1 Denison

Preliminary Construction Environmental Management Plan

Prepared for Winten Property Group

4 November 2016

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1. Introduction

This preliminary Construction Environmental Management Plan (CEMP) has been prepared for the 1 Denison St, North Sydney Project.

The site is located at 77 Berry St, North Sydney, and 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 site contains a building that needs to be demolished and will require 4 levels of basement excavation.

The construction methodology and planning for the mixed use commercial tower and retail building is detailed in this CEMP.

This preliminary CEMP will form part of the Section 75W project application and has been prepared to cover the construction management during the demolition, bulk excavation and construction works. A more detailed CEMP will be prepared by the Demolition and Building Contractor/s once appointed and prior to the Construction Certificate/s for the various stages being issued.

It is noted that the 1 Denison development site is in the immediate vicinity of other current and proposed sites at 100 Mount Street and the proposed Sydney Metro site between Denison Street and Miller Street. All subsequent CEMPs and Traffic and Pedestrian Management Plans will need to consider and coordinate with these other sites and North Sydney Council requirements.

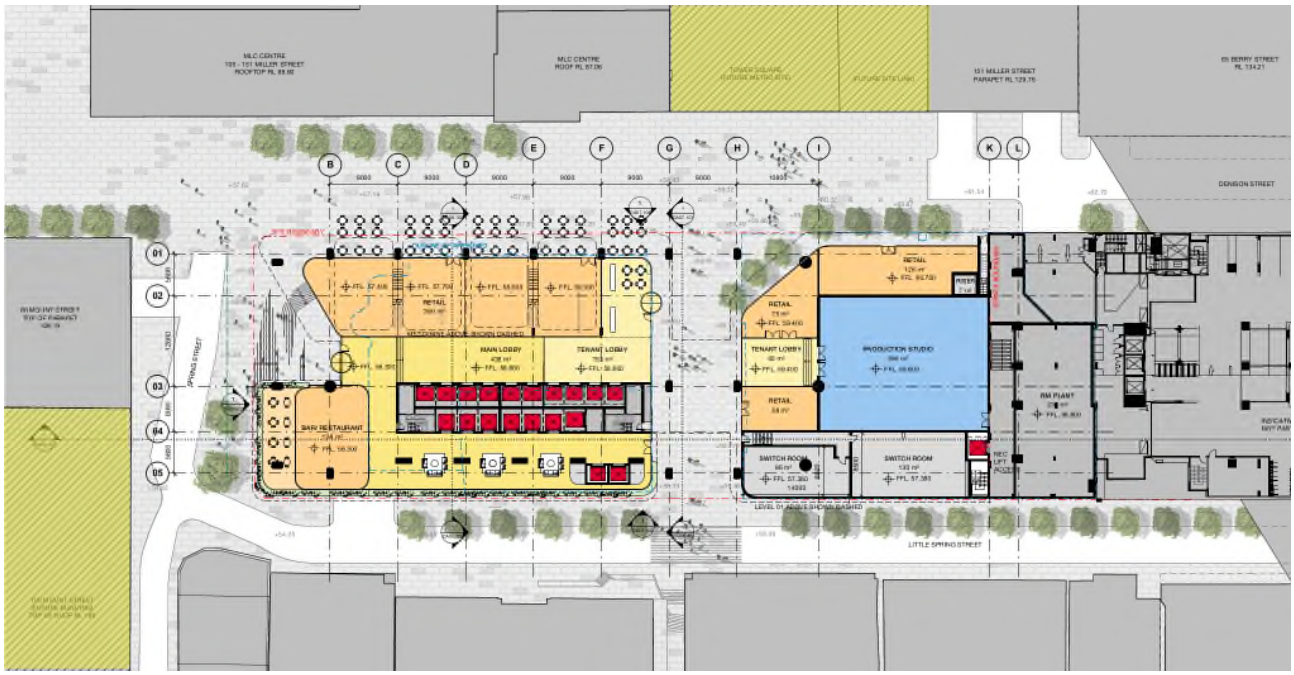

Fig 1: Site and Ground Floor Plan, showing adjacent construction sites in yellow: Future Metro Site at the top of diagram and current 100 Mount Street to the left of diagram.

2. Description of Works and Staging

The project involves the construction of a new mixed use building of approximately 66,170 sqm of GFA including:

- 5 basement levels accommodating parking, delivery spaces, plant and other service areas;
- Ground Floor and Mezzanine containing the commercial foyers and retail spaces;
- Level 1 Production Studios;
- Level 2 Plant Room;
- Level 3 to Level 35 Office Floors;
- Level 36 and 37 Plant Room.

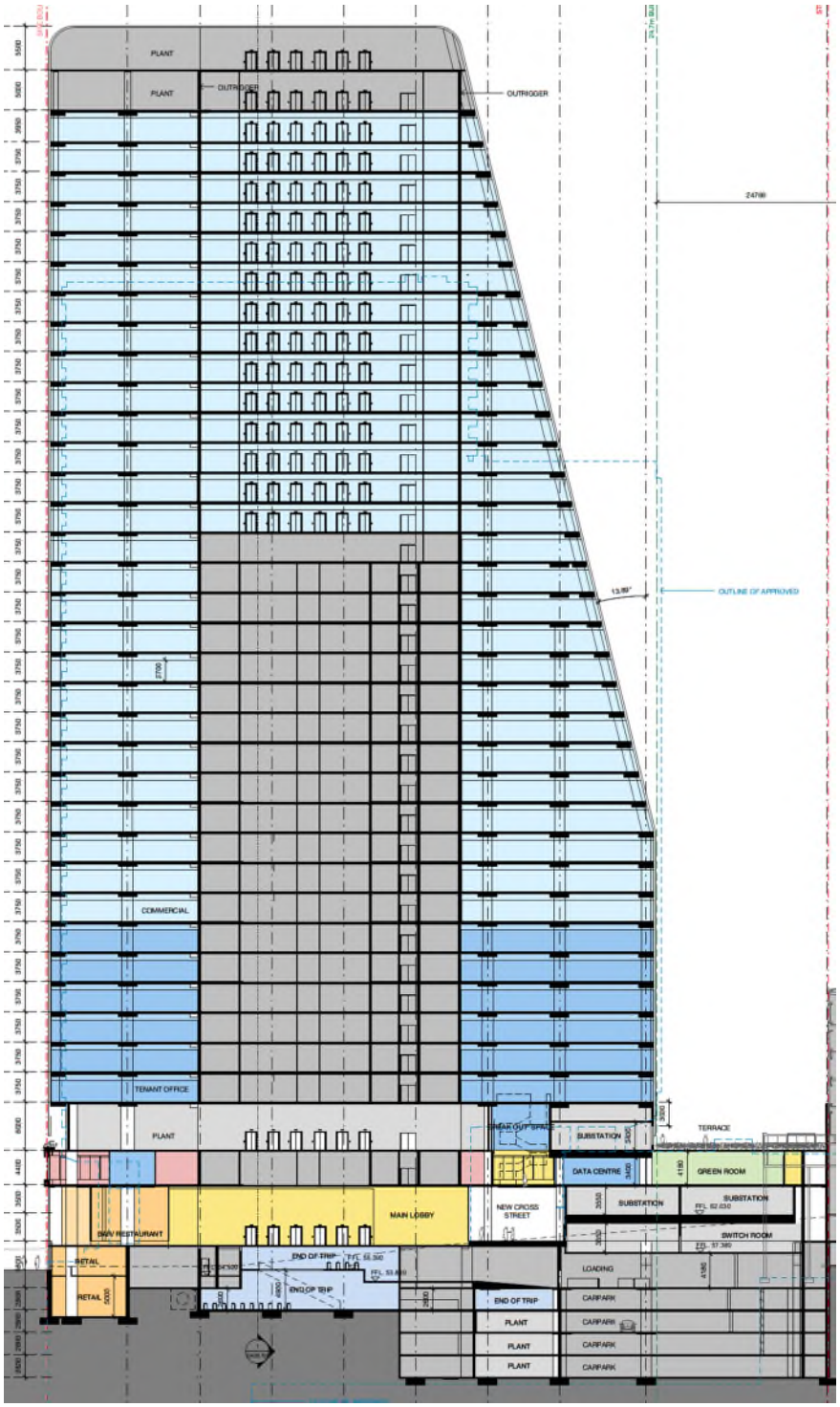

Fig 2: Section, Bates Smart

The work stages will consist of the following:

2.1 Preconstruction Phase

Prior to the works being undertaken on site, investigations will be undertaken to mitigate and control impacts arising from the works.

- A detailed dilapidation survey will be performed on surrounding areas and adjacent buildings.
- Undertake infrastructure investigations to locate and mark all in-ground services.
- Seek authority approvals from Council and utility providers as necessary.

2.2 Early Works

The existing site contains essential services that are required to maintain the amenity for occupants of the Beaumonde residential building at 77 Berry Street. It is proposed that separation and diversion works will be carried out prior to demolition and commencement of the main works. The services affected include substation and switch rooms; Fire Control Room and sprinkler booster pump/valve room; Stormwater; Sewer.

2.3 Site Establishment and Security

Site establishment will include the contractor's site offices, lunch and toilet facilities, vehicle access, vehicle loading and unloading zones, and establishment of site work areas. The contractor will ensure the security of all active work areas and vacant buildings for the safety of the public and protection of the works.

It is estimated that at the peak of construction there will be approximately 350 workers on site each day. Specific areas will be provided for the storage of materials and will be restricted to secure areas within the site. No storage will be allowed outside of the site.

2.4 Environmental and Safety Controls

Environmental and safety controls will be installed by the contractor/s prior to the commencement of demolition and bulk excavation. These will include:

- Security measures (fencing and gate access);
- Occupational health and safety measures including PPE and signage;
- Environmental management measures including dust minimisation, vehicle tyres, sediment and stormwater control, waste transport and disposal, storage of dangerous goods.

2.5 Disconnection and Blocking of Site Services

After consultation with the appropriate authorities, services will be disconnected and/or made safe prior to the demolition.

Disconnect gas supply and provide for future re-connection;

Disconnect existing 'house services' sewers and protect existing sewer trunk main;

Install new 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.

2.6 Removal of Hazardous Materials from the Site

Prior to the commencement of any works on site a Hazardous Material Survey will be conducted to identify any hazardous materials. A Hazardous Materials Plan will be developed to identify the arrangements for the removal and disposal of potentially hazardous materials. Suitably licenced contractors and disposal facilities will be used for the removal and disposal.

Materials that may be present on site that will require specialist removal and disposal include:

- Asbestos containing materials;
- Light Capacitors containing PCBs;
- Lead Paint Systems;
- SMF Insulation

Following the removal of hazardous materials, the buildings will be inspected by a qualified occupational hygienist. Clearance Certificates will be required before any further works can commence on the site.

2.7 Demolition

The Site includes an existing shopping centre building and basement parking that needs to be demolished to allow for the new development. This building will be demolished by a suitably licensed demolition contractor. A specific CEMP will be created by the demolition contractor for these works. Site Specific Quality, WHS and Environmental Management Plans will be developed by the Contractor prior to the works commencing.

2.8 Bulk Excavation

Bulk excavation and shoring of the basement will be completed by a suitably qualified contractor. A specific CEMP will be created by the contractor for these works. Site Specific Quality, WHS and Environmental Management Plans will be developed by the Contractor prior to the works commencing.

All material removed from site is to be sorted and disposed of in accordance with the Waste Minimisation and Management Act of 1995. All contaminated and non-recyclable materials will be loaded and transported to EPA approved landfill sites.

All loads departing the site shall be covered with tarpaulins to prevent any debris from escaping the truck or bin body.

The rock will be saw cut around the perimeter of the excavation using excavators fitted with rock saws. Bulldozers fitted with rippers will rip up the rock to the final level and excavators fitted with hydraulic hammers will break up the rock. Excavators will then load the material onto trucks for transporting off site.

2.9 Construction

Once the excavation work is complete, the contractor 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, roofs.

Once the construction of the floor slabs is past the ground level, temporary perimeter screens and or scaffold will be installed around the perimeter of each of the buildings for safety as the suspended deck construction progresses.

3. Site Boundary and Hoardings

The site is located in a busy part of North Sydney and has four public boundaries that will require hoardings and or other protective structures. “A” and “B” class hoardings and footpath closures will be installed and established throughout the project as required. Emergency Access and Egress gates will be provided. Security and public access lighting will be installed. Site sheds may be installed on hoarding.

A site plan showing the proposed location of hoarding and other protective measures is included at Appendix A. Site hoardings will need to be coordinated with the future Metro construction site on the western side of Denison Street.

3.1 Site Access

Signage will be placed at all site entrances clearly stating that access is for authorised persons only. Only those workers who have completed site specific inductions will be allowed to enter the site. Visitors to the site will need to first attend the Site Office and sign in.

An on-site manned and after hours mobile security presence will be maintained. All gates are to be securely locked outside of working hours and patrolled by security staff.

4. Materials Handling

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 Little Spring Street and possibly Denison Street will be required. Loading zones required to be established on existing roads, will require separate approval from the relevant Authorities and coordination with any adjacent construction sites.

For the buildings 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 marshalled 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 will be moved by hoist or builders lifts rather than the tower crane to the designated floor.

