

Construction Environmental Management Plan

1 Denison Street & 88 Walker Street North Sydney.

Construction Methodology



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Section 1 Introduction

This Construction Environmental Management Plan (CEMP) has been prepared by Brookfield Multiplex Pty Ltd for the 1 Denison Street and 88 Walker St, North Sydney Project.

The development is on 2 parcels of land. The site is located at 88 Walker Street and 1 Denison Street, North Sydney. The 1 Denison St is bounded by Berry Street to the North, Little Spring Street to the East, Spring Street to the South and Denison Street to the West. The 88 Walker St is bounded by buildings to the North and South and Walker Street and Little Spring Street to the East and West respectively.

Both sites have existing buildings which need to be demolished. The Walker Street site will require 2 levels of excavated basement whilst the Denison Street site will require four levels of excavation.

The construction methodology and planning for this 33 level mixed use commercial office and retail building and 30 level hotel is detailed in this CEMP.

It is proposed that each building will be constructed sequentially.

This CEMP will form part of the Project Application and has been prepared to cover the construction management of the site during the demolition, bulk excavation and construction works.

This proposal has been based on the available information provided in the original CEMP.

Section 2 Objectives

The objectives of the CEMP is to:

- Ensure that the works are carried out in accordance with appropriate environmental statutory requirements
- Ensure that works are carried out in such a way as to minimise impact to the neighbouring areas
- Ensure that works are carried out in such a way as to minimize potential environmental degradation by the implementation of best environmental practice;
- Ensure that all personnel engaged in the works comply with the terms and conditions of the CEMP;
- Ensure that no change is made to the CEMP without written permission of the Project Manager
- Respond to changes in environmental and physical conditions during the proposed works through review and monitoring and control programmes in consultation with the Project Manager or their nominated representative(s);
- Ensure that corrective actions are completed in a timely manner.

Section 3 Building Description

The project involves the construction of two new buildings, one for commercial and the other for hotel use.

The commercial building will be 33 storeys high and will comprise approximately 54,000m² GFA. The building will be designed to provide A - Grade commercial floor space and will seek to achieve a 5 star Green Star rating.

The hotel will be 30 storeys high and will accommodate approximately 200 hotel rooms with hotel facilities.

Section 4 Description of Works

4.1 Early Works

The existing Denison St. site contains essential services that are required to maintain the amenity for the occupants of the Beau Monde Apartments at 77 Berry St. Some of these services are:-

- Substation and switch rooms
- Fire Control Room and sprinkler booster pump /valve room
- Stormwater
- Sewer

To maintain the amenity of the Apartments, it is proposed to carry out these diversion works prior to the commencement of the main Development Works.

The substation early works will take approximately 6 months to complete and will involve the renovation of existing parts of the centre to construct the new substation & switch room below. As this substation is facing Denison Street and is at street level, an A class hoarding will need to be constructed around it on the kerb line with a small construction zone in front to facilitate the works. This will be required for the entire duration of the works.

4.2 Demolition

The sites have existing buildings being the Berry Square Shopping Centre and a commercial building at 88 Walker St which will need to be demolished to allow for the new Development. These buildings will be demolished by a suitably licensed demolition contractor. A specific CEMP will be created by the demolition contractor for these works.

'A'- class and 'B' - class hoardings will be installed to enclose the sites and an external scaffold suitable for demolition works will be installed prior to the works commencing. The next initial works will include services disconnection and redirection, removal and disposal of all contaminants (e.g. asbestos), followed by major demolition. This will commence with the internal strip out, removal of the asbestos roof structure (for the Berry Square Centre only) by a licensed contractor, progressively working down to the removal of the structural steel framing. Machines will then be

lifted on to the concrete slab & progressively demolish all walls, columns & slabs, finally reaching slab on ground which will be also be removed. The removal of footings, tanks and the like which have been cut into the rock will be removed by the excavation contractor.

4.3 Excavation

The bulk excavation will be undertaken using equipment in accordance with the Excavation Contractor's work methods and safe work method statements and OHS Act 2000 and OHS Regulations 2001.

1 Denison Street:

Works will commence with the clearing of the site, including the removal of footings and in-ground tanks followed by the installation of external shoring piles. Early bulk excavation will start from the Spring St. boundary until a sufficient depth has been reached, so as to allow the installation of a loading platform within the site at the southern boundary. This loading platform will be used to overcome the difficulties associated with the tight, land-locked, restricted nature of the site. The loading platform will ideally be designed as a temporary / permanent structure, with portions of it being incorporated in the final structure of the building once construction out of the basement reaches street level. It will not only provide a platform on which machinery can both excavate from, but both a 'loading zone' for trucks to load excavated materials as well as a mustering point for concrete trucks during concrete pours. During this stage, excavated material will be loaded out on to the Spring St. footpath. When this platform is complete, excavation will continue from the northern end of the site towards the south, with all materials to be loaded and unloaded from this platform. As the excavation proceeds, rock anchors will be installed as per the structural & geotechnical engineer's advice. As excavation continues below the shoring walls, geotechnical engineers will carry out regular inspections to determine the requirement for additional rock anchors, rock pins and shotcreting to ensure the structural adequacy of the remaining rock, as well as the safety of the workers inside. As the excavation nears completion, detailed excavation will commence with the core base to enable early commencement of the core tower. Detailed excavation of footings, pits and the like will follow from the northern end to the loading platform at the southern end. The final excavated material which cannot be reached by means of excavators will be removed with the assistance of the tower crane or mobile crane as required.

It is estimated that approximately 50,000m³ of excavated solid material will be removed from the 1 Denison Street site.

Please refer to Mainland Civil's Sequencing Plans, as attached.

