Appendix C

Transport Assessment

157-163 Cleveland Street, Redfern
Student Accommodation

Transport Assessment

Prepared for
Urbanest Pty Ltd

transportation | traffic | engineering | planning

November 2011

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1 INTRODUCTION

Cardno has been engaged to prepare a transport assessment to accompany a development application for student accommodation at 157-163 Cleveland Street, Redfern.

The application proposes to demolish existing buildings on the site and construct a multi-storey student accommodation building that caters for up to 461 residents. A key feature of the site that relates to traffic and transportation is that the development does not propose any car parking on-site.

This assessment demonstrates that this is an acceptable and appropriate outcome based on the travel characteristics of the uses proposed (obtained from a survey of similar developments) and its location with respect to key attractions and destinations as well as public transport facilities.

This report presents the summary of our findings based on consideration of the following scope of works:

- consideration of the existing traffic and transport related characteristics of the site and surrounding area;
- elements of the proposed development and proposed changes to the network that relate to traffic and transportation;
- consideration of the impacts of these changes;
- justification of the parking arrangements proposed as part of the site, based on surveys of travel characteristics of similar development types; and
- discussion of the other transportation related elements of the development proposal.

This report is informed by a review of the following reference documents:

- Metropolitan Plan for Sydney 2036
- The Sydney City Draft Sub-Regional Strategy
- The draft Sydney DCP 2010
- The Metropolitan Transport Plan 2010
- NSW Planning Guidelines for Walking and Cycling
- Development near Rail Corridors and Busy Roads – Interim Guideline
- RTA Guide to Traffic Generating Developments
- 157-163 Cleveland Street, Redfern Construction Management Plan
- 157-163 Cleveland Street, Redfern Waste Management Plan

2 EXISTING SITUATION

2.1 Development Site and Surrounding Area

The development site is located within the City of Sydney at Redfern and includes the entire city block bound by Cleveland Street, Abercrombie Street, Hudson Street and Hart Street. The site shown in Figure 2.1 below comprises three land parcels. Currently the site is developed with a mix of commercial uses within the warehouse component fronting Cleveland Street as well as a small residential component on the block fronting Abercrombie Street.

Light industrial land uses border the site to the immediate south and east on Hudson Street and Hart Street respectively and transitions to "The Block" and residential uses further to the south/southwest, while further east the immediate area is bound by the rail corridor.

Residential development dominates towards the west of the site, and to the north on the opposite side of Cleveland Street is a mix of commercial, educational and residential land uses.

It is important to note that site is located in close proximity to major educational institutions and transport facilities including:

- University of Sydney approximately 400-600m west on Cleveland Street;
- UTS approximately 500m north on Abercrombie Street;
- Ultimo College also approximately 600m north on Abercrombie Street;
- University of Notre Dame Australia approximately 500m north on Abercrombie Street;
- Redfern Railway Station approximately 300m south;
- Central Station and Bus Interchange approximately 800m north;
- Haymarket Light Rail Station approximately 1.1km north; and
- Broadway Shopping Centre approximately 600m to the northwest.

Various other smaller educational facilities as well as convenience retail and dining facilities are also in close proximity of the site.

Urbanest has also developed a similar student accommodation facility at Quay Street, Haymarket (also within the City of Sydney) approximately 800m to the north, which is now operational and has been used as a case study for various elements of this traffic and transport assessment.

Figure 2.1 Development Site and Surrounding Area

2.2 Surrounding Road Network

As noted above, the site is bound by road frontage on all sides, with Cleveland Street on the northern boundary, Hart Street on the east, Hudson Street on the south and Abercrombie Street to the west.

Cleveland Street is an RTA controlled arterial road with a 4 lane cross section (plus an additional two right turn lanes at the Cleveland Street/Abercrombie Street signalised intersection). Traffic survey data from the RTA indicated that this road was carrying in excess of 60,000vpd in 2005.

Cleveland Street also incorporates clearways in both peak hours in both directions.

Abercrombie Street is classified as a local road with a two lane, two way cross section at the site frontage and to the south, however to the north of the site, across Cleveland Street, Abercrombie Street transitions to a three lane, one way northbound arterial route under state control with a daily volume of approximately 19,000vpd in 2005. Parking is allowed (albeit with a 2P restriction during the hours of 8am-8pm) to the south of the development site.

Hudson and Hart Streets are both classified as local roads with pavement cross sections of 10m and 4m respectively, and unregulated parking is available on both streets.

As noted above, the intersection of Cleveland Street and Abercrombie Street is controlled with traffic signals, with some turning movements restricted. The remainder of the intersections on the site boundaries are priority-controlled intersections.

2.3 Pedestrian and Cyclist Facilities

Formalised pedestrian facilities are provided on all frontage roads of the site and in the surrounding area with footpaths and pram ramps provided.

Signalised pedestrian crossing facilities are provided on three of the four approaches at the intersection of Cleveland Street/Abercrombie Street on the north-western corner of the site.

These footpath facilities allow unobstructed pedestrian linkages from the site to major attractions and key destinations including Central Station (and Railway Square (to the north), Redfern Station (to the south) and the nearby universities and other educational institutions.

City of Sydney has defined a cycle network in the area, as shown in Figure 2.2 below, which indicates that strong cycle links are provided to key attractions in the area; these can be reached via the footpath network surrounding the site.

Figure 2.2 City of Sydney Cycle Network (City of Sydney Website)

