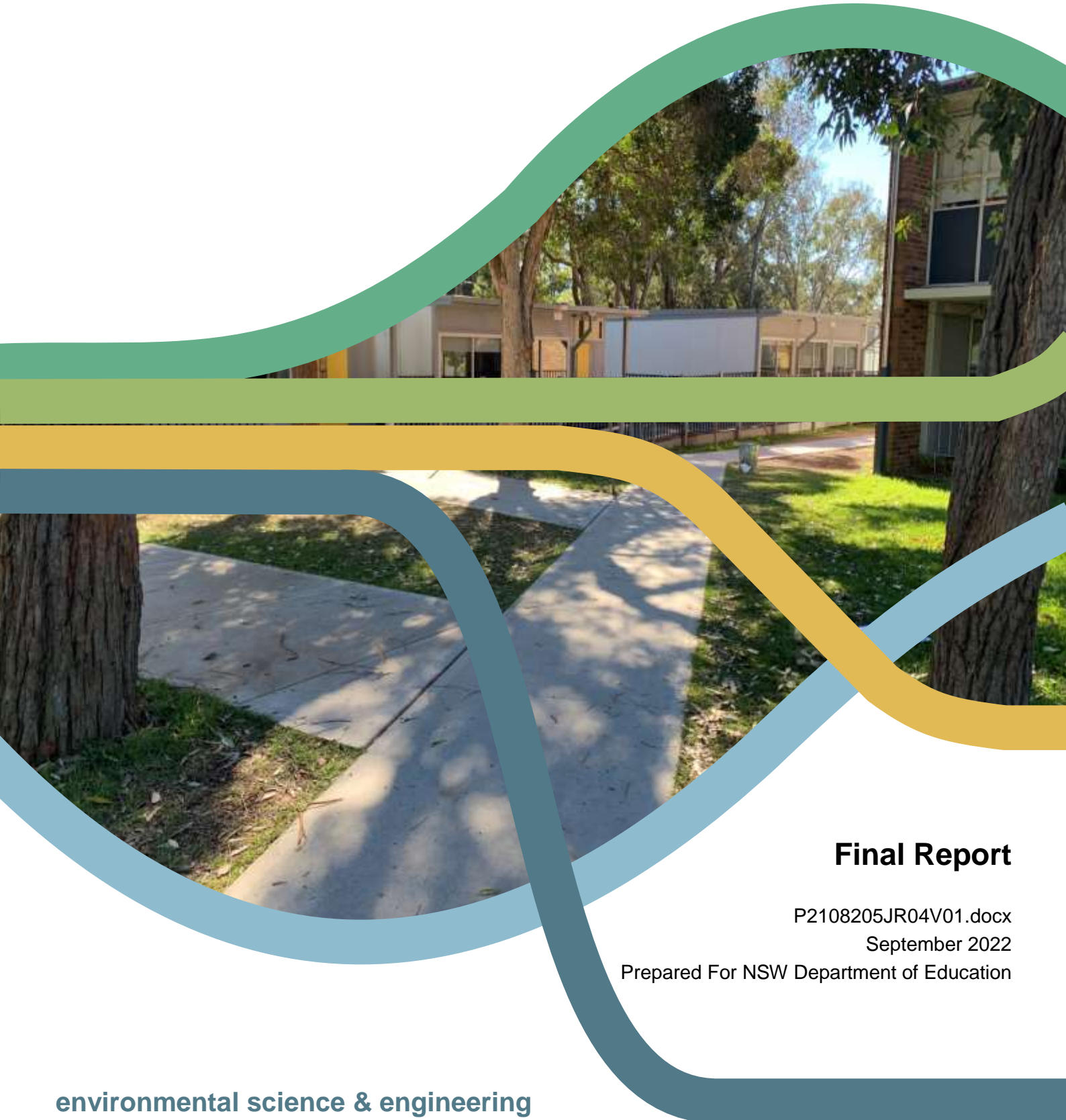


# Remedial Action Plan

Cronulla High School, Captain Cook Drive, Cronulla, NSW



**Final Report**

P2108205JR04V01.docx

September 2022

Prepared For NSW Department of Education

## Project Details

<b>Report Title</b>	Remedial Action Plan: Cronulla High School, Captain Cook Drive, Cronulla, NSW
<b>Client</b>	NSW Department of Education
<b>Document</b>	P2108205JR04V01.docx
<b>Director</b>	Daniel Martens
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## Document History

Issue	Issue Date	Status	Description / Comment	Author	Reviewer	Approved
1	8/09/2022	Draft	For Client Review	WX	BM, JF	JF
1	09/09/2022	Final	Final Report	WX	BM, JF	JF

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## Glossary of Terms

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ABC	Ambient background concentrations
ACM	Asbestos containing material
AEC	Area of environmental concern
AF/FA	Asbestos fines / Fibrous asbestos
ANZECC	Australia and New Zealand Environment Conservation Council
ANZG	Australian and New Zealand Governments
ARCP	Asbestos Removal Control Plan
ASC NEPM	National Environmental Protection (Assessment of Site Contamination) Measure (2013)
ASS	Acid sulfate soil
ASSMAC	Acid Sulfate Soils Management Advisory Committee
AST	Above ground storage tank
BGL	Below ground level
BH	Borehole
BTEXN	Benzene, toluene, ethylbenzene, xylene, naphthalene
CEMP	Construction Environmental Management Plan
COC	Chain of custody
COPC	Contaminants of potential concern
DA	Development application
DP	Deposited Plan
DPI	NSW Department of Primary Industry
DPIW	NSW Department of Primary Industry – Water
DQI	Data quality indicators
DQO	Data quality objectives
DSI	Detailed Site Investigation
EIL	Ecological investigation level
EMP	Environmental Management Plan
EPA	NSW Environmental Protection Authority
EQL	Estimated quantitation limit (interchangeable with PQL and LOR)
ESL	Ecological screening level
HHRA	Human Health Risk Assessment
HIL	Health investigation level
HSL	Health screening level
IA	Investigation area
LARC	Licensed Asbestos Removal Contractor
LGA	Local government area
LOR	Limit of reporting (interchangeable with EQL and PQL)
MA	Martens & Associates Pty Ltd
mAHD	Metres, Australian Height Datum
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
OCP	Organochloride pesticides
OPP	Organophosphorus pesticides
PACM	Potential asbestos containing material
PAH	Polycyclic aromatic hydrocarbons
PCB	Polychlorinated biphenyl
PFAS	Per and polyfluoroalkyl substances
PID	Photoionisation detector
ppb	Parts per billion

ppm	Parts per million
PQL	Practical quantitative limit (interchangeable with EQL and LOR)
PSI	Preliminary Site Investigation
QA/QC	Quality assurance / quality control
RAC	Remediation Acceptance Criteria
RAP	Remedial Action Plan
RPD	Relative percentage difference
RSGC	Royal Sydney Golf Club
SAC	Site assessment criteria
SAQP	Sampling and Analysis Quality Plan
SEPP	State Environmental Planning Policy
SIL	Soil investigation level
SOP	Standard operating procedure
SWL	Standing water level
SWMS	Safe Work Method Statement
TB	Trip blank
TCLP	Toxicity characteristics leaching procedure
TEQ	Toxic equivalency factor
TP	Test pit
TPH	Total petroleum hydrocarbons
TRH	Total recoverable hydrocarbons
TS	Trip spike
UCL	Upper confidence limit
UPSS	Underground petroleum storage system
UST	Underground storage tank
VOC	Volatile organic compounds
WHS	Work health and safety



# 1 Introduction

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## 1.1 General

This Remedial Action Plan (RAP) has been prepared by Martens and Associates Pty Ltd (MA) on behalf of the NSW Department of Education (DoE) to document remediation requirements for proposed redevelopment works at Cronulla High School (CHS), located at Captain Cook Drive, Cronulla, NSW (the site).

The investigation area (IA) for this RAP is limited to the proposed development location in the south western site portion of CHS, as noted on the development plans prepared by Fulton Trotter Architects (FTA, 2022). The proposed development is in the vicinity of Building 'L', Building 'M', Building 'I', and the new carpark and main entry area adjacent to Bate Bay Rd as shown in Appendix B.

This RAP has been prepared with reference to the NSW EPA (2020) *Consultants Reporting on Contaminated Land, Contaminated Land Guidelines*.

## 1.2 Background

Based on existing information provided to MA, the site has known asbestos containing material (ACM) impacted soils. An Asbestos Management Plan (AMP) (WSP, 2020), was provided by CHS and reviewed by MA as part of recent site contamination investigation works. The AMP identified five wider site areas with potential ACM impacts. One of the five areas identified in the AMP, noted as Area E, was located within the proposed development footprint and IA.

Prior to RAP development, MA undertook multiple contamination assessments in the IA including a and a Fill Characterisation Assessment (FCA) (MA, 2022a) and a Detailed Site Investigation (DSI) (MA, 2022b). These works identified 1 fragment of ACM in a total of 10 test pits and 18 boreholes completed across the IA. FCA and DSI reports concluded that the risk to human health by ACM impacted soil was considered to be 'low' provided that this material remained undisturbed.

