CONSTRUCTION MANAGEMENT PLAN

SOVEREIGN PARK

PROJECT ADDRESS
11-17 MOSBRI CRESCENT
THE HILL, NSW, 2300

PREPARED BY
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1.00 INTRODUCTION

1.01 PROJECT SUMMARY

The site is located at 11-17 Mosbri Crescent, The Hill NSW 2300, with the formal property description being Lot 1 DP204077.

The proposed development entails the construction of 172 residential dwellings.

The works associated with the proposed development, include:

- Demolition of the existing NBN television studio building and associated carparking.
- Earthworks including, clearing of site, bulk excavation and drilling and grouting for mines remediation.
- Construction of eleven (11) two-storey townhouses fronting Mosbri Crescent over a concrete basement car park.
- Construction of Block A consisting of nine (9) residential levels and a west wing consisting of six (6) residential levels.
- Construction of Block B consisting of seven (7) residential levels and roof top communal open space, with nine (9) two-storey integrated townhouses facing the internal courtyard.
- Construction of Block C consisting of five (5) residential levels.
- Interconnected double level concrete car parking servicing Blocks A, B and C.
- Pedestrian path, providing connection from Mosbri Crescent to Kitchener Parade.
- Landscaping, communal open space and associated signage.
- Services and site infrastructure.

1.02 PROJECT RISK AND OPPORTUNITIES

Prior to commencement on site, a project risk workshop shall be held to identify financial, contractual, program, quality, safety, environmental risks, stakeholder issues, resources, supplier and subcontractors' ability, build ability, project training requirements, practical completion issues and maintenance. The outcome of the risk workshop is a formalised Project Risk Assessment.

The Project Risk Assessment shall be reviewed monthly for the duration of project by the Principal's Project Manager (PPM) and updated to reflect any new risks introduced by site conditions, design changes, and work methodology etc.

1.03 CONSTRUCTION MANAGEMENT PLAN

This Construction Management Plan (CMP) describes the strategy, methods, controls, and requirements for the construction of the project. It is also intended to be an overarching document for site activities and procedures for system based activities.

This CMP is intended to be reviewed at intervals throughout the project as required to respond to changes in legislation, changing expectations of the interested parties, changes to activities, products or services, changes to the management structure, lessons learnt from competed projects, the results of internal and external audits, near misses, incident or accidents, and feedback from the project team.

The PPM has responsibility for the control, approval, maintenance, and issue of the CMP, including amendments.

1.04 SITE LOCATION

The site is bound by Kitchener Parade to the North, Mosbri Crescent and residential dwellings 9 Mosbri Crescent, 19 Mosbri Crescent and 41 Kitchener Parade to the West, 11 – 15 Hillview Crescent to the South and Arcadia Park to the East.

Figure 1: Site Plan

2.00 OVERALL SITE MANAGEMENT

2.01 PROGRAMME

A project programme shall be prepared for the project. The project programme may be amended from time to time and the latest revision will be controlled by the PPM and amended as required.

Estimated durations for the works are described in CMP have been provided in section 3.2 of the CMP.

2.02 DILAPIDATION REPORT

The building and surrounding areas will be inspected at project start up and dilapidation reports produced by the respective nominated contractor representatives. The reports together with any photographic evidence shall be issued to the PPM, who will provide a copy to the Principal.

At the end of the project the respective dilapidation reports will be reviewed for any change by the nominated D&C Contractor Project Manager.

2.03 PROJECT INSURANCES

The PPM will ensure the Contractors have the relevant insurances in place prior to the commencement of works.

Where the Principal is required to insure the works, or to insure any existing buildings or facilities, then the PPM will ensure that the Contractor is named on the policy, and that we obtain a copy of the policy and a certificate of currency prior to work commencing.

2.04 SITE ESTABLISHMENT

The nominated manager for each specific phase of works will provide a Site Establishment Plan for any of the scheduled project works. This is inclusive of early works and construction works that may include:

- Site Clearance.
- Mines Grouting Works, including drilling of boreholes for grouting
- Demolition.
- Services Infrastructure.

2.05 SITE SECURITY

The Contractor for each specific phase of works shall provide, erect and maintain all barricades, guards, fencing, hoardings temporary roadways, footpaths, signs and lighting and provide and maintain all traffic management lawfully and as required by City of Newcastle, or as necessary for the protection of the works, the public, or other neighbouring properties. The Contractor is responsible for the removal of all protection items at the completion of the works.

Perimeter fencing shall be provided around the extent of the development site (1.8m high secured temporary construction fence). It is the responsibility of the Contractor to maintain the integrity of such fencing and protect against unlawful entry for the duration of the project. Where necessary the Contractor is to provide additional fencing to adequately protect the site.

The Contractor shall prevent nuisance to the owners, tenants or occupiers of properties adjacent to the site, adjoining rights of way and to the public generally.

2.06 CAR PARKING

During each specific work phase, on-site parking for site personnel is very limited, with onsite parking only available during the mines grouting works as the asphalt hardstand will remain and sections of the site will be free for site personnel cars to be parked.

During the demolition and building works, as part of the site induction process trades and contractors will be directed to drop off equipment and tools and relocate vehicles away from the site, as general parking near the site will not be permitted.

Contractors and subcontractors are encouraged to use the following alternate parking and transport options to access the site, these include:

1. Coordinated ride sharing and shuttle from designated carparks

Site personnel will drive and park and designated all-day car parks near the site. The Contractor will arrange for company vehicle to transport workers to and from site. The all-day parking facilities are provided below.

2. Newcastle Public Transport System

As the site is located within proximity to Darby Street, Cooks Hill. There are public transport options for site personnel to travel to the site or a designated pick-up location to make use of the contractors shuttle system.

Those capable of travelling to site by train can transfer from the train to the light rail at the Newcastle Interchange in Wickham and get off at the Newcastle Beach Stop and catch the No.14 Bus down Darby Street. Details are provided below. From Darby Street it is approximately a 7-minute walk to the site.

