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DISCLAIMER
This report is based on information provided by Jacobs and Richard Crookes. To that extent, this report relies on the accuracy of the information provided to the consultant. This report is not a substitute for legal advice on the relevant environmental related legislation, which applies to businesses, contractors or other bodies. Accordingly, EcCell Environmental will not be liable for any loss or damage that may arise out of this project.

DOCUMENT CONTROL				
ISSUE NUMBER	DATE	AUTHOR	REVIEW	APPROVED BY
DRAFT	10/08/2021	Patrick Nolan	Jo Drummond	Jo Drummond
Version 1	2/11/2021	Partick Nolan	Jo Drummond	Jo Drummond
Version 2	8/06/2022	Partick Nolan	Jo Drummond	Jo Drummond
Version 3	19/07/2022	Partick Nolan	Jo Drummond	Jo Drummond

1 INTRODUCTION

This Construction Waste Management Plan (CWMP) accompanies an Environmental Impact Statement (EIS) pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) in support of a State Significant Development Application (SSD - 23512960).

The development is for upgrading works comprising alterations and additions to Glenwood High School at 85 Forman Avenue, Glenwood. The site is legally described as Lot 5227 DP 868693.

This report addresses the relevant Secretary's Environmental Assessment Requirements (SEARs), specifically: Section 18 Waste

Table 1 - SEARs Requirement & CWMP Page Reference

SEARs Item	Report Reference
Identify, quantify and classify the likely waste streams to be generated during construction.	Page 8-10 PROJECT PHASE
Provide the measures to be implemented to manage, reuse, recycle and safely dispose of this waste.	Page 4 ROLES AND RESPONSIBILITIES
Identify appropriate servicing arrangements (including but not limited to, waste management, loading zones, mechanical plant) for the site.	Section 6 Waste Management Complaince
Provide a hazardous materials survey of existing aboveground buildings that are proposed to be removed or altered.	Section 7

Table 2 - SSDA Condition C18,C29,C30,C31,C32,C33

C 18, C29, C30, C31, C32, C33	Report Reference
C 1.8 The Construction Waste Management Sub-Plan (CWMSP) must address, but not be limited to the procedures for the management of waste including the following (a) The recording of quantities, classification (for materielas to be removed) and validation (for materials to remain) of each type of waste generated during construction and proposed use for materials to remain: (b) Information regarding the recycling and disposal locations:and (c) Confirmation of the contamination status of the development areas of the site based on the vailidation results	Section 8 and 9 Douglas Partners Glenwood High School November 2021 Project Number 94626.00 Reference Moderate Salinity
C29. All waste generated during construction must be secured and maintained within designated waste storage areas at all times and must not leave the site onto neighbouring public or private properties.	Appendix A
C30. All waste generated during construction must be assess, classified and managed in accordance with the Waste Classification Guidelines Part 1: Classifying Waste (EPA, 2014).	Section 8 and 9
C31. The Applicant must ensure that concrete waste and rinse water are not disposed of on the site and are prevented from entering any natural or artificial watercourse	CEMP

C32. The Applicant must record the quantities of each waste type generated during construction and the proposed reuse, recycling and disposal locations for the duration of construction.	Section 8 and 9
C33. The Applicant must ensure that the removal of hazardous materials, particularly the method of containment and control of emission of fibres to the air, and disposal at an approved waste disposal facility is in accordance with the requirements of the relevant legislation, codes, standards and guidelines	Section 7.2 and 7.3

Table 3 – Council Conditions

COUNCIL CONDITIONS 8	Report Reference
8.1 The Construction Waste Management Plan needs to be prepared by a Qualified Waste Waste Contractor before commencement	EcCell Environmental
8.2 (a)The type and volume of all waste materials and the appropriate destination for each type of waste identified.	Section 8 and 9
8.2 (b)non-recyclable waste and containers are to be regularly, collected and disposed of at a licensed disposal site. Frequency of collection should be identified	Page 5
8.2 (c) No burning or burying of waste is permited on the site	Page 5
8.2 (d) Any bulk garbage bins delivered by authorized waste contractors are to be placed and kept within the property boundary.	Page 5
8.3 All waste (including hazardous materials) must be stored appropriately on site by the head contractor and disposed of by a licensed waste contractor at a licensed facility which can receive such waste	Page 5

2 THE PROPOSAL

The proposed development seeks to upgrade Glenwood High School. The upgrade consists of the following alterations and additions:

- Construction of a new three-storey building at the north-eastern portion of the site facing Glenwood Park Drive which will accommodate new learning spaces;
- Construction of one storey performance pavilion;
- Refurbishment of existing Building Block A (ground floor only) to provide one new support unit within the space of an existing general learning space;
- Refurbishment of Building Block D (ground floor only) to provide an additional office space and storeroom;
- Refurbishment of Building Block E to re-purpose it on the ground floor for computer learning spaces, staff and administration spaces as well as upgrades to the library on the first floor;
- Refurbishment of Building Block J to re-purpose it from visual arts and performing arts to learning spaces and workshops for food tech and woods/metal unit;
- Demolition of existing botany room and construction of a new single storey pavilion comprising of interview rooms and end-of trip facilities; and

3 PROJECT LOCATION

The site is roughly rectangular in shape, with a total area of 60,790m2 and street frontages to Forman Avenue to the south and Glenwood Park Drive to the east. Glenwood Reserve adjoins the northern and western boundaries of the school. The site is located at 85 Forman Avenue, Glenwood, NSW, 2768 as shown in Figure 1.

Figure 1 REF Transport and Accessibility Impact Assessment

4 OBJECTIVES OF THE CWMP

The Objectives of the CWMP Include:

a) Identify, quantity and classify waste streams to be generated during construction.
b) Identify appropriate servicing arrangements (including but not limited to, waste management, loading zones, mechanical plant) for the site.
c) To ensure storage and collection of waste is designed and managed having appropriate regard to space, location, amenity and ongoing management of waste management facilities.
d) Describe measures to be implemented to manage, reuse, and recycle and safely dispose of the waste.
e) To maximise reuse and recycling of construction materials and materials from development.
f) To encourage building design techniques in general which minimise waste generation.
g) To minimise the amount of waste being deposited to landfill with targets to reuse or recycle at least 90% of construction and demolition waste as per the EFSG DG02 2.7.1 Construction and demolition waste requirements.

5 NSW LEGISLATIVE REQUIREMENTS AND GUIDELINES

Relevant key legislation and guidelines applicable to the project include:

- *Protection of the Environment Operations Act 1997*
- *Protection of the Environment (General) Operations Act 1998*
- *Waste Avoidance and Resource Recovery Act 2014*
- *Protection of the Environment Operations (Waste) Regulation 2014*
- *Waste Classification Guidelines (EPA, 2014)*
- *NSW Department of Planning and Environment, Secretary's Environmental Assessment Requirements (SEARs)*
- *Blacktown Development Control Plan 2015 (DCP, 2015) - Part G Site Waste Management and Minimisation.*
- *DECCW's Waste Classification Guidelines (2008)*

6 WASTE MANAGEMENT COMPLIANCE

The current legislation determines that the generator of waste is the owner of the waste until the waste crosses a calibrated weighbridge into a licensed facility. Waste contractors to construction contractors are the primary transporters of waste off-site, accordingly, waste contractors will be required to provide verifiable monthly reports on waste reused, reprocessed or recycled (diverted from landfill) or waste sent to landfill. These reports have a direct bearing on the generator's compliance with the relevant regulations.

The CWMP will be implemented on-site throughout including; singularly or collectively the demolition, excavation and construction phases.

A Waste Data File must be maintained on-site and all entries are to include:

- The classification of the waste
- The time and date of material removed
- A description of and the volume of waste collected
- The location and name of the waste facility that the waste is transferred to
- The vehicle registration and the name of the waste contractor's company

The Waste Data File will be made available for inspection to any authorized officer at any time during the life of the site works. At the conclusion of site works, the designated person will retain all waste documentation and make this validating documentation available for inspection.

Arrangement's will be made with the Waste Contractor to increase bin supply if there is an unexpected increase in waste generation.

CONSTRUCTION WASTE MANAGEMENT EQUIPMENT, BIN SIZES AND COLLECTION FREQUENCY

All waste will be removed by a licensed waste contractor using bins on site. The construction waste will be removed when bins are full and within the construction site operating hours to reduce disturbance of the neighbours.

7 WASTE MANAGEMENT STRATEGIES

The waste management strategy for the project will operate over the design, procurement, and construction including; the fit-out of the project and is detailed below in Table 1 .

Table 2 - Breakdown of Tasks and Responsibilities

Management Strategies	Responsibilities
Design	
• Use of modular components in design • Use of prefabricated components in design • Design for materials to standard sizes • Design for operational waste minimisation	• Architect & Engineer • Architect, Builder, Subcontractors. • Architect, Subcontractors • Architect & Builder
Procurement	
• Select recycled and reprocesses materials • Components that can be reused after deconstruction	• Architect, Engineer, Builder & Sub Contractors • Architect, Engineer & Builder
Pre-construction	
• Waste management plan to be reviewed & approved prior to construction. • Contract a Waste Contractor	• Builder • Waste Contractor
Construction on-site	
• Use the avoid, reuse, reduce, recycle principles • Minimisation of recurring packaging materials • Returning packaging to the supplier • Separation of recycling of materials off site • Audit & monitor the correct usage of bins • Audit and monitor the Waste Contractor	• Builder & Waste Contractor • Sub-contractors • Builder & Sub-contractor • Waste Contractor • Builder & Waste Contractor • Builder

ON SITE WASTE MANAGEMENT and STORAGE REQUIREMENTS

There will be a designated waste storage area for the disposal and storage of construction waste prior to collection. This area will be located conveniently for the construction work team to use the bins as well as for waste contractors to collect. An indicative location has been provided in Appendix A.

Other requirements include:

- Construction waste storage is contained wholly within the site.
- The routes for movement of waste between work site and waste storage area are to be kept obstruction-free.
- The routes for movement of bins and waste between storage and collection points are marked in the site drawing and will be kept obstruction-free (if waste is moved between the waste storage area(s).
- The waste bin collection point provided will be accessible for waste collection vehicles. There are no obstructions to turning or reversing, pulling up vehicles and lifting bins.
- Access for waste collection vehicles will not be compromised by construction-related activities vehicles or other consequences of construction staging.
- All waste not being reused on site will be removed during, or at the completion of, the construction stage.

- No waste will be left on site unless it is part of valid reuse on site, which is integral to and in place in the design.
- In order to manage noise levels, collection of waste from the construction site will only occur during hours approved for construction work.
- All vehicles entering or leaving the site must have their loads covered.
- All vehicles, before leaving the site, to be cleaned of dirt, sand and other materials, to avoid tracking these materials onto public roads.
- At the completion of the works, the work site is left clear of waste and debris.
- Non-recyclable waste and containers are to be regularly, collected and disposed of at a licensed disposal site. Waste will be collected daily
- No burning or burying of waste is permited on the site
- Any bulk garbage bins delivered by authorized waste contractors are to be placed and kept within the property boundary
- All waste (including hazardous materials) must be stored appropriately on site by the head contractor and disposed of by a licensed waste contractor at a licensed facility which can receive such waste

7.1 REUSE OF DEMOLITION, EXCAVATION AND CONSTRUCTION MATERIALS

Construction Materials and off-cuts can be reused on-site. An area within the materials lay-down area will be allocated for the storage of materials to be reused.

These items include

- Plastic buckets
- Timber crates
- Timber off cuts
- Paint brushers and rollers (Wrapped in plastic to maintain moisture)
- Plasterboard offcuts
- Cardboard boxes
- Clean fill will be reused on-site after verification by soil testing and Waste Classification.

7.2 MANAGEMENT OF HAZARDOUS WASTE

All excavation waste removed from site will be classified by a suitably qualified environmental consultant as per Waste Classification Guidelines Part 1: Classifying Waste NSW EPA 2014 including:

- Virgin excavated natural material;
- ENM in accordance with Excavated Natural Material Order 2014;
- Asbestos;
- Disposal dockets (for non VENM/ENM) from landfill will be provided and kept in a Waste Data File on-site;
- Material tracking/dockets will be provided for VENM/ENM;
- Disposal facility will have appropriate licence to receive the waste in accordance with the waste classification; and
- if required a Remedial Action Plan will be prepared

A Waste Data File will be maintained on-site and all entries will include hazardous waste stating the following:

- The classification of the hazardous waste;
- The license of the facilities that can accept the hazardous waste material;
- The time and date of material removed;
- A description of and the volume of waste collected;
- The location and name of the waste facility that the waste is transferred to;
- The vehicle registration and the name of the waste contractor's company; and
- Disposal dockets.

The Waste Data File will be made available for inspection to any authorised officer at any time during the life of the site works. At the conclusion of site works, the designated person will retain all waste documentation and make this validating documentation available for inspection.

7.3 UNEXPECTED FINDS PROTOCOL

An unexpected find can be defined as:

- Any unanticipated archaeological discovery e.g. aboriginal relics, items of significance, etc.;
- Buried or surface asbestos containing materials (Bonded, Friable or other);
- Buried waste materials e.g. medical waste, contaminated waste, etc.;
- Septic or underground storage tanks;
- Animal burial pits; or
- discoloured and odorous soils and groundwater/seepage.

Should an unexpected find of potential contamination be encountered during the works, the CEMP procedure should be followed, with consideration of the following:

- Identified finding by worker;
- Cease work as soon as safe to do so and move clear of the finding;
- Do not tamper or attempt to remove the finding;
- Contact Construction Management immediately;
- Site Management to delineate an exclusion or quarantine zone around the area using fencing and or appropriate barriers and signage;
- Preliminary assessment of the find and need for immediate management controls;
- Further assessment and/or remediation works are required and how such works are to be undertaken in accordance with contaminated site regulations and guidelines;

- Any unexpected finds must be documented, and records of volumes and types of materials identified removed from the site must be kept on file;
- Receipt documentation from the licensed facility confirming volume received.

8 WASTE MANAGEMENT PLAN APPLICATION

Project

Glenwood High School Upgrade

Address

85 Forman Avenue, Glenwood, NSW, 2768.

Applicant

Dept of Education
School Infrastructure NSW
Level 8, 259 George Street,
Sydney, N.S.W, 2000

Details of Application

The development is a new build and upgrading works comprising alterations and additions to Glenwood High School at 85 Forman Avenue, Glenwood. The site is legally described as Lot 5227 DP 868693.

Description of Buildings and Other Structures Currently on the Site

The site is roughly rectangular in shape, with a total area of 60,790m 2 and street frontages to Forman Avenue to the south and Glenwood Drive to the east. Glenwood Reserve adjoins the northern and western boundaries of the school.

Brief Description of Proposal

The proposed development seeks to upgrade Glenwood High School. The upgrade consists of the following alterations and additions:

- Construction of a new three-storey building at the north-eastern portion of the site facing Glenwood Park Drive which will accommodate new learning spaces;
- Construction of one storey performance pavilion;
- Refurbishment of existing Building Block A (ground floor only) to provide one new support unit within the space of an existing general learning space;
- Refurbishment of Building Block D (ground floor only) to provide an additional office space and storeroom;
- Refurbishment of Building Block E to re-purpose it on the ground floor for computer learning spaces, staff and administration spaces as well as upgrades to the library on the first floor;
- Refurbishment of Building Block J to re-purpose it from visual arts and performing arts to learning spaces and workshops for food tech and woods/metal unit;
- Demolition of existing botany room and construction of a new single storey pavilion comprising of interview rooms and end-of trip facilities; and
- The proposed development will also involve ancillary works at the site associated with the proposed upgrades.

Prepared by:	
Name:	Jo Drummond
Signed:	
Contact Number:	0412 214 233
Date:	29/08/2022

9 PROJECT PHASE

9.1 DEMOLITION

MATERIAL TYPE ON SITE	ESTIMATED VOLUME (m^3) or WEIGHT (t) (Most Favourable → Least)			ON-SITE TREATMENT	OFF-SITE TREATMENT	
	Reuse	Recycling	Disposal	Proposed reuse and/or recycling collection methods	Disposal / Transport Contractor	Waste Depot, Recycling Outlet or Landfill site
Brick & Concrete		80 m^3		Comingled	Dump It	Boral Recycling 11815
Asphalt		15 m^3		Comingled	Dump It	Boral Recycling 11815
Metal		45 m^3		Comingled	Dump It	Sims Metal 6934
Plasterboard		30 m^3		Comingled	Dump It	Cleanaway Resource Co 20937
Timber		35 m^3		Comingled	Dump It	Fairfeild Council 5713
Doors & Windows	10 units			Removed for reuse	Dump It	Cleanaway Resource Co 20937
General Waste			60 m 3		Dump It	Cleanaway Resource Co 20937
Total	**265m3**					

Narrative: Demolition of the Botany Room and internal demolition of exsisitng buildings to accomodate the new fit out. All material will be comingled and taken off site for recycling.

9.2 EXCAVATION

MATERIAL TYPE ON SITE	ESTIMATED VOLUME (m^3) or WEIGHT (t) (Most Favourable → Least)			ON-SITE TREATMENT	OFF-SITE TREATMENT	
	Reuse	Recycling	Disposal	Proposed reuse and/or recycling collection methods	Disposal / Transport Contractor	Waste Depot, Recycling Outlet or Landfill site
Trees & Shrubs Roots		10 m^3		Separated to a designated Bin	TBA	Recycled
Clean Fill	330 m^3			Separated to a designated stockpile	TBA	Reused
Sub-Total	**340 m^3**					
Total	**340 m^3**					

Narrative: Aside from the new three-story building's excavations and pilings the proposed excavations on-site are minor excavation for piers and footings. Sometrees and shrubs are to be lopped and recycled. Moderately saline soils present across the site. Douglas Partners Geo Technical Investigation Glenwood High School November 2021 Project Number 94626.00

9.3 CONSTRUCTION

MATERIAL TYPE ON SITE	ESTIMATED WEIGHT (t) or VOLUME (m^3)			ON-SITE TREATMENT	OFF-SITE TREATMENT	
	Reuse	Recycling	Landfill Disposal	Proposed reuse and/or recycling collection methods	Disposal / Transport Contractor	Recycling Outlet or Landfill site
Concrete, Brick, Block Work, Render, Tiles		125 (m^3)		Co-mingled Bins	Dump It	Crushed for road base Boral Recycling 11815
Metals		90 (m^3)		Co-mingled Bins	Dump It	Scrap Metal Dealer for smelting EPL 6934
Timber Off-Cuts		110 (m^3)		Co-mingled Bins	Dump It	Recycled for woodchips and mulch Cleanaway Resource Co 12889
Cardboard		35 (m^3)		Co-mingled Bins	Dump It	Recycled into cardboard packaging Cleanaway Resource Co 12889
Plasterboard		120 (m^3)		Co-mingled Bins	Dump It	Recycled as soil conditioner
Containers, Plastics, Plastic Packaging		130 (m^3)		Co-mingled Bins	Dump It	Recycled into further plastic
Pallets And Reels	40 units			Co-mingled Bins	Dump It	Returned to the supplier
Liquid Waste			35 (m^3)	Separated Container/Bin	Dump It	Cleanaway Resource Co 12889
General Waste			80 (m^3)	Co-mingled Bins	Dump It	Cleanaway Resource Co 12889
Sub Total		**610 (m^3)**	**115 (m^3)**			
TOTAL	**(m^3)**			NB: An additional 40 pallets & reels (single units returned to suppliers for reuse)		

10 APPENDIX A: CONSTRUCTION WASTE BIN ALLOCATION

Figure 2.1: Site extents
Source: SIX Maps

CONSTRUCTION WASTE STORAGE AREA

TRAFFIC DIRECTION

6.8 CONSTRUCTION SOIL & WATER MANAGEMENT SUB-PLAN

The Construction Soil & Water Management sub-Plan has been prepared by SCP.

Refer to the following page.

Construction Soil and Water Management Sub-Plan

Glenwood High School

SCP Ref: S220004-GHS-CV-SW-RPT-03

Client Richard Crookes Construction

Project Glenwood High School

Date 12 September 2022

Revision table

Rev #	Date	Issue description	Prepared by	Reviewed by	Issued by
01	18/07/22	For Information	PS	HL	LS
02	12/09/22	Final	JC	BH	JC

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Contents

1 Introduction

SCP Consulting has been engaged by Richard Crookes Construction to prepare a **Construction Soil and Water Management Sub-Plan (CSWMSP)** for the proposed Glenwood High School (GHS) development to satisfy Condition B19 of the SSDA Conditions (reference: **SSD-23512960**).

Excerpt below:

> B19. The Applicant must prepare a Construction Soil and Water Management Sub-Plan (CSWMSP) and the plan must address, but not be limited to the following:
>
> (a) be prepared by a suitably qualified expert, in consultation with Council;
>
> (b) measures to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site;
>
> (c) describe all erosion and sediment controls to be implemented during construction, including as a minimum, measures in accordance with the publication Managing Urban Stormwater: Soils & Construction (4th edition, Landcom 2004) commonly referred to as the 'Blue Book';
>
> (d) provide a plan of how all construction works will be managed in a wet-weather events (i.e. storage of equipment, stabilisation of the Site);
>
> (e) detail all off-site flows from the site; and
>
> (f) describe the measures that must be implemented to manage stormwater and flood flows for small and large sized events, including, but not limited to 1 in 5-year ARI and 1 in 100-year ARI.

Consultation with Blacktown City Council (BCC) has occurred via email and telephone in the preparation of this report. Email correspondence from Council has been appended to this report. (Refer **Appendix B**).

1.1 Purpose of Report

The purpose of this report is to:

- Describe measures to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site;
- Describe all erosion and sediment controls to be implemented during construction;
- Provide a plan for how all construction works will be managed in a wet-weather event;
- Detail all off-site flows, and;
- Describe the measures that must be implemented to manage stormwater and flood flows for minor and major storm events.