As the proposed development involves bulk excavation at the location of ACM impacted soil area E (WSP, 2020) and within the location of confirmed ACM impacted soil identified in MA site investigations, the implementation of a Remedial Action Plan (RAP) during proposed earthworks is required. This RAP will therefore guide the management and validation of site within ACM impacted fill areas (Map 01 of Appendix A) during proposed earthworks to reduce exposure risk to sensitive receptors during and post development works.

## 1.3 Proposed Development

MA understands from schematic design plans by FTA (July 2022) and preliminary cut / fill plans provided by Cardno (July 2022) that proposed works in the IA are to include:

- Removal of demountable classroom buildings from the south western site portion.
- Construction of two new double storey buildings (Building 'L' and Building 'M') and a new on grade car park.
- Relocation of shade structure adjacent to Building D.
- Construction of a new onsite stormwater detention (OSD) system.

- Landscaping of main entry off Bate Bay Road.
- Internal refurbishment of existing Building D (no ground works associated with this).

Proposed development plans are provided in Appendix B.

From review of the preliminary cut / fill plans (Cardno, 2022), it is understood that bulk excavations will predominantly be limited to the new carpark, OSD and landscaping locations for the main entry. At the time of this report, MA had been advised by the Client that cut is likely to exceed filling requirements for the project. Subsequently, it was proposed that over excavation of natural material be undertaken so that ACM impacted fill material which is disturbed as part of the development works can be retained onsite and capped underneath proposed structures or hardstand.

## 1.4 Objectives and Scope of Work

This RAP outlines a strategy for remediation and management of site soil impacted with ACM. Specifically the objectives of the proposed strategy is to:

- Allow the proposed cut and fill earth works to proceed in a manner which ensure a low and appropriate level of risk to site construction workers and nearby sensitive receptors.
- Ensure that the site is suitable for future use as school at the completion of redevelopment works.

To meet the above objective the RAP shall provide:

- A summary of previous site investigation and information relating to known site contamination and characterisation of site contamination.
- Discussion of the extent of remediation required.
- Developing remediation goals and remediation criteria.
- Discussion of possible remediation options.
- Rationale for the selection of the preferred remediation option.
- A remediation plan to implement the preferred remediation option.
- An outlined of the requirements of future site safety and management plans to be followed during the remediation works.
- A process to validate the site after remediation.
- Identification of regulatory compliance requirements.
- Contingency plans to protect the surrounding environment and community during remediation.

## 2 Site Description and Background

### 2.1 Location and Setting

Site information is summarised in Table 1 and shown in Attachment A.

**Table 1:** Site Information Summary.

Item	Description / Detail
Site address	Captain Cook Drive, Cronulla, NSW
Legal identifier	Lot 1 in DP 815804
IA area	8468 m <sup>2</sup> (QGIS, 2022)
Approximate ACM Impacted Soil Area	1439 m <sup>2</sup> (QGIS, 2022)
Local Government Area	Sutherland Shire Council
Current zoning and land use	SP2 – Special purpose infrastructure The site is currently used as a school.
Site description	At the time of investigations, the site contained classroom buildings, teaching facilities and on grade car parking in the south western portion, and sports fields in the north eastern portion.
Surrounding land uses	Surrounding land use was as follows: <ul style="list-style-type: none"> <li>○ Woolooware Wader Lagoon and Woolooware Bay to the west and north west.</li> <li>○ Cronulla Golf Course to the south west.</li> <li>○ Low to medium density residential properties to the north east, east and south.</li> <li>○ Cronulla Wastewater Treatment Plant beyond residential properties to the north east (approximately 700 m from the site).</li> <li>○ Greenhills Beach and Bate Bay beyond residential properties to the east.</li> </ul>
Topography	The site was generally flat, with mild slopes typically around 2%. A batter slope with grades of approximately 20% was located in the south western portion of the site, sloping down towards the western boundary. Elevation ranged between approximately 6 mAHD at the eastern boundary, and 2 mAHD western boundary (LandPartners, 2020).
Geology and soil mapping	The Wollongong – Port Hacking 1:100,000 Geological Sheet 9029 – 9129 describes site geology as being Quaternary deposits, comprising medium to fine “marine” quartz sand with podzols. The NSW Environment and Heritage eSPADE website identifies the site as being located in an area of ‘disturbed terrain’, with potential for highly variable soils to depths of at least 1 mbgl, where most of the original natural material may have been removed, buried, or greatly disturbed.
Surface hydrology	The site was drained by internal stormwater infrastructure (pit / pipe network) which discharged to Captain Cook Drive to the west.

## 3 Summary of Previous Investigations

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### 3.1 Overview

The following contamination investigations have previously been undertaken for the CHS site:

- Cardno (2020) Preliminary Site Investigation: Cronulla High School. Report ref. 80821137.
- WSP (2022) Asbestos Management Plan: Cronulla High School. Report ref. 8261\_ASB\_301017\_AMP\_RevA.
- MA (2022a) Detailed Site Investigation: Cronulla High School, Cronulla, NSW. Report ref. P2108205JR01V02.
- MA (2022b) Fill Characterisation Assessment: Cronulla High School, Cronulla, NSW. Report ref. P2108205JC02V01.

Reports are summarised in the following sections.

### 3.2 Asbestos Management Plan (WSP, 2020)

An AMP was previously completed by WSP in June 2020 (Ref. 8261\_ASB\_301017\_AMP\_RevA) which detailed the presence of asbestos containing material (ACM) at the site, and outlined procedures used to remediate ACM and manage asbestos related health risks.

The AMP (WSP, 2020) identified surficial bonded ACM in five areas, located in the grassed south western portions of the site. One of the five locations (Area E) was located within the IA for the current development works. All locations were sparrow picked to remove visually accessible ACM, however WSP noted that ACM may have also impacted subsurface fill material. The AMP assessed risk to human health to be 'low' provided that this material remained undisturbed. Should the material be disturbed, the AMP recommended a Remedial Action Plan (RAP) be implemented for areas of ACM impacted soil.

### 3.3 Preliminary Site Investigation (Cardno, 2020)

A preliminary site investigation (PSI) was previously completed for the site by Cardno in November 2020 (Ref. 80821137), which identified potential sources of contamination across the site. The scope and findings of this PSI are summarised in Table 2.

**Table 2:** PSI (Cardno, 2020) Summary.

Investigation Details	Investigation Findings
Scope of works	<ul style="list-style-type: none"> <li>○ Desktop review of previous reports, aerial photographs, online databases and land title information.</li> <li>○ Review of local geology, hydrogeology and topography maps.</li> <li>○ Site walkover to review existing site conditions.</li> <li>○ Preparation of a PSI report in accordance with appropriate guidelines.</li> </ul>
Key findings of historic site review and walkover	<p>Cardno's review of historical aerals indicated that the site had been used as a school since 1961, with some additional construction and renovation of school buildings and sports fields occurring in the years since. Prior to its use as a school, the site contained minor roads and trails. Quarrying of sand dunes at Greenhill Beach to the east of the site occurred between 1956 and 1990, and the Cronulla Wastewater Treatment Plant to the north west of the site was constructed sometime between 1975 and 1983.</p> <p>The site walkover identified that:</p> <ul style="list-style-type: none"> <li>○ The site predominantly contained hardstand with a few maintained garden beds.</li> <li>○ A number of school buildings included vermiculite ceilings, which has the potential to contain asbestos.</li> <li>○ Minor chemicals and dangerous goods including organic and kerosene waste were kept in prep rooms for science classes.</li> <li>○ Rainwater tanks were observed on the site.</li> <li>○ The assembly hall and surrounding walkways were unable to be visually assessed due to ongoing examinations.</li> </ul>
Identified AEC and COPC	Cardno identified one potential contaminant source, being the vermiculite ceilings which had the potential to contain asbestos.
Recommendations	<p>Based on the findings of the PSI, Cardno concluded the following:</p> <ul style="list-style-type: none"> <li>○ There is low potential for site soils to be significantly contaminated.</li> <li>○ Should buildings containing vermiculite ceilings be disturbed or redeveloped, a suitably qualified hygienist should be present during construction works to ensure removal of asbestos waste.</li> <li>○ Asbestos waste should be disposed of at a facility licenced to accept Special Waste.</li> </ul>

### 3.4 Fill Characterisation Assessment (MA, 2022a)

Findings of the WSP (2020) AMP indicated the former presence of surficial ACM in five locations across the south western site portion. However, given that fill material had been identified in these locations, MA considered, that there was a reasonable risk of additional ACM contamination at depth within the fill profile.

In consideration of the proposed development plans, MA undertook a FCA (report reference P2108205JC02V01, dated 11 March 2022). Works involved test pitting to assess the extent of subsurface asbestos impact Area E (WSP, 2020) in accordance with ASC NEPM (2013) and WA DoH (2009). FCA investigation locations are provided on Map 02 in Appendix A and the FCA should be read in conjunction with this report.

FCA investigations encountered a single fragment of bonded asbestos in fill material at depth, which, based on results of laboratory analysis and w/w% calculation, was found to be below the adopted HSL (0.02% w/w) provided in ASC NEPM (2013). Laboratory testing of collected soil subsamples did not detect any asbestos fines or fibrous asbestos (AF / FA), and no ACM was observed at the ground surface. Additionally, air monitoring completed by Airsafe reported no detections of measurable airborne asbestos fibres during FCA investigations. Therefore, MA considered that the fill material assessed to date carried a very low contamination risk for current and future site receptors provided that material remained undisturbed.