Construction Zones will be required in Little Spring St and if possible Denison St. The Denison St Construction Zone will be phased in use so as not to cause excessive traffic congestion to these surrounding streets.

Construction zones will take the kerb lane in all cases. The current use of the areas where the Construction Zones have been nominated is either a parking spot, or a No Stopping Zone due to driveways into the Berry Square Shopping Centre which will have no purpose once construction works commence.

The need for maintaining smooth traffic flow and pedestrian safety is understood and so adequate, well informed and trained, traffic controllers will be used 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 queueing 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. If trucks are required to queue, a designated area will be sought so as not to affect North Sydney CBD traffic.

It is estimated that traffic flow generated by the construction of the development will be far less than what is currently generated by the operation of Berry Square Shopping Centre loading docks and associated Secure Carpark (117 car spaces). Estimated truck movements for construction are noted in section 6.2 of this report.

5. Street Closures

For the works to be completed safely, several temporary street closures will need to occur. These will affect Little Spring Street, Spring Street and Denison Street. These closures will be planned and documented in advance, coordinated with Council and other statutory authorities. Public that may be affected by these closures will be notified and consulted with as to alternate 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 carrying out hard and soft landscaping works.
- Reconfiguring of western end of Spring Street to carry out hard landscaping works.

Most of these closures should occur at non peak traffic times.

6. Traffic Management

The Contractor/s shall prepare a detailed Traffic Management Plan (TMP) prior to the commencement of each stage of the works. The detailed plans will be coordinated with North Sydney requirements for the precinct and surrounding construction sites.

A review of the proposed Traffic Management for the Development was prepared by Halcrow in 2011. With the exception of references to the portion of the development at 88 Walker Street, the preliminary Halcrow report is still relevant to the development. A copy of this report and associated plans and diagrams is included at **Appendix A.**

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 minimize vehicles waiting off the site.
- Site workers are to utilize local public transport and car sharing wherever possible.

The initial part of the development involves the demolition of the existing buildings and the shopping centre at 77-81 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 Works Zone within the Little Spring Street frontage.

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 B-Class hoardings along all boundaries of the site.

If there is a requirement to operate any material handling machinery on public access roads, the contractor 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.

6.1 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 the head contractor 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. The contractor 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 or Walker 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 and Walker Street in order to travel towards Berry Street.

Vehicle access routes are contained in attached Halcrow report **Appendix A.**

The proposed works will involve the provision of an access driveway within the Spring Street frontage and works zones will be required along part of Little Spring Street and Denison Street. The site access and Works Zone will require the use of accredited Traffic Controllers to monitor and control vehicle movements.

6.2 Truck Movements

The envisaged truck arrivals to site will be:

Excavation	25 - 40 per day
Demolition	5 - 10 per day
Structure	3 – 5 per day
Concrete Pour	5 – 40 per day (on pour days only)
Fit out	5 - 15 per day (mainly within loading dock)

7. Pedestrian Management

Pedestrian and cyclist safety is of utmost importance to all stakeholders and the plan to safeguard their protection is detailed below. Different stages of the Works will require different types of Hoardings. The existing building is built to the boundaries of the property.

All pedestrian management will need to be coordinated with North Sydney Council and any adjacent constructions sites, in particular the future Metro site on the opposite side of Dension Street.

The footpath in Little Spring St and Denison is about 1.2 to 1.6m wide. This width will not be sufficient for a safe B Class hoarding to be erected and allow for pedestrian access underneath. It is proposed that the footpath be closed to pedestrian access, an A Class hoarding be erected and the 5 board heavy duty scaffold be erected from the footpath to encapsulate the existing building for demolition. Similar hoardings will be required for the excavation stage.

To maximize public and pedestrian safety, it is proposed to close the footpath to the Spring St frontage of the building to pedestrian traffic and erect an A class Hoarding to 250mm in from the kerb line. This footpath area would also facilitate standing trucks to load them of the demolition rubble, hence minimizing the need to use streets to stand trucks for loading of rubble.

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

These hoarding layouts will also be needed for the structure stage of the works for the following reasons:-

- The new podium is built to the boundary alignment on two of the three frontages. For OH&S purposes the construction will require access from the footpath side. Given the narrow widths of the Little Spring St and Dennison St footpaths, the most practical and safe solution would be the A Class Hoarding at the kerb with the footpath closed.
- By maintaining the A Class in Little Spring St, it keeps pedestrians away from the construction site and truck access and egresses from site thus facilitating better public safety.

8. Work Program and Working Hours

Working hours will be strictly in accordance with the relevant authority approvals. No work shall be conducted on the site during Sundays or Public Holidays. If any works outside of these hours are necessary the required applications and approvals will be made well in advance of the dates requested.

9. Site Specific Management Plans

9.1 WHS Management Plan

A detailed site specific Work Health and Safety Management Plan, which will include a health and safety risk assessment for the planned construction works shall be prepared by the Contractor prior to the CC being issued.

The Plan 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;

9.2 Environmental Management Plan

Prior to the commencement of works, a detailed site specific Environmental Management Plan will be prepared by the contractor/s. The EMP will include the following sections:

9.2.1 Noise and Vibration Management Plan

The contractor 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:

- The Contractor 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.
- The Contractor will be responsible for scheduling activities that generate high noise to short term duration wherever possible and practical.
- 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.

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

- Demolition of the building
- Excavation of the commercial 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.

A register of noise complaints should be maintained by the Contractor.

9.2.2 Waste Management Plan

The Contractor shall prepare the Waste Management Plan (WMP) prior to the commencement of works.

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

9.2.2.1 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 Site Manager 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:

Concrete/Brick	3600 tonnes
Rubbish	1000 tonnes
Steel	200 tonnes

9.2.2.2 Construction Waste

During excavation all trucks will be required to exit the site via a dedicated gate. This gate will have facilities such 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.

9.2.3 Air Quality Management Plan

A detailed Air Quality Management Plan shall be prepared by the Contractor 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.

9.2.4 Soil and Water Management Plan

The Stormwater and Sediment Control plan is to be prepared by the Contractor 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 the Contractor 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 the Contractor.

APPENDIX A

Review of Construction Traffic Management

Halcrow, 6 July 2011

1 Denison Street & 88 Walker Street, North Sydney

Review of Construction Traffic Management

6 July 2011

Prepared for

Eastmark Holdings Pty Ltd

Halcrow

1 Denison Street & 88 Walker Street, North Sydney
Review of Construction Traffic Management

Prepared for
Eastmark Holdings Pty Ltd

This report has been issued and amended as follows:

Rev	Description	Date	Prepared by	Approved by
V01	Draft client review	5/7/2011	NI	JR
V02	Final for submission	6/7/2011		JR

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1 Introduction

On behalf of Eastmark Holdings, Brookfield Multiplex Pty Ltd have prepared a *Construction Environmental Management Plan* (CEMP) [1] for the proposed construction methodology for the approved development proposal at 1 Denison Street and 88 Walker Street North Sydney.

Included in the CEMP construction methodology is a detailed outline of the proposed staging of construction, operational conditions such as working hours and the associated construction traffic management measures to be implemented during construction.

Halcrow has been engaged by Eastmark Holding to review and provide input into the development of the CEMP regarding the construction traffic management arrangements.

Specifically the review of the CEMP has been prepared to address Condition 14 of Consent MP08_0238 dated 25 February 2010.

Therefore this review of construction traffic management is to be read as a supporting document to the overall construction methodology described in the CEMP.

The purpose of this CTMP is to:

- provide a review of the proposed construction activities with regard to traffic and parking;
- identify potential construction traffic implications on the operation of the surrounding road, transport and pedestrian networks; and
- recommend management measures to be implemented to mitigate these implications.

[1] *Construction Environmental Management Plan – 1 Denison Street & 88 Walker Street North Sydney* (6 July 2011) prepared by Brookfield Multiplex Pty Ltd

It is also noted that the proposed construction methodology was discussed with North Sydney Council officers at a meeting held on the 21 June 2011. The key outcomes of this meeting regarding construction traffic were:

- in principle the use of kerb side "work zones" for construction loading / unloading was supported by Council. Changes to the on street parking arrangements would need to be accompanied with a signage plan;

- any proposed amendments to the existing Berry Street parking conditions would need not generally be supported by Council and would need to consider other construction activities in the area; and

- pedestrian access and safety in the laneways (ie. Little Spring Street, Denison Street and Spring Street) needs to be considered and maintained at all times; and

- access to adjacent properties (both vehicular and pedestrian) to be maintained at all times.

These issues have been considered and incorporated into the CEMP submitted to Council for approval via the North Sydney Traffic Committee.

It is noted that the CEMP and this review sets out the principles for construction traffic management including standard TCPs to be implemented. Detailed traffic control plans (TCP's) including signage location, details of traffic control and work zone occupation will be made via separate TCPs and applications for road occupation for each of the various stages of development.

2 Proposed Works

2.1 Proposed Construction Works and Traffic Management

2.1.1 Overview of Works

The CEMP report outlines the various stages of construction for the proposed development at 1 Denison Street and 88 Walker Street.

The works will include:

- Early works (to relocate existing essential services);
- Demolition;
- Excavation ; and
- Building works.

The construction activities will be staged with work commencing initially on the 1 Denison Street site and then subsequently on 88 Walker Street site.

The location of the site and the surrounding road and transport network is shown in Figure 1.

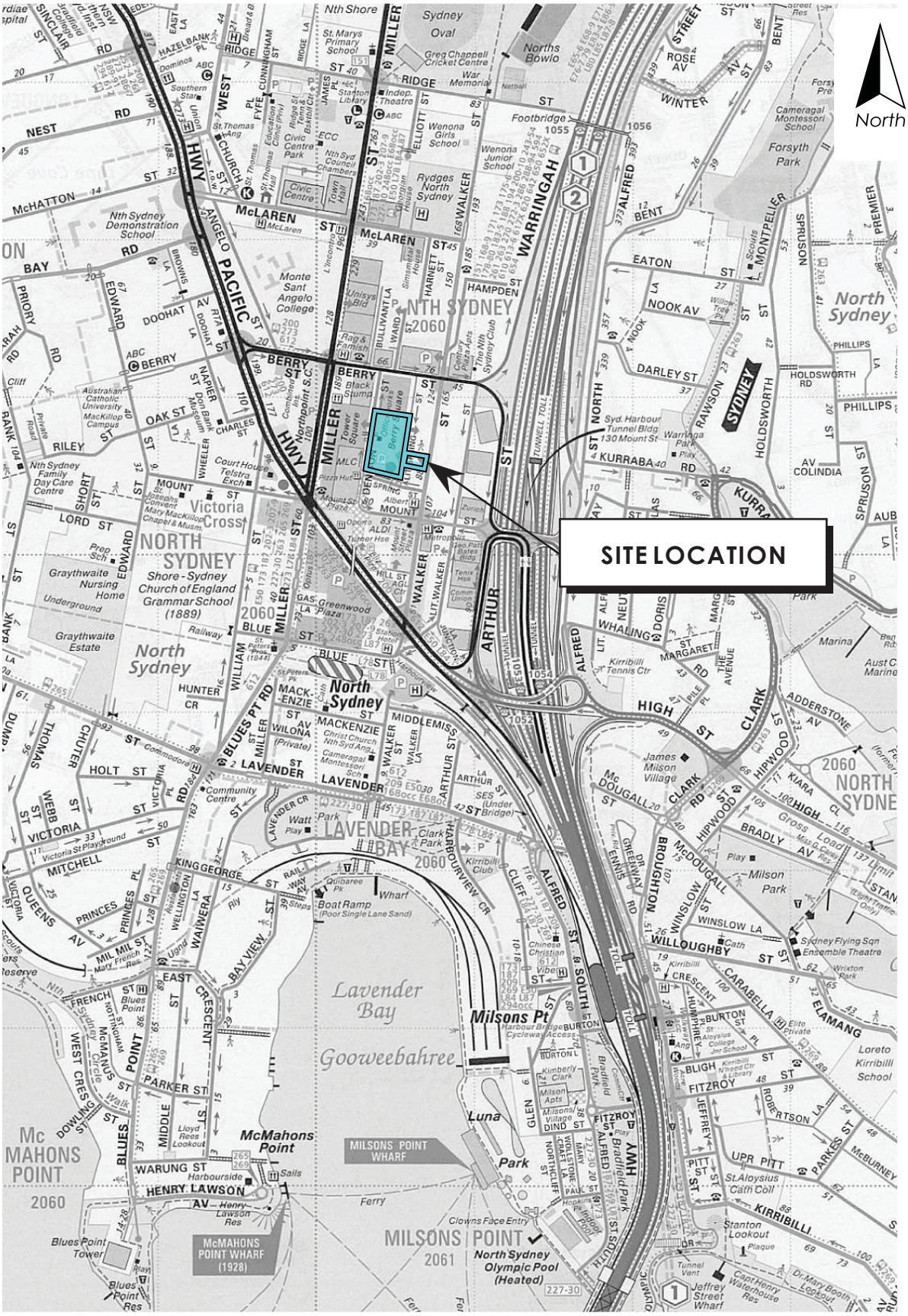
2.1.2 Overview of Truck Movement Types

The proposed construction operations affecting traffic are outlined below:

- Delivery trucks associated with site establishment works including the installation of any fencing / hoarding, worker facilities, and the like;
- Loading and unloading of trucks from public roads throughout the works;
- Use of Medium Rigid Vehicles (including truck and trailer) for demolition and excavation material removal;
- Use of trucks longer than heavy rigid vehicles such as semi trailers for delivery of materials and machinery.
- Concrete deliveries by medium rigid concrete trucks; and
- Delivery vans, utilities and cars as required.

