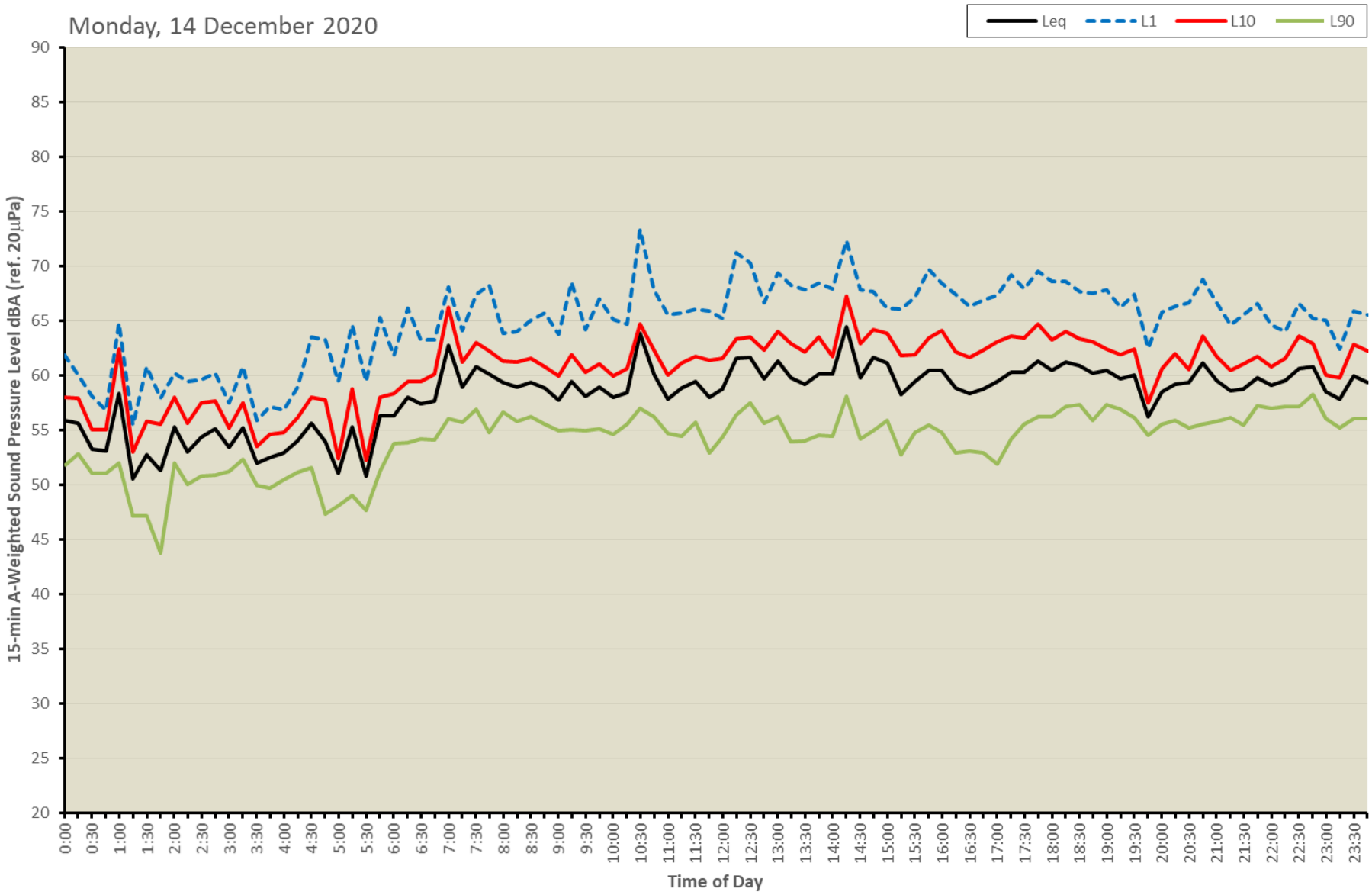
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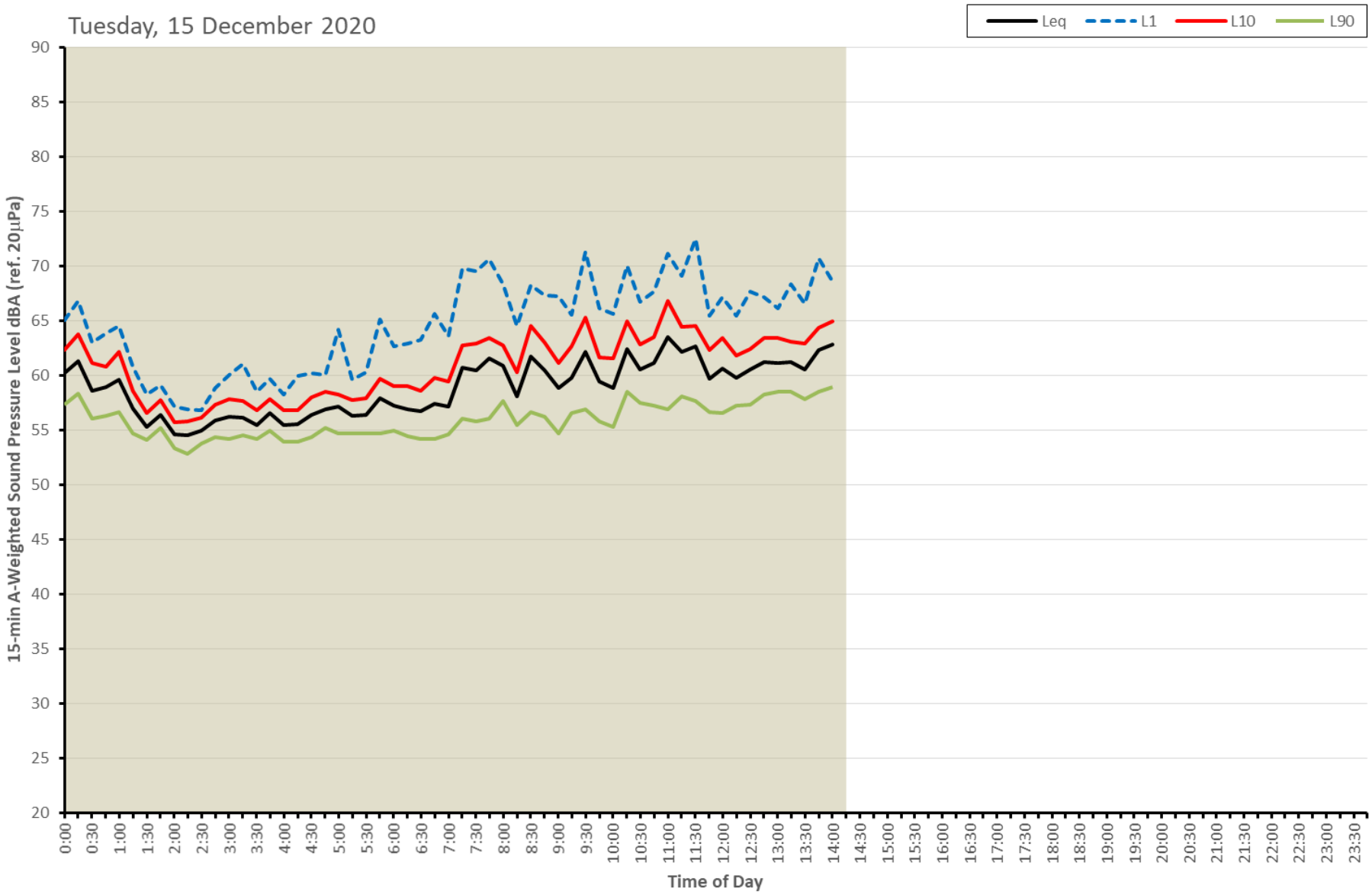
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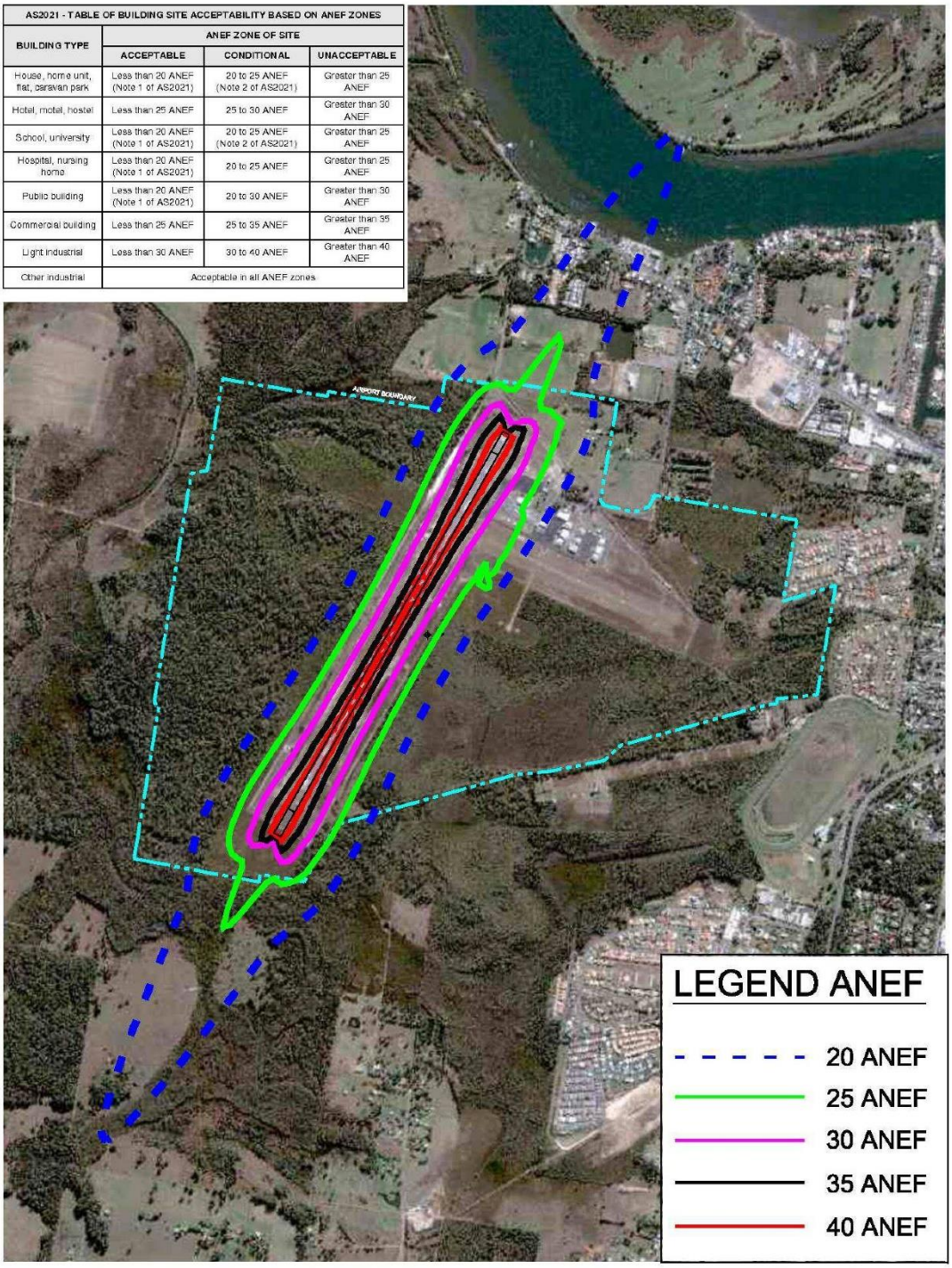
APPENDIX B: PORT MACQUARIE AIRPORT ANEF 2030

AS2021 - TABLE OF BUILDING SITE ACCEPTABILITY BASED ON ANEF ZONES			
BUILDING TYPE	ANEF ZONE OF SITE		
	ACCEPTABLE	CONDITIONAL	UNACCEPTABLE
House, home unit, flat, caravan park	Less than 20 ANEF (Note 1 of AS2021)	20 to 25 ANEF (Note 2 of AS2021)	Greater than 25 ANEF
Hotel, motel, hostel	Less than 25 ANEF	25 to 30 ANEF	Greater than 30 ANEF
School, university	Less than 20 ANEF (Note 1 of AS2021)	20 to 25 ANEF (Note 2 of AS2021)	Greater than 25 ANEF
Hospital, nursing home	Less than 20 ANEF (Note 1 of AS2021)	20 to 25 ANEF	Greater than 25 ANEF
Public building	Less than 20 ANEF (Note 1 of AS2021)	20 to 30 ANEF	Greater than 30 ANEF
Commercial building	Less than 25 ANEF	25 to 35 ANEF	Greater than 35 ANEF
Light industrial	Less than 30 ANEF	30 to 40 ANEF	Greater than 40 ANEF
Other industrial	Acceptable in all ANEF zones		



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AMPC
Airport Master Planning Consultants

Base Image: © Land and Property Information, Panorama Dr. Bathurst (2013)

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PORT MACQUARIE AIRPORT

PORT MACQUARIE AIRPORT MASTER PLAN 2010 ADDENDUM

FIGURE 12-4

2030 ANEF

(BASED ON A2 DRAWING PMAN 104C)

PHILIP CHUN
Building Compliance

State Significant Development Application Report

ACCESS

Hastings Secondary College - Port Macquarie Campus

16 Owen St, Port Macquarie NSW 2444

Report Prepared for: School Infrastructure NSW (SINSW)
Report Prepared by: David Choe
Philip Chun Accessibility Pty Ltd

Our Ref: AN021-216162
Date: 21 April 2021

CONTENTS

DOCUMENT ACCEPTANCE

	Name	Signed	Date
Prepared by	David Choe *Access Consultant* *ACAA Affiliate Member No. 574*		21 April 2021

REVISION HISTORY

Revision No.	Prepared by	Description	Date
00	David Choe	DRAFT	19 February 2021
01	David Choe	FINAL	29 March 2021
02	David Choe	UPDATED FINAL	16 April 2021
03	David Choe	UPDATED FINAL	21 April 2021

This report has been prepared based on the available time allocated to conduct the review, and all reasonable attempts have been made to identify key compliance matters pursuant to the BCA and additional issues which have been deemed an impediment to access provision and may increase Client risk of attracting a complaint under the DDA.

The information provided within this report is relevant to this project and the documentation referenced. As such the information provided may not be transferred to other projects. This report must not be issued for public comment or be used for any other purpose without prior permission from Philip Chun Access.

Philip Chun Access accepts no responsibility for any loss suffered as a result of any reliance upon such assessment or report other than providing guidance to alleviate access barriers in the built environment and reduce Client risk of attracting a complaint under the DDA.

1. INTRODUCTION

Philip Chun Accessibility Pty Ltd has been commissioned by School Infrastructure NSW (SINSW) on behalf of the Department of Education (DOE) to prepare an accessibility report 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.

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.

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.

1.2 Reviewed Documentation

This report is based upon the following relevant design documents prepared and issued by FJMT Studio via:

- FJMT Extranet on Monday, 19 April 2021 3:02 PM

  Link: https://extranet.fjmtstudio.com/_QUN5EC8F0M4lAR
  File Name: SSDA Architectural & Landscape .zip
  File Size: 181.4 MB

Document No	Title	Revision
SSDA-120000	Site Site Plan - Existing	05
SSDA-120010	Site Site Plan - Proposed	05
SSDA-130031	Site Demolition and Preparation Zone 2 - CAPA + Building B Ground Floor-Site Demolition + Preparation Plan	04
SSDA-130032	Site Demolition and Preparation Zone 2 - CAPA + Building B Level 1 - Site Demolition + Preparation Plan	04
SSDA-130033	Site Demolition and Preparation Zone 3 -Building L + T Ground Floor Site Demolition + Preparation Plan	04
SSDA-200000	General Arrangement Plans 1:500 Overall Plan- Lower Ground Floor North PCYC	03
SSDA-200001	General Arrangement Plans 1:500 Overall Plan- Ground floor North PCYC	03
SSDA-200002	General Arrangement Plans 1:500 Overall Plan - Lower Ground L & B	03
SSDA-200003	General Arrangement Plans 1:500 Overall Plan - Ground TAS, Level 1 Block L	03
SSDA-200004	General Arrangement Plans 1:500 Overall Plan - Level 1 TAS	03
SSDA-201010	General Arrangement Plans General Arrangement Plan - CAPA & New Link Ground Floor Plan	05
SSDA-201011	General Arrangement Plans General Arrangement Plan - CAPA & New Link Level 1 Plan	05
SSDA-201020	General Arrangement Plans General Arrangement Plan - Building B Refurbishment Level 1 Plan	05
SSDA-201030	General Arrangement Plans General Arrangement Plan - Building L Refurbishment Ground Floor Plan	05
SSDA-201031	General Arrangement Plans General Arrangement Plan - Building L Level 1	04
SSDA-201060	General Arrangement Plans General Arrangement Plan - North South	05

	Link Lower & Ground Floor	
SSDA-201061	General Arrangement Plans General Arrangement Plan - North South Link Level 1 Plan	05
SSDA-201070	General Arrangement Plans General Arrangement Plan - School Entry Canopy Plan	04
SSDA-201080	General Arrangement Plans General Arrangement Plan - PCYC Lower Ground	04
SSDA-201081	General Arrangement Plans General Arrangement Plan - PCYC Ground Floor	05
SSDA-201082	General Arrangement Plans General Arrangement Plan - PCYC Level 1 Plan	05
SSDA-800001	Landscape Site Plan	03
SSDA-810000	Landscape General Arrangement Plans Landscape Plan – Zone 1 School Entry & CAPA	02
SSDA-810001	Landscape General Arrangement Plans Landscape Plan – Zone 2 PCYC	04

1.3 Methodology

Philip Chun Accessibility aims to provide achievable recommendations related to the provision of access to premises based on current legislation and' best practice' options, enabling independent, equitable and functional access for all.

Access requirements for people with a disability have been assessed against the provisions of the BCA-2019 and the Premises Standards 2010. Any assessment against Australian Standards such as AS1428.1-2009, where not specifically referenced in the BCA or the Premises Standards, will be provided as recommendations.

1.4 Exclusions

This accessibility report has assessed the State Significant Development Application (SSDA) scope of works proposed at Hastings Secondary College and excludes assessments of any Complying Development Certificate (CDC) scope of works.

2. LEGISLATION

2.1 National Construction Code / Building Code of Australia

The Access needs of this SSDA Accessibility Report have been assessed based on the new work having a primary BCA classification of Class 9b school.

2.2 Part D3 - General Building Access Requirements

Part D3 of the BCA and Premises Standards prescribes the minimum requirement for access to a building. Access for people with disabilities is required through the principal pedestrian entrance and throughout the building in accordance with Table D3.1.

The following table outlines the general building access requirements for this project:

Class of building	Access requirements
Class 9b *Schools*	To and within all areas normally used by the occupants. To wheelchair seating spaces provided in accordance with D3.9. To and within all other areas normally used by the occupants, except that access need not be provided to tiers or platforms of seating areas that do not contain wheelchair seating spaces.

2.3 Disability Discrimination Act 1992 (Cth) (DDA)

The Disability Discrimination Act 1992 (Cth) has a section that addresses access requirements for '*buildings*', under Section 23, which relates to access to premises and facilities which the public may enter or use.

There is also a mechanism within the DDA to create specific Disability Standards. These Standards provided more details and certainty in specific areas.

The following Standards apply to this DA - Disability (**Access to Premises** –Buildings) Standards 2010.

2.4 Access to Premises Standards 2010

The purpose of the Premises Standards (and corresponding changes to the Building Code of Australia and state and territory building law) is:

- to ensure that dignified, equitable, cost-effective and reasonably achievable access to buildings, and facilities and services within buildings, is provided for people with disability, and
- to give certainty to building certifiers, developers and managers that if the Standards are complied with they cannot be subject to a successful complaint under the DDA in relation to those maters covered by the Premises Standards.

This SSDA Accessibility Report refers to clauses within BCA 2019 and referenced Australian Standards. This report does not refer to the Access to Premises Standards 2010, as the BCA access provisions discussed within this report are in effect mirrored from Schedule 1 (Access Code) of the Premises Standards. Any reference to access requirements in the BCA is also, by default, consistent with the provisions of the Premises Standards.

3. EXECUTIVE SUMMARY

We have reviewed the documentation, available to date, and the proposed design against the Building Code of Australia 2019 and Premises Standards. The proposed development is capable of compliance with the necessary Access requirements necessary.

It is noted that this documentation is for State Significant Development Application (SSDA) and as such the level of detail for some items may not be resolved. These specific items will require further clarification at the Developed Design and Construction Stages to confirm compliance with the relevant detailed access requirements within the BCA 2019 and Premises Standards. These will include, but not limited to:

1. Accessible and Braille Signage,
2. Luminance Contrast requirements,
3. Door clear widths, door circulation areas and door hardware,
4. Switches, Controls and GPO's,
5. Stairs, Ramps, and handrail details,
6. Lift details,
7. Sanitary facilities fit out details,
8. Hearing augmentation details,
9. Construction tolerance limitations.

The proposed new CAPA and PCYC buildings, refurbishment to existing buildings B and L and new landscaped works can achieve access for people with disabilities on rectification of the following issues identified throughout this report during subsequent detailed design development stages:

a) Gradients and crossfalls for all the new landscaped works and all new walkways and ramps and landings along a required accessway can be confirmed, assessed, and coordinated to comply with AS1428.1-2009 during subsequent detailed design development stages.

b) There are multiple doorways inside new CAPA and PCYC buildings and modified parts of building L that can be power operated or automated or if manually operated – the door circulation spaces can be increased to comply with AS1428.1-2009 during subsequent detailed design development stages.

c) During subsequent detailed design development stages, the scissor ramp associated with PCYC building can be further developed to prevent wheelchair users travelling outside the allotment boundary to access the PCYC building entrance on ground level from the lower ground level car park where there are accessible car parking spaces proposed.

   Alternatively, recommend the passenger lift within PCYC building to travel down to the basement car park.

d) Generally, if staff and students cannot share ambulant and unisex accessible sanitary compartments, this will need to be addressed with an accompanying signed management letter/plan from the school. Certifier to confirm if an additional performance-based solution report from Philip Chun Accessibility is required during subsequent detailed design development stages.

4. BUILDING CODE OF AUSTRALIA - ACCESSIBILITY

The table below is an assessment of the proposed works against the relevant applicable DtS provisions of the BCA and Premises Standard Access Code. Each line item provides a summary description of the DtS provision and comments on the status of compliance. This table must be read in conjunction with BCA and Premises Standard Access Code.

No	BCA Requirements	Status of Compliance	Discussion
Access and Facilities for People with Disabilities – Sections D, E, and F			
1.	D3.1 General building access requirements Section D3 requires suitable access be provided to and within all areas of the building normally used by the occupants.	**Note only**	
D3.2 Access to New Buildings CAPA & PCYC and New Works to Existing Buildings B & L			
1.	Access from the Allotment Boundary. The BCA requires that a continuous accessible path of travel be provided from the allotment boundary at the main points of pedestrian entry to the main entrance.	**Can Comply**	Complies in Principle. Full compliance is subject to further design modifications and coordination during subsequent detailed design development stages.
2.	Access from the Accessible Carparking The BCA requires a continuous accessible path of travel be provided from the accessible carparking areas to the main entrance.	**Can Comply**	Complies in Principle. Full compliance is subject to further design modifications and coordination during subsequent detailed design development stages. During subsequent detailed design development stages, the scissor ramp can be further developed to prevent wheelchair users travelling outside the allotment boundary to access the PCYC building entrance on ground level from the lower ground level car park.
3.	Access Between Buildings on Site The BCA requires a continuous accessible path of travel be provided between associated accessible buildings.	**Can Comply**	Complies in Principle. Full compliance is subject to further design modifications and coordination during subsequent detailed design development stages.
4.	Building Entrances The BCA requires a continuous, accessible path of travel to be provided through the principal pedestrian entrance and not less than 50% of all pedestrian entrances.	**Can Comply**	Complies in Principle. Full compliance is subject to further design modifications and coordination during subsequent detailed design development stages.
D3.3 Parts of Buildings to be Accessible			
1.	Every ramp and stairway, except for ramps and stairways in areas exempted by D3.4, must comply AS 1428.1; as required.	**Can Comply**	Complies in Principle. Full compliance is subject to further design modifications and coordination during subsequent detailed design development stages.