88 Walker Street:

Works will commence in a similar fashion to the 1 Denison Street site, however an underground tunnel is also to be dug connecting the newly completed site to the basement level excavation on the 88 Walker St site. Excavated material from this site will be loaded onto Walker Street and Little Spring Street. All structural and geotechnical inspections will take place to ensure adequate shoring, rock anchoring and shotcreteing takes place as per the 1 Denison Street excavation with detailed excavation to follow.

During the tunneling works, traffic will be closed locally and re-diverted via the new road as part of the 1 Denison St. project.

It is estimated that approximately 5,000m³ of solid excavated material will be removed from the 88 Walker Street site.

4.4 Construction

1 Denison Street

Construction will commence with the early erection of Tower Crane 1 to facilitate materials handling for the site. As detailed excavation is completed to the lift core, 'form, reo, pour' of the lift overrun pits & core base will commence, followed by the erection of the core jump-form system. On completion of the core base, Tower Crane 2 will be erected. This, along with the lift lobby slabs will continue with adjustments to its completed height. The construction of footings will commence at the same time as the core base. Progressively as the footings are completed, in-ground services and pits will be constructed followed by the slab on ground. Suspended slabs will then commence from level B3 which will be completed in three pours. This three-pour system will continue to the Lower ground level. Due to the complexity of the ground floor slab, this will be broken up in to a number of pours so as to accommodate the extra steps and folds. At this point, partial removal of the staging platform may be required. As the podium levels are split into two separate portions, they will generally be completed in 2 – 3 pours, with the use of a Cuplock formwork system due to the height required, especially in void areas. The typical tower floors will reduce to two pours with the pour joint being located at the core. The tower will be encapsulated by a manual climbing formwork screen system and serviced by two external 28/32 Alimaks with the addition of a single internal core Alimak. The formwork subcontractor will be required to install an external formwork hoist or an internal monorail to lift formwork materials. From level 27 upwards, the pour joint will move southward to continue the two pour sequence to the top. As the floors are progressively stripped of formwork, installation and rough in of services will commence. When formwork screens have been raised up the building to provide four clear floors, the curtain wall will progress with final services, finishes and fitout following.

88 Walker Street:

This site will operate one tower crane only, erected in the south eastern corner of the site. Construction of the tower will commence in the same fashion as the 1 Denison Street project with lift overrun pits, lift core bases, footings and in-ground services all to follow accordingly. Suspended slabs will commence from level B1 with a 2-pour system continuing up to the roof slab.

Please refer to The Proposed Hoarding, Craneage & Materials Handling Schematics, as attached.

4.5 Materials Handling

1 Denison Street:

It is envisaged that the majority of materials unloading and loading during demolition and excavation will occur on site however a street construction zone on Denison Street and Walker Street will be required. The Walker Street construction zone will be limited in its availability by the 'clearway' on

Walker St. which is in operation from 6am – 10am & 3pm – 7pm. This construction zone will be for the delivery of materials that are either too large or too long to fit down the perimeter streets of Little Spring Street, Spring Street and Denison Street and will provide an alternate crane pickup point for five hours per day on weekdays and all day on Saturday. This crane will be capable of performing approximately 20 - 30 lifts per day. Through the use of a steel grillage system over the roof of 88 Walker St, a steel gantry style 'B' - class hoarding spanning over the entire width of a lower section of Little Spring St. as well as a 'B' – class hoarding over the footpath on Walker St, all measures have been taken to ensure that no materials will be lifted by this crane, unprotected over any public roads or footpaths. Denison Street construction zone will be used for the loading and unloading of all other materials and will occupy approximately 60m of the southern end of Denison Street. Construction zones required to be established on existing roads, will require separate approval from the relevant Authorities.

These elements are further detailed in the attached 'Materials Handling' sketches.

Once the excavation works are complete, Brookfield Multiplex will set up the tower cranes and commence construction of the basement. It is envisaged that there will be two (2) tower cranes servicing the project. The tower cranes will be used to handle materials for the installation of the structure, services, façade and roof. Crane 1 will be positioned in the SE corner of the project site, externally to the building. This crane will be set up first and erected from Little Spring Street. This crane will predominantly be used to load materials from the Walker Street Construction zone and transport them to the working decks of the tower. It will also have the ability to load materials from the southern end of the Denison Street construction zone and will principally be used to service the southern half of the site. Crane 1 will most likely be a Favelle Favco M440D. Crane 2 will be set up using Crane 1 and will be positioned within the high rise lift core. This crane will be used to load materials from the northern end of the Denison Street construction zone and service the northern half of the site. Crane 2 will most likely be a Favelle Favco 310D. The site will also operate a 2832 twin hoist which will be positioned on the southern face of the building. As this southern side of the building will be used for concrete pouring and turning circle area of larger trucks, this twin hoist may be better served being within the building line, however this would have a detrimental effect on any decision by the client for a staged handover. There will be an additional hoist located within the core to provide access to the jumpform access system. Again, the formwork subcontractor will be required to install an external formwork hoist or an internal monorail to lift formwork materials. The formwork subcontractor will also provide a Crown 'lift & reach' fork to facilitate the horizontal movement of materials and the raising of the formwork screens. A two tonne forklift will be provided by Brookfield Multiplex once the basement formwork has been stripped.

88 Walker Street:

The majority of the off site materials handling for the 88 Walker Street site will be done from the two construction zones operation for the site. These will be established in Walker Street and Little Spring Street with the entire site serviced by one tower crane erected in the south east corner of the site. The Walker Street construction zone will be a continuation of the 1 Denison Street construction zone and will be restricted by the same clearway hours.

The crane and hoist locations are shown in the attached Proposed Material Handling Schematics.

General:

For the building to be built, Construction Zones will be required for the majority of the construction building time.

The Construction Zones will be used to park trucks for the purpose of:-

- Unloading materials required for the Works.
- Load up surplus materials including waste, from the works.
- Standing a concrete pump and concrete trucks required for the Works.