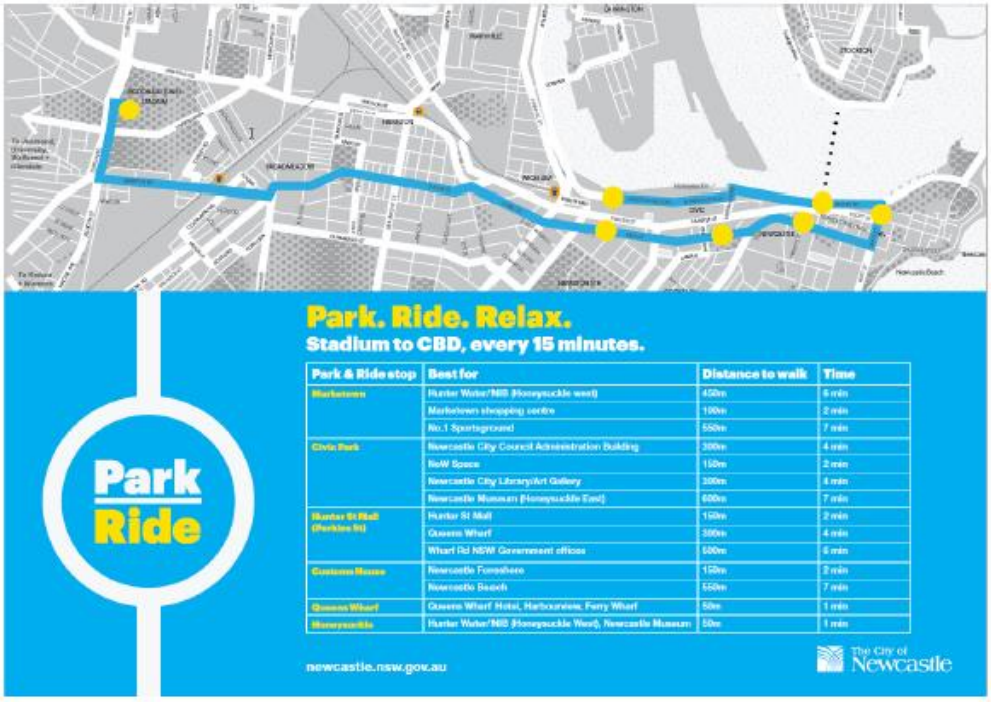
https://newcastletransport.info/plan-your-trip/light-rail/

3. Newcastle Park and Ride Scheme

The Newcastle “Park and Ride” scheme encourages parking outside the CBD. The park and ride service operates Monday to Friday from McDonald Jones Stadium every 15 minutes from 7.00am

to 9.00am to the CBD. The return trip is every 15 minutes from 3.00pm to 6.30pm. The service has a stop on Darby Street which is approximately 7minutes walk to the site. Details are provided below.

Park and Ride - City of Newcastle (nsw.gov.au)



4. All day free and paid parking

Site personnel can make use of numerous all day free and paid parking facilities that will allow workers to access site through a coordinated site shuttle system or use of public transport. A sample of the parking facilities are listed below and can also be found on the below link.

https://www.parkopedia.com.au/parking/carpark/national_park/2302/newcastle_west/?country=au&arriving=202106140700&leaving=202106141630

- High St Garage - 22 spaces
- Pasha Way - 36 spaces
- Newcomen St Garage - 16 spaces
- Bar Beach Garage - 200 spaces
- No. 2 Sportsground – 200 spaces
- Bolton Street – 570 Spaces

2.07 UNDERGROUND SERVICES

Before any work is undertaken which may affect underground services, underground cables or underground pipes of any kind, existing prior to the commencement of the construction works in any stage, the relevant contractor will make a written request to the relevant public authority (or the owner) of such services, cables or pipes for documents or information as to the location of such services; cables or pipes; and obtain from the Public Authority or the owner of such services, cables or pipes written confirmation of the exact position of such services, cables or pipes; and subsequently trace the location of the services, cables or pipes and indicate the location in situ.

2.08 EROSION AND SEDIMENT CONTROL

Erosion and sediment control measures are to be installed and maintained in accordance with the Concept Stormwater Management Plans prepared by Northrop Consulting Engineers as part of the Development Application.

The contractor for the specific works will need to manage and update the erosion and sediment control measures throughout the duration of the works. Specific requirements include:

- Sediment and Erosion Control measures shall be installed prior to the commencement of demolition, mines and construction works and regularly maintained in accordance with the engineering drawings and specifications.
- Install sediment protection filters on all new and existing stormwater inlet pits in accordance with the agreed control measures and shall include any/all stormwater pits in the vicinity of the works.
- All stormwater devices in the designated route of vehicular access shall be protected from damage. All damage to stormwater devices during the works shall be repaired or replaced immediately, otherwise an interim drainage system shall be installed until the full repair or replacement can be undertaken. In any event, all repair and replacement shall be undertaken prior to the completion of works.
- Install a 'rumble strip' or 'shakedown' at all vehicle exit points to reduce the likelihood of sediment being trafficked offsite. Manually remove (by means other than washing into stormwater drains) sediment tracked offsite on the adjacent roads. The Contractor shall monitor, and maintain as necessary, a sweep clean process of the pavement surface adjacent to the ingress and egress to the site on a daily basis.
- Construct and maintain all material stockpiles on the site, which are to be watered and covered to prevent dust generation.
- The specific works Contractor shall be responsible for keeping a detailed written record of all erosion and sediment controls on site during the demolition, mines and construction works. This record shall be updated daily and shall contain details on the condition of controls and any/all maintenance, cleaning and breaches. This record shall be kept on site at all times and shall be made available for inspection by an authorised person during normal working hours.

2.09 CONTAMINATION REMEDIATION

During the demolition, mines grouting and building works, the relevant Contractors are required to complete the review, investigation and works in accordance with the Detailed Site Assessment prepared by Coffey Services Australia, which accompanies the Development Application. In general, the following methodology is recommended to be implemented:

- Prior to the commencement of works, any existing Hazardous Materials Register(s) should be reviewed for currency and an assessment made as to whether the register is suitable to provide WHS guidance during demolition of building structures;
- A Construction Environmental Management Plan must be prepared by the relevant construction contractor and implemented prior to the commencement of works; and
- An unexpected finds protocol must be included as part of the CEMP or as a stand-alone document in order to manage potentially contaminated fill material that may be encountered during demolition, grouting and construction phases.

2.10 ABORIGINAL ARCHAEOLOGY

The relevant contractors must complete the works in accordance with the Aboriginal Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (DECCW 2010). The contractor will be responsible for obtaining any required aboriginal heritage permits prior to the commencement of works in accordance with the site-specific details and methodology referenced in the Umwelt Draft Aboriginal Cultural Heritage Assessment Report dated December 2021, submitted in support of the Development Application.

2.11 EMERGENCY MANAGEMENT

Contractors will organise and prepare an Emergency Management Plan (EMP) for the relevant phase of works. The EMP will describe the project specific requirements to control and manage emergency planning and preparedness.

The EMP for the specific phase of works will get reviewed regularly, and as required during works to align with the risk assessment.