No	BCA Requirements	Status of Compliance	Discussion
2.	Every passenger lift must comply with E3.6;	**Can Comply**	Complies in Principle. There appears to be three new passenger lifts proposed with one inside the new PCYC building, one inside Building L and the remaining lift proposed between Building B and new CAPA building. Full compliance is subject to further design modifications and coordination during subsequent detailed design development stages.
D3.4 Exemptions			
1.	Exempt areas are not required to be accessible:	**Exemptions Applicable** **To Be Confirmed**	Rooms/areas for building services and maintenance such as Cleaner's Rooms, Comms Rooms, Laundry etc. can be exempt from accessibility under Clause D3.4 of BCA. There are multiple store rooms and learning activities based rooms and spaces such as Dark Room and Kiln Space that will need to be confirmed if the school intends to make which store rooms and which learning spaces fully accessible during subsequent detailed design development stages. Generally, if there are store rooms or learning spaces that require proper manual handling procedures for lifting and transporting heavy equipment, articles or objects and/or proper Work Health and Safety procedures for handling materials or tools or conditions that pose a risk to safety and health to students and staff such areas can be exempt or be provided with a management letter/plan.
D3.5 Accessible carparking			
1.	The accessible carparking space and associated circulation spaces should comply with AS/NZS 2890.6.	**Can Comply**	There appears to be a total of 21 x new car parking spaces proposed on the lower ground level of new PCYC building as shown on SSDA-201080 (rev. 03). Out of the 21 x car parking spaces proposed there are 2 x accessible car parking spaces proposed which readily satisfies minimum accessible car parking provision rate of BCA Clause D3.5. Full compliance is subject to detailed design coordination (e.g. adjacent shared zone and head clearances with service trays/sprinklers etc.) post SSDA-phase.

No	BCA Requirements	Status of Compliance	Discussion
D3.8 Tactile Indicators			
1.	Tactile ground surface indicators (TGSI's) are required to warn people who have a vision impairment they are approaching a hazardous location**.**	**Can Comply**	To be coordinated and addressed to comply during subsequent detailed design development stages post SSDA.

No	BCA Requirements	Status of Compliance	Discussion
F2.4 Sanitary and Other Facilities			
1.	Accessible unisex sanitary compartments must be provided in accessible parts of the building as per Table F2.4 (a). Ambulant toilets for both male and females to be provided at each bank of toilets in addition to an accessible toilet. Accessible unisex shower must be provided in accessible parts of the building as per Table F2.4 (b).	**Can Comply** **Performance Solution Possible**	Complies in Principle. The following new unisex accessible compartments and new ambulant sanitary compartments to serve males and females have been proposed: <u>New CAPA Building</u> • GFL – 1 x Right Hand (RH) transfer CAPAR0001 AWC • GFL – CAPAR0014 SF WC ambulant sanitary compartment • GFL – CAPAR0015 SM WC ambulant sanitary compartment • L1 – 1 x Left Hand (LH) transfer CAPAR0002 TWC • L1 – CAPAR1014 SF WC ambulant sanitary compartment • L1 – CAPAR1015 SM WC ambulant sanitary compartment <u>Building L</u> • GFL – 1 x Right Hand (RH) and 1 x Left Hand (LH) transfer unisex accessible toilets inside LR0052 ACCESS WC CHANGE ROOM • GFL – 1 x Right Hand (RH) transfer unisex accessible toilet inside LR0072 AWC • GFL – LR0077 SM WC ambulant sanitary compartment • GFL – LR0078 SF WC ambulant sanitary compartment <u>New PCYC Building</u> • GFL – 1 x Left Hand (LH) Transfer unisex accessible toilet and change room (assumed to be a combined facility with accessible toilet and shower) • GFL – 1 x Right Hand (RH) transfer unisex accessible toilet • GFL – 1 x male changeroom and 1 x female change room presumed each with ambulant cubicles • L1 – 1 x unisex accessible toilet and change room (assumed to be a combined facility with accessible toilet and shower) If staff and students cannot share ambulant and unisex accessible sanitary compartments, this will need to be addressed with an accompanying signed management letter/plan from the school. Certifier to confirm if an additional performance-based solution report from Philip Chun Accessibility is required during subsequent detailed design development stages.

Note: Further details for all the above/previous pages' items on previous pages and all detailed access requirements will need to be coordinated and confirmed at subsequent detailed design development stages.

5. CONCLUSION

We have reviewed the documentation, available to date, and the proposed design against the Building Code of Australia 2019 and Premises Standards. The proposed development is capable of compliance with the necessary Access requirements necessary.

It is noted that this documentation is for State Significant Development Application (SSDA) and as such the level of detail for some items may not be resolved. These specific items will require further clarification at the Developed Design and Construction Stages to confirm compliance with the relevant detailed access requirements within the BCA 2019 and Premises Standards. These will include, but not limited to:

1. Accessible and Braille Signage,
2. Luminance Contrast requirements,
3. Door clear widths, door circulation areas and door hardware,
4. Switches, Controls and GPO's,
5. Stairs, Ramps, and handrail details,
6. Lift details,
7. Sanitary facilities fit out details,
8. Hearing augmentation details,
9. Construction tolerance limitations.

The proposed new CAPA and PCYC buildings, refurbishment to existing buildings B and L and new landscaped works can achieve access for people with disabilities on rectification of the following issues identified throughout this report during subsequent detailed design development stages:

a) Gradients and crossfalls for all the new landscaped works and all new walkways and ramps and landings along a required accessway can be confirmed, assessed, and coordinated to comply with AS1428.1-2009 during subsequent detailed design development stages.

b) There are multiple doorways inside new CAPA and PCYC buildings and modified parts of building L that can be power operated or automated or if manually operated – the door circulation spaces can be increased to comply with AS1428.1-2009 during subsequent detailed design development stages.

c) During subsequent detailed design development stages, the scissor ramp associated with PCYC building can be further developed to prevent wheelchair users travelling outside the allotment boundary to access the PCYC building entrance on ground level from the lower ground level car park where there are accessible car parking spaces proposed.

   Alternatively, recommend the passenger lift within PCYC building to travel down to the basement car park.

d) Generally, if staff and students cannot share ambulant and unisex accessible sanitary compartments, this will need to be addressed with an accompanying signed management letter/plan from the school. Certifier to confirm if an additional performance-based solution report from Philip Chun Accessibility is required during subsequent detailed design development stages.

METRO BUILDING CONSULTANCY

16th April 2021

NSW Education
School Infrastructure NSW
Level 8, 259 George Street
Sydney NSW 2000

Attention: Kenny Nguyen

Hastings Secondary College – Port Macquarie Campus
16 Owen Street, Port Macquarie NSW 2444
SSDA BCA Compliance Statement

Metro BC have been engaged to carry out the BCA review of the design documentation for the SSDA Works.

We have carried out BCA reviews of the initial documentation and will continue to carry out reviews until the completion of the design and prior to the issuance of the s6.28 crown works certificate to ensure works are capable of achieving consistency with the relevant provisions of the Building Code of Australia.

If you have any questions, please do not hesitate to contact this office.

Regards,

Sean Moore
Metro Building Consultancy

Sustainable Development Plan

Hastings Secondary College – Port Macquarie Campus

May 2021

JHA

CONSULTING ENGINEERS

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 – Port Macquarie Campus Schematic Design Report – Final Issue
Description	Sustainable Development Plan
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Prepared By

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Revision History

Issued To	Revision and Date								
SINSW	REV	Draft	Draft V2	Draft V3					
C/- Currie & Brown	DATE	22/02/21	25/02/21	10/03/21					
SINSW – Final Schematic Design Submission	REV	Final v1	Final V2	Final V3					
	DATE	26/03/21	16/04/21	11/05/21					
	REV								
	DATE								

CONTENTS

1 EXECUTIVE SUMMARY

JHA Consulting Engineers has been commissioned by School Infrastructure NSW (SINSW) on behalf of the Department of Education (DOE) to prepare Sustainability Development 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.

2 INTRODUCTION

2.1 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.

2.2 SITE LOCATION

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.

Figure 1 – Aerial photo of site

2.3 SUSTAINABLE DEVELOPMENT (SD) PLAN FRAMEWORK

This project is required to comply with the Secretary's Environmental Assessment Requirements (SEARs). The initiatives outlined within this report illustrate a pathway to demonstrate compliance with these requirements. However the ESD strategy will evolve and adapt over time as the design develops, and as such the assessed ESD credentials of the project may change.

The SEARs requirement include the following in relation to ESD:

"18. Ecologically Sustainable Development Report

Report prepared to detail how the proposal addresses the ESD principles under the EP&A Regulations and identifies the ESD initiatives incorporated into the proposed development.

The report must identify:

- How ESD principles (clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000) would be incorporated in the design and ongoing operation phases of the development.
- Proposed measures to minimise consumption of resources, water (including water sensitive urban design) and energy.
- How the future development would be designed to consider and reflect national best practice sustainable building principles to improve environmental performance and reduce ecological impact. This should be based on materiality assessment and include waste reduction design measures, future proofing, use of sustainable and low carbon materials, energy and water efficient design (including water sensitive urban design) and technology and use of renewable energy).
- How environmental design will be achieved in accordance with the GANSW Environmental Design in Schools Manual (GANSW, 2018).

The report must provide:

- An assessment against an accredited ESD rating system or an equivalent program of ESD performance. This should include a minimum rating scheme target level.
- A statement regarding how the design of the development is responsive to the NARCliN projected impacts of climate change.
- An integrated Water Management Plan detailing any proposed alternative water supplies, proposed end uses of potable and non-potable water, and water sensitive urban design
- The following policy/policies and/ or guideline/ guidelines must be addressed in this deliverable:
- NSW and ACT Government Regional Climate Modelling (NARCliM) climate change projections.
- Plans and diagrams must include key dimensions, RLs, scale bar and north point."

The project will be targeting the following sustainability ratings, illustrating commitment to economic, social and environmental sustainability, alongside improved student/staff wellbeing and comfort:

- National Construction Code (NCC) Section J – Energy Efficiency Targets (i.e.: exceeding targets); and
- Achieve a certified 4 Star Green Star Design & As Built V1.3 rating

In addition, the project has included the design principles of the Educational Facilities Standards and Guidelines (EFSG) which is further detailed in Section 5 of this report. The EFSG is a suite of information to aid in the planning, design and use of NSW Department of Education school facilities.

The items listed above of the SEARS requirements are addressed in sections 3, 4, 5 & 6 and appendixes of this report respectively.

3 RESPONSE TO SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS (SEARS)

The principles of Secretary's Environmental Assessment Requirements as defined in clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000 have been incorporated into the design and on-going operation phases of the development as follows:

3.1 THE PRECAUTIONARY PRINCIPLE

Namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:

(i) Careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and;
(ii) An assessment of the risk-weighted consequences of various options.

PROJECT RESPONSE:

This development is being designed in accordance with a wide range of ESD goals that pertain to the design, construction and operational stages. The development team will ensure that the building minimises the impact on the environment in the areas of energy, water and materials. The design will incorporate high performance glazing and shading strategy, together with energy efficient appliances, water efficient fixtures and water conservation. In conjunction with the use of renewable energy which will together contributes to significant strides toward minimising climate change impacts.

In addition to the above a Risk Management Plan (RMP) will be undertaken to include the assessment of natural and urban hazards (e.g. flood, storm, heatwaves, bush fires, extreme storm and other weather events). Increasing resilience to natural hazards must be considered in the business case development so that associated costs are budgeted. (EFSG, DG02.08) With considering the NSW and ACT Government Regional Climate Modelling (NARCliM) climate change projections, there will be no significant temperature change for the proposed site with comparing the temperature of 1990 – 2009 to 2020-2079.

3.2 INTER-GENERATIONAL EQUITY

Namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.

PROJECT RESPONSE:

This development will not cause any significant impact on the health, diversity and productivity of the environment and will provide a community benefit in the form of upgraded teaching, learning and working facilities. The project will contribute to a lively community environment and add architectural interest to the surrounding area.

Refer pto the Risk Management Plan for the details of climate risks identified for this project and the relative responses, actions and responsibilities for high and extreme risks identified. (EFSG, DG02.08)

3.3 CONSERVATION OF BIOLOGICAL DIVERSITY AND ECOLOGICAL INTEGRITY

Namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration

PROJECT RESPONSE:

An Assessment of the biodiversity values of the site, and the impact of the proposed development on these values has been carried out. The assessment finds that the proposed development will not impact significant, threatened or endangered flora and fauna.

3.4 IMPROVED VALUATION, PRICING AND INCENTIVE MECHANISMS

Namely, that environmental factors should be included in the valuation of assets and services, such as:

(i) Polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,

(ii) The users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,

(iii) Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

PROJECT RESPONSE:

The design of this development has employed lifecycle costing to determine the optimum strategy with regards to major items of plant, with decisions being made based on whole of life costs rather than capital expenditure only.

The Whole of Life cost considerations will be followed along with consideration of: long-term maintenance, access, quality, life-span, multi-service integration and interface, innovation, future improvement, value of money and sustainability, ESD & Green Star. (EFSG, DG01.03)

Waste management plan will be implemented to cover the construction and demolition waste and operational waste. (EFSG, DG02.07)

3.5 OVERVIEW

Through the inclusion of the above and the sustainability initiatives outlined within this report the project clearly addresses the ESD Principles as defined in clause 7(4) of schedule 2 of the Environmental Planning and Assessment Regulation 2000. Further detail of the general sustainability initiatives are outlined in Section 4.

4 SUSTAINABLE DESIGN INITIATIVES

4.1 SUSTAINABILITY BENCHMARKING

In accordance with the NSW Resource Efficiency Policy all new facilities must be designed and built to exceed by 10% the reference building energy consumption as specified in National Construction Code (NCC) Section J deemed-to-satisfy provision.

The design team must include Ecologically Sustainable Development principles in new school buildings to a level that could achieve a 4 Star Green Star certified rating.

See also Section 5.9

4.2 ENVELOPE

Intelligent design and material selection ensure that thermal comfort is not entirely achieved by a mechanical means. Passive design initiatives such as performance glazing, shading and use of insulation will reduce demand on the mechanical air conditioning systems resulting in a reduction of energy consumption and greenhouse gas emissions.

4.2.1 Building Envelope Performance

The building fabric will be designed to meet or exceed the NCC 2019 requirements for building envelope. Thermal breaks will be incorporated into walls and roofs where appropriate.

4.2.1.1 Building Fabric

The preliminary minimum performance requirements obtained under JV3 provision for the development (Class 9b) at the proposed location (Climate Zone 5) as per the NCC 2019 Section J - Energy Efficiency are as per Section J report.

This will necessitate the use of insulation in the walls, floor and roof. Insulation reduces heat flow and consequent heat loss in winter and heat gain in summer. This minimises the heating and cooling load demand on the air conditioning systems.

Light coloured roof material is recommended to be used to reflect more sunlight and reduce summer heat gain.

4.2.1.2 Glazing

It is recommended that windows will be high performance glazing systems. Glazing is the majority source of heat transfer between internal conditioned spaces to the outside, the specification of glazing could impact directly to the heat gain in summer and heat loss in winter. Performance glazing substantially reduces heat transmission. This particularly reduces heat loss in winter; therefore, internal heat gain from equipment, lighting and people are better contained. Also, performance glazing absorbs the infrared portion of sunlight and reduces the amount of heat transferred into the conditioned space. This will correspond in a reduction of both heating and cooling loads.

The building will comply with NCC Section J Energy Efficiency by means of Performance Solution JV3 as appropriate. A preliminary assessment is done and result as per Section J report.

4.3 SHADING AND DAYLIGHTING

The proposed CAPA have been designed to have roof covered walkway and shaded balconey to the North. This will avoid the unwanted heat gains from the northern sun.

The provision of south facing glazing allows for increased natural daylight into the visual arts room whilst minimising unwanted passive solar heat gain. The large portion of north windows are shaded by roof eaves and sunlight screens that will reduce the amount of summer solar radiation through windows.

The proposed PCYC have been designed to have enclosed courts on the western part of the building with eave covered highlight windows only. The proposed window on east and west are less than 30% of the façade area and majorly to the court, the windows to the habitable rooms are minimal. These will avoid unwanted heat gain from the north, east and west sun.

The proposed building has sufficient glazing to the south which allows for natural daylight whilst minimising unwanted passive solar heat gain.

The proposed design for Block B are for internal changes only, no proposed work to the external façade.

The proposed refurbishment of Block L has been designed to allow more solar accesses to the lower ground level and no façade changes to the other level.

The provision of less glazing allows for minimising unwanted passive solar heat gain from the east and west. The all of east windows are shaded by roof eaves that will reduce the amount of summer solar radiation through windows.

These passive design features allow for enriched daylighting and greater access to external views for occupants. Additional daylighting reduces the reliance on artificial light and benefits alertness, mood and productivity. External views provide a connection to nature and the school setting and also help to create an environment constructive learning.

4.4 NATURAL VENTILATION

Adequate natural air movement makes an important contribution in creating a comfortable indoor environment and reducing the need for mechanical ventilation by carrying accumulated heat out and replacing it with cooler external air. This is important during the summer months where heat build-up within spaces can be quickly removed with the availability of suitable breeze at the site.

The design team proposed to utilise natural ventilation and air circulation through ceiling fans and openable windows.

4.5 ENERGY EFFICIENCY

Each climate zone under the Building Code has different design and conditioning requirements to minimise energy use for heating and cooling. Good balance of heating and cooling reduction techniques are required to create an energy efficient development.

4.5.1 HEATING, COOLING AND VENTILATION SYSTEMS

All habitable spaces of the proposed development are to be air conditioned. All rooms to be naturally ventilated. Mechanically assisted natural ventilation required to areas which do not comply with best design practices for natural ventilation.

All areas which are air conditioned will be heated with reverse cycle air conditioning and no gas or electric panel heaters will be used for the proposed development.

All bathroom, storage, and general exhaust to be naturally ventilated where possible, with mechanical ventilation required where necessary. Printing, storage, comms and cleaner room to be mechanically ventilated via in-line or roof mounted fans.

The air-conditioning and ventilation systems shall be designed to comply with, or exceed, the minimum requirements of NCC 2019 Section J5.

Ductwork and pipework systems will be designed to reduce system pressure losses to reduce fan and pump motor power. This includes the selection of equipment for reduced coil and vessel pressure drops and being generous with ductwork and pipework sizes to reduce friction losses.

These initiatives will provide significant savings in energy use.

4.5.2 LIGHTING

Lighting will be designed to comply with, or exceed the minimum requirements of NCC 2019 Section J6.

Fittings incorporating the latest lamp technologies will be installed to minimise energy use and provide efficient artificial lighting systems.

The proposed development shall be illuminated using LED fittings and be controlled via automatic control system.

Lighting in each learning area shall be provided with a daylight sensor to reduce light output or turn off lights when sufficient daylight is provided within the space. For large spaces the perimeter lighting shall be on a separate zone to make maximum use of daylight.

See also Section 5.3.1

4.5.3 CONTROLS

All new lighting and Heating, Ventilation and Air Conditioning (HVAC) installed will be controlled by time switch or motion sensor for energy conservation for:

- Workshop
- GLAs
- Office areas

A period bell alarm timer system shall be installed to control luminaires in appropriate rooms.

The automatic switching shall operate as per the EFSG requirements.

See also Section 5.3.2

4.5.4 ELECTRICITY METERING

Electricity metering and sub-metering shall be specified in accordance with the Green Star requirement for the CAPA and PCYC buildings and EFSG to monitor and manage electricity consumption for Block B & L.

4.5.5 PHOTOVOLTAICS

Collecting solar energy has been chosen as a key ESD strategy for the project, with an aspirational goal of reducing the building's energy consumption and greenhouse gas emissions from a renewable source via the provision of a roof-mounted photovoltaic system.

See also Section 5.3.4

4.5.6 VERTICAL TRANSPORT

The use of lifts within the development will be discouraged by providing visually prominent staircases for all floors.

4.6 INDOOR AIR QUALITY (IAQ)

The quality of indoor air has a significant impact on our health and environment. Poor indoor air quality can resulting in adverse health effect such as allergy, asthma, etc.

The outdoor air ventilation rates shall be in accordance with AS 1668.2 for mechanically ventilated spaces. Mechanical ventilation systems shall be linked to CO_2 sensors and designed to not exceed 1,500ppm for more than 20 consecutive minutes in each day.

Ventilation system shall be designed to minimise the entry of outdoor pollutants.

4.7 WATER CONSERVATION

The following initiatives are proposed to ensure that significant water savings be achieved.

4.7.1 Fittings and Fixtures

It is an EFSG requirement that all water fittings and fixtures such as showerheads, water tap outlets and toilet cisterns must have, or exceed, the following Australian Government's Water Efficiency Labelling Scheme (WELS) star ratings.

Water Fittings / fixtures	Minimum WELS Rating
Shower head rating	3.5 stars (>4.5 but <=6.0 l/min)
Toilets and urinals	4 stars
Washing machines	4.5 stars
Dishwashers	5 stars
Taps and flow controllers	5 stars

In addition:

- Flow restrictors can be used to minimise water usage and wastage for staff amenities.
- Taps with timed flow can be used to minimise water usage and wastage in student amenities.

See also Section 5.4.1

4.7.2 On-Site Alternative Water Supply

Rainwater tank will be installed on the site and the location will be shown on plan to reduce the demand on drinking water supplies, and will be connect to locally identified end use such as irrigation or toilet flushing system.

To manage the risk of contamination, tanks for drinking and non-drinking water use are to be designed and installed in accordance with HB 230 Rainwater Tank Design and Installation Handbook, Managing Urban Stormwater Harvesting and Reuse AS3500.

See also Section 5.4.2

4.7.3 METERING

Sub-metering shall be specified in accordance with the Green Star requirements for CAPA, PCYC and EFSG for Block B & L to mixed irrigation systems, laboratory buildings, amenities blocks, canteens and any other major water use on the site.

4.8 MATERIALS

4.8.1 LOW VOC / LOW FORMALDEHYDE MATERIALS

Adhesives, sealants, flooring and paint products will be selected to contain low or no Volatile Organic Compounds (VOCs) and all engineered wood products used in exposed or concealed applications are specified to contain low or no formaldehyde to avoid harmful emissions that can cause illness and discomfort for occupants.

See also 5.5.2

4.8.2 RECYCLED CONTENT

Loose furnishings within the building shall be selected based on their recycled content, end-of-life recyclability and product stewardship agreements. By selecting loose furnishings which comply with independent environmental

certification, for example *Eco specifier* or *Good Environmental Choice Australia*, the project will confidently reduce environmental impacts and waste from furnishings over the life of the building.

Steel and concrete will comply with Green Star requirements, pending feasibility.

- For steel frame buildings at least 60% of the fabricated structural steelwork shall be supplied by a steel fabricator/ contractor accredited to the Environmental Sustainability Charter of the Australian Steel institute (ASI).
- For concrete framed buildings at least 60% (by mass) of all reinforcing bar and mesh is produced using energy-reducing processes in its manufacture.

No rainforest timbers, or timbers from high conservation forests, are to be used unless plantation grown. Sustainable timber shall be specified for at least 95% (by cost) of all timber products used on the project. This can be achieved by using products certified by a forest certification scheme and from a reused source.

4.9 WASTE

Waste collection and disposal plays an important role in the protection of the environment and the health of the population in the urban areas.

A waste management plan is prepared in accordance with the EFSG requirements so that to assess and monitor the waste management process during construction and demolition, as well as waste produced during occupation within the development.

The waste management plan has incorporate how to minimise the amount of waste generated, maximise the reuse, recycling and reprocessing construction waste materials and minimise the volume to materials disposed to landfill. See also Section 5.7

4.10 WATER SENSITIVE URBAN DESIGN

External area design will implement best practice of water sensitive urban design, including permeable paving and indigenous low water usage plants to increase stormwater retention, decrease total suspended solids and mitigate the urban heat island effect. The carbon sequestration of the plants will also contribute to the combating of climate change contributions.