To alleviate congestion to the Construction Zones and streets, once the permanent basements are constructed and stripped of formwork, trucks that can be marshaled into the basements will be directed there for unloading and / or reloading of materials. Some of these activities will be:

- Delivery of concrete trucks
- Pick up of rubbish bins
- Delivery of finishing materials such as bricks, blocks, gyprock, light fittings and generally anything else which can practically be hoisted by hoist or builders lifts rather than the tower crane to the designated floor.

Attached is the Proposed Materials Handling Schematic showing the likely locations of the required Construction Zones with associated tower crane positions.

The need for maintaining smooth traffic flow and pedestrian safety is essential and so four, well informed and trained, traffic controllers will be required to ensure this occurs.

To assist the traffic flow and the traffic controllers, Site Management will ensure that all trucks are pre booked well in advance for a designated time to stop in the Construction Zones so that no unnecessary cueing occurs which will restrict traffic flow. The tower cranes will have a schedule for the anticipated truck deliveries so that they can schedule their work to minimize truck waiting time in the Construction Zones. This will be monitored by a dedicated member of the Site Management team who will be responsible for this element of works. All necessary assistance will be afforded to this member by the whole team as the smoothness of operation of these Construction Zones will benefit the Project, members of the public and surrounding business operation.

4.6 Site Establishment, Accommodation and Security

Site establishment will include the establishment of site offices, mess and toilet facilities, vehicle access, vehicle loading and unloading, lay down areas, establishment and maintenance of on-site work areas.

1 Denison Street:

We have allowed for 350 workers at the peak of construction on this stage. Initial site sheds and amenities will be located on the northern portion of the existing basement carpark which is to be retained and later form part of the new lower ground and retail areas. This will have a capacity of 150 men with the additional sheds for the remaining 250 workers required elsewhere on the job. Brookfield Multiplex's current thoughts are to provide sheds either in the new tower, or if space is available, possibly located within the 88 Walker Street building. A site office will need to be located off-site in one of the surrounding buildings with a preference being at 88 Walker Street, provided space is available and will need to be in the order of 400 – 600m².

An average number of workers on site for each stage of the project will be as follows:

Early Works: 15 per day
Demolition: 20 workers + trucks
Excavation: 25 workers + trucks
Structure: 200 workers
Finishes: 300 workers
Landscaping: 15 workers

88 Walker Street:

We have allowed for 250 workers at the peak of construction on this stage. Initial site sheds and amenities will be located within the 1 Denison St project and once the basement levels of the 88 Walker St project are completed, site sheds will be transferred over there.

An average number of workers on site for each stage of the project will be as follows:

Demolition: 20 workers + trucks
Excavation: 15 workers + trucks
Structure: 100 workers
Finishes: 150 workers
Landscaping: 15 workers

General:

Specific areas will also be provided for the storage of materials and will be restricted to secure areas within the site. No storage will be allowed elsewhere onsite or off site.

Brookfield Multiplex will ensure the security of all active work areas, heritage buildings and vacant buildings to ensure the safety of the public and protection of the works.

Access to the sites will be monitored by a security guard, who will ensure that no unauthorised person gains access, and all people who are permitted on site are registered and records kept of their being on site. This security guard also performs an important PR role; he is the face of the site, the first person with whom visitors, passersby and neighbours have contact.

Site Security will be responsible for all compliance management procedures, with the Smartek Compliance Management system utilised.

4.7 Environmental and Safety Controls

Environmental and safety controls shall be installed by Brookfield Multiplex prior to the commencement of the bulk excavation and construction works.

These will include but not be limited to:

- Security measures (fencing and gate access)
- Occupation health and safety measures (personal protective equipment, first aid supplies, signage and barriers if needed); and
- Environmental management measures (spill kits, booms, storm water control, dust control)

4.8 Disconnection and Capping of Site Services

After consultation with the appropriate utility companies, services will be disconnected/made safe as necessary prior to the commencement of any demolition and recycling works; comprising:

- Disconnect gas supply and provide for future re-connection;
- Disconnect existing 'house services' sewers and protect existing sewer trunk main;
- Install new temporary kiosk substation and re-connect existing feeds to residents and business external to the site;
- Disconnect energy services to all buildings to be demolished;
- Disconnect most existing stormwater connections and implement new temporary stormwater strategy, for management of stormwater run-off during the period of demolition and recycling, bulk excavation and construction; and
- Disconnect existing communications services and implement protection to existing services transiting the site.

4.9 Removal of Hazardous Materials from the Site Buildings

Prior to commencement of the works a Hazardous Materials Survey for the site will be completed by an appropriately qualified consultant to identify the presence and location of hazardous materials (asbestos, PCBs, lead-based paints and SMF).

Dismantling and removal of all hazardous materials from the site is to be completed prior to the demolition and recycling of buildings and will be in accordance with the Demolition Contractor's Work Plan and the Safe Work Method Statements (SWMS) for the identified hazardous materials.

The hazardous material removal work will be undertaken in accordance with relevant legislation and guidelines cited in Section 4.8.

4.9.1 Clearance Certificate

Following removal of the hazardous materials, the buildings will be inspected by a qualified occupational hygienist. The occupational hygienist will issue a Clearance Certificate once satisfied that all hazardous materials have been removed and appropriately disposed of in accordance with relevant legislation. Demolition and recycling of a building will not commence until a Clearance Certificate has been issued.

4.9.2 Hazardous Materials Plan

A Hazardous Material Survey will be conducted at the site to identify hazardous materials located in the building on site. The Hazardous Materials Management Plan will identify the arrangements for the removal and disposal of potentially hazardous materials from the site, specifically asbestos. Suitably licensed disposal facilities will be used for disposal. The DCPM will track and record the disposal of hazardous materials of asbestos materials. This will be undertaken in accordance with the Protection of the Environment Operations (Waste) Regulation 2005.