Safe site access for Emergency Vehicles will be maintained at all times through Mosbri Crescent and onto the site through designated site entry. The EMP must be updated if site conditions change and must be reflective of the stage of the project.

3.00 PROJECT DELIVERY

3.01 SCOPE OF WORKS

The scope of works addressed by this project and CMP are described in the table below:

Stage	Description	Estimated Duration
Demolition	• Service location • Tree Removal • Site Clearance • Removal of redundant equipment and plant left by tenant • Demolition of main building, including Stages 1 and 2 • All hardstands and retaining walls to remain for stability and working platform for mines works	5 Months
Mines	• Service location • Site Establishment • Survey • Drilling • Grouting • Reporting	5 Months
Building and Construction	• Service Location • Site Establishment • Site Fencing / Hoarding • Excavation • Sub-Structure • Structure • External Finishes • Finishes • Landscaping • Handover and Completion	24 Months

4.00 DEMOLITION

4.01 WORKS METHODOLOGY

The Demolition Contractor is responsible for the site clearance and removal of the large commercial double storey building, separate metal clad storage shed and other plant and material as left by the outgoing tenant (NBN).

The main commercial double storey building consists of:

- Brick veneer construction.
- Steel and timber framing.
- Metal / Asbestos roof sheeting.
- Concrete slabs on ground and level 1.
- Aluminium windows.
- Building services.

The Metal Storage Shed consists of:

- Steel portal frame.
- Concrete slab .

The demolition works will be completed in stages to allow the use of sections of the existing building and concrete slabs on ground are to be left to allow for a working platform during the mines grouting works.
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4.02 STAGING AND DURATION

To provide site stability, structured working platforms and on-site storage and batching facility during the mines grouting works, the demolition works will be completed in 3 stages. The Stages are defined below and detailed in Demolition Plan provided in the Architecture Design Package.

1. Site Clearance and Demolition of the Main Building except for Studio 1.
2. Studio 1 Demolition and Tree Removal
3. Removal of Hardstand and Site Retaining Walls – This is to be completed by the Building Contractor during Building and Construction phase of the project

The estimated duration is for Stage 1 demolition works is months and duration of Stage 2 demolition works is 1 month. These periods may be extended due to a change in work sequence, unforeseen materials found on site and management of environmental controls to ensure demolition works are completed in accordance with authority and legislative requirements.

4.03 SITE PROTECTION

The Demolition Contractor shall provide, erect and maintain all barricades, guards, fencing, hoardings temporary roadways and footpaths in accordance with the CMP. The Demolition Contractor shall also provide the necessary protection to the flora and fauna in Arcadia Park as detailed in the April 2021 Arborist Report Impact Assessment provided in the Development Application.

4.04 PLANT AND EQUIPMENT

The following plant and equipment is generally what will be used for the demolition works:

- Excavators (5t – 25t)
- Scissor and Boom Lifts
- Working Platforms
- Water tanks and sprays for dust control
- Trucks to remove building materials.

4.05 TRAFFIC MANAGEMENT

Traffic Management during the Demolition and Construction works has been assessed in the Traffic and Parking Assessment (TPA) Addendum 1, prepared by Intersec Traffic dated 7 April 2021, submitted in support of the Development Application.

As recommended in the TPA, the Demolition Contractor shall develop a site-specific Construction Traffic Management Plan (CTMP), prepared by an accredited professional, for all works associated with vehicular and pedestrian access and egress. These plans shall include both the internal of the site (i.e. movements within the bounds of the site), as well as external to the site (i.e. encompassing access points and transport routes for material delivery).

Implementation, review, and updates of the CTMP will be the responsibility of the Demolition Contractor.

The Demolition Contractor shall undertake training for all site personnel (preferably delivered as part of the general induction or site induction) to ensure the CTMP is implemented safely and with the knowledge of all site personnel. All traffic control personnel shall have relevant accreditations, skills and be equipped with adequate protective and operational equipment.

4.06 ENVIRONMENTAL MANAGEMENT

4.06.1 Noise and Vibration Management

Noise emissions and vibration need to be managed during the course of the works in order to protect and maintain the health and wellbeing of people who are involved in the demolition works and the amenity of those that work in areas adjacent to the site.

To ensure that noise and vibrations are reduced where possible and practical, all site operations shall be undertaken with consideration given to their potential to produce noise and vibrations. A management strategy of *avoid* > *minimise* > *control* shall be developed and implemented.

Prior to the commencement of the mines grouting works, the Contractor shall review, assess, and follow the recommendations detailed in the Construction Noise and Vibration Assessment, April 2021 completed by RAPT Consulting, which is provided in the Development Application.

4.06.2 Noise Management

During demolition, the works shall only be undertaken during standard construction hours, to mitigate any potential impacts. Work that generates noise that is audible at residential premises is to be restricted to the times referenced in the Development Consent and generally in accordance with the following times:

- Monday to Friday, 7:00 am to 5:00 pm and Saturday, 8:00 am to 1:30 pm.
- No noise from construction/demolition work is to be generated on Sundays or public holidays.

Noise management shall comply with:

- Guide to Noise and Vibration Control on Construction;
- Demolition and Maintenance Sites (AS 2436-2010);
- Protection of the Environment Operations Act (1997) and
- SafeWork NSW and
- Environmental Protection Authority (Noise) Regulations.

Noise management shall include, but not be limited to:

- All plant, equipment and vehicles being fitted with appropriate noise suppression equipment to reduce noise levels as far as is practicable.
- Ensuring all equipment is operating in good condition.
- A list of all proposed machinery is to be provided with the expected noise levels at the operator position and an estimate provided as to the noise hazard.
- All site workers to be trained in noise reduction (such as proper use of machinery and the use of hearing protection) and informed of locations requiring the use of such equipment (this training shall form part of the site induction).
- All outside workers must wear appropriate hearing protection if in close proximity to machinery for extended periods. Workers exposed to elevated noise levels above occupational limits to have hearing tests.
- Warning signs shall be set up in active work areas, prohibiting entry to persons without hearing protection (where necessary).
- Prior warnings are to be provided to potentially affected premises where noise levels are expected to be in excess of the nominated levels in AS/NZS2107:2000 including how long the activity is expected to last.

Noise levels may be monitored from time to time to ensure that noise generated as a result of the works does not disturb local commercial and retail residents and that WHS guidelines are complied with.

4.06.3 Vibration Management

Vibration can occur as a result of demolition and construction activities, which if excessive can cause damage to nearby buildings and structures and cause discomfort to nearby residents. In addition to the guidelines and regulations, the Demolition Contractor shall comply with Australian Standard AS 2670.2 – Evaluation of Human Exposure to Whole Body Vibration (1990).