5 EFSG SUSTAINABILITY TARGETS

5.1 OVERVIEW

The Educational Facilities Standards and Guidelines (EFSG) have been developed by the NSW Department of Education, to assist the management, planning, design, construction and maintenance of new and refurbished school facilities. The EFSG is to be treated as a reference guide that provides a starting point to allow for a consistent standard of delivery across various types of school developments.

The EFSG Design Guide considers a framework incorporating several aspects of design including extensive Ecologically Sustainable Development (DG02) requirements. The following categories are covered within the EFSG DG02 Design Guide:

- NSW Government Resource Efficiency Policy
- Energy Conservation
- Water conservation
- Sustainable Materials
- Ecological Conservation
- Waste Management
- Climate Change Adaptation
- Sustainability Benchmarking

The proceeding sections outline how the project addresses each of the requirements of the EFSG DG02 Design guideline.

5.2 NSW GOVERNMENT RESOURCE EFFICIENCY POLICY

The purpose of the *NSW Government Resource Efficiency Policy* is to reduce NSW government agency operating costs by implementing resource efficiency measures, and its implementation is mandatory for all NSW Government agencies, including the Department of Education. The proposed project is targeting a 4 star Green Star Design & As-Built certified rating for the CAPA and PCYC buildings and the EFSG sustainability initiatives will be addressed for Block B & L.

5.3 ENERGY CONSERVATION

In accordance with the *NSW Government Resource Efficiency Policy* all new facilities must be designed and built so that energy consumption is predicted to be at least 10% lower than if built to minimum compliance with National Construction Code requirements. The energy consumption reduction must be achieved without including renewable energy generation in the calculation.

5.3.1 LIGHTING

Lighting will be designed to comply with or exceed the minimum requirements of NCC 2019 Section J6.

Fittings incorporating the latest lamp technologies will be installed to minimise energy use and provide efficient artificial lighting systems.

The proposed development shall be illuminated using LED fittings and be controlled via automatic control system.

Lighting in each learning area shall be provided with a daylight sensor to reduce light output or turn off lights when sufficient daylight is provided within the space. For large spaces the perimeter lighting shall be on a separate zone to make maximum use of daylight.

See also Section 4.5.2

5.3.2 LIGHTING AND HVAC CONTROLS

All new lighting and HVAC systems installed in schools must have timed or sensor feedback functionality for energy conservation.

See also Section 4.5.3

5.3.3 ENERGY EFFICIENT APPLIANCES AND EQUIPMENT

In accordance with the *NSW Government Resource Efficiency Policy*, all new electrical equipment for the proposed project will be at least 0.5 stars above the market average star rating. In categories where no star ratings are available, equipment purchased should be recognised as high efficiency either by being ENERGY STAR® accredited, in a high efficiency band under Australian Standards or being above-average efficiency of Greenhouse and Energy Minimum Standards (GEMS) registered products.

5.3.4 RENEWABLE ENERGY GENERATION

Collecting solar energy has been chosen as a key ESD strategy for the project, with an aspirational goal of reducing the building's energy consumption and greenhouse gas emissions from a renewable source via the provision of a roof-mounted photovoltaic system.

See also Section 4.5.5

5.4 WATER CONSERVATION

5.4.1 WATER EFFICIENT APPLIANCES

It is an EFSG requirement that all water fittings and fixtures such as showerheads, water tap outlets and toilet cisterns must have or exceed the following Australian Government's Water Efficiency Labelling Scheme (WELS) star ratings.

Water Fittings / Fixtures	Minimum WELS Rating
Shower head rating	3.5 stars (>4.5 but <=6.0 l/min)
Toilets and urinals	4 stars
Washing machines	4.5 stars
Dishwashers	5 stars
Taps and flow controllers	5 stars

In addition:

- Flow restrictors can be used to minimise water usage and wastage for staff amenities.
- Taps with timed flow can be used to minimise water usage and wastage in student amenities.

See also Section 4.7.1

5.4.2 ROOF WATER HARVESTING AND TANK STORAGE

Rainwater tanks will be installed on the site to reduce the demand on drinking water supplies, and will be connect to locally identified end use such as irrigation or toilet flushing system.

To manage the risk of contamination, tanks for drinking and non-drinking water use are to be designed and installed in accordance with HB 230 Rainwater Tank Design and Installation Handbook, Managing Urban Stormwater Harvesting and Reuse AS3500.

See also Section 4.7.2

5.4.3 STORMWATER MANAGEMENT

Stormwater management will be designed and aim to minimise the transportation of toxicants to waterways and other offsite environments, and maintain the existing hydrological regimes.

Refer to relevant local regulations for Stormwater pollution reduction targets.

Refer to DG95 Stormwater for further requirements on system design.

5.5 SUSTAINABLE MATERIALS

5.5.1 TIMBER

No rainforest timbers, or timbers from high conservation forests, are to be used for the proposed development. Use only recycled timber, engineered and glued timber composite products, or timber from plantations or from sustainably managed regrowth forests that is FSC, AFS or PEFC certified.

5.5.2 LOW VOC

Adhesives, sealants, flooring and paint products will be selected to contain low or no Volatile Organic Compounds (VOCs) and all engineered wood products used in exposed or concealed applications are specified to contain low or no formaldehyde to avoid harmful emissions that can cause illness and discomfort for occupants.

See also Section 4.8.1

5.5.3 PESTICIDES

It is proposed that no chemical pesticides and termiticide are to be used on site and this will be included in project Environmental Management Plan.

5.6 ECOLOGICAL CONSERVATION

This development is proposed on a previously developed school site.

An assessment of the biodiversity values of the site, and the impact of the purposed development on these values has been carried out. The assessment finds that the proposed development will not impact significant, threatened or endangered flora and fauna.

See also Section 3.3

5.7 WASTE MANAGEMENT

Waste collection and disposal plays an important role in the protection of the environment and the health of the population in urban areas.

A waste management plan is prepared in accordance with the EFSG requirements so that to assess and monitor the waste management process during construction and demolition, as well as waste produced during occupation within the development.

The waste management plan has incorporate how to minimise the amount of waste generated, maximise the reuse, recycling and reprocessing construction waste materials and minimise the volume to materials disposed to landfill.
See also Section 4.9

5.8 CLIMATE CHANGE ADAPTATION

This development will not cause any significant impact on the health, diversity and productivity of the environment and will provide a community benefit in the form of upgraded teaching, learning and working facilities. The project will contribute to a lively community environment and add architectural interest to the surrounding area.

Refer project RMP for the details of climate risks identified for this project and the relative responses, actions and responsibilities for high and extreme risks identified. (EFSG, DG02.08)

See also Section 3.2

5.9 SUSTAINABILITY BENCHMARKING

In accordance with the *NSW Resource Efficiency Policy* all new facilities must be designed and built to exceed by 10% the reference building energy consumption as specified in National Construction Code (NCC) Section J deemed-to-satisfy provision.

The design team must include Ecologically Sustainable Development principles in new school buildings to a level that could achieve a 4 Star Green Star certified rating.

See also Section 4.1

6 GREEN STAR DESIGN & AS BUILT (CAPA & PCYC BUILDIGNS ONLY)

Proposed development is targeting a formal certification of 4 Star Green Star rating for the new buildings only.

6.1 OVERVIEW

The Green star rating system is a comprehensive tool for assessing environmental performance of Australian buildings.

The Green Star framework incorporates ESD principles which are comprised of nine categories. Points are awarded across each category for credits that are incorporated into the project. The Design and As-built documentation is then verified through two rounds of independent assessments by the Green Building Council of Australia (GBCA). This section outlines Hastings Secondary College Port Macquarie Campus CAPA & PCYC building's strategy for achieving the principles of a formal certification 4 Star rating under the Green Star Design and As Built tool version 1.3.

6.2 THE GREEN STAR RATING SCALE

The Green Star rating is determined by comparing the percentage of available points achieved out for the total available points. The rating scale shown below details the percentage thresholds for the star ratings awarded.

% of available points	Rating	Outcome
Less than 10	Zero Star	Assessed
10 – 19	One Star	Minimum Practice
20 – 29	Two Star	Average Practice
30 – 44	Three Star	Good Practice
45 – 59	Four Star	Australian Best Practice
60 – 74	Five Star	Australian Excellence
75+	Six Star	World Leadership

Credit points available for proposed project (Both CAPA & PCYC):

Category	Total Points Targeted CAPA	Total Points Targeted PCYC
Management	14	14
Indoor Environment Quality	17	17
Energy	22	22
Transport	9	10
Water	12	12
Materials	14	14
Land Use & Ecology	6	6
Emissions	5	5
Innovation	10	10
Not Applicable	1	1
Total	99 points + 10 innovation	100 points + 10 innovation

6.3 GREEN STAR TARGETED CREDITS

Category	Total Points Targeted CAPA	Total Points Targeted PCYC
Management	13	13
Indoor Environment Quality	11	11
Energy	4	4
Transport	3	3
Water	4	4
Materials	7	7
Land Use & Ecology	2	2
Emissions	4	4
Innovation	2	1
Total	50 points	49 points
Project Score	50.5	49

7 APPENDIX A – EFSG SCHEDULE

PROJECT:		Hastings Secondary College Port Macquarie Campus				
Theme	Indicator	Sustainability initiatives / requirements from the EFSG This is an extract only from the relevant EFSG. For full requirements refer to https://efsg.det.nsw.edu.au/welcome	EFSG	EFSG type	Crossover with Green Star	Standard evidence to demonstrate compliance
Energy & carbon	EC1: Energy efficiency	**Improvement over NCC** All new facilities must be designed and built so that energy consumption is predicted to be at least 10% lower than if build to minimum compliance with National Construction Code requirements.The energy consumption reduction must be achieved without including renewable energy generation in the calculation.	DG02.03	Mandatory	DAB c15E.0 GHG Emissions Reduction - Conditional Requirement	1. Energy modelling report / Predictive energy modelling and thermal comfort assessment. Report needs to show at least 10% improvement of building over minimum NCC requirements; and 2. As-built evidence that model is an accurate representation of the building, e.g. drawings; and 3. Specifications / calculations supporting modelling inputs, e.g. window energy rating scheme certificates, calculated R-values of walls, roofs, etc. 4. As an alternative to 2 and 3 above, a Statement by energy modeller confirming that the moel accurately represents the building.
Energy & carbon	EC1: Energy efficiency	**Energy conservation** Design and construct all school buildings within the parameters specified in the: - NSW Public Works Energy Manual for Buildings - Building Code of Australia (BCA) Section J for Energy Efficiency The NSW Public Energy Manual for Buildings provides an energy-saving strategy by identifying aspects of the building and services where reductions in operating and maintenance costs can be made through proper selection of: - Building fabric - Insulation materials - Shading and ventilation - Services and control It also requires the formulation of an energy impact statement.	DG65.02	Mandatory	DAB c15 GHG Emissions Reduction	1) Section J report 2) Energy impact statement
Energy & carbon	EC1: Energy efficiency	**Daylighting** - Designers must seek to maximise natural daylight in all learning and administration spaces to reduce energy usage through windows and skylights - Including daylight sensors in rooms to reduce light output or turn off light when sufficient daylight is provided within the space - When the space is large and perimeter lighting is adjacent to windows, perimeter lighting is on a separate zone to make maximum use of daylight	DG2.3.1 DG12	Mandatory	DAB c15 GHG Emissions Reduction	1. Daylight modelling report demonstrating how natural daylight has been maximised in all habitable spaces; and 2. As built drawings demonstrating that the model accurately represents the building (i.e. window size and location; skylights installed, etc.); and 3. Specifications supporting inputs used in modelling (e.g. skylights and glass specs)
Energy & carbon	EC1: Energy efficiency	**Shading devices** On exposed facades subject to direct sunlight, external window shading has been considered as part of the building design	DG2.3.1	Mandatory	DAB c15 GHG Emissions Reduction	1. As built drawings
Energy & carbon	EC1: Energy efficiency	**Lighting energy conservation** Lighting system must have timed or sensor feedback functionality for energy conservation	DG2.3.2	Mandatory	DAB c15 GHG Emissions Reduction	1. As built mechanical drawings / statement from head contractor
Energy & carbon	EC1: Energy efficiency	**Energy efficient lighting** - LED lighting must be installed - The design of the lighting systems and the selection of fittings is to be undertaken based on a Whole of Life approach - System must support sustainable design principles including reducing energy consumption - Use light sources lamps and control gear with a long life	DG2.3.1 SG63.01	Mandatory	DAB c15 GHG Emissions Reduction	1. As built electrical drawings
Energy & carbon	EC1: Energy efficiency	**Maximum illumination power densities** Section J part 6 of the National Construction Code provides tables that define the maximum illumination power density that is acceptable in various locations. This, and all other elements of Section J part 6 should be applied appropriately.	DG63.05.01	Mandatory	DAB c15 GHG Emissions Reduction	1) Lighting drawings 2) Lighting specifications / schedules 3) Lighting modelling report showing compliant power densities
Energy & carbon	EC1: Energy efficiency	**Lighting control** The required communication protocol for the luminaires is DALI. The following systems for the control of luminaires fitted with DALI control gear are considered acceptable: - Diginet Rapix suite of products. - Clipsal C-bus suite of products - Philips Dynalite suite of products - KNX based systems Systems must be designed to be as simple as possible. This simplicity must extend from the topography to ease of use. It is a specific requirement that programming of any control system must be relatively simple and not limited to costly specialist consultants. Allowances should be made in system design specifications for user group training of control systems and for the programming of the system as part of the commissioning and hand over process. All equipment and manuals necessary to operate and maintain the system must be provided to the school and Asset Management	DG63.06.01	Mandatory	DAB c15 GHG Emissions Reduction DAB c4 Building Information	1) Commissioning report 2) Confirmation from AMU that all relevant manuals have been handed over
Energy & carbon	EC1: Energy efficiency	**Constant light output / Daylighting** -Constant Light Output (CLO) systems consisting of dimming luminaires and light level sensors are highly recommended as they are effective in maintaining the required illuminance values. CLO systems ensure that the lit environment remains compliant at the lowest possible Watts per square metre for the reasonable operating life of the luminaires. Maintained illuminance values required for design compliance will result in areas being over-lit for a large proportion of their operating life without a CLO system. - Sensors can be fitted to each luminaire or by utilising sensors that control groups of luminaires. - Once in operation a CLO system delivers compliant light levels over the life of a system by reducing the light through dimming and ramping the levels up over the lifespan of the luminaire. These systems should be seamless and invisible in operation to users of the locations. - Daylight Harvesting can be delivered as a component of a CLO system and requires no additional hardware above and beyond that required for a CLO to operate. - Daylight harvesting is recommended in areas where there is a rapid transition from natural day light to a dark environment, such as when entering a multi deck or underground car park from a street in full daylight, or in a classroom where daylight from windows is within the field of view.	DG63.06.02 DG63.06.03	Mandatory	DAB c15 GHG Emissions Reduction	1) Lighting drawings 2) Lighting modelling report showing compliant power densities
Energy & carbon	EC1: Energy efficiency	**Switching strategy** - Local switching should be provided where it is identified that the users can benefit from manual operation of the lighting and other lighting automation technology is considered cost prohibitive. The switching should be clearly marked and robust. - Achieve energy efficient switching in Schools by: The use of multiple switching groups Automatic control of these groups to operate as follows: Controlled luminaires are to automatically turn-off nominally 3 minutes after the bell sounds. Turn-off is to be in two steps other than in small rooms, one step after 3 minutes and the second group 2 minutes later (5 min). If the lighting is required for the next period, occupants of that room can prevent the lights turning off by pressing the ON switch/es after the bell sounds. The luminaires in each room can be turned off at any time by pressing the OFF switch/es. The off signal is to be capable of transmission at the end of normal school hours or at other selected times without the bells sounding, with the lighting turning off in two steps (other	DG63.07 DG65.03.01	Negotiable / TBC	DAB c15 GHG Emissions Reduction	1) Electrical & lighting drawings showing switching groups and automatic controls
Energy & carbon	EC1: Energy efficiency	**Energy efficient HVAC system** HVAC system must have timed or sensor feedback functionality for energy conservation Systems shall be designed to minimise energy consumption. System design / equipment selection is to be based on whole of life cost analysis. Specifically air conditioning equipment should: - support sustainable design principles including reducing energy consumption; and - be easily accessible and serviceable – easy to maintain with minimal impact on school operations / activities when maintenance is being performed. All new school buildings are to be designed to meet or exceed the requirements of building regulations for conditioned spaces	DG2.3.2 DG55 DG16.09	Mandatory	DAB c15 GHG Emissions Reduction	1. As built mechanical drawings / statement from head contractor; 2. Whole of life cost analysis demonstrating systems were selected based on WOL performance.

Energy & carbon	EC1: Energy efficiency	**Energy efficient appliances & equipment** Electrical equipment must be at least 0.5 stars above the market average star rating or comply with high efficiency standards specified in the GREP	DG2.3.3	Mandatory	DAB c15 GHG Emissions Reduction	1. Schedule of appliances and equipment with their star ratings or performance standards, signed by head contractor or architect. All appliances and equipment required in the GREP must be listed, incl air conditioning equipment, electric motors, transformers, etc.
Energy & carbon	EC1: Energy efficiency	**Heat loss/gain** Building/HVAC design must consider: - Climate/ micro-climate: This data must come from the current AIRAH handbook and where a specific area is not referenced in the handbook, the Bureau of Meteorology statistics must be utilised. - Orientation: exposure to sun(solar) and wind - Natural Ventilation and cross ventilation - Insulation, thermal capacity and time lag of building fabric. - Energy and Resources Cost: Initial and on-going, of heating and cooling. Reduced energy consumption provides future cost savings and a reduced carbon footprint. - Activities / Equipment that may produce excess heat. Energy modelling software must be used to determine heating and cooling loads as part of the Whole of Life analysis that must be undertaken. (i.e. Camel or Carrier).	DG04.01	Mandatory	DAB c15 GHG Emissions Reduction	1. Thermal modelling report 2. As built evidence demonstrating that model is an accurate representation of the building 3. Specifications/ calculations supporting modelling inputs
Energy & carbon	EC1: Energy efficiency	**Passive design** The need for active cooling and heating shall be minimised by employing passive / sustainable design principles. Windows: The size and proportions of windows need to be carefully considered in the design to provide maximum efficiency and a balance between the ESD factors such as; maximising daylight in rooms but avoiding unnecessary solar heat gain and thermal loss etc. Roofing: The colour selected will have an impact on the thermal performance. Light colours will reflect more of the sun's heat and darker colours absorb more of the sun's heat, which will be transferred into the roof structure. Unless prevented by glare issues to surrounding development, light colours must be selected to reduce the thermal load from solar heating and contribute to heat island effect mitigation. Orientation (as close to True North as possible). With appropriate shading, this will provide a balanced approach to reducing summer heat ingress and encouraging solar warmth during winter. Appropriate glazing/ shading strategy (related to orientation and local environment), Depending on the climate, windows would be minimised on southern, eastern & western elevations with external shading on western and eastern facades). Use of thermal mass (to stabilise internal temperatures). Insulation: maximise insulation in line with	DG55 DG06.02 DG27.12	Mandatory / Recommended	DAB c15 GHG Emissions Reduction	1. Thermal modelling report 2. As built evidence demonstrating measures implemented to reduce need for active cooling / heating 3. Passive design report by Architect listing all passive design initiatives implemented
Energy & carbon	EC1: Energy efficiency	**Ventilation strategy** A ventilation strategy must be developed to ensure that sufficient ventilation is provided to all spaces to meet the requirements of the BCA/NCC and associated standards. Specifically ventilation equipment must be designed from a whole-of-life perspective and: - Enable healthy learning environments with indoor air quality (IAQ) that supports learning and teaching (i.e. IAQ that is fit for purpose for schools) - Support sustainable design principles including reducing energy consumption - Be accessible and serviceable - easy to maintain with minimal impact on school use when maintenance is being performed	DG57.01	Mandatory	DAB c15 GHG Emissions Reduction	1) Cooling system strategy including WOL analysis 2) Concept plans 3) Construction drawings 4) Trade-based specification 5) As built drawings
Energy & carbon	EC1: Energy efficiency	**Natural ventilation** - Is required to all classrooms for comfort in summer and to maintain a healthy indoor environment. - Where cross ventilation may be restricted (i.e. where rooms are located on each side of a corridor, at least one whole wall of operable windows plus ceiling fans are required, to provide air movement. - Some windows need to be operable in driving rain and so must be protected with appropriately designed weather hoods, eaves overhang or other method of protection.	DG05.01	Mandatory	DAB c15 GHG Emissions Reduction	As built drawings demonstrating windows have been installed as required.
Energy & carbon	EC1: Energy efficiency	**Mechanically assisted cross-ventilation** In two storey blocks where cross flow ventilation is not possible to the lower floor, mechanically assisted cross ventilation is to be provided to the lower floor learning spaces nominated in the EFSG. The ventilation system is to be sized to provide at least 7 air changes per hour. The system is to be thermostatically controlled to activate when room temperature exceeds 28 deg C and is to run continuously until the room temperature drops below 27 deg C. Additionally the system is not to be activated unless the outdoor temperature is lower than the indoor temperature and is to be immediately de-activated as soon as the outdoor temperature exceeds indoor air temperature. Provide programmable seven-day time clock and 0-2 hrs adjustable after-hour timer to control each mechanically assisted exhaust ventilation system.	DG57.18	Mandatory	DAB c15 GHG Emissions Reduction	As built mechanical drawings and specifications Extracts from commissioning report
Energy & carbon	EC1: Energy efficiency	**Ceiling void ventilation** Provide ventilation so as to remove hot air build-up in large enclosed roof spaces. Roof mounted turbo ventilators are an approved method. - The size and number of ventilators to be included will depend upon the volume and use of the individual rooms and the local climatic conditions to provide suitable air changes and room cross ventilation. - Provide a minimum of two roof ventilators to each Secondary General Learning Space or a Primary Home Base unless otherwise directed, or other number recommended by the manufacturer for the size of the space (whichever is the greater). - Ventilator throat diameter to be no less than 400mm.	DG05.02 DG37	Mandatory	DAB c15 GHG Emissions Reduction	As built mechanical drawings demonstrating ventilation has been installed as required.
Energy & carbon	EC1: Energy efficiency	**Roof ventilator control** Provide controls for the operation of the motorised dampers on the roof ventilators. Generally one switch is required for each space within the school where roof ventilators are installed	DG65.16	Mandatory	DAB c15 GHG Emissions Reduction	Mechanical / electrical drawings showing controls
Energy & carbon	EC1: Energy efficiency	**Wind powered roof ventilators** School buildings can use wind powered roof ventilators with dampers to provide effective summer ventilation. Design to suit local ambient climatic conditions to ensure correct sizes, locations and numbers are provided for each particular application. Co-ordinate the locations of ventilators with the ceiling fans to achieve effective air movement. Fan assisted ventilators should also be considered on days of low wind Provide a wall mounted switch to open /close the damper.	DG57.14	Mandatory	DAB c15 GHG Emissions Reduction	As built mechanical drawings showing location of roof ventilators if installed
Energy & carbon	EC1: Energy efficiency	**Ventilation in sanitary spaces** - Greater air circulation than that required by building regulations is required, with sufficient natural ventilation or mechanical ventilation, to disperse odours and /or humidity. - Cross ventilation is to be used where possible. - Provide mechanical ventilation to all Disabled Toilets. - Operate the system by time control equipment (time switches or run-on timers as appropriate).	DG05.04 DG57.16	Mandatory	DAB c15 GHG Emissions Reduction	As built mechanical drawings demonstrating ventilation has been installed as required.
Energy & carbon	EC1: Energy efficiency	**Ventilation in storage spaces** - Permanent air ventilation openings are to be provided (without compromising security), to prevent concentration of odours.	DG05.05	Mandatory	DAB c15 GHG Emissions Reduction	As built mechanical drawings demonstrating ventilation has been installed as required.
Energy & carbon	EC1: Energy efficiency	**Ventilation in permanent learning spaces and libraries** Where feasible / practical: - Ceiling fans shall be installed where ceiling height is equal to or greater than 2,700mm. - Wall fans shall be installed where ceiling heights are less than 2,700mm	DG55	Mandatory	DAB c15 GHG Emissions Reduction	As built drawings demonstrating ceiling/wall fans have been installed as required.