4.9.2.1 Asbestos Containing Materials

Electrical backing boards will be removed whole, sealed in appropriately marked plastic bags and placed in sealed, plastic lined bins for disposal at an EPA approved waste facility. Fibro sheeting and asbestos roofing and other asbestos containing materials (gutters, lashing etc) will be removed whole and placed in plastic sealed lined bins for disposal to a NSW EPA approved waste facility. Water will be used to prevent generation of dust. The causing Bins will be labelled 'Caution Asbestos' in accordance with the requirements of the Protection of the Environment Operations (Waste) Regulation 2005. An accredited asbestos removal company will be used for the asbestos removal works.

4.9.2.2 Light Capacitors Containing PCBs

Light capacitors containing PCBs will be removed whole and placed in plastic bags and then placed in appropriately labelled and sealed 200 L drums. The drums will be transported for treatment and disposal to BCD Technologies in Queensland, or another approved facility.

4.9.2.3 Lead Paint Systems

Lead paint systems will be removed by manual scraping of the surfaces which will be wetted down during the works. Plastic will be placed on the ground around and under the work area. On completion of the scraping, the plastics will be rolled and placed in a sealed bin for disposal at a NSW EPA approved waste disposal facility.

4.9.2.4 SMF Insulation

SMF insulation will be removed and bagged in clearly marked and sealed plastic and placed in plastic lined sealed drums for disposal at a NSW EPA approved waste disposal facility.

4.10 Work Programme and Working Hours

The working hours will be in accordance with the conditions of the consent. The Saturday working hours may be reviewed with an acoustic consultant.

With these hours, the following is a summary of the Works Program:-

- Early Works (including substation early works) - 6 months
- Decant 88 Walker St and Berry Square & Demolish existing buildings – 4 months

- Excavate for Basements – 6 months
- Construct Structures 20 months
- Finishing works to buildings – 10 months
- Hard and soft landscapes – 4 months

The entire construction of the 1 Denison Project is expected to take approximately 22 months

Hotel:

The hotel will follow a similar format with similar timeframes however the excavation duration will be considerably shorter at around 2 months and the construction of the main structure at around 12 months. The Hotel will commence shortly before the completion of 1 Denison St.

4.11 Street Closures

For the works to be completed safely, several temporary street closures will need to occur. These may affect Little Spring Street, Denison Street and Walker Street. These closures will be well planned and documented in advance with all coordination and approvals with council and other statutory authorities sought beforehand. Public that may be affected by these closures will be notified and consulted with as to alternative arrangements.

Some of the activities that will require these closures are:

- Erecting and dismantling tower cranes
- Removal of existing pedestrian bridge over Denison Street to the Berry Square Shopping Centre
- Diversion of statutory authority services and utilities in various surrounding streets.
- Reconfiguring southern end of Denison Street and western end of Spring Street and carrying out hard and soft landscaping works.
- Excavation and construction of underground tunnel linking the basements of the commercial building and the Hotel.

Most of these road closures should occur at non peak traffic times. In regard to the last two items, these works will not be able to be limited to non peak times due to their nature and extent. To minimise the impact on traffic and maintain access to driveways, these works may be carried out when the new laneway connecting Little Spring Street and Denison Street through the Development is open to the public and traffic. This will resolve most of the traffic issues.

Attached is a sketch showing the Proposed Traffic Flows with laneway open and whilst these works are occurring.

4.12 Protection of Heritage Buildings

Barriers / fencing are to be placed around and over heritage items to create protection and / or exclusion zones as required.

The location of the fencing will be submitted by the Contractor and approved by the Project Manager prior to the works commencing.

Site induction and tool box talks will be held by the Contractor to inform site personnel and visitors of the location and requirements for the protection of the heritage structures. Work Method Statements shall be developed by the contractor for works in close proximity to the heritage structures.

Section 5 Environmental Management Plans

The bulk excavation and construction works will be undertaken in accordance with the CEMP. The following EMPs are provided separately by other Consultants:

- Heritage Impact statement - Details to be provided by other consultants
- Stormwater and Sediment Control Plan – Details to be provided by other consultants
- Traffic Management Plan – Halcrow

Prior to the commencement of construction works, a site specific Health and Safety Plan will be prepared by Brookfield Multiplex and implemented for the site

This document and the associated reports provide the generic conditions which will be augmented in more detail by Brookfield Multiplex

5.1 Noise and Vibration Management Plan

Brookfield Multiplex shall provide a Noise and Vibration Management Plan prior to the commencement of the works.

All works will comply with The Environmental Protection Authority guidelines for noise emissions from construction/ demolition works and the provisions of the Protection of Environmental Operations Act 1997.

The following noise management measures will be implemented during the construction works:

- Brookfield Multiplex shall set up noise and vibration monitors around the site at locations identified by the Acoustic Consultant as sensitive areas and high risk areas.
- Works on site will only be carried during approved hours
- Brookfield Multiplex will be responsible for scheduling activities that generate high noise to short term duration wherever possible and practical
- Establishment of site practices and strategic positioning of processes on site
- Establishment of direct communication with affected Parties

Vibration monitoring will be used:

- At the commencement of a new activity near a sensitive structure, establish and confirm safe working distances from the sensitive structure
- When activity identified as producing significant ground vibration is occurring within the safe working distance established, continuously record vibration levels at sensitive structures using unattended vibration loggers. These will also provide a visual/audible alarm when vibration limits are approached
- When operating very close to sensitive structures, attended monitoring is to ensure that any preventative action is taken immediately to prevent the targets from being exceeded.

Where a monitor alarm is activated, the following actions shall be undertaken:

- All vibration producing works in the vicinity of the alarm shall cease immediately
- Cause of the exceedence shall be investigated immediately
- If the cause of the event is likely to be caused again, or if another alarm is triggered, then the acoustic specialist should be advised and further action taken place before works recommence.