The following procedures are proposed to be undertaken:

- Adhering to the defined hours of site operation.
- Prior warnings are to be provided to potentially affected premises where vibration levels are expected to be in excess of the nominated levels in Annexes of AS2670.2-1990 including how long the activity is expected to last.
- Where relevant, reasonable and feasible, preference will be given to the use of low vibration emitting plant and construction methods.

4.06.4 Dust management

The Contractor will complete works in accordance with the environmental management recommendations of the Construction Air Quality Assessment prepared by Northstar Air Quality and submitted in support of the development application.

The Demolition Contractor shall be responsible for managing any dust generated from the demolition of the works. To ensure that dust generation is mitigated, all site operations shall be undertaken with thought and consideration to reduce the impact and creation of dust.

The Demolition Contractor shall implement measures to minimise and control generation of dust from the site. These measures shall include, but not be limited to:

- Program works around periods of significant and adverse meteorological conditions.
- Install wind fences around stockpiles that contain material with a significant number of fine particulates.
- Maintain vegetation across the site where possible, otherwise establish vegetation or seal disturbed site areas as soon as practical.
- Provide water trucks or sprinkling devices during construction as required to suppress dust, specifically for site vehicular traffic or dumping and filling operations.

4.06.5 Air Quality

The Contractor will complete works in accordance with the environmental management recommendations of the Construction Air Quality Assessment prepared by Northstar Air Quality and submitted in support of the development application.

During the removal of any identified asbestos and demolition works, air quality control monitors shall be used. Air Monitors shall be installed and managed by a hygienist engaged by the Demolition Contractor. Any monitoring that exceeds the acceptable levels shall be reported directly to the PPM. The Contractor will be responsible for implementing as asbestos management plan to address the necessary actions to remove asbestos from the site. This is generally inclusive of, stopping works, assess the site conditions, plan the works and control the Air Quality.

4.07 HAZARDOUS SUBSTANCES

ANY hazardous materials identified within the building and surrounding areas will require Contractor to prepare a hazardous substances management plan.

The below information provides a possible sequence of works when working with hazardous substances found on the site:

- Notify Safe Work NSW 7 days before commencing work.
- Notify all neighbouring properties before any works have commenced.
- All workers involved are to be health monitored tested before commencing.

- Safety wrap the perimeter to encapsulate fibres from the defined area.
- Hygienist to supply air monitors around perimeter of the contaminated work area.
- Barricade area the works are to take place.
- Delineate an area in zone for the de-contamination area.
- All workers involved are to go through the SWMS and be aware of all hazards and controlsbefore starting any work.
- Set temporary scaffold up to roof access for access and egress from roof.
- Have constant water spray mist going to capture fibres.
- Remove roof sections in full sections so no fibres will release.
- Wrap up manageable parcels near where crane set up is to remove sections from roof to load truck.
- All waste is to be double wrapped in 200um plastic for offsite disposal.
- Remove all waste to authorised landfill facility.
- After area all vacuumed, they will spray PVA glue to area to seal any particles.
- Hygienist to clear and test area prior to demolition.

4.08 WASTE MANAGEMENT

The Contractor will complete works in accordance with the management recommendations of the Waste Management Plan prepared by SLR Consulting and submitted in support of the development application.

Most materials will be disposed offsite to certified recycling facilities. Any items unfit for recycling shall be disposed offsite to certified General Waste capable facilities. Appropriately licensed contractors will handle the transport, processing and disposal of waste and recycling.

If hazardous substances are identified, then they must be removed in accordance with the hazardous materials management plan prepared by the Contractor.

All waste that is to be removed, must be complete in accordance with the waste management plan that is completed by the Contractor. The waste management plan is to ensure the following items will be implemented:

- Demolition shall be undertaken in a de-construction manner to ensure maximum re-use and recycling of materials.
- Allocated area(s) for waste storage on site separated for the purposes of reuse, recycling and disposal. Waste storage areas to be suitably covered and contained.
- Bulk waste storage bins to be located within the site wherever possible, or alternatively seek approval from Council to position the container within the road reserve.
- Arrange contractors for the transport, processing and disposal of waste and recycling. Ensure that all contractors are aware of the legal requirements for disposing of waste. Contractors shall be employed to remove waste from the site regularly.
- During construction phase, delivery of materials 'as needed' to prevent the degradation of materials through weathering and moisture damage and consider organising to return excess materials to the supplier or manufacturer.
- Clearly sign post the purpose and content of all bins and storage areas on site.
- Retain all records demonstrating lawful disposal of waste and keep them readily accessible for inspection by regulatory authorities such as Council, DECC or NSW WorkCover Authority.

Any excavated material to be removed from the site is to be assessed and classified in accordance with the NSW Environment Protection Authority's 'Waste Classification Guidelines Part 1: Classifying Waste' and be transported and disposed of in accordance with the provisions of the Protection of the Environment Operations Act 1997 and the Protection of the Environment (Waste) Regulation 2014.

4.09 TREE PROTECTION

All works need to consider all the tree protection measures and recommendations detailed in the Arborist Impact Assessment provided in support of the Development Application. This is inclusive of works in the vicinity of Arcadia Park and Mosbri Crescent Park.

4.10 EROSION AND SEDIMENT CONTROL

Erosion and sediment control measures are to be installed and maintained in accordance with the Concept Stormwater Management Plans prepared by Northrop Consulting Engineers, and submitted in support of the Development Application. The control measures are to ensure stormwater and surface water is to be managed and directed away from adjoining properties, detailing erosion and sediment control, management of soil stockpiles, control and management of surface water and groundwater.

Procedures should be included to ensure that all roads adjacent to the site are kept free and clear from mud and sediment.
The contractor for demolition, mines and construction works will be required to manage and update their erosion control measures depending on changed site and environmental conditions that may occur throughout the duration of the works.

5.00 MINES GROUTING WORKS

5.01 WORKS METHODOLOGY

The Proposed Development is located within the Newcastle Mine Subsidence District, and abandoned mine workings currently exist beneath the Subject Site. Due to the existence of abandoned mine workings, in order to comply with Subsidence Advisory New South Wales. Crescent Newcastle proposes to insert grout into the abandoned mine voids beneath the Site (Mines Grouting Works). The Mine Grouting Works are described in the Mine Subsidence Grouting Remediation Strategy Summary Report prepared by Coffey. The Contractor will complete works in accordance with the Mine Subsidence Grouting Remediation Strategy and associated Geotechnical Report prepared by Coffey.