Energy & carbon	EC1: Energy efficiency	**Indoor environment controls** - Both the thermal comfort and indoor air quality shall be controlled automatically within specified parameters. - Controls shall be simple and intuitive to use. - A prominent green light shall highlight to occupants when conditions are suited to opening windows and doors to utilise natural ventilation. - A prominent blue light shall highlight to occupants when the air conditioning is operating. - The lights shall be clearly labelled with trafolyte labels as follows: + Green light – "External conditions are suited to opening windows and doors" + Blue light – "Air conditioning is operating. Windows and doors should be closed" - Temperature and CO2 sensors are to be installed within the space and be readily accessible for maintenance. - Sensors must be located so as to accurately record the actual room temperature and indoor air quality (CO2). - Controls shall be designed to minimise energy consumption – e.g.: by minimising over cooling and heating and automatically switching off when the space is unoccupied. - Controls shall be designed so that the system/s will shut down automatically if a room is unoccupied for greater than 10 minutes (except in specific cases such as designated computer rooms). - Controls shall be properly labelled and suitably located in the space (preferably near the light switch) and incorporate: + a key operated auto / manual / off switch; and + a push on / push off adjustable hour run timer. The run timer shall be adjustable from 1 to 4 hours and initially be set at 2 hours	DG55	Mandatory	DAB c15 GHG Emissions Reduction	1) As built evidence demonstrating controls have been installed as required. 2) Commissioning report / statement by head contractor confirming controls have been set as required
Energy & carbon	EC1: Energy efficiency	**Access for maintenance** All systems and equipment that is installed within a school is to be provided with suitable access to ensure that this equipment is safely and efficiently maintainable. In order to ensure that maintenance is available, on the completion of all buildings, drawings are to be provided showing the completed (As Built) building including all equipment and equipment access arrangements. **Communication services** DoE requires a 4 hour on-site training session for up to four persons on the use of the SCS. Training is to be accompanied by appropriate documentation and a video that demonstrates operation of the system and its components, including patching, cable management for voice, video and data of the SCS installed on site. Include explanation of detailed drawings left on site. The video / CD ROM may be generated from the on-site training for future use by DoE school staff. The Project Manager will, in consultation with the School Principal, nominate the timing of this session together with the number of attendees. Manuals are to be handed to the school during the training session. Include in copies of all cabling test reports and the (minimum) 20-year warranty certificate the manual. As built documentation and manufacturers warranty and test results are required **Building user's guide** Produce a Building User's Guide to enable the client to understand the building systems and operate systems to maximise efficiency. This must: - Clearly and concisely describe the operation of building and its services - Detail a reasonable maintenance program	DG16.10 DG64.10 DG65.02	Mandatory	DAB c4 Building Information	1) As built drawings including all equipment access arrangements for maintenance 2) Training records 3) Operation manuals 4) Manufacturers warranties and cabling test reports 5) Building user's guide
Energy & carbon	EC2: Scope 1 & 2 emissions	**Renewable energy** A grid connected solar PV system must be installed in line with DG66 requirements Where feasible, PV systems shall be installed to offset as much of the electricity consumed by the school as is practicable	DG2.3.4 DG55	Mandatory	Emissions Reduction; DAB c16 Peak Electricity Demand	1) As installed drawings of PV system 2) Energy modelling report showing renewable energy generation
Energy & carbon	EC2: Scope 1 & 2 emissions	**Energy storage** Battery used as energy storage of grid or solar energy may be used for grid forming, grid support, peak-demand management and load shifting, and self-consumption of renewable electricity. Energy storage is substantiated when: - there is historical evidence of grid outages and a need for backup power; - there are critical loads which require an uninterruptible power supply or backup power supply; - It is economical for energy storage systems to supplement or replace an existing backup generator (financial assessment required); - the DNSP requires that the energy storage be implemented; - The financial benefit of the system outweighs the cost of the system. This can be demonstrated by calculating and showing that the Levelised Cost of Electricity (LCOE) from a battery energy system with a certain operation regime is less than the retail tariff rate experienced at the site, or by showing that the BESS can reduce energy cost at the site and	DG66.8.3	Mandatory	DAB c15 GHG Emissions Reduction; DAB c16 Peak Electricity Demand Reduction	1) As installed drawings of battery storage system
Energy & carbon	EC2: Scope 1 & 2 emissions	**Heaters** Electric heating must be preferred over gas heating. Where gas heating is considered, it must be approved by SINSW Sustainability Heating equipment must be designed from a whole-of life perspective and: - Support sustainable design principles including reducing energy consumption and carbon emissions - Be accessible and serviceable - easy to maintain with minimal impact on school use when maintenance is being performed	DG56	Mandatory	DAB c15 GHG Emissions Reduction	1) If reverse cycle air conditioning is installed, confirmation that gas heaters are not installed, OR 2) Evidence that the gas heaters installed are energy efficient
Energy & carbon	EC2: Scope 1 & 2 emissions	**Water heaters** - Hot water and tempered water generation for schools must be carefully considered to ensure that a Whole of Life assessment is undertaken to minimise life cycle costs and carbon emissions - Environmentally friendly options such as solar heating (if vandal resistant) and heat pumps are preferred energy sources to minimise energy consumption.	DG53.09	Mandatory	DAB c15 GHG Emissions Reduction	1. WOL cost assessment for hot water systems 2. Hydraulic drawings/schematics showing installed DHW systems
Energy & carbon	EC3: Scope 3 emissions	Transport plan	N/A	N/A	DAB c17 Sustainable Transport	
Energy & carbon	EC3: Scope 3 emissions	**Bicycle storage** Provide 1 space for every 20 students to AS2890.3 standard	SG552 4.36	TBC	DAB c17 Sustainable Transport	
Water	W1: Water use efficiency	**Potable water conservation** WATER CONSERVATION STRATEGIES must be implemented on school sites, including: Manual Flush Urinal Systems: New and replacement urinals must use manual in lieu of automatic flushing mechanisms. A microwave-activated urinal flushing system may be used as an alternative. Water Conserving Taps: Use metal flow control valves and /or push down taps with pre set flow limits. All new water-using appliances must be at least 0.5 stars above the average Water Efficiency Labelling and Standards (WELS) star rating by product type, except toilets and urinals, which must be purchased at the average WELS star rating. Refer to DG53.02 for specific rating requirements. Harvest Rainwater: Where practical, harvest roof water and connect to a pumped rainwater supply system to authorities' requirements for landscaped areas and toilet flushing	DG53	Mandatory	DAB c18 Potable Water	1. Schedule of fixtures and fittings showing type of urinals and taps installed are as required
Water	W1: Water use efficiency	**Fixture efficiency** All products must be rated to AS 6400 to the following minimum WELS ratings: - Tapware to 5 star flow rating requirements - Showers to have 3 star flow rating requirements - Water Closet Pans to 4 star flow rating requirements - Flow restrictors can be used to minimise water usage and wastage for staff amenities - Taps with timed flow can be used to minimise water usage and wastage in student amenities. In any case, all new water-using appliances must be at least 0.5 stars above the average WELS star rating by product type, except toilets and urinals, which must be purchased at the average WELS star rating. Where WELS rating is not available, use the alternative WaterMark rating scheme.	DG53.02 DG2.4.1	Mandatory	DAB c18B.1 Potable Water - Sanitary Fixture Efficiency	1. Schedules of materials, fixtures, fittings and equipment with WELS/WaterMark ratings, demonstrating compliance and identifying those with flow restrictors and timed flow.

Water	W1: Water use efficiency	**Hydraulic services** Hydraulic services should: - Support sustainable design principles including reducing water consumption and waste production. - Appropriately treat any trade waste to ensure minimal environmental impact - Be accessible and serviceable - easy to maintain with minimal impact on school use when maintenance is being performed - Use products with a long life span – many hydraulic services are concealed so durability is essential	DG51.01	Mandatory	DAB c18 Potable Water	1) Hydraulic report showing sustainability initiatives implemented to reduce potable water consumption 2) As built drawings showing trade waste arrestors
Water	W1: Water use efficiency	**Water sub-metering** In addition to the main water meter for the site provide sub meters for the following: - Mixed irrigation systems - Laboratory buildings - Amenities blocks - Canteens - Any other major water use on the site	DG53.04	Mandatory		1) As built hydraulic drawings
Water	W2 – Proportion of potable vs non-potable water	**Rainwater collection** It is DoE policy to include roof water harvesting and tank storage in new schools and to encourage it where practical in existing schools, to reduce the demand on drinking water supplies. Tank water can connect to drip irrigation systems for adjacent landscape/gardens with the major preference being for gravity fed supply to minimise ongoing maintenance.	DG53.14 DG2.4.2 DG53.01	Mandatory	DAB c18B.2 Rainwater Reuse	1) As built hydraulic drawings showing tank connection to end uses and capacity
Water	W2 – Proportion of potable vs non-potable water	**Fire system water reuse** Where schools are required to install a sprinkler system for fire safety, it is recommended to install a closed loop system must be installed to capture and reuse fire systems testing and maintenance water, or by useing an alternative non-potable water source.	DG2.4.2	Optional	DAB c18B.5 Fire System Test Water	Fire engineering report
Water	W2 – Proportion of potable vs non-potable water	**Ground water** Where ground water is available for use for irrigation purposes in drought affected locations, enquiries must be undertaken with the Department of Planning, Industry and Environment to determine the suitability of a ground water system.	DG53.03	Mandatory	DAB c18 Potable Water	1. Relevant due diligence report / investigation
Water	W3 – Responsible water discharge	**Stormwater management** Must aim to minimise the transportation of toxicants to waterways and other offsite environments, and maintain the existing hydrological regimes. Due diligence for flooding must be done early to inform building and landscaping design	DG2.4.3	Mandatory	DAB c26 Stormwater	Stormwater modelling report showing stormwater pollution and flows. Civil / Hydraulic drawings showing management measures. Water sensitive urban design report (if WSUD was use4)
Water	W3 – Responsible water discharge	**Trade waste** Arrestors for acid, grease, plaster and clay of adequate capacity must be installed to treat wastewater from science laboratories, kitchens, art rooms and canteens as required in DG52.	DG52	Mandatory	Not covered in Green Star	1) As built drawings showing trade waste arrestors or 2) Letter by Hydraulic Engineer confirming arrestor have been installed as required
Waste & materials	WM1: Materials selection and use	**Life cycle assessment (environmental)** Environmental impacts of products and materials has been assessed and inform material selection	DG01.03	Recommended	DAB c19A - Life cycle assessment	Life cycle assessment report
Waste & materials	WM1: Materials selection and use	**Whole of life costing (WOL)** Total cost of ownership (TCO) assessment / Analysis of direct and indirect costs and benefits / Life cycle costing analysis When calculating the whole of life cost for the different materials / building elements or systems, the following must be considered: - the total initial capital cost of the system/s – including design, project management, builder and building services works in connections etc. - resources (energy and where applicable water) consumption. - Maintenance. - the replacement of component parts. - disposal costs - ecological sustainable options - durability - vandalism - safety The whole of life cost shall be calculated over the estimated life of the asset/s.	DG01 All design guides for selection of materials and building systems	Recommended	GSC c20 - Return on Investment	Life cycle costing report for relevant system
Waste & materials	WM1: Materials selection and use	**Sustainable materials** Construction materials must be selected based on the following: - Adequately and economically perform their intended functions, and also have lower adverse environmental impacts throughout their life cycle (refer to DG 3) - Contain reduced or no hazardous substances (e.g. low VOC) to ensure effective indoor environmental quality. Reduce the demand for rare or non-renewable resources. - Have low embodied energy and water. - Are made from or contain recycled materials or can be reused or recycled at the end of their useful life.	DG02.05	Optional	DAB c21 Sustainable Products	Environmental Product Declarations of products / materials used; Product certificates (like GECA, FSC, et3) Suppliers' declarations confirming recycled contents in products Bill of quantities
Waste & materials	WM1: Materials selection and use	**Sustainable timber** - No rainforest timbers, or timbers from high conservation forests, are to be used unless plantation grown. Use only recycled timber, engineered and glued timber composite products, or timber from plantations or from sustainably managed regrowth forests that is FSC, AFS or PEFC certified - All timber used is to be termite (white ant) resistant or treated to be termite resistant to the appropriate hazard level.	DG2.5.1 DG21.05.01	Mandatory	DAB c20.2 Responsible Building Materials - Timber	1. Evidence of chain of custody 2. Bill of quantities
Waste & materials	WM1: Materials selection and use	**Built for disassembly** Consider the use of building materials which are able to be disassembled for re-use, in conjunction with considerations for the addition and removal of accommodation over time.	DG02.07	Mandatory		
Waste & materials	WM1: Materials selection and use	**Concrete** - Use materials complying with AS based on the Whole of Life approach to materials selection. - Do not use breccia or dolerite in concrete mixes. - Fly ash is a manufacturing bi-product that can be used as a cement replacement but should limited to a maximum of 20% by weight of cement content.	DG21.02	Mandatory	DAB c19B.1	Structural specifications and drawings Structural Engineer's report showing %cement replacement
Waste & materials	WM2 – Resource efficient school operations	**Operational waste** A waste storage area must be included in all new school sites. The provision of space must include source separation including bin stations and appropriate signage of waste and receptacles for multiple waste streams, including: - Organics - Comingled containers - Paper & cardboard - Container deposit scheme - Soft plastic - General waste Designers must refer to AS 4123.7 Mobile waste containers - Colours, markings, and designation requirements for further guidance on bin colour, waste stream and waste type. Safe methods for vehicle access and the transfer of waste must also be considered. For new and refurbished schools, an operational waste management plan (OWMP) must be developed to establish operational waste targets, identify opportunities for reuse and recycling in the operation of the facilities and make adequate provision for the facilities to accommodate for the OWMP. The OWMP must address all requirements from DG 2.7.2	DG02.07	Mandatory	DAB c8 Operational Waste	Operational waste management plan Operational waste reports showing diversion rates
Waste & materials	WM2 – Resource efficient school operations	**Building flexibility** Position structural members considering the future flexibility of the structure. Avoid ad hoc placing of columns internally, giving preference to uniformity in layout. Design all internal walls as non-load bearing to enable future flexibility.	DG21.1.16	Mandatory	Not covered in Green Star	As built drawings or statement by relevant professional
Waste & materials	WM3 – Responsible management of waste	**Construction waste** Consider opportunities for re-use and recycling of materials in the construction phase	DG02.07	Mandatory	DAB c22 Construction and Demolition Waste	Construction waste reports showing percentage of waste re-used and recycled (diverted from landfill)

Waste & materials	WM3 – Responsible management of waste	**Operational waste** A waste storage area must be included in all new school sites, with the provision of space for the separation of waste and receptacles for multiple waste streams, including: - general rubbish, - co-mingled recycling, - paper and cardboard, - secure waste, and - green waste. Safe methods for vehicle access and the transfer of waste must also be considered.	DG02.07	Mandatory	DAB c8 Operational Waste	As-built drawings showing location of waste storage area
Place	P1 – Green infrastructure	**Environmental conservation education** The design of the facilities provide unique and valuable environmental conservation learning opportunities and effective environmental modelling to the wider community.	DG02.06	Mandatory		Statement / Report by qualified ecologist
Place	P1 – Green infrastructure	**Productive landscape** Consider including opportunities for development of community garden within the site and relationships with community groups for this to occur.	DG02.06	Optional	GSC c14.2 Local Food Production	Site plan demonstrating location and size of community garden
Place	P1 – Green infrastructure	**Drinking water catchment protection** For developments within drinking water catchment areas, a water cycle management study is to be included with the Development Application for Education Facility developments involving: - Agriculture facilities - Biosolids and effluent re-use schemes - Sewerage systems or works (including package sewerage treatment plants) - Stormwater or works involving the disposal of untreated runoff	DG51.07	Mandatory	GSC c24 Integrated Water Cycle	1. Water cycle management study 2. Evidence that recommendations in the study have been followed / implemented
Place	P2 – Community & heritage connections	**Site investigations for place making / community connections** The following detailed reports/ surveys/ information should be considered in developing the business case: - Local environment/ character - Climate and microclimate - Heritage significance / impact - Appraisal of physical and visual factors affecting site development - Available transport/ road infrastructure servicing the site - Geo-technical and Soil reports will be required for each site to investigate the suitability of the topsoil and anticipated sub-grade materials for horticultural purposes. - Testing for toxic residues must be undertaken in all areas identified as being a possible risk - i.e. filled or dumped ground.	DG03.02	Negotiable	GSC c12 Culture, Heritage and Identity DAB 24.2 Contamination and Hazardous Materials	1) Relevant reports/surveys developed (these ideally include recommendations for further development stages) 2) Evidence demonstrating recommendations / best practice solutions have been implemented/addressed.
Place	P2 – Community & heritage connections	**Sense of place** The following design principles to every landscape zone of the school. - A healthy and safe landscape - A sense of place - A sustainable landscape - A low maintenance landscape	DG90.04	TBC	Not covered in Green Star	1) Landscape design report 2) Landscape drawings
Place	P2 – Community & heritage connections	**Community use of facilities** Some school facilities are used out of hours for activities such as weekend church groups, sport events and public meetings. Liaise with the Project Director to gain an understanding of any shared use, or community use arrangements that are being considered for the site. New schools should be designed so that direct access to the open play space, fields , hall and gym can be achieved without the public gaining access to the buildings.	DG16.08	TBC	DAB c30B Community Benefits	1. Confirmation by the Architect that direct access has been provided to open space and any other facilities that could be shared with the community. 2) A list of community engagement activities undertaken to develop a community benefits strategy. 3) Plans clearly outlining how the outcomes from the community benefits strategy have been implemented in the project 4) Joint-use or lease agreements where already in place
Place	P2 – Community & heritage connections	Reconciliation action plan	N/A	N/A	DAB c30D Reconciliation Action Plan	1) DoE's Reconciliation Action Plan 2) Evidence of the project's relationship with the RAP, e.g. actions implemented in line with RAP, etc.
Place	P3 – Welcoming learning spaces	**Daylighting** Maximise natural daylight in all habitable spaces to improve indoor amenity and create a pleasant environment.	DG2.3.1	Mandatory	DAB c12 Visual Comfort	1. Daylight modelling report demonstrating how natural daylight has been maximised in all habitable spaces; and 2. As built drawings demonstrating that the model accurately represents the building (i.e. window size and location; skylights installed, etc.); and 3. Specifications supporting inputs used in modelling (e.g. skylights and glass specs)
Place	P3 – Welcoming learning spaces	**Daylight glare control** Discomforting glare and brightness contrasts must be avoided. Designers must seek to: - Exclude direct sunlight from all learning spaces, libraries, administrative offices and staff studies for the period of 9.00am to 3.30pm including Eastern Daylight Saving Time between 21st September to 21st March (equinoxes). - Exclude direct sunlight from desk level in all learning spaces between 9am and 3:30pm. Sun exclusion and glare control can be achieved by the use of elements such as; Sun shades, eave extensions, vertical blades and the like. Glare must only be controlled by blinds as a last resort. Designers must prepare sun diagrams in the design phase as a minimum requirement.	DG12 DG07.01	Mandatory	DAB c12.0 Glare Reduction	1. Daylight glare modelling report / sun diagrams showing direct sunlight has been excluded as required. 2. Drawings supporting inputs of model, showing location of blinds and any other glare control device
Place	P3 – Welcoming learning spaces	**Lighting comfort** - Consider the furniture layouts to determine the orientation of luminaires. Especially when positioning luminaires in Materials Technology spaces to ensure adequate illumination on machines and work surfaces; - avoid potential stroboscopic effects and avoid shadows from ductwork - Mount luminaires as high as possible, but generally no higher than 4000mm AFFL (excluding Gymnasiums and Halls), to improve luminance uniformity and reduce direct glare in the direction of normal view - The standard lamp colour temperature is 4,000°K, except in certain toilet areas where the Design Guide requires the use of blue colours - Compliance with the uniformity requirements of the applicable standard should be demonstrated by the presentation of the output from lighting design software. - Unified Glare Rating (UGR) must be calculated using design software and compliant with the maximum recommended in AS/NZS 1680.1:2006	DG63.03 DG63.03.05	Mandatory	DAB c11 Lighting Comfort	1) Lighting drawings 2) Architectural drawings 3) Lighting specifications / schedules 4) Product data sheets 5) Isolux plot drawings 6) Lighting modelling report showing compliant uniformity and UGRs
Place	P3 – Welcoming learning spaces	**Lighting modelling** Lighting designs should be carried out utilising industry standard lighting design software such as AGI32, Dialux or Relux. Modelling must provide output that clearly demonstrates that the proposed design is compliant with the standards including but not limited to the following parameters: - Maintained illuminance values (average, maximum and minimum) on horizontal surfaces such as floors or working planes as required, broken down to identify the parameters defined in AS/NZS1680.4 or AS/NZS1158 as applicable - Maintained illuminance values (average, maximum and minimum) on vertical surfaces such as walls, shelves or racks as required, broken down to identify the parameters defined in AS/NZS1680.4 or AS/NZS1158 as applicable - Unified Glare Rating (UGR) as defined by AS/NZS1680, - Uniformity as defined by the applicable standard for indoor or outdoor illumination, - Lighting power density in System Watts/m2	DG63.03.02	Mandatory	DAB c11.1 General Illuminance and Glare Reduction	Lighting modelling report confirming compliance with required standards and parameters
Place	P3 – Welcoming learning spaces	**External access lighting** External Access Lighting shall be provided to illuminate building entrances, footpaths, sheltered walkways, roadways and car park. External Access Lighting must: - Be minimal and designed to prevent glare to pedestrians, nearby residents and to motorists. Evidence of compliance with AS4282, AS/NZS 1158 and other applicable Australian Standards must be provided by the designer. - Be located so as to link various sources of illumination such as street lighting (for carpark and roadways) and internal security lighting (for footpaths, walkways and entrances). - Illuminate building entry doors. - Highlight 'accident-prone' areas such as changes in level, stairs and ramps. - Provide vertical illumination.	DG63.08.01	Mandatory	DAB c27.0 Light Pollution to Neighbouring Bodies	1) As built drawings indicating the location of all external luminaires 2) Letter by lighting designer describing glare prevention measures