SITE LOCATION

1 DENISON STREET & 88 WALKER STREET, NORTH SYDNEY



Halcrow

Figure 1

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Date: 17 June 2011

2.1.3 Work Zones

It is proposed that material handling will be undertaken via 4 separate Construction (Work) Zones, namely:

- Construction Work Zone 1 - western side of Little Spring Street
- Construction Work Zone 2 - eastern side of Denison Street (southern zone)
- Construction Work Zone 3 - western side of Walker Street at 88 Walker Street
- Construction Work Zone 4 - eastern side of Denison Street (northern zone)

These Work Zones will be utilised at various stages of the overall construction works. For example Work Zone 4 would only be used as a work zone during the early works associated with the construction of the electrical substation room.

It is proposed to construct a loading platform at the southern end of the 1 Denison Street site. This will reduce the volume of materials received at the other "on street" work zones.

The proposed Work Zones are shown in Appendix A and Appendix B of this review.

Further details are provided in the CEMP.

These Work Zones will include the permanent use of hoardings / fencing and would be directly controlled by construction staff when in operator. In this way the public is protected from overhead loading by cranes.

The selection of locations for Work Zones has taken into account a number of significant restrictions for material handling, including;

- Crane manoeuvrings and reach limitations associated with adjacent buildings; and
- Heavy vehicle access restrictions to Work Zone areas (namely difficulties in maintaining semi trailer access to Little Spring Street and Denison Street).

It is noted that the proposed Work Zone in Walker Street would not operate on a 24 hour per day basis.

In Walker Street, parking would be permitted outside of clearway and construction hours. In Little Spring Street, parking would be permitted outside of construction hours in the section without B-Class hoarding (ie. north of the site).

2.2 Timing of the Works

Approximate timing of the works has been calculated and presented in the CEMP based on the approved hours of operation as set out in the conditions of consent, namely:

- Monday – Friday : 7am – 5pm
- Saturday: 8am – 1pm
- Sunday: No work

As stated above, the proposed Walker Street Work Zone would only be available between 10am – 3pm on weekdays.

3 Construction Vehicle (Truck) Management

3.1 Truck Routes

General truck traffic would have different origins / destinations throughout Sydney. There are a limited number of options for inbound and outbound routes depending on origin and destination of trucks.

The recommended truck arrival and departure routes for construction vehicles accessing the site are shown in Figure 2 and Figure 3.

These figures show the local road routes to be used to access the proposed construction site from the regional road network.

The truck access routes shown in Figure 2 and Figure 3 attempt to minimise the extent of construction traffic movements on local roads and direct construction vehicles to the Warringah Freeway or Pacific Highway as directly as possible.

The extent of the proposed "work Zones" in Little Spring Street and Denison Street is to facilitate convenient vehicle access for both construction vehicles and other vehicles.

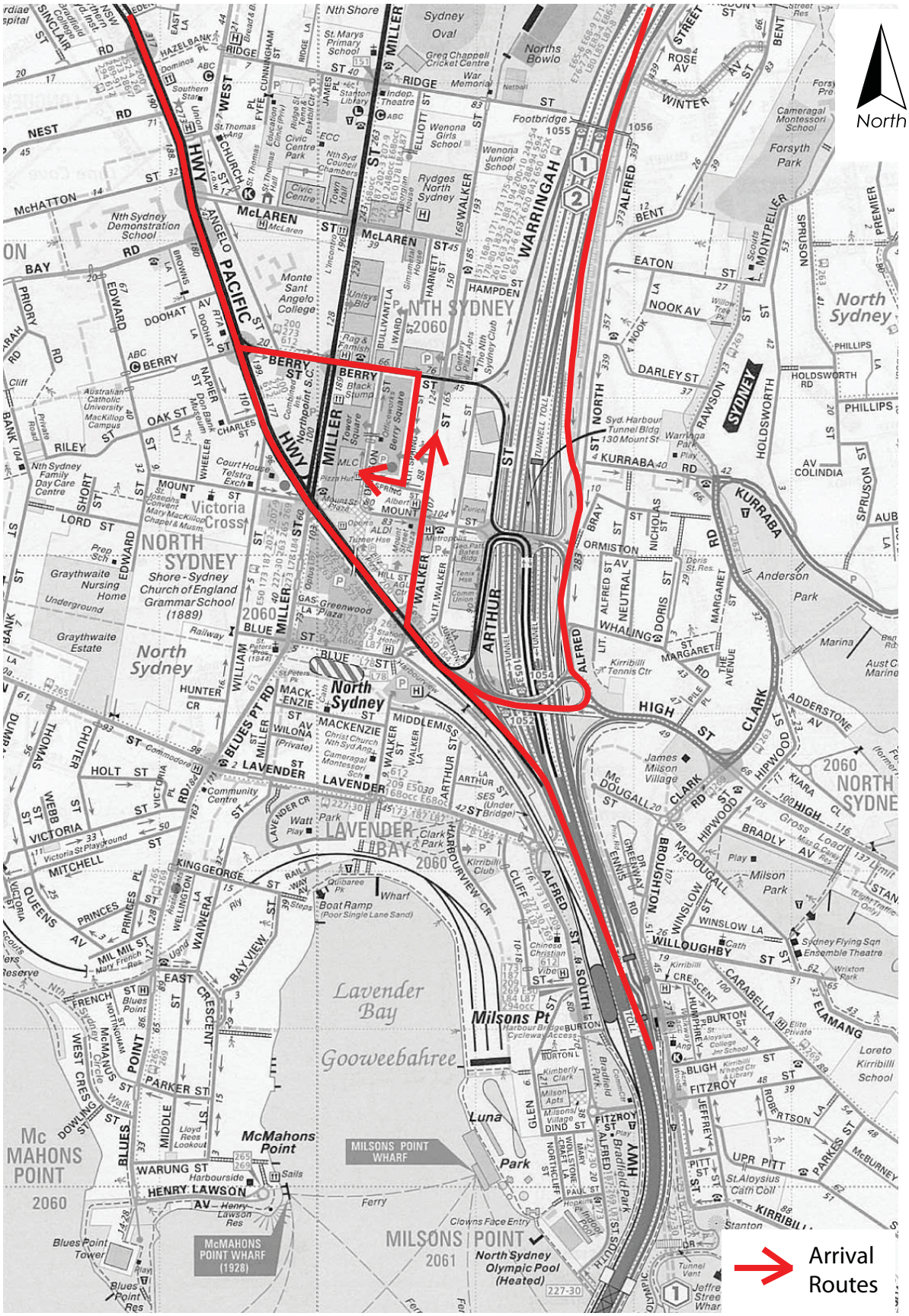
3.2 Materials Handling Options

3.2.1 Onsite Loading

Onsite loading and unloading would be facilitated with the early construction of the vehicle platform at the southern end of the site. The onsite platform would allow construction vehicles to enter and exit in a forward direction. This arrangement provides the safest method of work as it minimises the impact to the public and reduces the amount of traffic control that would be required.

CONSTRUCTION VEHICLE ARRIVAL ROUTES

1 DENISON STREET & 88 WALKER STREET, NORTH SYDNEY



Halcrow

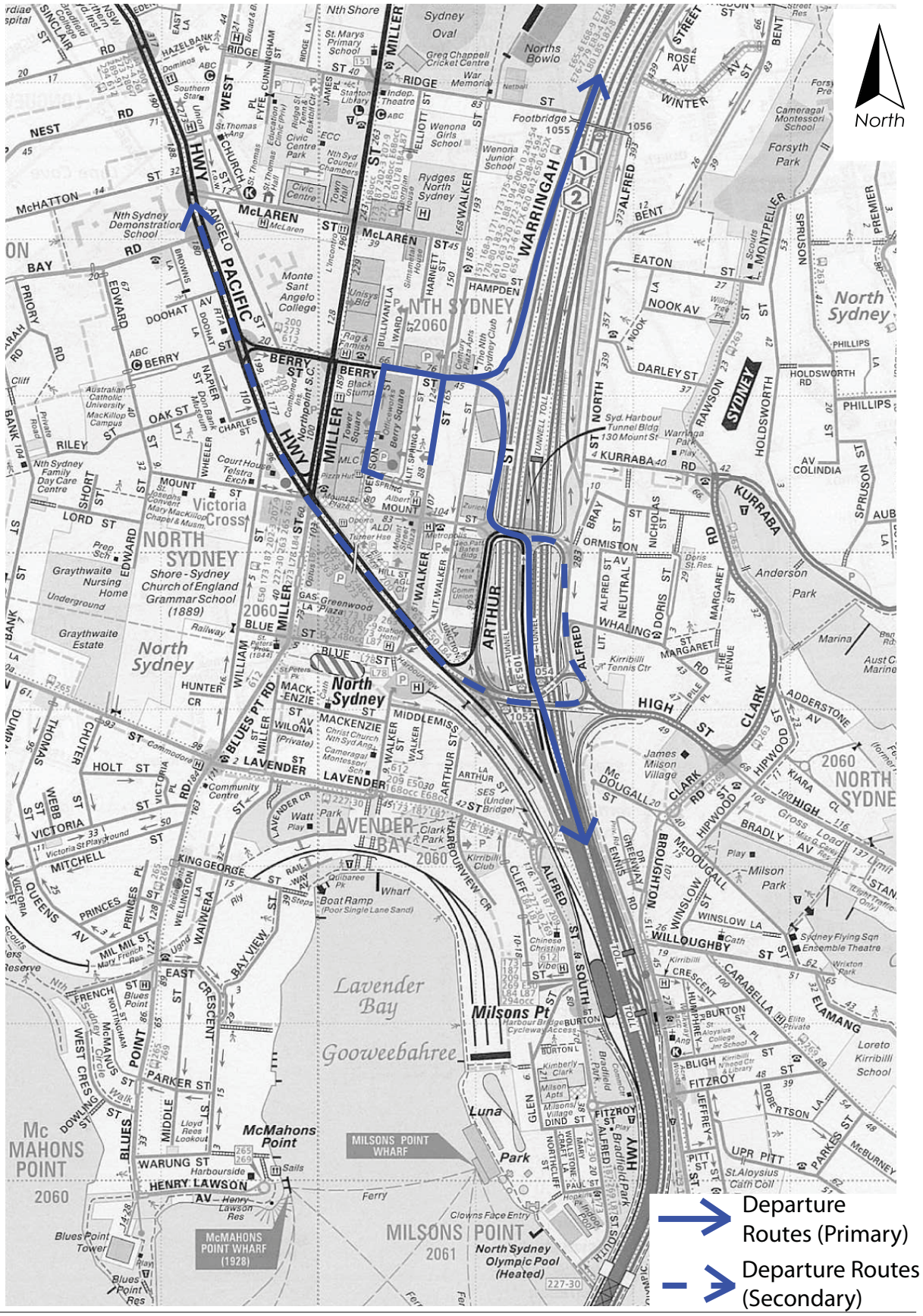
Figure 2

Filename: CTLRDSdi02.ai

Date: 17 June 2011

CONSTRUCTION VEHICLE DEPARTURE ROUTES

1 DENISON STREET & 88 WALKER STREET, NORTH SYDNEY



Halcrow

Figure 3

Filename: CTLRDSdi03.ai

Date: 17 June 2011

3.2.2 Offsite Loading

Use of the on site loading platform would need to be supplemented by on street areas.

The use of larger trucks would be required when:

- materials must be delivered by a heavy rigid truck over 10.7 metres due to size or weight;
- direct crane lifting is required from the street frontage;
- during construction of the loading platform; and
- accommodate truck numbers during peak periods such as concrete pours.

3.3 Traffic Control Plans (TCP)

As indicated in Section 1 of this report, this review sets out the principles for construction traffic management including standard TCPs to be implemented.

Detailed traffic control plans (TCP's) including signage location, details of traffic control and work zone occupation will be made via separate TCPs and applications for road occupation for each of the various stages of development.

The operation of the proposed "work zones" would not necessitate the preparation of a TCP as defined by the RTA's *Traffic Control at Work Sites* manual.

However the principles of the manual shall be applied and specific TCP's be development for the following activities:

- Use of traffic controllers;
- Temporary partial or full closure of road ways for erection of hoarding / tower cranes; and
- Closure of pedestrian access.

Example TCPs extracted from the RTA's *Traffic Control at Work Sites* manual are provided in Appendix C.

3.4 Work Zone Impacts to On-street Parking

As indicated above, the implementation of on street work zones will impact on the existing on street parking provisions.

An audit of the existing on street parking signage (and other signage) has been undertaken as part of this review. This audit of existing signage has been used to identify where changes to the existing on street parking signage are required to accommodate the proposed work zones.

Details of the existing and proposed on street parking signage are provided in Appendix B.

The purpose of the detailed signage plans is to allow Council to:

- Quantify the impact to the various types of on street parking (ie. metered / unmetred parking); and
- Install signage in accordance with the proposal (if approved).