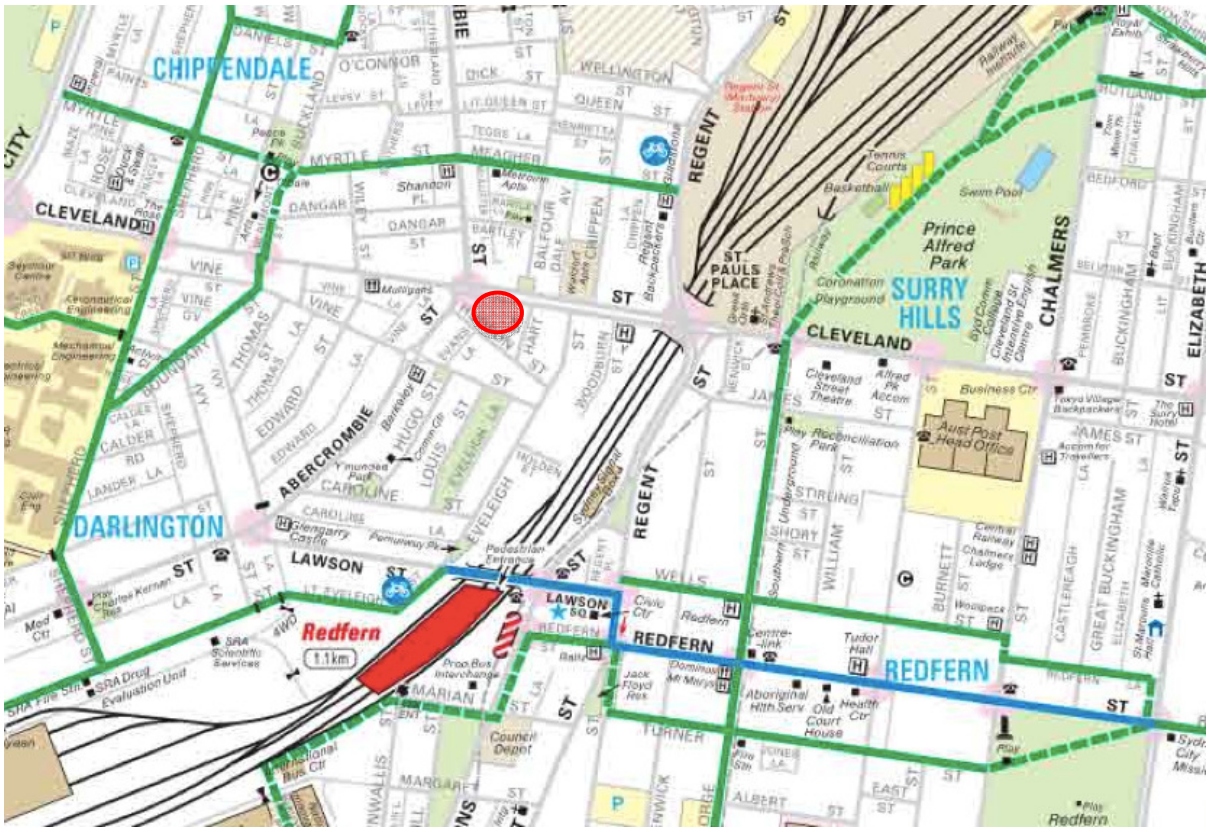
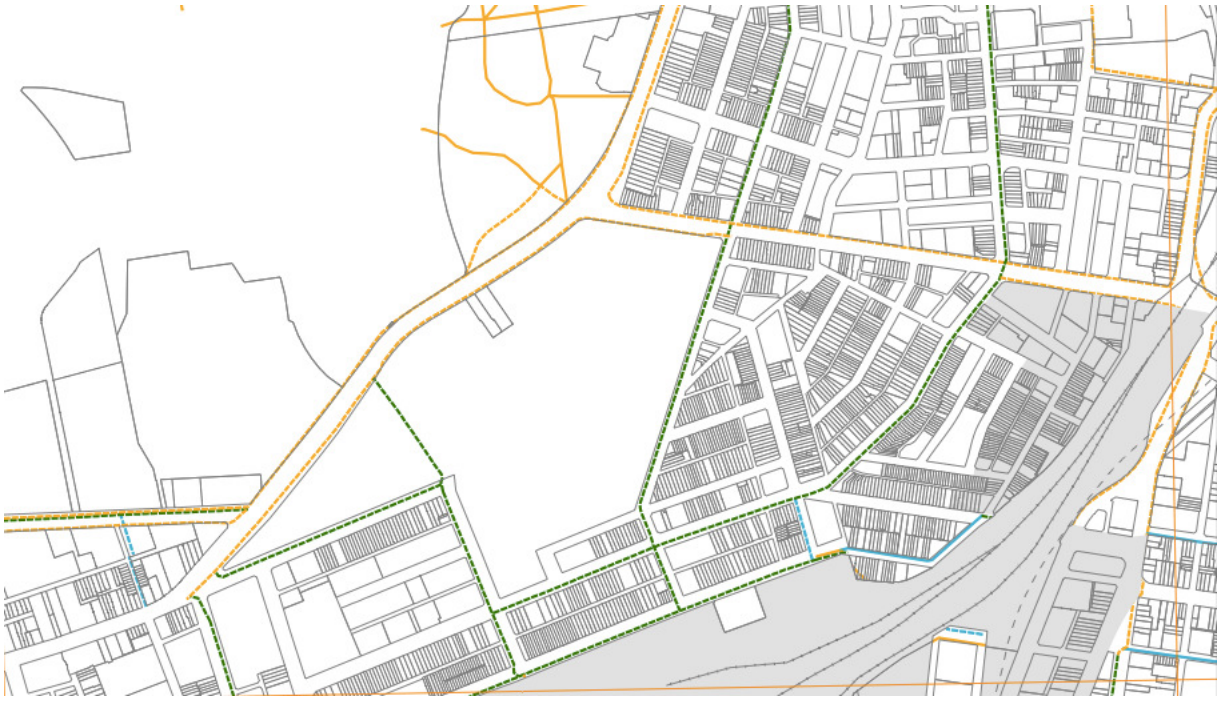


Figure 2.3 below indicates that shared pedestrian/cycle paths (yellow dashed) are proposed along Cleveland Street in the immediate vicinity of the site and separated cycle pathways (green dashed) are proposed along Abercrombie Street. Both these facilities will ultimately improve cycle accessibility in the immediate vicinity of the site.

Figure 2.3 City of Sydney Draft DCP 2010 Cycle Network



2.4 Public Transport Facilities

As can be expected for a development located within the inner city suburbs, accessibility to a variety of high frequency and high quality public transport facilities is excellent.

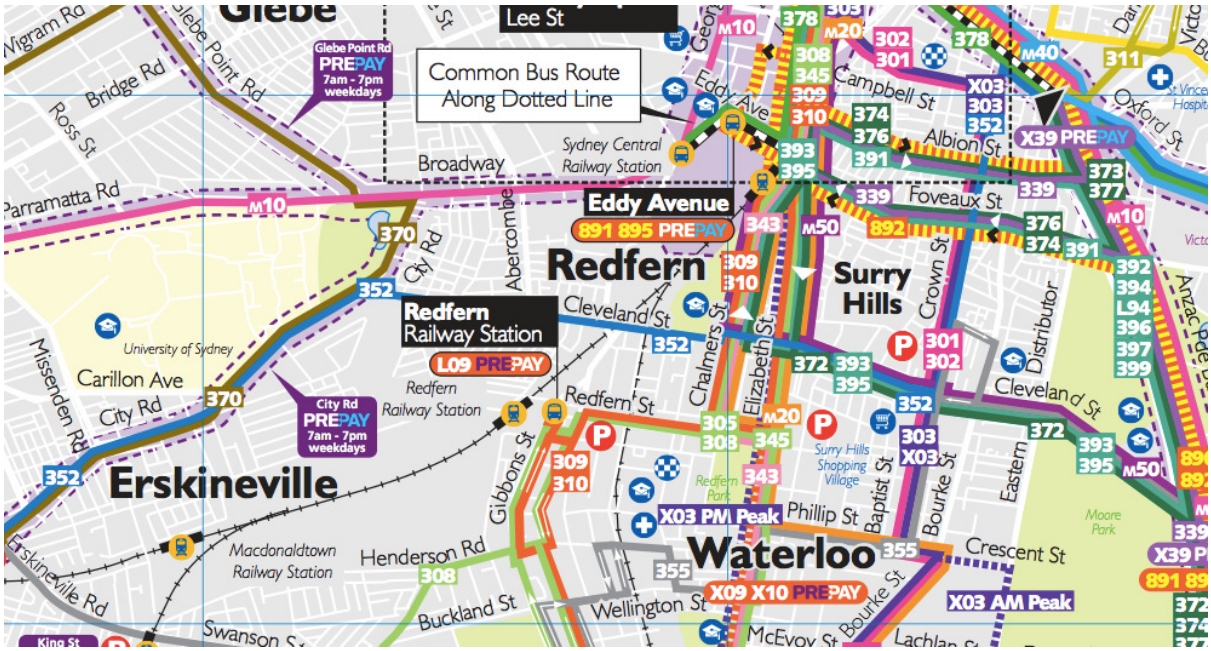
As noted previously, Redfern Station and Central Station are located in close proximity to the site, approximately 300m and 800m away respectively. Each of these stations provides high frequency links to the majority of rail services within Sydney and both are extremely accessible for the site.