Place	P3 – Welcoming learning spaces	The inclusion of active cooling within school facilities is directed by the Department's Air Cooling policy: 2.1 Schools with a long term average mean maximum January temperature of 33 oC and above: Generally, air conditioning is to be provided to all school buildings. 2.2 Schools with a long term average mean maximum January temperature of below 33oC: Air conditioning is to be installed in all permanent learning spaces and libraries forming part of each projects scope. - Thermal modelling is undertaken to demonstrate that learning spaces and libraries have been designed to achieve a predicted mean vote (PMV) of +/- 0.5 for 95% of occupied hours	DG06.03 DG55.01 DG55.02	Mandatory	DAB c14 Thermal Comfort	1) Mechanical drawings showing HVAC systems installed, or 2) Confirmation from sub-contractors that services have been installed and commissioned as required; and 3) Modelling report showing required PMV is achieved. Modelling report to be done in line with methodology described in Draft thermal comfort and indoor air quality interim performance brief for DG55
Place	P3 – Welcoming learning spaces	**Background noise levels** - HVAC systems shall be designed in accordance with the recommended internal noise levels noted in table 1 of DG55.02. The noise levels are the result from the cumulative contribution of traffic noise (via the façade) PLUS the building air-conditioning /ventilation systems. The noise measurement and documentation must be provided by a qualified acoustic consultant and in accordance with AS/NZS 2107. Noise measurement must account for all internal and external noise including noise arising from building services equipment, noise emission from outdoor sources such as traffic, and (where known) noise from industrial process. Occupancy noise is excluded. Compliance shall be demonstrated through measurement, and the measurements shall be conducted in at least 10% of the spaces in the nominated area. The selection of representative spaces must be justified and must consider how the spaces are considered to be the most conservative with respect to both internal, and external noise sources. The range of measurement locations shall be representative of all spaces available within the nominated area. All relevant building systems must be in operation at the time of measurement. Projects less than 500m2 Gross Floor Area (GFA) must account for measurements conducted in at least 95% of spaces within the nominated area.	DG55.02 DG08.06	Mandatory	DAB c10.1 Internal Noise Levels	1. Road, rail, aircraft, industrial and rain noise assessment as per DG11.02 2. Report by qualified acoustics consultant demonstrating noise measurements are compliant.
Place	P3 – Welcoming learning spaces	**Room-to-room noise control** The following elements have prescriptive acoustic performance or construction requirements: - Operable walls (between general learning areas, all schools): Rw 45 - Entry doors to occupied teaching, music, drama and sports spaces: Solid core, minimum 35 mm thick with acoustic weather (where external) seals on all rebated closing faces. Gap at floor to be minimized. - Internal glazed sections in walls and vision panels in or adjacent to internal doors: minimum 10.38 mm laminated glass. In some situations acoustic windows may be needed for satisfactory noise separation. - Construction separating wastewater pipework from occupied spaces: Rw 40 - Where adjacent to an occupied space (and not serving that space), hydraulic supply pipework and wastewater pipework shall be separated from the adjacent occupied space. Construction between the adjacent spaces in this instance shall be a 'staggered stud'	DG11.05	Mandatory	DAB c10.3 Acoustic Separation	1. Detailed drawings including the acoustic design specification of operable walls, entry doors, internal glazed sections, etc. OR 2. Statement by a qualified acoustics consultant confirming compliance
Place	P3 – Welcoming learning spaces	**Noise emissions** Generally noise emission to the environment from mechanical services noise sources (such as air conditioners) are the subject of a development consent conditions. In NSW the development consent conditions will refer to the Industrial Noise Policy (INP) or Local Council requirement. Where no condition regarding noise sources exists for a school development, noise emission from such sources should be designed, in-principle, to satisfy the requirements of the Industrial Noise Policy.	DG11.04	Optional	Not covered in Green Star	
Place	P3 – Welcoming learning spaces	**Acoustic post-occupancy evaluation** Post Occupancy evaluations are often undertaken to assess the performance of recently completed or existing facilities. Where a Post Occupancy Evaluation is to be undertaken it should be conducted by the project team or acoustic engineer and should be undertaken of selected acoustic parameters only. Evaluation may include: - Internal noise levels, - Room acoustics, - Noise emission, - Room-to-room acoustics performance	DG11.07	Optional	GSP c13 Internal Noise Levels	1. Commitment by SI to conduct acoustic post-occupancy evaluation
Place	P3 – Welcoming learning spaces	**Low VOC-emitting materials** All surface coatings, and other volatile organic compound (VOC) emitting products including adhesives, sealants, carpets, carpet tiles, and carpet underlays, must be made from low-VOC emission materials. Paints must meet the limits stipulated in the Australian Paint Approval Scheme's (APAS) VOC limits for low VOC paints. Adhesives and sealants must not exceed the maximum VOC limits stipulated in Table 13.1.1B of the Green Star – Design & As Built v1.3 tool. Carpets must not exceed the total VOC limits stipulated in Table 13.1.2B of the Green Star – Design & As Built v1.3 tool.	DG2.5.2	Mandatory	DAB c13 Indoor Pollutants	Product specifications, certificates, safety datasheets that demonstrate low-VOC contents Bill of quantities
Place	P3 – Welcoming learning spaces	**Low formaldehyde-emitting materials** Only low formaldehyde-emitting engineered wood products should be used, such as those that meet the Australian Standards for formaldehyde emission limit E1 (NICNAS classification) or lower.	DG2.5.2	Mandatory	DAB c13 Indoor Pollutants	Product specifications, certificates, safety datasheets that demonstrate low-formaldehyde contents Bill of quantities
Place	P3 – Welcoming learning spaces	**Ventilation in printing rooms** The ventilation system is to be designed to serve the whole room and is not intended to provide localised exhaust at equipment. - Discharge air from the ventilation unit to the outside of the building via a vermin proofed louvre. - Draw make-up air from inside the building through wall or door grilles. - Locate the inlet/s and exhaust to achieve good airflow across the room in plan and elevation to pick up all machine emissions. -Ensure the airflow doesn't draw equipment emissions across operator's face. -Note that the room door in many schools may be left open in normal daily operation. Allow for this when locating the exhaust fan so that cross ventilation is achieved with make-up air drawn through the door opening. - Required speed range: minimum of 6 air changes per hour and maximum of 15 air	DG57.07	Mandatory	DAB c9.3 Exhaust or Elimination of Pollutants	1. Mechanical drawings and specifications showing compliant printing room ventilation
Place	P3 – Welcoming learning spaces	**Chemical store ventilation** - Provide mechanical exhaust system with high and low level exhaust points to all chemical stores, with a minimum of 15 air changes per hour flow rate. - Discharge air according to the requirements of BCA. The discharge outlet is to be fitted with bird wire mesh. - Provide make up air to all chemical stores, (to replace exhausted air) through openings in an external wall, fitted with weatherproof louvres. All grilles and louvres are to be fitted with vandal proof bars and be fitted with vermin mesh. - For security and fire rating reasons do not use windows/doors or door grilles for air intake. - The chemical stores ventilation systems are to run continuously.	DG57.09	Mandatory	Not covered in Green Star	
Place	P3 – Welcoming learning spaces	**Pesticide free environments** Schools must be designed, constructed and maintained, without using chemicals for termite and other pest control. No chemical pesticides and termicide to be used. Preventive treatments to be by physical means and careful design to minimise risk	DG2.5.3	Mandatory	Not covered in Green Star	Statement by head contractor that no pesticides or termites have been used.
Place	P3 – Welcoming learning spaces	**Green cleaning**	N/A	N/A	GSP c6 Green Cleaning	1) WEB Clean School User Guide 2) Green Cleaning specifications
Place	P3 – Welcoming learning spaces	**Fly free indoors** Fly screening must be provided in all schools to the doors, windows and other openings in food preparation, biology, and non-water-closet toilet spaces or where specifically nominated in the EFSG. Schools in localities where fly incidence constitutes a health hazard (especially trachoma or other nuisance) will require fly screens to all opening sashes.	DG31.01	Mandatory	Not covered in Green Star	As-built drawings showing fly screening has been provided as required

Place	P3 – Welcoming learning spaces	For mechanically ventilated spaces: 1. Outdoor air ventilation rates are in accordance with requirements of AS 1668.2. 2. Mechanical ventilation systems shall be linked to CO2 sensors to provide demand-controlled ventilation within each space to ensure that CO2 levels are maintained below the required CO2 threshold. 3. Mechanical ventilation systems shall be designed to provide adequate access for maintenance and cleaning. 4. Ventilation systems are designed to maintain an average daily CO2 concentration as per the latest NCC code, and so that the maximum concentration does not exceed 1,500ppm for more than 20 consecutive minutes in each day. 5. The required outdoor air ventilation rates and CO2 concentrations shall be maintained without the need for any human intervention e.g. the opening of windows or external louvres. 6. Ventilation systems shall be designed minimise the entry of outdoor pollutants through ensuring that the ventilation system design is in accordance with the relevant parts of AS 1668.2. and ASHRAE Standard 62.1. 7. Where local sources of pollutants are present e.g. photocopiers, minimum exhaust ventilation flow rates should be provided in accordance with AS1668.2: Table B1.	DG55.02	Mandatory	DAB c9 Indoor Air Quality	Mechanical drawings and specifications Extracts from commissioning report
Place	P3 – Welcoming learning spaces	**Ecological conservation** Schools sites must conserve for future generations, the biological diversity of genetic materials, species and ecosystems on that site and consider the surrounding natural environment. The design of the facilities must provide unique and valuable environmental conservation learning opportunities and effective environmental modelling to the wider community. Schools must model best practice design, material use, systems and operational methodology, demonstrating human's connections to nature and the operation of natural cycles of sun, wind, rain and the four seasons. Schools must connect with nature and incorporate biophilic design principles. Open space must allow for exploration, and biodiversity and earth education to enhance the site's outdoor learning potential. New and refurbished schools must: Preserve or re-establish native flora (unless it poses a safety risk or cannot be designed around) and create new landscapes through liaising with local government authorities, Landcare and environmental groups, and the use of native low water use plants. Consider opportunities for development of community garden within the site and relationships with community groups for this to occur. Adequate due diligence must be conducted where biodiversity or high ecological value is identified on the site. For more details see DG90 Landscape Design	DG02.06	Mandatory	DAB c23 Ecological Value GSC c29 Ecological Value (incl Biodiversity Enhancement)	1) Biodiversity or ecological assessment / local flora and fauna survey 2) Biodiversity management plan describing measures for the conservation and protection of threatened species or communities, biodiversity enhancement, tree protection, etc. 3) Evidence demonstrating measures have been implemented to protect and enhance endangered species / ecological communities identified; to preserve or re-establish native flora; etc.
Place	P3 – Welcoming learning spaces	-All new facilities must meet current DTS provisions of the NCC and the associated standards. Generally AS 1428.1 is the minimum design standard for access and mobility. However, it is DoE's policy that any enhanced requirements noted in AS 1428.2 be incorporated in any new design. -Additionally, DoE have enhanced circulation requirements as noted in DG / CIRCULATION - Provide hearing augmentation system for areas that have amplification, generally within Gymnasium, libraries, movement studios and Communal Halls, provide a system to assist the aurally challenged to hear music and speech within the main auditorium and on the stage - Provide the International Symbol for Deafness to indicate that an assistive hearing device is installed.	DG19.01 DG65.14	Mandatory	DAB 30D Universal design	1) Accessibility plan 2) As-built drawings or other evidence demonstrating that minimum and enhanced accessibility requirements have been provided for walkways, corridors, ramps, etc. 3) Photographic or other evidence of signage installed
Place	P3 – Welcoming learning spaces	**Weather protection** Circulation areas provided between administrative, staff and all student spaces (except Agriculture), should be protected from sun, rain and unfavourable winds.	DG08.05	Mandatory	Not covered in Green Star	As built drawings showing circulation areas are protected as required
Place	P3 – Welcoming learning spaces	**Open play space** Open play space must be provided for students to access during recess, lunch breaks and for outdoor learning. Open play space can be comprised of - Paved and grassed areas - Rooftops and terraces - Covered outdoor areas The designated open play space must be easily monitored and managed by school staff. Where a joint use agreement can be negotiated with a local council or land owner, the required play space can be located off-site, providing the facilities are - In close proximity to the school - Easily accessible - Safe and secure Designs must aim to achieve a minimum of 10m2 per student. Where this figure is not achievable the proposed m2 per student of the completed project must not be less than the existing m2 per student currently on the site.	DG10.03	Mandatory	Not covered in Green Star	Plan view drawings showing provision of open space
Place	P3 – Welcoming learning spaces	**Staff room**	N/A	N/A	GSI c Amenity Space	1) Extracts from the EFSG requirements for staff rooms 2) Evidence of staff room delivered accordingly
Place	P3 – Welcoming learning spaces	**Healthy canteen policy**	N/A	N/A	DAB c30D Integrating Healthy Environments	1) Research report behind Healthy Canteen Policy 2) Evidence that policy initiative has been incorporated into the school under assessment.
Place	P3 – Welcoming learning spaces	**Safety by design** - The Work Health and Safety Act and the Department of Education principles of student safety and welfare mandate the avoidance of accidents through careful design of facilities - The designer must ensure, so far as is reasonably practicable, that the plant, substance or structure is designed to minimise risks to the health and safety of all parties who will work on a site connected with its design as well as the end users of the facility. - An important part of the Safety by Design principle is recording the risk assessments that are conducted during the design and providing to the client, owners, any users/occupiers of the facilities and those who will be building or maintaining the facilities, details of risks and hazards identified. - The design of facilities should not only be inherently safe but visually and pragmatically safe and not tempt students or the general public into unsafe practice. Examples: <u>Glazing</u>: The safety of occupants is paramount where glass is being used, especially in areas subject to human impact. All glazing types and thickness are to comply with the relevant AS as a minimum. <u>Hot water</u>: To minimise scalding risk all hand basins, showers and the kitchen sink in practical activities areas serving IO/IS classes, require "warm" rather than "hot" water provided at a specified temperature, by mixing hot and cold water through a Thermostatic Mixing Valve. (Note: Tempering Valves are not permitted in schools) <u>Drinking water tanks</u>: Ensure rainwater is not collected from areas containing lead materials. All coating materials used inside the reservoir must be suitable for drinking water and guaranteed against liner leakage for a period of 20 years. A filtering and UV system to be provided where drinking water tanks are present.	DG14.02 DG31.03 DG53.11 DG53.16 DG53.17	Mandatory	Not covered in Green Star	1. Safety risk assessments 2. Short report identifying safety-by-design principles incorporated / Sign off by head contractor confirming all mandatory requirements in DG14 have been addressed. 3. Manufacturer's certificate to AS/NZS 4020 for tanks
Place	P3 – Welcoming learning spaces	**Microbial control** As a measure to prevent legionella, heated water to hand basins, showers etc. shall be stored at temperature above 65 C. Thermostatic mixing valves are to be used for tempered water generation at each point of use. Valves need to comply with microbe disinfection requirements - "Code of Practice for Thermostatic Mixing Valves NSW" as approved by the NSW Health Department.	DG51.09 DG53.11	Mandatory	DAB c28 Microbial Control	1. Letter by hydraulic engineer confirming hot water is stored above 65 deg and that valves comply with code of practice.

		Security Safety in Design and Crime Prevention Through Environmental Design (CPTED) principles are to be implemented in project planning stage. Advice on the electronic surveillance systems can be sought early in the design phase. CCTV systems are required in several locations where indicated in the Rooms and Spaces Technical Data table, including: - Secondary clinic - Primary sick bay - Library				1) Crime risk assessment or equivalent 2) Evidence of designing out crime principles implemented 3) Security services plans, schedules and forms by School Security Unit (SSU) 4) SSU specification and evidence of input on project specification
Place	P3 – Welcoming learning spaces		DG14.10 DG65.08 DG65.10	TBC	GSC c15 Safe Places	
		Hazardous materials Where a new school is to be developed a Hazardous materials study is to be conducted, including: - Asbestos Containing Materials (ACM) - Synthetic Mineral Fibres (SMF) - Polychlorinated Biphenyl's (PCB) - Lead Paint - Ozone Depleting Substances Any existing structures and all parts of the site should be examined in order to determine the presence of hazardous materials before commencement of any renovation or demolition. Inspection should be conducted by organisations with the National Association of Testing Authorities (NATA) accreditation complying with the requirements of AS/NZS ISO.IEC 17020 for the inspection of hazardous materials (HazMat) including asbestos. Hazardous Materials inspection reports should be produced in accordance with the requirements of the various Safe Work Australia "Codes of Practice" for the management and control of hazardous substances. Where hazardous materials are found a Hazardous Materials Management Plan should be			DAB 24.2 Contamination and Hazardous Materials	1. Hazardous materials study / site inspection report / survey 2. Management plans for hazardous materials identified 3. Remediation strategies implemented 4. Environmental auditor certificates / clearance certificates
Place	P3 – Welcoming learning spaces	prepared	DG48.01	Mandatory		
		Digital infrastructure New buildings and refurbishments are required to provide a common wireless solution compatible across the school, providing a consistent user experience and support mechanism. This involves the replacement of existing legacy wireless equipment, such as wireless access points and site switches				
Place	P3 – Welcoming learning spaces		DG64.12.02	Mandatory	GSC c22.2 Digital Infrastructure	1) Contracts describing the network infrastructure specification and operational requirements
		Sustainability benchmarking Ecologically Sustainable Development principles must be included in any new school buildings to a level that the building could be benchmarked to achieve a 5 Star Green Star rating if located in Sydney, Newcastle, or Wollongong metropolitan areas or a 4 star Green Star rating if located elsewhere in NSW. Benchmarking must be undertaken against the Green Star credits using the edition of the Green Star scorecard current at the time of the assessment. The filled out scorecard must demonstrate the project can achieve enough points for the required rating. Formal Green Star certification is not mandatory				
Place	P3 – Welcoming learning spaces		DG02.09	Mandatory	All credits	1) Green Star scorecard demonstrated the final desing is benchmarked to the required rating (by a Green Star Accredited Professional)
		Site investigations for resilience The following detailed reports/ surveys/ information should be considered in developing the business case: - Slope, drainage and erosion issues including flood risks (if any) - Geotechnical and soil conditions - Airborne pollutants - Bushfire risks - Appraisal of available services infrastructure - Climate change risk assessment must be undertaken considering at least two different climate change scenarios An environmental risk report will be required for developments proposed within sensitive natural environments or sites subject to natural risks (i.e. flood prone sites, bush fire areas).				1) Detailed reports or surveys developed
Resilience	R1 – Preparation for shocks		DG03.02	Negotiable	DAB c3 Adaptation and Resilience	2) Environmental risk report 3) Evidence demonstrating recommendations have been implemented and risks addressed through design responses.
		Bushfire protection Development applications on bush fire prone land must be accompanied by a Bush Fire Assessment Report demonstrating compliance with the aim and objectives of Planning for Bush Fire Protection and the specific objectives and performance criteria for the land use proposed. Local Authorities and the Rural Fire Service can provide advice on the design of buildings in bush fire prone areas. The Building Code of Australia and AS3959 "Construction of buildings in bushfire-prone areas" set out the requirements for buildings which are within close proximity to a defined bush fire zone. Mandatory landscape management strategies: - Keep the amount of fuel (leaves, twigs, logs, dead grass) in the vicinity of buildings to a minimum. - Ensure trees are located at away from buildings to avoid branches overhanging and leaves collecting on roofs. - Do not plant shrubs against buildings. - The crowns of trees planted on the hazard side of the development should not be contiguous. - Plant fire resistant trees and shrubs on the hazard side of the development to reduce the potential impact of wind, fire intensity, radiant heat, and rate of spread as well as intercepting burning embers. - Avoid combustible fencing materials. - Provide irrigation and garden sprinklers to water areas near the buildings (subject to water authority approval).				1) Bush fire assessment report 2) Statement by Architect / fire consultant outlining building strategies implemented in line with BCA and AS3959. 3) Bush fire management plan outlining management strategies implemented 4) Landscape plans detailing bush fire management measures implemented
Resilience	R1 – Preparation for shocks		DG13.01	Mandatory	DAB c3 Adaptation and Resilience	
		Climate change adaptation Sites and school communities must be able to withstand natural and urban hazards and adaptively respond to climate change over time, especially for projects involving vulnerable communities e.g. climate generating exacerbated flood, storm surge, inundation, heatwaves, bush fires, extreme storm and other weather events. School facilities must be able to withstand natural hazards and adapt to shocks and stresses to avoid social and economic costs of interrupted operation and repairing or replacing damaged assets. To achieve this, increasing resilience to natural hazards must be considered in the business case development so that associated costs are budgeted. An initial assessment of natural hazards and project vulnerability must be carried out, in consultation with resilience experts, to inform the business case and identify hazards where further analysis is required. Where significant risks are identified in the initial assessment, a comprehensive climate change risk assessment must be undertaken. Any high or extreme risks identified must be addressed through design measures.				1) Climate risk assessment, and 2) Climate adaptation plan 3) Emergency management plan
Resilience	R2 – Preparation for stresses		DG02.08	Mandatory	DAB c3 Adaptation and Resilience	

8 APPENDIX B – GREEN STAR SCORE CARD (CAPA)

Green Star - Design & As Built Scorecard

Project:	CAPA	**Round:**	1
Targeted Rating:	4 Star - Best Practice		

Points Available (Targeted)	Project Score (Targeted)	NA Targeted
99.0	50.5	1.0

CATEGORY / CREDIT	AIM OF THE CREDIT / SELECTION	CODE	CREDIT CRITERIA		POINTS AVAILABLE	POINTS TARGETED	NA AVAILABLE
Management					**14**		
Green Star Accredited Professional	To recognise the appointment and active involvement of a Green Star Accredited Professional in order to ensure that the rating tool is applied effectively and as intended.	1.1	Accredited Professional		1	1	-
Commissioning and Tuning	To encourage and recognise commissioning, handover and tuning initiatives that ensure all building services operate to their full potential.	2.0	Environmental Performance Targets		-	Complies	-
		2.1	Services and Maintainability Review		1	1	-
		2.2	Building Commissioning		1	1	-
		2.3	Building Systems Tuning		1	1	-
		2.4	Independent Commissioning Agent		1		-
Adaptation and Resilience	To encourage and recognise projects that are resilient to the impacts of a changing climate and natural disasters.	3.1	Implementation of a Climate Adaptation Plan		2	2	-
Building Information	To recognise the development and provision of building information that facilitates understanding of a building's systems, operation and maintenance requirements, and environmental targets to enable the optimised performance.	4.1	Building Information		1	1	-
Commitment to Performance	To recognise practices that encourage building owners, building occupants and facilities management teams to set targets and monitor environmental performance in a collaborative way.	5.1	Environmental Building Performance		1	1	-
		5.2	End of Life Waste Performance	A. Contractual Agreements	1	1	-
Metering and Monitoring	To recognise the implementation of effective energy and water metering and monitoring systems.	6.0	Metering		-	Complies	-
		6.1	Monitoring Systems		1	1	-
Responsible Construction Practices	To reward projects that use best practice formal environmental management procedures during construction.	7.0	Environmental Management Plan		-	Complies	-
		7.1	Environmental Management System		1	1	-
		7.2	High Quality Staff Support		1	1	-
Operational Waste	A. Performance Pathway	8A	Performance Pathway: Specialist Plan		1	1	-
		8B	Prescriptive Pathway: Facilities		0		-
Total					**14**	**13**	

Indoor Environment Quality					17		
Indoor Air Quality	To recognise projects that provide high air quality to occupants.	9.1	Ventilation System Attributes		1	1	0.0
		9.2	Provision of Outdoor Air	☐ A. Comparison to Industry Standards ☑ B. Performance Based Approach ☐ C. Natural Ventilation	2		0.0
		9.3	Exhaust or Elimination of Pollutants	☐ A. Removing the Source of Pollutants ☑ B. Exhausting the Pollutants Directly to the Outsic	1		0.0
Acoustic Comfort	To reward projects that provide appropriate and comfortable acoustic conditions for occupants.	10.1	Internal Noise Levels		1	1	0.0
		10.2	Reverberation		1.00	1	0.00
		10.3	Acoustic Separation	A. Sound Reduction	1.00		0.00
Lighting Comfort	To encourage and recognise well-lit spaces that provide a high degree of comfort to users.	11.0	Minimum Lighting Comfort		Complies	Complies	-
		11.1 General Illuminance and Glare Reduction	11.1.1 General Illuminance	☑ A. Non Residential Spaces ☐ B. Residential Spaces	1.00	1	0.00
			11.1.2 Glare Reduction	☑ A. Prescriptive Method 1 ☐ B. Prescriptive Method 2 ☐ C. Performance Method			
		11.2	Surface Illuminance	☑ A. Prescriptive Method ☐ B. Performance Method ☐ C. Residential Spaces (Prescriptive Method)	1.00	1	0.00
		11.3	Localised Lighting Control		1.00	1	0.00
Visual Comfort	To recognise the delivery of well-lit spaces that provide high levels of visual comfort to building occupants.	12.0	Glare Reduction	☐ A. Fixed Shading Devices ☑ B. Blinds or Screens ☐ C. Daylight Glare Model	Complies	Complies	-
		12.1	Daylight	☐ A. Prescriptive Methodology ☑ B. Compliance Using Daylight Factor ☐ C. Compliance Using Daylight Autonomy	2	1	0.0
		12.2	Views		1	1	0.0
Indoor Pollutants	To recognise projects that safeguard occupant health through the reduction in internal air pollutant levels.	13.1 Paints, Adhesives, Sealants and Carpets	13.1.1 Paints, Adhesives and Sealants	☑ A. Product Certification ☐ B. Laboratory Testing ☐ C. No Paints, Adhesives or Sealants	1.00	1	0.00
			13.1.2 Carpets	☑ A. Product Certification ☐ B. Laboratory Testing ☐ C. No Carpets			
		13.2	Engineered Wood Products	☑ A. Product Certification ☐ B. Laboratory Testing	1.00	1	0.00
Thermal Comfort	To encourage and recognise projects that achieve high levels of thermal comfort.	14.1	Thermal Comfort	☑ A. Naturally Ventilated Spaces ☑ B. Mechanically Ventilated Spaces ☐ C. Residential Spaces	1	1	0.0
		14.2	Advanced Thermal Comfort	☐ A. Naturally Ventilated Spaces ☐ B. Mechanically Ventilated Spaces ☐ C. Residential Spaces ☐ D. Industrial spaces	1		0.0