3.5 Pedestrians

Details of the proposed pedestrian management and safety measures are provided in the CEMP. Essentially hoarding (B-Class and A-Class) would be used to protect pedestrians on the footpaths.

Pedestrian access along the laneways shall be maintained at all times. Where existing pedestrians may need to be temporarily disrupted, alternate crossings and pathways shall be provided and appropriately signposted.

3.6 Public Transport

There are no designated bus stops within the laneways or areas of the proposed work zones.

It is not expected that public transport services would need to detoured during construction works.

3.7 Emergency Vehicle Access

Emergency protocols on the site would include a requirement for traffic controllers to assist with emergency access from the street. Emergency protocols must also be established and staff inducted on emergency evacuation protocols for the site under OHS.

3.8 Green (Work Place) Travel Plan

It is recommended that the builders of the development implement a Green (Workplace) Travel Plan for construction workers.

A Green Travel Plan would potentially include:

- Information on Transport Options
    - Preparation of an "access guide brochure" detailing how to get to and from North Sydney by public transport, cycling and walking.
    - This access guide shall be provided to each employee and contractor on the project as part of the site induction process.
    - The access guide shall be mounted on employee notice boards

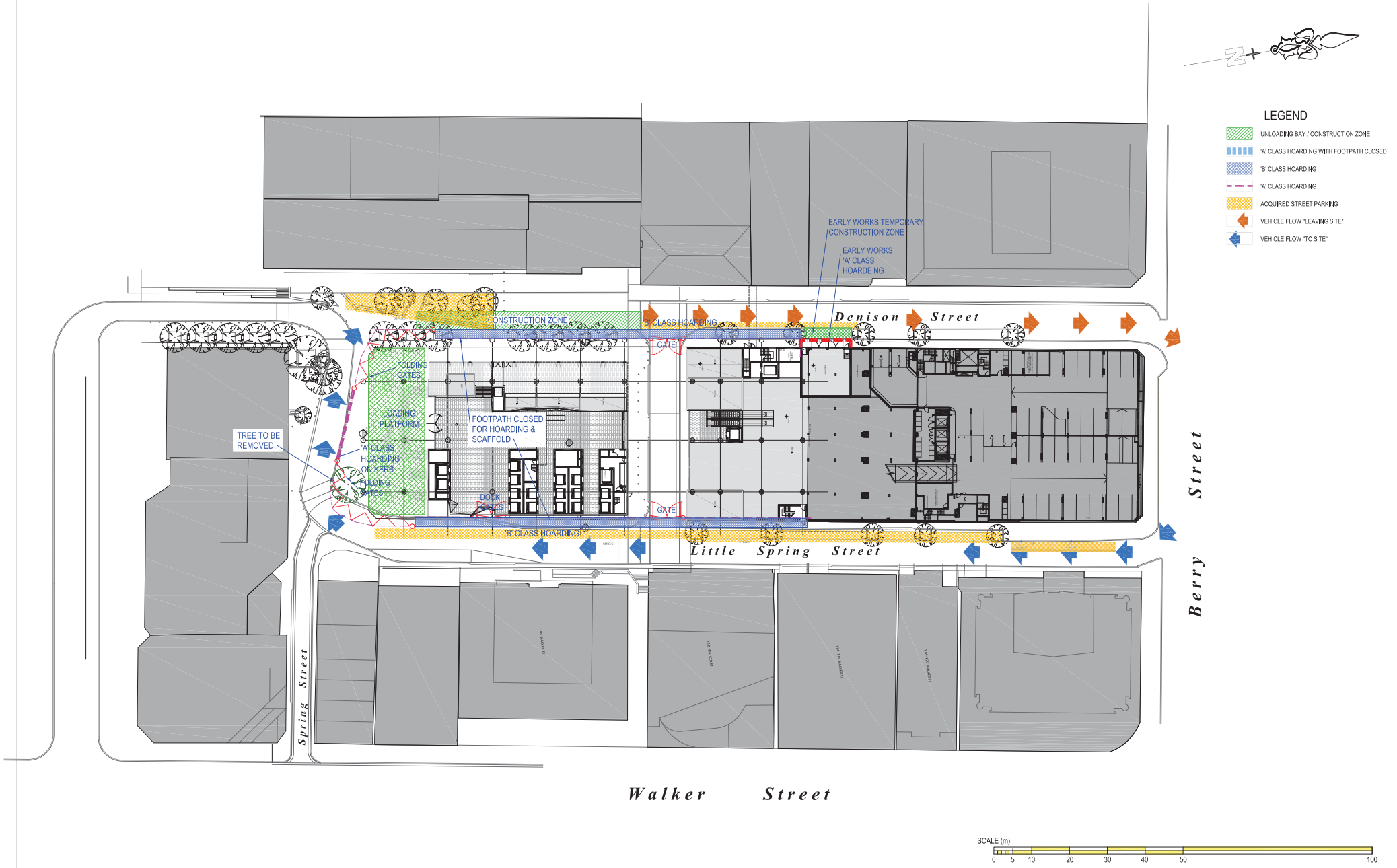
- On Site Bicycle Facilities
    - Bicycle parking areas could be provided on site.
    - Showers will be provided on site and would be available to workers cycling to the site.

- Tool Drop Off and Storage Facilities
    - On site tool drop off and storage facilities shall be provided such that workers do not need to bring tools each day to the site by vehicle. Storage of tools allows workers to more conveniently utilise public transport.

Appendix A CEMP Traffic Management Diagrams

Source: CEMP prepared by Brookfield Multiplex (7 July 2011)

Appendix B On Street Parking Signage Plans



Legend

1 DENISON STREET

Project

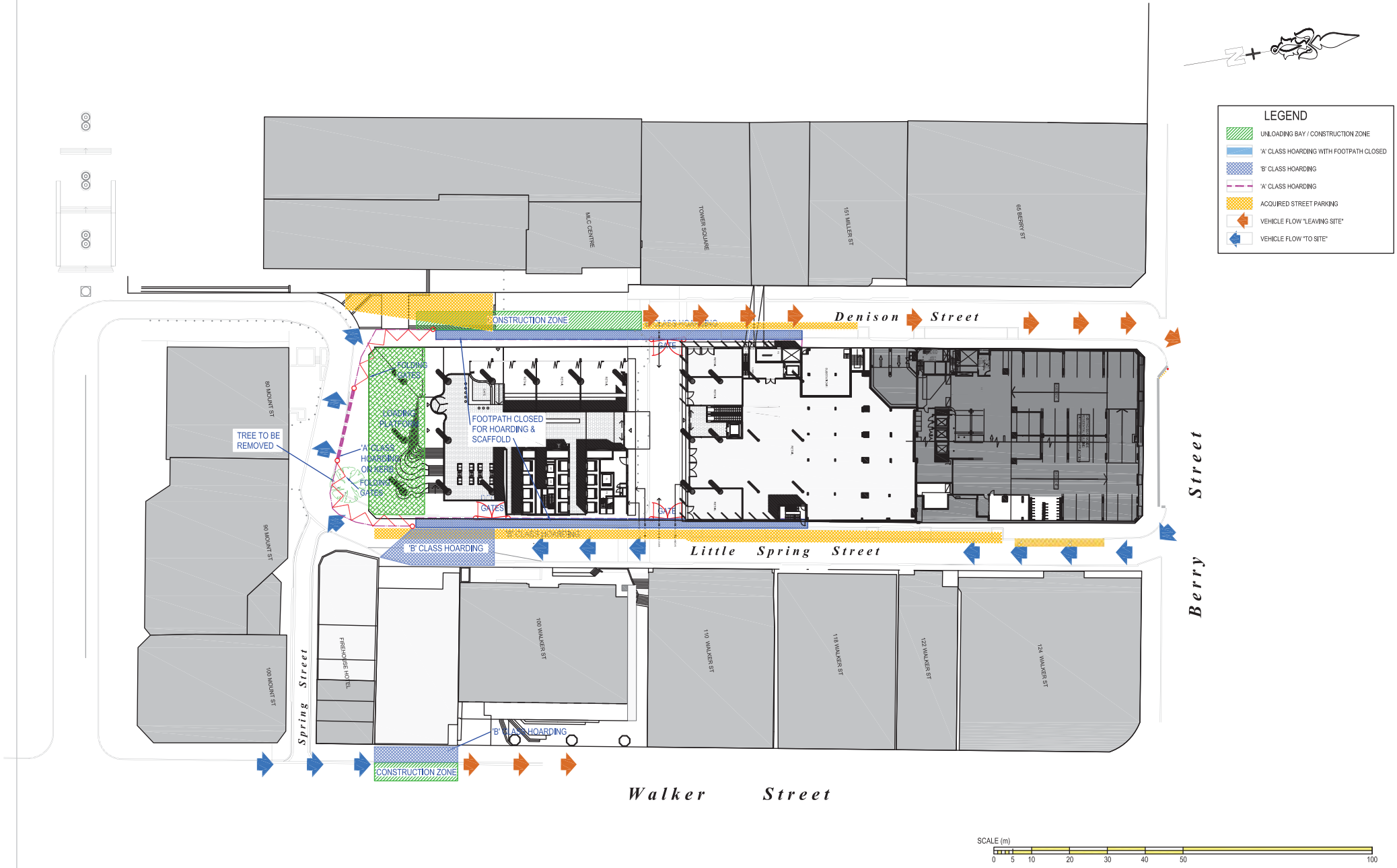
TRAFFIC FLOW, CONSTRUCTION ZONES & HOARDINGS DEMOLITION / EXCAVATION STAGE

Drawing Title: TRAFFIC FLOW, CONSTRUCTION ZONES & HOARDINGS DEMOLITION / EXCAVATION STAGE

Job No.	1 Denison St -010	DRAFTING	
Discipline	-	Date	06-07-2011
Drawing No.	Sk. 006	Revision	B

Steve Wilson

Brookfield MULTIPLEX
Brookfield MULTIPLEX Constructions Pty Ltd
Level 22, 135 King Street Sydney NSW 2000
Tel: +61 2 9322 2000 Fax: +61 2 9322 2001



Legend

1 DENISON STREET

Project

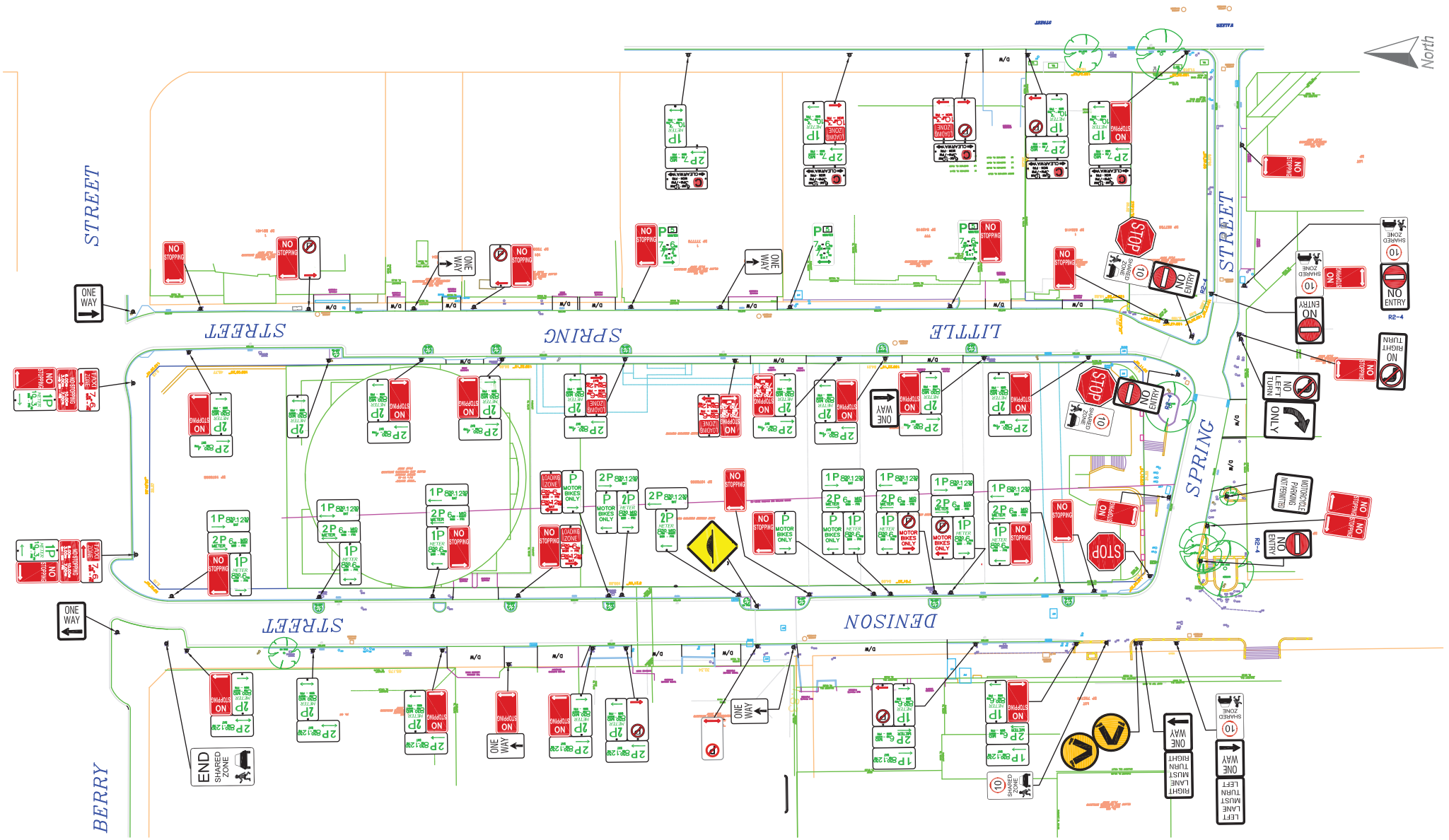
TRAFFIC FLOW, CONSTRUCTION ZONES & HOARDINGS