One of two courses of action can then follow:

- If attended monitoring is established the activity can continue with the attended monitoring confirming that even if the alarm level is exceeded the works can proceed provided the vibration limits are not exceeded
- Work practices are modified and attended monitoring used to confirm the vibration limits are being achieved, before returning to unattended monitoring

The 2 stages of construction that will generate the most noise are:

- Demolition of the existing building
- Excavation of the basement car park

Demolition will be carried out with the use of heavy plant equipment. Where possible all plant will have necessary noise suppression equipment fitted. During demolition noise and vibration monitoring will be carried out by an Acoustic Consultant.

Excavation will be carried out with the use of heavy plant equipment. Where possible all external faces of the excavation will be saw cut to reduce excessive vibration for the amenity of adjoining neighbours. Where possible all plant will have necessary noise suppression equipment fitted. During excavation noise and vibration monitoring will be carried out by an Acoustic Consultant.

All Brookfield Multiplex construction workers undertake an induction program, which includes policies of minimising noise during construction, respecting neighbours and being mindful of the environment.

Brookfield Multiplex has reviewed all recommendations made by the acoustic consultant, Acoustic Logic, made in their 'Extended Hours Noise Impact Assessment Report' and will consider any necessary noise attenuation procedures as recommended to ensure permissible noise levels are not breached.

A register of noise complaints should be maintained by Brookfield Multiplex

5.2 Air Quality Management Plan

A detailed Air Quality Management Plan shall be prepared by Brookfield Multiplex prior to the commencement of works.

The following air quality management measures will be adopted during the construction works:

- Dust emissions will be controlled by the use of water spraying when required;
- Concrete decks to be kept clean to reduce dust emissions
- All motorized equipment used on the site will be selected on the basis of its noise performance and will comply with regulatory standards for noise generation;

- High efficiency mufflers are to be installed for major plant items particularly those that would be used for long periods on the project to reduce construction noise;
- Equipment will be operated in a proper, efficient and correct manner which includes proper maintenance in order to control noise and associated exhaust emissions;
- Odour emissions from the site which could adversely affect air quality or the amenity of the local area to be monitored
- No materials will be burnt on site.

5.3 Soil and Water Management Plan

The Stormwater and Sediment Control plan is to be prepared by Brookfield Multiplex prior to the commencement of the works and shall include measures to ensure compliance with the Protection of the Environment Operations Act (2000), as amended, and other relevant legislation. The SSC shall include a plan showing the location of the sediment controls to be implemented by Brookfield Multiplex with the following measures to be adopted:

- Provide temporary drainage channels and detention pondage to appropriately manage stormwater
- Stormwater drain grates will be wrapped in filtration medium. The filtration medium will be periodically cleaned and changed as and when required;
- Diversion drains will be constructed to minimize runoff from rainfall flowing into the works area. Stormwater diversion drains are to be constructed in the vicinity of areas to be excavated to minimize water flow into excavations;
- Regular visual inspection of the site drainage system will be undertaken by Brookfield Multiplex

5.4 Waste Management Plan

Brookfield Multiplex shall prepare the Waste Management Plan (WMP) prior to the commencement of works.

Brookfield Multiplex shall retain waste records and submit quarterly reports to the Project Manager. As a minimum, Brookfield Multiplex shall reuse or recycle 80% (by mass) of the construction waste.

5.4.1 Demolition waste

All demolition and recycling works will be conducted in accordance with AS2601 – 2001 (The Demolition of Structures) and OHS Act 2000, OHS Regulation 2001. All personnel will be inducted in accordance with the approved Safe Work Method Statement before commencing works on site. The demolition subcontractor for the project will be a Workcover Class 1 Demolition Supervisor. There will be an average of 15 to 20 personnel engaged in the demolition, recycling and hazardous materials removal related works at any one time. All waste will be kept within the site confines.

Demolition will be phased so as to ensure that different types of materials are not contaminated to all as much recycling as possible.

Estimated quantities of demolition and recycling material are summarised in the following table.

Material Type Estimated Quantity

Concrete/Brick: 3600 tonnes

Rubbish: 1000 tonnes

Steel: 200 tonnes

5.4.2 Construction Waste

During excavation all trucks will be required to exit the site via a dedicated gate. At this point, personnel will be in place to ensure that loads are covered and wheels are free of sediment.

All construction waste will be separated as much as possible and waste will be minimised by ensuring that all construction waste packaging be returned to the suppliers of all manufactured items.

5.5 Traffic Management Plan

Brookfield Multiplex shall prepare a Traffic Management Plan (TMP) prior to the commencement of works.

The road network serving the site comprises:

- Walker Street
- Little Spring Street
- Denison Street
- Spring Street
- Berry Street

Traffic will generally be managed at the site in the following way:

- Designated transport routes shall be communicated to all personnel
- Strict scheduling of vehicle movements is to occur to minimise vehicles waiting off the site
- Current directional traffic flow around Little Spring Street Denison Street and Spring Street will not be altered during the construction phase of the project.
- Site workers are to utilise local public transport and car sharing wherever possible

The initial part of the development involves the demolition of the existing shopping centre at 77 Berry Street, which will involve the movement of construction vehicles and pedestrian management measures.

Daily construction activity on the site is scheduled to occur as detailed in the consent conditions . No work shall be conducted on the site during Sundays or Public Holidays. Vehicular movements associated with construction will only operate within these hours, which will be defined by the Conditions of Consent. All works will be undertaken within the site, other than the unloading of materials, which will require the provision construction zone within the Walker Street and Denison Street frontages.

No tracked vehicles will be permitted or required on any paved roads. Public roads and access points will not be obstructed by any materials, vehicles, refuse skips or the like, under any circumstances. It is anticipated that all works will be carried out within the site and will require the provision of 'A'-Class hoardings along all boundaries of the site.