1.2 Site Context

The proposed development is within the grounds of the existing Glenwood High School and is located on the corner of Glenwood Park Drive and Forman Avenue, Glenwood, NSW. The site is bound by residential development to the east (Glenwood Park Drive) and south (Forman Avenue). To the west and north of the site is Glenwood Reserve. Refer to Figure 1 for an aerial view of the site boundary.

Figure 1: Aerial View of Site Boundary (Source: Aerial Survey)

1.3 Existing Site

A desktop review was undertaken to determine the existing infrastructure within the development site. The inspection revealed the following:-

- The existing site grades in a north-easterly direction at a grade of approximately 3%;
- There are nineteen (19) demountable buildings, all of which will be required to be removed to make way for the new development;
- There are a number of existing stormwater pits and pipes within the development area. Where the existing stormwater will clash with the proposed development, the stormwater will need to be relocated, diverted or removed;
- Council stormwater infrastructure is located in Glenwood Park Drive and Forman Avenue, and;
- There are no upstream flows entering the development site.

Refer to Figure 2 for an illustration of the existing site grading as discussed above.

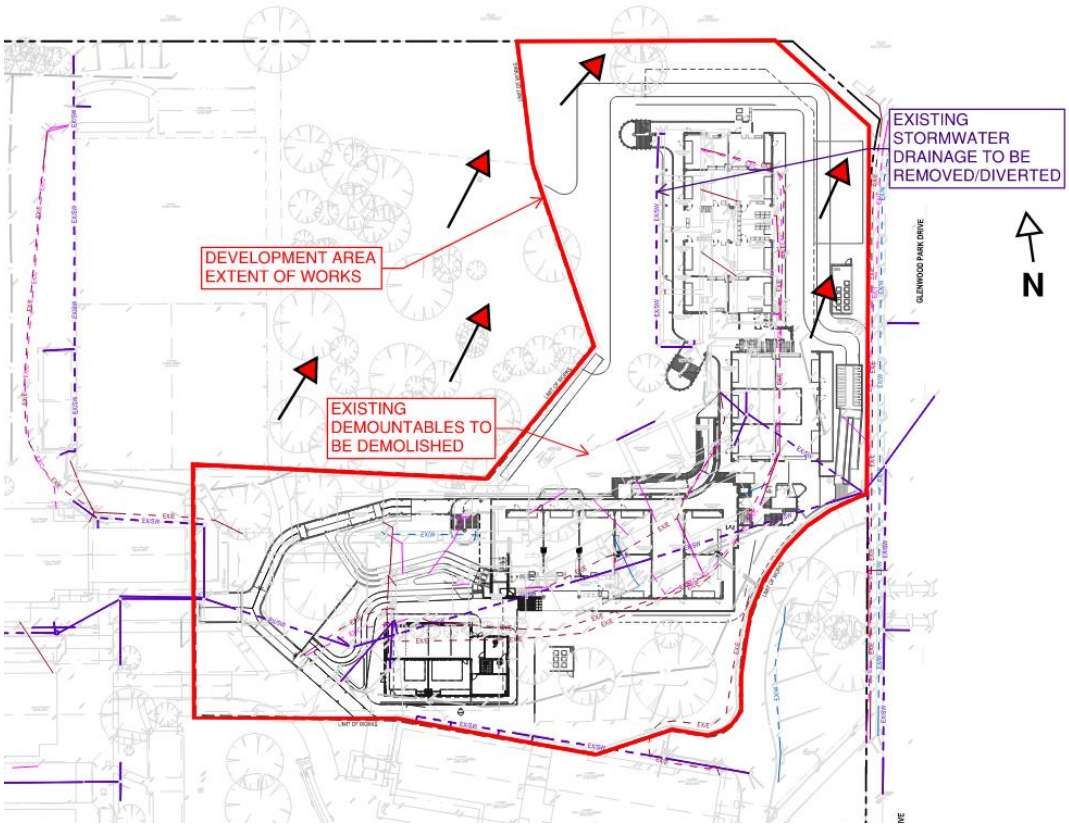


Figure 2: Existing Site Grading

1.4 Proposed Development

The proposed development includes the construction of:-

- New three (3) storey building;
- New one (1) storey performance arts building;
- Demolition of existing botany room and construction of single storey pavilion;
- Ancillary works at the site associated with the proposed upgrades.

Due to the size of the proposed development and considerable impact it will have to the landscape of the site, a sufficient site management plan must be implemented to ensure minimal impact to the environment and surrounding sites. It is pivotal that erosion, sediment and run-off from the site are controlled throughout excavation and construction, until completion of the development.

This report details the measures to be taken on-site from the start of excavation until the completion of construction in order to effectively manage all sediment, run-off and erosion, and to protect the surrounding properties and infrastructure.

2 Soil and Water Management

Soil and water management measures are to be in place to manage the impact of construction on the local environment. The following measures are to be implemented prior to the start of construction works and to remain installed until the completion of works. These measures cover both small 20% Annual Exceedance Probability (AEP) storm events and larger 1% AEP storm events.

Following the various storm events, maintenance is to occur for the implemented soil and water management controls, in accordance with maintenance procedures within this report.

A Soil and Water Management Plan has been prepared in accordance with Landcom's Soil and Construction manual (commonly known as the Blue Book). The Contractor for the works is required to provide the specified measures in accordance with the general requirements outlined below:-

2.1 Site Access

Site access shall be provided via two (2) stabilised construction vehicle access points which consists of a minimum 5m long by 3m wide 'shaker grid'.

The following should be adhered to with regards to vehicle access:-

- All construction vehicles entering/exiting the site shall be required to pass over the vehicle access to prevent them becoming a source of sediment. The vehicle entry may consist of a timber, concrete or steel shaker grid or rubble area;
- The vehicle access area is to be maintained in a clean and serviceable condition throughout construction;
- All public roads are to be cleaned immediately in the case that sediment is tracked onto the public roadway by vehicles leaving the construction site, and;
- Unsealed roads within the site are to be topped with 100mm compacted thickness, 40mm nom. Aggregate

As required, vehicles are to be hosed down within the site prior to exiting to adjacent public roadways.

2.2 Sediment Control

All erosion and sedimentation control measures, where possible, are to be installed prior to the commencement of any excavation or construction works on-site. The erosion and sediment control plans for each stage of construction, as shown in the drawings prepared by SCP, nominates the required measures. The devices are to be maintained throughout the entire excavation and construction process and **recommended** be maintained for a minimum of three (3) months **after the** completion of works, where necessary or approved otherwise at completion.

2.2.1 Sediment Fence

All disturbed areas where it may be possible for runoff to transport silt and sediment down a slope, and particularly allow it to enter an adjacent site or stormwater system, a sediment fence will be installed along the boundaries of the site.

In accordance with *Managing Urban Stormwater: Soils and Construction – Volume 1*, the sediment fence will be constructed with geotextile fabric preventing suspended particles greater than 50mg/L non-filterable solids to pass through.

The sediment fence will be constructed at a minimum in accordance with the following:-

- Geotextile fabric to be buried 150mm below surface level;
- 150mm overlaps will be provided at joins in the fabric at support posts;
- The ends of the fabric will be turned up for a length of 1 metre in order to prevent volumes of suspended solids escaping in a storm event;
- Sediment fence will be installed as close as parallel to the contours of the site or at the toe of a slope;
- 1.5m long star pickets are to be driven into the ground at 3m intervals to provide rigid support for the fence. Where there is insufficient soil depth over the rock, holes are to be drilled into rock to accept the star pickets;
- Backfill trench over base of fabric and compact;
- On hard/rocky ground, smooth a 500mm wide strip upslope of the fence line, turn the bottom 500mm of the fabric upslope and anchor in place with suitable aggregate, and;
- Where a sediment fence is constructed down slope from a disturbed batter, the sediment fence shall be located approximately 2m down slope from the toe of the batter.

2.2.2 Pit Sediment Traps

All existing and proposed stormwater grated inlet pits within the site will be protected by geotextile filter traps throughout the duration of construction. Council owned kerb inlet and gully pits are to be protected by filter bales and sandbags. Water Clean Filter Cartridges are to be provided in the gully opening to provide an additional level of treatment/protection to the Council stormwater system.

The pit sediment traps will be constructed at a minimum in accordance with the following:-

- Sleeves for the sediment barriers are to be made from geotextile fabric longer than the length of the inlet pit;
- The sleeve is to be filled with5mm to 10mm clean gravel;
- Place the sleeve at the opening of grated inlet pit, leaving approximately 100mm gap to act as an emergency overflow;
- Ensure no gaps to prevent bypass into the system;
- Filters to be cleaned and maintained daily, and;
- All care is to be taken to minimise sediments reaching and entering into the stormwater system. This can be done by preventing excess water flow through the site and minimising excavation works.

2.2.3 Stockpiles

Stockpiles shall be located in accordance with the erosion and sediment control plans drawings prepared by SCP. Where stockpiles are to be in place longer than ten (10) days it is recommended they are stabilised by covering with mattering or tarps. Use sediment fences and earth bank downstream of stockpiles, as required, to manage erosion.

Stockpile material may be removed from site to reduce the risk of further pollution of site runoff.

2.2.4 Site Stabilisation

All disturbed areas are to be stabilised within twenty (20) working days of the completion of site works. All disturbed areas are to be protected so that the land is permanently stabilised within three (3) months. Topsoil shall be respread over the site as required to achieve a minimum depth of 75mm of hydromulchable soil (exact required depth to be confirmed by supplier).

The site shall be stabilised and revegetated using a hydromulch mix (or equivalent) to be specified by the supplier, as appropriate for the site. Soil testing may be required to tailor the mix for the site.

If hydromulching is not suitable for site stabilisation, refer to Table 1 for the seed mix that can be used for temporary stabilisation, assuming topsoil depths are sufficient.

Table 1: Proposed Stabilisation Seed Mix

SEASON	STABILISATION SEED MIX
Autumn/Winter	Oats at 40kg/ha and Japanese millet at 10 kg/ha
Spring/Summer	Oats at 20kg/ha and Japanese millet at 20 kg/ha

The above seed mix will provide temporary protection for up to six (6) months until such time as more permanent stabilisation measures can be implemented for permanent stabilisation of the site.

2.3 Dust Control

The following dust control procedures will be adhered to within the construction site:-

- Construction vehicles and other machinery leaving the site will have their wheels washed and agitated prior to travelling on public Council roads;
- All fences will have shade cloth fixed to the inside of the fence;
- Dust will be suppressed within the construction site through the use of water sprinklers or water carts across ground surfaces when the surface has dried and there is potential to generate visible levels of dust. Dust can be generated through the operation of equipment or wind;
- Water will be sprayed at a rate of not less than 3L/s and not less than 700kPa pressure to suppress dust within the site. The area within which sprays are used will be small enough to maintain damp surfaces but not generate runoff;
- Materials will not be burned on site;
- Soil transportation into the site will be done from the main access into the site, and;
- Loose loads entering/leaving the construction site will be secured using a tarpaulin or similar material in accordance with RMS and local Council guidelines.
- Sediment traps are only to be removed once the specific construction area has been properly stabilised, and
- Site and sediment fences are only to be removed once all construction works are completed.

It is considered that by complying with the above, appropriate levels of protection are afforded to the site and the adjacent public roads, footpaths and environment.

2.4 Off-Site Flow Controls

2.4.1 Minor Events

Off-site flow from the site is currently managed within measures detailed in the erosion and sediment control plan drawings prepared by SCP. Off-site flow is anticipated to occur via the following means:

- Through existing internal stormwater pits on site - sediment trap barriers and geotextile linings are proposed around all pits. All new pits installed during construction to have same detail upon installation.
- Flows leaving site along the downstream boundary (to the north-east) - sediment fencing and impermeable fencing provided.
- Leaving site along the driveway entrance - raised construction entry/ cattlegrid and removable sediment sock in storm events as required.
- Through existing external stormwater pits in the external surrounding streets - Sediment not anticipated to reach these, but in the event it does, sediment trap barriers are to be placed around existing pits closest to site, particularly those along Glenwood Park Drive.

The soil and water management measures have been designed in accordance with the Blue Book. All measures shown within the CSWMP and ESCP are designed for up to and including the 20% AEP storm flows.

2.4.2 Major Events

The Blue Book specifies effective control measures are difficult to achieve within the 1% AEP storm event due to the velocity and volume of floodwaters. It is noted that GHS is not subject to flooding during the 1% AEP storm event. The proposed and existing stormwater network are designed to accommodate flows up to, and including, the 5% AEP storm.

Sediment barriers and measures nominated within the ESCP are likely to be effective in larger storm events such as the 5% AEP storm, however it cannot be guaranteed to have full control of the sediment.

Erosion and sediment control measures specific to major storm events on an urban project like this are not recommended as it has the potential to cause obstruction to overland flow paths and raise the flood levels. Localised raising of flood levels in urban areas can lead to inundation of existing properties surrounding the proposed development areas.

It is recommended that the primary overland flow path, southwest to northwest: from the Southeast corner of the site at Forman Avenue, to the northeast corner at Glenwood Park Drive, is not obstructed during construction around existing and proposed buildings in major storm events.

It is the contractor's responsibility to ensure that an overland flow path is maintained and that the overland flow path does not generate or convey sediment unnecessarily.

2.5 Maintenance Requirements

The following maintenance requirements will be adhered to throughout the duration of construction: -

- It is the responsibility of the contractor to ensure erosion and sediment control measures are installed properly and maintained on site.
- Accumulated silt and sediment will be removed from site at regular intervals and after major storm events.
- Silt and sediment will be removed from site or moved to a location within the site where it will not erode, and Council approval is given to do so;
- Sediment fences and pit sediment traps are to be regularly inspected, particularly after major storm events, and kept in good condition to ensure effective functionality.
- Prior to the closing of the site every day, the public road will be swept, and materials deposited back onto the site.
- Appropriate and approved covering material such as plastic sheeting will be used to cover stockpiles and other unsealed surfaces.

Appendix A – CVs

James Clare

Associate Civil Engineer
Stormwater & Flood Modelling Specialist

Bachelor of Engineering (Civil, Construction)
Diploma in Engineering Practice
Member, Institute of Engineers Australia (MIEA)
National Engineering Register (NER)

James has honed his impressive Civil Engineering skills working over the last ten years with some of Australia's largest engineering groups, such as Lendlease Building and ACOR Consultants. He has also spent a year working for a small civil contractor providing James with valuable construction knowledge which he now applies to his current projects.

Joining SCP Consulting in 2016, James' knowledge and experience assisted him in achieving the position of Associate in June 2017. James is a highly proficient project manager and regularly manages multi-disciplinary projects delivered by SCP as a single point of contact for clients. This leads to successful development of engineering concepts through to construction and strong client relationships. James is known for his design expertise, attention to detail and enthusiasm to produce excellent results. Specialising in stormwater management and flood modelling, James has a wealth of knowledge across many stormwater and flood modelling software packages including HEC-RAS, DRAINS, WBNM and TUFLOW allowing him to provide in depth analysis of stormwater and flooding issues.

Skills and Expertise

- Flood modelling using hydrodynamic software models
- Stormwater hydraulics
- Environmental treatment systems
- Innovative approach to achieve significant cost benefits and best practice solutions to complex engineering problems
- Disciplined on-time and on-budget professional delivery on all projects
- Sound understanding of Local Government and Defence requirements
- Broad knowledge base across multiple disciplines resulting in the holistic delivery of projects

Value Add

- Recent experience at HMAS *Watson* Redevelopment creating the stormwater management plan
- Major project experience as civil engineering lead and stormwater designer
- Lead Civil Design Consultant on BaptistCare Affordable Housing (500 units across 8 sites) for Lendlease displaying a strong capacity for prioritising project elements across multiple large-scale developments
- Lead Civil Design Consultant on South Coast Correctional Centre for Lendlease optimising and finalising design for fast-tracked commencement of works on-site

Key Projects

- **South Coast Correctional Centre, NSW / $170M**
  360 bed expansion of existing correctional centre, civil, stormwater, pavements and earthworks.
- **BaptistCare Affordable Housing, NSW / $260M**
  500 units across 8 sites, master planning of civil infrastructure including stormwater, earthworks, pavements, and services coordination.
- **Royal Randwick Racecourse, NSW / $50M**
  Multi-storey car park, Kensington Track upgrade, earthworks, water quality and quantity management.
- **ATC Warwick Farm, NSW / $8M**
  Grass Track (A-Track), Stables Precinct, multiple sheds within the site, earthworks, water quality and quantity management.
- **University of Sydney Regiment, NSW / $80M**
  Mixed use development, civil and stormwater.
- **Hornsby Kuring-gai Hospital, NSW / $20M**
  Multi-storey car park, civil, stormwater, pavement and earthworks.
- **EST00346 TDL Redev & EST00347 KC-30A Facilities Project, NT**
  Civil, Traffic, Aerodrome Pavements, Hydraulic Building Services, Hydraulic Infrastructure, Hydraulic Building Services and Fire Protection (Wet) services were provided.
- **N2232 HMAS Watson Redevelopment, NSW / $160M**
  Development of a Stormwater Management Plan as part of the civil works.
- **Base Security Improvement Program (BSIP) / $200M**
  16x Defence bases / establishments across NSW, VIC, ACT and QLD.
- **Moorebank Units Relocation (MUR) Project, Holsworthy Army Base NSW / $800M**
- **MH-60R Romeo Seahawk Aviation Facilities Project, HMAS Albatross & Twofold Bay NSW / $200M**
  Naval Airfield Station Base including taxiways and Aprons.

Henry Lam

Senior Civil Engineer

Bachelor of Engineering (Civil) & Bachelor of Project Management
Honours Class I
Chartered Professional Engineer (CPEng)
National Engineering Register (NER)

Henry has used his Engineering and Project Management skills over the last 7 years to deliver a variety of siteworks projects. During his time at ARUP, Henry was responsible for the delivery of major Health projects including Westmead Central Acute Services Building.

Recently joining SCP Consulting Henry has demonstrated that he is a highly proficient engineer and project manager able to manage all aspects of projects that he has taken on from master planning, feasibility studies, concept design, detailed design, tender design, and construction. This leads to successful development of engineering concepts through to construction.

Skills and Expertise

- Master planning and feasibility studies
- Civil 3D modelling
- Innovative approach to achieve significant cost benefits and best practice solutions to complex engineering problems
- Disciplined on-time and on-budget professional delivery on all projects
- Sound understanding of Local Government requirements
- Project Management expertise resulting in a holistic approach to civil engineering design.

Value Add

- Major project experience as civil engineering lead and siteworks designer
- Lead Civil Design Consultant for the Westmead Redevelopment Central Acute Services Building project including concept, tender and construction design and construction services.
- Lead Civil Design Consultant for Liverpool Hospital redevelopment project including value engineering, construction design and construction services.

Key Projects

- **Elara Village Shopping Centre, Marsden Park, NSW / $60M**

  Civil and Stormwater Lead

  New shopping centre. Civil design of earthworks, grading, pavements, stormwater conveyance and quality management, and public domain including shared path.

- **Knox Street Plaza, Double Bay, NSW / $5M**

  Civil and Stormwater Lead

  New public plaza. Civil design of grading, pavements and stormwater conveyance.

- **Alexandria Park Community School Redevelopment, Alexandria, NSW / $100M**

  Civil Designer

  School redevelopment involving works around Sydney Water culvert. Civil design of public domain including grading, pavements, stormwater conveyance and street furniture.

- **100 Mount Street, North Sydney, NSW / $480M**

  Civil Lead

  New office tower. Civil design of public domain including grading, pavements, stormwater conveyance and street furniture.

- **Greenland Centre Sydney, Sydney, NSW / $400M**

  Civil Lead

  New residential tower. Civil design of public domain including grading, pavements, stormwater conveyance and street furniture.

- **Westmead Redevelopment – Central Acute Services Building, Westmead, NSW / $1B**

  Civil and Stormwater Lead

  New hospital building. Civil design of earthworks (including remediation of contaminated material), grading, pavements, stormwater conveyance, flooding, in-ground services coordination.

- **Liverpool Hospital Redevelopment, Liverpool NSW / $750M**

  Civil and Stormwater Lead

  New hospital building. Civil design of earthworks, pavements, grading, stormwater conveyance and quality management, flooding, in-ground services coordination with BIM.

- **Macquarie University Ainsworth Building, Macquarie Park, NSW / $30M**

  Civil and Stormwater Lead

  New teaching building. Civil design of earthworks, grading, pavements, stormwater conveyance and quality management.

- **Woolworths National Distribution Centre, Moorebank, NSW / $1.2B**

  Civil and Stormwater Lead

  New warehouse facility with on-grade car park. Civil design of earthworks, grading, pavements, stormwater quantity and quality management.

- **DHL Leppington, Leppington, NSW / $80M**

  Civil and Stormwater Lead

  New warehouse facility with on-grade car park. Civil design of earthworks, grading, pavements, stormwater quantity and quality management.

Appendix B Consultation with Council

James Clare

From: Amelia Tabrett <Amelia.Tabrett@blacktown.nsw.gov.au>
Sent: Monday, 12 September 2022 4:20 PM
To: James Clare
Subject: RE: Glenwood High School - CSWMSP

Hi James,

Thanks for submitting the plans.

I don't have any comments to add to the report or the plans.

Kind regards,

Amelia Tabrett
Environmental Health Officer

9839 6124
Amelia.Tabrett@blacktown.nsw.gov.au
PO Box 63 Blacktown NSW 2148
blacktown.nsw.gov.au

Follow us on social media

From: James Clare <james.clare@scpconsult.com.au>
Sent: Monday, 12 September 2022 12:15 PM
To: Amelia Tabrett <Amelia.Tabrett@blacktown.nsw.gov.au>
Subject: Glenwood High School - CSWMSP

Hi Amelia,

Please find attached Glenwood High School CSWMSP and associated erosion and sediment control plans and details.

Can you please review and provide any comments.