These services are critical, high capacity interchanges in the transport network and are heavily utilised.

Sydney buses also service the site with stops for route 352 on the site frontage on Cleveland Street as well as other routes along City Road and Parramatta Road in close proximity. Railway Square at Central Station also incorporates a bus-rail interchange with a variety of high frequency services.

The Sydney Bus network map in the area is shown in Figure 2.4 below.

Figure 2.4 Sydney Buses Network Map



It is also noted that light rail services are located at Haymarket approximately 1.1km to the north of the site further adding to the mix of services available in close proximity

2.5 Parking

The site is located within City of Sydney Parking Area 32, however unregulated parking is currently allowed on Hudson Street and Hart Street on the development frontage.

Cleveland Street incorporates clear zones during peak hours in both directions and Abercrombie Street allows regulated parking with a 2P restriction between 8am and 8pm (without a resident parking permit) to the south of the site.

It should also be noted that a carshare-only parking space is located immediately opposite the site on Abercrombie Street and a further ten spaces within a 400m walking catchment of the development site.

3 PROPOSED DEVELOPMENT

The development proposal involves demolition of the existing buildings on site and construction of a multi storey student accommodation building containing accommodation for up to 461 students in a mix of studio and share apartments. Plans of Development are included as part of the DA package.

Due to the nature of the development proposed and the resultant travel characteristics of the users, its location with respect to adjacent land uses and their relationship to the needs of residents, the availability of public transport facilities and accessibility to car share facilities, the development does not propose to provide any on site parking (which is consistent with the existing site at Quay Street 800m north and Council and Transport NSW objectives with respect to a minimalistic approach to carparking).

The development proposes to provide approximately 95 Class 1 bicycle parking spaces as well as 40 Class 3 bicycle parking spaces to meet the needs of residents, staff and visitors. This equates to a total supply of 135 spaces and approximately 1 bicycle parking space per 3.4 residents.

No further changes to existing traffic and transport infrastructure are proposed.

4 QUAY STREET TRAVEL CHARACTERISTICS SURVEY

As part of the assessment, questionnaire surveys of the travel patterns of residents at Urbanest at Quay Street, Ultimo were undertaken to help identify the demand for parking and the travel patterns of the users and inform the development of travel facilities on site.

A total of 71 responses were received for the survey relating to transport, which is greater than 20% of the total population of the Quay Street development, and therefore the results can be considered representative of the entire population of this development.

It should also be noted that the Quay Street site is in close proximity to the subject development, is of a similar size and also does not include any carparks – these factors can give confidence that the results will be representative of the expected characteristics of the proposed development.

Key outcomes of the questionnaire survey include:

- 76% of residents studied at either University of Sydney or UTS (within walking distance of the either development site);
- For trips with a study purpose**, 0% of the respondents travelled via car**, 34% used public transport, 65% walked, and 1% travelled via motorbike/scooter;
- For trips with a work purpose**, 0% of the respondents travelled via car**, 23% used public transport, 59% walked, 2% travelled via motorbike/scooter, and 2% took a taxi;
- For trips with a social purpose (going out, dinner etc), **0% of the respondents travelled via car as a driver**, 2% travelled as a passenger, 33% used public transport, 61% walked, 0% travelled via motorbike/scooter or bicycle and 4% took a taxi;
- Bicycles are the vehicle of choice for the respondents; 14% said that they owned or planned to own a bicycle during their stay at urbanest. This compares with 10% for a car and 6% for a motorbike/scooter.
- Of those that took public transport, approximately 70% outlined that this was their preference as it was either faster, cheaper or more convenient that the other alternatives;
- 14% of respondents said they either owned, or planned to own a bicycle during their residence at Quay Street (note that this compares consistently with the requirements of the draft City of Sydney DCP for student accommodation that bicycle parking should be provided at rates of 1 per 6 beds, or approximately 17% of demand. Note this development proposes bicycle parking at a rate of 1 per 3.4 beds meaning 30% of residents can use a bicycle parking space);
- Of the residents that owned cars, 40% parked in a paid parking space, and 60% used a friends or relatives space;
- For 55% of residents, their friends and relatives did not visit by car, and of the visitors who arrived by car, 66% visited once per week or less.

The results of these surveys clearly reinforce that residents are making a conscious choice to live in similar facilities as proposed and not be reliant on a car as mode of transport.

Given the nature and location of the subject development and inherent similarities with the surveyed site, similar results will be representative of the expected characteristics of the proposed development

5 PARKING ASSESSMENT

As noted, the development does not propose any off-street parking supply. This is considered an acceptable outcome due to the following aspects.

5.1 Proximity to Education and Public Transport Facilities

The development proposes student accommodation in close proximity (i.e. within a comfortable walking and cycling distance) of major and minor tertiary education facilities that the residents will attend. In addition, the development is very well serviced by public transport facilities which provide residents, staff and guests with excellent public transport connections to all areas of the city. The travel characteristics of the student residents identified through surveys of other Urbanest properties in the surrounding areas do not indicate a demand for parking and have low or negligible rates of private vehicle ownership (clarified in Section 4).

5.2 On-Street Parking

The development is located within a residential parking scheme area but the residents of the development are unable to obtain a parking permit, limiting the attractiveness of on-street parking. There are however short/medium term spaces in close proximity to the site allowing friends, family and other guests to park when visiting residents.

5.3 Bicycle Parking Provisions

High levels of bicycle parking in suitable facilities for residents, staff and visitors, and associated end of trip facilities are provided as part of the development, in excess of the City of Sydney draft DCP guidelines. This combined with the site's strong cycle connections, both planned and existing, will facilitate bicycle trips to and from the site.

5.4 Car Share Provisions

A carshare-only parking space is located immediately opposite the site on Abercrombie Street, and a further ten spaces are within a 400m walking catchment of the development. Irrespective, the developer would endorse further carshare spaces on Hudson Street.

5.5 Motorcycle/Scooter Parking

The travel surveys outlined in Section 4 indicate that at the Quay Street development, currently one out of 71 students surveyed currently own a motorcycle/scooter (1.4%) and a total of 4 out of 63 intend to own one during their stay at Urbanest (6.3%).

This represents a low proportion of residents that choose this mode of transport, and it is likely that an actual demand for motorcycle/scooter spaces for the site is likely to be in order of 7-8 spaces (1.5-2.0%), and roughly equivalent to one kerbside space car space.

It is recommended that the preferred approach to accommodate this demand is for Council to designate a section of the unrestricted kerbside parking area on Hudson Street at the development frontage to a motorcycle/scooter parking zone that can accommodate the demand above.

While this is the preferred approach, alternatively this demand can be met through informal kerbside parking within the area, given:

- the small demand for parking of this type
- the small size of vehicles parked
- the availability of kerbside parking in the immediate area
- recommendations of City of Sydney's Motorcycle & Scooter Strategy and Action Plan where motorcycle and scooter riders no longer need to buy or display a ticket in the City as long as they conform to the temporal restrictions

6 TRANSPORT ASSESSMENT

6.1 Safety for Cyclists and Pedestrians

Cyclists and pedestrians traveling to and from the site have immediate access to the local pedestrian and cycle network. Cyclists entering and exiting the site will be required to dismount the bicycle, ensuring they do not approach the street from the site at high speeds. Additionally, the development entrance is positioned on the Abercrombie Street side of the site, ensuring cyclists and pedestrians do not enter directly onto busy Cleveland Street.