The proposed mines grouting works are to be coordinated with the demolition of the existing NBN building. The drilling and grouting works to the perimeter of the site may proceed prior to Stage 1 demolition works. The drilling and grouting methodology includes the use of the existing Studio 1 Building to provide a safe and weatherproof storage for the fly ash and cement material as it is progressively required during the grouting of the abandoned mines. The Studio 1 Building is to removed as part of the Stage 2 demolition works.

All cement and fly ash will be delivered and unloaded within the existing studio building. No fly ash or cement will be stored or mixed outside the existing Studio 1 Building.

The mines grouting contractor will be directly contracted to the Principal and managed PPM on behaf of the Principal. The Mines Remediation Contractor is responsible for the site establishment, survey, safety, environmental controls, and traffic management during the works.

5.02 MINE WORKING DETAILS

5.02.1 Yard Seam

The Yard Seam is at depth of 41m to 45m below ground level, Due to the age of the working, mapping of the Yard Seam is very limited. As the workings are unmapped, Coffey have recommended that boreholes are drilled at 10 metre centres across the site from north to south and at 20 metre centres east to west.

The remediation of the Yard Seam is estimated to require approximately 71 boreholes and a volume of grout in the order of 1,400m3 to 2,000m3 (20m3 to 30m3 per borehole).

5.02.2 Borehole Seam

The Borehole Seam depth is at a depth of 90m to 100m. The strategy proposed by Coffey for the Borehole Seam is to drill in a systematic pattern based on the historical mapping of the workings. The systematic pattern will be to partially grout the old workings, backfilling select rows of bords using grout to effectively form larger strip pillars running across the site.

Coffey's investigations indicate that the void heights in the Borehole Seam are between 0.5m and 1.65m, sitting above some 3m and 5m of rubble infill.

The remediation of the Borehole Seam is estimated to require 52 boreholes, with the grout intake likely to be highly variable, with current estimates ranging from 100m3 to 600m3 for each location. For the purposes of programming an estimated allowance of 400m3 per borehole has been adopted.

5.02.3 Mines Remediation Summary

Item	Yard Seam	Borehole Seam
Depth of Seam	41m – 45m	90m – 100m
Number of Boreholes	71	52
Estimated Quantity per Borehole	30 m3	400 m3
Estimated Total Volume	2,000m3	20,800 m3

5.03 BOREHOLE SITE IMPACT

5.03.1 Borehole impact on the site

The following summarises the impact on the site of the drilling of boreholes associated with the mines remediation works.

Item	Impact
Total site area	12,235m2
Yard Seam	115mm diameter x 71m x 40m holes
Borehole Seam	115mm diameter x 40m x 96m holes
Total Estimated Borehole area	12m2
Percentage of site area with boreholes	**0.098% of the site.**

5.03.2 Removal of Spoil from Boreholes

Spoil from the boreholes will be stockpiled and removed from site progressively throughout the duration of the mine grouting works. The material will be removed by trucks (approximately 2 per week) and disposed of in accordance with the waste removal section of the CMP.

Wherever possible the mines grouting contractor will mix the spoil with grout and pump into the abandoned mine workings.

Item	Volume of Material
Yard Seam	360 m3
Borehole Seam	560 m3
Total Estimated Volume	**920 m3**

5.03.3 Groundwater Management

Water extracted from the abandoned mines during the drilling and grouting works may be mixed with the grout before returning to the mine workings. All water pumped from the mine will be returned to the mine workings.

The Contractor will provide a small catchment at each drill location that will collect any groundwater the reaches the surface during the drilling works. As referenced above this collected water will be re-used as part of grout mixing process and pumped back into the viad as part of the grout mix.

5.04 WORKS SUMMARY

The mines grouting works for both the Yard and Borehole Seams are planned to be completed in the following sequence to enable the works to be completed as safely, efficiently and with minimal environmental impacts as possible, this includes:

5.04.1 Site Establishment

- Inspect condition of site and access prior to commencement of works
- Existing services inspection.
- Site survey.
- Install environmental controls.
- Float plant and equipment to site.

5.04.2 Drilling and Grouting Works – Yard Seam

- Commence drilling boreholes for the Yard Seam.

- The Yard Seam workings layout will be defined during the drilling phase.
- All material (spoil) removed from the boreholes is to be stockpiled and managed in accordance with the CMP.
- Grout is mixed using the on-site batching plant within the enclosure area of the existing building Studio 1.
- All cement and fly-ash shall be delivered daily as required to maintain consistent grouting quantities per day and reduce stockpiling of fly-ash on site.

5.04.3 Drilling and Grouting Works – Borehole Seam

- Drilling of directional boreholes from within the site. Generally, a total of 32 boreholes will reach the Borehole Seam within the boundary of the site and 20 will extend beyond the boundary of the site. All the boreholes targeting areas outside the Site will terminate beneath the road reserve or crown land. There is no grouting proposed under private property outside the limits of the site.
- Grout is mixed using the on-site batching plant within the enclosed area of the existing building Studio 1
- All cement and fly-ash shall be delivered daily as required and stored within the existing building Studio 1. to maintain consistent grouting quantities per day and reduce stockpiling of fly-ash on site.

5.05 PRE-COMMENCEMENT

Prior to commencing works, the Mines Remediation Contractor shall submit their proposed grouting methodology and mix design is to be submitted to the geotechnical engineer for review and acceptance.

Copies of risk assessments, service records of plant, contractor's insurance, WHS Construction Cards for workers proposed to be working on the site will be obtained and reviewed for satisfaction and compliance. Further copies can be provided to the PPM upon request along with a copy of the WHS Management Plan & Quality Plan.

5.06 SITE STABILITY

The Stage 1 demolition scope is to leave the external carpark hardstand, existing Studio 1 for grout batching and material storage, main building concrete ground floor slabs and the retaining walls on the site. The purpose is to provide solid working platforms for the mines remediation works plant and equipment to complete the drilling and grouting works. This will enable more effective management of the environmental controls across the site, allowing controlled water management and reduction of dust during the mines grouting works.

5.07 SITE LAYOUT

The Mines Remediation Contractor shall provide a site layout plan in accordance with the Mines Grouting Layout Plan provided below, which details the use of the existing building to store the fly ash, cement, batching plant and concrete pump to mix the grout for the filling of the abandoned mines. The layout plan also details the proposed location of any spoil that is to be stockpiled prior to the removal from site. Any external stored material is to consider the proximity to neighbouring properties, site safety, dust management, noise creation, soil and water management and any other environmental impacts.

The site layout is to be reviewed by the geotechnical engineer and accepted by the PPM prior to the commencement of works.