Thanks,

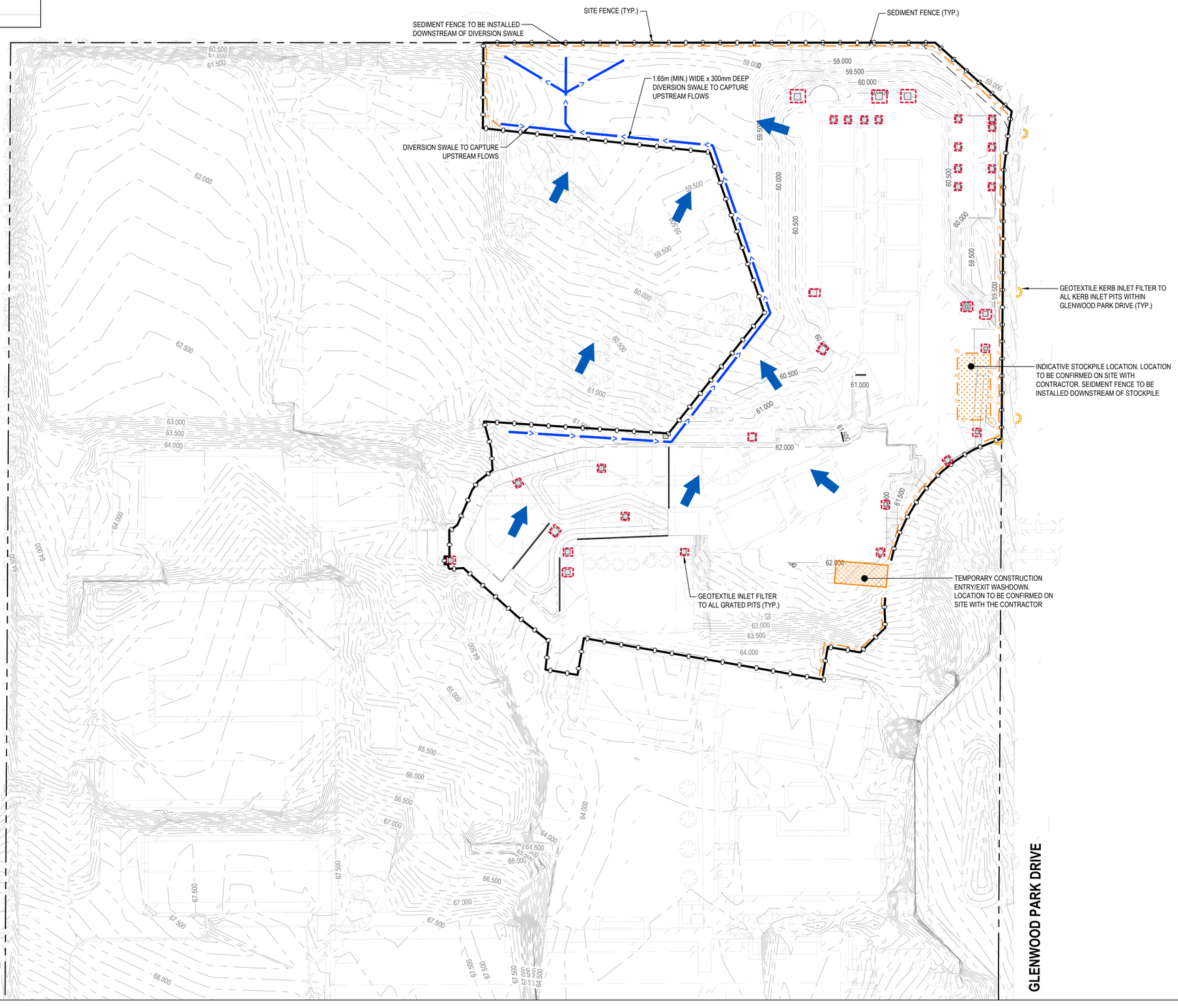
James Clare
Associate Director | Civil

T 1300 SCP ENG (727 364)
M 0400 385 572 D 02 8358 8732

A1

EROSION & SEDIMENT LEGEND

- SITE FENCE
- SEDIMENT FENCE
- TEMPORARY CONSTRUCTION ACCESS
- KERB INLET PROTECTION
- GEOTEXTILE INLET SEDIMENT FILTER
- OVERLAND FLOW
- DIVERSION SWALE



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Rev	Revision Description	Date
05	ISSUED FOR CONSTRUCTION CERTIFICATE	12.09.22
04	ISSUED FOR 100% DESIGN DEVELOPMENT	09.09.22
03	ISSUED FOR CONSTRUCTION CERTIFICATE	18.07.22
02	ISSUED FOR CONSTRUCTION CERTIFICATE	11.07.22
01	ISSUED FOR 85% DETAILED DESIGN	21.06.22

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ABN 80 003 076 024

Client
RICHARD CROOKES CONSTRUCTIONS
NSW GOVERNMENT Education School Infrastructure

Project
GLENWOOD HIGH SCHOOL
FORMAN AVENUE, GLENWOOD
NSW, 2768

Title
EROSION AND SEDIMENT CONTROL PLAN

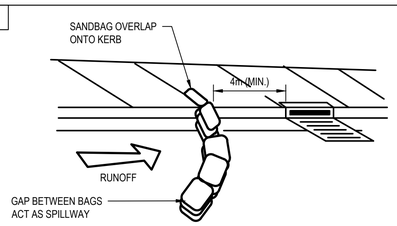
Scale:
AS SHOWN
0 5 10 15 20 25m
1:500

Drawn	Designed	Checked	Approved
E.F.	J.E.	H.L.	L.S.

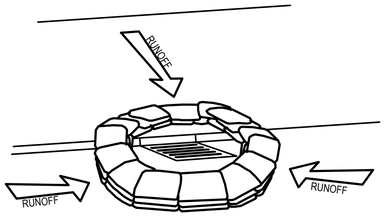
Project Number	Drawing Number	Revision
S220004	GHS-CV-SW-DRW-06-0001	05

File Path: \\SCP-FILE1\ENGINEERING\S220004 GLENWOOD HIGH SCHOOL\07. CIVIL\BIM\DRAWINGS\GHS-CV-SW-DRW-06-0001.DWG - EROSION AND SEDIMENT CONTROL PLAN-04 - DATE PRINTED: 12/09/2022 10:50:12 AM

A1

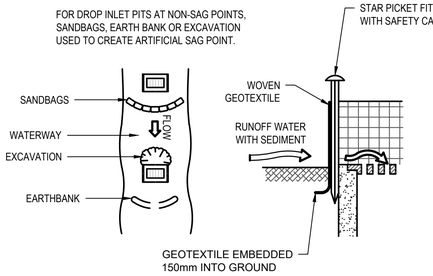


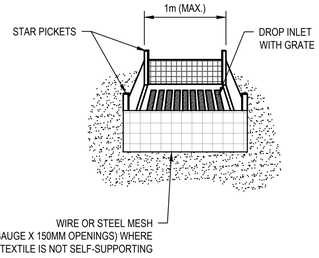
KERB INLET SEDIMENT FILTER (ON GRADE)
NTS



KERB INLET SEDIMENT FILTER - SANDBAG SURROUND
NTS

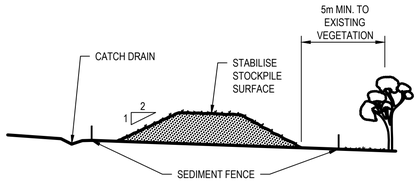
KERB INLET SEDIMENT FILTER
1. REFER TO APPROVED PLANS FOR LOCATIONAND INSTALLATION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION,DIMENSIONS, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.
2. ENSURE THAT THE INSTALLATION OF THE SEDIMENT TRAP WILL NOT CAUSE UNDESIRABLE SAFETY OR FLOODING ISSUES.
3. INSTALL SEDIMENT TRAP IN ACCORDANCE WITH STANDARD DRAWING SUPPLIED WITH THE APPROVED PLAN, OR AS DIRECTED BY THESITE SUPERVISOR.
4. ENSURE THE SEDIMENT TRAP IS CONSTRUCTED UP-SLOPE OF AN ON-GRADE KERB INLET. THE SEDIMENT TRAP MUST NOT SURROUND THE KERB INLET UNLESS SPECIFICALLY DIRECTED BY THE SITE SUPERVISOR.
5. ENSURE THE SEDIMENT TRAP FULLY ENCLOSES THE KERB INLET. USE APPROPRIATE SPACERS TO ENSURE THE SEDIMENT TRAP DOES NOT BLOCK THE SIDE-ENTRY INLET.
6. TAKE ALL NECESSARY MEASURE TO MINIMISE THE SAFETY RISK CAUSED BY THE STRUCTURE





DROP INLET FILTERS
NTS

1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE OF STRAW BALES.
2. FOLLOW STANDARD DRAWINGS OF STRAW BALE FILTERS AND SEDIMENT FENCES FOR INSTALLATION PROCEDURES FOR THE STRAW BALES OR GEOFABRIC. REDUCE THE PICKET SPACING TO 1m CENTERS.
3. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
4. DO NOT COVER THE INLET WITH GEOTEXTILE UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.

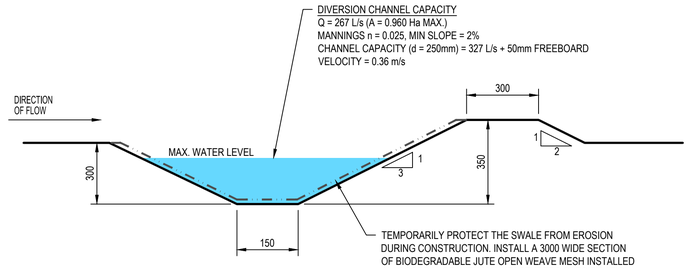


STOCKPILE
NTS

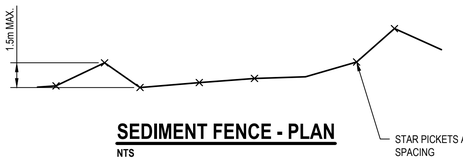
SOURCE: MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION. THIRD EDITION, AUGUST 1998
PRODUCED BY THE DEPARTMENT OF HOUSING

STOCKPILE
NTS

1. PLACE ALL STOCKPILES IN LOCATIONS MORE THAN 5m FROM EXISTING VEGETATION, ROADS & HAZARD AREAS.
2. CONSTRUCT AS LOW, FLAT ELONGATED MOUNDS.
3. SIDE SLOPE TO BE 1V:2H MAX.
4. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2m IN HEIGHT.
5. WHERE STOCKPILES ARE TO BE IN PLACE MORE THAN 10 DAYS, STABILISE USING WOOD CHIP MULCH - 16 TONNE/Ha.
6. CONSTRUCTION SEDIMENT FENCE WITH CATCH DRAIN ON UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES.



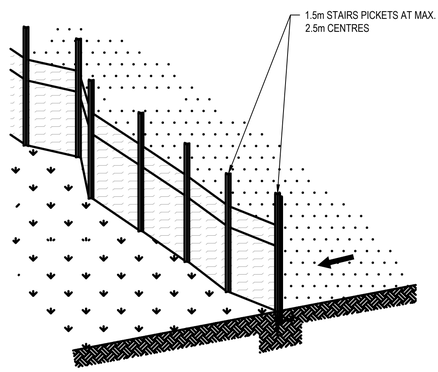
DIVERSION DRAIN
NTS



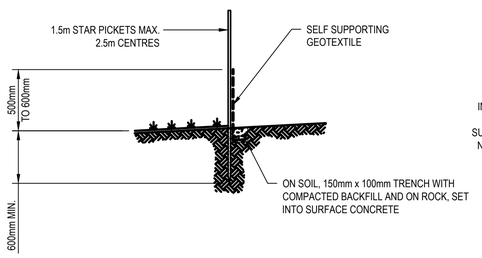
SEDIMENT FENCE - PLAN
NTS

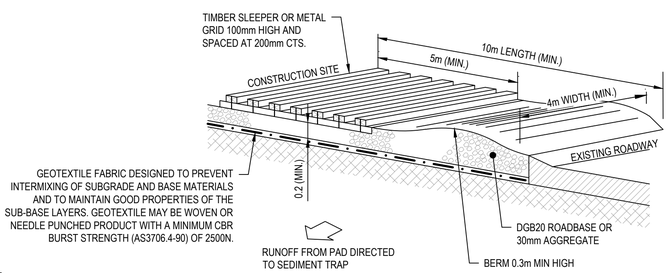
SEDIMENT FENCE
NTS

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BE PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING, TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 litres/sec IN THE DESIGN STORM EVENT, USUALLY THE 10 YEAR EVENT.
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5 METER LONG STAR PICKETS INTO GROUND AT 2.5 METER INTERVALS (MAX.) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS, ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES, OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.



SEDIMENT FENCE
NTS





TEMPORARY STABALISED CONSTRUCTION EXIT
NTS

CONSTRUCTION NOTES
1. CONTRACTOR SHALL CONDUCT A DIAL BEFORE YOU DIG SEARCH PRIOR TO COMMENCEMENT OF ANY WORK.
2. ENSURE THAT ALL COUNCIL AND PUBLIC UTILITY ASSETS ARE MAINTAINED AND PROTECTED AT ALL TIMES IN THE VICINITY OF THE TEMPORARY CONSTRUCTION EXIT.
3. STRIP TOPSOIL AND LEVEL SITE.
4. COMPACT SUBGRADE.
5. COVER AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
6. CONSTRUCT 200mm THICK PAD OVER GEOTEXTILE USING ROADBASE OR 30mm AGGREGATE.
7. CONSTRUCT HUMP IMMEDIATELY WITHIN BOUNDARY TO DIVERT WATER TO A SEDIMENT FENCE OR OTHER SEDIMENT TRAP WHERE THE SEDIMENT IS COLLECTED AND REMOVED.

MAINTENANCE NOTES
1. THE EXIT SHALL BE MAINTAINED IN A CONDITION WHICH PREVENTS TRACKING OR FLOWING OF SEDIMENT OFF THE CONSTRUCTION SITE. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL GRAVEL AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED OFF THE CONSTRUCTION SITE MUST BE REMOVED IMMEDIATELY.

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Rev	Revision Description	Date
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02	ISSUED FOR CONSTRUCTION CERTIFICATE	11.07.22
01	ISSUED FOR 85% DETAILED DESIGN	21.06.22

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mail@scpconsult.com.au
www.scpconsult.com.au
ABN 80 003 076 024

Client
RICHARD CROOKES CONSTRUCTIONS
NSW GOVERNMENT Education School Infrastructure

Project
GLENWOOD HIGH SCHOOL
FORMAN AVENUE, GLENWOOD
NSW, 2768

Title
EROSION AND SEDIMENT CONTROL DETAILS

Scale:
AS SHOWN

Drawn	Designed	Checked	Approved
E.F.	J.E.	H.L.	L.S.

Project Number	Drawing Number	Revision
S220004	GHS-CV-SW-DRW-06-6001	05

File Path: \\SCP-FILE1\ENGINEERING\S220004 GLENWOOD HIGH SCHOOL\07. CIVIL\BIM\DRAWINGS\GHS-CV-SW-DRW-06-6001.DWG - EROSION AND SEDIMENT CONTROL DETAILS-04 - DATE PRINTED: 12/09/2022 10:52:42 AM

6.9 COMMUNITY CONSULTATION AND COMPLAINTS HANDLING

The community consultation strategy has been generated by SINSW as required by the relevant conditions.

Refer to the following page.

NSW GOVERNMENT Education

September 2022

School Infrastructure NSW

Community Communication Strategy

Glenwood High School Upgrade

SSD-23512960

Version	Date of Review
1.0	

Contents

Document purpose

School Infrastructure NSW (SINSW) engages with stakeholders throughout the development of a school project. This engagement helps inform the design of the school and provides an opportunity to address potential construction impacts.

The Glenwood High School Upgrade project is classified as a State Significant Development (SSD) and has been assessed by the Department of Planning and Environment (DPE). Consent was provided on 25 August 2022.

A Consultation Report outlining the engagement during the planning phase of the project was submitted as part of the State Significant Development (SSD) application. The Consultation Report is available on the planning portal https://pp.planningportal.nsw.gov.au/major-projects/projects/glenwood-high-school-upgrade

This Community Communications Strategy (CCS) provides an overview of how SINSW will continue to communicate and consult with the community during construction of the project.

It outlines SINSW's commitment to:

- Managing stakeholder and community expectations as integral to the successful delivery of the project.
- Informing affected stakeholders, such as the local community or road users about construction activities.
- Enabling the open and proactive management of issues and communications.

This CCS, developed to comply with SSD condition B10, will be implemented throughout the construction phase of the project and for 12 months following construction completion.

Plan review

The CCS will be revised as required to address any changes in stakeholders or the project management or complaints handling process. This will be done in close consultation with the SINSW Senior Project Director, appointed project management company (Jacobs) and/or contractor and SINSW Community Engagement Manager.

Approval

The CCS is reviewed and approved by the SINSW Senior Project Director, in close consultation with Schools Operations and Performance, with final endorsement from the SINSW Community Engagement Senior Manager.

Table 1: List of SSD requirements and where they are addressed in this CCS

State Significant Development: Condition B10	The Community Communications Strategy addresses this in section
No later than 48 hours before the commencement of construction, a Community Communication Strategy must be submitted to the Planning Secretary for information. The Community Communication Strategy must provide mechanisms to facilitate communication between the Applicant, the relevant Council and the community (including adjoining affected landowners and businesses, and others directly impacted by the development), during the design and construction of the development and for a minimum of 12 months following the completion of construction. *The Community Communication Strategy must:* *a) identify people to be consulted during the design and construction phases;*	▪ Section 3. Stakeholders
b) include a requirement to give notice to adjacent properties and Council at least 5 days prior to works commencing for approved works under this consent which are located within Council controlled lands;	▪ Section 4. Engagement Approach ▪ Section 5. Engagement Delivery Timeline
c) set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development;	▪ Section 4. Engagement Approach
d) provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development;	▪ Section 4: Engagement Approach
e) set out procedures and mechanisms: (i) through which the community can discuss or provide feedback to the Applicant; (ii) through which the Applicant will respond to enquiries or feedback from the community; and (iii) to resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation.	▪ Section 4: Engagement Approach ▪ Section 6: Protocols

1. Context

An upgrade is underway at Glenwood High School. Under the SSD pathway, the contractor will:

- Build a new 3-storey building with 47 learning spaces,
- Build a new single storey performing arts centre,
- Refurbish the ground floor of Block A, and
- Refurbish Blocks E and J

For more information on the project, visit the project web page on the School Infrastructure NSW website.

2. Community engagement objectives

SINSW's goal is that our school infrastructure meets the needs of a growing population and enables flexible learning and teaching. This CCS has been developed to achieve the following community engagement objectives:

a) Promote the benefits of the project

b) Build key school community stakeholder relationships and maintain goodwill with impacted communities

c) Manage community expectations and build trust by delivering on our commitments

d) Provide timely information to impacted stakeholders, schools and broader communities

e) Address and correct misinformation in the public domain

f) Reduce the risk of project delays caused by negative third party intervention

g) Leave a positive legacy in each community.

3. Stakeholders

The stakeholder list below summarises who will be informed and consulted during the construction phase via ongoing face to face meetings, communications collateral and digital engagement methods.

Table 2: Stakeholders

Stakeholders	Interest and involvement
School community • DEL – Tania Riley • Principal – Sonja Anderson • Teachers • Staff • Parents and carers • Students	a) Safe pedestrian and traffic access to the temporary school during construction b) Construction impacts and how these will be minimised c) Quality of infrastructure and resources upon project completion d) How to access the new school once completed
Local community • Forman Ave • Kidman Street • Chelsea Terrace • Wheedon Street • Glenwood Park Drive • Shaun Street	a) Noise and truck movements during construction b) Increased traffic and congestion on nearby streets c) Local traffic and pedestrian safety d) Changed traffic conditions during pick-up and drop-off e) Shared use of school facilities and amenities
Adjoining/affected landowners and businesses • Goodstart Early Learning	a) Noise and truck movements during construction b) Increased traffic and congestion on nearby streets

Stakeholders	Interest and involvement
• Mariam's Daycare • u-value Finance Services • Jo's Barking Bubbles • Computer Guy Support • Momolicious Australia • Frosted Treats	c) Local traffic and pedestrian safety d) Changed traffic conditions during pick-up and drop-off e) Shared use of school facilities and amenities f) Environmental impacts during construction
Local Members of Parliament • Federal Member for Greenway, Michelle Rowland (Labor) • State Member for Riverstone, Kevin Conolly (Liberal)	a) Meeting the economic, social and environmental objectives of state and federal governments b) Delivering increased public education capacity on time c) Delivering infrastructure which meets expectations d) Addressing local issues such as traffic, congestion and public transport solutions
Government agencies and peak bodies: • Transport for NSW • Roads and Maritime Services NSW • Fire and Rescue NSW • NSW Department of Education • NSW Department of Planning, Industry and Environment • NSW Environmental Protection Authority • NSW Rural Fire Service • Sydney Water • NSW Heritage Council • NSW Office of Environment and Heritage • NSW Department of Premier and Cabinet	a) Traffic and congestion on the local road system b) Adequate public transport options and access c) Ensuring new infrastructure meets standard requirements for safety and fire evacuation d) Ensuring the development is compliant e) Ensuring the development does not impact heritage items f) Easing overcrowding in local schools
Local Council – Blacktown City Council • Mayor, Tony Bleasdale • Deputy Mayor, Councillor Brad Bunting • Councillor Chris Quilkey • Councillor Jess Diaz • Councillor Moninder Singh • Councillor Julie Griffiths • Councillor Michael Stubley • Councillor Kushpinder Kaur • Councillor Allan Green • Councillor Kathie Collins	a) Schedule for construction and opening of school b) Plans for enrolled students during the operation of the temporary school c) Impacts to the local community including noise, congestion and traffic d) Shared use of community spaces e) Providing amenities to meet increase population density f) Copies of information distributed to local residents g) Processes and protocols in place to manage interactions with local residents

Stakeholders	Interest and involvement
• Councillor Susai Benjamin • Councillor Carol Israel • Councillor Bob Fitzgerald • Councillor Peter Camilleri • Councillor Livingston Chettipally	
Nearby public schools • Quakers Hill East Public School • Quakers Hill High School • Kings Langley Public School • Caddies Creek Public School • Parklea Public School • Bella Vista Public School • Kellyville Public School • Kellyville High School	a) Impact on school resources b) Impact on current students c) Implications for teaching staff d) Possible impacts on enrolments e) Opportunities to view the new facilities
Community groups • Glenwood Community Group (NSW), private Facebook group • Glenwood Community Group NSW, Facebook page • Glenwood Community Association, NSW	

4. Engagement approach

The key consideration in delivering successful outcomes for this project is to make it as easy as possible for anyone with an interest to find out what is going on. In practice, the communications approach across all levels of engagement will involve:

a) Using uncomplicated language

b) Taking an energetic approach to engagement

c) Encouraging and educating whenever necessary

d) Engaging broadly including with individuals and groups that fall into harder to reach categories

e) Providing a range of opportunities and methods for engagement

f) Being transparent

g) Explaining the objectives and outcomes of planning and engagement processes.