Building Zone	.
Drawing Title	TRAFFIC FLOW, CONSTRUCTION ZONES & HOARDINGS
Job No.	1 Denison St -002
Discipline	.
Date	06-07-2011
Drawing No.	001
Revision	A
Drafting	Steve Wilson

Brookfield MULTIPLEX
Brookfield Multiplex Constructions Pty Ltd
No.1 KENT STREET, SYDNEY N.S.W. 2000
Tel: (02) 9299 5000

EXISTING STREET SIGNAGE

1 DENISON STREET + 88 WALKER STREET, NORTH SYDNEY



Scale: 1:600@A3

Halcrow

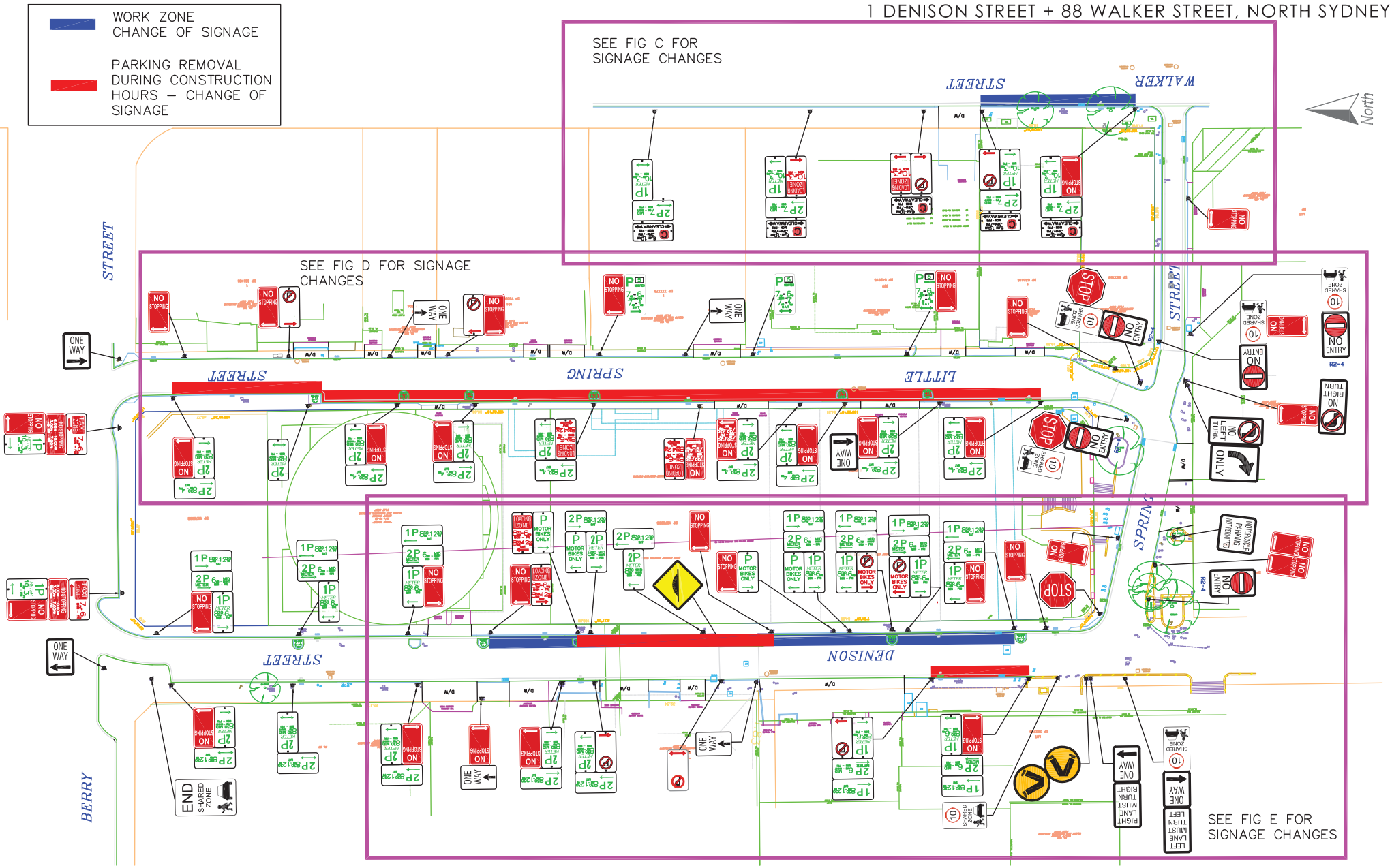
Filename: CTLRDSda06

Figure A

Date: 04 JULY 2011

PROPOSED EXTENT OF WORK ZONES

1 DENISON STREET + 88 WALKER STREET, NORTH SYDNEY



Scale: 1:600@A3

Halcrow

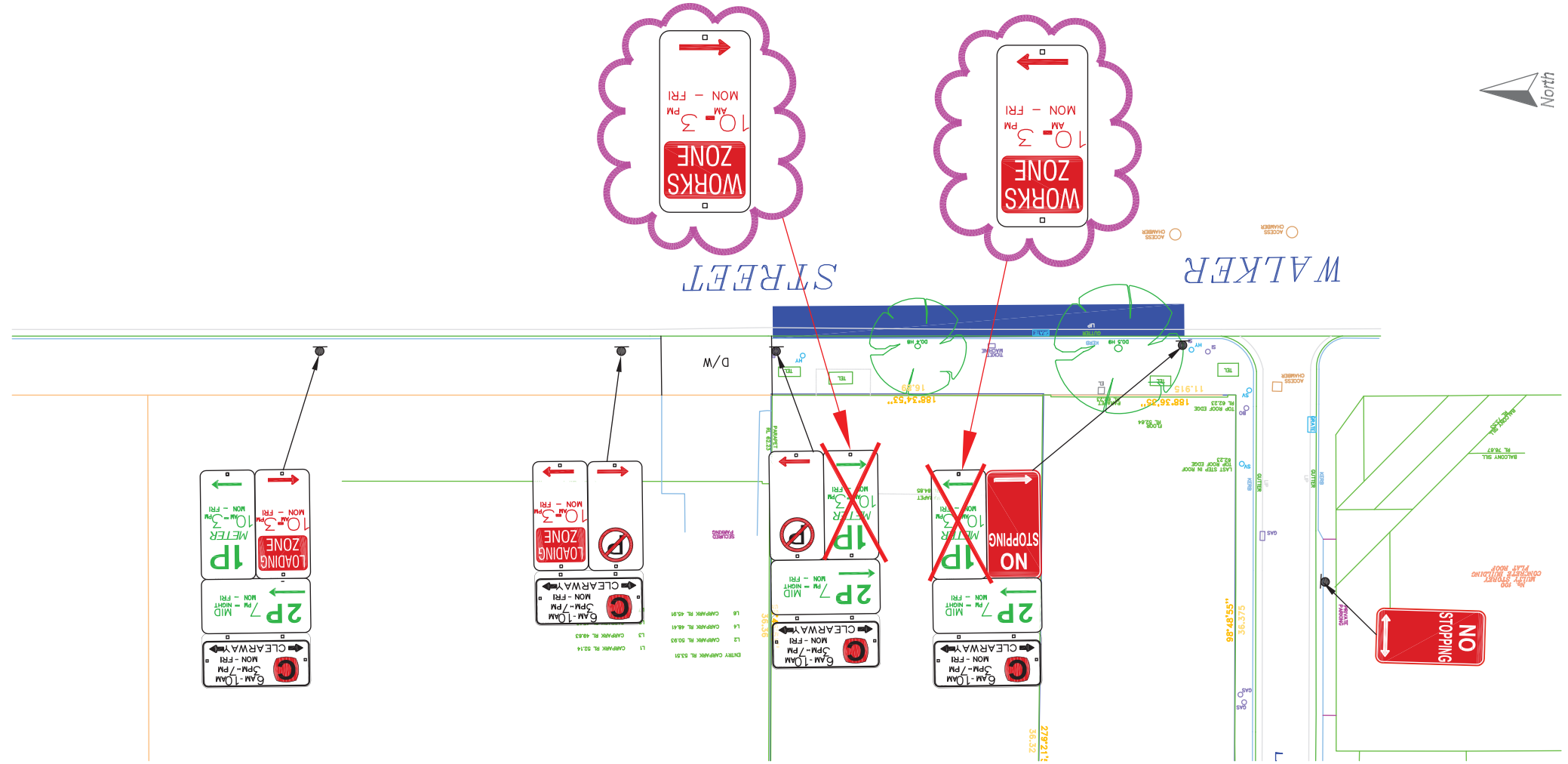
Filename: CTLRDSda06

Figure B

Date: 04 JULY 2011

WALKER STREET - PROPOSED WORK ZONE SIGNAGE CHANGES

1 DENISON STREET + 88 WALKER STREET, NORTH SYDNEY



Scale: 1:250@A3

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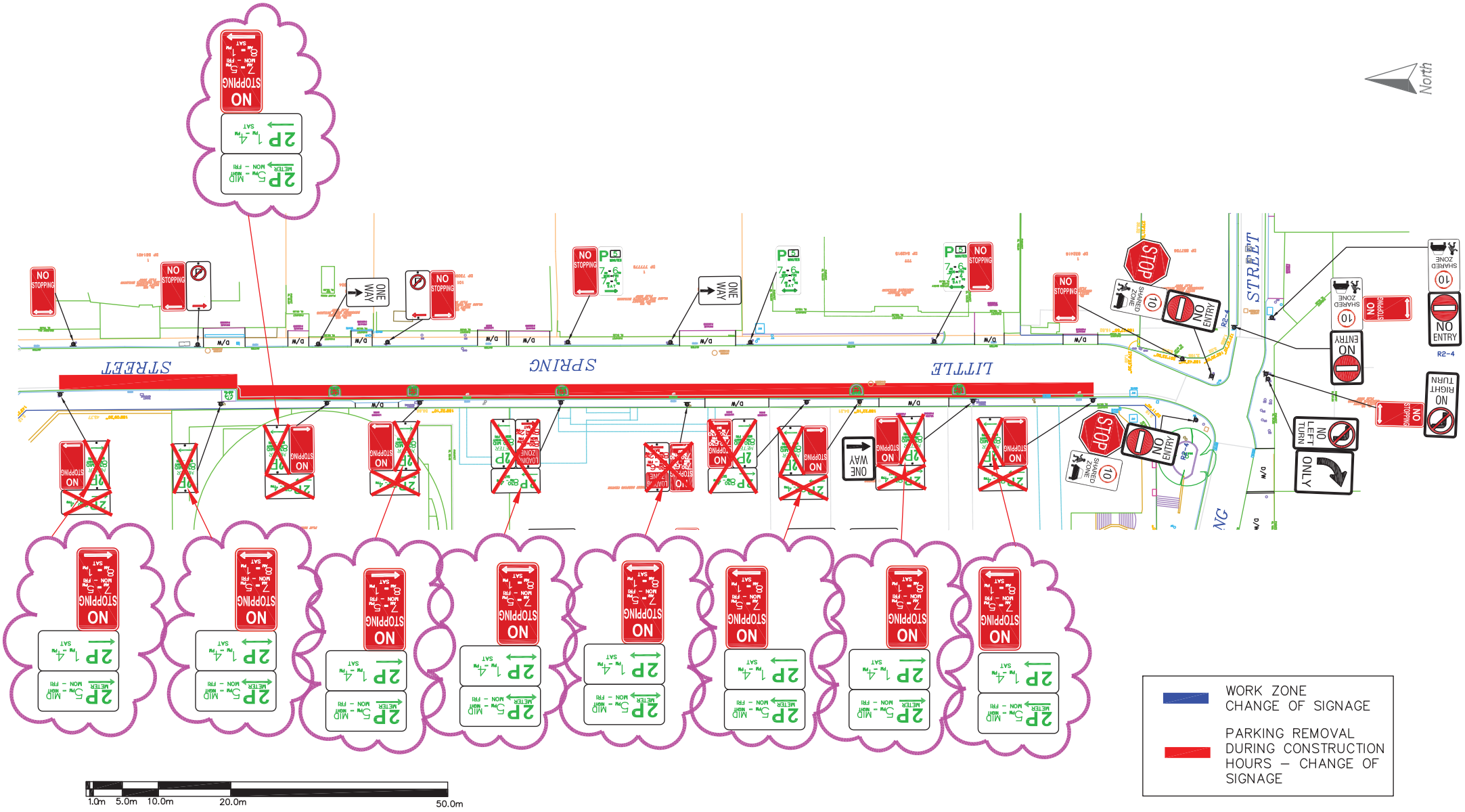
Filename: CTLRDSda06