If there is a requirement to operate any material handling machinery on public access roads, Brookfield Multiplex will be required to seek Council or police approval prior to the event occurring. All associated requirements and regulations relative to such work will be satisfied.

In partnership with the Traffic Consultant, a detailed heavy vehicle access route map will be produced, outlining routes through Council areas to arterial roads with provision to ensure through traffic is maintained at all times.

Access to neighboring properties will be maintained at all times and Brookfield Multiplex will keep property owners and residents advised of the timeframes for completion of the various stages of the project via letter drops.

Consideration should be given by the client to hold discussions with North Sydney Council to attempt to acquire portions of the parking zones on Little Spring St. and the narrower sections of Denison St. The reason for this is two fold: Firstly and most importantly, it is to protect the safety of pedestrians and people getting in and out of their cars on these roads. Secondly, it is to protect the parked cars on these roads from damage and to allow the larger trucks to pass by with minimal congestion. Brookfield Multiplex has had preliminary discussions with members of North Sydney Council on these matters and has received support in principal for these requests. North Sydney Council has suggested that further discussions with their head of construction and planning would be beneficial.

Please refer to Appendix G – ‘Halcrow Traffic Management Report’, for further details regarding Traffic Management

5.5.1 GENERAL REQUIREMENTS

There will be some heavy vehicles arriving and departing the site each day during the demolition and construction stages of the works. All vehicles transporting loose materials will ensure the entire load is covered by means of a tarpaulin or similar impervious material. The vehicle driver will take all precautions to prevent any excess dust or dirt particles depositing onto the roadway during travel to and from the site. The respective trades will be inducted by Brookfield Multiplex into the above procedures and will monitor their trucks entering and exiting the works zones to ensure the procedures are met.

The appointed contractors and suppliers within the site will ensure that the entry and exit points will be kept free from material that has been deposited by any site vehicles. Brookfield Multiplex will monitor the roadways leading to and from the site on a daily basis and take all necessary steps to have rectified any adversely impacted roads pavements caused by site vehicles. The roads will also be cleaned on a regular basis when required to minimize dirt particles depositing externally from the site.

Vehicles operating to and from and within the site shall do so in a manner which does not create unreasonable or unnecessary noise or vibration. No vehicle will cause interference to any adjoining property or business.

Truck movements associated with the demolition and construction processes will approach the site from Berry Street and will use Little Spring Street and Spring Street respectively so that a straight approach to the site frontages can be achieved. Exiting vehicles would use Denison Street in order to travel back towards Berry Street and exit North Sydney.

Vehicle access routes are contained in attached Construction Traffic flow Schematic.

5.5.2 TRUCK MOVEMENTS

The envisaged truck arrivals will be:

Early works -	5 per day
Excavation –	25 - 40 per day
Demolition -	5 - 10 per day
Concrete Pour -	10 – 40 per day (on pour days only)
General Construction -	5 – 15 per day
Fit out -	5 - 15 per day (mainly within loading dock)
Landscaping -	5 – 10 per day

5.6 Health and Safety Management Plan

A detailed Health and safety Management Plan (HASP), which will include a health and safety risk assessment for the planned construction works shall be prepared by the Brookfield Multiplex prior to the CC being issued.

The HASP shall include, but not be limited to:

- Name key personnel responsible for site safety;
- Emergency contact details and procedures;
- Identify and describe the risks associated with each operation conducted;
- Describe actions to be taken to mitigate risks and hazards;
- Confirm that on-site personnel are adequately trained to perform their job responsibilities;
- Describe personal protective clothing and equipment that will be worn by personnel;

5.7 Pedestrian Safety

Pedestrian safety is of utmost importance to all stakeholders and the plan to safeguard their protection is detailed below. Brookfield Multiplex will provide temporary signage where necessary to direct the public and to warn them of any potential hazards. The content and position of the signs will be in accordance with statutory and council requirements. Temporary crossovers will also be constructed so as to divert pedestrian traffic when footpaths are closed.

During the demolition stages, an 'A' - Class Hoarding and heavy duty scaffold encapsulating the existing buildings will be required to allow the works to be completed safely. The existing buildings are built to the boundaries of the properties.

1 Denison Street:

The footpath in Little Spring Street and Denison Street is between 1.2 to 1.9m wide. To safely allow pedestrians to pass by, 'B' – class hoardings will be erected on both these streets, 3m from the building line, to allow pedestrian access underneath. It is proposed that heavy duty scaffold be erected on top of the hoarding to encapsulate the existing building for demolition.

To maximize public and pedestrian safety, we would propose the erection of an 'A' – class hoarding at the kerb line to the Spring Street frontage of the building, closing the footpath to pedestrian traffic. This footpath area within the site hoarding would also facilitate standing trucks to load them of the demolition rubble, hence eliminating the need to use areas other than the construction zones to stand trucks for loading of rubble.

To facilitate pedestrians using the alternate side footpaths, we would suggest the installation of a raised pedestrian crossing in Little Spring Street similar to the ones that exist in Denison Street. Adequate signage will be provided by the builder to inform pedestrians to this effect.

During the excavation stage, the hoardings as proposed for the demolition stage will remain and would continue through the construction stages of the project.

88 Walker Street:

The site for the Hotel has a reasonably wide footpath on Walker St and a 1.2m narrow footpath on Little Spring St.

It is proposed that a B Class Hoarding be erected on the Walker St and frontage and a modified B Class hoarding on the Little Spring St frontage for all construction stages of the works. Due to the varying nature of the works and width of the footpath at the site frontage, the Little Spring St hoarding will need to be realigned several times through the construction program.