In addition to engagement with Government Departments and Agencies and Council, community engagement will continue for the project during construction in two streams:

a) School-centric involvement from school communities (including students, parents/caregivers, teachers, admin staff) unencumbered by broader community issues, and

b) Broad community involvement unencumbered by school community wants and needs. Broad community stakeholders include local residents, neighbours and local action groups.

4.1. General community input

Members of the general public impacted by the construction phase are able to enquire, provide feedback and complain about environmental impacts via the following channels:

a) 1300 482 651 number that is published on all communications material, including project site signage

b) School Infrastructure NSW email address (schoolinfrastructure@det.nsw.edu.au) that is published on all communications material, including project site signage

c) Project webpage 'contact us' form

d) During information booths and information sessions held at the school or local community meeting place, and advertised at before on our website and via letterbox drops.

Refer to Section 6.5 of this document for detail on our enquiries and complaints process.

A number of tools and techniques will be used to keep stakeholders and the local community involved as summarised in table 3 below.

For reference, project high level milestones during the delivery phase include:

a) Site establishment/early works (may be complete prior to this CCS being implemented as part of SSD conditions of approval)

b) Commencement of main works construction

c) Term prior to project completion

d) Project completion

e) First day of school following project completion / official opening

Table 3: School Infrastructure NSW Communications Tools

Communications Tool	Description of Activity	Frequency
1300 community information line	The free call 1300 482 651 number is published on all communication materials and is manned by SINSW.	Throughout the life of the project and accessible for 12 months post completion

Communications Tool	Description of Activity	Frequency
	All enquiries that are received are referred to the appointed Community Engagement Manager and/or Senior Project Director as required and logged in our CRM. Once resolved, a summary of the conversation is updated in the CRM.	
Advertising (print)	Advertising in local newspapers may be undertaken prior to significant construction activities, major disruptions and opportunities to meet the project team or find out more at a face to face event.	At project milestones
Call centre scripts	High level, project overview information may be provided to external organisations who may receive telephone calls enquiring about the project, most namely stakeholder councils.	Throughout the project when specific events occur or issues are raised by stakeholders
Community contact cards	These are business card size with all the SINSW contact information. The project team/ contractors are instructed to hand out contact cards to stakeholders and community members enquiring about the project. Cards are offered to school administration offices as appropriate. Directs all enquiries, comments and complaints through to our 1300 number and School Infrastruture NSW email address.	Throughout the life of the project and available 12 months post completion
CRM database	All projects are created in SINSW's Customer Relationship Management system at project inception. Interactions, decisions and feedback from stakeholders are captured, and monthly reports generated. Any enquiries and complaints are to be raised in the CRM and immediately notified to the Senior Project Director, Project Director and Community Engagement Manager.	Throughout the life of the project and updated for 12 months post completion
Display boards	A0/A1 size full colour information boards to use at info sessions or to be permanently displayed in appropriate places (school admin office for example).	As required
Door knocks	Provide timely notification to nearby residents of upcoming construction works, major impacts such as changes to pedestrian movements, temporary bus stops, expected impacts and proposed mitigation. Provide written information of construction activity and contact details.	As required prior to periods of significant construction impacts
FAQs	Set of internally approved answers provided in response to frequently asked questions. Used as part of relevant stakeholder and community communication tools. These are updated as required, and included on the website if appropriate.	Throughout the life of the project
Information booths	Information booths are held locally and staffed by a project team member to answer any questions, concerns or complaints on the project.	At project milestones and as required

Communications Tool	Description of Activity	Frequency
	Information booths may be held both at the school/ neighbouring school, as well for the broad community: a) School information booths are held at school locations at times that suit parents and caregivers, with frequency to be aligned with project milestones and as required. b) Community information booths are usually held at local shopping centres, community centres and places that are easily accessed by the community. They are held at convenient times, such as out of work hours on weekdays and Saturday's. Collateral to be provided include community contact cards, latest project notification or update, with internal FAQs prepared. All liaison to be summarised and loaded in the CRM.	
Community information sessions	Information sessions are a bigger event than an info booth, held at a key milestone or contentious period. We have more information on the project available on display boards/ screens and an information pack handout – including project scope, planning approvals, any impacts on the school community or residents, project timeline, FAQs. Members from the project and communications team will be available to answer questions about the project. These events occur after school hours on a week day. All liaison summarised and loaded on the CRM.	As required
Information pack	A 4 page A4 colour, fold out flyer that can include information about the project scope, progress, FAQs, timeline and next steps. To be distributed at info sessions or at other bigger events/ milestones in hard copy and also made available electronically.	As required
Media releases/events	Media releases are distributed upon media milestones. They promote major project milestones and activities and generate broader community awareness.	Media milestones during construction period may include: a) Planning approval granted b) Construction contract tendered c) Construction contract awarded d) Sod turning opportunity e) Handover / Official opening
Notifications and updates	A4 printed in colour that can include FAQs if required Notifications are distributed under varying templates with different headings to suit different purposes: a) **Works notification** are used to communicate specific	As required according to the construction program. Distributed (refer construction works

Communications Tool	Description of Activity	Frequency
	information/ impacts about works, impacts and mitigations. b) **Project update** is used when communicating milestones and higher level information to the wider community i.e. project announcement, concept design/DA lodgement, construction award, completion. Includes the project summary, information booths/ sessions if scheduled, progress summary and contact info.	notification distribution methodology in Section 4.2) via letterbox drop to local residents and via the school community prior to construction activities or other milestones throughout the life of the project. Specific timings indicated in table 5 – Section 8.
Photography and videography	Images may be used in notifications, on the website, at information sessions and in presentations. Once the project is complete, SINSW will organise photography of external and internal spaces to be used for a range of communications purposes.	Project completion (actual photography and video of completed project) Prior to project completion - artist impressions, flythrough, site plans and contruction progress images may be used.
Presentations	Details project information for presentations to stakeholder and community groups.	As required
Priority correspondence	Ministerial (and other) correspondence that is subject to strict response timeframes. Includes correspondence to the Premier, Minister, SINSW and other key stakeholders. SINSW is responsible for drafting responses as requested within the required timeframes.	As required
Project Reference Group	SINSW facilitated Project Reference Group sessions providing information on the design solution, construction activities, project timeframes, key issues and communication and engagement strategies.	Meets every month or as required. PRG during the delivery phase is generally reduced or retired.
Project signage	A0 sized, durable aluminium signage will be installed at Glenwood High School. Provides high level information including project scope, project image and SINSW contact information. Fixed to external fencing/ entrances etc. that are visible and is updated if any damage occurs.	Throughout the life of the project and installed for 12 months post completion
Site visits	Demonstrate project works and progress and facilitate a maintained level of interest in the project. Includes media visits to promote the reporting of construction progress.	As required
School Infrastructure NSW email address	Provide stakeholders and the community an email address linking direct to the Community Engagement team. Email address	Throughout the life of the project

Communications Tool	Description of Activity	Frequency
	(schoolinfrastructure@det.nsw.edu.au) is published on all communications materials.	
School Infrastructure NSW website	A dedicated project page for Glenwood High School is located on the SINSW website https://www.schoolinfrastructure.nsw.gov.au/projects/g/glenwood-high-school-upgrade.html	Updated at least monthly and is live for at least 12 months post completion of the project
Welcome pack/ thank you pack	At project completion the following flyers are utilised: ▪ **Welcome pack** – project completion for school community provided on the first day/week they are returning to school when new facilities are opening, or attending a new school. Includes project overview, map outlining access to the school and key locations, FAQs, contact information. ▪ **Thank you pack** – tailored to the local residents to thank them for their patience and support of the project.	Project completion only

4.2. Construction works notification distribution methodology

Construction works notifications will be distributed to targeted properties in the vicinity of the project. These properties have been identified as part of the technical studies and plans submitted as part of the planning and assessment approval pathway and post approval requirements. Specifically, the map of community notification areas at **Figure 1** below has been prepared through an analysis of the potential project impacts and requirements identified in:

- the acoustic assessment supporting the SSD application
- the transport assessment supporting the SSD application
- the Construction Worker Transportation Strategy
- the Construction Environmental Management Plan, including the:
    - Construction Noise and Vibration Management Sub Plan
    - Construction Traffic and Pedestrian Management Sub Plan.

This methodology has been used to identify the anticipated construction impacts identified for this project. It does not include an arbitrary distribution area due to the robust impact analysis that has been carried out during planning and assessment phase of the project.

The distribution area may be altered:

- to address specific construction activities where the impact/s affect fewer or greater properties, depending on the nature of the work
- where ongoing monitoring shows more widespread impacts to that predicted in the environmental impact assessment
- if complaints are received outside of the distribution area
- if there is an approved project modification in the future that results in more widespread impacts
- at the discretion of School Infrastructure NSW.

Additional project updates and notifications will also be distributed when communicating milestones and higher-level information to the wider community such as construction contract award and project completion. Such updates and notifications may not detail construction impacts and may be distributed to a greater number of addresses to widely publicise the project's achievements.

Figure 1: Map of community notification areas

The below details the nearest sensitive receivers that may be impacted by construction including noise. These stakeholders will receive notifications for unplanned out of hours works before undertaking the activities or as soon as is practical afterwards. This will also consider residents that may be impacted by heavy vehicle movements and other non site specific impacts (e.g. truck movements).

Receiver 1: Residences to the north of the site at 278-270 Glenwood Park Drive and 17-11 Wheedon Street.

Receiver 2: Residences to the north east of the site at 1-7 Shaun Street.

Receiver 3: Residences to the east of the site located at 9-15 Kidman Street.

Receiver 4: Residences to the east of the site located at 17-27 Kidman Street.

Receiver 5: Residences to the south of the site located at 66-100 Forman Avenue.

Figure 2: Map of sensitive receivers

5. Engagement Delivery Timeline

The following engagement delivery timeline maps tailored communications tools and activities by key milestone.

Table 4: Engagement timeline

Project Phase / milestone	Target Audiences	Proposed communication tools / activities / purpose as per Table 3	Timing / implementation
Prior to SSD approval – consultation during planning and design development	Department of Planning & Environment	Consultation Report submitted as part of SSD	November 2021
Main construction works, including but not limited to: a) Remediation b) Works commenced c) Key impact periods – noise, dust, traffic, vibration	School community Local community Adjoining/affected landowners and businesses State MP	Sod turn Webpage update Media release (if required) Project updates Works notifications Doorknock/s, if required	Mid-2022 (at key construction events as required, as per our notification process in Table 5)
Term prior to project completion	School community Local community Adjoining/affected landowners and businesses State MP	Webpage update Project update/information pack Information booth	Late 2022
Handover and welcome to new school	School community Local community State MP	D1T1 welcome pack for school community D1T1 welcome team Completion pack for school community once works are completely finalised Thank you pack for the local community Webpage update Media release (if required)	Early 2023
Opening	School community Local community State MP	Official opening ceremony	Early 2023
Post-opening, for 12 months following operation	All	Website remains live Project signage remains installed 1300 phone and email still active, and CRM still	Early 2024 (at least 12 months post construction completion)

Project Phase / milestone	Target Audiences	Proposed communication tools / activities / purpose as per Table 3	Timing / implementation
		maintained for complaints and enquiries.	

6. Protocols

6.1. Media engagement

SINSW manages all media relations activities, and is responsible for:

a) Responding to all media enquiries and instigating all proactive media contact.

b) Media interviews and delegation to SINSW media spokespeople who are authorised to speak to the media on behalf of the project

c) Informing the Minister's Office and SINSW project team members and communications representatives of all media relations activities in advance and providing the opportunity to participate in events where possible.

6.2. Site visits

SINSW, in partnership with the Department of Education Schools Operations and Performance, organises and hosts guided project site tours and media briefings as required by the Minister's Office. The Project Team will ensure the required visitor site inductions are undertaken and that all required Personal Protective Equipment (PPE) is worn.

For media site visits and events, SINSW creates, or contributes to, the production of an event pack. This will include an event brief, media release, speaking notes and Q&As.

6.3. Social, online and digital media

SINSW initiates and maintains all social and online media channels. These channels may include the Department's Facebook and Twitter, and SINSW's LinkedIn and website.

6.4. Stakeholder and community notification process

Notification letters or project updates will be distributed to the community and stakeholders in advance of any activity with the potential to cause impacts.

Depending on the work activity and stakeholder, notifications are primarily distributed via letterbox drop, via the school, electronically via email, as well as uploaded to the SINSW project webpage. If appropriate, notification may also be delivered in person via door knocks, or via phone call or text message, or one-on-one briefings.

Notifications will be written in plain English and will:

- outline the reason that the work is required
- outline the location, nature, and duration of the proposed works
- outline date/s of work, where practicable
- outline work hours
- include a diagram that clearly indicates the location of the works, where required
- include a 1300 community contact number, project email address and website details
- Provide details for a translation service, where required.

Table 5 below outlines minimum notification periods that will be targeted for work activities with the potential to impact sensitive receivers. All notification periods prescribed within development approvals or by approving bodies will be adhered to.

Regular construction updates regarding the general work program and significant milestones will also be provided to the school community and neighbouring properties throughout construction.

The contractor will provide SINSW with the information necessary to meet the notification requirements and target timeframes contained, where practicable.

Table 5: Target community notification periods

Notification period	Work activity
Same day (or as soon as practical)	Major incident, emergency works/unforeseen events
	Unplanned out of hours work (notification provided to affected residents by the contractor before undertaking the works or as soon as practical)
	Unexpected hazardous material find or incident (e.g. asbestos, lead, chemical spill or other harmful material)
7 days	Start of works or site establishment
	Works outside of the site boundary
	Planned out of hours work or change to approved work hours
	Planned investigation and remediation of hazardous materials including asbestos
	Phase of high noise generating works including demolition, tree removal, rock breaking, rock hammering, piling or similar
	Major traffic or pedestrian access changes including parking impacts, detours, and road diversions/closures
	Operational changes for the school community including to school drop-off points, entry and exit points, bus stops, and play space
3 months	Major impacts to school community, including relocation to temporary school, changes to student intake area or similar

6.5. Enquiries and complaints management

SINSW manages enquiries (*called interactions in our Customer Relationship Management (CRM) software, Darzin*), and complaints in a timely and responsive manner.

Prior to project delivery, a complaint could be related to lack of community consultation, design of the project, lack of project progress, etc.

During project delivery, a complaint is defined as in regards to construction impacts – *such as* – safety, dust, noise, traffic, congestion, loss of parking, contamination, loss of amenity, hours of work, property damage, property access, service disruption, conduct or behaviour of construction workers, other environmental impacts, unplanned or uncommunicated disruption to the school.

If a phone call, email or face-to-face complaint is received during construction, it will be acknowledged within 2 working days and logged in our CRM, actively managed, closed out and resolved by SINSW within 2 to 5 business days, where practicable. Where complaints are unable to be resolved within this timeframe the complainant will be provided with regular updates regarding the complaint resolution process.

A 24-hour contact number for the project site manager will be displayed at the site and can be shared with the community as necessary for any urgent issues that need to be addressed on site, outside of business hours.

As per our planning approval conditions, a complaints register is updated monthly, or as required by the planning authority, and is publicly available on the project's website page on the SINSW website.

If the complainant is not satisfied with SINSW response, and they approach SINSW for rectification, the process will involve a secondary review of their complaint as per the outlined process.

Complaints will be escalated when:

- An activity generates three complaints within a 24-hour period (separate complainants).
- Any construction site receives three different complaints within a 24-hour period.
- A single complainant reports three or more complaints within a three-day period.
- A complainant threatens to escalate their issue to the media or government representative.
- The complaint was avoidable.
- The complaint relates to a compliance matter.
- The complaint relates to a community safety matter.
- The complaint relates to a property damage claim.

Complaints will be first escalated to the Senior Manager, Community and Engagement or Director of Communications for SINSW as the designated complaints handling management representatives for our projects. Further escalation will be made to the Executive Director, Office of the Chief Executive to mediate if required.

If a complaint still cannot be resolved by SINSW to the satisfaction of the complainant, we will advise them to contact the NSW Ombudsman - https://www.ombo.nsw.gov.au/complaints.

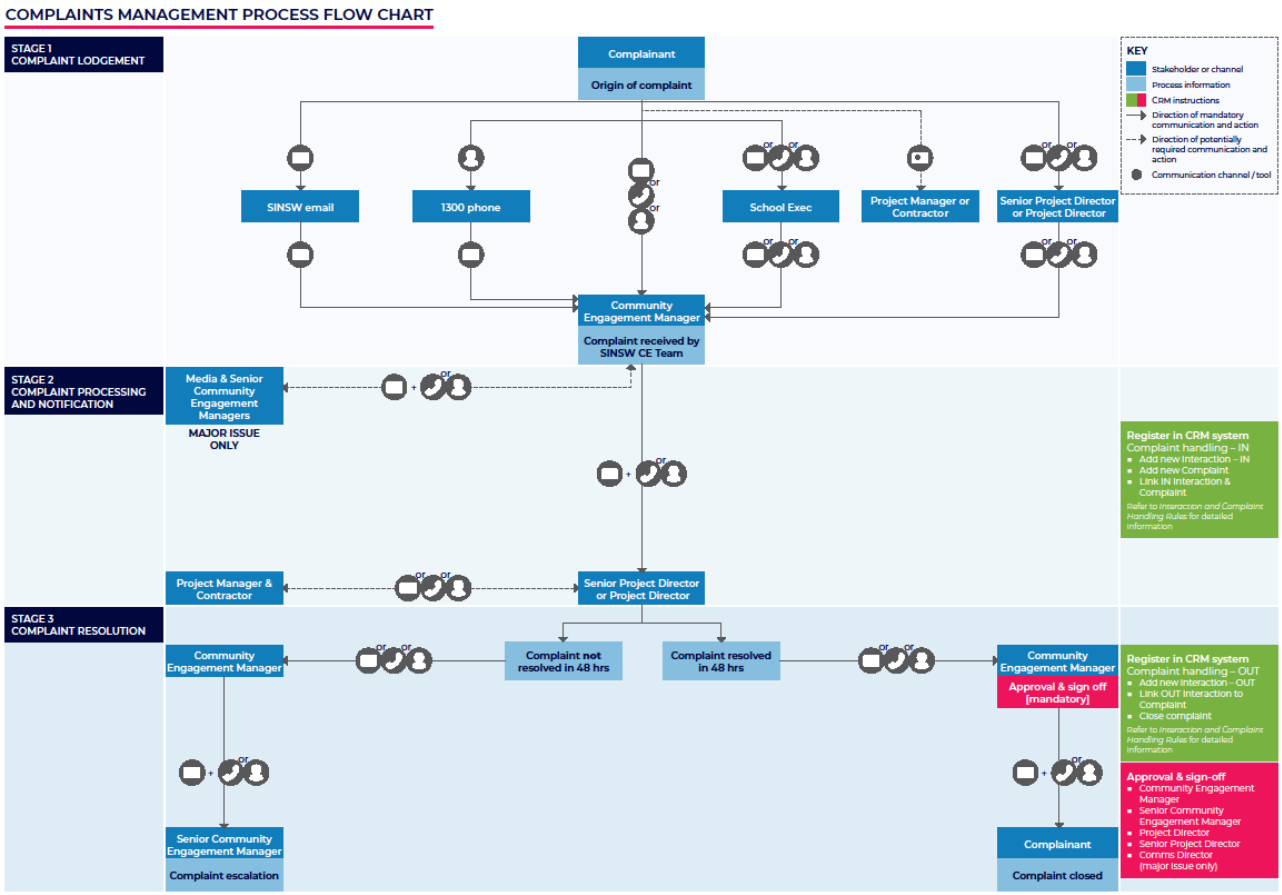
Table 6 below outlines target timeframes for responding to enquiries and complaints, through each correspondence method:

Table 6: Complaint and enquiry response time

Complaint	Acknowledgement times	Response times
Phone call during business hours	At time of call – and agree with caller estimated timeframe for resolution.	Complaint to be closed out within 2 business days. If not possible, continue contact, escalate as required and resolve within 7 business days.
Phone call after hours*	Within two (2) hours of receiving message upon returning to office.	Following acknowledgement, complaint to be closed out within 2 business days. If not possible, continue contact, escalate as required and resolve within 7 business days.
Email during business hours	At time of email (automatic response)	Complaint to be closed out within 2 business days. If not possible, continue contact, escalate internally as required and resolve within 7 business days.
Email outside of business hours	At time of email (automatic response)	Complaint to be closed out within 2 business days. If not possible, continue contact, escalate internally as required and resolve within 7 business days.
Interaction/ Enquiry		
Phone call during business hours	At time of call – and agree with caller estimated timeframe for response.	Interaction to be logged and closed out within 7 business days.
Phone call after hours	Within two (2) hours of receiving message upon returning to office.	Interaction to be logged and closed out within 7 business days.
Email during business hours	At time of email (automatic response)	Interaction to be logged and closed out within 7 business days.
Email outside of business hours	At time of email (automatic response)	Interaction to be logged and closed out within 7 business days.
Letter	N/A	Interaction to be logged and closed out within 10 business days following receipt.