Figure C

Date: 05 JULY 2011

LITTLE SPRING STREET - PROPOSED WORK ZONE SIGNAGE CHANGES

1 DENISON STREET + 88 WALKER STREET, NORTH SYDNEY



Scale: 1:500@A3

Halcrow

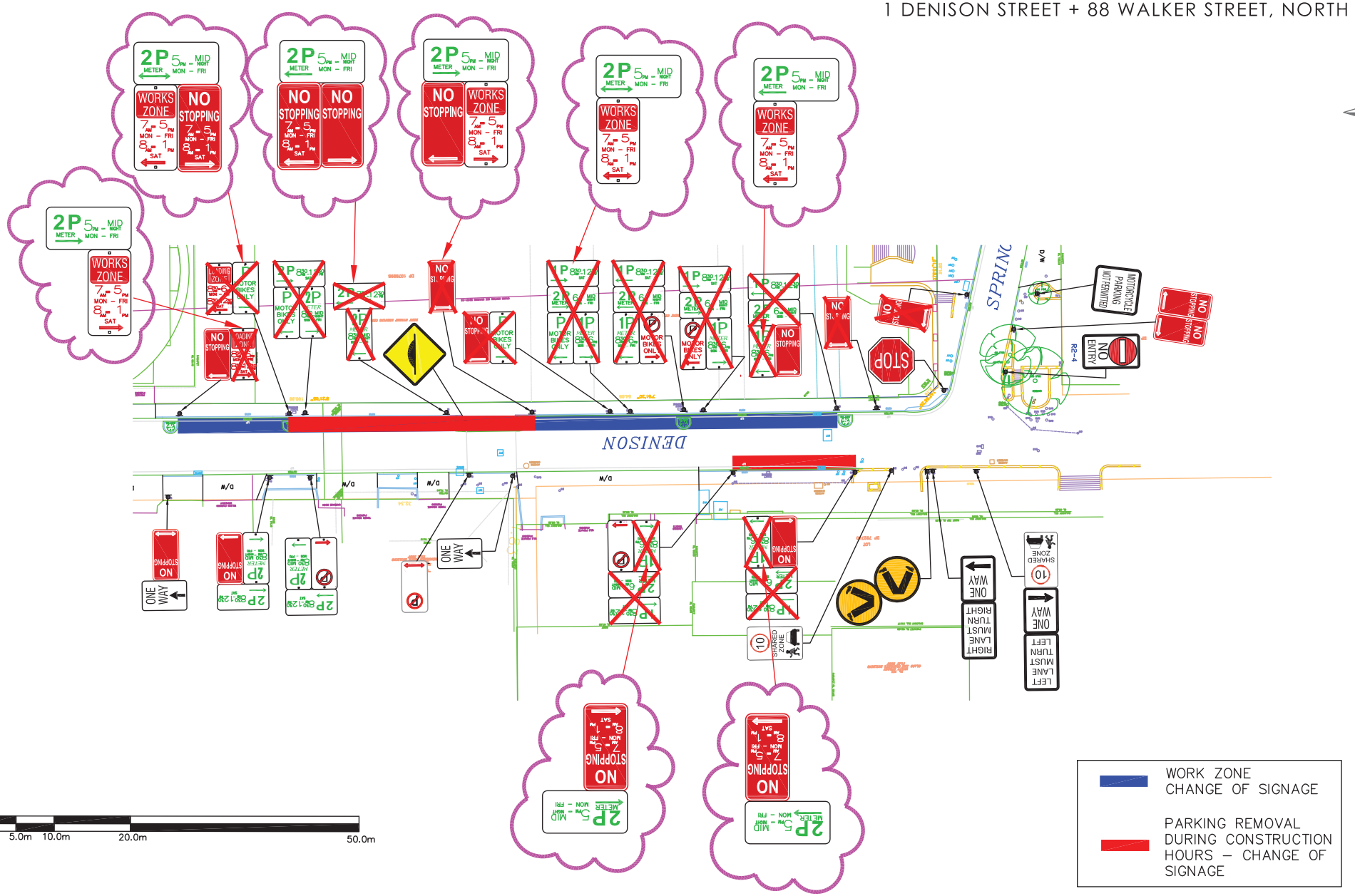
Filename: CTLRDSda06

Figure D

Date: 05 JULY 2011

DENISON STREET - PROPOSED WORK ZONE SIGNAGE CHANGES

1 DENISON STREET + 88 WALKER STREET, NORTH SYDNEY



Scale: 1:500@A3

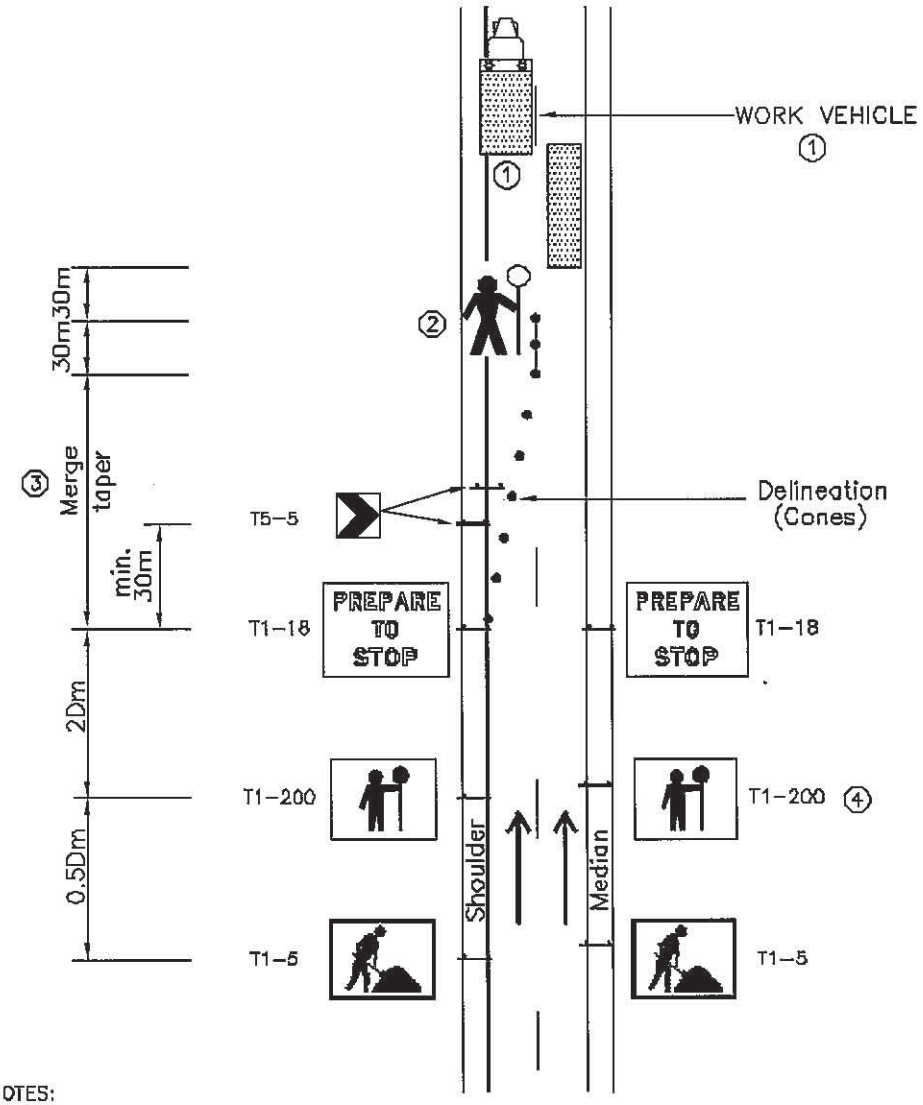
Halcrow

Filename: CTLRDSda06

Figure E

Date: 05 JULY 2011

Appendix C Traffic Control Plans (Principles)



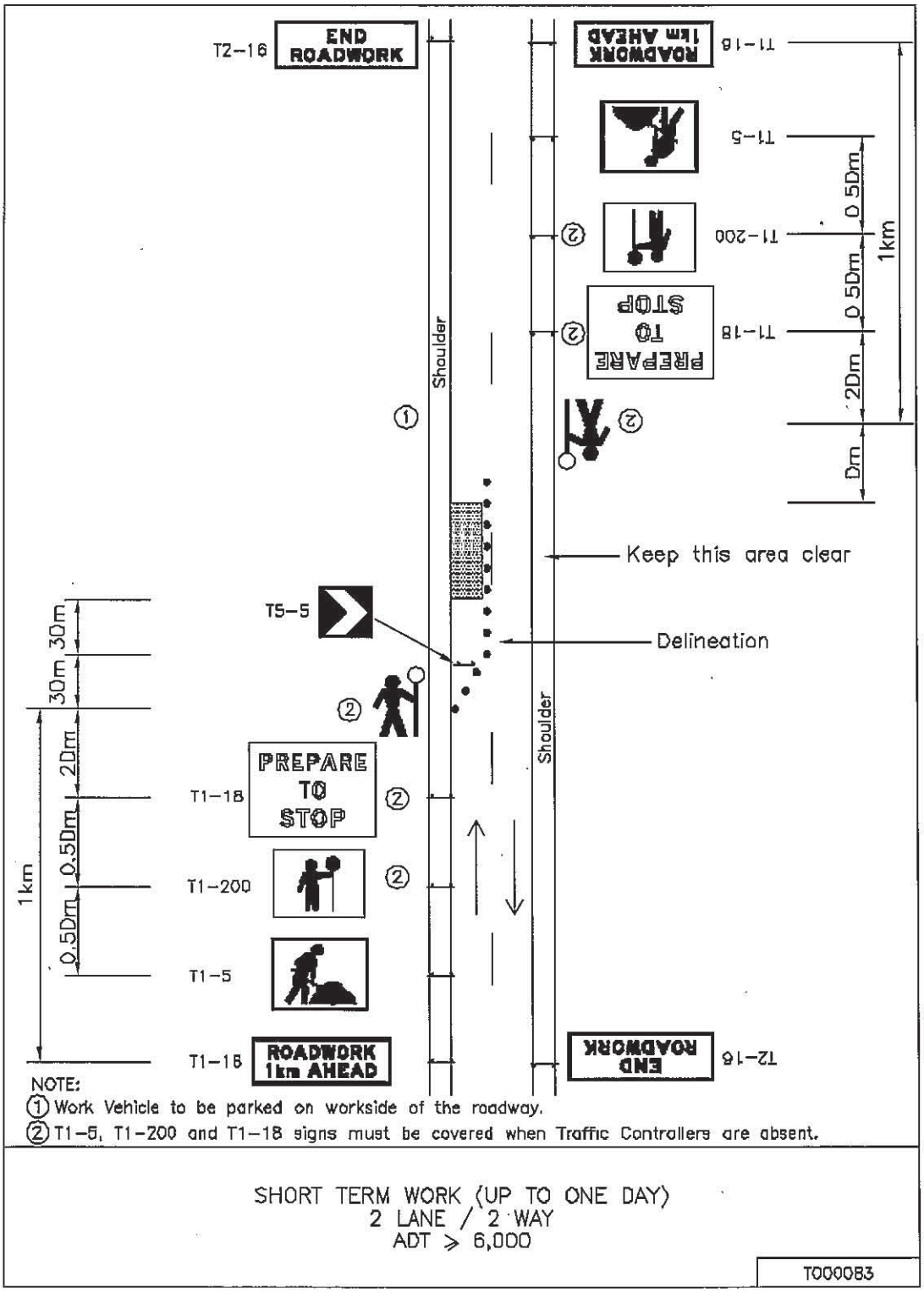
NOTES:

1. Work Vehicle to be parked in the slow lane.
2. Traffic Controller to stop traffic for duration of work and then direct traffic through work area, once it has been cleared of personnel.
3. The length of merge tapers is to be determined from ***Traffic Control at Work Sites***, Table 5.2, ***Recommended taper lengths.***
4. T1-5, T1-200 and T1-18 signs may be duplicated in accordance with Section 3 2 4, ***Duplication of Signs.***