### 3.5 Detailed Site Investigation (2022b)

A DSI was undertaken for the IA and the report is summarised below in Table 3.

**Table 3:** Site Contamination Assessment (MA, 2022b) summary.

Investigation Details	Investigation Findings
Scope of works	<ul style="list-style-type: none"> <li>○ Review of previous site documentation.</li> <li>○ Intrusive subsurface investigations and soil sampling.</li> <li>○ Laboratory analysis of samples for COPC.</li> <li>○ Preparation of a SCA report</li> </ul>
CSM summary	<p>The site CSM identified the following AEC requiring assessment</p> <ul style="list-style-type: none"> <li>○ The entire IA, which may be impacted by fill of unknown origin.</li> <li>○ Existing school structures.</li> </ul>
Field investigations	<p>Subsurface soil investigations were completed on 22 and 23 May 2021 concurrently with the geotechnical investigation (MA, 2022a), and involved:</p> <ul style="list-style-type: none"> <li>○ Excavation of 10 boreholes (BH101 - 110) using a 4WD mounted drill rig fitted with solid flight augers, to a maximum investigation depth of 10.0 mbgl.</li> <li>○ Collection and analysis of representative soil samples.</li> <li>○ Collection of three QA / QC samples for laboratory analysis.</li> </ul> <p>Additional subsurface soil investigations were completed on 6 July 2022 concurrently with the geotechnical investigation (MA, 2022b), and involved:</p> <ul style="list-style-type: none"> <li>○ Excavation of 8 boreholes (BH201 - 208) using a 4WD mounted drill rig fitted with solid flight augers, to a maximum investigation depth of 1.5 mbgl.</li> <li>○ Collection and analysis of representative soil samples.</li> <li>○ Collection and analysis of four surficial asphaltic cement samples.</li> <li>○ Collection of one QA / QC samples for laboratory analysis.</li> </ul>
Results of field observations	<p>Initial field observations on 19 May 2021 were as follows:</p> <ul style="list-style-type: none"> <li>○ The south western site portion contained all classroom buildings and teaching facilities for the Cronulla High School campus.</li> <li>○ The south western site portion was mostly covered by hardstand, with managed lawns and scattered trees along the western and southern boundaries.</li> <li>○ The north eastern site portion contained grassed sports fields and a sports club house.</li> <li>○ The batter slope located parallel with the south western boundary appeared to consist of fill and was an unnatural topographical feature. Filling was likely undertaken to create site levels. No anthropogenic inclusions, soil staining or unnatural odours were observed at the surface of the fill material.</li> <li>○ No surficial ACM was observed during the inspection. However, it should be noted that a detailed inspection of the north eastern site portion containing sports fields (outside the IA) was not undertaken as part of this assessment.</li> <li>○ All site buildings and pavement were observed to be in good condition.</li> <li>○ Cronulla Golf Course and Woolooware Wader Lagoon were located to the west and north west of the site, respectively. The site was surrounded in all other directions by low to medium density residential development.</li> <li>○ No obvious current potentially contaminating activities were noted on or adjacent to the site during the inspection.</li> </ul> <p>Investigation works undertaken on 22 and 23 May 2021 and 6 July 2022 did not observe any signs of surficial or sub surface contamination (odours, staining, anthropogenic inclusions etc.). Site structures and conditions had remained generally unchanged, as compared to the inspection undertaken on 19 May 2021, between the times of both inspections.</p>
Results of soil investigations and sampling	<p>Soil analysis were below the adopted SAC for all contaminant concentrations in all samples and no ACM was observed in any borehole, apart from minor anthropogenic inclusions.</p>

Investigation Details	Investigation Findings
Recommendations	As the proposed redevelopment works involve bulk earthworks within the IA, a RAP was recommended to address remedial strategies and management of ACM impacted soils should they be encountered during bulk earthworks.

## 4 Extent of Remediation Required

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### 4.1 Remediation Area

Based on the existing site contamination information discussed in Section 3, the proposed earthworks areas have been divided into two separate areas as presented below. The indicative extent of these areas is presented in Map 01 in Appendix A.

#### 4.1.1 ACM Impacted Fill Area

The ACM impacted fill area will require supervision and visual inspection during excavation by environmental consultant / hygienist to confirm if asbestos is present and how it is best managed (i.e. placed in capping area, disposed offsite or tested and validated for reuse onsite).

#### 4.1.2 Non ACM Impacted Areas

This area generally contains natural soil or shallow fill which is different to the ACM impacted fill described above. Supervision by an environmental consultant / hygienist is not expected to be required for earthworks in these areas, other than if / where ACM impacted fill is placed in these areas as part of strategic reburial of material or where unexpected finds are observed.



## 5 Conceptual Site Model

Based on identified contaminants or concern provided in the DSI (MA, 2022b) and the current site status, a Conceptual Site Model (CSM) has been developed to guide remedial options.

### 5.1.1 Contamination Source

Based on the findings of these investigations the primary source of contamination within the IA is the possible presence of ACM impacted soil.

### 5.1.2 Potential Exposure Pathways and Receptors

A CSM based on the AEC and COPC identified in the DSI (MA, 2022b), and the associated exposure pathways to potential receptors, is summarised in Table 4.

**Table 4:** Conceptual site model.

Item	Description
Affected Media	Soil has been identified as the primary source of contamination for the site.
Potential Receptors	<p>Based on results of past investigations and the proposed development, there may be a potential risk to future construction workers that will be involved the proposed earthworks.</p> <p>Once ACM impacted fill material are capped and contained under hardstand or proposed structures, ACM contamination in fill material would be considered low to all human receptors as it is below the NEPM criteria (not within top 100 mm and less than w/w% criteria).</p>
Potential Exposure Pathways	<p>Potential exposure pathways include ingestion and inhalation of dust.</p> <p>At the time of this DSI, the site surface was covered by hardstand in areas of higher traffic / student circulation, and managed lawns in all other areas. Therefore there was no easily identifiable complete pathway between contaminants and current receptors.</p> <p>However the proposed development may present complete exposure pathways where hardstand is to be removed, or subsurface material is to be disturbed such as during earthworks and / or excavations. In particular, the area of the site containing identified filling and potential subsurface ACM presents an increased risk to human health when soils are disturbed.</p>

### 5.1.3 CSM Discussion

The ACM identified within TP305 (MA, 2022a), was generally considered to be in good condition. Therefore the risk of exposure to human receptors is considered low. However, when ACM is subject to damage, breaking or cutting, during the proposed earthworks process, it could still present a risk of loose asbestos fibre release. Proposed redevelopment of the site will intercept areas of the site where the ACM impacted soil may be encountered and will present a risk to site workers and the public if not managed appropriately during the development works.

## 5.2 Remediation Criteria

Remediation acceptance criteria (RAC) for the entire site is shown in Table 5.

**Table 5:** Remediation Acceptance Criteria.

Contaminant	Adopted Remediation Validation Level
Asbestos	<u>HSL C – Recreational land use:</u> All forms of asbestos - no visible asbestos for surface (top 100 mm) soils. Bonded ACM – 0.02% (w/w). Friable asbestos (AF / FA) - 0.001% (w/w).

## 6 Remediation Goals, Options and Recommendations

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### 6.1 Remediation Goals

The goal of remediation works is to:

- Allow the proposed earthworks to proceed in a manner which ensures a low and appropriate level of risk to site construction workers and nearby sensitive receptors.
- Ensure that the site is suitable for future use as school at the completion of redevelopment works.

### 6.2 Assessment of Remediation / Management Options

Soil remediation options were considered with regards to ASC NEPM (2013) preferred hierarchy of options for site clean up and / or management, namely:

1. Onsite treatment of the contamination so that is it destroyed or nullified, and the associated risk is reduced to an acceptable level.
2. Offsite treatment of excavated soil, so that the contamination is destroyed or nullified and the associated risk is reduced to an acceptable level, after which the soil is returned to the site.
3. Removal of contaminated material to an approved facility, followed, where necessary, by replacement with appropriate material.
4. Cap and contain material onsite with an appropriately designed barrier.
5. Where the assessment indicates that remediation would have no net environmental benefit or a net adverse environmental effect, implementation of an appropriate management strategy.

Review of available soil remediation strategies and technology considered on the basis of:

- Effectiveness at achieving remediation objectives in review of the updated CSM.
- Suitability considering the proposed development.
- Anticipated costs.
- Ongoing environmental and public health adequacy.

A review of treatment options is presented in Table 6.