Total			**17**	**11**	

Energy				**22**		
		15A.0	Conditional Requirement: Prescriptive Pathway	-	Complies	-
		15A.1	Building Envelope	0		-
		15A.2	Wall-Glazing Construction and Retail Display Glazing	0		-
		15A.3	Lighting	0.00		-
		15A.4	Ventilation and Air Conditioning	0		-
		15A.5	Domestic Hot Water	0		-
		15A.6	Transition Plan	0		-
		15A.7	Fuel Switching	0		-
		15A.8	On-Site Storage	0		-
		15A.9	Vertical Transportation	0		-
		15A.10	Off-Site Renewables	0		-
		15B.0	Conditional Requirement: NatHERS Pathway	-		-
		15B.1	Thermal and Energy Performance	0		-
		15B.2 Building Services and Appliances	15B.2.1 Lighting	0		-
			15B.2.2 Ventilation and Air Conditioning ☐ A. Mechanically Conditioned Spaces ☐ B. Spaces With Mechanical Heating Only ☐ C. Naturally Ventilated Spaces	0		-
			15B.2.3 Domestic Hot Water	0		-
			15B.2.4 Appliances & Equipment	0		-
			15B.2.5 Fuel Switching	0		-
			15B.2.6 On-Site Storage	0		-
			15B.2.7 Vertical Transportation	0		-
			15B.2.8 Passive Laundry Facilities	0		-
			15B.2.9 Unoccupied Areas	0		-
			15B.2.10 Off-Site Renewables	0		-
		15C.0	Conditional Requirement: BASIX Pathway	-		-
		15C.1	BASIX Greenhouse Gas Reductions	0		-
		15C.2	Off-Site Renewables	0		-

Greenhouse Gas Emissions	E. Reference Building Pathway	15D.0	Conditional Requirement: NABERS Pathway	-		-
		15D.1	NABERS Energy Greenhouse Gas Emissions Reduction	0		-
		15D.2	Off-Site Renewables	0		-
		15D.3 Additional Prescriptive Measures	15D.3.1 Transition Plan	0		-
			15D.3.2 Fuel Switching	0		-
			15D.3.3 On-Site Storage	0		-
		15E.0	Conditional Requirement: Reference Building Pathway	-	Complies	-
		15E.1	GHG Emissions Reduction: Building Fabric	4		-
		15E.2	GHG Emissions Reduction	16	3	-
		15E.3	Off-Site Renewables	8		-
		15E.4	District Services	7		-
		15E.5 Additional Prescriptive Measures	15E.5.1 Transition Plan	1		-
			15E.5.2 Fuel Switching	2		-
			15E.5.3 On-Site Storage	1		-
		15H.0	Conditional Requirement: Industrial Prescriptive Pathway	-		-
		15H.1	Building Envelope	0		-
		15H.2	Wall-Glazing Construction	0		-
		15H.3 Lighting	15H.3.1 Internal Lighting	0		-
			15H.3.2 External Lighting	0		-
		15H.4	Ventilation and Air Conditioning	0		-
		15H.5	Domestic Hot Water	0		-
		15H.6	Transition Plan	0		-
		15H.7	Fuel Switching	0		-
		15H.8	On-site Storage	0		-
		15H.9	Provision of Structure for PV	0		-
		15H.10	Off-site Renewables	0		-
		15I.0	Conditional Requirement: On-site Renewables Pathway	-		-
		15I.1	On-site Renewable Energy	0		-
Peak Electricity Demand Reduction	A. Prescriptive Pathway	16A	Prescriptive Pathway: On-Site Energy Generation	1	1	-
		16B	Modelled Performance Pathway: Reference Building	0		-
Total				**21**	**4**	

Transport							
					9		
Sustainable Transport	B. Prescriptive Pathway	17A	Performance Pathway		0		-
		17B.1	Access by Public Transport		3	1	-
		17B.2	Reduced Car Parking Provision		1	1	0.0
		17B.3	Low Emission Vehicle Infrastructure	A. Parking for Fuel-Efficient Vehicles	0		0.0
		17B.4	Active Transport Facilities		1		-
		17B.5	Walkable Neighbourhoods	A. Proximity to Amenities	1	1	-
		17C.1	Access by Public Transport		0		-
		17C.2	Reduced Car Parking Provision		0		-
		17C.3	Low Emission Vehicle Infrastructure	☐ A. Parking for Fuel-Efficient Vehicles ☐ B. Parking for Electric Vehicles ☐ C. Parking for Car Share Vehicles ☐ D. No Parking Spaces Provided ☐ E. Low Emission Facility Transport	0		-
		17C.4	Active Transport Facilities		0		-
		17C.5	Proximity to Amenities		0		-
Total					7	3	

Water							
					12		
Potable Water	B. Prescriptive Pathway	18A	Potable Water - Performance Pathway		0		-
		18B.1	Sanitary Fixture Efficiency		1	1	-
		18B.2	Rainwater Reuse		1	1	-
		18B.3	Heat Rejection		2	2	-
		18B.4	Landscape Irrigation		1		0.0
		18B.5	Fire Protection System Test Water		1		0.0
Total					6	4	

Materials							
					14		

Life Cycle Impacts	B. Prescriptive Pathway - Life Cycle Impacts	19A.1	Comparative Life Cycle Assessment		0		-
		19A.2	Additional Reporting	☐ A. Additional Life Cycle Impact Reporting ☐ B. Material Selection Improvement ☐ C. Construction Process Improvement ☐ D. LCA Design Review	0		-
		19B.1 Concrete	19B.1.1 Portland Cement Reduction		2	1	-
			19B.1.2 Water Reduction		0.5	0.5	-
			19B.1.3 Aggregates Reduction	B. Fine Aggregate Reduction	0.5	0.5	-
		19B.2 Steel	B. Reduced Use of Steel Reinforcement		1	1	-
		19B.3	Building Reuse	19B.3.1 Façade Reuse	2		-
				19B.3.2 Structure Reuse	2		-
		19B.4	Structural Timber	19B.4.0 Responsible Sourcing	-		-
				19B.4.1 Reduced Embodied Impacts	3		-
		19C.1 Concrete	19C.1.1 Portland Cement Reduction		0		-
			19C.1.2 Water Reduction		0		-
			19C.1.3 Aggregates Reduction	A. Course Aggregate Reduction	0		-
		19C.2 Steel	19C.2.1 Reduced Mass of Steel Framing	A. High Strength Steel	0		-
			19C.2.2 Reduced Use of Steel Reinforcement		0		-
		19C.3	Building Reuse	19C.3.1 Façade Reuse	0		-
				19C.3.2 Structure Reuse	0		-
		19C.4	Structural Timber	19C.4.0 Responsible Sourcing	-		-
				19C.4.1 Reduced Embodied Impacts	0		-
Responsible Building Materials	To reward projects that include materials that are responsibly sourced or have a sustainable supply chain.	20.1	Structural and Reinforcing Steel	20.1.0 Responsible Steel Maker	-	Complies	-
				A. Responsible Steel Fabricator	1	1	0.0
		20.2	Timber	☑ A. Certified Timber ☑ B. Reused Timber	1	1	0.0
		20.3	Permanent Formwork, Pipes, Flooring, Blinds and Cables	B. Best Practice Guidelines for PVC	1	1	0.0
Sustainable Products	To encourage sustainability and transparency in product specification.	21.1	Product Transparency and Sustainability	☐ A. Reused Products ☐ B. Recycled Content Products ☐ C. Environmental Product Declarations (EPDs) ☐ D. Third Party Certification ☐ E. Stewardship Programs	3		-
Construction and Demolition Waste	A. Fixed Benchmark	22.0	Reporting Accuracy	A. Compliance Verification Summary	-	Complies	-
		22A	Fixed Benchmark		1	1	-
		22B	Percentage Benchmark		0		-

Total					**12**	**7**	

Land Use & Ecology					**6**		
Ecological Value	To reward projects that improve the ecological value of their site.	23.0	Endangered, Threatened or Vulnerable Species	A. EPBC	-		-
		23.1	Ecological Value		3		-
Sustainable Sites	To reward projects that choose to develop sites that have limited ecological value, re-use previously developed land and remediate contaminate land.	24.0	Conditional Requirement		-	Complies	-
		24.1	Reuse of Land	A. Previously Developed Land	1	1	-
		24.2	Contamination and Hazardous Materials	☐ A. Site Contamination ☐ B. Hazardous Materials	1		0.0
Heat Island Effect	To encourage and recognise projects that reduce the contribution of the project site to the heat island effect.	25.1	Heat Island Effect Reduction		1	1	-
Total					**6**	**2**	

Emissions					**5**		
Stormwater	To reward projects that minimise peak stormwater flows and reduce pollutants entering public sewer infrastructure.	26.1	Stormwater Peak Discharge		1	1	-
		26.2	Stormwater Pollution Targets		1	1	-
Light Pollution	To reward projects that minimise light pollution.	27.0	Light Pollution to Neighbouring Bodies		-	Complies	-
		27.1	Light Pollution to Night Sky	A. Control of Upward Light Output Ratio (ULOR)	1	1	-
Microbial Control: Legionella Impacts from Cooling Systems	B. Waterless Heat Rejection Systems	28A	Natural Ventilation		0	0	-
		28B	Waterless Heat Rejection Systems		1	1	-
		28C	Water-Based Heat Rejection Systems		0		-
Refrigerant Impacts	To encourage operational practices that minimise the environmental impacts of refrigeration equipment.	29.1	Refrigerants Impacts	A. Calculating TSDEI	1		-
Total					**5**	**4**	

Innovation				**10**		
Innovative Technology or Process	The project meets the aims of an existing credit using a technology or process that is considered innovative in Australia or the world.	30A	Innovative Technology or Process			-
Market Transformation	The project has undertaken a sustainability initiative that substantially contributes to the broader market transformation towards sustainable development in	30B	Market Transformation			-

Improving on Green Star Benchmarks	The project has achieved full points in a Green Star credit and demonstrates a substantial improvement on the benchmark required to achieve full points.	30C	Improving on Green Star Benchmarks	10	2	-
Innovation Challenge	Where the project addresses an sustainability issue not included within any of the Credits in the existing Green Star rating tools.	30D	Innovation Challenge			-
Global Sustainability	Project teams may adopt an approved credit from a Global Green Building Rating tool that addresses a sustainability issue that is currently outside the scope of	30E	Global Sustainability			-
Total				**10**	**2**	

TOTALS	**TARGETED**
CORE POINTS	**48.0**
INNOVATION POINTS	**2.0**
NA POINTS	**1.0**
POINTS AVAILABLE	**99.0**
PROJECT SCORE	**50.5**

9 APPENDIX C – GREEN STAR SCORE CARD (PCYC)

Green Star - Design & As Built Scorecard

Project:	PCYC	**Round:**	1
Targeted Rating:	4 Star - Best Practice		

Points Available (Targeted)	Project Score (Targeted)
100.0	49.0

CATEGORY / CREDIT	AIM OF THE CREDIT / SELECTION	CODE	CREDIT CRITERIA		POINTS AVAILABLE	POINTS TARGETED
Management					**14**	
Green Star Accredited Professional	To recognise the appointment and active involvement of a Green Star Accredited Professional in order to ensure that the rating tool is applied effectively and as intended.	1.1	Accredited Professional		1	1
Commissioning and Tuning	To encourage and recognise commissioning, handover and tuning initiatives that ensure all building services operate to their full potential.	2.0	Environmental Performance Targets		-	Complies
		2.1	Services and Maintainability Review		1	1
		2.2	Building Commissioning		1	1
		2.3	Building Systems Tuning		1	1
		2.4	Independent Commissioning Agent		1	
Adaptation and Resilience	To encourage and recognise projects that are resilient to the impacts of a changing climate and natural disasters.	3.1	Implementation of a Climate Adaptation Plan		2	2
Building Information	To recognise the development and provision of building information that facilitates understanding of a building's systems, operation and maintenance requirements, and environmental targets to enable the optimised performance.	4.1	Building Information		1	1
Commitment to Performance	To recognise practices that encourage building owners, building occupants and facilities management teams to set targets and monitor environmental performance in a collaborative way.	5.1	Environmental Building Performance		1	1
		5.2	End of Life Waste Performance	A. Contractual Agreements	1	1
Metering and Monitoring	To recognise the implementation of effective energy and water metering and monitoring systems.	6.0	Metering		-	Complies
		6.1	Monitoring Systems		1	1
Responsible Construction Practices	To reward projects that use best practice formal environmental management procedures during construction.	7.0	Environmental Management Plan		-	Complies
		7.1	Environmental Management System		1	1
		7.2	High Quality Staff Support		1	1
Operational Waste	A. Performance Pathway	8A	Performance Pathway: Specialist Plan		1	1

Operational Waste	A. Performance Pathway	8B	Prescriptive Pathway: Facilities		0	
Total					**14**	**13**

Indoor Environment Quality					**17**	
Indoor Air Quality	To recognise projects that provide high air quality to occupants.	9.1	Ventilation System Attributes		1	1
		9.2	Provision of Outdoor Air	☐ A. Comparison to Industry Standards ☑ B. Performance Based Approach ☐ C. Natural Ventilation	2	
		9.3	Exhaust or Elimination of Pollutants	☐ A. Removing the Source of Pollutants ☑ B. Exhausting the Pollutants Directly to the Outsi	1	
Acoustic Comfort	To reward projects that provide appropriate and comfortable acoustic conditions for occupants.	10.1	Internal Noise Levels		1	1
		10.2	Reverberation		1.00	1
		10.3	Acoustic Separation	A. Sound Reduction	1.00	
Lighting Comfort	To encourage and recognise well-lit spaces that provide a high degree of comfort to users.	11.0	Minimum Lighting Comfort		Complies	Complies
		11.1 General Illuminance and Glare Reduction	11.1.1 General Illuminance	☑ A. Non Residential Spaces ☐ B. Residential Spaces	1.00	1
			11.1.2 Glare Reduction	☑ A. Prescriptive Method 1 ☐ B. Prescriptive Method 2 ☐ C. Performance Method		
		11.2	Surface Illuminance	☑ A. Prescriptive Method ☐ B. Performance Method ☐ C. Residential Spaces (Prescriptive Method)	1.00	1
		11.3	Localised Lighting Control		1.00	1
Visual Comfort	To recognise the delivery of well-lit spaces that provide high levels of visual comfort to building occupants.	12.0	Glare Reduction	☐ A. Fixed Shading Devices ☑ B. Blinds or Screens ☐ C. Daylight Glare Model	Complies	Complies
		12.1	Daylight	☐ A. Prescriptive Methodology ☑ B. Compliance Using Daylight Factor ☐ C. Compliance Using Daylight Autonomy	2	1
		12.2	Views		1	1
Indoor Pollutants	To recognise projects that safeguard occupant health through the reduction in internal air pollutant levels.	13.1 Paints, Adhesives, Sealants and Carpets	13.1.1 Paints, Adhesives and Sealants	☑ A. Product Certification ☐ B. Laboratory Testing ☐ C. No Paints, Adhesives or Sealants	1.00	1
			13.1.2 Carpets	☑ A. Product Certification ☐ B. Laboratory Testing ☐ C. No Carpets		
		13.2	Engineered Wood Products	☑ A. Product Certification ☐ B. Laboratory Testing	1.00	1
				☑ A. Naturally Ventilated Spaces		

Thermal Comfort	To encourage and recognise projects that achieve high levels of thermal comfort.	14.1	Thermal Comfort	☑ B. Mechanically Ventilated Spaces ☐ C. Residential Spaces	1	1
		14.2	Advanced Thermal Comfort	☐ A. Naturally Ventilated Spaces ☐ B. Mechanically Ventilated Spaces ☐ C. Residential Spaces ☐ D. Industrial spaces	1	
Total					**17**	**11**

Energy					**22**	
		15A.0	Conditional Requirement: Prescriptive Pathway		-	Complies
		15A.1	Building Envelope		0	
		15A.2	Wall-Glazing Construction and Retail Display Glazing		0	
		15A.3	Lighting		0.00	
		15A.4	Ventilation and Air Conditioning		0	
		15A.5	Domestic Hot Water		0	
		15A.6	Transition Plan		0	
		15A.7	Fuel Switching		0	
		15A.8	On-Site Storage		0	
		15A.9	Vertical Transportation		0	
		15A.10	Off-Site Renewables		0	
		15B.0	Conditional Requirement: NatHERS Pathway		-	
		15B.1	Thermal and Energy Performance		0	
		15B.2 Building Services and Appliances	15B.2.1 Lighting		0	
			15B.2.2 Ventilation and Air Conditioning	☐ A. Mechanically Conditioned Spaces ☐ B. Spaces With Mechanical Heating Only ☐ C. Naturally Ventilated Spaces	0	
			15B.2.3 Domestic Hot Water		0	
			15B.2.4 Appliances & Equipment		0	
			15B.2.5 Fuel Switching		0	
			15B.2.6 On-Site Storage		0	
			15B.2.7 Vertical Transportation		0	
			15B.2.8 Passive Laundry Facilities		0	
			15B.2.9 Unoccupied Areas		0	

Greenhouse Gas Emissions	E. Reference Building Pathway		15B.2.10 Off-Site Renewables	0	
		15C.0	Conditional Requirement: BASIX Pathway	-	
		15C.1	BASIX Greenhouse Gas Reductions	0	
		15C.2	Off-Site Renewables	0	
		15D.0	Conditional Requirement: NABERS Pathway	-	
		15D.1	NABERS Energy Greenhouse Gas Emissions Reduction	0	
		15D.2	Off-Site Renewables	0	
		15D.3 Additional Prescriptive Measures	15D.3.1 Transition Plan	0	
			15D.3.2 Fuel Switching	0	
			15D.3.3 On-Site Storage	0	
		15E.0	Conditional Requirement: Reference Building Pathway	-	Complies
		15E.1	GHG Emissions Reduction: Building Fabric	4	
		15E.2	GHG Emissions Reduction	16	3
		15E.3	Off-Site Renewables	8	
		15E.4	District Services	7	
		15E.5 Additional Prescriptive Measures	15E.5.1 Transition Plan	1	
			15E.5.2 Fuel Switching	2	
			15E.5.3 On-Site Storage	1	
		15H.0	Conditional Requirement: Industrial Prescriptive Pathway	-	
		15H.1	Building Envelope	0	
		15H.2	Wall-Glazing Construction	0	
		15H.3 Lighting	15H.3.1 Internal Lighting	0	
			15H.3.2 External Lighting	0	
		15H.4	Ventilation and Air Conditioning	0	
		15H.5	Domestic Hot Water	0	
		15H.6	Transition Plan	0	
		15H.7	Fuel Switching	0	
		15H.8	On-site Storage	0	
		15H.9	Provision of Structure for PV	0	
		15H.10	Off-site Renewables	0	

		15I.0	Conditional Requirement: On-site Renewables Pathway		-	
		15I.1	On-site Renewable Energy		0	
Peak Electricity Demand Reduction	A. Prescriptive Pathway	16A	Prescriptive Pathway: On-Site Energy Generation		1	1
		16B	Modelled Performance Pathway: Reference Building		0	
Total					**21**	**4**

Transport					**10**	
Sustainable Transport	B. Prescriptive Pathway	17A	Performance Pathway		0	
		17B.1	Access by Public Transport		3	1
		17B.2	Reduced Car Parking Provision		1	1
		17B.3	Low Emission Vehicle Infrastructure	D. No Parking Spaces Provided	1	
		17B.4	Active Transport Facilities		1	
		17B.5	Walkable Neighbourhoods	A. Proximity to Amenities	1	1
		17C.1	Access by Public Transport		0	
		17C.2	Reduced Car Parking Provision		0	
		17C.3	Low Emission Vehicle Infrastructure	☐ A. Parking for Fuel-Efficient Vehicles ☐ B. Parking for Electric Vehicles ☐ C. Parking for Car Share Vehicles ☐ D. No Parking Spaces Provided ☐ E. Low Emission Facility Transport	0	
		17C.4	Active Transport Facilities		0	
		17C.5	Proximity to Amenities		0	
Total					**7**	**3**

Water				**12**	
Potable Water	B. Prescriptive Pathway	18A	Potable Water - Performance Pathway	0	
		18B.1	Sanitary Fixture Efficiency	1	1
		18B.2	Rainwater Reuse	1	1
		18B.3	Heat Rejection	2	2

		18B.4	Landscape Irrigation		1	
		18B.5	Fire Protection System Test Water		1	
Total					**6**	**4**

Materials					**14**	
Life Cycle Impacts	B. Prescriptive Pathway - Life Cycle Impacts	19A.1	Comparative Life Cycle Assessment		0	
		19A.2	Additional Reporting	☐ A. Additional Life Cycle Impact Reporting ☐ B. Material Selection Improvement ☐ C. Construction Process Improvement ☐ D. LCA Design Review	0	
		19B.1 Concrete	19B.1.1 Portland Cement Reduction		2	1
			19B.1.2 Water Reduction		0.5	0.5
			19B.1.3 Aggregates Reduction	B. Fine Aggregate Reduction	0.5	0.5
		19B.2 Steel	B. Reduced Use of Steel Reinforcement		1	1
		19B.3	Building Reuse	19B.3.1 Façade Reuse	2	
				19B.3.2 Structure Reuse	2	
		19B.4	Structural Timber	19B.4.0 Responsible Sourcing	-	
				19B.4.1 Reduced Embodied Impacts	3	
		19C.1 Concrete	19C.1.1 Portland Cement Reduction		0	
			19C.1.2 Water Reduction		0	
			19C.1.3 Aggregates Reduction	A. Course Aggregate Reduction	0	
		19C.2 Steel	19C.2.1 Reduced Mass of Steel Framing	A. High Strength Steel	0	
			19C.2.2 Reduced Use of Steel Reinforcement		0	
		19C.3	Building Reuse	19C.3.1 Façade Reuse	0	
				19C.3.2 Structure Reuse	0	
		19C.4	Structural Timber	19C.4.0 Responsible Sourcing	-	
				19C.4.1 Reduced Embodied Impacts	0	
		20.1	Structural and Reinforcing Steel	20.1.0 Responsible Steel Maker	-	Complies
				A. Responsible Steel Fabricator	1	1

Responsible Building Materials	To reward projects that include materials that are responsibly sourced or have a sustainable supply chain.	20.2	Timber	☑ A. Certified Timber ☑ B. Reused Timber	1	1
		20.3	Permanent Formwork, Pipes, Flooring, Blinds and Cables	B. Best Practice Guidelines for PVC	1	1
Sustainable Products	To encourage sustainability and transparency in product specification.	21.1	Product Transparency and Sustainability	☐ A. Reused Products ☐ B. Recycled Content Products ☐ C. Environmental Product Declarations (EPDs) ☐ D. Third Party Certification ☐ E. Stewardship Programs	3	
Construction and Demolition Waste	A. Fixed Benchmark	22.0	Reporting Accuracy	A. Compliance Verification Summary	-	Complies
		22A	Fixed Benchmark		1	1
		22B	Percentage Benchmark		0	
Total					**12**	**7**