5.08 WORKING HOURS

Working hours on site are proposed to be from Monday to Friday 7am to 5pm and Saturday 7am to 1.30pm. This is dependent on Development Consent.

5.09 DURATION

Based on the number of boreholes to be drilled and estimated grouting quantities, it is anticipated that the mines remediation works will take approximately 5 months to complete.

The 5-month duration is an estimate and may change depending on weather, site conditions, drilling progress, volumes of grout required to fill the voids.

5.10 PLANT AND EQUIPMENT

Examples of typical plant and equipment that may be used to complete the mines grouting works are shown in the table below. The Mines Remediation Contractor is responsible for the maintenance, delivery, operation and safety of all plant and equipment that is required for mines grouting works. As referenced in the table below, the cement silo, batching plant and concrete pump will be stored within the existing building to allow the on-site mixing of the grout in a controlled environment.

Plant / Equipment	Description	Image
Truck and Dog	- Delivery of fly ash for on-site grout batching - Fly Ash will be unloaded within the existing building. - Removal of any spoil from the site to approved waste facility.	
Drilling Rig	- Drill boreholes to locate mines voids and fill with grout.	
Cement Truck	- Delivery of cement to site to allow grout batching on site	
Mobile Cement Silo	- Storage of cement on site. - Located within the existing building Studio 1 Storage area.	
Mobile batching plant	- Grout mixing plant located on site. - Located within the existing Studio 1 storage area.	

Plant / Equipment	Description	Image
Concrete Pump	- Located within the existing Studio 1 building.	

5.11 TRAFFIC MANAGEMENT

Traffic Management during the mines grouting works has been assessed in the Traffic and Parking Assessment provided by Intersec Traffic, which is provided in the Development Application. The Mines Remediation Contractor shall develop a site-specific Construction Traffic Management Plan (CTMP), prepared by an accredited professional, for all works associated with vehicular and pedestrian access and egress.

The CTMP shall cover both internal areas of the site (i.e. movements within the bounds of the site), as well as external to the site (i.e. encompassing access points and transport routes for material delivery). Implementation, review, and updates of the CTMP will be the responsibility of the Mines Remediation Contractor.

It is anticipated that the Mines Remediation Contractor will pump 200m3 of grout per day into the workings. To achieve this, the Mines Remediation Contractor will require one delivery of cement and 10 deliveries of fly-ash per day. Deliveries will be via a cement tanker to fill the onsite cement silo and truck and dogs to deliver the fly ash. The below plan provides details on how the material delivery and excess material will be removed during the works.

Vehicles / Trucks	Estimated Truck Movements	
	Per Day	Per Week
Cement Trucks	1	6
Truck and Dogs	10	60
Truck for Spoil Removal		2

Truck Movement Plan

5.12 ENVIRONMENTAL MANAGEMENT

The Mines Remediation Contractor is responsible for completing an environmental assessment of works prior to commencement of any activities related to the works on the site. The specific areas that must be assessed include:

- Grouting Material
- Noise and Vibration Management
- Dust Management
- Hazardous Substances
- Gas Emissions
- Soil and Water Management
- Waste Management
- Emergency Response and Spill Contingence

5.12.1 Grouting Material

The Mines Remediation Contractor shall verify that all ash material used meets the requirements of the NSW EPA Coal Ash Order. This order, is issued by the Environment Protection Authority under clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 (Waste Regulation), imposes the requirements that must be met by suppliers of coal ash and blended coal ash,

In this order, coal ash means coal combustion products (CCPs), fly ash or furnace bottom ash from burning black coal.

Prior to coal ash (fly ash) is distributed for use, in accordance with the Coal Ash Order, the processor must provide with each transaction the following information:

- A written statement of compliance certifying that all the requirements set out in this order have been met
- a copy of the coal ash exemption
- a copy of the coal ash order

Testing of the coal ash prior to use required by this order must be undertaken by analytical laboratories accredited by the National Association of Testing Authorities (NATA), or equivalent.

The testing for any chemical and other attributes in the coal ash supplies are tested in accordance with the test methods specified in the order.

5.12.2 Noise and Vibration Management

The noise and vibration activities during the mines grouting works will be mainly caused by truck movements, loading and unloading of material on the site and drilling boreholes to reach the mine voids.

The use of the existing building Studio 1 will significantly reduce the noise impact as the fly-ash deliveries will be unloaded withing the building.

Prior to the commencement of the mines grouting works, the Contractor shall review, assess, and follow the recommendations detailed in the Construction Noise and Vibration Assessment, April 2021 completed by RAPT Consulting, which is provided in the Development Application.

5.12.3 Dust Management

The Mines Remediation Contractor is to complete the works in accordance with the Northstar Air Quality Report, April 2021 provided in the Development Application.

Generally, the mines remediation contractor shall assess any activities that will generate dust. All identified activities are to be managed in accordance with the CMP.

The use of the existing building Studio 1 will significantly reduce any dust (including Fly Ash) impact as the fly-ash deliveries will be unloaded withing the building.

The measures to be considered include, but are not limited to:

- Program works around periods of significant and adverse meteorological conditions.
- All stockpile piled material to be covered with shade cloth when not being accessed.

- All trucks to be covered when transporting spoil to or from the site.
- Provide water trucks or sprinkling devices during construction as required to suppress dust, specifically for site vehicular traffic or dumping and filling operations.

5.12.4 Fly-Ash Management

The Mines Remediation Contractor is to address the potential dust risk of the use fly ash during the mines grouting works. This is related to the delivery, storage and batching of the fly ash to make the grout for the void filling works. Mitigation measures can include, but are not limited to:

- Fly ash to be delivered on a needs basis to limit material stored on site.
- Fly ash is only to be stockpiled within the dedicated storage facility located within the existing Studio 1 building.
- Fly ash material will only be unloaded within the dedicated area of the storage building.

- If material not used in the same day, then fly ash will be stored and doors to the Studio 1 storage building will be shut to prevent any material leaving the storage facility
- Cement and fly ash will be blended to form the grouting material within the Studio 1 storage facility using the on-site batching plant.
- The concrete pump and pump lines will be located within the Studio 1 storage facility.
- All trucks to be covered when delivering material to site.

5.12.5 Sediment and Erosion Control

The Mines Remediation Contractor will need to follow the sediment and erosion control measures detailed in the CMP and referenced in the Northrop Stormwater Management Plan, August 2020. Which states that sedimentation control measures must be in accordance with the 'Managing Urban Stormwater: Solis and Construction (Blue Book).