6.2 Public Transport Impacts

Given the proximity of the site to two of Sydney's most heavily trafficked train stations and the Railway Square bus interchange at Central Station, the proposed development's impact, of a maximum 461 residents, will have negligible impact on the capacity of nearby public transport facilities. The only bus route that directly passes the site, Bus Route 352 (Marrickville Metro to Bondi Junction) travels west along Cleveland Street from the site and heads south down King Street passing the University of Sydney. This route will not be significantly impacted as only a portion of the student accommodation residents, those attending University of Sydney, are likely to use the route with regularity during peak travel periods. However, given the proximity to the University (400-600m away) most students are expected to walk/cycle.

6.3 Services/Construction Access Arrangements

Waste Management

The proposed development's Waste Management Plan including specific traffic arrangements is included in Appendix B which indicates waste collection will occur via an arrangement with a private waste management supplier rather than Council's municipal waste management services.

The waste management plan proposes an on-street collection arrangement on Hudson Street. The plans of development indicate that the refuse room provides access to Hudson Street so that at collection times refuse bins can be collected via a direct on-street arrangement.

The approach outlined within the Waste Management Plan is for a refuse collection vehicle to service the building by stopping in the kerbside traffic lane on Hudson Street. This leaves approximately 3m of travel lane remaining, which is sufficient to allow one-way operation during collection times

This arrangement is considered an acceptable outcome given:

- the low traffic volumes currently on Hudson Street;
- the indirect nature of Hudson Street meaning that no significant extra traffic is expected to use the street;
- the low frequency of the collection (once per day);
- the short duration of the collection event (2-5mins);
- the low speed environment;
- private contractor arrangements allowing management of collection outside of peak times;
- no conflicts with the sight distance available on Hudson Street.

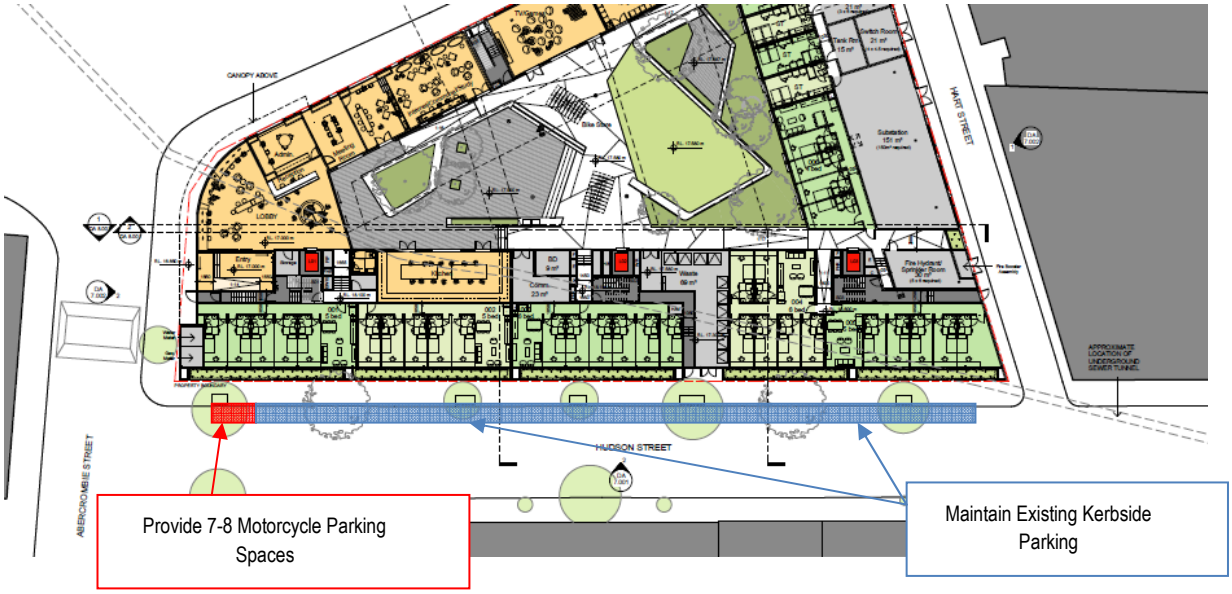
Servicing by Other Vehicles

While the movement of large furniture items is not anticipated as the accommodation is fully furnished and management restrictions of these type of furniture items ; loading and unloading of any additional possessions and furniture will be reliant on the using the existing kerbside storage on Hudson Street.

It is noted that when the development is constructed, existing driveways on Hudson Street will be removed, increasing the space available for kerbside parking and servicing

The general kerbside utilisation on Hudson Street (incorporating the preferred motorcycle arrangement) is shown in Figure 6.1 below.

Figure 6.1 Recommend Approach to Kerbside Utilisation On Hudson Street



Construction Access

Access and servicing arrangements during the construction period are outlined within the Construction Management Plan at Appendix A.

7 ROAD NETWORK IMPACTS

Operationally, as the development does not propose to provide any car parking, and residents and staff will be reliant on public transport, walking, cycling, taxis or car share to travel to and from the development, the traffic generated by the site will be very minor.

It is expected that the traffic to/from the development will solely comprise service vehicle trips such as waste collection and servicing, as well as friends and family members who choose to travel via private vehicle when visiting residents.

Additionally, the existing approved uses on site could have been expected to generate traffic volumes that will no longer occur following development of the site.

Therefore, the net potential traffic generation can be considered negligible (likely to be less than 50vpd), especially in comparison to the traffic volumes on the adjacent streets (>60,000 vpd on Cleveland Street).

To this end, no operational assessment of road network components or intersections in the area is considered warranted.

A separate Construction Management Plan (prepared by others), outlining the impacts and details of vehicle movements and site access during construction is provided in Appendix A.

Furthermore, it is understood that the Roads and Maritime Services (RMS) has concerns with the existing operation and access arrangements of Hart Street, particularly with respect to road width, sight distance, queuing and ultimately safety when accessing it via Cleveland Street. RMS recommends that Hart Street be converted to one-way northbound to resolve this.

This recommendation is considered an appropriate strategy to resolve the existing deficiency; however it is noted that since the development does not propose any carparking, and generates a negligible amount of traffic, and any generated is very unlikely to utilise Hart Street as a primary access, it is reasonable that undertaking an assessment of the impacts, and actual implementation of this change remains the responsibility of the RMS.

8 RECOMMENDATIONS & CONCLUSIONS

Considering the outcomes of the assessment, several key conclusions and recommendations are made regarding expected travel patterns of the residents and visitors, and how the development proposal and existing transport infrastructure responds to these.