**Table 6:** Review of Remediation / Management Options.

Remediation Option	Advantages	Disadvantages	Comments
Strategic reburial and capping of ACM impacted soil	<ul style="list-style-type: none"> <li>○ No costs incurred for offsite waste disposal.</li> <li>○ Human health risk is mitigated through separation.</li> <li>○ Compatible with proposed development design.</li> </ul>	<ul style="list-style-type: none"> <li>○ Will not remove asbestos impacted soil material.</li> <li>○ Future liability due to entombed contaminated material.</li> <li>○ Will require an Environmental Management Plan (EMP) or an update to the existing AMP to manage ongoing risks and note on title. ACM impacted soils may only be handled through the remediation process by suitably qualified and licenced personnel / contractors.</li> </ul>	Containment of ACM impacted soil by relocation will likely be compatible with proposed development objectives as bulk excavation involves offsite disposal of excavated natural material and capping of excavated fill material under proposed development structures and hardstand.
Offsite disposal of ACM impacted soil	<ul style="list-style-type: none"> <li>○ Will provide the shortest timeframe for remediation.</li> <li>○ Removes human health risks and long term management requirements by removing contamination from the site.</li> <li>○ Relatively low amount of material requiring offsite disposal.</li> </ul>	<ul style="list-style-type: none"> <li>○ Cost of material classification, transport and disposal.</li> <li>○ Not compatible with proposed redesign as excavated fill material will be re used on site and capped in hardstand.</li> </ul>	Offsite disposal of ACM impacted soil will remove identified contamination and associated risk from the site, however it is not compatible with the proposed redesign as excavated fill material will be re used on site and capped in hardstand.

### 6.3 Preferred Remediation Option

In consideration of the proposed development, the CSM and information from DoE, the preferred remediation option will be to implement a strategic reburial and capping strategy for soils impacted with ACM. A summary of the strategy is as follows:

- Soils cut from ACM impacted areas (as outlined in Map 01) shall be excavated as required by the proposed earthworks and transported and placed into various capping areas beneath future hardstand areas or future site structures. Capping areas may need to be over excavated prior subject to cut / fill volumes and design levels. Capping areas are further discussed in Section 8.
- The material placed into a capping area is to be covered with a marker layer prior to the construction of either hard stand or future structures.
- The resultant remediation excavation (from asbestos and suspected asbestos areas) and the capping areas shall be validated following the methodology outlined in Section 8.

Following completion of the remediation works, potential risk to future site receptors shall be managed via preparation of a long term environmental management plan (EMP) or updates to the existing AMP. This process is discussed further in Section 7.7.

Based on the information obtained by MA from the DSI and other site contamination assessments, the onsite encapsulation of asbestos impacted soils is considered unlikely to impact sensitive environmental receptors given that:

- Analytical testing of site soils, including asbestos impacted fill material, as part of the DSI did not identify significant concentrations of potential contaminants of concern other than asbestos.
- Based on preliminary groundwater measurement (discussed in the DSI) it is considered unlikely that asbestos impacted material will be placed at a depth that will intercept site groundwater.
- The potential for infiltration of surface water through the capping layer is considered to be low given the final finish of the capping areas will be either hardstand pavement or beneath a proposed building.

# 7 Remediation Plan

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## 7.1 Introduction

The following sections outline the anticipated sequence of works required to manage ACM contamination during the proposed earthworks phase of the development and ensure that at the completion of development works the site remains suitable for ongoing use as a school.

**Unless otherwise identified, activities discussed below will be the responsibility of the contractor or its representative.**

## 7.2 Stage 1 – Notifications

The following notifications will be required:

- If the works are Category 2 under Clause 4.11 of State Environmental Planning Policy (Resilience and Hazards) 2021 (the SEPP), a notice is to be given to Council 30 days before commencement of remedial works in accordance with Clause 4.13 of the SEPP.
- A notice of completion of remediation works must be given to Council and the consent authority, within 30 days after completion of the remedial work in accordance with Clauses 4.14 and 4.15 of the SEPP.
- Notifications for asbestos works as required by SafeWork NSW.

## 7.3 Stage 2 – Appointment of Remediation Contractor, Environmental Consultant and Project Surveyor

For remedial works to be successfully completed the appointment of a suitability qualified environmental consultant, a licensed asbestos removal contractor (LARC), and a suitably licensed earthworks contractor is required.

The AMP (WSP, 2020) is to be adhered to by all nominated contractors during onsite works.

### 7.3.1 Environmental Consultant

A suitably qualified environmental consultant shall be engaged to:

- Document all stages of the excavation, disposal, stockpiling and placement of natural material and ACM impacted soil.
- Waste classify any soil requiring disposal offsite.
- Monitor and document the excavation and offsite disposal of natural material to appropriately licenced landfill.
- Monitor and supervise the cut and fill (excavation and replacement) of ACM impacted soil onsite.
- Monitor the placement of geotextile marker layer after replacement of excavated ACM impacted soil onsite.

- Undertake visual validation inspections and collect validation samples (Section 7.6).
- Prepare a validation report documenting remediation and validation reports, and confirming final site status.

### 7.3.2 Licensed Asbestos Removal Contractor

As AF / FA is not expected, it is recommended that for the remediation area, the selected contractor have (or be supervised by) a SafeWork NSW Class B (non friable) licenced contractor as outlined in the NSW Work Health and Safety Regulation (2017). Should AF / FA asbestos be identified, then a Class A licensed contractor would be required to complete the works.

The LARC will be required to prepare an asbestos removal control plan (ARCP) which along with this RAP will require submission to SafeWork NSW.

### 7.3.3 Surveyor

A suitably qualified surveyor shall be engaged to:

- Undertake a survey of the area(s) where ACM impacted fill material is excavated.
- Undertake a survey of the area(s) where ACM impacted fill material are placed after placement of the geotextile marker layer.
- Estimate volume of ACM impacted fill material excavated and strategically buried.

## 7.4 Stage 3 – Site Establishment

General site establishment shall include set up of site office, work sheds and amenities of site workers.

Site establishment for remediation works will include the set up temporary 'work zones' when earthworks are to encounter ACM impacted soils (as indicated on Map 01). Established works zones shall include the implementation of various controls outlined in this RAP including:

- Installation of temporary site fencing, physical barriers and site signage around the works zone.
- Establishment of asbestos air monitoring around the work zone perimeter (if deemed necessary by the LARC and or environmental consultant).
- Installation of appropriate dust control measures.

The appointed LARC will be responsible for managing the induction process for all site personnel. The induction should include identification of all site asbestos and the relevant site controls in place to manage associated risks during remediation works

## **7.5 Stage 4 – ACM Impacted Soil Remediation Work**

### **7.5.1 Excavation of Asbestos and Suspected Asbestos Impacted Soil**

Earthworks in the ACM impacted soil areas are to be undertaken by the LARC following preparation of an asbestos removal control plan (ARCP) which is further discussed in Section 9.

All earthworks in asbestos and suspected asbestos areas works will be conducted in strict accordance with the ARCP to ensure that the potential to introduce asbestos related risks to site workers and or nearby sensitive receptors is minimised.

The sequencing and staging of excavation of asbestos and suspected asbestos impacted material will be left to the discretion of the LARC.

### **7.5.2 Temporary Stockpiling of Asbestos Impacted Material**

Should there be a need to temporary stockpile asbestos impacted material, stockpiling works shall be done under the supervision of the environmental consultant and in accordance with stockpile management methodology outlined in Section 8.2.1.

### **7.5.3 Potential Capping Methodology**

The exact locations and dimensions of capping areas where strategic burial of ACM impacted soils will take place has not been provided in this RAP. Prior to commencement of remediation works, a final capping area plan will need to be prepared by the civil works contractor or civil engineer and included as an addendum to this RAP. Based on indicative information from the cut and fill plan (Cardno 2022) and information provided by DoE, it is understood that capping areas are likely to be located beneath a building slab or within future paved areas of the Site.

Final design of capping area is to be formalised by the LARC. A likely methodology is expected to include the following:

1. Establishment of work zone as noted in Section 7.4. Section length is to be determined by the appointed LARC. Temporary fencing is to be established around the work zone.
2. Capping area to be prepared. This may require over excavation of non ACM impacted fill and / or natural soils as needed to provide design development levels following placement of ACM impacted soils. Excavation and preparation of the capping area is to be supervised by the project environmental consultant to ensure that material excavated (prior to placement of ACM impacted soils) is uncontaminated and suitable for reuse on the site as fill material or waste classified and taken offsite as required.
3. Excavation works to commence in ACM impacted soil areas. Excavated soils are to be either temporarily stockpiled or transported directly to the capping area.
4. Asbestos impacted material to be placed within the designated capping area and compacted in accordance with any geotechnical requirement (which will likely differ for various capping areas).
5. Following placement and compaction of asbestos impacted material in the capping area, a highly visibility marker layer (such as a geotextile fabric in a white or orange colour) is to be placed over the fill material to establish a 'marker layer'. The marker layer will act as a separator between the ACM impacted soil and the final capping layer (i.e. establishment of the hardstand or building slab).



6. Following installation of the marker layer, establishment of a suitable capping layer shall be undertaken. Further information on final capping layer options is provided in Section 8.
7. An iterative survey of the capping area by a registered surveyor is to be completed during ACM impacted soil earth works. The survey is to be undertaken in mAHD and of sufficient detail to allow the locating and estimation of total volume of capped ACM impacted soil at each capping area. The following aspects of the capping area(s) are to be surveyed:
  - Lateral extensions and base elevations of the placed ACM impacted soil material.
  - Elevation of the top of the asbestos impacted material (marker layer).
  - Elevation of the top of the capping layer (noting this step will need to be completed following construction of building slab or hardstand pavement).
8. Should excess ACM impacted fill material remains after establishment of the capping area(s), that ACM impacted material is to be waste classified and removed from site to an appropriately licensed / approved location subject to the waste classification.