The below diagram outlines our internal process for managing complaints.

Figure 3 - Internal Complaints Process



6.5.1. Disputes involving compensation and rectification

School Infrastructure NSW is committed to working with the school and broader community to address concerns as they arise. Where disputes arise that involve compensation or rectification, the process for resolving community enquiries and complaints will be followed to investigate the dispute. Depending upon the results of the investigation, School Infrastructure NSW may seek legal advice before proceeding.

6.6. Incident management

An incident is an occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance. Material harm is harm that:

(a) involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial; *or*

(b) results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000, (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment).

6.6.1. Roles and responsibilities following an incident

In the event of an incident, once emergency services are contacted, the incident must be immediately reported to the SINSW Senior Project Director who will inform:

a) SINSW Executive Director

b) SINSW Community Engagement Manager

c) SINSW Senior Manager, Community Engagement

d) SINSW Communications Director

SINSW Communications Director will:

a) Lead and manage all communications with the Minister's office in the event of an incident, with assistance as required

b) Direct all communications with media to the SINSW Media Manager in the first instance for management

c) Notify all other key project stakeholders of an incident.

The school and local community will be notified within 24 hours in the event of an incident, as per our notification timelines in Table 5.

The SINSW Senior Project Director will issue a written incident notification to Department of Planning & Environment (DPE) and Local Council (if required) immediately following the incident to set out the location and nature of the incident.

This must be followed within seven days following the incident of a written notification to the Department of Planning and Environment that:

(a) identifies the development and application number;

(b) provides details of the incident (date, time, location, a brief description of what occurred and why it is classified as an incident);

(c) identifies how the incident was detected;

(d) identifies when SINSW became aware of the incident;

(e) identify any actual or potential non-compliance with conditions of consent;

(f) describes what immediate steps were taken in relation to the incident;

(g) identifies further action(s) that will be taken in relation to the incident; and

(h) provides the contact information for further communication regarding the incident (the Senior Project Director).

Within 30 days of the date on which the incident occurred or as otherwise agreed to by the Planning Secretary, SINSW will provide the Planning Secretary and any relevant public authorities (as determined by the Planning Secretary) with a detailed report on the incident addressing all requirements below:

(a) a summary of the incident;

(b) outcomes of an incident investigation, including identification of the cause of the incident;

(c) details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence; and

(d) details of any communication with other stakeholders regarding the incident.

6.7. Reporting process

Throughout the project, data will be recorded on participation levels both face to face and online, a record of engagement tools and activities carried out in addition to queries received and feedback against emerging themes.

Stakeholder and community sentiment will be evaluated throughout to ensure effectiveness of the engagement strategy and to inform future activities.

Reporting will include but not be limited to:

a) Stakeholder engagement reporting – numbers of forums, participation levels and a summary of the outcomes Community sentiment reporting – outputs of all community engagement activities, including numbers in attendance at events, participation levels and feedback received against broad themes

b) Online activity – through the project website.

6.10 BIODIVERSITY MANAGEMENT

The biodiversity management measures have been developed by Kleinfelder

Refer to the following page.

Biodiversity Management Sub-plan Update
Glenwood High School

Forman Avenue (Lot 5227 DP868693), Glenwood NSW 2768

NCA22R143542

21 September 2022

KLEINFELDER
Bright People. Right Solutions.

Suite 3, 240-244 Pacific Highway,
Charlestown, NSW 2290

Phone: +61 2 4949 5200

Biodiversity Management Sub-plan Update
Glenwood High School

Forman Avenue (Lot 5227 DP868693), Glenwood NSW 2768

Kleinfelder Document: NCA22R143542

Kleinfelder Project: 20231836

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Kevin Wormington David Martin James Baldry	Dallas Milburn David Martin	Dallas Milburn David Martin

Only School Infrastructure New South Wales (SINSW), its designated representatives or relevant statutory authorities may use this document and only for the specific purpose for which this submission was prepared. It should not be otherwise referenced without permission.

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1 INTRODUCTION

1.1 BACKGROUND

Kleinfelder Australia Pty Ltd (Kleinfelder) was engaged by Jacobs Group Australia Pty Ltd (Jacobs) to prepare a Biodiversity Management Plan (BMP) to manage and regenerate an area of *Cumberland Plain Woodland in the Sydney Bioregion* (Cumberland Plain Woodland) (Critically Endangered Ecological Community [CEEC]) located within the grounds of Glenwood High School, Forman Avenue (Lot 5227 DP868693), Glenwood NSW 2768 (The 'Subject Site') (see

Figure 1). The completion of a BMP for the Subject Site is a requirement of the Request for Additional Information from the Department of Planning and Environment (DPE) (dated 23/03/2022):

> *"The revised Glenwood High School Biodiversity Development Assessment Report (BDAR) submitted as part of the Response to Submissions (RtS) recommends measures be imposed to manage and regenerate the Cumberland Plain Woodland area, as part of a Biodiversity Management Plan (BMP). The EIS states that the BMP would be developed outside of the SSD application and by the school operator. The Department considers the regeneration of the Cumberland Plain Woodland a vital component of the site and SDD application, accordingly appropriate management of the regeneration area is required. You are requested to submit a preliminary strategy for the management and regeneration of the Cumberland Plain Woodland undertaken by a qualified ecologist or bush regeneration specialist" (NSW Department of Planning and Environment 2022).*

The following terms are used throughout this report to describe geographical areas (

Figure 1).

- **Subject Site –** Forman Avenue (Lot 5227 DP868693), Glenwood NSW 2768.
- **Development Site -** The area within the Subject Site to be directly impacted by the proposed development, i.e. the footprint of the school building.
- **Reserve** - areas of Cumberland Plain Woodland within the Subject Site proposed for management.
- **Locality** – land within a 5 km radius of the Subject Site.

This BMP provides a summary of biodiversity values within the Subject Site, key threats associated with construction and operational phases of the proposed development, and key strategies for the management of biodiversity values, with an implementation period for the operational life of the school. The above implementation period is required to account for indirect impacts, that have not been considered and appropriately offset in the BDAR, which may occur on threatened species, ecological communities and their habitats.

1.2 SITE DESCRIPTION

The Subject Site is located within the suburb of Glenwood, approximately 5 km northeast of Blacktown CBD (

Figure 1). The Subject Site is within the Blacktown City Council Local Government Area (LGA) and is zoned as SP2 – Infrastructure under the *Blacktown Local Environmental Plan 2015* (LEP).

The Subject Site is bound by residential developments to the east via Glenwood Park drive and to the south via Forman Avenue. The northern and eastern boundaries of the school are bound by Glenwood reserve, which is zoned RE1 – Public Recreation. The majority of Subject Site is either mixed native/exotic gardens or managed exotic grassland and existing infrastructure. There is a small patch of intact native grassy woodland located in the north-eastern portion of the Subject Site (

Figure 2). The vegetation within this patch is commensurate with *Cumberland Plain Woodland in the Sydney Bioregion* CEEC under the New South Wales Biodiversity Conservation Act 2016 (BC Act).

1.3 PROPOSED DEVELOPMENT

The proposal involves major alterations and additions to the existing high school, comprising the construction of a new 3 storey building that will provide contemporary learning spaces, replacing 18 existing demountable classrooms on site. The proposed development will provide 47 additional learning spaces, including refurbished wood/metal and food tech units, provision of an additional support learning unit plus new administration and staff facilities, upgrades to the existing library, construction of new covered walkways and ancillary utility infrastructure and landscaping works.

1.4 MANAGEMENT PLAN OBJECTIVES

1.4.1 Objectives

This BMP is a requirement of the Request for Additional Information from the Department of Planning and Environment (DPE). The BMP is required to be prepared by a suitably qualified person (i.e. qualified ecologist or bush regeneration specialist) and provide a preliminary strategy for the management and regeneration of the Cumberland Plain Woodland. The key objectives of the BMP include:

1. To minimise impacts to flora and fauna, and their habitats, during the construction phase of the Glenwood High School development.
2. To improve the condition of the Cumberland Woodland within the Reserve and to ensure that it is maintained in a healthy condition.
3. To restore the existing derived grassland areas within the Reserve with species commensurate with that of Cumberland Plain Woodland and to ensure that it is maintained in a healthy condition.
4. To outline a strategy for the management of key weed species identified within the BDAR (Kleinfelder 2021) as key threats to the vegetation within the Reserve.
5. To augment ground habitat (e.g. ground timber and hollow logs) in the existing derived grassland areas and to maintain such habitat features throughout the Reserve.
6. The condition of the Cumberland Woodland within the reserve should be measured using the Vegetation Integrity Assessment in the Biodiversity Assessment Operational Manual – Stage 1 (DPE 2020). The proportion of each growth form, that has unhealthy foliage from disease or pest attack, should be estimated; with healthy vegetation containing low proportions of these attributes.
7. The data from the BDAR assessment would be used as the base line condition, with condition scores improving in future assessments.

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DRAWN BY: GJoyce

DATA SOURCE:
NSW DFSI - 2021
Nearmap - 2022

Locality

Jacobs Group (Australia) Pty Ltd
Biodiversity Management Plan
Glenwood High (Lot 5227 DP868693)
Forman Avenue, Glenwood NSW

FIGURE:

1

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2 BIODIVERSITY VALUES

2.1 KEY BIODIVERSITY VALUES

A Biodiversity Development Assessment Report (BDAR) was completed for the Glenwood High School development by Kleinfelder following the completion of a site-based assessment (01 June 2021). The key results of the BDAR are detailed below.

2.1.1 Flora Species

A total of 64 flora species were identified during field surveys, 36 of these were exotic species. No threatened species were identified within the Subject Site. A list of the flora species identified within the Subject Site is provided in **Appendix B**.

A total of seven (7) 'High Threat Exotics" and three (3) Priority Weeds for the Greater Sydney Local Land Services Region under the *Biosecurity Act 2015* (NSW) were identified within the site, all of which are also listed as Weeds of National Significance (WoNS) (DAWE 2022). An additional species is listed as a WoNS but not as a Priority Weed is included in the list of species below:

- *Asparagus asparagoides* (Bridal Creeper) [WoNS and Priority Weed]
- *Senecio madagascariensis* (Fireweed) [WoNS and Priority Weed]
- *Olea europaea* subsp. *cuspidata* (Common Olive) [WoNS]
- *Rubus fruticosus sp. agg.* (Blackberry complex) [WoNS and Priority Weed]

Notable infestations of other exotic species were also identified within the site, including the following species:

- *Cenchrus clandestinus* (Kikuyu)
- *Setaria parviflora*
- *Sporobolus africanus* (Parramatta Grass)

A comprehensive list of exotic species is presented in **Appendix A**. Discussion of the threat of weed infestations on the area of Cumberland Plain Woodland is provided in **Section 2.2.1**. Level of weed infestation within each Management Zone is discussed in **Section 3.1.** Mitigation measures to prevent the spread of weeds are presented in **Section 3**.

2.1.2 Vegetation Communities

One (1) native vegetation community exists within the Reserve. This community is represented by three condition classes within the Subject Site, two (2) of which exist within the Reserve (**Figure 3**), including:

- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion (CEEC - Moderate Condition) - Area within Reserve: 0.33 ha.
- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion (Low Condition) - Area within Reserve: 0.08 ha.

The vegetation within the Reserve represents one Critically Endangered Ecological Community (CEEC); *Cumberland Plain Woodland in the Sydney Bioregion* CEEC as listed under the BC Act (see **Figure 3**).

2.1.3 Fauna and Habitat Values

Fauna habitat within the Subject Site is characterised by open managed (mown) grassland areas, gardens of dense shrubs (i.e. *Callistemon spp.*, *Acacia spp.* and exotics), mature eucalypts, and a fenced off patch of intact native woodland. Much of the vegetation within the Subject Site is highly managed, as such there is a low abundance of wooden debris, leaf litter and dense shrub cover which would otherwise provide important habitat for ground dwelling native fauna. As such, most of the vegetation within the Subject Site is likely to only constitute habitat for highly mobile threatened species (i.e. birds and bats), and locally occurring species associated with urban/suburban environments.

The exception is the patch of native woodland (The Reserve), which is characterised by a mature canopy of eucalypts, a scattered midstorey of *Melaleuca spp. Acacia spp.* and *Bursaria spinosa*, hollow-bearing trees, abundant fallen timber, and a drainage depression capable of retaining water (considered likely frog habitat). Conversely, the Reserve is dominated by exotic groundcover species and is only partially connected to scattered patches of vegetation along a watercourse to the north, and streetside vegetation throughout the locality. As such, the Reserve represents habitat for locally occurring woodland birds, common arboreal marsupials, and only highly mobile threatened species (i.e. birds and bats).

Key fauna habitat features identified during the site assessment includes the following:

- Four (4) Hollow-bearing Trees (HBT) either *Eucalyptus tereticornis* (Forest Red Gum) or *Eucalyptus moluccana* (Grey Box) with and additional two (2) dead stags (**Figure** 2).
- Two (2) hollow fallen logs within the Reserve creating habitat for reptiles and mammals (**Figure** 2).
- Mature trees within the Subject Site provide foraging and nesting habitat for several common native bird species. Other species include several microbats and other arboreal mammals may occupy these large mature trees.
- A Drainage Swale occurs within the Reserve, providing habitat suitable for a variety of native fauna species.

No threatened fauna species were identified within the Subject Site during the site assessment. A total of eleven (11) species of fauna were detected within the Subject Site during field surveys. These included eleven (11) bird species, which are common to urban/suburban environments. More commonly encountered species included the Red-rumped Parrot (*Psephotus haematonotus*), Rainbow Lorikeet (*Trichoglossus haematodus*), Eastern Rosella (*Platycercus eximius*), and Noisy Miner (*Manorina melanocephala*).

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Legend

- Subject Site
- Development Site
- Reserve
- Unnamed Watercourse
- Sub-arterial Road
- Local Road

Habitat Features

- Dead Stag
- Hollow Log (on ground)
- Hollow bearing Tree

Plant Community Types

- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion (Moderate Condition)
- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion (Low Condition)
- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion (Planted)
- Planted Native/Exotic Vegetation
- Exotic Grassland (Managed)
- Existing Infrastruture

Metres
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NSW DFSI - 2021
Nearmap - 2022

Vegetation and Biodiversity Values

Jacobs Group (Australia) Pty Ltd
Biodiversity Management Plan
Glenwood High (Lot 5227 DP868693)
Forman Avenue, Glenwood NSW

FIGURE:
2

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2.2 KEY THREATS

2.2.1 Weed Incursions

Weeds are known to compete with native flora species, leading to declines in species diversity and regeneration, and changes to fauna habitat values (DECCW 2010). Cumberland Plain Woodland is considered 'highly vulnerable' to weed invasion due to its position on relatively fertile soils, past land-use practices, and its naturally grassy understory (DEC 2005). A total of three (3) Priority Weed species for the Greater Sydney Local Land Services Region (DPI 2022) were identified within the Subject Site. All three species are also listed as Weeds of National Significance (WoNS) (DAWE 2023). These species included: *Asparagus asparagoides* (Bridal Creeper), *Senecio madagascariensis* (Fireweed) and *Rubus fruticosus sp. agg.* (Blackberry). An additional species *Olea europaea subsp. cuspidata* (Common Olive) is listed exclusively as a WoNS, Of the abovementioned weeds, Bridal Creeper was identified as having the highest cover within the Reserve, however all four occur at a relatively low abundance. Dominant weed species occur in the understorey of the Reserve and include *Cenchrus clandestinus* (Kikuyu), *Ehrharta erecta* (Panic Veldtgrass), *Setaria parviflora* and *Sporobolus africanus* (Parramatta Grass)

African Olive and Bridal Creeper, and Moth Vine (*Araujia sericifera*), all recorded on site, have been identified as particularly significant weeds or the Cumberland Plain Woodland, owing to their highly competitive nature and ability to suppress understorey species. Bridal Creeper and Moth Vine are among a suite of exotic vines and scramblers that are listed as a threatening process in NSW which are also considered a specific threat to the ecological community (NSW Scientific Committee, 2006). African Olive is a particularly significant threat to the ecological community. It has an ability to permanently change the structure of the ecological community through dense mid-canopy formation and, like other weeds such as Bridal Creeper, can suppress native plant species in the understorey

Weed incursions will continue to be a threat to biodiversity values during:

- ***Construction Phase:*** Construction activities occurring on site as part of the proposed development, namely vehicle movements and transport of materials (i.e. soil and mulch) have the potential to facilitate the spread of exotic flora species within the Subject Site.
- ***Operational Phase:*** The proposed educational facility, if unmanaged, may further exacerbate local weed incursions or facilitate the introduction of novel weed species through the dumping of garden waste and changes to nutrient inputs from increase runoff (i.e. due to potential changes to surface hydrology).

2.2.2 Vegetation Clearing and Habitat Loss

Vegetation Clearing of is considered a primary threat to the conservation of Cumberland Plain Woodland CEEC (BC Act) (DEC 2005). This clearing has occurred gradually over time resulting in increasingly isolated, small patches of woodland that are more vulnerable to potential impacts and support fewer species. The proposed development will require the clearing of native vegetation to a minor extent, including 0.01 ha of woodland (PCT 849 – *Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion*). Vegetation clearing will not impact any hollow bearing trees identified within the Subject Site that may represent nesting habitat for a variety of native bird and arboreal mammal species. Incursions into areas of native woodland

and grassland may exacerbate existing weed management threats and adversely impact threatened species and ecological communities occurring within the Subject Area.

Vegetation clearing and habitat loss represents a threat to biodiversity values during:

- ***Construction Phase:*** Other than the direct impacts to native vegetation and fauna habitat detailed above, construction activities within the Subject Site have the potential to impact retained vegetation through accidental incursions, and the introduction and facilitation of weed incursions.
- ***Operational Phase:*** The proposed development may further exacerbate habitat loss and degradation of vegetation through inappropriate management of retained vegetation.

2.2.3 Erosion and Sedimentation

Mature vegetation is considered integral in preventing erosion through bank stabilisation and sediment control (DEC 2005). Erosion resulting from earthworks such as the operation of machinery during the construction phase may facilitate the movement of water-borne sediments that have the potential to adversely impact important biodiversity values on site. This may include impacts on the condition of native vegetation, threatened ecological communities (Cumberland Plain Woodland) and threatened species habitat.

2.2.4 Urbanisation and Increased Nutrient Loading

Much of the Cumberland Plain was cleared historically to make way for agricultural practices. Whilst still common, the landscape, particularly within the Blacktown LGA has become increasingly urban in nature, with agricultural sites being subdivided to make way for high density urban developments. Urbanisation results in 'site hardening' or the covering of ground surfaces with impervious infrastructure that prevents rainwater from entering the water table (DEC 2005). This results in increased runoff, most of which ends up flowing overland or via creeks through bushland. Runoff often collects and carries excess sediment and nutrients produced in the urbanised landscape and transports it to native bushland.

The excess nutrient load can negatively impact bushland by encouraging the growth of exotic plant species, some of which may have been introduced via the runoff.

Urbanisation and increased nutrient loading represent a threat to biodiversity values during:

- ***Construction Phase:*** Construction activities within the Subject Site have the potential to reduce soil stability and cause erosion. Suitable conditions could result in potential impacts to retained vegetation via runoff, and the introduction/facilitation of weed incursions.
- ***Operational Phase:*** The proposed education facility may further exacerbate nutrient loading within native vegetation, in turn facilitating habitat degradation through the introduction/facilitation of weed incursions.

2.2.5 Lighting, Noise and Water Pollution

Urban developments can result in a number of indirect impacts pertaining to Cumberland Plain Woodlands and the habitat they provide, including increased lighting (light pollution) and noise (noise pollution), and changes to surface water runoff and quality. Threats to local biodiversity values pertaining to the proposed development include the following:

- ***Construction Phase:*** Increased noise from construction activities and changes to surface water runoff patterns and quality.
- ***Operational Phase:*** The proposed development action may result in changes to soil nutrient status from fertilisers and wastewater disposal; increased/inappropriate lighting within the woodland area; and increased noise from traffic.

3 MANAGEMENT PLAN

3.1 MANAGEMENT ZONES

Four (4) Management Zones pertain to the Subject Site based on current condition/status, management requirements, and proposed future land use. The management zones are shown in **Figure 3**, and detailed in **Table 1**.