- There is clearly low demand for resident parking spaces for this style of development in the area with residents choosing to live in this accommodation style due to the accessibility of the development to study facilities and connections to public transport as well as the ability to walk and cycle to their desired destination. This is to the extent that residents do not need to own a car;
- When a motorised vehicle is used, it is more than likely a motorcycle/scooter or a taxi – this can, and should be catered for by converting some of the unregulated kerbside space on the Hudson Street development frontage to motorbike parking zones and potentially a taxi zone on Abercrombie Street at the main entrance to the development;
- Parking demand for visitors is also irregular, and this is more likely to be short term occurrence that can be managed through the existing regulatory parking mechanisms in the area;
- The bicycle parking provision is in excess of the code requirements and provision of spaces at the rate of 1 per 3.4 beds should also be encouraged with appropriate end of trip facilities (most of these are incorporated into the residential component of the development);
- Therefore the proposed approach of providing no on-site carparking is appropriate;
- Subsequently, given no parking is proposed, essentially traffic generated by the site will be very minor, particularly in the context of the major roads on the site boundary and therefore no detailed operational assessment is required;
- Due to the infrequent nature of the servicing arrangements and low volumes, servicing via an on-street arrangement on Hudson Street is proposed and is considered an appropriate outcome from a traffic impact perspective;
- The existing car-share space opposite the site should be retained and additional car-share spaces in the area should be encouraged;
- RMS recommendations regarding strategies to improve existing deficiencies are considered appropriate and are supported; however, it is reasonable that these remain the responsibility of RMS to implement.

APPENDICES

Appendix A

Construction Management Plan

Construction Management Plan

For

Urbanest Student Housing
157 Cleveland St
Chippendale, NSW

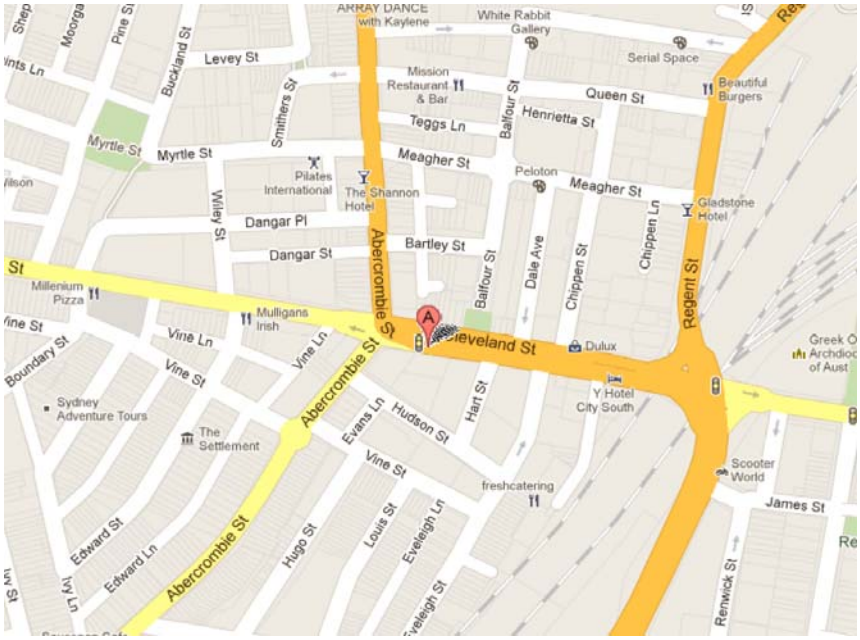
20th November 2011

Revision 3

CONTENTS

1.0 INTRODUCTION

This Construction Management Plan (CMP) has been prepared to address the impact of the Demolition and Construction works associated with the proposed development of **157 Cleveland St, Chippendale, Sydney,** and the surrounding environment and community. The CMP will outline procedures that are intended to be implemented to manage construction activities ensuring that unacceptable high levels of environmental or community disturbance do not occur throughout the duration of the works.



1.1 OBJECTIVES

The objectives of the CMP are to:

- Anticipate the impact of and propose a methodology within which the demolition and construction activities may be completed in a manner which will not cause environmental or community disturbances above agreed levels;

- Provide a framework for procedures to be adopted when undertaking the construction activities, including the location of construction plant and amenities;

- Provide a framework for procedures to be adopted when monitoring the construction performance against agreed criteria, including but not limited to City of Sydney Council Guidelines for construction, traffic and pedestrian management and the applicable DA conditions for the development.

- Implementation statutory requirements in respect to environmental issues associated with the construction of the work;

1.2 REFERENCES

- City of Sydney Council regulations and guidelines including,
- Urban Erosion and Sediment Control 1992 (CALM);
- Relevant Australian Standards;
- Environment Protection Legislation
- Clean Waters Act 1970;
- Clean Air Act 1961;
- Waste Minimisation Act 1995 (NSW);
- Australian Standard 2436-1981, “Guide to Noise Control on Construction, Maintenance and Demolition Sites.”
- City of Sydney Code of Practice for Construction Hours/Noise 1992

1.3 CONSULTATION

The planning and implementation of the construction works will be completed in consultation with the following statutory authorities where applicable:

- City of Sydney Council;
- Environmental Protection Authority (EPA);
- Sydney Water;
- Energy Australia;
- Roads and Traffic Authority;
- Workcover Authority;
- Department of Natural Resources;

1.4 CONSTRUCTION HOURS

The hours of work for construction will be in accordance with the approved DA Consent Conditions. As a guide these hours are anticipated to be as follows:

Monday to Friday 7.00am to 7.00pm
Saturday 7.00am to 5.00pm
Sundays and public holidays – no work

These hours are in-line with the Code of Practice 1992, Construction hours / Noise, NSW EPA, Environment Noise Control Manual. Noise management methodology, during these working hours, is addressed in section 9 of this CMP.

1.5 SCOPE OF CONSTRUCTION ACTIVITIES

The development of 157 Cleveland St, Chippendale, Sydney will include:

- Demolition of an existing 2 storey residential / commercial block and a single storey industrial building. Part of the brick façade of the industrial building is to be retained for the new development.
- The new structure will be of concrete slab / column / masonry construction with final structural systems still to be detailed by the structural engineer.
- The construction will include for the following:- Ground floor entrance lobby, main building services and communal student areas, 4 levels of student accommodation, 5 stair cores, 4 internal lifts servicing all floors and an internal landscaped courtyard / recreation area. The building facade will consist of lightweight cladding, brickwork and glazed shopfronts.

1.6 CONNECTION OF SERVICES

The requirements for any ‘road openings’ to connect services will be addressed by our Consulting Engineers. The building infrastructure requirements are as follows;

- Sewer Drainage
- Stormwater Drainage
- Gas Services
- Domestic Water & Fire Services
- Electrical / Communications

1.7 MATERIALS HANDLING

The subject site is contained by City of Sydney street frontages on all 4 sides. These streets include Cleveland St, Abercrombie St, Hudson St and Hart St. It is envisaged that a workzone will be set up on Hudson St as the most efficient route to access the site and a B class hoarding will be installed along the entire site perimeter for overhead protection of pedestrians and the public during the demolition and construction works.

The workzone will allow for the efficient delivery of materials to the work face. Internally, a crane, hoist and loading platforms will be used to load materials from the workzone to the required area throughout the project. Refer *Appendix 1*which demonstrates the proposed construction site plan

The general construction works will have a low traffic generation and would not have significant affects on the operation or amenity of the surrounding road network. It is calculated that the normal deliveries would be approximately 8-10 deliveries per day. The overall construction duration is approximately 60 calendar weeks.