Temporary cross overs will be required to both street frontages to allow truck and material access and egress into the site during some of the demolition and excavation stages. With these measures we do not envisage that cyclists will be adversely affected.

5.8 Existing Trees

It is believed that to facilitate the traffic flow of construction vehicles around the site, existing mature trees in two separate locations may need to be removed. The tree on the footpath on the corner of Spring St and Little Spring St currently poses issues in its current position with the movement of trucks around this corner. The removal of this tree and the subsequent widening of the available truck turning area will benefit the job as a whole, minimizing traffic delays and reducing congestion in the surrounding streets. The mature tree situated on the footpath in front of the Walker St. construction zone will impede the visibility and loading maneuverability of the crane's access in this area. In order for this already time constrained construction zone to operate at its full potential, Further dialogue will be initiated with North Sydney Council regarding the removal of this tree.

5.9 Adjacent Buildings

Brookfield Multiplex, along with the traffic consultant will implement a fully integrated traffic control system on all surrounding streets with the use of on site traffic controllers, so as to ensure surrounding buildings and their driveways are not blocked by construction vehicles.

It is understood from North Sydney Council that the construction of the nearby building at 86-96 Mount St may occur at the same time and that this project's proposed construction traffic route is also from Little Spring St. This will require careful planning from both sites to ensure traffic movements in the area don't disrupt the public.

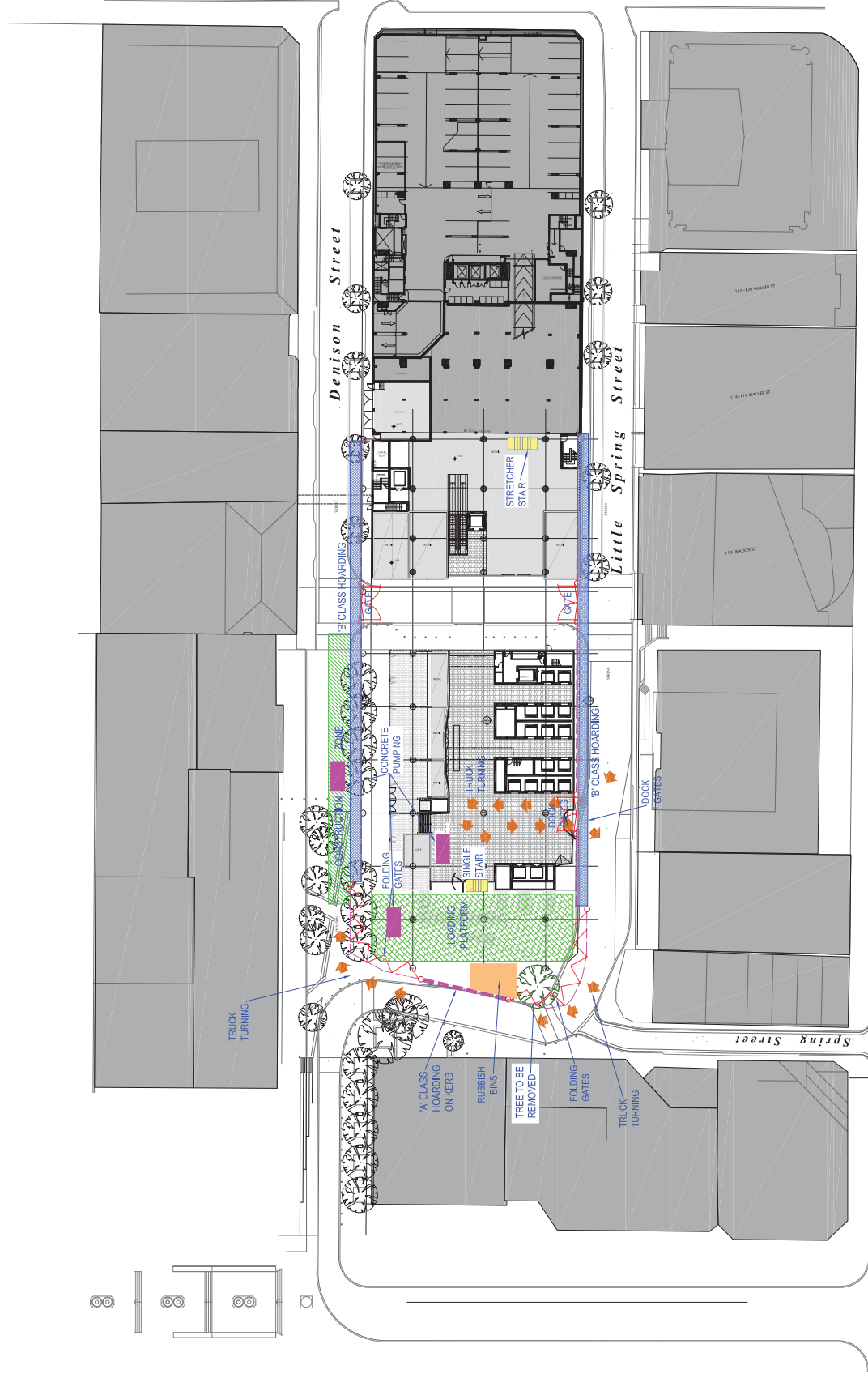
As this project requires the use of a tower crane to be situated adjacent to Little Spring St., lifting over the existing building at 88 Walker St will be a requirement. This has OH&S implications which will require Brookfield Multiplex to put in place a Safe Work Method Statement which would incorporate restricted access to the plant rooms of this building. A steel structure has been designed by a structural engineer to be installed on top of the roof of the 88 Walker Street property. This has

been designed and engineered to accommodate the required 10kPa protection for the craning of materials overhead. The installation and erecting of this steel structure will be undertaken after hours so as to minimise the impact on the existing tenants in the top floors of 88 Walker Street.

For further information on this steel grillage structure, please refer to Appendix E & F, Taylor Thompson Whitting's report as attached.