## 7.6 Stage 5 – Site Validation

### 7.6.1 Data Quality Objectives

The data quality objective (DQO) process is required to define the type, quantity and quality of data needed to support decisions relating to the environmental condition of the site. Table 7 outlines the process used to develop the DQO for the site post remediation and were developed with reference to NSW EPA (2017) and ASC NEPM (2013).

**Table 7:** Data Quality Objectives.

<b>Step 1</b> <b>Stating the Problem</b>	Previous site investigations have identified ACM impacted soils within the site which shall be encountered during proposed school redevelopment works. Appropriate management of the asbestos impacted soils is required to ensure that during and at the completion of development works, there are no unacceptable risks to human receptors for ongoing land use as an education facility.
<b>Step 2</b> <b>Identifying the Decision(s)</b>	Key decision include: Has the completed remediation works capped and contained all disturbed ACM impacted soil so that no pathways between sensitive receptors and contaminated material are present? Do soils outside of the proposed capping area(s) pose an unacceptable risk to future site receptors? Is the proposed capping area design suitable for managing risk to sensitive receptors? Is long term management of the Site required?
<b>Step 3</b> <b>Identification of Inputs to the Decision</b>	The inputs to the validation of the site will include: <ul style="list-style-type: none"> <li>• Existing assessment data.</li> <li>• Observations during remedial activities.</li> <li>• Survey data generated during remediation works.</li> <li>• Soil sampling results from remediation and validation works (if required).</li> </ul>
<b>Step 4</b> <b>Study Boundary Definitions</b>	Study boundaries are as follows: Lateral – Lateral boundary of the assessment is defined by the IA and remediation area extents.

	<p>Vertical – Vertical boundary will be governed by the maximum depth of placed contaminated material (expected to be approximately 1.0-1.5 mbgl).</p> <p>Temporal – Date of site inspections, remediation and validation works.</p>
<p><b>Step 5</b> <b>Development of Decision Rules</b></p>	<p>The decision rules for this remediation area are as follows:</p> <ul style="list-style-type: none"> <li>• If the fill material surface is visually free of ACM, and the fill material is covered by a marker layer and capping layer in accordance with this RAP, then the fill material area can be validated as being adequately remediated.</li> <li>• If any material nominated for offsite disposal, it shall be classified in accordance with NSW EPA (2014) Waste Classification Guidelines.</li> <li>• Material tracking is to be appropriately documented and waste disposal records showing disposal to appropriately licenced landfill shall be presented in the validation report.</li> </ul>
<p><b>Step 6</b> <b>Specification of Limits on Decision Errors</b></p>	<p>Errors in survey data are to be specified by the registered surveyor preparing the survey and are to be considered in the assessment of the depth of the placed capping layers.</p> <p>For interpretation of waste classification data, guidance found in ASC NEPM (2013) Schedule B2 regarding 95% upper confidence limit (UCL) may be applied. Schedule B2 states that the 95% UCL of the arithmetic mean provides a 95% confidence level that the true population mean will be less than or equal to this value. Therefore, a decision can be made based on a probability that 95% of the data collected will satisfy the site acceptance criteria. A limit on decision error will be 5% that a conclusive statement may be incorrect.</p> <p>In applying the statistical analysis of the data:</p> <p>No individual sample results have a concentration that exceeds 250% of the adopted criteria.</p> <p>The standard deviation of the sampled population should not exceed 50% of the adopted criteria.</p>
<p><b>Step 7</b> <b>Optimisation of Sampling Design</b></p>	<p>Validation based on the remediation option, to ensure that all the necessary data is collected to confirm site suitability the proposed land use.</p>

### 7.6.2 Validation of Capping Areas

The exact location(s) and dimension(s) of the capping area(s) will be based on the final civil design plans and at the discretion of the principal contractor and or the LARC.

Structural slabs, pavements and road areas are to be constructed in accordance with the relevant engineering design specifications. Indicative capping design options are provided in Section 8. Capping is to be provided to ensure a minimum 100mm cover over the marker layer.

Capping layer verification is to be provided by the environmental consultant once an as built survey of the marker layer and the capping layer has been prepared by a register surveyor and the environmental consultant is satisfied that it demonstrates a capping layer in accordance with this RAP.

Copies of the surveys and a comparison of the two surfaces is to be included in the validation report and the AMP / EMP.

### 7.6.3 Validation of Disturbed ACM Impacted Soil Area

At the completion of excavation / construction works within the ACM impacted soil area, any disturbed soil areas will require validation to confirm there is no unacceptable risk to future site receptors. Validation will be dependent on the final development scenarios, as noted below:

1. Proposed carpark area: validation to follow the capping validation requirements in Section 7.6.2.

2. Residual pervious areas (such as garden bed / grassed areas): validation of the residual pervious areas of the ACM impacted soil area shall be through shallow test pitting, sampling and laboratory analysis by a suitably qualified environmental consultant to a depth of not less than 500 mm. Test pits are to be completed at a density to comply with the NSW EPA (2022) *Sampling Design Guidelines*. A visual assessment and final surface clearance inspection is to be completed by a suitably qualified person in conjunction with test pit validation sampling. The results of test pit works and surface clearance results are to be included in the final site validation report.

## 7.6.4 Validation Test Failure

### 7.6.4.1 Capping Area Validation Failure

Where placed capping thickness is less than the specified minimum thickness (based on design specifications), additional capping material is to be placed and the surface resurveyed. This process is to continue until minimum cap thickness is validated.

### 7.6.4.2 Disturbed ACM impacted Soil Area Validation Failure

Should asbestos contaminated soils be identified during test pitting or surface clearance work that does not meet RAC, the impacted material will need to be either:

- Delineated and then moved to an available capping area and be encapsulated in accordance with this RAP.
- Be waste classified and disposed offsite to a suitably licensed waste facility.

## 7.6.5 Imported Soil Material Protocol

Where any soil material is imported to the Site during remediation or for further earthworks, the material is to be documented and verified as VENM, ENM or other waste exempt material. Waste classification documentation is to be provided and reviewed by the appointed environmental consultant prior to material importation.

All imported material is to be tracked and inspected by the environmental consultant during any importation works.

## 7.6.6 Validation Reporting

A site validation report is to be prepared by the environmental consultant at the completion of remediation works. This report shall document the remediation and validation sequence, detail all remedial works, observations and results of the assessment, provide material tracking data for material taken from the site (if required) and document any imported material (and testing or supporting documentation). All asbestos clearance certification from the LARC shall be included in this report.

Staged validation of sections of the remediation area may be provided by the appointed environmental consultant following appropriate remediation of that area to allow other site works to continue. Where this is completed, interim validation documentation is to be prepared prior to any further works being undertaken. Any prepared interim validation documentation is to be included in the final validation report for the site.

The final validation document shall include the survey showing Site boundaries and extent / depth of buried ACM impacted fill. It shall identify residual risks posed by remaining contaminants, and provide comment on whether remediation has been successful and the suitability of the IA for the proposed land use.

## 7.7 Environmental Management Plan

An environmental management plan (EMP) is typically required as part of the long term approach to the management of site contamination. Given an existing AMP has been prepared for the CHS site, this should be updated in lieu of an EMP to include:

- A plan(s) clearly identifying the location and extent of capped ACM impacted material.
- Provide protocols and procedures to ensure the integrity of the capping layer.
- Identify WHS requirements to current and future site users or workers.
- Provide recommendations and control measures for any future site works which have the potential to impact the capping layer (e.g. future building construction, planting / landscaping or services installation / maintenance works etc).
- Detail how the AMP will be legally enforced (such as whether it is to be included on the site's Section 10.7 planning certificate as a note on title).

## 8 Capping Options and Specifications

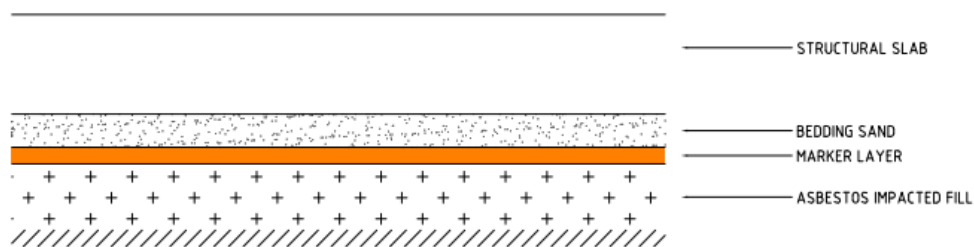
### 8.1 Overview

The adopted capping option for each capping area will be dependent on the final capping area plan and any site specific engineering requirements. Indicative capping design options for potential capping areas are outlined in the following sections. The environmental consultant is to review final capping area design prior to the commencement of remediation works.

### 8.2 Concrete Ground Slabs

The capping solution for concrete slabs (whether below a building or pedestrian walkways / driveway) is to comprise, as a minimum:

1. A marker layer (geotextile layer) over ACM impacted fill;
2. Bedding sand with thickness to design specifications; and
3. Structural concrete slab to design engineer's specification with minimum slab thickness of 100 mm.