Material Handling is proposed to be managed by the careful programming and co-ordination of trades and suppliers. Deliveries will be staged for arrival to the site on a daily programming regime which will minimize disruption to the traffic and pedestrian flows adjacent to the site and within the immediate precinct. (as described above)

1.8 CRANE REQUIREMENTS

It is proposed that a single electric operated hammerhead tower crane and some mobile cranes will be required for the construction of the development. The electric operation of the tower crane is ideally suited to facilitate efficient delivery of materials to the workface with minimal disruption to the surrounding environment.

Road closures (partial) will be required for the installation and removal of the tower crane and will be coordinated through the required processes of Council.

All deliveries will be programmed by the onsite management so as to ensure minimal disruption and inconvenience to the pedestrian and traffic flows for the area.

The following guidelines will apply when operating a mobile crane.

- All applicable permits shall be applied for and be in place along with a comprehensive traffic management plan.
- Accredited traffic controllers will be used to manage all traffic whilst the mobile crane is in operation, when required. The appropriate Council and Police permits shall accompany the crane whilst it is in operation, when required.
- Consent will be obtained under Section 68 of the Local Government Act prior to hoisting of goods over footpaths. Overhead protection or traffic / pedestrian controls will be utilised.
- When the need for traffic controllers arises pedestrian flow will be maintained at all times when the mobile crane is being set-up, dismantled or accessing the site. This will be achieved by providing temporary controlled lanes as required. Temporary traffic lanes and pedestrian walkways will be established with the use of temporary traffic management systems as required to statutory authority requirements and managed by accredited traffic controllers.

2.0 PEDESTRIAN AND TRAFFIC MANAGEMENT DURING CONSTRUCTION WORKS

2.1 TRAFFIC MANAGEMENT

A Traffic Management Plan compliant with AS1742 and the RTA manual will be submitted to council for approval prior to the issue of a Construction Certificate.
The proposed traffic management during the construction phase of the re-development is detailed below. It includes the following;

Proposed ingress and egress routes to the site for construction vehicles and impact on the local traffic routes.

The following options are considered appropriate for traffic routes;

- During demolition and construction, trucks to generally approach the site along Hudson St in an east bound direction with parking along the proposed workzone.

- All deliveries will be programmed to ensure multiple deliveries do not occur at the one time. Deliveries will be scheduled to ensure that peak traffic flow times and thereby congestion are avoided at the site and the local roadways.

Proposed work and crane pick up zone location;

The crane methodology is described in section 1.9 (Crane Requirements). A Work Zone (Construction Zone) will be sought from Council/RTA to the site frontage on Hudson St which will facilitate an area for deliveries to be unloaded via the crane located onsite.

Waste bin delivery access and removal to / from site;

The waste bins will be rotated by the tower crane from the workzone to the waste bin storage area located within the development. Where practicable the site shall recycle as much material as possible utilizing a number of bins to facilitate the process.

Other measures to facilitate Traffic Management;

- Traffic control during temporary operations, such as crane erection, will be by accredited traffic controllers;

- Workers will be encouraged to use public transport to and from site.

- Deliveries to and from the site shall be programmed to suit any prevailing RTA and City of Sydney Council guidelines for the local area.

2.2 PEDESTRIAN TRAFFIC

Pedestrian movement during the construction phase will not be adversely affected by the redevelopment. Pedestrian management considerations are detailed below. They include the following;

- Protection for pedestrians will be as per statutory requirements with perimeter fencing and a full perimeter Class 'B' (overhead) Hoarding during construction. Scaffolding with chain and mesh on the outside will be installed to provide protection from falling objects to all building elevations

- Traffic controllers for construction vehicles entering and leaving the site where required;

- Provision of night lighting, protective barriers and traffic barriers will be used where applicable;

- Diversion of pedestrians away from working areas except where continuity of access is required (protection to be provided to these areas) whilst maintaining existing pedestrian pathways where practical; with pedestrian supervision via competent and ticketed controllers and pedestrian management means.

2.3 CONSULTATION

Consultation shall be undertaken with the following statutory authorities;

- City of Sydney Council;
- Roads and Traffic Authority (RTA);
- NSW Police

3.0 DEMOLITION

All Demolition works will be undertaken as per the Development Consent Conditions. As well as compliance with:-

- EPA Guidelines,
- Workcover Regulations
- Roads and Traffic Authority
- City of Sydney Council

The following is a summary of the construction methodologies for the project;

Retention of Existing Heritage Facade

- The structural design incorporates the retention of existing façade to the industrial building located on the site. Structural works will be carried out to ensure the stability of the existing façade during the demolition of the remainder of the site as well as ensure the façade remains in an acceptable condition to incorporate into the new development.

Hoardings, Fencing & Scaffolding

- Protection for pedestrians will be as per statutory requirements with perimeter security fencing and Class B (overhead) Hoarding for the full length of the property perimeter.

- The site will be securely and appropriately fenced during all phases of the demolition and construction works. The fencing shall be covered in dust suppressing shade cloth and will be kept neat at all times to ensure there are no unacceptable impacts on the amenity of adjoining properties.

Existing Services

- Prior to the commencement of works, the position and location of all existing services will be ascertained from drawings received from the relevant authorities (i.e. Dial Before You Dig), investigation carried out on site and by other means appropriate; all relevant authorities shall be consulted and employed to provide accurate services searches and information.

- Each existing service affected by the construction work will be disconnected, capped off, removed, altered or re-directed, as necessary for the completion of the works. Any redirection or capping of any services required will not affect any surrounding property.

Recycling

For recycling information refer to section 7 – Waste Management.

Acoustic Control

For acoustic control Information refer to section 9 – Noise Methodology.

4.0 REMEDIATION METHODOLOGY

Any remediation works that should be required will be carried out on site in accordance with the following;

- All relevant EPA Guidelines and Regulations.
- All relevant Local Council regulations.
- All relevant Work Cover regulations.

It is not envisaged any remediation works will be required for this project.

5.0 STORM AND WASTE WATER MANAGEMENT DURING CONSTRUCTION

5.1 INTRODUCTION

A storm and waste water management plan will be implemented during the construction of the project. The purposes of these procedures are to ensure that storm and waste water runoff is managed ensuring there is no off site environment impact. It is envisaged that the existing stormwater system shall be utilised until such time as the upgrade or diversion is programmed within the construction program. Works shall be managed to ensure that there is no impact to the surrounding environment or the local catchment area.

5.2 SCOPE

The scope shall be as per the relevant Development Consent Conditions.

5.3 REFERENCES

- All relevant council regulations;
- DA consent conditions;
- Environmental Protection Legislation;
- Clean Waters Act 1970;

5.4 CONSULTATION

The following organizations and their regulations and guidelines will be consulted in the preparation of the storm and waste water management plan:

- Environmental Protection Authority;
- City of Sydney Council;
- NSW Department of Land and Water Conservation;

6.0 WASTE MANAGEMENT DURING CONSTRUCTION

6.1 PURPOSE

To ensure that resources are conserved and waste is processed responsibly by minimising waste generation and maximising recycling of materials.

6.2 SCOPE

To address the waste management procedures for all demolition and construction activities.