The key aspect to managing the sediment and erosion control measures during the mines grouting works is leaving the concrete and asphalt hardstands on the site during the extent of the mines grouting works. The main sediment that requires to be controlled is from the spoil that is removed from the drilling works. All spoil from the drilling works will be captured through bunded sediment traps, and sediment protection filters are to be installed on all new and existing stormwater inlet pits.

In addition, control measures will be installed to manage water run-off from the on-site grout batching within the storage facility. This shall involve the creation of a bunded area around the batching plant. Any grout that is captured is to be disposed of in accordance with the waste disposal requirements in the CMP.

5.12.6 Hazardous Substances

The Mines Remediation Contractor shall provide a Hazardous Substance Register prior to the commencement of works on the site. Any hazardous materials shall be accompanied by a Safety Data Sheet (SDS)

5.12.7 Gas Emissions

The Coffey Report 754-NTLGE220504-AQ provided with the Development Application, indicates, with reference to the EPA guideline (NSW EPA, 2019) that there is a very low risk of gases being released from the mines working during the remediation works.

Whilst this is considered a very low risk, the risk shall be verified by the Mines Remediation Contractor with gas monitoring during the drilling works.

5.12.8 Waste Management

All waste that is to leave the site must follow the requirements of the CMP. This is inclusive of accurate logs of any material on the site.

As per all other site activities. Waste shall be collected within the site and transported to an approved disposal facility via covered trucks. All waste products shall be disposed of off-site in accordance with authority requirements.

6.00 BUILDING AND CONSTRUCTION WORKS

6.01 WORKS METHODOLOGY

The works to be completed by the engaged Design and Construct Contractor (D&C Contractor) can generally be described as follows:

- Clearing of the site
- Bulk excavation
- Piling
- Construction of (11) 2 storey houses with basement carpark that front Mosbri Crescent
- Construction of Block A, consisting of 9 residential levels.
- Construction of Block B, consisting of 7 residential levels.
- Construction of Block C, consisting of 5 residential levels.
- Interconnected double level concrete car parking servicing Block A, B and C
- Pedestrian paths providing internal connections through the development and connection from Mosbri Crescent to Kitchener Parade.
- Landscaping and communal open spaces and pavilions.

6.02 DURATION

The estimated overall duration for the building works is 24 months. This duration is subject to variance based on external factors such as inclement weather, site conditions and authority approvals.

6.03 SITE PROTECTION

The D&C Contractor is responsible for providing any/all hoardings, fencing, temporary roadways, footpaths, lighting, signs, and traffic management in accordance with City of Newcastle requirements. The monitoring and maintenance of the site protection must be managed by the D&C Contractor to ensure the site boundary is clear and safe for the public and site personnel.

6.03.1 Site Establishment

The D&C Contractor shall ensure that the site is established in accordance with the agreed procedures, WHS legislation, site layout plan, code of practice and direct site safety operational requirements.

6.03.2 Site Rules

The D&C Contractor shall ensure that site rules are communicated and form site specific induction for all site personnel in and around the site.

6.03.3 Site Attendance Register

The D&C Contractor shall nominate and team member to ensure all workers and visitors on site record their attendance and departure.

6.03.4 Subcontractors

Subcontractors cannot commence work on the site unless they have undertaken a risk assessment of the work to be carried out and provided the Contractor a copy of the SWMS and Standard Operating Procedures that are applicable to the work they will carry out.

6.04 PLANT AND EQUIPMENT

There are many types of plant and equipment required to complete the works, which can range from specialist equipment for installation of finishes, drilling equipment for piling and cranes for material handling.

The numerous plant and equipment to be operated on the site all have associated levels of risk that need to be managed in accordance with the Work Health and Safety Plan and the general guidelines set out below.

6.04.1 Site Register

Prior to the use of any plant and equipment on site, the contractor must ensure all items have been registered on the Plant Register. This is also inclusive all subcontractors performing works on the site.

6.04.2 Licences

Operators of plant must hold the relevant High-Risk Work (HRW) Certificate, VOC training / licences appropriate to the plant. The operator must sign into the plant risk assessment to confirm training in the operational parameters of the plant including plant risk assessment.

6.04.3 Equipment Manufacturers Manuals

Maintenance records, logbooks, plant risk assessments are to be maintained on site at all times.

6.04.4 Logbooks / Pre-starts

Must be specific to the needs of plant and checked prior to commencement of works.

6.04.5 Emergency Response

Detailed emergency response plans must be developed and communicated through the Site-Specific Risk Plan and Work Health and Safety Plan.

6.05 TRAFFIC MANAGEMENT

Traffic Management during the Demolition and Construction works has been assessed in the Traffic and Parking Assessment provided by Intersec Traffic, provided in the Development Application.

The D&C Contractor shall develop a site-specific Construction Traffic Management Plan (CTMP), prepared by an accredited professional, for all works associated with vehicular and pedestrian access and egress.

The CTMP shall cover both internal areas of the site (i.e. movements within the bounds of the site), as well as external to the site (i.e. encompassing access points and transport routes for material delivery). Implementation, review, and updates of the CTMP will be the responsibility of the Contractor.

6.06 WORKING AT HEIGHTS

All works at height shall be conducted in accordance with the requirements of the applicable codes and regulations, with particular reference to Managing the Risk of Falls in the Workplace Safework NSW 2016. All systems / structures that are put in place to prevent falls must be installed and inspected according to the specifications of the manufacture and any other relevant requirements.

The following hierarchy of controls shall be adopted and documented by the D&C Contractor for the effective management of the risks associated with the risk of falls in the workplace:

- Can the need to work at height be avoided to eliminate the risk of fall?
- Can the fall be prevented by working on solid construction?
- Can the risk of the fall be minimised where the protection of falls must be managed by providing and maintaining safe system of work?

Potential activities where the protection of falls must be managed such as, but not limited to:

- Tower crane erection and dismantle.
- Materials hoist erection and dismantle.
- Working in lift shafts.
- Erection and dismantle and scaffold and formwork.
- Work on roofs / live edges.
- Carrying out maintenance of plant and equipment.

6.07 WORKING IN OR AROUND EXCAVATIONS

The D&C Contractor shall ensure that a risk assessment has been completed to identify potential hazards when working in an excavation/embankment. Items to be considered include:

- Access to work area for Confined Space classification.
- Ensure a safe system of work has been developed for the required work.

- An emergency plan has been developed to rescue an injured worker if required.
- Safe access and egress has been provided to the workplace.
- Adequate training of those people required to work in the area.