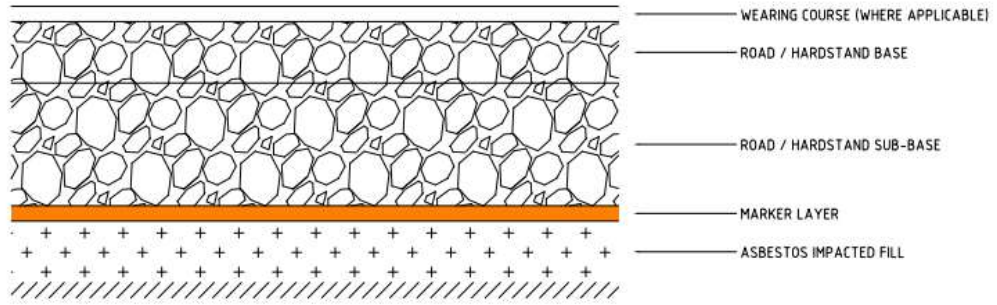


STRUCTURAL SLABS

### 8.3 Flexible Road Pavements / Hardstands

The capping solution for flexible road pavements is to comprise:

1. A mandatory marker layer (geotextile layer) over ACM impacted fill;
2. A pavement subbase / base layer with thickness to design specifications as required;
3. and
4. Where required, a wearing course (e.g. chip seal / asphalt) with thickness to design specifications.



FLEXIBLE ROAD AREAS / HARDSTANDS

## 9 Site Management Plan for Remediation

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### 9.1 Overview

A site specific asbestos removal control plan (ARCP) and worker health and safety plan (WHSP) are to be prepared by the appointed Remedial Contractor prior to the commencement of site works. The following sections are intended as a guide to the information that should be included in these plans.

### 9.2 Asbestos Removal Control Plan

Based on the site condition and proposed remediation method, primary environmental hazards requiring management during remedial works may include:

- Soil management.
- Noise and odour controls.
- Air monitoring / dust control.
- Decontamination
- Erosion and sediment control measures.

Additional onsite management issues that should be included in the ARCP include:

- Site access and security.
- Signage and contact Information.
- Traffic control.
- Hours of operation.
- Imported material.

Suggested requirements for these management points are discussed in the following subsections.

#### 9.2.1 Soil and Stockpile Management

The following should be addressed regarding soil and stockpile management in accordance with Landcom (2004) Managing Urban Stormwater: Soils and Construction:

All stockpiles containing soil or material identified as contaminated shall be stored in clearly marked areas with appropriate signage.

#### 9.2.2 Noise Control

To mitigate noise impacts which may arise as a result of remedial works, the contractor shall undertake works in accordance with state and local noise regulations. The contractor's machinery, including machinery hired by the contractor, should be in good working order so that abnormal machine noise is avoided.

All works are to be undertaken with the designated working hours in Section 7.2.11.

### **9.2.3 Odour Control**

Based on the identified site contaminants and site location relative to surrounding receptors, odour is not considered to be a significant environmental concern. Should odours be encountered during excavation works, contingency measures including the covering of temporary stockpiles should be implemented.

### **9.2.4 Asbestos Air Monitoring**

Asbestos air monitoring required will be at the discretion of the LARC and documented in the ARCP. We note that previous investigations have only observed bonded ACM in the impacted fill material.

Should AF / FA be encountered during excavation, asbestos fibres may be released during disturbance of friable asbestos or cutting into ACM.

### **9.2.5 Air Quality / Dust Control**

Dust control measures may be required at the site if excessive dust is generated. Dust control procedures may include:

- Cover of all soil loads entering or exiting the site.
- Use of water sprays across disturbed areas.

### **9.2.6 Erosion and Sediment Control Measures**

Erosion and sediment control measures will be required at the site in accordance with Landcom (2004). Measures are to be:

- Suitable for the proposed remediation works;
- Assessed, maintained and where necessary repaired throughout the duration of works;
- Appropriate for mitigating topsoil erosion, containing sediment within the site after works have been completed; and
- Maintained onsite until all surface soils have been stabilised at the premises.

### **9.2.7 Site Access and Security**

Prior to works commencing, barricades shall be erected to control access to the designated work area, along the proposed remediation area boundary. Site security and access controls must remain in place during all onsite construction works.

### **9.2.8 Signage and Contact Information**

Security fencing and appropriate signage around all open excavations must be installed and maintained by the contractor.

A sign displaying the contact details of the contractor (including the onsite foreman or manager) shall be displayed for the duration of onsite works.



### 9.2.9 Hours of Operation

Onsite works are only permitted during the following hours as outlined in NSW Government (NSW, 2020) noise restriction specifications:

- Monday – Friday: 7:00 am – 6:00 pm.
- Saturday: 8:00 am – 1:00 pm.
- Sunday and public holidays: No work permitted.

In certain instances, these hours may be modified when the contractor has the approval of Council.

## 9.3 Worker Health and Safety Plan (WHSP)

Worker health and safety of all onsite workers or visitors is the responsibility of the contractor. The purpose of a WHSP is to provide relevant health and safety information for all personnel working on or visiting the site.

The WHSP should include (but not necessarily be limited to):

- WHS legislative requirements.
- Hazardous materials identification (including fuel and chemical management).
- Induction requirements. All onsite personnel and visitors must be suitably inducted prior to entering the site.
- Location of worker facilities.
- Designation, delineation and control of access to various work zones.
- Community notification.
- Roles and responsibilities.
- Training and competency.
- Hazard identification and risk assessment.
- Control measures including personal protective equipment (PPE).
- Incident and emergency response.
- Safe work method statement(s).
- Toolbox meetings.
- Audits and inspections.

### 9.3.1 WHS Legislation and Standards

All onsite works should comply with the WHS act, regulations, codes of practice, and with relevant Australian Standards. As a minimum all work must comply with:

- Workplace Health and Safety Act (2011).
- Workplace Health and Safety Regulation (2017).
- AS 1940 (2017) – The Storage and Handling of Flammable and Combustible Liquids.
- AS 2436 (2010 R2016) – Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites.
- Managing the Work Environment and Facilities Code of Practice (December 2018).
- Managing Noise and Preventing Hearing Loss at Work Code of Practice (October 2018).
- Hazardous Manual Tasks Code of Practice (October 2018).
- Work Health and Safety Consultation, Co-operation and Co-ordination Code of Practice (May 2018).
- SafeWork NSW Code of Practice: How to Safely Remove Asbestos (2019).

### 9.3.2 Hazard Assessment

A WHS hazards assessment is to be completed by the contractor and incorporated into the WHSP. Key hazards include:

- Asbestos exposure.
- Onsite chemical hazards (storage of fuels, contaminated soils).
- Heat exposure for workers.
- Noise.
- Dust.
- Operation of heavy equipment.

### 9.3.3 Worker Facilities

Prior to starting works, site workers and subcontractors involved in the project shall attend a site specific safety induction.

Documented evidence of the safety induction must be available onsite. The contractor must supply site workers and subcontractors with appropriate PPE as outlined in Section 9.3.5.

### 9.3.4 Site Inductions

Prior to starting works, site workers and subcontractors involved in the project shall attend a site specific safety induction.

Documented evidence of the safety inductions must be available onsite.

### 9.3.5 Personal Protective Equipment

Table 8 below lists the personal protective equipment (PPE) required to prevent exposure to contaminants, in designated remediation work zone areas.

**Table 8:** Personal Protective Equipment.

Type	Description	Where Required
Head protection	Hard hat	All site activities
Eye protection	Safety glasses	All site activities
Hand protection	Disposable nitrile gloves	All site activities
	Cut resistant gloves	Manual handling activities
Body protection	High visibility clothing	All site activities
	Type 5 & 6 disposable overalls	All site activities
	Sunhat, sunscreen	All site activities
Foot protection	Steel toed boots	All site activities
Hearing protection	Ear plugs or ear muffs	Site activities likely to generate potentially harmful noise levels
Respiratory protection	Minimum half face respirators with P2 filters	All remedial activities involving movement of ACM impacted fill soils (or any other asbestos contaminated material, if encountered unexpectedly).

Site personnel should be aware that personal protective equipment required to be worn may limit manual dexterity, hearing, visibility and may increase the difficulty of performing tasks. PPE places an additional strain on the user when performing work that requires physical activity.

Eating, drinking, chewing gum or tobacco, smoking or any practice that involves hand to mouth transfer increases the probability of ingestion of foreign matter into the body. Hands must be thoroughly washed before eating, drinking or smoking. Clothing which becomes dirty from onsite work should be washed separately from other clothing.

# 10 Environmental Regulatory Requirements

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## 10.1 State Environmental Planning Policies

If the works are Category 1 under Clause 4.8 of the SEPP Resilience and Hazards (2021), remediation works are not to be undertaken without the consent of Council.

If the works are Category 2 under Clause 4.11 of the SEPP Resilience and Hazards (2021), a notice is to be given to Council 30 days before commencement of remedial works in accordance with Clause 4.13 of the SEPP.

In accordance with Clauses 4.14 and 4.15 of the SEPP, Council is to be notified 30 days post completion of remedial works.