Land Use & Ecology					**6**	
Ecological Value	To reward projects that improve the ecological value of their site.	23.0	Endangered, Threatened or Vulnerable Species	A. EPBC	-	
		23.1	Ecological Value		3	
Sustainable Sites	To reward projects that choose to develop sites that have limited ecological value, re-use previously developed land and remediate contaminate land.	24.0	Conditional Requirement		-	Complies
		24.1	Reuse of Land	A. Previously Developed Land	1	1
		24.2	Contamination and Hazardous Materials	☐ A. Site Contamination ☐ B. Hazardous Materials	1	
Heat Island Effect	To encourage and recognise projects that reduce the contribution of the project site to the heat island effect.	25.1	Heat Island Effect Reduction		1	1
Total					**6**	**2**

Emissions					**5**	
Stormwater	To reward projects that minimise peak stormwater flows and reduce pollutants entering public sewer infrastructure.	26.1	Stormwater Peak Discharge		1	1
		26.2	Stormwater Pollution Targets		1	1
Light Pollution	To reward projects that minimise light pollution.	27.0	Light Pollution to Neighbouring Bodies		-	Complies
		27.1	Light Pollution to Night Sky	A. Control of Upward Light Output Ratio (ULOR)	1	1
Microbial Control: Legionella Impacts from Cooling Systems	B. Waterless Heat Rejection Systems	28A	Natural Ventilation		0	
		28B	Waterless Heat Rejection Systems		1	1

Cooling Systems		28C	Water-Based Heat Rejection Systems		0	
Refrigerant Impacts	To encourage operational practices that minimise the environmental impacts of refrigeration equipment.	29.1	Refrigerants Impacts	A. Calculating TSDEI	1	
Total					**5**	**4**

Innovation					**10**	
Innovative Technology or Process	The project meets the aims of an existing credit using a technology or process that is considered innovative in Australia or the world.	30A	Innovative Technology or Process		10	
Market Transformation	The project has undertaken a sustainability initiative that substantially contributes to the broader market transformation towards sustainable development in	30B	Market Transformation			
Improving on Green Star Benchmarks	The project has achieved full points in a Green Star credit and demonstrates a substantial improvement on the benchmark required to achieve full points.	30C	Improving on Green Star Benchmarks			1
Innovation Challenge	Where the project addresses an sustainability issue not included within any of the Credits in the existing Green Star rating tools.	30D	Innovation Challenge			
Global Sustainability	Project teams may adopt an approved credit from a Global Green Building Rating tool that addresses a sustainability issue that is currently outside the scope of	30E	Global Sustainability			
Total					**10**	**1**

TOTALS	**TARGETED**
CORE POINTS	**48.0**
INNOVATION POINTS	**1.0**
NA POINTS	**0.0**
POINTS AVAILABLE	**100.0**
PROJECT SCORE	**49.0**

Hastings Secondary College, Port Macquarie Campus, Port Macquarie

Secondary School Development

CONSTRUCTION & DEMOLITION WASTE MANAGEMENT PLAN

21/04/2021
Revision F

Client

School Infrastructure on behalf of NSW Department of Education

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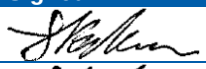
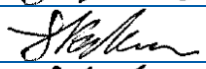
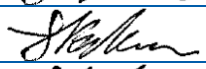
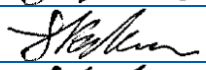
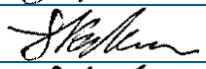
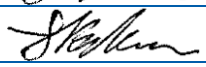
SCOPE

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	

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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:

Bin Size	Access	Dimensions
2.5m	Top loading	
3m	Drop door walk-in	
4m	Drop door walk-in	
5m	Drop door walk-in	
6m	Double doors walk-in	

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

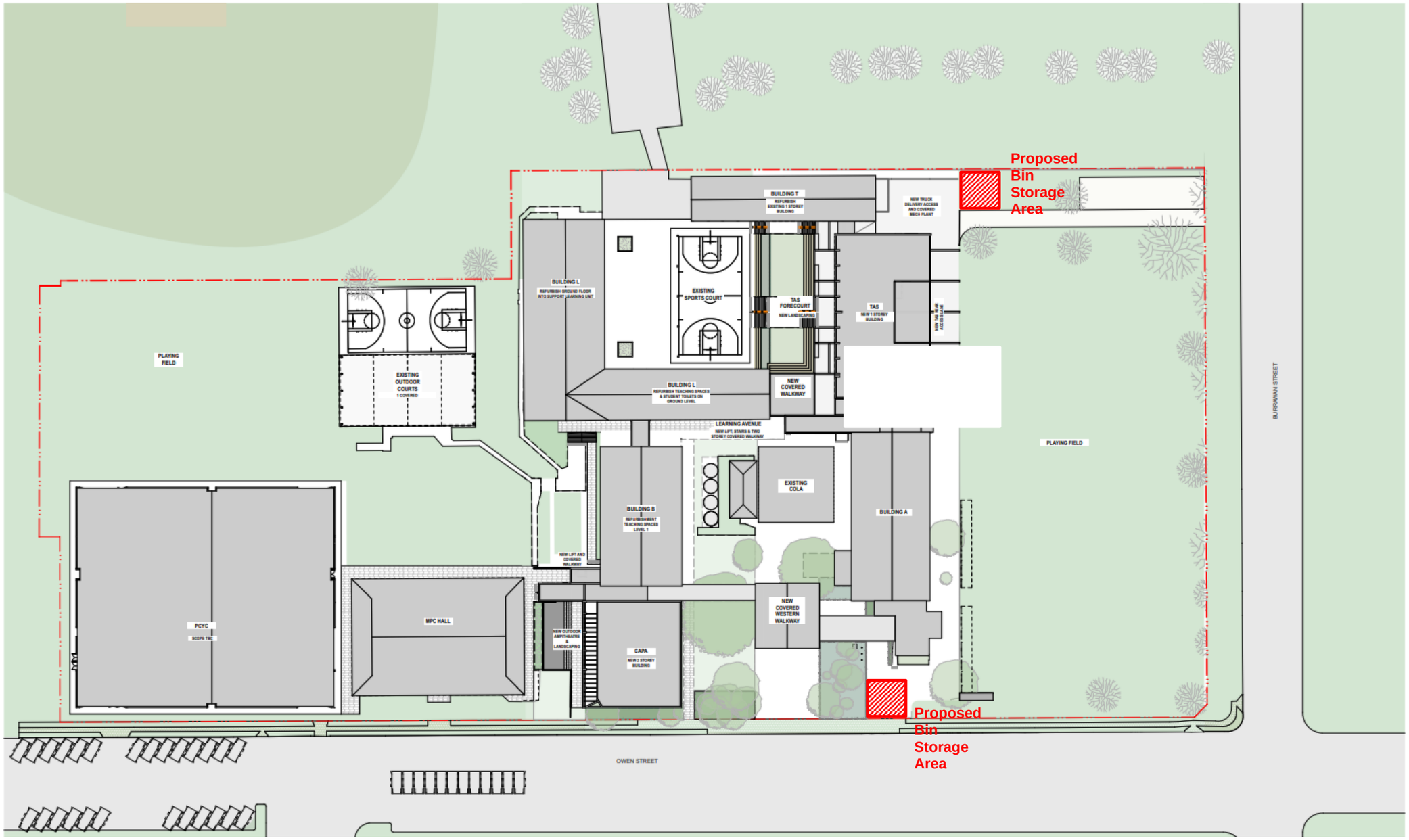
The frequency of waste removal from site will be determined by the volume of materials deposited into the dedicated skip bins. Skip bins will be monitored on a daily basis by the Construction Site Manager to ensure they do not overflow. If skip bins are reaching capacity, removal and replacement should 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

Hastings Secondary College, Port Macquarie Campus, Port Macquarie

Secondary School Development

OPERATIONAL WASTE MANAGEMENT PLAN

21/04/2021
Report No. SO905
Revision E

Client

School Infrastructure on behalf of NSW Department of Education

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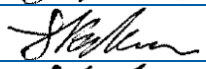
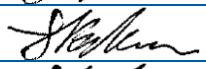
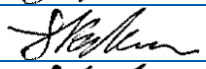
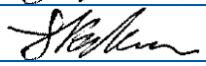
SCOPE

This waste management plan (WMP) only applies to the **operational** phase of the proposed development; therefore the requirements outlined in this WMP must be implemented during the operational phase of the site and may be subject to review upon further expansion for, and/or changes to the development.

The waste management of the **construction** and **demolition** phases of the development are not addressed in this report. It is EFRS's understanding that a construction and demolition WMP will be completed by a separate party appointed by the developer, and submitted separately to this report. Typically, the head contractor of the site will be responsible for removing all construction-related waste offsite in a manner that meets all authority requirements.

REVISION REFERENCE

Revision	Date	Prepared by	Reviewed by	Description	Signed
A	18/02/2021	J Parker	A Armstrong	Draft	
B	8/03/2021	J Parker	A Armstrong	Amendment	
C	1/04/2021	J Parker	A Armstrong	Final	
D	20/04/2021	J Parker	A Armstrong	Amendment	
E	21/04/2021	J Parker	A Armstrong	Amendment	

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GLOSSARY OF TERMS

TERM	DESCRIPTION
Baler	A device that compresses waste into a mould to form bales which may be self-supporting or retained in shape by strapping
Collection Area/Point	The identified position or area where garbage or recyclables are actually loaded onto the collection vehicle
Compactor	A machine for compressing waste into disposable or reusable containers
Composter	A container/machine used for composting specific food scraps
Crate	A plastic box used for the collection of recyclable materials
Garbage	All domestic waste (Except recyclables and green waste)
Green Waste	All vegetated organic material such as small branches, leaves and grass clippings, tree and shrub pruning, plants and flowers
Hopper	A fitting into which waste is placed and from which it passes into a chute or directly into a waste container. It consists of a fixed frame and hood unit (the frame) and a hinged or pivoted combined door and receiving unit
L	Litre(s)
Liquid Waste	Non-hazardous liquid waste generated by commercial premises that is supposed to be connected to sewer or collected for treatment and disposal by a liquid waste contractor (including grease trap waste)
LRV	Large rigid vehicle described by AS 2890.2-2002 Parking facilities – Off-street commercial vehicle facilities as heavy rigid vehicle (HRV)
Mobile Garbage Bin(s) (MGB)	A waste container generally constructed of plastic with wheels with a capacity in litres of 120, 240, 360, 660, 1000 or 1100
MRV	Medium rigid vehicle
Putrescible Waste	Component of the waste stream liable to become putrid. Usually breaks down in a landfill to create landfill gases and leachate. Typically applies to food, animal and organic products.
Recycling	Glass bottles and jars – PET, HDPE and PVC plastics; aluminium aerosol and steel cans; milk and juice cartons; soft drink, milk and shampoo containers; paper, cardboard, junk mail, newspapers and magazines
Refuse	Material generated and discarded from residential and commercial buildings including general waste, recyclables, green waste and bulky items
SRV	Small rigid vehicle as in AS 2890.2-2002 Parking facilities – Off-street commercial vehicle facilities, generally incorporating a body width of 2.33

LIST OF TABLES

INTRODUCTION

EFRS has been commissioned by School Infrastructure NSW (SINSW) on behalf of the Department of Education (DOE) to prepare an Operational 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.

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.

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.

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 OBJECTIVES

- 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.
- Embed sustainable and effective waste management practices at public places and at public events.

STAKEHOLDER ROLES AND RESPONSIBILITIES

The following table demonstrates the primary roles and responsibilities of the respective stakeholders:

Table 1: Stakeholder Roles and Responsibilities

Roles	Responsibilities
Management	• Ensuring that all waste service providers submit monthly reports on all equipment movements and waste quantities/weights; • Organising internal waste audits/visual assessments on a regular basis; and • Manage any non-compliances/complaints reported through waste audits.
Site Caretaker	• Ensuring effective signage, communication and education is provided to occupants, tenants and cleaners; • Providing staff/contractors with equipment manuals, training, health and safety procedures, risk assessments, and PPE to control hazards associated with all waste management activities; • Ensuring site safety for residents, children, visitors, staff and contractors; • Abiding by all relevant OH&S legislation, regulations, and guidelines; • Assessing any manual handling risks and prepare a manual handling control plan for waste and bin transfers; • Preventing storm water pollution by taking necessary precautions (securing bin rooms, preventing overfilling of bins) • Cleaning and transporting of bins as required; • Organising, maintaining and cleaning the general and recycled waste holding area; • Organising both garbage and recycled waste pick-ups as required; • Organising replacement or maintenance requirements for bins; • Organising bulky goods collection when required; and • Investigating and ensuring prompt clean-up of illegally dumped waste materials.
Staff/Students	• Dispose of all garbage and recycling in the allocated MGBs provided; • Ensure adequate separation of garbage and recycling; and • Compliance with the provisions of Council and the WMP.
Waste Contractor	• Provide a reliable and appropriate waste collection service; • Provide feedback to staff/students in regards to contamination of recyclables; and • Work with management/site caretaker to customise waste systems where possible.
Gardening/Landscaping Contractor	• Removal of all garden organic waste generated during gardening maintenance activities for recycling at an offsite location.

EDUCATION

The caretaker/management are responsible for creating and managing the waste management education process.

Educational material encouraging the correct separation of garbage and recycling items must be provided to each staff member to ensure the correct disposal of waste, including bulky goods (old furniture, large discarded items, etc.).

LIMITATIONS

The purpose of this report is to document a Waste Management Plan (WMP) as part of a development application and is supplied by Elephants Foot Recycling Solutions (EFRS) with the following limitations:

- Drawings, estimates and information contained in this waste management plan have been prepared by analysing the information, plans and documents supplied by the client, and third parties including Council and government information. The assumptions based on the information contained in the WMP is outside the control of EFRS;
- the figures presented in the report are an estimate only – the actual amount of waste generated will be dependent on the occupancy rate of the building/s and waste generation intensity as well as the site managements approach to educating staff and students regarding waste management operations and responsibilities;
- the site caretaker will make adjustments as required based on actual waste volumes (if waste is greater than estimated) and increase the number of bins and collections accordingly;
- the report will not be used to determine or forecast operational costs or prepare any feasibility study or to document any safety or operational procedures;
- the report has been prepared with all due care however no assurance or representation is made that the WMP reflects the actual outcome and EFRS will not be liable to you for plans or outcomes that are not suitable for your 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;
- any manual handling equipment recommended should be provided at the recommendation of the appropriate equipment provider who will assess the correct equipment for supply;
- Design of waste management equipment and systems must be approved by the supplier.

SECONDARY SCHOOL WASTE MANAGEMENT

The New South Wales Environmental Protection Authority *Better Practice Guide for Resource Recovery* (2019) has been referenced to calculate the total number of bins required for the school. Calculations are based on generic figures; waste generation rates may differ according to the tenants' waste management practice.

ESTIMATED WASTE VOLUMES AND PROVISIONS

The following table shows the estimated volume (L) of garbage and recycling generated by the school in operation.

Table 2: Calculated Waste Generation – School

	# Students	Garbage Generation Rate (L/student/week)	Generated Garbage (L/week)	Recycling Generation Rate (L/student/week)	Generated Recycling (L/week)
Secondary	758	20	15160	15	11370
Collections & Equipment		Garbage Bin Size (L)	1100	Recycling Bin Size (L)	1100
		Garbage Bins per Week	14	Recycling Bins per Week	11
		Garbage Collections per Week	3	Recycling Collections per Week	3
		Total Garbage Bins Required	5	Total Recycling Bins Required	4

It is the responsibility of the caretaker to monitor the number of bins required for the school. Waste volumes may change according to the development's management, and attitudes to waste disposal and recycling. The bin numbers, sizes and collection frequencies may need to be altered to suit the school's operation. Seasonal periods i.e. public and school holidays should also be considered.

SCHOOL ROOMS AND FACILITIES WASTE MANAGEMENT STRATEGY

All operations within the school will share bins, the bin holding room and collection services.

The bin holding room will be located close to the new truck delivery access point off Burrawan Street. This area will contain 9 x 1100L bins in total for the collection of the garbage and recycling as per Table 2.

The caretaker, waste collection staff and cleaners will be the only personnel with access to the bin holding room. All transportation of waste and recycling must be co-ordinated with the caretaker or cleaners.

Suitably labelled garbage and recycling bins will be placed throughout each building as required for the collection of garbage and recycling generated in each space. Receptacles should be provided in convenient locations and areas of high waste generation.

The students, staff and visitors will be responsible for placing their garbage and recycling into the correct receptacle. The capacity of the source separation bins will be monitored by the caretaker and cleaners.

The cleaners will circulate throughout the building after hours and empty the garbage and recycling receptacles situated throughout the school. The cleaners will then transport the garbage and recycling to the bulk bins in the waste room and dispose of the garbage and recycling into the appropriate bins.

BATHROOMS

Washroom facilities should be supplied with collection bins for paper towels (if used).
Sanitary bins for female restroom facilities must also be arranged with an appropriate contractor.

SOURCE SEPARATION

Waste avoidance, recovery and reuse of discarded materials and responsible management of hazardous waste are all crucial elements of sustainable development. Effective waste management practices in developments significantly improve environmental, social, and economic outcomes on both a local and regional scale and should be integrated into the waste management processes.

GENERAL WASTE (GARBAGE) AND RECYCLING

Garbage and recycling bins will be located around the building where considered appropriate. It is recommended that bins are placed in areas of high waste generation and in convenient locations. Recycling must not be bagged.

BULKY WASTE AND RE- USEABLE ITEMS

A room or caged area should be allocated for the storage of bulky waste items such as discarded furniture, eWaste, etc. The room must have a minimum doorway width of 1.5m to allow for easy movement of large waste items in and out of the room. A space should also be designated for the storage of reusable items such as crates, pallets etc.

The caretaker will be responsible the management of the bulky goods room and storage of reusable items. School staff will need liaise with the caretaker for assistance with disposing of bulky items.

ORGANIC WASTE AND COMPOSTING

Recycling organic waste, such as food scraps and garden materials, dramatically reduces the quantity of waste being diverted to land fill and thus reduces the school's ecological footprint. Compost material can also be returned to the soil as a rich fertilizer and improve plant growth and the overall health of surrounding vegetation. The school may wish to pursue the use of worm farms or a communal composting facility (see APPENDIX C.3). Composting facilities are to be sited on an unpaved area with soil depth of at least 300mm.

MANAGEMENT OF SPECIALITY WASTE STREAMS

The caretaker/management are responsible for making arrangements for the disposal and recycling of specialised waste streams with an appropriate contractor. Specialised wastes cannot be placed in garbage bins as they can have adverse impacts to human health and the environment if disposed of in landfill. Staff will need to liaise with the site caretaker when disposing of specialised waste streams.

Specialised waste streams include:

- Chemical Waste
- Liquid wastes
- Toner cartridges
- Lightbulbs
- eWaste
- Batteries

MOVEMENT AND TRANSPORTATION OF BINS

The cleaners are responsible for the transportation of bins from their designated operational locations to the bin holding area when full and returning them once emptied to resume operational use.

Transfer of waste and all bin movements should require minimal manual handling. The school management must assess manual handling risks. If required, the school management should contact a bin-tug, trailer or tractor consultant to provide equipment recommendations.

COLLECTION OF WASTE

A private contractor will be engaged by the school to service the waste and recycling to an agreed schedule. This report assumes that garbage and recycling will be collected three times per week.

The waste collection vehicle will access the site from Burrawan Street and pull-up at the new truck delivery access point adjacent to the waste room. Collection staff will collect the bins directly from the waste room.

Once all bins have been collected, the vehicle will leave the site in a forward-facing direction via the same route.

COLLECTION AREA

It is Elephant Foot's understanding that the collection areas have been reviewed by a traffic consultant to confirm the swept paths, load requirements and clearances for waste collections.

INSTALLATION EQUIPMENT AND DESIGN

EQUIPMENT SUMMARY

Table 3: Equipment Summary

Component	Part	Qty	Notes
Equipment	Suitable Bin Moving Equipment	N/A	Optional (See APPENDIX B.4 & APPENDIX B.5 for Typical Bin Movers)

WASTE ROOM AREAS

The areas allocated for waste storage are detailed in Table 4 below. The areas provided are estimates only. Final areas will depend upon room and bin layouts.

Table 4: Waste Room Areas

Location	Waste Room Type	Equipment	Estimated Area (m^2)
Truck Delivery Access Point	Bin Holding Room	5 x 1100L Garbage Bins 4 x 1100L Recycling Bins	30
	Bulky Goods Storage Room	N/A	4

GARBAGE ROOMS

CONSTRUCTION REQUIREMENTS

The garbage room will be required to contain the following facilities to minimise odours, deter vermin, protect surrounding areas, and make it a user-friendly and safe area:

- waste room floor to be sealed with a two pack epoxy;
- waste room walls and floor surface is flat and even;
- all corners coved and sealed 100mm up, this is to eliminate build-up of dirt;
- a cold water facility with hose cock must be provided for washing the bins;
- any waste water discharge from bin washing must be drained to sewer in accordance with the relevant water board. (Sydney Water);
- tap height of 1.6m;
- storm water access preventatives (grate);
- all walls painted with light colour and washable paint;
- equipment electric outlets to be installed 1700mm above floor levels;
- the room must be mechanically ventilated;
- light switch installed at height of 1.6m;
- waste rooms must be well lit (sensor lighting recommended);
- optional automatic odour and pest control system installed to eliminate all pest types and assist with odour reduction – this process generally takes place at building handover – site manager makes the decision to install;
- if 660L or 1100L bins are utilised, 2 x 820mm (minimum) door leafs must be used;
- all personnel doors are hinged, lockable and self-closing;
- waste collection area must hold all bins – bin movements should be with ease of access;
- conform to the Building Code of Australia, Australian Standards and local laws; and
- childproofing and public/operator safety shall be assessed and ensured

SIGNAGE

The site manager is responsible for waste room signage including safety signage (*see APPENDIX B.2*). Appropriate signage must be prominently displayed on walls and above all bins, clearly stating what type of waste or recyclables is to be placed in the bin underneath.

VENTILATION

Waste and recycling rooms must have their own exhaust ventilation system either;

- Mechanically - exhausting at a rate of 5L/m² floor area, with a minimum rate of 100L/s minimum; or
- Naturally - permanent, unobstructed, and opening direct to the external air, not less than one-twentieth (1/20) of the floor area

Mechanical exhaust systems shall comply with AS1668 and not cause any inconvenience, noise or odour problem.

USEFUL CONTACTS

Elephants Foot Recycling Solutions does not warrant or make representation for goods or services provided by suppliers.