- **Management Zone 1:** Reserve (woodland rehabilitation)
- **Management Zone 2:** Reserve (woodland restoration)
- **Management Zone 3:** Development Site
- **Excluded:** Existing School Grounds (not impacted)

Table 1: Management Zones within the Subject Site

Management Zone	Description
Management Zone 1: Reserve (woodland rehabilitation)	**Total area within Subject Site:** 0.33 ha **Community:** PCT 849 – *Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion*, Critically Endangered Ecological Community (BC Act) - Moderate Condition **Form:** Grassy Woodland **Description:** The vegetation within this zone was characterised by a canopy dominated by *Eucalyptus tereticornis* (Forest Red Gum), with the occasional *Eucalyptus crebra* (Narrow-leaved Ironbark). The midstorey is comprised of *Melaleuca decora*, *Acacia parramattensis* (Parramatta Wattle), *Bursaria spinosa* (Sweet Bursaria), and the occasional *Olea europaea* subsp. *cuspidata* (African Olive). The ground layer within this zone is dominated by exotic grasses including *Paspalum dilatatum**(Paspalum), *Eragrostis curvula* (African Lovegrass), and *Ehrharta erecta* (Panic Veldtgrass). A mix of native grasses and herbs still persist within this vegetation zone, including *Microlaena stipoides* (Weeping Grass), *Einadia hastata* (Berry Saltbush), *Dichondra repens* (Kidney Weed), and *Commelina cyanea* (Native Wandering Jew). **Disturbances:** Vegetation condition within this zone is impacted by the occurrence of priority weed species and the dominance of an exotic grassy groundlayer. Key exotic species within this zone include the dominance of High Threat Weeds (HTW) in the ground layer (e.g., *Paspalum dilatatum*, *Eragrostis curvula*, *Ehrharta erecta*) and Priority Weeds for the Greater Sydney region including *Olea europaea* subsp. *cuspidata*, *Rubus fruticosus* (Blackberry), *Asparagus asparagoides* (Bridal Creeper), and *Senecio madagascariensis* (Fireweed). **Management Goals:** This zone exists outside of the Development Site and will be retained within the proposed Reserve. It will be subject to active management to maintain and restore the CEEC, improve habitat values, reduce weed impacts and extent. Supplementary plantings of Cumberland Plain Woodland species should be completed alongside restoration within Management Zone 2 where needed.
Management Zone 2: Reserve (woodland restoration)	**Total area within Subject Site:** 0.08 ha **Community:** PCT 849 – *Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion* - Low Condition **Form:** Derived Grassland **Description:** Canopy is reduced to scattered canopy trees including *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark), and *Angophora floribunda* (Rough-barked Apple). The midstorey, whilst largely reduced, contains *Melaleuca decora*, *Acacia parramattensis* (Parramatta Wattle). The groundcover within this zone is highly managed (mown) and dominated by exotic grasses including *Cenchrus clandestinus* (Kikuyu Grass), *Setaria parviflora* (Pigeon Grass), *Lolium rigidum*

Management Zone	Description
	(Wimmera Ryegrass), and *Sporobolus africanus* (Parramatta Grass). Some native grasses and herbs persist within the vegetation zone including *Microlaena stipoides* (Weeping Grass), *Dichondra repens* (Kidney Weed), and *Oxalis perennans*. An intermittently filled swale occurs within the Reserve. **Disturbances:** Historic vegetation clearing and ongoing management (mowing). This management zone is primarily comprised of exotic grasses and forbs. **Management Goals:** The extent of this community within the Reserve will be subject to active management to maintain and restore the community, improve habitat values, reduce weed impacts and extent. Most notably, this will include restoration of canopy vegetation through the planting of tree species associated with PCT 849. Additional planting of sub-aquatic vegetation within the existing swale is recommended to enhance its overall habitat value.
Management Zone 3: Development Site	**Total area within Subject Site:** 0.76 ha **Community:** This zone is managed as part of Glenwood High School and is predominantly occupied by existing infrastructure. A small area (approximately 0.01 ha) of low condition PCT 849 - *Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion,* lies within this management zone. Additionally, a managed exotic grassland occurs within the Development Site. **Form:** Low condition native vegetation to be impacted by development. Managed as open space and occupied by existing infrastructure proposed for removal. **Description:** An area actively managed and occupied by infrastructure associated with Glenwood High School. Management Zone 3 includes a small area (0.01 ha) of PCT 849 as well as managed exotic grasslands. **Management Goals:** This zone will be occupied by a new 3 storey building that will provide contemporary learning spaces for the Students of Glenwood High School. Construction will be managed in a way that minimises potential indirect impacts to the neighbouring Reserve. Here, planting will occur to improve the overall condition of native vegetation within the Subject Site.
Excluded: Existing School Grounds (not impacted)	**Total area within Subject Site:** 4.9 ha **Form:** Derived Grassland impacted by development. Managed as parks and open spaces. **Description:** The extent of the Subject Site outside of the Reserve and Development Site. It is predominantly comprised of existing infrastructure associated with the school and exotic grassland. A lesser extent of low condition PCT 849 – Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion, occurs sporadically across the Subject Site. Areas of planted exotic/native vegetation occur within this zone.

3.1.1 Management Stages

The BMP will be implemented over a 5-year period. The timing of management tasks and performance criteria are based on Management Stages defined by the progress of the proposed development. The stages are defined as the following:

- **Pre-Construction Phase:** Between development approval and the initiation of construction works on site.
- **Construction Phase:** Between the initiation and completion of construction within the site.
- **Post Construction Phase:** Between the completion of construction and the first monitoring event.
- **Adaptive Management/Operational Phase:** Between the first monitoring event (Baseline) following the completion of works to the end of the implementation period, i.e., the cessation of operations at Glenwood High School.

3.1.2 Performance Criteria

The overall performance criterion of this BMP are as follows:

- **Vegetation Extent:** The area of Cumberland Plain Woodland within the Reserve will increase to encompass areas of Management Zone 1 and Management Zone 2 through the restoration of low condition vegetation (Management Zone 2)
- **Vegetation Condition:** The condition of vegetation within Management Zone 1 and 2 will progress towards the community benchmarks for PCT 849, derived from the NSW BioNet Vegetation Classification, by the final monitoring report (DPE 2022). These benchmarks are outlined below:
  - A high diversity of native species commensurate with Cumberland Plain Woodland,
  - A high cover of native species consistent with Cumberland Plain Woodland including:
    - 53% Foliage Percentage Cover (FPC) of tree species (TG)
    - 16% FPC of shrub species (SG)
    - 9% FPC of forb species (FG)
    - 58% FPC of grass and grass-like species (GG)
    - 4% FPC of ‘other’ species
- The presence of native canopy regeneration within Management Zone 2 of the Reserve – measured through sapling presence/absence of key canopy species including: *Eucalyptus fibrosa* (Red Ironbark), *Eucalyptus tereticornis* (Forest Red Gum) and *Eucalyptus crebra* (Narrow-leaved Ironbark).
- The presence of native understorey species regeneration within Management Zone 2 of the Reserve – measured through the presence/absence of key understorey species including: *Themeda australis* (Kangaroo Grass), *Carex inversa* (Know Sedge), *Bursaria spinosa subsp. spinosa* (Native Blackthorn), *Daviesia ulicifolia* (Gorse Bitter Pea) and *Dodonaea viscosa subsp. cuneata* (Hop Bush).
- Absence of Priority Weeds, Weeds of National Significance (WoNS), and High Threat Weeds (HTWs)
- Absence of foliar damage due to disease or pest attack.
- Absence of tree or shrub deaths caused by disease or pest attack.

3.1.3 Responsibilities

Implementation and funding of this BMP is the responsibility of the school who will be the proprietor of the Reserve throughout the implementation period. The BMP will be implemented over a 5-year period. Management of the Reserve will adopt an adaptive management process and may be subject to review of monitoring results and recommendations.

Strategies outlined in the BMP will be undertaken by suitably experienced and qualified persons or companies engaged by the proprietor of the site and Reserve. Any vegetation restoration works (including weed management, plantings and landscaping) will be undertaken by a suitably qualified and experienced professional bush regeneration contractor. The minimum qualifications and experience required for the bush regeneration contractor are a TAFE Certificate IV in Conservation and Land Management (or equivalent) and three years demonstrated experience (for site supervisor) and a TAFE Certificate 2 in Conservation and Land Management and one year demonstrated experience (for other personnel). Monitoring and reporting will be undertaken by suitably qualified Ecologists. Fire management should only be undertaken by suitable qualified and experienced professionals in the field of ecological burn management.

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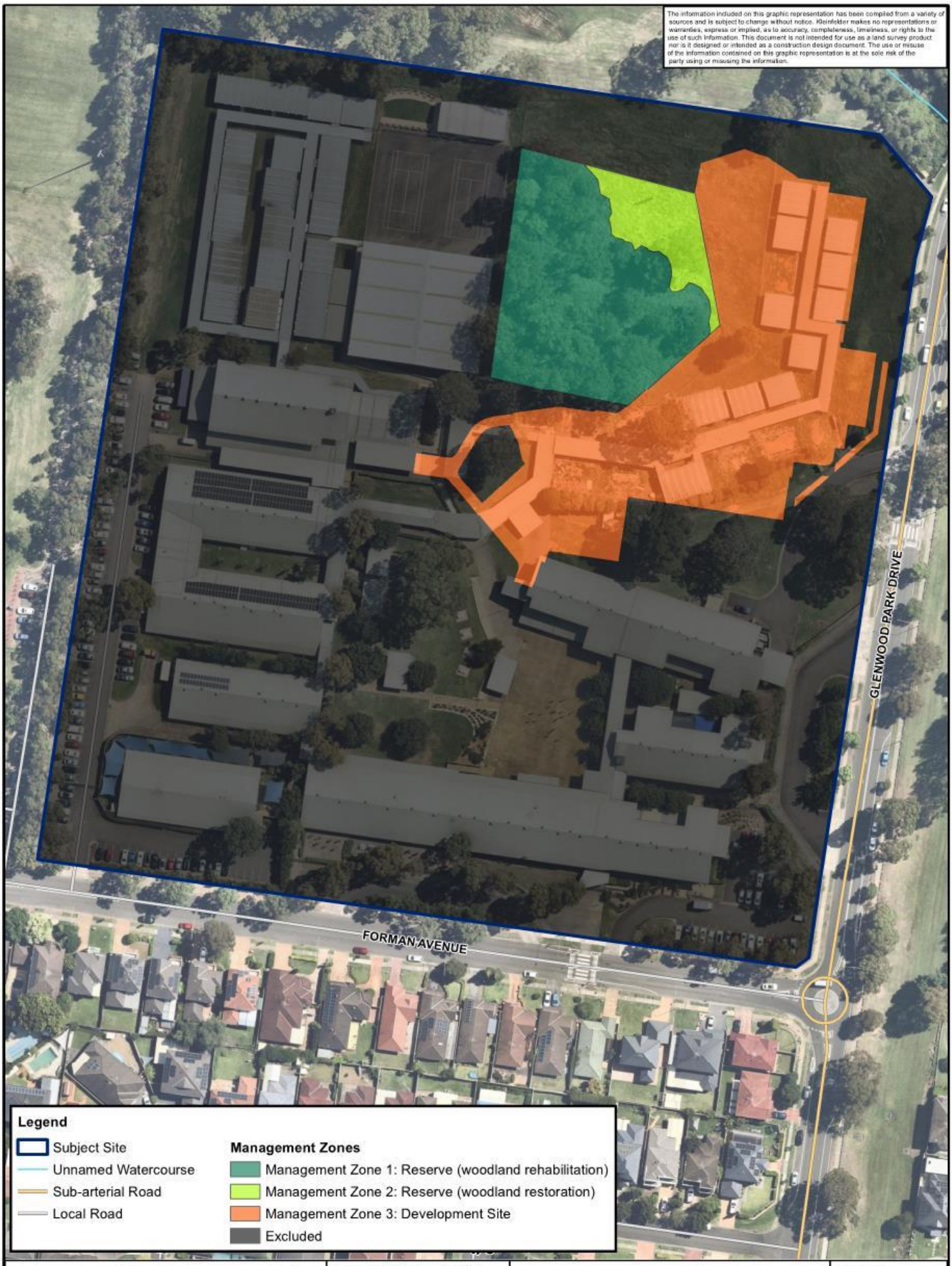

Legend

- Subject Site
- Unnamed Watercourse
- Sub-arterial Road
- Local Road

Management Zones

- Management Zone 1: Reserve (woodland rehabilitation)
- Management Zone 2: Reserve (woodland restoration)
- Management Zone 3: Development Site
- Excluded

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DATA SOURCE:
NSW DFSI - 2021
Nearmap - 2022

Management Zones

Jacobs Group (Australia) Pty Ltd
Biodiversity Management Plan
Glenwood High (Lot 5227 DP868693)
Forman Avenue, Glenwood NSW

FIGURE:
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3.2 PRE-CONSTRUCTION PHASE

3.2.1 Construction Environmental Management Plan (CEMP)

A Construction Environmental Management Plan (CEMP) will be established prior to the commencement of construction. The CEMP should include:

- The environmental site management measures must remain in place and be maintained throughout the period of the development.
- The CEMP shlould address all environmental aspects of the development's construction phases, and include where relevant, but not be limited to, the following:
    - Project Contact Information
    - Site Security Details
    - Timing and Sequencing Information
    - Site Soil and Water Management Plan
    - Noise and Vibration Control Plan
    - Air Quality monitoring and management
    - Health and Safety Plan
    - Incident Management Contingency
    - Implementation of mitigation measures specified in Section 5 (subsection 5.3) of the Biodiversity Development Assessment Report (BDAR) (Kleinfelder 2021).
    - Unexpected Finds Protocol

3.2.2 Establishment of Monitoring Program

Floristic monitoring plots and photo monitoring points are to be established within the Reserve in accordance with monitoring program detailed in **Section 3.5.1.** Baseline monitoring is to be completed within one (1) month of the completion of construction works within the Subject Site.

3.3 CONSTRUCTION PHASE

The following measures will be adhered in the construction phase of the project, that being immediately prior to, during and immediately after completion of clearing, earthworks and construction. All contractors, sub-contractors, and personnel must be notified of these measures.

3.3.1 Construction Impact Mitigation

The procedures and mitigation measures detailed below are to be followed/implemented to minimize direct and indirect impacts to biodiversity values within the Subject Site:

- Vegetation may only be removed from the approved development footprint
- Exclusion fencing will be installed around the boundaries of vegetation to be retained. The exclusion fencing is recommended to extend 5 m from trees and vegetation, noting site restraints.
- Trees to be retained within the Development footprint will have bunting installed around their drip line, to prevent any disturbance that may impact on their health; this should remain around the tree until all construction activities have been completed.

- The areas of retained vegetation within the exclusion fencing shall be marked as **'No-Go' zones**. All vehicles, construction materials and refuse will be prohibited from these areas.

3.3.2 Vegetation Clearing Supervision

The following procedures in relation to vegetation clearing are to be followed to minimise impacts to biodiversity values within the Subject Site and to maximise the salvage of habitat features to be used in restoration works within the Reserve.

- Vegetation clearing should not occur during the months of spring, to avoid the peak breeding period of hollow-dependent fauna.
- Preclearing surveys will be conducted by the project ecologist and will include the following procedures:
    - The project ecologist will inspect vegetation within the clearing footprint and advise the site manager and tree clearing staff of any habitat potential and precautions necessary during vegetation removal.
    - Any significant, salvageable habitat features (such as large ground logs and bush rocks) will be clearly marked with flagging tape or spray paint and are to be salvaged and redistributed in the Reserve, particularly within Management Zone 2 under the supervision of the project ecologist.
- Removal of habitat trees within the Subject Site will be done under the supervision of the project ecologist and will include the following tree felling procedures:
    - Felled trees will be inspected by the project ecologist or licensed wildlife carer immediately following tree felling. Any displaced fauna will be relocated into adjacent habitat, as close to the development area as possible. Any injured fauna will be placed into the care of a local veterinary hospital or wildlife rescue group. In circumstances where native fauna species are detected, clearing will cease until the ecologist or wildlife carer has relocated the animal.
    - Before being stock-piled, felled trees must be left for at least 48 hours on the ground to allow fauna to escape.
    - During vegetation clearing works, tree trunks and larger branches (over 10 cm diameter) determined to be salvageable on instruction from the project ecologist can be removed from the Development Site and are to be cut up into long pieces (i.e. over 4 m where possible) and carefully placed within the Reserve, in such a way as to look natural, not add to bushfire risks, and to provide benefit to native fauna (on instruction from the project ecologist).
    - Cleared vegetation (that is not salvageable as ground habitat, see above) will be mulched and re-used throughout the site, where necessary, as part of any vegetation regeneration or landscaping activities. Non-salvageable material shall be disposed of in an approved manner.
    - If any injured or displaced fauna are encountered onsite in the absence of an ecologist or licensed wildlife carer, the advice of the ecologist and/or a local wildlife rescue group will be sought immediately.
    - During site inductions, all contractors, sub-contractors, and personnel must be notified of these vegetation protection requirements.

3.3.3 Management of Erosion and Sedimentation

Hydrological and erosion / sediment controls must be implemented to maintain the quality and quantity of pre-development water flows into downstream wetland areas.

Measures to reduce soil erosion and pollutant run-off during construction activities include:

- Installation of erosion and sediment control measures (including silt fencing) around the boundary of the Development Site prior to any works
- Regular inspection of erosion and sediment control measures, particularly following rainfall events, to ensure their ongoing functionality.
- Management of excavated materials to reduce the movement of sediments during high wind or rainfall events.
- Avoiding stockpiling of materials adjacent to the Reserve. Stockpiling should be undertaken in areas that are already cleared/ disturbed.
- Undertake maintenance of silt fences and other mitigation measures to isolate runoff.

Erosion and sediment control measures should be designed and installed following the Guidelines for Erosion and Sediment Control on Building Sites (DLWC 2001). Useful information can also be found within the Blue Book (Landcom 2004).

3.3.4 Weed Management During Construction

Appropriate weed control measures should be implemented during the construction phase, including the following:

- All weeds removed from the site can be transported in a sealed container or bag and disposed at a waste management facility licensed to accept green waste.
- Vehicles, machinery and equipment should be free from weed material (including seeds) before entering the construction corridor, as practicably possible.

3.4 Post Construction Phase

3.4.1 Establishment of Reserve

Existing school fencing occurs along the boundary of the Reserve. It is recommended this fencing be replaced with a style with greater durability, that can simultaneously restrict access to students, delineate the boundary for general school maintenance (i.e. mowing), and prevent exotic grasses from growing into the Reserve. Suitable fencing could include a post and rail style with a 30cm solid barrier at the base of the fence line to minimise exotic grass infiltration into the Cumberland Plain Woodland.

3.4.2 Restoration of Cumberland Plain Woodland

Restoration of Cumberland Plain Woodland will occur in Management Zones 1 and 2 within the Reserve. This aims to maintain and enhance biodiversity values within Management Zone 1 (woodland) and restore woodland within Management Zone 2. Consequently, each zone has specific restoration requirements based on current state (woodland or grassland) and condition. Detailed goals for each management zone are detailed in **Table 1**. Performance criterion for the reservation of the vegetation within Reserve are summarised in **Section 3.1.2**.

The restoration of Cumberland Plain Woodland CEEC within the Reserve will adopt a strategy of adaptive management, informed by annual monitoring results and recommendations.

Restoration techniques used within the Reserve include restricting entry to the site, weed management, habitat augmentation as well as planting of indigenous plant species through direct seeding, tubestock, and 5 litre (L) pots (McIntosh and Phelps, 2021). These methods are detailed below:

Restriction of Entry

The Reserve occurs within the grounds of Glenwood High School where it is surrounded by managed exotic grassland and existing education related infrastructure. Whilst a fence occurs around this community, it has been exposed to various degrading processes that are likely impacting native floristic diversity and structure, canopy regeneration, weed abundance, and resulted in elevated nutrient loads. Several of these impacts, particularly weed infiltration, can be exacerbated by foot traffic. To minimise further degradation of the vegetation, access to the site will be restricted. This shall be achieved through the upgrading of the fence and the installation of signage communicating that entry is restricted only to those permitted.

Weed Management

Weed management will be undertaken within the Reserve (Management Zones 1 and 2) in accordance with **Section 3.4.5**.

Revegetation and Supplementary Planting

The Reserve is characterised by sparse mature woodland, scattered native shrubs, and a high cover of exotic groundcover species (i.e. grasses and herbs). It occurs within a highly developed landscape in a disturbed condition, where it is surrounded by infrastructure and managed exotic grassland. The improvement of fencing and signage aims to further restrict entry by students and reduce weed incursion, in turn aiding the process of natural regeneration. This regeneration is expected to be further assisted through the control and suppression of weeds throughout the BMP implementation period and the planting of native species throughout the Reserve.

The following supplementary planting is recommended:

- **Management Zone 1:** Supplementary planting of shrub and understorey species characteristic of the local vegetation community (PCT 849) and Cumberland Plain Woodland CEEC (see **Appendix B**). Supplementary planting of canopy species is to be completed within this Management Zone to increase canopy cover alongside the species recommendations detailed for Management Zone 2.
- **Management Zone 2:** Revegetation of canopy, shrub and understory species is required within this zone following weed control. These species are to be planted in accordance with planting list in **Appendix B**. A different assemblage of water-tolerant species will be planted within the Drainage Swale to create additional habitat for native fauna. The need (or lack thereof) for supplementary planting following the initial planting event will be communicated in future annual monitoring reports.

All planting should utilise the species listed within **Appendix B**, with preference for local provenance stock. Recommended species include those associated with PCT 849 and Cumberland Plain Woodland CEEC (DPE 2022, DPE 2010). Where these species cannot be sourced, only local species indicative of Cumberland Plain Woodland should be used. Planting will be staged as required, including direct seeding as well as the placement of tubestock and 5L tree stock (Management Zone 2).

Planting and Maintenance Effort

Planting of canopy species trees using 5L tree stock should be placed approximately 5 m apart in Management Zone 2. The 5L tree stock should not be placed under the canopy of existing trees. Approximately 30 trees would be required in the 0.08 ha area of Management Zone 2.

The cover of shrub species in Management Zones 1 and 2 would eventually require a cover of 16%. Allowing for a 2 m^2 cover for each shrub at maturity in Management Zones 1 and 2 (0.41 ha), approximately 330 shrub tubestock would be required for planting.

Seed mixes for native ground cover should be sown at the recommended rate by the supplier in any bare soil patches, including those created by the control and spraying of exotic species.

The hole for each tube stock shrub or 5L tree stock should be:

- Twice the depth of the tube stock and minimum 7.5cm diameter to allow for root development.
- Twice the depth of the 5L tree stock and 1.5 its diameter to allow for root development.
- Watered with a minimum of 10 litres at time of installation to remove any air pockets and provide adequate moisture levels for the recently installed plant.
- The plant will be planted with the root/stem interface at the soil surface.
- Create a small depression (bowl) at the surface to allow water flow to infiltrate to the plant root zone.

After planting, the trees and shrubs should be watered with minimum six litres of water at the following intervals:

- Twice a week for the first two weeks.
- Once a week for the next four weeks.
- Once a fortnight for the next six weeks.