SHORT TERM WORK (UP TO FIVE MINUTES)
2 LANE / DIVIDED CARRIAGEWAY
ADT < 10,000

T000082

TCP 82

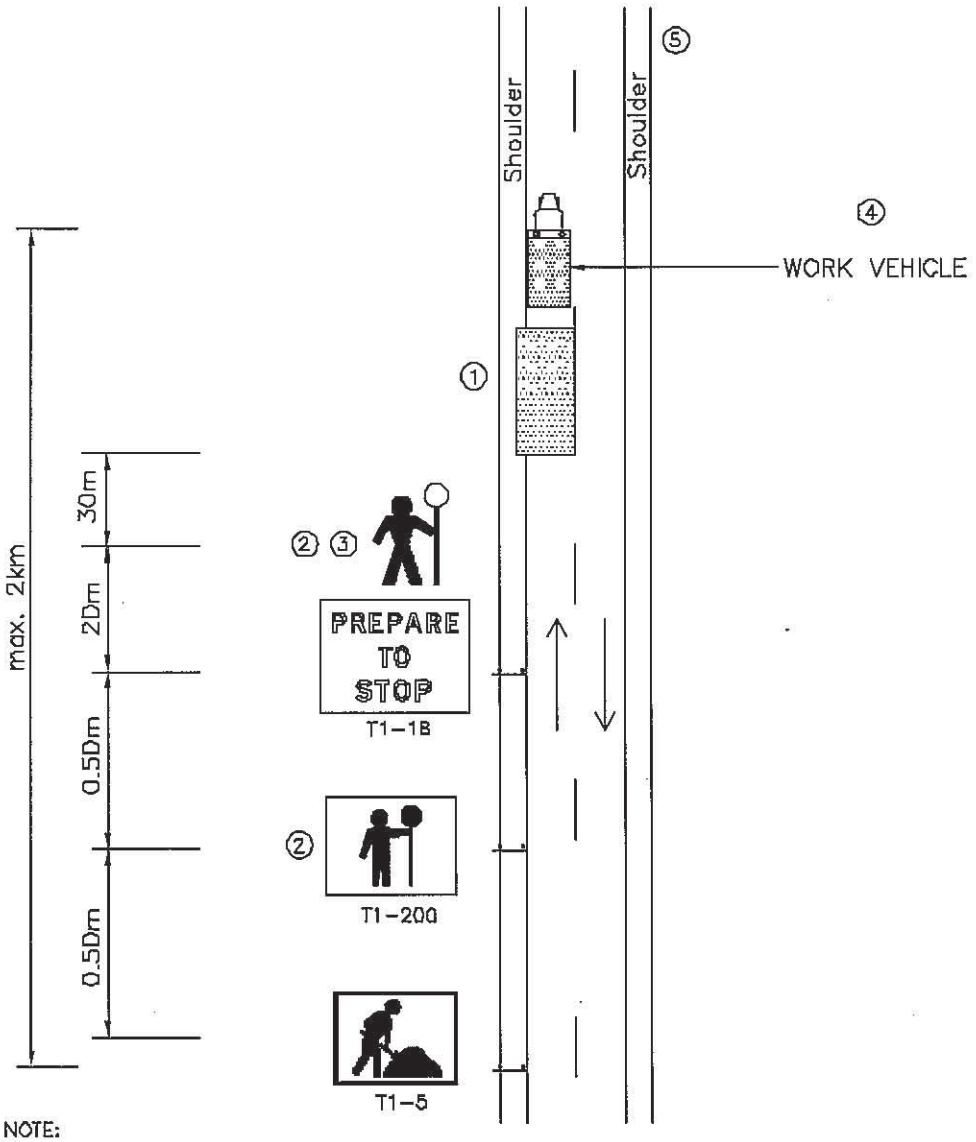


NOTE:
① Work Vehicle to be parked on workside of the roadway.
② T1-5, T1-200 and T1-18 signs must be covered when Traffic Controllers are absent.

SHORT TERM WORK (UP TO ONE DAY)
2 LANE / 2 WAY
ADT > 6,000

T000083

TCP 83



NOTE:

① Each stoppage less than 5 minutes. Work within specific limits set by signs T1–5.

② If ADT is less than 300 vehicles per day Traffic Controller, T1–200 & T1–18 signs are optional.

③ Traffic Controller to stop traffic for duration of work and then direct traffic through work area, once it has been cleared of personnel and work vehicle.

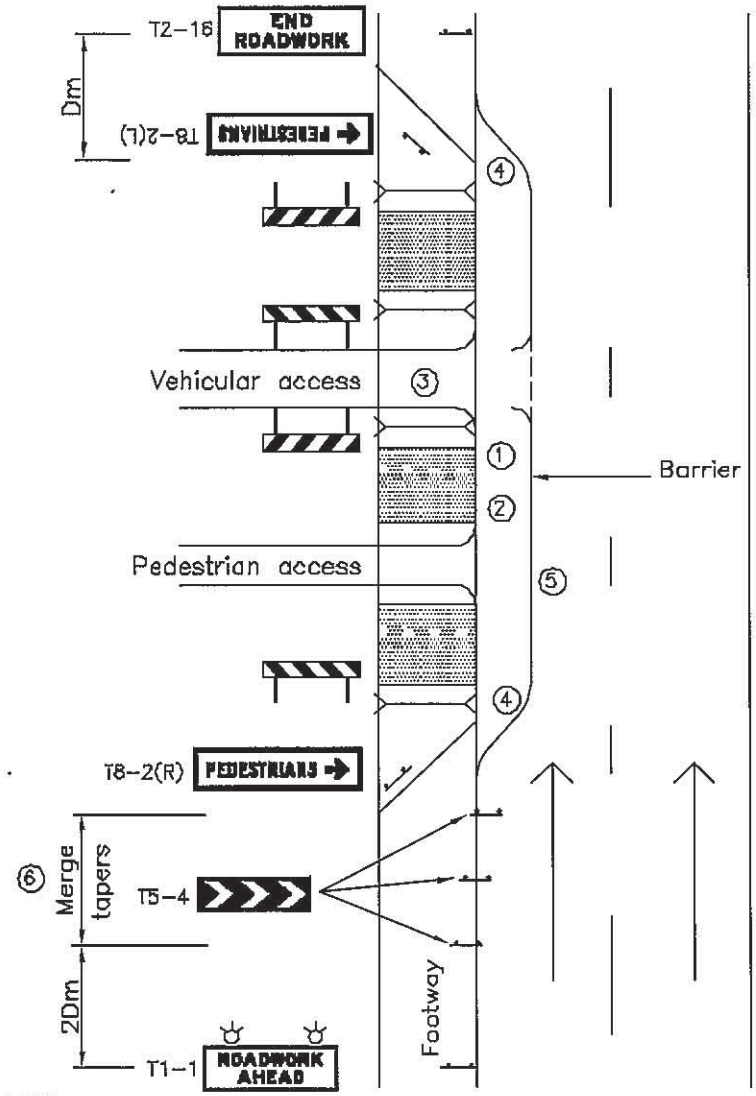
④ During work, park Work Vehicle in lane in front of the work to protect personnel from traffic in the opposite direction.

⑤ Signs may be necessary facing the other direction of traffic.

SHORT TERM WORK (MOVING ALONG ONE SIDE PROGRESSIVELY)
2 LANE / 2 WAY
ADT < 3000

T000078

TCP 78



NOTE:

① Prohibit vehicles stopping along the length of narrowed carriageway.

② Provide a minimum clear width of 1.2m (desirable 2.0m) for pedestrian traffic and a minimum traffic lane width of 3.0m (desirable 3.5m).

③ Arrange vehicular access across the work area using portable barriers or plastic mesh fencing.

④ Provide a full width temporary ramp for prams and an all-weather surface on all pedestrian areas.

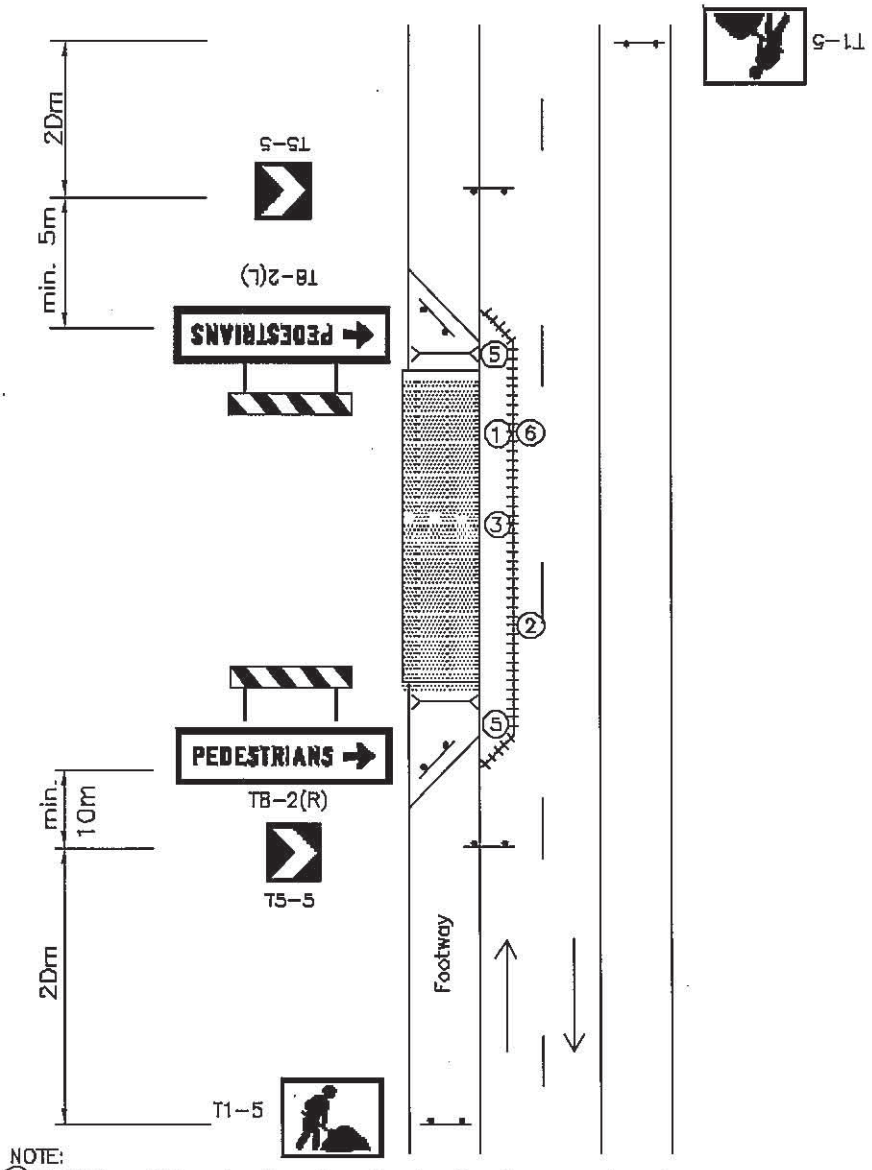
⑤ Ensure that the requirements of *Traffic Control at Work Sites*, Section 3.6, *Safe clearances between workers and through traffic*, are met for pedestrians.

⑥ The length of merge tapers is to be determined from *Traffic Control at Work Sites*, Table 5.2, *Recommended taper lengths.*

LONG TERM WORK
ALL ROADS
WORK OCCUPY THE FULL WIDTH OF A FOOTWAY

T000109

TCP 109



NOTE:

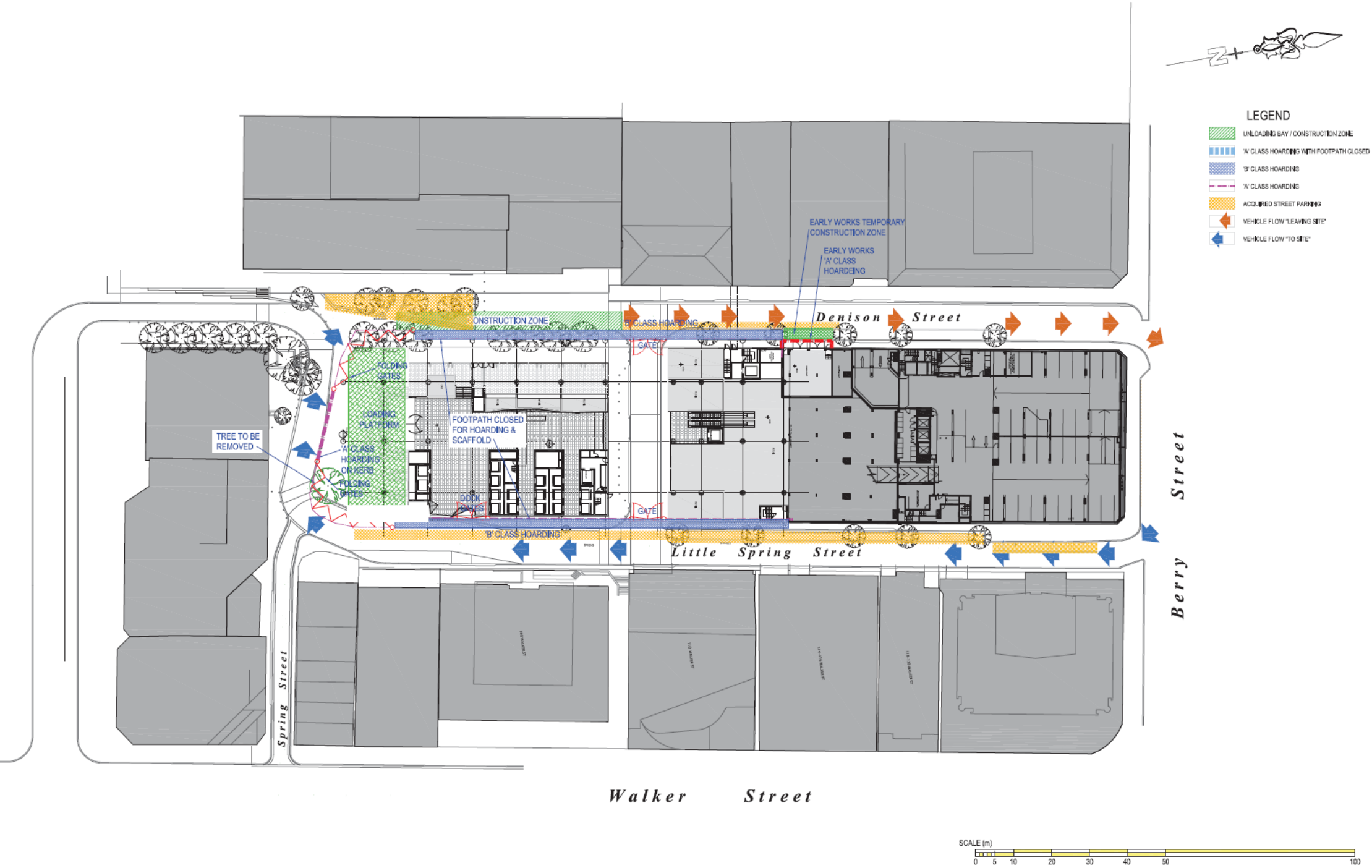
(1) Prohibit vehicles stopping along the length of narrowed carriageway.
(2) Provide a minimum traffic lane width of 3.0m (desirable 3.5m).
(3) Provide a minimum clear width of 1.2m (desirable 2.0m) for pedestrian traffic.
(4) Arrange vehicular access across the work area using portable barriers or plastic mesh fencing.
(5) Provide a temporary ramp for prams and a safe path for pedestrians
(6) Ensure that the requirements of ***Traffic Control at Work Sites***, Section 3.6, ***Safe clearances between workers and through traffic***, are met for the pedestrians.