## 10.2 Waste Disposal Requirements

All waste soil must be classified in accordance with EPA (2014) waste classification guidelines prior to offsite disposal to a suitably licenced waste receiving facility.

Waste classification documentation must be kept for validation of the remediation works.

## 10.3 Asbestos Licenses

If any asbestos is detected during remedial works, it shall be assessed by the LARC. Any removal shall be undertaken in accordance with relevant work health and safety regulation including but not limited to:

- Safework NSW – Applicant Guide for Asbestos Licences and Notifications (2019).
- Work Safe Australia – How to Safely Remove Asbestos: Code of Practice (2016).

## 11 Remediation Contacts

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Names and phone numbers of appropriate personnel for contact during the remediation will be provided prior to commencement of remediation work.

# 12 Contingency Plan for Remediation

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## 12.1 Overview

It is considered possible that unexpected events may occur during remediation and site redevelopment works, including the possibility of uncovering unidentified contamination. A site contingency plan for managing unexpected events must be prepared by the contractor.

Unexpected events that may arise include:

1. Uncovering previously unidentified contamination (unexpected finds).
2. Generation of unacceptable levels of asbestos fibres.
3. Generation of unacceptable levels of dust.
4. Generation of an unacceptable level of noise.
5. Excessive rainfall.
6. Collection of excessive water in excavations.

The following sections outline contingency procedures for the events listed above.

## 12.2 Unexpected Finds

If unexpected situations occur during remediation and site redevelopment, including the possibility to uncover unidentified environmental concerns or unexpected AF / FA which to date has not been identified or surveyed, the following steps are to be undertaken by the contractor:

1. Cease all work in the area and notify site foreman / manager and environmental consultant.
2. Notify any relevant authorities (e.g. fire brigade) if an emergency response is required.
3. Construct temporary barricading to prevent worker / public access to any unexpected and / or unknown substances.
4. Install appropriate stormwater diversion and sediment controls as required.
5. Notify relevant authorities that the contractor is legally required to notify (e.g. EPA and / or Council).
6. Site foreman / manager is to arrange site inspection by the environmental consultant to assess the unexpected find and determine if any sampling or remedial action is required in the area.
7. The environmental consultant is to prepare an assessment and, if required, validation of each unexpected find to the contractor prior to the recommencing of works ceased as a result of the unexpected find.

All site personnel are to be aware of their responsibilities under the unexpected finds protocol and are to report any potential signs of contamination (e.g. observed ACM, petroleum and / or oil spills, chemical odours or staining) to the site manager immediately.

All unexpected finds are to be documented in the site Validation Report prepared by the environmental consultant. It is noted that the use of appropriately licensed contractors will be required to remediate any unexpected asbestos contamination.

### **12.3 Unacceptable Level of Dust**

Contingency measures must be prepared to control unacceptable dust levels.

Excessive dust may be identified by workers, dust monitoring equipment or community complaints.

Actions to control excessive dust can include:

- Increased use of water sprays.
- Covering soil stockpiles.
- Changing work protocols (e.g. avoiding work on windy days).

### **12.4 Unacceptable Level of Noise**

Contingency measures must be prepared to control unacceptable noise levels.

- Actions to control excessive noise can include:
- Identification and isolation of the source of noise.
- Modification of the action of the source to reduce the noise.
- Erection of temporary noise barriers.

### **12.5 Excessive Rainfall**

Contingency measures must be prepared to control the effects of excessive rainfall.

Actions to control the impacts of excessive rainfall can include:

- Construction of sediment and surface water controls.
- Diversion of surface water away from excavations, soil stockpiles and active work areas.
- Appropriate stockpile covers.
- Changing work protocols.
- Wash down facilities for vehicles exiting the site.

## 12.6 Waste Classification

If any material is to be disposed from site, it must be classified in accordance with EPA (2014) waste classification guidelines prior to offsite disposal.

Waste classification documentation must be provided to the site environmental consultant for documentation to the validation report.

## 12.7 Asbestos Waste Transport and Receipt

Asbestos waste must be transported in accordance with the Protection of the Environment Operations (Waste) Regulation 2014, to a place that can lawfully accept it, as defined in of the Protection of the Environment Operations Act 1997.

Asbestos waste must be tracked when it is transported from its place of generation to its final destination. The POEO Waste Regulation (2014), requires waste operators, transporters, and waste and recycling facilities to use the EPA Waste Locate when consigning, transporting or accepting more than 100 Kg of asbestos waste, or more than 10 m<sup>2</sup> of waste asbestos sheeting, in any single load.

## 12.8 Asbestos Licenses

All asbestos removal shall be undertaken in accordance with relevant work health and safety regulations and guidelines, including but not limited to:

- Workcover NSW (now Safework NSW) – Managing asbestos in or on soil (2014).
- Safework Australia – Model Code of Practice: How to safely remove asbestos (2016).

As noted in previous sections, a SafeWork NSW Class A (friable) licenced contractor is required for all asbestos removal works as outlined in the NSW Work Health and Safety Regulation (2017).



## 13 Conclusion

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This document outlines remedial requirements and describes the selection of the preferred remediation option to address identified ACM impacted soils at the site. The preferred remediation option is via capping and containment of ACM impacted soil under hardstand pavements and proposed development structures at the site.

Validation testing and reporting will be required following remediation works, to confirm the objectives of this RAP have been met and that the IA is suitable for the proposed ongoing use as a high school.

## 14 Resources

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Cardno (2020) *Preliminary Site Investigation – Cronulla High School*. Ref. 80821137.

Cardno (2022) *Civil Bulk Excavation Plan – Cronulla High School*. Ref. 80821341.

Fulton Trotter Architects (2021) *Schematic Design – Cronulla High School*. Ref. SD-1003. Rev. 08.

LandPartners (2020) *Detailed Survey of Lot 1 DP 815804, Captain Cook Drive, Cronulla*. Ref. SY075045.000.1.1.

Martens and Associates Pty Ltd (2022a) *Fill Characterisation Assessment: Cronulla High School, Cronulla, NSW*. Ref. P2108205JC02V01.

Martens and Associates Pty Ltd (2022b) *Detailed Site Investigation: Cronulla High School, Cronulla, NSW*. Ref. P2108205JR01V02.

NEPC (1999, amended 2013) *National Environmental Protection (Assessment of Site Contamination) Measure*. Referred to as ASC NEPM (2013).

NSW DEC (2007) *Guidelines for the Assessment and Management of Groundwater Contamination*.

NSW EPA (2017) *3rd Ed. Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme*.

NSW EPA (1995) *Contaminated Sites: Sampling Design Guidelines*.

NSW EPA (2020) *Contaminated Land Guidelines: Consultants Reporting on Contaminated Land*.

State Environmental Planning Policy (2021) – *Biodiversity and Conservation*.

State Environmental Planning Policy (2021) – *Resilience and Hazards*.

Western Australia Department of Health (2009) *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*. Referred to as WA DoH (2009).

WSP (2020) *Cronulla High School Asbestos in Grounds Management Plan*. Ref. 8261\_ASB\_301017\_AMP\_RevA.

## Appendix A – Maps

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**Legend**

- ▭ Cronulla High School Site Boundary
- Investigation Area
- Approximate ACM Impacted Soil Area



1:750 @ A3  
 Viewport A  
 Aerial: Nearmap (2021)



Map Title / Figure:  
**Approximate ACM Impacted Soil Area**

## Appendix B – Proposed Development Plans

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**1 PLAN**  
**PROPOSED SITE PLAN**  
 SCALE: 1:500

01	CONSULTANT COORDINATION - PLANNER REVIEW	29/04/22	LW / NE
02	CONSULTANT COORDINATION	05/05/22	NE
03	CONSULTANT COORDINATION	10/05/22	NE
04	CONSULTANT COORDINATION ISSUE	19/05/22	LW / NE / JP
05	SCHEMATIC DESIGN ISSUE - DRAFT	02/06/22	LW / JP / SZ / NE
06	Consultant Co-ordination	20/06/22	LW
07	Consultant Co-ordination	24/06/22	LW
08	SCHEMATIC DESIGN ISSUE	04/07/22	LW
REV.	DESCRIPTION	DATE	INIT.