Following the above period of watering, the plants will be assessed fortnightly for the next eight months to check if the soil is moist or if the plants are stressed. If either has occurred, the plants should be watered as the maintenance staff see fit. During this period if any plants die, they will require replacement. Any new plants will follow the above maintenance schedule. In the second year, the plants will be checked on a monthly basis and watered if required. During years 3-5 the trees should be checked on a six-monthly basis. After the maintenance phase (5 years) there should be 90% successful establishment of the planted KFTs. If there is less than 90% of the original KFTs surviving, the deficit below 90% should be replanted and maintained as per above.

Habitat Augmentation

Fallen and standing timber (coarse woody debris and dead branches, snags, stumps etc.) provides essential or important breeding, foraging or shelter habitat for many threatened species. Tree trunks and larger branches (over 10 cm diameter) deemed suitable by the project ecologist supervising clearing can be removed from the development area during vegetation clearing. Where suitable these trunks and larger branches can then be cut up into long pieces (i.e., over 4 m where possible) and carefully placed into woodland and grassland areas within the Reserve. Placement of logs and branches are to be in such a way as to look natural, not add to bushfire risks, and to provide benefit to native fauna (on instruction from the project ecologist).

3.4.3 Restoration of Drainage Swale

An existing drainage swale occurs within Management Zone 2 of the Reserve. This swale intermittently holds water, creating habitat for native fauna. Vegetation within and surrounding the swale is largely comprised of exotic grasses and forbs. The revegetation of the swale will be completed at the same time as revegetation works elsewhere in the Reserve, following the completion of construction. Plant species to be planted in these areas will be characteristic of the local vegetation community (PCT 849) and Cumberland Plain Woodland CEEC, with

the addition of suitable wetland species recommended by Blacktown Local Council (See **Table B2**, **Appendix B**).

3.4.4 Landscaping of Parks and Open Spaces

Landscape planting in open spaces within the Subject Site will include plant species consistent with local vegetation (PCT 849) and the Cumberland Plain Woodland CEEC, in accordance with the Landscape Design Plans (McIntosh and Phelps, 2021). The following measures are to be implemented where suitable and alongside the requirements of the Landscape Design Plans (McIntosh and Phelps, 2021) in the landscaping of parks and open space areas:

- Any native trees to be retained within proximity to the Development Site will be protected during construction and appropriately maintained throughout the implementation period.
- Stockpiled topsoil and mulched vegetation from the development site will be utilised in site landscaping and revegetation works for any areas that require rehabilitation.
- Fertiliser use will be strictly limited to a specifically designed Australian native plant fertiliser or an organic based fertiliser with low levels of phosphorus (P). Artificial and chemical fertilisers are strictly prohibited within proximity to the Reserve.

3.4.5 Weed Management

Weed management within the Reserve will prioritise the management of the following species, including:

- *Asparagus asparagoides* (Bridal Creeper) [WoNS and Priority Weed]
- *Rubus fruticosus sp. agg*. (Blackberry) [WoNS and Priority Weed]
- *Olea europaea subsp. cuspidata* (Common Olive) [WoNS]
- *Paspalum dilatatum* (Paspalum)
- *Araujia sericifera* (Moth Vine)

Management will adopt the 'Bradley method', which involves the progressive, staged removal of weeds from less disturbed areas (i.e., Management Zone 1) followed by removal from more weed infested areas (i.e. Management Zone 2). This method also aims to remove weeds with minimal disturbance and allow native species to re-establish naturally from the existing seed bank and rootstock. The first stage of weed removal should occur within the Reserve prior to any planting, with an effort made to preserve existing native groundcover species.

The following steps are to be followed when controlling weeds on the site:

1. The weed removal team will require a site-specific induction, to understand what weeds are to be removed, the process of removal, identification of the native species, and the procedures to be followed.
2. Manual weed removal. Due to presence of native groundcover species within Reserve, the manual removal of weeds will be prioritised where possible.
3. Weed propagules collected during weed control activities are to be taken offsite. This will stop weed material smothering native plants and prevent re-establishment. This material is to be taken to an appropriate waste disposal center to prevent further weed spread in the region.

4. Chemical weed control. Chemical should be applied only where application to larger weeds can be isolated (i.e. no broad application).

For concentrations and dosage rates on targeted chemical control, refer to the Department of Primary Industries New South Wales 'WeedWise' webpage (DPI 2022). Any weed spraying should be conducted by an authorised person, having a Chemical Application Certificate or similar qualification. This would ensure that best practice is adhered to in consideration of the sensitive nature of the surrounding ecosystems.

The removal of general exotic species (of which 36 were recorded – see **Appendix A** for full list of exotic plant species recorded within the Subject Site [Kleinfelder 2021]) will be based on the recommendations provided in annual monitoring reports. Follow up weed management may be required as per the recommendations of future reports. It is expected that other restoration tasks including the restriction of entry, upgrading of fence and additional plantings will assist in the natural reduction of general exotic species cover over the duration of the BMP implementation period until the end of the operational life of the school.

3.5 ADAPTIVE MANAGEMENT/OPERATIONAL PHASE

Adaptive management will be undertaken within the Reserve throughout the implementation period, with monitoring and report recommendations used to continually inform management strategies. Monitoring and reporting requirements under this BMP are detailed below.

3.5.1 Monitoring Program

A monitoring program will be implemented to ensure that the measures detailed within this BMP are implemented and successful. The program will be completed throughout the implementation period, a summary of key monitoring events and deliverables are shown in **Table 2**. Monitoring program methods are detailed below. Reporting requirements are detailed in **Section 3.5.2**.

Table 2: Monitoring and Reporting Summary

Monitoring Event	Timing	Scope	Deliverable
Clearance Supervision	During vegetation clearing	Supervision of vegetation clearing of habitat features to be removed.as per **Section 3.3.2**	Clearance Supervision Letter Report
Baseline Monitoring Survey	Completed within one (1) month following the completion of the project	Establishment of two permanent monitoring plots and completion of the Monitoring Programme	Baseline Monitoring Report
Annual Monitoring Survey	Completed one (1) year following the completion of construction. Completed annually until the fourth year of the monitoring program.	Completion of the Monitoring Programme	Annual Monitoring Survey Report
Final Summary Report	Completed at the end of the 5-year implementation period.	Completion of the Monitoring Programme Summary of the Monitoring Programme throughout implementation period.	Final Annual Summary Report inclusive of Year 5 results.

Monitoring Program Methods

Monitoring will be completed within the Reserve throughout the implementation period as per the schedule detailed in **Table 2**. Monitoring methods address key performance criterion listed in **Section 3.1.2**, and are informed by the following resources:

- The Biodiversity Assessment Method 2020 (DPE 2020); and
- Vegetation Benchmarks for PCT 849 as per the NSW BioNet Vegetation Classification (DPE 2022)

The Monitoring Program is comprised of three (3) key components: *Vegetation Extent*, *Vegetation Condition*, and *Reserve Maintenance* detailed below.

Vegetation Extent

The mapped extent of native woodland (comprising native canopy species; Management Zone 1) and weed infestation are to be updated during every monitoring event using a hand-held GPS.

Vegetation Condition

A total of two (2) 20 m x 20 m quadrats are to be established within the Reserve during baseline monitoring, with one (1) quadrat placed within Management Zone 1, and the other (1) within Management Zone 2. The quadrats are to be sampled as per Section 5.3.4 of the NSW Biodiversity Assessment Method (BAM), excluding the implementation of a central 50 m transect (DPE, 2020). The midline at the starting point of each quadrat is to be marked with a stake to ensure accuracy of repeat monitoring. The location and bearing of the quadrats are to be recorded in a GPS device.

Within each plot the following metrics are collected:

- Floristic diversity (number of native and exotic species within the nested 20 m x 20 m quadrat)
- Floristic cover and abundance for each species in accordance with the BAM (20 m x 20 m quadrat).
- Stem size classes and the presence of native canopy regeneration (as per BAM 2020) (within the 20 m x 20 m quadrat)
- Cover of litter and bare ground (as per adjusted BAM method) (within the 20 m x 20 m quadrat)
- Total length of fallen logs (dbh <10 cm) (as per adjusted BAM method) (within the 20 m x 20m quadrat)
- Photo monitoring: a single photo is to be taken at the staked point facing into the quadrat.

Reserve Maintenance

The monitoring program will assess condition of the Reserve through a general meander of the site and notes on the following features:

- Condition of boundary fencing and signage around the Reserve
- Signs of degradation e.g., dumping of waste (inc. garden waste), infiltration of exotic species and priority weeds.
- Condition of habitat features (i.e. existing hollows)
- Condition and composition of native vegetation within the Drainage Swale.

3.5.2 Reporting

Reporting requirements and timing of deliverables are summarised within **Table 2**, all monitoring and reporting will be completed by a suitably qualified person (i.e., Ecologist), content of reporting deliverables are detailed below:

- **Baseline Monitoring Survey Report:** This report will provide details on location of monitoring points, baseline measurements of key extent and condition variables within the Reserve.
- **Clearance Supervision:** This report will detail the results of the clearance supervision including identification of any fauna recorded during clearing works and the location of habitat features re-distributed within the Reserve to provide for habitat.
- **Annual Monitoring Survey Report:** This report will detail the results of annual monitoring, with comparison to baseline results and preceding survey events. Reporting will provide recommendations for future monitoring and management within the Reserve. These reports are to be submitted annually to the consent authority.
- **Final Summary Report:** The final Annual Monitoring Survey Report for the post-construction period of the school, inclusive of the monitoring results of Year 5 as well as a summary the results of the Monitoring Programme throughout. This is to be delivered 5 years post completion of works.

4 REFERENCES

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APPENDIX A FLORA SPECIES LIST

Table A1: Subject Site Flora Species List

Number	Family	Scientific Name	Common Name	Form
1.	**Apiaceae**	*Daucus glochidiatus*	Native Carrot	Forb (FG)
2.	**Campanulaceae**	*Lobelia purpurascens*	Whiteroot	Forb (FG)
3.	**Chenopodiaceae**	*Einadia hastata*	Berry Saltbush	Forb (FG)
4.	**Chenopodiaceae**	*Einadia trigonos*	Fishweed	Forb (FG)
5.	**Commelinaceae**	*Commelina cyanea*	Native Wandering Jew	Forb (FG)
6.	**Convolvulaceae**	*Dichondra repens*	Kidney Weed	Forb (FG)
7.	**Fabaceae (Faboideae)**	*Glycine tabacina*	Variable Glycine	Other (OG)
8.	**Fabaceae (Mimosoideae)**	*Acacia parramattensis*	Parramatta Wattle	Tree (TG)
9.	**Juncaceae**	*Juncus subsecundus*	Finger Rush	Grass & grasslike (GG)
10.	**Lamiaceae**	*Westringia fruticosa*	Coastal Rosemary	Shrub (SG)
11.	**Lomandraceae**	*Lomandra longifolia*	Spiny-headed Mat-rush	Grass & grasslike (GG)
12.	**Myrtaceae**	*Angophora floribunda*	Rough-barked Apple	Tree (TG)
13.	**Myrtaceae**	*Callistemon citrinus*	Crimson Bottlebrush	Shrub (SG)
14.	**Myrtaceae**	*Eucalyptus crebra*	Narrow-leaved Ironbark	Tree (TG)
15.	**Myrtaceae**	*Eucalyptus moluccana*	Grey Box	Tree (TG)
16.	**Myrtaceae**	*Eucalyptus tereticornis*	Forest Red Gum	Tree (TG)
17.	**Myrtaceae**	*Melaleuca decora*	-	Shrub (SG)
18.	**Oxalidaceae**	*Oxalis perennans*	-	Forb (FG)
19.	**Pittosporaceae**	*Bursaria spinosa*	Native Blackthorn	Shrub (SG)
20.	**Poaceae**	*Cynodon dactylon*	Common Couch	Grass & grasslike (GG)
21.	**Poaceae**	*Microlaena stipoides*	Weeping Grass	Grass & grasslike (GG)
22.	**Proteaceae**	*Grevillea spp.*	-	Shrub (SG)
23.	**Proteaceae**	*Grevillea spp.*	-	Shrub (SG)
24.	**Vitaceae**	*Cayratia clematidea*	Native Grape	Other (OG)

Table A2: Subject Site Exotic Flora Species List

No.	Family	Scientific Name	Common Name	Form	Status
1.	Agavaceae	*Yucca aloifolia*	Spanish Bayonet	Exotic	
2.	Apocynaceae	*Araujia sericifera*	Moth Vine	HTW - Manageable	
3.	Apocynaceae	*Plumeria rubra*	Frangipani	Exotic	
4.	Asparagaceae	*Asparagus asparagoides*	Bridal Creeper	HTW	Priority Weed and WoNS
5.	Asteraceae	*Bidens pilosa*	Cobbler's Pegs	Exotic	
6.	Asteraceae	*Dimorphotheca ecklonis*	Cape Daisy	Exotic	
7.	Asteraceae	*Senecio madagascariensis*	Fireweed	Exotic	Priority Weed and WoNS
8.	Asteraceae	*Soliva sessilis*	Bindyi	Exotic	
9.	Asteraceae	*Sonchus asper*	Prickly Sowthistle	Exotic	
10.	Asteraceae	*Taraxacum officinale*	Dandelion	Exotic	
11.	Brassicaceae	*Brassica fruticulosa*	Twiggy Turnip	Exotic	
12.	Caryophyllaceae	*Stellaria media*	Common Chickweed	Exotic	
13.	Fabaceae (Faboideae)	*Medicago polymorpha*	Burr Medic	Exotic	
14.	Fabaceae (Faboideae)	*Trifolium repens*	White Clover	Exotic	
15.	Lamiaceae	*Marrubium vulgare*	White Horehound	Exotic	
16.	Malvaceae	*Modiola caroliniana*	Red-flowered Mallow	Exotic	
17.	Malvaceae	*Sida rhombifolia*	Paddy's Lucerne	Exotic	
18.	Oleaceae	*Fraxinus spp.*	-	Exotic	
19.	Oleaceae	*Olea europaea*	Common Olive	HTW - Manageable	WoNS
20.	Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues	Exotic	
21.	Plantaginaceae	*Plantago major*	Large Plantain	Exotic	
22.	Plumbaginaceae	*Plumbago auriculata*	Cape Leadwot	Exotic	
23.	Poaceae	*Cenchrus clandestinus*	Kikuyu Grass	Exotic	
24.	Poaceae	*Ehrharta erecta*	Panic Veldtgrass	HTW	
25.	Poaceae	*Eragrostis curvula*	African Lovegrass	HTW	
26.	Poaceae	*Lolium rigidum*	Wimmera Ryegrass	Exotic	

No.	Family	Scientific Name	Common Name	Form	Status
27.	Poaceae	*Paspalum dilatatum*	Paspalum	HTW	
28.	Poaceae	*Poa annua*	Winter Grass	Exotic	
29.	Poaceae	*Setaria parviflora*	-	Exotic	
30.	Poaceae	*Sporobolus africanus*	Parramatta Grass	Exotic	
31.	Rosaceae	*Rubus fruticosus sp. agg.*	Blackberry complex	Exotic	Priority Weed and WoNS
32.	Rubiaceae	*Galium aparine*	Goosegrass	Exotic	
33.	Rubiaceae	*Galium murale*	Small Bedstraw	Exotic	
34.	Sapindaceae	*Acer negundo*	Box Elder	HTW - Manageable	
35.	Solanaceae	*Solanum nigrum*	Black-berry Nightshade	Exotic	
36.	Solanaceae	*Solanum pseudocapsicum*	Madeira Winter Cherry	Exotic	

APPENDIX B RECOMMENDED PLANTING LISTS

Table B1: Reserve Recommended Planting List

Stratum	Scientific Name	Common Name	Management Zone 1	Management Zone 2
Canopy	*Eucalyptus crebra*	Narrow-leaved Ironbark		✓
	Eucalyptus moluccana	Grey Box		✓
	Eucalyptus tereticornis	Forest Red Gum		✓
Shrubs	*Bursaria spinosa subsp. spinosa*	Native Blackthorn	✓	✓
	Acacia decurrens	Black Wattle	✓	✓
	Acacia implexa	Hickory Wattle	✓	✓
	Acacia parramattensis	Parramatta Wattle	✓	✓
	Dodonaea viscosa subsp. cuneata	Hop Bush	✓	✓
	Daviesia ulicifolia	Gorse Bitter Pea	✓	✓
Ground/ Climbers	*Aristida ramosa*	Purple Wiregrass	✓	✓
	Aristida vagans	Threeawn Speargrass	✓	✓
	Cheilanthes sieberi	Poison Rock Fern	✓	✓
	Clematis glycinoides var. glycinoides	Headache Vine	✓	✓
	Cymbopogon refractus	Barbed Wire Grass	✓	✓
	Cyperus gracilis	Slender Flat-sedge	✓	✓
	Dianella longifolia	Blue Flax Lily	✓	✓
	Echinopogon caespitosus	Bushy-hedgehog Grass)	✓	✓
	Goodenia hederacea	Ivy Goodenia	✓	✓
	Lomandra filiformis	Mat Rush	✓	✓
	Lomandra multiflora	Many-flowered Mat-rush	✓	✓
	Microlaena stipoides	Weeping Grass	✓	✓
	Poa labillardieri var. labillardieri	Tussock Grass	✓	✓
	Themeda triandra	Kangaroo Grass	✓	✓
	Wahlenbergia gracilis	Sprawling Bluebell	✓	✓

Table B2: Drainage Swale Recommended Planting List

Stratum	Scientific Name	Common Name
Ground	*Bolboschoenus caldwellii*	
	Carex appressa	Tall Sedge
	Cymbopogon refractus	Barbed-wire Grass
	Cyperus polystachyos	
	Juncus kraussii	Sea Rush
	Lomandra longifolia	Spiny Mat-Rush
	Lomandra filiformis	Mat Rush
	Themeda triandra	Kangaroo Grass
	Poa labillardieri var. labillardieri	Tussock Grass

APPENDIX C STAFF CONTRIBUTIONS

The following staff were involved in the compilation of this report.

Name	Qualification	Title/Experience	Contribution
David Martin	MSc	Ecologist (Botanist)	Field surveys (BDAR), and Report Review.
James Baldry	MBioCons	Ecologist	Report Author
Gayle Joyce	BSc (Forestry) (Hons)	GIS Specialist	GIS and Figure Preparation

APPENDIX D LICENSE AND PERMITS

Kleinfelder employees involved in the current study are licensed or approved under the *Biodiversity Conservation Act 2016* (License Number: SL100730, Expiry: 31 March 2023) and the *Animal Research Act 1985* to harm/trap/release protected native fauna and to pick for identification purposes native flora and to undertake fauna surveys.

6.11 FLOOD EMERGENCY RESPONSE

The flood emergency response plan has been developed by SCP

Refer to the following page.

Flood Emergency Response Sub-Plan

Glenwood High School

SCP Ref: S220004-GHS-CV-SW-RPT-02

Client Richard Crookes Construction

Project Glenwood High School

Date 30 August 2022

Revision table

Rev #	Date	Issue description	Prepared by	Reviewed by	Issued by
01	18/07/22	For Information	PS	HL	LS
02	30/08/22	Final	JC	LS	JC

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Contents

1 Introduction

SCP Consulting has been engaged by Richard Crookes Construction to prepare a **Flood Emergency Response Sub-Plan (FERSP)** for the proposed Glenwood High School (GHS) development to satisfy Condition B20 of the SSDA Conditions (reference: **SSD-23512960**).

Excerpt below:

> B20. The Construction Flood Emergency Management Sub-Plan must address, but not be limited to, the following:
>
> (a) be prepared by a suitably qualified and experienced person(s);
>
> (b) address the provisions of the *Floodplain Risk Management Guidelines* (EHG);
>
> (c) include details of:
>
> (i) the flood emergency responses for both construction phases of the development;
>
> (ii) predicted flood levels;
>
> (iii) flood warning time and flood notification;
>
> (iv) assembly points and evacuation routes;
>
> (v) evacuation and refuge protocols; and
>
> (vi) awareness training for employees and contractors, and users/visitors.

The purpose of this FERSP is to promote a satisfactory awareness of expected flood behaviour and risks, identify measures to become flood prepared and recommended courses of action before, during, and after flood events.

This FERSP relies on flood modelling and studies completed by Enstruct (reference: Glenwood High School – Civil Engineering Flood Study Report, dated 10/11/2021).

This FERSP addresses the provisions of the Floodplain Risk Management Guidelines (EHG) as discussed in Section 3.2.

The following table identifies sections of the report which address details listed above

ITEM ADDRESSED	RELEVANT SECTION
i) the flood emergency responses for both construction phases of the development	Section 4
ii) predicted flood levels	Section 3
iii) flood warning time and flood notification	Section 3.2, Section 4
iv) assembly points and evacuation routes	Section 4.3
v) evacuation and refuge protocols; and	Section 4.3, Section 4.4
vi) awareness training for employees and contractors, and users/visitors	Section 5

1.1 Site Context

The proposed development is within the grounds of the existing Glenwood High School and is located on the corner of Glenwood Park Drive and Forman Avenue, Glenwood, NSW. The site is bound by residential development to the east (Glenwood Park Drive) and south (Forman Avenue). To the west and north of the site is Glenwood Reserve. Refer to Figure 1 for an aerial view of the site boundary.

Figure 1: Aerial View of Site Boundary (Source: Aerial Survey)

2 Abbreviations

AEP	Annual Exceedance Probability
AHD	Australian Height Datum
ARR	Australian Rainfall and Runoff
BCC	Blacktown City Council
BOM	Bureau of Meteorology
FFL	Finished Floor Level
FPL	Flood Planning Level
GHS	Glenwood High School
IL	Invert Level
L/s	Flow in Litres per second
m3/s	Flow in cu.m per second
OSD	On-Site Detention
PSD	Permissible Site Discharge
RL	Reduced Level

3 Flood Behaviour

3.1 Flooding Source and Extent

As per the Blacktown City Council Maps Online platform, the site is not identified as flood prone (refer **Figure 2**). The closest flooding extent from Corbin Reserve is considered high risk but is over 2 kilometres away from the site boundary of GHS.