Materials Selection & Ordering:

- Selection of all materials has been undertaken by architectural designers;
- Materials requirements are to be accurately calculated to minimise waste from over ordering;
- Materials ordering process is to aim at minimisation of materials packaging;
- Material Safety Data Sheets (MSDS) are to accompany all materials delivered to site, where required, to ensure that safe handling and storage procedures are implemented;

Waste Recycling

- Waste generation from construction activities on site will be minimized, reused or recycled where applicable;
- Recyclable materials are to be specified wherever practical;
- Dedicated and secure containers will be provided on site by an approved waste handling company for non-recyclable waste
- Where practical, dedicated and secure recycling containers will be provided on site by an approved waste handling company, manufactures, or specialist recycling organizations for the following materials;
    - Steel
    - Paper/Cardboard
    - Glass
    - Concrete/Brick/General Rubbish
    - Plasterboard

7.0 AIR QUAILITY MANAGEMENT DURING CONSTRUCTION

7.1 PURPOSE

To ensure that deconstruction and construction activities do not lead to the generation of unacceptably high levels of dust or other air pollution.

7.2 SCOPE

To establish air quality management systems and procedures to be implemented during construction activities as per Development Consent Conditions.

7.3 OTHER MAJOR CONTROL MEASURES

- All construction plant, equipment and vehicles are to be properly maintained and operated so as to alleviate excessive exhaust emissions;
- Waste loads leaving the site are to be covered at all times;
- All dust generating construction activities are to cease during high wind conditions unless such operations can be controlled by localized watering or other control means;
- The burning of waste materials and the lighting of fires will be strictly prohibited on the site at all times;
- Continual visual monitoring of the site will be undertaken by site management to ensure that works do not generate unacceptably high levels of dust;
- Wherever practical, materials and processes that are non-toxic will be employed to minimize possible harmful affects to air quality;
- Wherever practical any ozone depleting gases in building services installations will be removed prior to deconstruction works;

8.0 NOISE MANAGEMENT DURING CONSTRUCTION

8.1 PURPOSE

To ensure that construction activities do not lead to the generation of unacceptably high levels of noise.

8.2 SCOPE

To establish a noise management procedure to be implemented during demolition and construction activities.

8.3 MAJOR MEASURES

Machine Demolition:

- Demolition or removal of any materials involving the use of machinery of any kind, including compressors and jackhammers will be limited to the approved DA working hours, with regular breaks of 15 minutes each hour.

Standards

- The maximum noise levels of all deconstruction and construction plant and equipment is to generally comply with EPA requirements;
- Noise levels to comply with for Australian Standard 2436-1981, “Guide to Noise Control on Construction, Maintenance and Demolition Sites.”
- City of Sydney Code of Practice for Construction Hours/Noise 1992
- City of Sydney Council Development Consent Conditions.

Management

- An Acoustic Consultant may be engaged on site to advise and recommend on minimisation of noise generated by the site deconstruction and construction work;
- The maintenance of exhaust silencing attachments on all diesel powered equipment;
- Only silenced compressors and silenced, bagged jackhammers (if required) will be permitted to be used on site.
- Potential for noise generation to be used is an important criteria in the selection of construction plant and equipment on the site;
- On site periodic checks are to be carried out to ensure that noise suppression devices are installed on all required plant and equipment;

Site Induction

The Site Manager will ensure that all employees and sub-contractors are advised of the procedures under the 'Noise Management Methodology' during each Site Specific Safety Induction prior to commencement of work on the site.

The Site Induction will:

- Explain employee's responsibilities as outlined in the 'Noise Management Methodology.
- Highlight the sensitivity of the issue of power tool noise to adjoining residents.
- Explain the restrictions of the usage of any equipment or device on site.
- Notify approved hours of work.
- Ensure that the employee is competent and skilled in the tasks to be performed.
- Record certificates of competency to induction records.
- Fortnightly 'Tool Box' meetings to be held on site to ensure consistent monitoring of on site activities.
- Meetings will identify if the procedures established under this Methodology are being abided and followed by all site personnel.
- A site contact phone number will be issued to surrounding neighbours so they can immediately discuss any concerns they may have regarding noise associated with construction activities on site.

9.0 EROSION & SEDIMENT CONTROL

9.1 PURPOSE

To ensure that sediment and erosion during the demolition and construction activities are controlled and do not effect surrounding roads, footpaths, and neighbouring properties.

9.2 SCOPE

To establish erosion and sediment control measures to be implemented during construction activities.

9.3 MAJOR MEASURES

The project Civil Engineer will be responsible for developing an erosion and sediment control plan in accordance with the requirements under the relevant code (Urban Erosion and Sediment Control 1992 (CALM)). All construction plant, equipment and vehicles are to follow sediment control procedures when entering and leaving site. Prior to construction temporary sediment control devices are to be established and maintained throughout construction at the development.

Measures to be implemented where appropriate include the following;

- A vehicle wheel wash, cattle grid, wheel shaker or other appropriate device will be installed to prevent mud and dirt leaving the site.
- Stockpiles within the construction site must be protected with adequate sediment controls.
- Compliance with the relevant Development Consent Conditions.

10.0 TREE PROTECTION

Tree Protection Zones (TPZ) will be established along Hudson St so as to limit the potential for damage to the trees to be retained during construction. The zones will have a min 1.80m high protective barrier around the trunk and the trees will be mulched, irrigated and maintained. Site personnel will be made aware of the tree protection requirements during their site induction.

B Class hoarding will be installed above a number of the smaller trees along Hudson St to provide overhead protection to the tree crown. Some of the larger trees along Hudson St will require extensive pruning to avoid contact with power lines and allow the B Class hoarding to be installed. All pruning works are to be carried out by a qualified Arborist and al work will be in accordance with the Australian Standard for Pruning Amenity Trees AS 4373 - 1996

Work Within Tree Protection Zones - Generally, excavation or construction equipment will not be permitted to operate from within the TPZs of trees to be retained. Where it is considered necessary to operate machinery within the TPZ, steel plates or timber planking will be installed within TPZ to avoid soil compaction and root damage. Where operation of machinery within TPZs and close to tree trunks becomes necessary, trunk protection will be installed around affected trees (as per the below diagram).

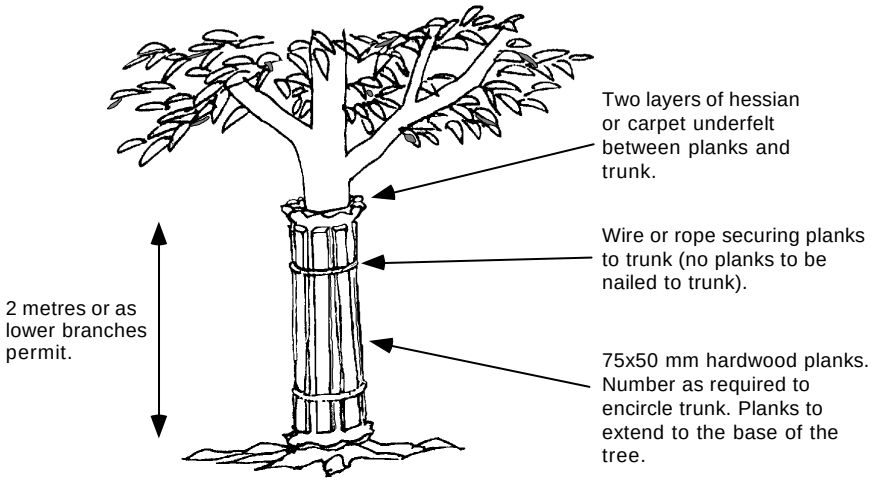


Diagram 1 – Method of installing trunk protection

Trenches for temporary or permanent underground utilities are to be located outside of the fenced off tree protection zones where possible. In the event that underground services are to be located within a TPZ, the option of tunnelling or boring under trees will be investigated and implemented where feasible.