- LEGEND**
- UNLOADING BAY / CONSTRUCTION ZONE
 - A' CLASS HOARDING WITH FOOTPATH CLOSED
 - B' CLASS HOARDING
 - A' CLASS HOARDING



Legend

Project

1 DENISON STREET

Denison St
Concrete Pumping & Site Amenities
Excavation Stage

Job No. 1 Denison St-010
Scale 1:500
Drawn By: S. 007
Checked By: S. 007
Date: 15/07/2011
Sheet No. 1 of 1

Brookfield
MULTIPLEX

Brookfield MULTIPLEX
Constructions Pty Ltd
Level 25, 250 King Street, Sydney NSW 2000
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- LEGEND**
- UNLOADING BAY / CONSTRUCTION ZONE
 - A' CLASS HOARDING WITH FOOTPATH CLOSED
 - B' CLASS HOARDING
 - A' CLASS HOARDING
 - A' CLASS HOARDING



SCALE (m)
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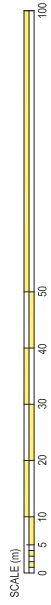
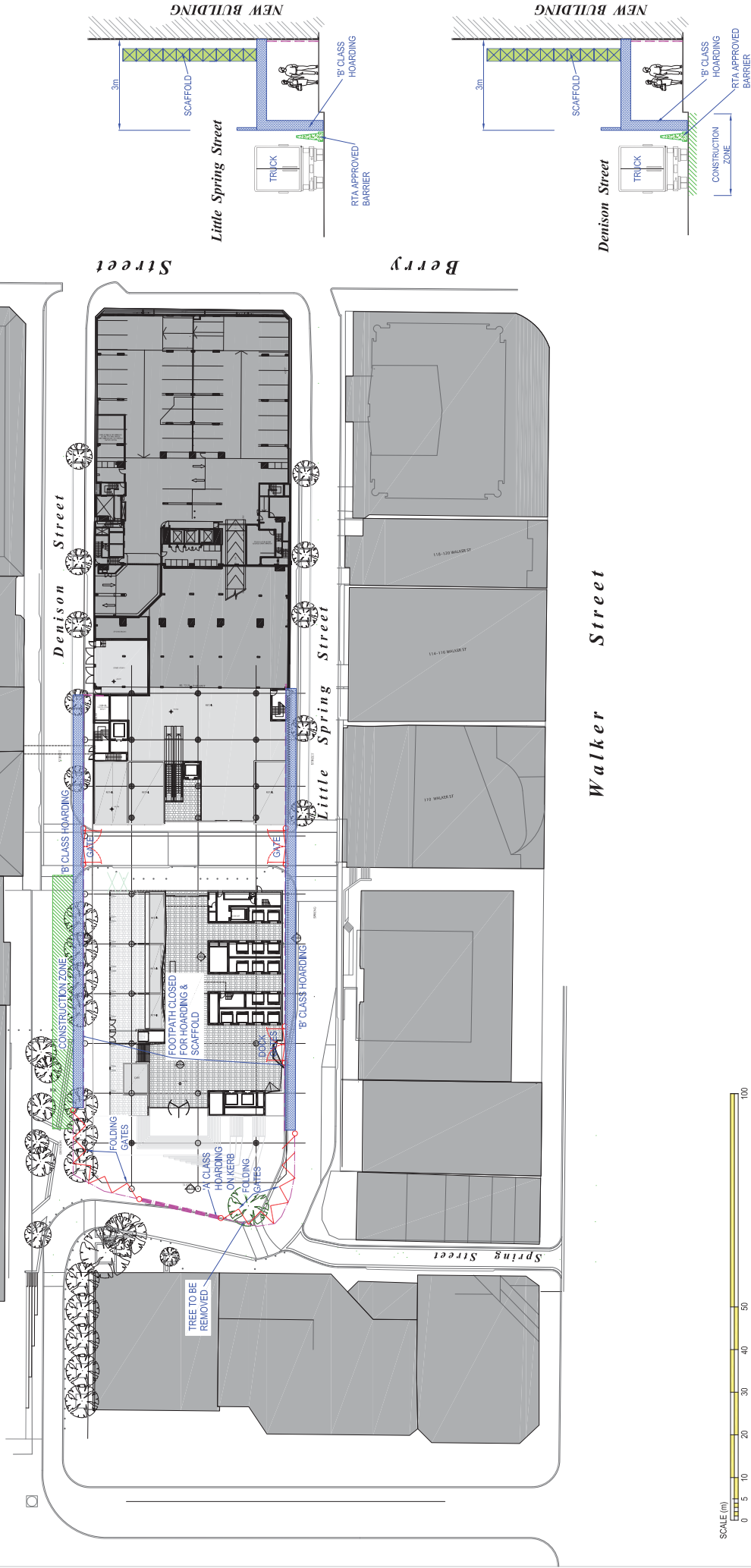
1 DENISON STREET

CONCRETE PUMPING & SITE AMENITIES

Client	CONCRETE PUMPING & SITE AMENITIES
Job No.	1 Denison St-002
Drawn	06/07/2017
Checked	06/07/2017
Scale	A
Sheet	1000



- LEGEND**
- UNLOADING BAY / CONSTRUCTION ZONE
 - A' CLASS HOARDING WITH FOOTPATH CLOSED
 - B' CLASS HOARDING
 - A' CLASS HOARDING



Legend

Project

1 DENISON STREET

MATERIALS HANDLING DEMOLITION / EXCAVATION STAGE

Brookfield
MULTIPLEX

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Drawing Title: MATERIALS HANDLING DEMOLITION / EXCAVATION STAGE

Job No.: 1 Denison St-010

Scale: 1:500

Drawing No.: SH_001

Sheet No.: A

Sheet Name: 1 Denison Street