Furthermore, as the site is not in a flood affected area and is not in proximity to any tidal affected or perennial watercourses, the site is not expected to be impacted by rising sea levels due to climate change.

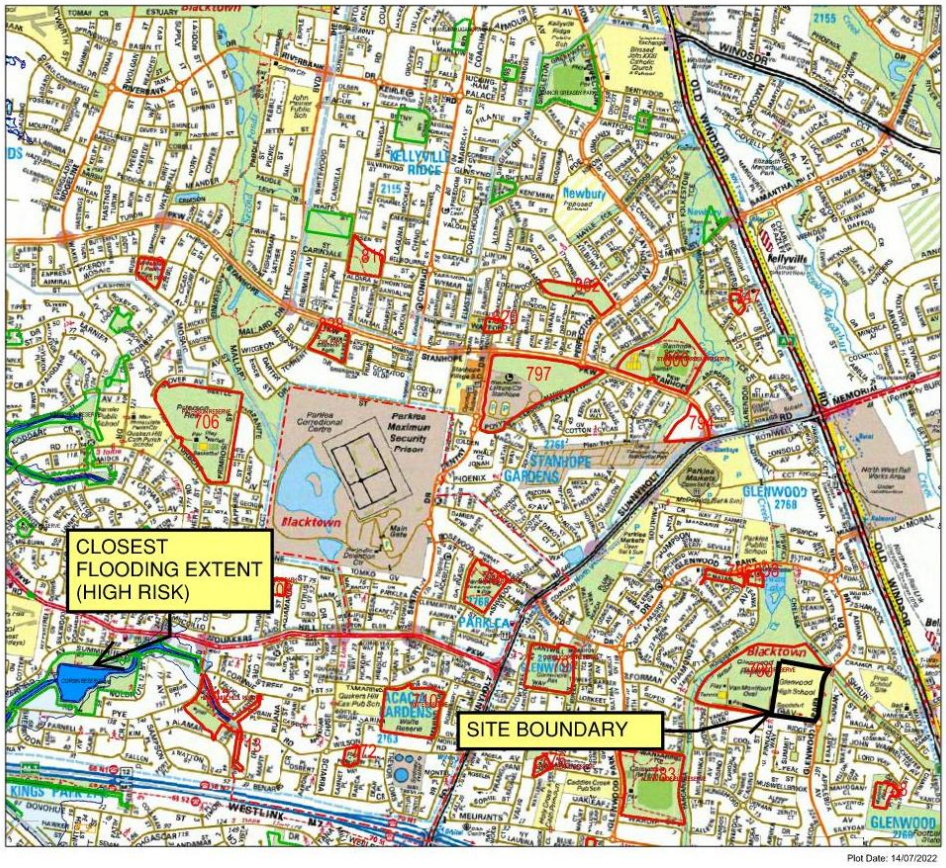

Figure 2: Flood Prone Land Extent (Source: BCC Online Maps)

3.2 Flood Categorisation

The school site is designated as a **Low Hazard Risk** area due to the predicted extents of the 1% AEP flood as shown in Figure 3. The development site is approximately 50m away from the 1% AEP flood extent within Glenwood Reserve to the north. The development site is also generally RL 64.00 to 60.90. This is at least 1.6m above the adjacent flood level in Glenwood Reserve of RL 58.30.

Flood results demonstrate that the proposed new building location is not susceptible to flooding during the 1% AEP, 0.5% AEP and 0.2% AEP flood events as the flood water is contained within the road reserve of Glenwood Park Drive and the drainage channel/water course. Minor flooding is observed in the PMF flood event. A maximum flood depth of 0.5m is expected throughout the

school campus with between 0-0.5m of flooding through the Main Works Building area during the PMF.

Refer to Figure 3, Figure 4, Figure 5 and Figure 6 for the 1% AEP, 0.5%, AEP 0.2% AEP and PMF flood extents, respectively. The critical storm duration has not been identified in the project flood report however based on the site being in an urban environment it is understood that flood presented below would occur as flash flooding over the course of minutes and hours rather than days.

Figure 3: 1% AEP Flood Extent and Levels (Source: Enstruct)

Figure 4: 0.5% AEP Flood Extent and Levels (Source: Enstruct)

Figure 5: 0.2% AEP Flood Extent and Levels (Source: Enstruct)

Figure 6: PMF Flood Extent and Levels (Source: Enstruct)

In accordance with the Floodplain Risk Management Guidelines, the site can be categorised in an emergency response planning (ERP) context for the following events:-

- 20% AEP: Indirectly Affected Areas (IAA)
- 1% AEP: Indirectly Affected Areas (IAA)
- PMF: Areas with Overland Escape Routes (OER)

IAAs are areas which are outside the limit of flooding and therefore will not be inundated nor will they lose road access. However, they may be indirectly affected as a result of flood damaged infrastructure or due to the loss of transport links, electricity supply, water supply, sewerage or telecommunications services and therefore may require resupply or evacuation.

OERs are areas where access roads to flood free land cross lower lying flood prone land. Evacuation can take place by road only until access roads are closed by floodwater. Escape from rising flood water is possible but only by walking overland to higher ground. Anyone not able to walk must be able to be reached by boat or aircraft.

4 Flood Response

4.1 Flood and Evacuation Warnings

A network of rainfall gauge stations is maintained throughout the Georges River and Woronora River catchment (Flood Watch Area No. 54). These stations provide information to the Bureau of Meteorology (BOM) as one source of information informing their flood warning system.

BOM should issue flash flood warnings through radio, television and through their website: http://bom.gov.au. Additionally, the NSW State Emergency Service (SES) may issue a flood bulletin, evacuation warning or evacuation order.

The BOM warning types are as follows:

4.1.1 Flood Watch

A 'flood watch' is issued when forecast rainfall suggests that local flash flooding and/or riverine flooding is possible. The purpose of a flood watch is to provide early advice of a developing situation that may lead to flooding. A flood watch isn't a warning of imminent flooding.

A flood watch can be issued up to four (4) days in advance of expected flooding. Flood watches are updated daily (minimum) and are finalised once all areas covered by flood warnings, or the risk of flooding has passed.

4.1.2 Flood Warning

A 'flood warning' is issued when flooding is expected at a particular location. Flood warnings are more targeted and are issued for specific catchments and locations within catchments. The severity of the flood is also forecasted in each flood warning as minor, moderate or major.

- Minor flooding: causes inconvenience, low-lying areas next to water courses are inundated, minor roads closed and low-level bridges submerged.
- Moderate flooding: evacuation may be required, traffic routes may be affected, some buildings may be affected above floor level.
- Major flooding: evacuation may be required, many buildings affected above floor level, traffic routes closed, utility services may be affected.

Flood warnings cover larger rivers that take more than six hours to respond to rainfall.

4.1.3 Severe Weather Warning

BOM does not issue warnings for flash flooding. Instead, a Severe Weather Warning may be issued. Severe weather warnings are provided for potentially hazardous or dangerous weather including very heavy rain that may lead to flash flooding. They are issues whenever severe weather is occurring or is expected to develop or move into an area.

This type of warning is anticipated to be the main trigger for flood response protocols to be implemented on this project due to the flash nature of flooding that could occur.

4.2 Flood Response Personnel

Flood wardens are to be appointed who will be available to monitor river/creek and rainfall conditions and who will have access to contact details for all personnel on site. It is recommended that the flood wardens be persons who are frequently on site and who are familiar with the daily construction activities and operations.

4.3 Assembly and Evacuation Routes

4.3.1 Emergency Assembly Area

The northern edge of the site has been nominated as the emergency assembly point as shown in **Figure 7**. Levels in this area are approximately RL 59 mAHD. This is at least 1 m above the adjacent 1% AEP flood level. This location is easily accessible and within view of staff and contractors.

Once everyone has assembled and been accounted for, evacuation will be undertaken as required to the agreed refuge location.

4.3.2 Evacuation Route

From the emergency assembly area, staff and contractors can evacuate via Glenwood Park Drive, which is expected to be free from flooding in storm events up to the 1% AEP.

In larger storm events, i.e. the PMF event, it is recommended to evacuate to the quadrangle in the existing site, as this is further away from the flooded area including Glenwood Reserve. Staff and contractors are then to evacuate in a southerly direction, towards Forman Avenue, away from expected flood waters.

It is unlikely that staff or contractors will be on site during a PMF event. It is expected that works will be suspended well ahead of the PMF event occurring. Staff and contractors will be required to evacuate in a PMF event prior to inundation occurring.

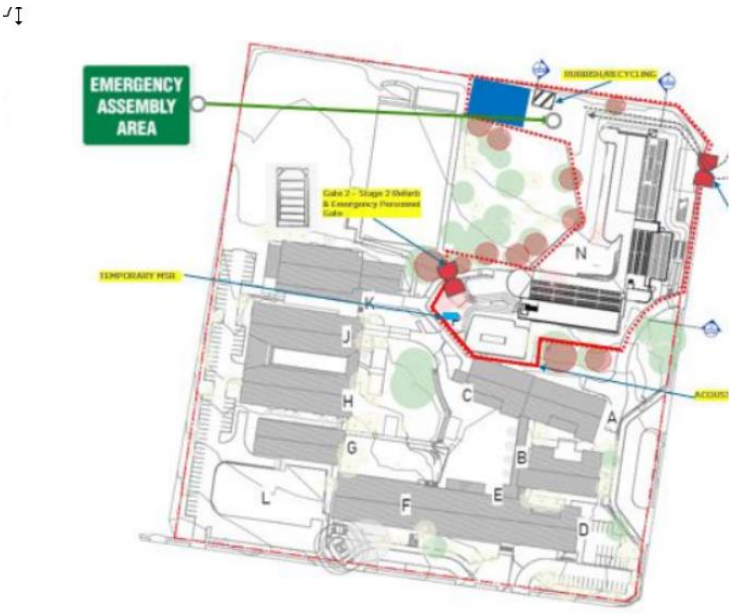

Figure 7: Proposed Emergency Assembly Area and Evacuation Route

4.4 Emergency Contact

For emergency assistance during flood events, contact SES on 132 500.

If a life-threatening situation emerges, contact Police, Fire and/or Ambulance on 000.

5 Flood Response Preparation

All staff and contractors on site are to be familiar with the contents of the FERSP. Reading of the FERSP should be part of the site induction.

5.1 Evacuation Drills

Evacuation drills are designed to increase flood awareness. Evacuation drills are to be undertaken within the first three months of site activities commencing, and twice yearly to familiarise all staff and contractors with the procedures when responding to a flood event.

All staff and contractors are to be aware of the emergency assembly point and the emergency refuge point.

5.2 Flood Emergency Kit

The SES recommends that the following items are prepared in a flood emergency kit:

- Air horn and handheld loudspeaker
- Portable radios with spare batteries
- A torch with spare batteries
- A first aid kit
- Candles and waterproof matches
- Waterproof bag for valuables

When leaving or evacuating, the following are to be placed into the emergency kit:

- Sign in book for visitors and contractors
- Individual Health Care items such as asthma puffers, diabetes medication and Epi pens, etc.
- Drinking water and non-perishable food items.

The flood emergency kit should be kept in a waterproof container in an easily accessible location. The contents of the kit and management during a flood event will be the responsibility of the **Flood Wardens**.

The flood emergency kit is to be checked periodically (monthly) to ensure all items are in suitable working order.

5.3 Monitoring of Weather

It is the responsibility of the Flood Wardens to monitor the weather situation to be aware if any warnings have been issued. This is to be actioned by checking of radio, television and the BOM website.

6 Flood Response Actions

6.1 Before Flooding

In order to mitigate the risk to life of staff and contractors, it is recommended that works be suspended on any day there is reasonable chance of rainfall up to 150mm (i.e. greater than 50% of rainfall of 100-150mm). This number represents the amount of rainfall required to produce a 1% AEP flood event.

The Flood Warden is responsible for reviewing weather forecasts daily and distributing notification of cancellation of staff and contractors.

Consideration should also be given to:

- Securing objects/plant that are likely to float and cause damage.
- Turning off mains power, water and gas
- Relocating chemicals above the predicted water level

6.2 During Flooding

If a flood warning is issued:

- Flood Warden to active project siren/hooter to raise alarm.
- Flood Warden to collect attendance register.
- Flood Warden to emergency assembly point
- Flood Warden to conduct roll call to establish if anyone is missing.
- Evacuate to refuge point as required.
- Wait at refuge point until the flooding has passed.
- Maintain regular communication with staff and contractors.

6.3 After Flooding

Once a Final Flood Warning or SES “All Clear” has been provided:

- A thorough check of services such as electricity, sewer, water and gas should be undertaken by qualified persons.
- Advice should be sought from a suitably qualified engineer as to the structural integrity of surrounding buildings.
- Personal protective equipment should be worn during the clean and disinfection should be used.

7 Revision of the FERSP

This plan should be revised if the expected flood behaviour within the catchment changes.

The FERSP should also be reviewed periodically and updated to reflect site activities and/or changes in personnel on site.

8 References

1. Blacktown City Council (2022, June 29) *BCC MapsOnline,* Blacktown City Council, https://maps.blacktown.nsw.gov.au/
2. Bureau of Meteorology (2022, June 29) *Flood Warning Services.* Bureau of Meteorology. http://www.bom.gov.au/water/floods/floodWarningServices.shtml
3. Department of Environment and Climate Change (2007) *Flood Emergency Response Planning Classification of Communities,* Department of Environment and Climate Change, https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Water/Floodplains/floodplain-risk-management-guideline-flood-emergency-response-160732.pdf?la=en&hash=07081CD0D12ABA36C56C7BDBBA4F829FA2D86738
4. Department of Planning and Environment (2022, June 29) *Floodplain Risk Management Guidelines*, Department of Planning and Environment, https://www.environment.nsw.gov.au/topics/water/floodplains/floodplain-guidelines
5. Enstruct (2021), Glenwood High School – Civil Engineering Flood Study Report
6. NSW State Emergency Service (2022, June 29) *Emergency Kit.* NSW State Emergency Service. https://www.ses.nsw.gov.au/floodsafe/prepare-your-home/emergency-kit/

Appendix A – CV

James Clare

Associate Director | Civil
Stormwater & Flood Modelling Specialist

Bachelor of Engineering (Civil, Construction)
Diploma in Engineering Practice
Member, Institute of Engineers Australia (MIEA)
National Engineering Register (NER)

James has honed his impressive Civil Engineering skills working over the last ten years with some of Australia's largest engineering groups, such as Lendlease Building and ACOR Consultants. He has also spent a year working for a small civil contractor providing James with valuable construction knowledge which he now applies to his current projects.

Joining SCP Consulting in 2016, James' knowledge and experience assisted him in achieving the position of Associate in June 2017. James is a highly proficient project manager and regularly manages multi-disciplinary projects delivered by SCP as a single point of contact for clients. This leads to successful development of engineering concepts through to construction and strong client relationships. James is known for his design expertise, attention to detail and enthusiasm to produce excellent results. Specialising in stormwater management and flood modelling, James has a wealth of knowledge across many stormwater and flood modelling software packages including HEC-RAS, DRAINS, WBNM and TUFLOW allowing him to provide in depth analysis of stormwater and flooding issues.

Skills and Expertise

- Flood modelling using hydrodynamic software models
- Stormwater hydraulics
- Environmental treatment systems
- Innovative approach to achieve significant cost benefits and best practice solutions to complex engineering problems
- Disciplined on-time and on-budget professional delivery on all projects
- Sound understanding of Local Government and Defence requirements
- Broad knowledge base across multiple disciplines resulting in the holistic delivery of projects

Value Add

- Recent experience at HMAS *Watson* Redevelopment creating the stormwater management plan
- Major project experience as civil engineering lead and stormwater designer
- Lead Civil Design Consultant on BaptistCare Affordable Housing (500 units across 8 sites) for Lendlease displaying a strong capacity for prioritising project elements across multiple large-scale developments
- Lead Civil Design Consultant on South Coast Correctional Centre for Lendlease optimising and finalising design for fast-tracked commencement of works on-site

Key Projects

- **South Coast Correctional Centre, NSW / $170M**
  360 bed expansion of existing correctional centre, civil, stormwater, pavements and earthworks.
- **BaptistCare Affordable Housing, NSW / $260M**
  500 units across 8 sites, master planning of civil infrastructure including stormwater, earthworks, pavements, and services coordination.
- **Royal Randwick Racecourse, NSW / $50M**
  Multi-storey car park, Kensington Track upgrade, earthworks, water quality and quantity management.
- **ATC Warwick Farm, NSW / $8M**
  Grass Track (A-Track), Stables Precinct, multiple sheds within the site, earthworks, water quality and quantity management.
- **University of Sydney Regiment, NSW / $80M**
  Mixed use development, civil and stormwater.
- **Hornsby Kuring-gai Hospital, NSW / $20M**
  Multi-storey car park, civil, stormwater, pavement and earthworks.
- **EST00346 TDL Redev & EST00347 KC-30A Facilities Project, NT**
  Civil, Traffic, Aerodrome Pavements, Hydraulic Building Services, Hydraulic Infrastructure, Hydraulic Building Services and Fire Protection (Wet) services were provided.
- **N2232 HMAS Watson Redevelopment, NSW / $160M**
  Development of a Stormwater Management Plan as part of the civil works.
- **Base Security Improvement Program (BSIP) / $200M**
  16x Defence bases / establishments across NSW, VIC, ACT and QLD.
- **Moorebank Units Relocation (MUR) Project, Holsworthy Army Base NSW / $800M**
- **MH-60R Romeo Seahawk Aviation Facilities Project, HMAS Albatross & Twofold Bay NSW / $200M**
  Naval Airfield Station Base including taxiways and Aprons.

Lovdeep Singh

Senior Civil Engineer

Bachelor of Engineering (Civil Construction)/Diploma in Engineering Practice (Hons)

Member, Institute of Engineers Australia (MIEA)

Lovdeep comes from a design background, having worked with WMAwater and Warren Smith and Partners (WS+P) over a period of five years. Since joining SCP in January 2020, Lovdeep has applied her skills and knowledge in the areas of flood modelling, hydraulic systems design, stormwater management planning and stormwater quality treatment system specification. Recently, Lovdeep has undertaken stormwater management design, including stormwater quantity and quality modelling, and flood modelling on the RAAF Base Tindal Redevelopment and RAAF Point Cook Redevelopment projects. Lovdeep is reliable and strives to work within a team to produce high quality deliverables within a given timeframe.

Skills and Expertise

- Flood modelling using hydrodynamic software models.
- Stormwater hydraulics.
- Environmental/WSUD treatment systems.
- Innovative approach to achieve significant cost benefits and best practice solutions to complex engineering problems.
- Disciplined on-time and on-budget professional delivery on all projects.
- Sound understanding of Local Government and Defence requirements.

Value Add

- Project experience as the Lead Civil Engineering Design Consultant and stormwater designer.
- Holistic approach to stormwater management and flood mitigation to reduce impacts as a result of proposed developments.
- Stormwater management designs to comply with Local Government stormwater and flood immunity criteria.

Key Projects

- **N2232 HMAS Watson Redevelopment, NSW**

  Civil and Stormwater Lead

  Stormwater management system for this coastal location including water quality and quantity management in accordance with local council criteria and foreshore harbour trust requirements.

- **EST00346 RAAF Base Tindal Redevelopment Stage 6 and EST00347 US Force Posture Initiatives (USFPI) RAAF Base Tindal Airfield Works and Associated Infrastructure Projects, NT**

  Civil, Hydrology and Stormwater Lead

  Basewide flood modelling and stormwater design to inform sitewide infrastructure upgrades including new Living-In Accommodation, Security Force Amenities, Visiting Squadron Facilities, Defence Communications Facilities, and Workers Accommodation Village.

- **RAAF Base Point Cook Redevelopment, VIC**

  Flood Modeller

  Establishment of basewide flood model including groundwater, sea level tidal affects, storm surge and climate change adaption factors. Stormwater quality modelling for selection of stormwater improvement devices.

- **Calvary Ryde ILUs, RACF, NSW**

  Civil and Stormwater Lead

  Development of aged care nursing homes including civil, stormwater, WSUD analysis, pavements, earthworks and associated public domain design.

- **RSL LifeCare Labuan ILUs, Narrabeen, NSW**

  Civil and Stormwater Lead

  Development of aged care nursing homes including civil, stormwater, WSUD analysis, pavements and earthworks.

- **Warwick Farm Course Proper, NSW**

  Flood Modeller

  Flood modelling and options assessment of proposed tracks and stormwater basins at the Warwick Farm racecourse to ensure no impacts are observed external to the racecourse.

- **Chatswood Education Precinct (CEP), NSW**

  Civil and Stormwater Lead

  Staged Chatswood High School and Chatswood Public School redevelopments, including temporary works development, civil, stormwater, WSUD analysis, flood mitigation, pavements and earthworks.

- **BaptistCare Carlingford, NSW**

  Civil and Stormwater Lead

  162-unit development across three buildings, including civil, stormwater, WSUD analysis, pavements, earthworks and significant downstream catchment analysis to Vineyard Creek.

- **Royal Randwick Racecourse, NSW**

  Civil and Stormwater Lead

  Multi-storey function centre within existing Ledger Lawn including civil, stormwater, WSUD analysis, pavements and earthworks.

- **University of New South Wales (UNSW) D14 Redevelopment, NSW**

  Civil and Stormwater Lead

  Redevelopment of the UNSW University Hall in accordance with Randwick City Council requirements including civil, stormwater, WSUD analysis, pavements, earthworks and combined services.

- **McCarrs Creek Road, Church Point, NSW**

  Stormwater Lead

  Design and construction services of stormwater associated with approximately 300m of realigned public roadway and a two-level carpark, taking into account significant upstream catchment.

- **Rainbow Street Public School, Randwick, NSW**

  Stormwater Lead

  Peer review of stormwater management plan and proposal of stormwater/OSD upgrades to ensure compliance with Randwick City Council requirements.

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