**PROPOSED SITE PLAN LEGEND**

EXISTING BUILDINGS		EXISTING EASEMENT		PROPOSED BUILDINGS		PROPOSED TURNING ZONE	
EXISTING BUILDINGS TO BE REFURBISHED		PERMANENT DEMOUNTABLES		PROPOSED TURF		RELOCATED SHADE STRUCTURE	
EXISTING PAVING TO BE RETAINED		PROPOSED FIRE HYDRANTS		PROPOSED ENTRY FORECOURT PAVING		ROOF OVER	
EXISTING BITUMEN		PROPOSED TREE		PROPOSED CONCRETE PATH		FENCE	
EXISTING TREES TO BE RETAINED				PROPOSED GRAVEL PATH		PROPOSED GARDEN	

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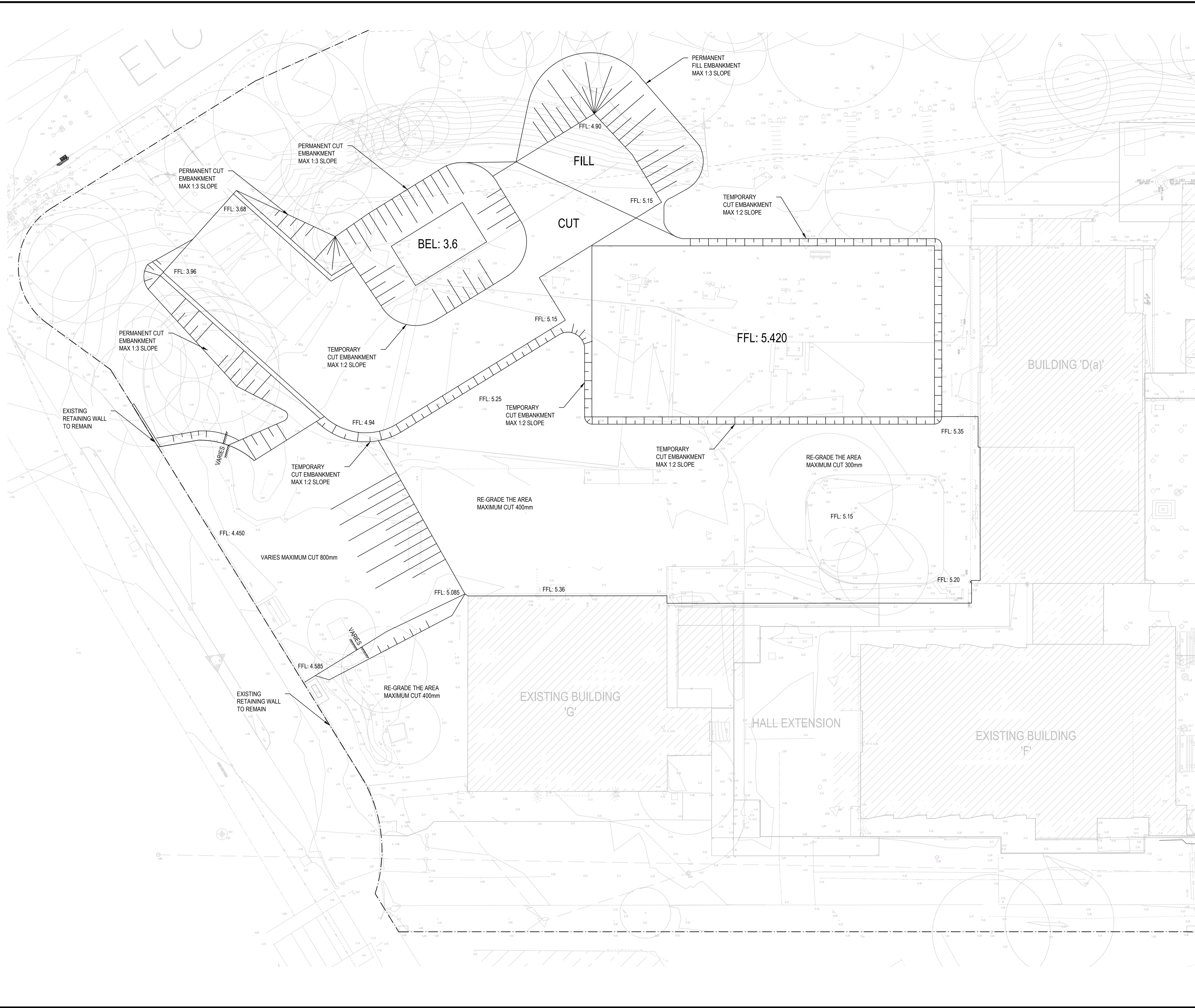
**PHASE 1 CLIENT PROJECT**  
**SCHEMATIC DESIGN**  
 NSW DEPARTMENT OF  
 EDUCATION (SCHOOLS  
 INFRASTRUCTURE)  
 CRONULLA HIGH SCHOOL

Address: Captain Cook Dr  
 Cronulla, NSW

**DRAWING**  
**PROPOSED SITE PLAN**

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

PROJECT NUMBER	DIRECTOR	CHECKED
<b>7068CR04</b>	<b>JW</b>	
DRAWING NUMBER	REVISION	
<b>SD-1003</b>	<b>08</b>	



FOR CONTINUATION REFER TO DRAWING CI-0108

Rev.	Date	Description	Des.	Verif.	Appd.
1	05/07/2022	INDICATIVE EXTENT OF EARTHWORKS	VJ	VJ	PP



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Designed	VJ	Date	MAY 2022	
Verified	PP	Date	MAY 2022	
Approved				

Client **NSW DEPARTMENT OF EDUCATION**

Project **CRONULLA HIGH SCHOOL  
CAPTAIN COOK DRIVE, CRONULLA NSW**

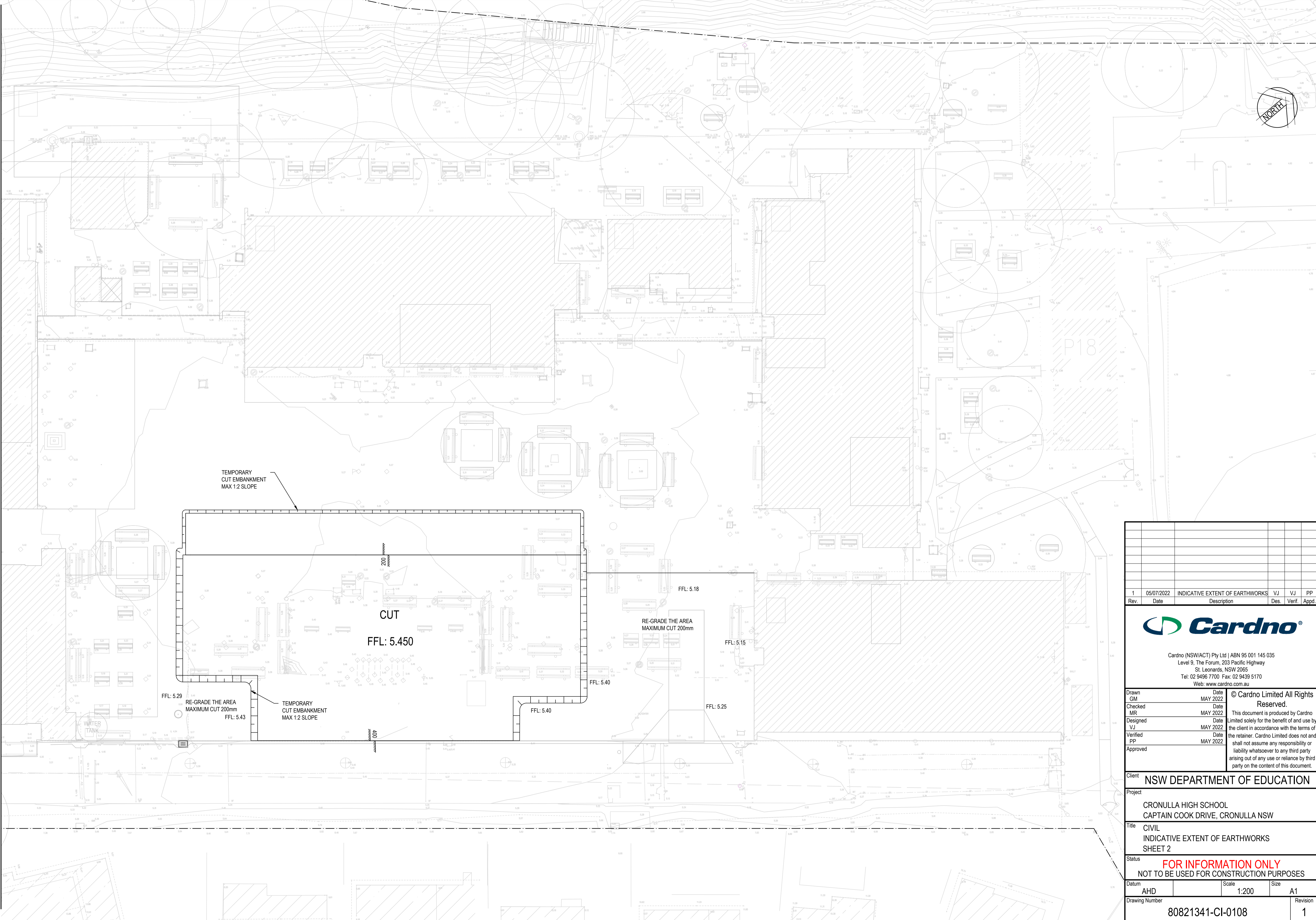
Title **CIVIL  
BULK EXCAVATION PLAN  
SHEET 1**

Status **FOR INFORMATION ONLY  
NOT TO BE USED FOR CONSTRUCTION PURPOSES**

Datum	AHD	Scale	1:200	Size	A1
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Drawing Number	80821341-CI-0107	Revision	1
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FOR CONTINUATION REFER TO DRAWING C-I-0101



Rev.	Date	Description	Des.	Verif.	Appd.
1	05/07/2022	INDICATIVE EXTENT OF EARTHWORKS	VJ	VJ	PP



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Title **CIVIL  
 INDICATIVE EXTENT OF EARTHWORKS  
 SHEET 2**

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