APPENDIX C

Construction Soil and Water Management Plan

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William Clarke College – Bryson Building

Construction Soil and Water management Plan

Rohrig

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1 INTRODUCTION

1.1 PURPOSE OF THIS DOCUMENT

This Construction Soil and Water Management Plan (CSWMP) has been prepared on behalf of Rohrig Constructions for the construction phase of the 'Bryson Building' within William Clarke College in Kellyville NSW.

This plan has been prepared to meet the standards defined in *Managing Urban Stormwater: Soils and Construction Vol 1, 4th Edition,* Chapter 2 Landcom, 2004 ('The Bluebook')

This plan has been prepared by an experienced Certified Professional in Erosion and Sediment Control (CPESC #6805).

1.2 SCOPE OF THIS DOCUMENT

This plan defines the management measures and erosion and sediment controls for the earthworks component of the proposed construction works.

As defined in chapter two of The Bluebook, this plan includes information on:

- Principles of erosion and sediment control
- Project specific requirements
- Geographic and climatic constraints and timing of works
- Topsoil storage and reuse
- Temporary site stabilisation and permanent rehabilitation
- Inspection and maintenance requirements
- A site layout drawing including:
    - Works footprint and location of proposed erosion and sediment control measures
    - Approximate grades and drainage patterns
    - Waterways and stormwater discharge points
    - Location of vegetation, for removal or retention (including no go zones)
    - Location of all soil and other material stockpiles
    - Location of site access, compounds and hardstands
    - Existing and proposed drainage patterns with stormwater discharge points.

1.3 SITE CONSTRAINTS

The site is located within an operational school. The school is located at the intersection of Wrights Road and Morris Grove, Kellyville (Lot 10 DP 1169003).

The total site disturbance area is expected to be approximately 0.29 hectares. The site is surrounded by existing school infrastructure and does not adjoin any roads or waterways.

The construction site is a highly disturbed landscape, and currently consists of a largely level, cleared surface approximately 130m long x 25m wide. The site grade is on average 3% and generally falls from north to south.

Figure 1-1 Disturbance footprint

Demolition of existing structures is complete, and the soil surface is bare.

Preliminary geotechnical testing indicates that:

- Salinity is unlikely the site
- The underlying geology is largely shale with bedrock encountered at depths of 0.3-2.4m below ground level
- Soils consist of fill to a depth of 0.2-1.2m, overlying and residual silty clays and weathered bedrock
- Groundwater is not expected to be encountered within excavation depth
- Site soils are not likely to containing potential contamination or actual acid sulfate soils.

There are no defined natural drainage lines within the site however there are existing stormwater inlets to manage surface water in the school adjacent.

The site is not considered flood prone, with inundation unlikely under the 1%AED.

Stormwater draining from the site would enter council stormwater system on Wrights Road and Morris Grove and ultimately into local creeks within the Cattai creek/Hawkesbury catchment.

Figure 1-2 Council stormwater assets

There is no existing vegetation within the site.

The site is not considered flood prone, but council flood mapping indicates potential inundation at probable maximal flood level (Georges River Council).

1.4 THE PROJECT

The project involves the construction of Stage 1 works at William Clarke College in Kellyville NSW. This stage of work is part of an approved masterplan for the school to meet the demands of the growing local community.

Stage 1 works have been approved by the Minister for Planning and Public Spaces (NSW) under section 4.38 of the Environmental Planning and Assessment Act (1979).

Rohrig will be undertaking the construction of the Bryson building as part of these approved stage 1 works including:

The works can be summarised as the below phases of construction

1. Site establishment and preliminary works
    a. Site hoarding, access, signage and fencing and temporary car parking
    b. Environmental controls installation
2. Bryson Building construction
    a. Groundworks and construction of new building
    b. Construction of footings and slab (north and south)
    c. Structural concrete and steel works
    d. Cladding and roofing of new building
    e. External works to the main building concurrent with
    f. Internal building services and fit out
    g. Defects rectification and commissioning
    h. Completion works and disestablishment

1.5 SITE CONTACT DETAILS

Role	Contact name	Contact detail
General Manager (Rohrig office)	David Campbell	02 9695 1668
Project Manager	Brad Blanshard	0435 755 307
Site manager	Andries van der Walt	0437 017 720

2 SOIL AND WATER MANAGEMENT

2.1 EROSION RISK

Erosion risk is a quantitative assessment of the potential risk for erosion from a site for the purposes of planning erosion and sediment control. This is based on a number of factors including rainfall, slope, soil types and site management conditions. The erosion risk has been determined for this site based on the Revised Universal Soil Loss equation (RUSLE) in Appendix A1 of the Bluebook.