6.08 WORKING NEAR HIGH VOLTAGE CABLES

Prior to commencement of works, the D&C Contractor is responsible for:

- Identifying all overhead electrical cables and telecommunication hazards, assessing risks and implementing control measures to prevent injury to persons and accidental damage to the cables that may interrupt supply.
- Contacting the relevant supply company to discuss the possibility of isolation or relocation of cables that may impact on the works to be carried out.
- Contacting the asset owner to clarify the training and competency requirements required when encroaching overhead assets and utilities in the direct site area.

6.09 ENVIRONMENTAL MANAGEMENT

The D&C Contractor shall prepare a project specific Environmental Management Plan (EMP) to cover the building works. The purpose of the EMP is to:

- Identify the environmental issues (aspects and impacts) for the project.
- Establish, communicate, and implement environmental operational controls to reduce any adverse impacts on the environment.
- Implement and monitor compliance by all suppliers and subcontractors with the requirements of all relevant environmental legislation, conditions of any licence, approval and permit, regulatory requirements, and the EMP.
- Action any outcomes from incidents or accidents, project audits or other identified non-conformances to continually improve the EMP.

6.10 SUBCONTRACTORS AND SUPPLIERS

Subcontractors, and where relevant, suppliers, engaged on the site must meet the environmental management requirements specified in the project specific EMP.

Subcontractors are to be made fully aware of their responsibilities under the terms of the applicable environmental legislation. All subcontractors shall be provided a copy of the project EMP and will participate in site inductions.

Subcontractors whose activities may have a significant impact on the environment shall submit Safe Work Method Statements (SWMS), Inspection and Test Plans (ITPs) or environmental procedures with details of how they manage any environmental aspects and impacts associated with their activities.

6.11 SITE CONTAMINATION

The D&C Contractor is responsible for testing and monitoring all material that is to be removed from the site. The D&C Contractor shall notify the PPM of potential contamination issues associated with the site and use the procedures identified in the CMP and EMP to define how to manage the contamination.

6.12 GROUND WATER

The D&C Contractor shall complete the works in accordance with the Groundwater Assessment NTLGE220504-SB March 2021, provided in the Development Application.

6.13 IMPORTED FILL

The D&C Contractor shall ensure that records are maintained of all products such as imported fill and recycled products used on site to enable traceability if future health and safety issues arise.

No fill is to be imported to site without a validating certificate for the material confirming its suitability for the land use.

6.14 NOISE AND VIBRATION MANAGEMENT

Noise emissions and vibration need to be managed during the course of the works in order to protect and maintain the health and wellbeing of people who are involved in the construction works and the amenity of those that work in areas adjacent to the site. The D&C Contractor shall complete works in accordance with the RAPT Acoustic Report provided in the Development Application.

To ensure that noise and vibrations are reduced where possible and practical, all site operations shall be undertaken with consideration given to their potential to produce noise and vibrations. A management strategy of *avoid* > *minimise* > *control* shall be developed and implemented.

Earthmoving equipment has the potential to cause nuisance noise, especially if large numbers of machinery are used that are in poor operating condition (i.e. noisy mufflers). Therefore, the transport, filling and removal activities associated with the works have the potential to create a social disturbance as a result of generating nuisance noise. Noise will be generated from various sources including (but not limited to) vibrating machinery, movement of trucks, operation of excavators, cranes, piling rigs and other large machinery, vehicle reversing alarms and general construction noise.

Noise management shall comply with the:
- Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites (AS 2436-2010);
- Protection of the Environment Operations Act (1997); SafeWork NSW and
- Environmental Protection Authority (Noise) Regulations.

Noise management shall include, but not be limited to:

- Adhering to the hours of normal operation.
- All plant equipment and vehicles' being fitted with appropriate noise suppression equipment to reduce noise levels as far as is practicable.
- The Contractor will need to demonstrate and have procedures in place to ensure that all equipment is operating in good condition.
- A list of all proposed machinery is to be provided with the expected noise levels at the operator position and an estimate provided as to the noise hazard.
- All site workers to be trained in noise reduction (such as proper use of machinery and the use of hearing protection) and informed of locations requiring the use of such equipment (this training shall form part of the general or site induction).
- All outside workers must wear appropriate hearing protection if in close proximity to machinery for extended periods. Workers exposed to elevated noise levels above occupational limits to have hearing tests.
- Warning signs should be set up in active work areas, prohibiting entry to persons without hearing protection (where necessary).

Prior warnings are to be provided to potentially affected premises where noise levels are expected to be in excess of the nominated levels in AS/NZS2107:2000 including how long the activity is expected to last.

6.15 DUST MANAGEMENT

The D&C Contractor shall complete the works in accordance with the Northstar Air Quality Report, April 2021 provided in the Development Application.

In addition, to ensure that dust generation is eliminated or reduced where possible and practical, all site operations shall be undertaken with consideration given to their potential to produce dust. A management strategy of *avoid* > *minimise* > *control* shall be implemented.

The D&C Contractor shall instigate measures to minimise and control generation of dust from the site. These measures shall include, but not be limited to:

- Program works around periods of significant and adverse meteorological conditions.
- Install wind fences around stockpiles with significant number of fine particulates.
- Maintain vegetation across the site where possible, otherwise establish vegetation or seal disturbed site areas as soon as practical.
- Provide water trucks or sprinkling devices during construction as required to suppress dust, specifically for site vehicular traffic or dumping and filling operations.

6.16 HAZARDOUS SUBSTANCES

The D&C Contractor shall ensure that all hazardous substances are identified and that the manufacturers substances are identified and that the manufacturers label is legible prior to being used or stored on site. Upon identification of a hazardous substance being brought to site, the D&C Contractor should consider if there is a non-hazardous alternate.

Hazardous substances, including all those used by subcontractors on site, shall be recorded on a Hazardous Substances Register and the register will be updated as new substances are introduced to site or as recorded substances are no longer on site.

A current copy of the Hazardous Substances Register and Safety Data Sheets (SDS) for each hazardous substance will be maintained on site. Site Personnel to be trained in the use of the substances as per the SDS, with records of the training that has occurred.

Hazardous substances to be stored and separated as required by the Dangerous Goods Regulation with relevant signage, bund and barricading.

6.17 WASTE MANAGEMENT

On-site waste shall be managed and properly disposed of off-site. Appropriate measures shall also be implemented to ensure that material brought to site is free from contaminants, and any dangerous/ hazardous goods are managed appropriately.

Waste will include all materials used in relation to construction activities (including, but not limited to: concrete, steel, plastic, bitumen, masonry, chemical compounds, timber) as well as site personnel waste.

Waste shall be collected within the site area and transported off-site to an approved disposal facility via a covered truck or other safe means. Waste products shall be disposed of off-site in accordance with all government and council regulations.