PORT MACQUARIE-HASTINGS COUNCIL CUSTOMER SERVICE
Phone: 02 6581 8111 Email: council@pmhc.nsw.gov.au

SULO MGB (MGB, Public Place Bins, Tugs and Bin Hitches)
Phone: 1300 364 388

CLOSED LOOP (Organic Dehydrator)
Phone: 02 9339 9801

ELECTRODRIVE (Bin Mover)
Phone: 1800 333 002 Email: sales@electrodrive.com.au

RUD (Public Place Bins, Recycling Bins)
Phone: 07 3712 8000 Email: Info@rud.com.au

CAPITAL CITY WASTE SERVICES (Private Waste Services Provider)
Phone: 02 9359 9999

REMONDIS (Private Waste Services Provider)
Phone: 13 73 73

SITA ENVIRONMENTAL (Private Waste Services Provider)
Phone: 13 13 35

NATIONAL ASSOCIATION OF CHARITABLE RECYCLING ORGANISATIONS INC. (NACRO)
Phone: 03 9429 9884 Email: information@nacro.org.au

PURIFYING SOLUTIONS (Odour Control)
Phone: 1300 636 877 Email: sales@purifyingsolutions.com.au

MOVEXX (Bin Movers)
Phone: 1300 763 444

AUSCOL (Recyling Oils & Animal Fats)
Phone: 1800 629 476

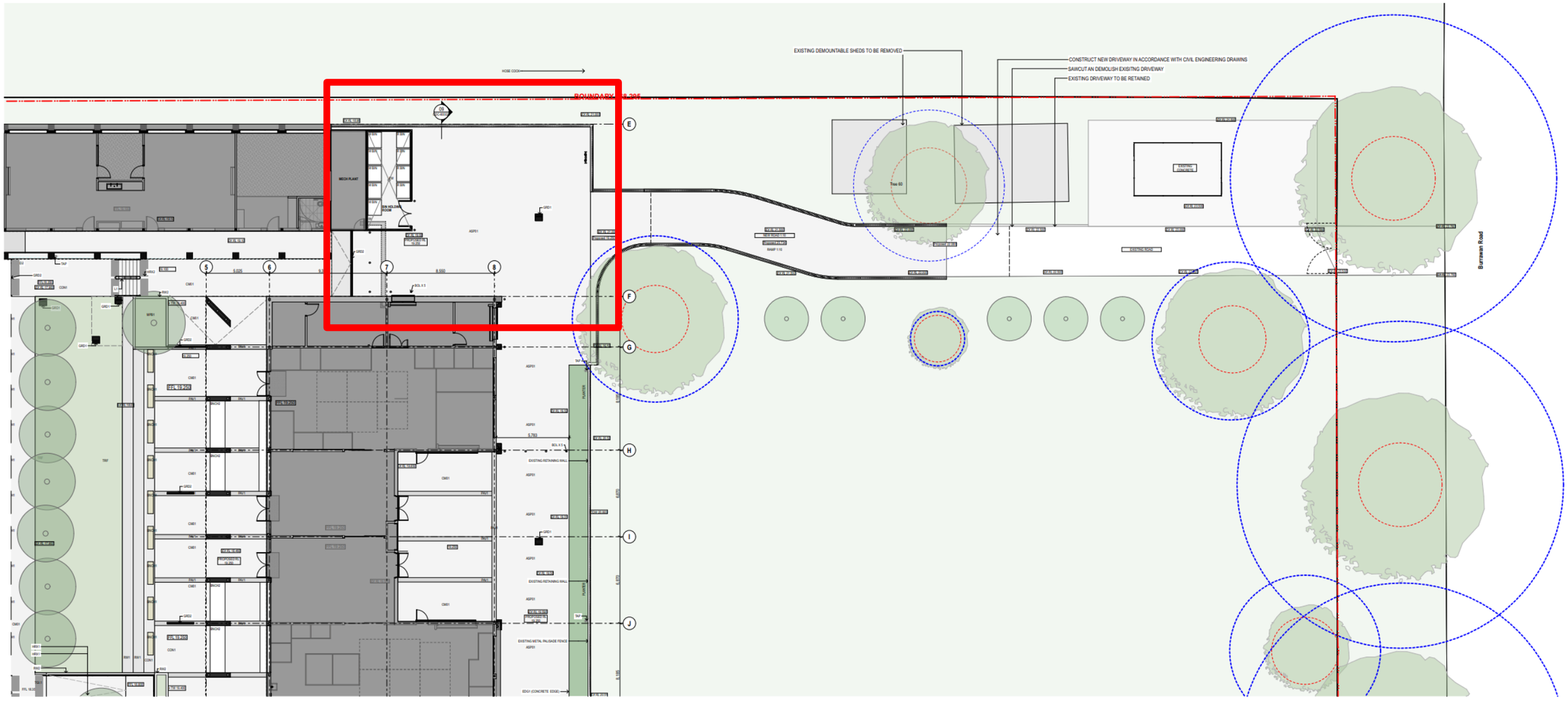
KOMPACT EQUIPMENT (Equipment & Servicing Provider)
Phone: 1300 566 722 Email: info@kompactequipment.com.au

ELEPHANTS FOOT RECYCLING SOLUTIONS (Chutes, Compactors & eDiverter Systems)
44 – 46 Gibson Avenue
Padstow NSW 2211
Phone: 1300 434 374 Email: info@efconsulting.com.au

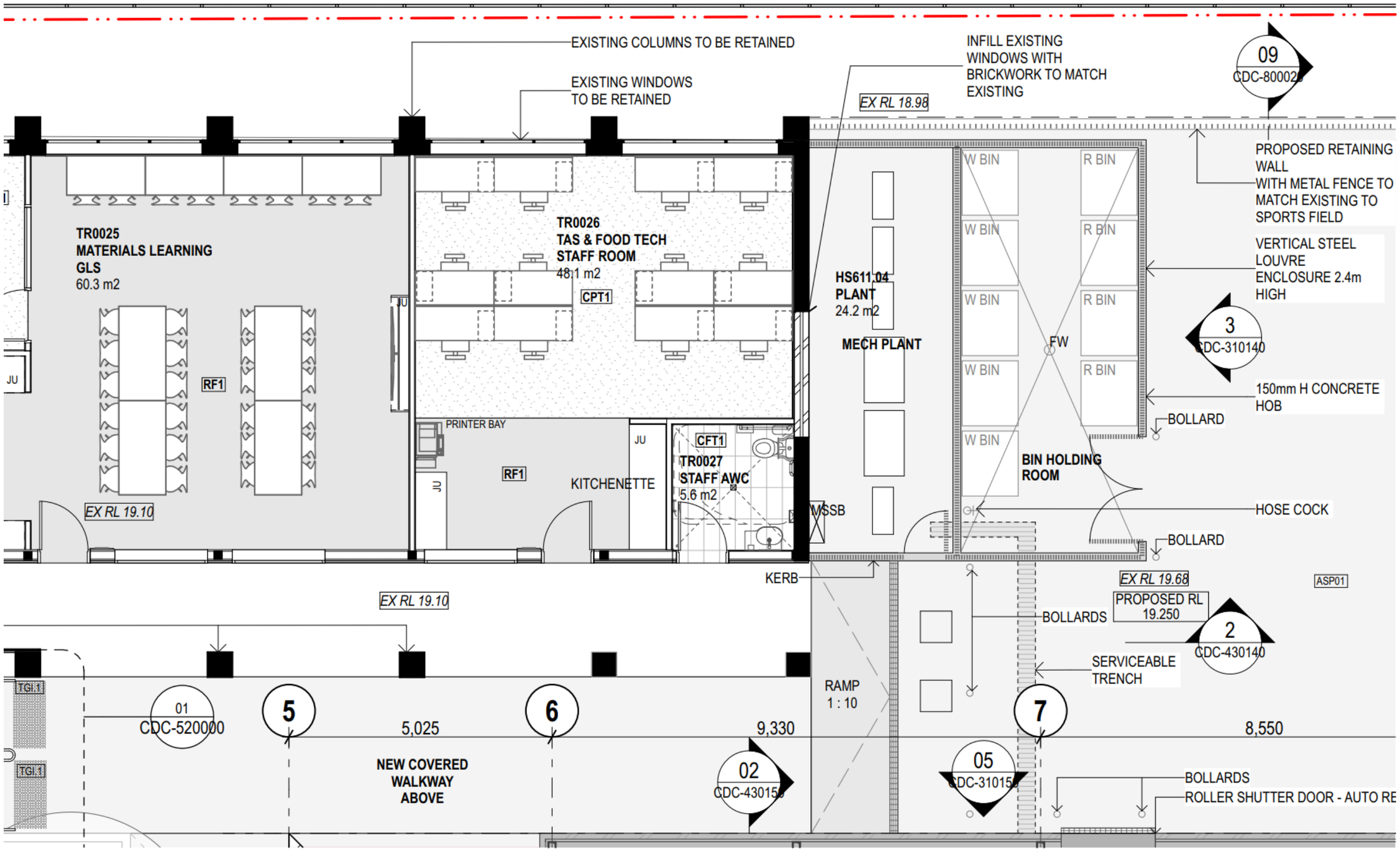
APPENDICES

APPENDIX A ARCHITECTURAL DRAWING EXCERPTS (From CDC Approval. Not part of SSD Submission)

APPENDIX A.1 WASTE ROOM/LOADING AREA



Source: FJMT Studio, Drawing No. CDC-800010, Rev.03, 31/03/21 – Landscape Plan – TAS Access Driveway



Source: FJMT Studio, Drawing No. CDC-201040, Rev.03, 31/03/21 – Building T – General Arrangement Plans

APPENDIX B PRIMARY WASTE MANAGEMENT PROVISIONS

APPENDIX B.1 TYPICAL BIN SPECIFICATIONS

The most common bin sizes are provided below, although not all sizes are shown. These dimensions are a guide only and differ slightly between manufacturers.

Average dimension ranges for two-wheel mobile bins

Wheelie bin

Bin capacity	80L	120L		140L		240L	360L
Height (mm)	870	940	1065	1080	1100		
Depth (mm)	530	530		540		735	820
Width (mm)	450	485		500		580	600
Approximate footprint (m^2)	0.24	0.26–0.33		0.27-0.33		0.41–0.43	0.49
Approximate weight (kg)	8.5	9.5		10.4		15.5	23
Approximate maximum load (kg)	32	48		56		96	Not known

Sources include Sulo, Single Waste, Cleanaway, SUEZ, just wheelie bins and Perth Waste for two-wheel mobile bins

Average dimension ranges for four-wheel bulk bins

Dome or flat lid container

Bin capacity	660L	770L	1100L	1300L	1700L
Height (mm)	1250	1425	1470	1480	1470
Depth (mm)	850	1100	1245	1250	1250
Width (mm)	1370	1370	1370	1770	1770
Approx footprint (m^2)	0.86–1.16	1.51	1.33–1.74	2.21	2.21
Approx weight (kg)	45	Not known	65	Not known	Not known
Approx maximum load (kg)	310	Not known	440	Not known	Not known

Sources include Sulo, Signal Waste, Cleanaway, SUEZ, Just Wheelie Bins and Perth Waste

Average dimension ranges for bulk bins over 1700L in capacity

Bulk bins greater than 1700L

Bin capacity)	1m^3	1.5m^3	2m^3	3m^3	4.5m^3	6m^3
Height (mm)	1000	910–1250	865–1000	1020–1580	1440–2014	1650
Depth (mm)	1000	905–1000	1300–1400	1470–1700	1605–1900	1900
Width (mm)	1400	1805–2010	1830–2000	1400–2010	1800–2010	2000
Approximate footprint (m^2)	1.4	1.63–2.01	2.4–2.8	2.1–3.4	2.9–3.8	3.8

Sources include TORO Waste Equipment, SUEZ, Signal Waste, Perth Waste and ACT Industrial

Source: New South Wales Environmental Protection Authority *Better Practice Guide for Resource Recovery* (2019)

APPENDIX B.2 SIGNAGE FOR WASTE & RECYCLING BINS

Waste Signs

Signs for garbage, recycling and organics bins should comply with the standard signs promoted by the EPA (Environmental Protection Authority).

Examples of waste wall posters (EPA supplied)

Examples of bin lid stickers (EPA supplied)

Problem Waste Signs

The EPA has also produced a range of images and signs that can be used for problem wastes, such as fluoro globes and tubes, household and car batteries, e-waste and smoke detectors. To access these resources, contact the NSW EPA. Some examples are shown below.

Safety Signs

The use of safety signs for waste resource recovery rooms must comply with *AS1319 Safety signs for occupational environments*. Safety signs must be used to regulate and control safety related to behaviour, warn of hazards and provide emergency information, including fire protection information. Suitable signs should be decided for each development as required.

Example safety signs

Source: New South Wales Environmental Protection Authority *Better Practice Guide for Resource Recovery* (2019)

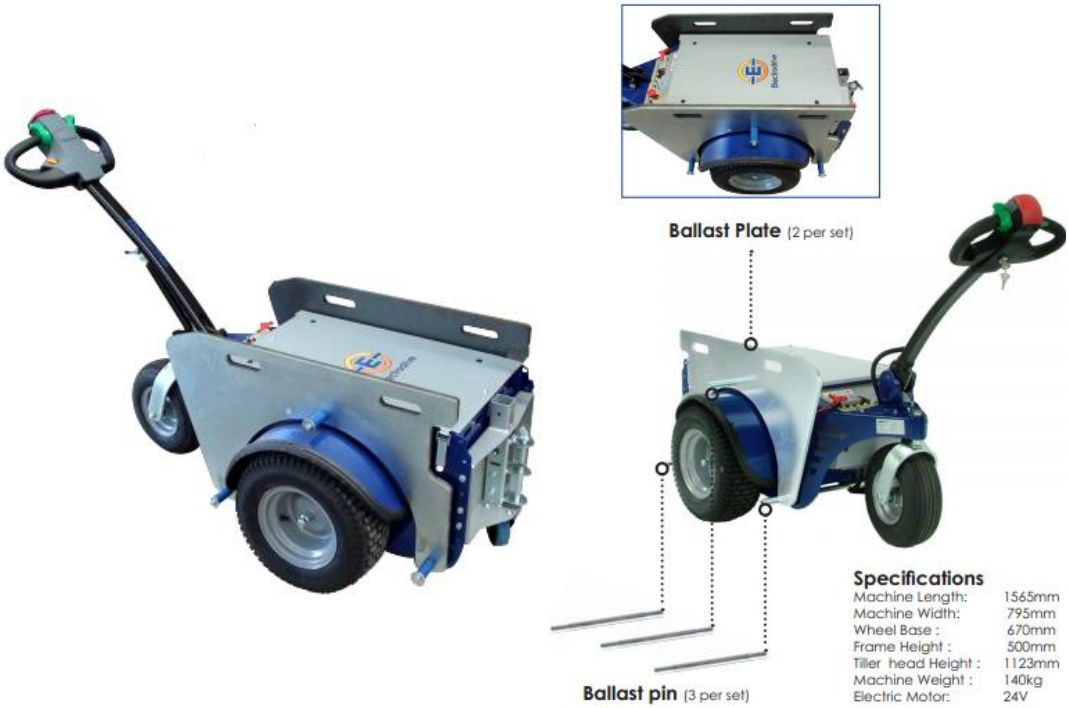
APPENDIX B.3 TYPICAL COLLECTION VEHICLE INFORMATION

Australian Standards for turning circles for medium and heavy rigid class vehicles

Vehicle class	Overall length (m)	Design width (m)	Design turning radius (m)	Swept circle (m)	Clearance (travel) height (m)
Medium rigid vehicle	8.80	2.5	10.0	21.6	4.5
Heavy rigid vehicle	12.5	2.5	12.5	27.8	4.5

Source: New South Wales Environmental Protection Authority *Better Practice Guide for Resource Recovery* (2019)

APPENDIX B.4 TYPICAL MOTORISED BIN TUG



Typical applications:

- Move trolleys, waste bin trailers and 660/1100L bins up and down a ramp incline.
- Quiet, smooth operation with zero emissions and simple to use, no driver's licence required
- Suitable for:
    - High rise building & apartment basements
    - Large factories & warehouse with sloped ground
    - Caravan parks & other large outdoor areas

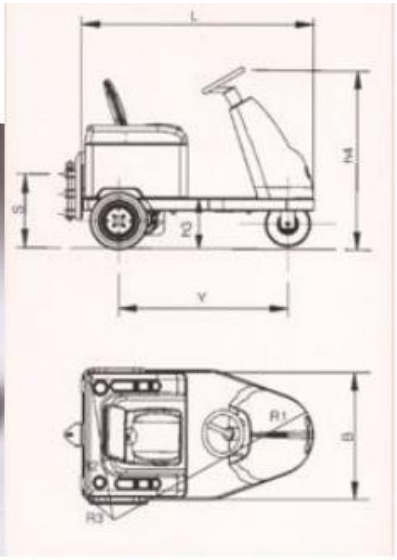
Features:

- 1 tonne tow capacity of inclines up to 8 degrees
- 500kg tow capacity if inclines up to 14 degrees
- CE Compliant
- 4.5 km/h max speed
- 2 x 80amp batteries – includes charger
- Powerful transaxle
- Hitch to suit 660L bins

Safety Features:

- Intuitive paddle lever control
- Stops and repels the unit if activated when reversing.
- Site assessment recommended to assess ramp incline steepness *(See Useful Contacts)*

APPENDIX B.5 TYPICAL SEATED BIN MOVER

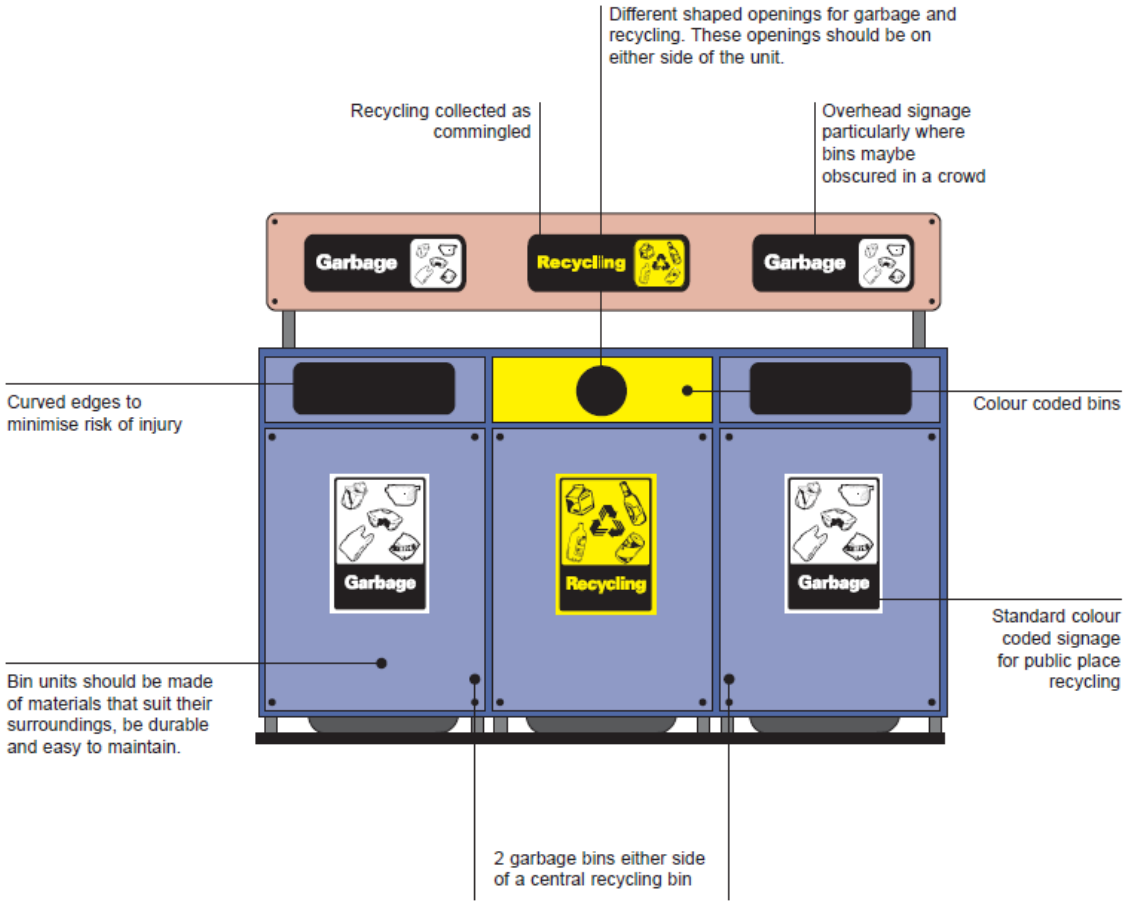


		UNIT M.	BULL 2	BULL 4
Manufacturer	DEC			
Model	BULL			
Platform loading cap.	Nominal capacity	kg	-----	-----
Pull capacity	Pull nominal capacity	kg	2000	4000
Power type	Electric - endotermic		electric	electric
Controltype	Standing / seated thiller / steer		seated / steer	seated / steer
Tyres	Pn=pneum. Se=superelastic		Pn	Pn
Wheels	N. front/rear - x drive	n.	1/2X	1/2X
Platform dimensions	L x B (lengh x width)	mm	-----	-----
Platform hight	h6 = unload clearence	mm	-----	-----
Overal dimensions	L = lenght B = width h1 = foot leve h3 = Seat height h4 = Steer height	mm mm mm mm mm	1500 900 1820 310 1250	1600 930 1960 340 1330
Turning radius	R1 = front min. external R2 = rear min. external R3 = front min. internal	mm mm mm	1400 1000 400	1500 1000 400
Aisle width	A = 180° turn	mm	2200	2300
Tow hook height	s = center from ground	mm	220-350-490	240-380-520

APPENDIX C SECONDARY WASTE MANAGEMENT PROVISIONS

APPENDIX C.1 TYPICAL BACK OF HOUSE BINS

APPENDIX C.2 TYPICAL PUBLIC PLACE WASTE BINS



Source: *Department of Environment and Conservation (NSW) Better Practice Guide for Public Place Recycling* (2005)

APPENDIX C.3 TYPICAL WORM FARM AND COMPOST BINS

Worm farms

Worm farms or vermiculture systems transform food and other organic material into vermicast (worm compost) and vermi-liquid (liquid extraction from a worm farm). Seafood, seafood shells, meat or bones, and dairy products are not an acceptable part of the worms' diet and should not be appled to these systems. Worm farms can occupy a small footprint and be located on balconies or in gardens. The worm farm should be placed in a sheltered position to avoid getting too hot in summer.

Worm farms come in different sizes and designs and are sold through hardware stores and often at local government offices. Medium and large-scale worm farms can service many households and commercial acticities. These larger systems need a management process to ensure they are properly maintained.

Onsite composting

Compost tumblers and bins and compost bays transform food and other organic material into useful soil enhancer (compost). They are more versatlie than worm farms as they can generally process a wider range of materials, including woody garden organics and can be placed in the sun. A variety of compost bins and tumblers are available from hardware stores or some local councils. There are also various online resources on how to construct them using recycling materials such as timber pallets. The footprint area requirement for a typical single household compost bin is about 1m x 1m x 1m.

Before setting up an onsite composter or worm-farm system, check with council for any local requirements such as setback distances from property boundaries.

SOURCE: Better practice guide for resource recovery in residential developments 2019, NSW Environmental Protection Authority

Our ref: SSD-11920082

Ms Alejandra Rojas
Principal Statutory Planner
Department of Education

-via email-
Alejandra.rojas1@det.nsw.edu.au

Dear Ms Rojas,

Subject: Request to waive the requirement for a biodiversity development assessment report (BDAR) under the *Biodiversity Conservation Act 2016* (BC Act) for the Hastings Secondary College Upgrade (SSD-11920082)

I refer to your request to waive the requirement for a Biodiversity Development Assessment Report (BDAR) to be submitted as part of above state significant development (SSD) application.

Section 7.9(2) of the *Biodiversity Conservation Act 2016* (BC Act) provides the following in relation to an application for SSD:

> *"Any such application is to be accompanied by a biodiversity development assessment report unless the Planning Agency Head and the Environment Agency Head determine that the proposed development is not likely to have any significant impact on biodiversity values."*

The authority of the *"Planning Agency Head"* to determine whether a proposed development is *"not likely to have any significant impact on biodiversity values"* has been delegated to Directors within the Planning and Assessment Division of the Department of Planning, Industry and Environment (the Department).

Accordingly, I have reviewed the application of the test of significance under sections 1.5 and 7.3 of the BC Act and clause 1.4 of the Biodiversity Conservation Regulation 2017 and considered the information provided in the assessment report prepared by Ecoplanning dated 18 March 2021. I have determined that the development is not likely to have any significant impacts on biodiversity values and that the application does not need to be accompanied by a BDAR. A waiver under section 7.9 is therefore granted for the proposed development (being the Hastings Secondary College Upgrade SSD-11920082)

The delegated "*Environment Agency Head"* in the Environment, Energy and Science Group (EESG) of the Department has also granted a waiver in a letter dated 25 March 2021 and a copy of that letter is attached.

Please note that the waiver is issued in respect of the proposed development detailed in the Secretary's Environmental Assessment Requirements issued on 23 December 2020. Amendments to the development may require a further waiver to be sought and issued.

Should you have any enquiries regarding the above matter, please contact Jenny Chu on 8275 1327 or via email to jenny.chu@planning.nsw.gov.au

Yours sincerely,

20 April 2021

Jason Maslen
A/Director, Social and Infrastructure Assessments
As delegate of the Planning Secretary