Erosion risk (A) = R K LS P C

Assumed factors:

- R Rainfall erosivity = 3000 (Sydney R factor map)
- K Soil erodibility = 0.025 (Assume Type F, Glenorie landscapes silty clay, low dispersibility)
- LS Slope length/gradient = 1.00 (4m elevation/130mlength=3%)
- P Erosion control practice = 1 (worst case construction phase)
- C Groundcover management = 1.3 (worst case construction phase).
- Site disturbance area = 0.29 hectares

Based on an estimated soil loss of 97.5 tonnes per hectare per year, there is a generally low erosion risk from this site. This is mainly due to the low overall gradient, lack of concentrated flow paths and soil types. It should be noted that there would be batter areas with localised steeper slopes that may require additional management during works.

Based on the nature of the site and the low erosion risk, as per section 6.3.2 d of the Bluebook, a constructed sediment retention basin is not required.

Notwithstanding this, the erosion risk will be further reduced by taking a cautious approach to works planning to:

- Planning works around climate and weather for periods of reduced rainfall
- Focusing on temporary erosion controls during works to reduce risk of soil loss
- Installation and maintenance of sediment controls throughout works

2.2 TIMING AND STAGING OF WORKS

Weather conditions and forecasts are to be regularly monitored (as a minimum daily) during the earthworks stripping, reshaping and capping phases. Earthworks works will be put on hold in periods of rainfall where runoff cannot be managed effectively at the site. Note that unexpected storms may be experienced in this area.

Effective construction planning will be critical to reducing erosion risk at this site by minimising both area and duration of exposed soil surfaces during works. The re-establishment of stable surfaces progressively as the works move from earthworks into footing works will greatly reduce the areas susceptible to erosion.

Dust producing works should be put on hold during dry and/or windy periods if dust cannot be effectively mitigated and contained within the site boundary.

Temporary construction phase erosion and sediment control measures will be in place prior to commencement of earthworks and remain in place until suitable long term ground cover is established.

Long term erosion control would be established as part of construction including surfacing, planting and stormwater drainage works.

2.3 PRINCIPLES OF EROSION AND SEDIMENT CONTROL

The following general principles are to be adhered to during works:

- minimise disturbance footprint area and time of exposure through appropriate works planning

- focus on erosion control as a priority wherever applicable
- install sediment controls downslope before disturbing ground and for the duration of disturbance
- monitor and maintain controls to ensure function, especially before and after rain
- progressive stabilisation of disturbed areas should be undertaken during works
- review and update the plan as required as site conditions change through the works.

2.4 DISCHARGE CRITERIA

Any water discharged from site is to have a neutral or beneficial effect on receiving water quality.

Table 2-1 Site Discharge criteria

Criteria	Measurement
Turbidity	<=50 NTU
pH	6.5-8.5
Contamination (other chemical)	Within ANZECC guidelines

2.5 EROSION CONTROL

The most effective erosion control is to avoid disturbance of stable soil surfaces. Existing ground cover and site vegetation is to be retained, where feasible, to minimise the risk of erosion. This can be achieved through:

- Delineation of no-go areas on site to avoid disturbance unless necessary
- Progressive stabilisation of disturbed areas during works
- Temporary erosion control measures implemented on bare soil areas during works
- Installation of permanent erosion control measures progressively, ASAP and at completion.
- Construction of a sealed stable access road and site parking

2.6 SEDIMENT CONTROL

Sediment controls are to be installed prior to ground disturbance and maintained for the duration of works until site is stabilised with effective revegetation. Measures that will be implemented include:

- All sediment controls are be monitored and maintained regularly to ensure function during construction
- Controls may only be removed once site stabilisation and make good is complete
- No spoil is to be stockpiled without appropriate sediment control in place
- All stormwater pits within and directly downslope of the site are to have temporary inlet protection installed prior to ground disturbance and maintained for the duration of works
- Ensure that controls are monitored and cleaned out after rainfall as required to ensure function by removing deposited sediment
- Removed sediment can be reincorporated as fill on the site or disposed of offsite at a licenced facility.

As a minimum the following sediment control measures are to be implemented at this site for the duration of disturbance:

- Sediment fencing to be erected around the entire boundary of the works disturbance area where there is a risk of sedimentation offsite (installation as per figure SD-8 in the Bluebook)
- Stormwater inlets are to be protected with effective sediment controls
- Refer to the site-specific soil erosion sediment control plan in section 3 of this document for locations of controls

2.7 SITE ACCESS

During the works controls will be placed on the operation and movement of equipment to reduce risk of sediment tracking offsite. General procedures that will be implemented include:

- Excavation equipment to be cleaned of soil and contamination prior to leaving the site
- Effective truck wheel cleaning facilities will be provided at the site egress to minimise risk of tracking onto the nearby streets if trucks leave sealed areas.
- In wet weather, trucks that may have to exit the site are to avoid traversing unsealed or muddy areas
- Construction vehicles are to enter and exit the site only via a stable sealed access road off Morris Grove
- No trucks or equipment carrying contaminated soils should be allowed to move across unsealed ground surfaces with the exception of designated transport corridors.
- All vehicle loads transporting soil, or potentially contaminated materials are to be covered, to minimise dust generation / material falling from the vehicle.
- The stabilised access point is to be maintained for the duration of the works in a condition that will prevent tracking of sediment onto roads
- If sediment does track onto the road for any reason, remove it immediately via broom (do not use hose to wash sediment into gutter or drain)
- Check the stabilised access at the end of each day and before and after a rain event to ensure function

2.8 STOCKPILE MANAGEMENT

Surplus soil requiring off-site disposal will be classified in accordance with NSW EPA, Waste Classification Guidelines (2014) prior to being taken off site and transported to an appropriately licenced landfill facility.

Site excavated material may require temporary stockpiling prior to removal or reuse as backfill. The following will be implemented for stockpiles:

- Stockpiles are not to be located in drainage lines
- If stockpiles and batters will remain bare for more than 14 days, they are required to be stabilised or covered
- Stockpiles are to have an upslope diversion and downslope sediment control in place for duration as per standard drawing 4-5 in the Bluebook
- Separate differently classified materials from each other and from the surrounding soils to avoid cross contamination
- All stockpiles of soil or other materials likely to generate dust shall be covered
- Daily inspections will be undertaken to ensure that stockpiles are contained within control measures.

2.9 COMPOUND AREA

Stable site parking and amenities are to be established at the northern section of the site.

2.10 DUST MITIGATION

During construction works must be undertaken so that activities are carried out in a manner that minimises dust including emission of wind-blown or traffic generated dust.

Demolition of existing buildings has been completed prior to Stage 1 construction works and all potentially hazardous in situ building materials removed from site.

Mitigation measures are to be implemented to reduce the risk of dust generation during Stage 1 works including:

- All trucks to have their loads covered

- Vehicle speed limits are to be reduced to low speeds (<20kmh) on unsealed road surfaces
- The main vehicular access to the site from Morris Grove will be bitumen sealed
- Unsealed access roads are to be monitored and maintained to reduce vehicle generated dust.
- A water sprinkler system will be utilised during construction to mitigate dust generation
- A stable site access (grid) is constructed so that vehicles do not track dirt onto the sealed road network
- Public roads adjacent to the site are monitored and cleaned of dirt if required using manual or plant mounted brooms (not hosed into stormwater)
- Disturbed areas are to be stabilised progressively on site to minimise exposed soil surfaces.
- Bare soil areas or stockpiles that generate dust are to be stabilised or covered
- Demolition works are to have dust mitigation measures in place such as hosing or misting to reduce dust

If dust cannot be kept within the site boundary, then works should be stopped and methodology reviewed to mitigate dust generation.

2.11 SITE DRAINAGE

Structures required to convey concentrated flows of water through the site are required to:

- Divert 'clean' upslope water away from disturbed areas and reduce erosion risk and
- Convey 'dirty' site generated water through sediment controls

The existing site drainage consists largely of uncontrolled overland flow. There is existing stormwater inlets adjacent to the site.

2.11.1 DRAINS

Drains installed on bare soil within the site for the duration of works are to have erosion protection measures to ensure that concentrated flows do not erode drains.

For installation guidance, refer to Bluebook standard drawings 5-22 for check dams and 5-28 for geofabric lining.

2.12 VEGETATION MANAGEMENT

All existing vegetation within the site has ben removed prior to works.

Revegetation of the completed works will comprise of landscaped features.

2.13 MAINTENANCE OF CONTROLS

All controls are to be inspected daily and maintained to ensure function as per intended use:

- Monitor weather forecast regularly for likely rainfall or wind impacts
- Inspect all sediment control measures regularly – particularly before and after rainfall
- Make repairs as needed to ensure function of control measure
- Remove collected sediment from controls after rainfall events
- Dispose of trapped sediment spoil offsite, or as excavation backfill if suitable
- Maintain records of checks and maintenance of controls

2.14 PLAN REVIEW

This plan is to be reviewed regularly during works and updated as required to reflect changes in site conditions or scope as the project progresses.

Site controls as per the site ESCP in section are to be reviewed for functionality and changed or upgraded as required as site works progress and if current controls inadequate to mitigate sedimentation from the site.

3 EROSION AND SEDIMENT CONTROL PLAN

A site-specific soil erosion and sediment control plan has been prepared (Birzulis associates July 2023).

This plan denotes the types and locations of controls to be implemented during the project on sheet 1.

Standard drawings and notes for installation are provided on sheet 2.

Further guidance on installation can be obtained via the following standard drawings in the Bluebook:

- SD4-1 Stockpiles
- SD 6-8 sediment fence
- SD 6-9 alternate sediment fence
- SD6-11 inlet filter
- SD 6-12 geotextile inlet filter
- SD 6-14 Stabilised site access