SHORT TERM WORK
ALL ROADS
WORK OCCUPYING THE FULL WIDTH OF A FOOTWAY

T000061

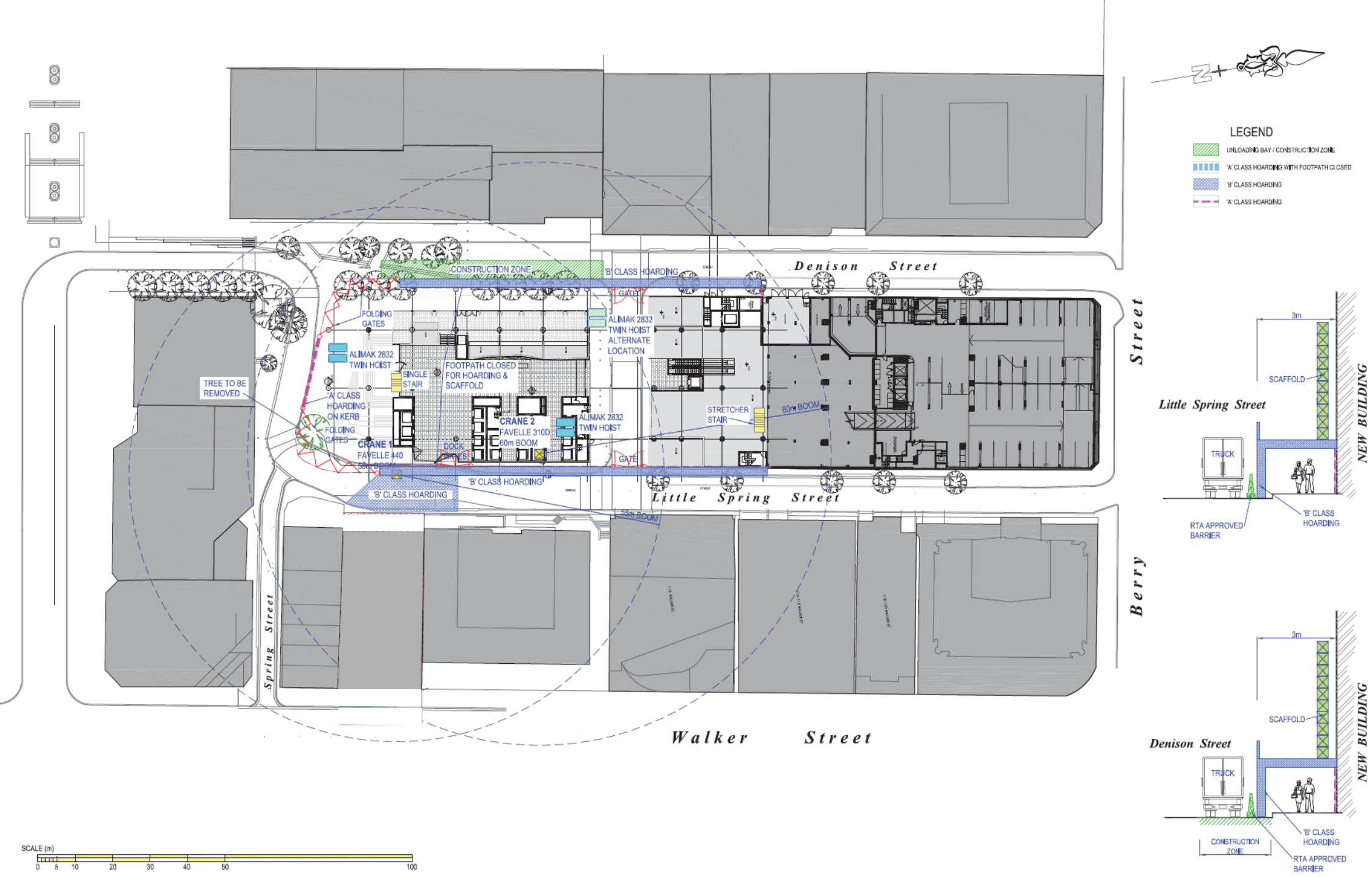
TCP 61

C. Project Planning Sketches

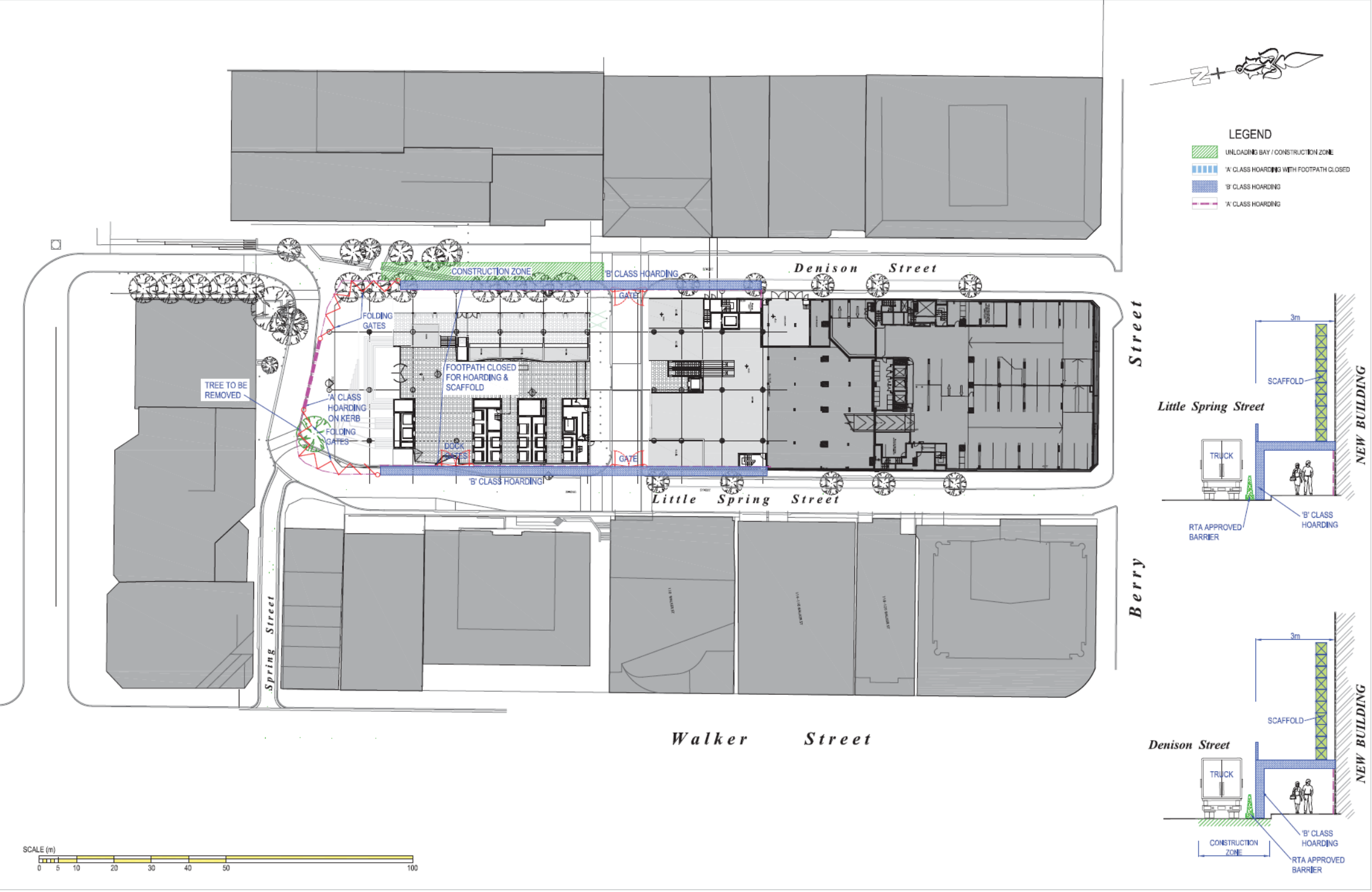


TRAFFIC FLOW, CONSTRUCTION ZONES & HORDINGS

DEMOLITION / EXCAVATION STAGE

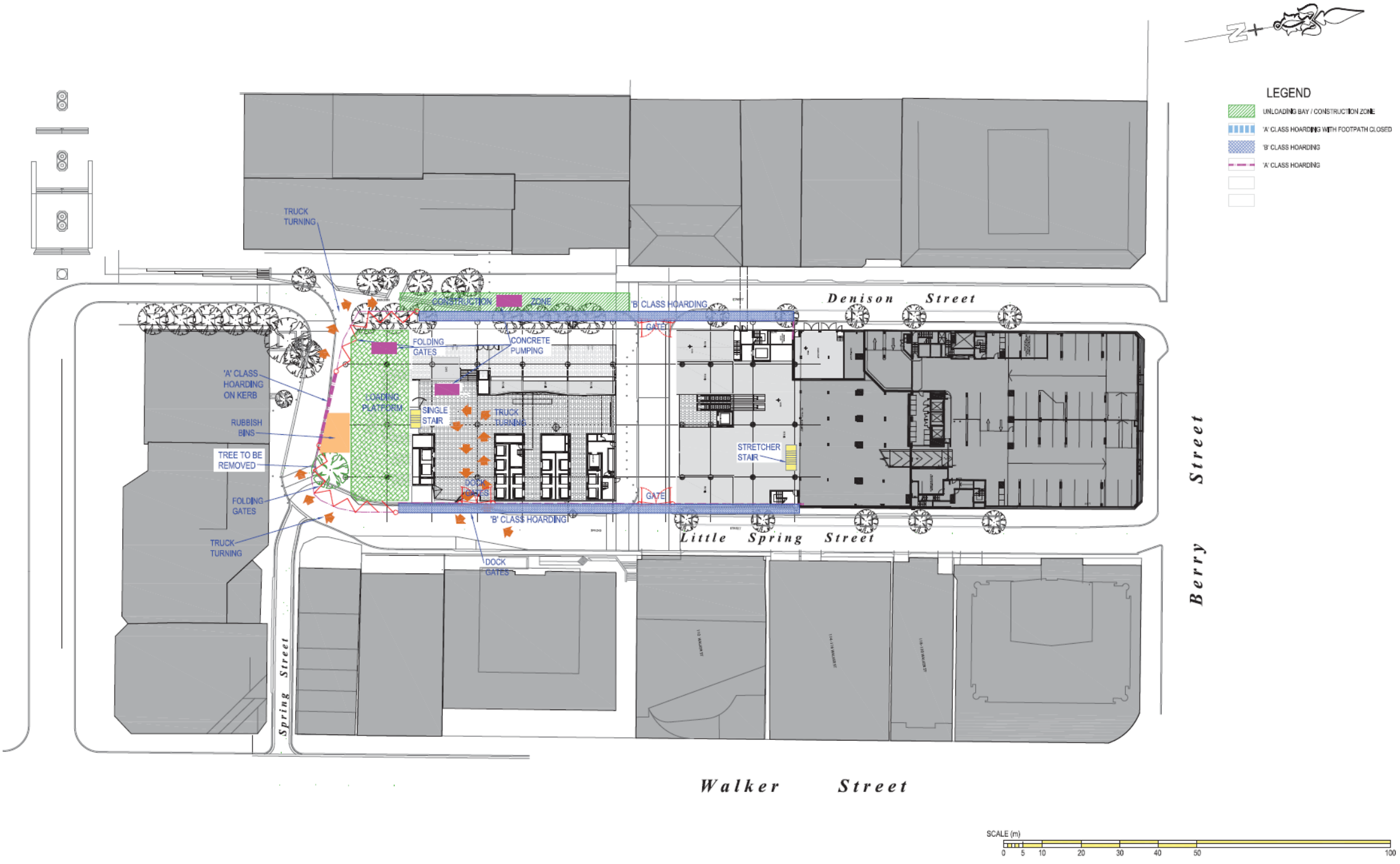


MATERIALS HANDLING



MATERIALS HANDLING

DEMOLITION / EXCAVATION STAGE



CONCRETE PUMPING & SITE AMENTITIES

EXCAVATION STAGE