11.0 SITE AMENITIES

11.1 CONTRACTOR SITE OFFICE

From commencement the Contractor Site Office will be established on top of the B Class hoarding. At the time of hoarding removal from the development, the office will be relocated once to a location to enable the completion of the project.

11.2 SITE AMENITIES & ABLUTIONS

Initially, it is proposed that the Site Amenities and Ablutions for Workers will be located on top of the B class hoarding. Once the Ground Floor structure and internal walls are complete, these amenities will be relocated into a suitable location within the construction site.

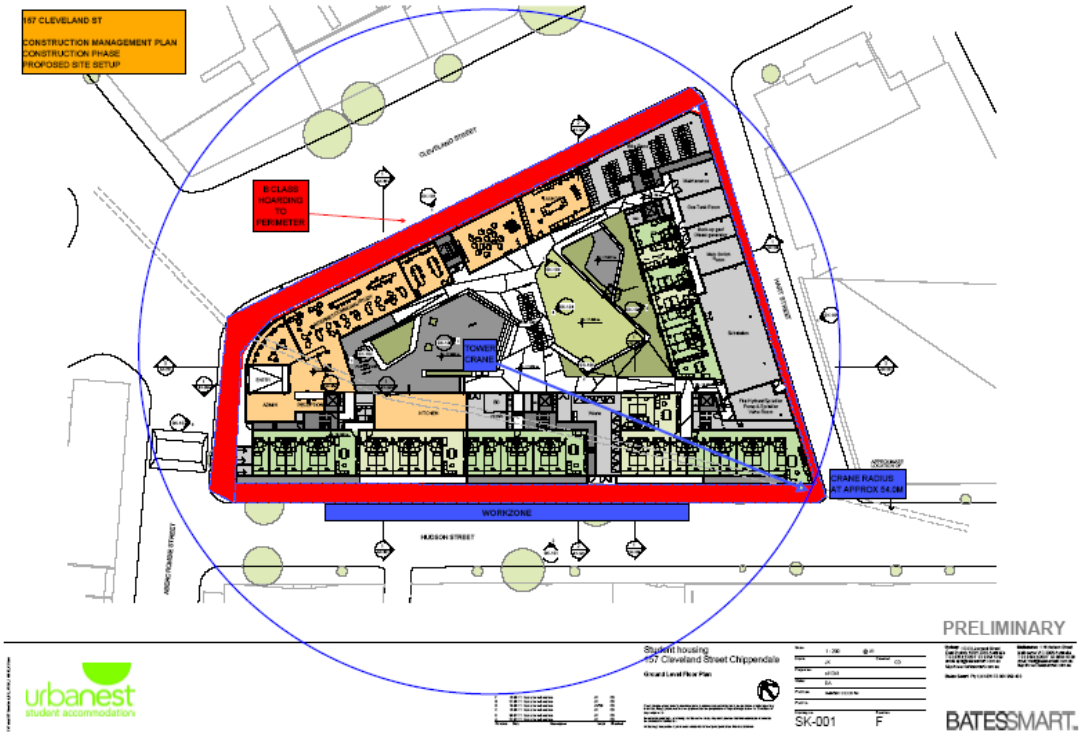
The location of the facilities may need to be moved several times during construction to permit continuity of works to all areas. Amenities will be in accordance with the code of practice.

11.3 PARKING

There are no facilities on site for the provision of parking and it is not feasible to provide such a facility. Subcontractors would be required to provide a transport solution for their works either by providing them with paid parking in the surrounding area or through the use of public transport.

APPENDIX 1.0

CONSTRUCTION PHASE SITE PLAN (DURING WORKZONE HOURS)



Appendix B

Waste Management Plan

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Waste Management Plan

157-163 Cleveland Street, Redfern

• Adelaide • Brisbane • London • Melbourne • Sydney •

Contents

1 INTRODUCTION

The development consists of –

- Student Accommodation Beds – 461 (assumes double occupancy of all studios)
- Student Communal Spaces - 391m^2
- Student Communal Kitchen – 78m^2

This waste management plan aims to provide a review of the building layout and apartment details and provide a Waste Management Plan identifying –

- Calculation of weekly waste and recyclable volumes
- Establish procedures for storage and transportation of waste and recyclables within the building
- Include technical brochures and drawings for typical equipment

All procedures and equipment shall be in compliance with Council codes, BCA, Australian Standards, and statutory requirements.

The results of the above analyses are outlined in the following sections.

2 SUMMARY

- The garbage store is located on the ground floor of the development adjacent to Hudson Street and is accessed both internally and externally
- Residential garbage and recycling waste collections shall be performed seven (7) times a week or as required by private collection contractors from Hudson Street
- Residents will be responsible for storing garbage in the bins provided within the apartments and subsequently transferring the garbage to the garbage room as required
- Residents will be responsible for storing recyclables within the apartments and subsequently transferring the recyclables to the garbage room as required
- The building manager will be responsible for monitoring bin levels in the garbage store ensuring clean empty bins are available to receive waste
- It is proposed to use a private collection contractor to service the student accommodation development in order to reduce adverse visual impacts, improve hygiene/amenity and reduce impacts upon adjacent land users
- The collection contractors will be responsible for transferring all full bins for collection from the garbage store to the collection vehicle and return to the residential refuse room immediately upon completion of collection

- The residents of the apartments will dispose of garbage into 6 x 1000 litre collection bins provided within the garbage store

- The residents of the apartments will separate recyclable waste from garbage and dispose of recyclables into 4 x 1000 litre collection bins provided within the garbage store

- Residents and staff of the building will dispose of garbage whilst using the communal kitchen/courtyard/internal areas and dispose of garbage into 1 x 240l collection bins (or equivalent) provided within the courtyard of the development. These bins will be transferred by staff to the garbage store as required.

- Residents and staff of the building will separate recyclable waste from garbage whilst using the communal kitchen/courtyard/internal areas and dispose of recyclables into 1 x 240l collection bins (or equivalent) provided within the communal kitchen/courtyard/internal areas of the development. These bins will be transferred by staff to the garbage store as required.

3 WASTE MANAGEMENT PLAN CONTEXT

This waste management plan is based on the following conditions.

3.1 INCLUSIONS

- On-going use of the premises. Does not include demolition or construction stages (refer Construction Management Plan).

- Waste volume figures are based on waste generation rates specified within Sydney City Council's Policy for Waste Minimisation in New Developments and is comparable with other student accommodation development. Waste generation will be influenced by the tenant, resident and operator's disposition toward waste disposal and recycling, and by the development's occupancy rate. Refer to the enclosed tables for rates and assumptions.

3.2 EXCLUSIONS

- Hard rubbish and green/garden wastes. Disposal shall be arranged by the building manager via appropriate contractors.

4 GENERATED WASTE VOLUME ESTIMATE

Residential Waste Calculation			
Studio Apartments *(assumes all dbl occupancy)*		*Occupants*	*116*
Garbage	4,640	Rate: l/occupant/week	40
Comingled Recycling	2,320	Rate: l/occupant/week	20
3, 5 & 6 Bedroom Apartments		*Occupants*	*345*
Garbage	13,800	Rate: l/occupant/week	40
Comingled Recycling	6,900	Rate: l/occupant/week	20
Student Communal Spaces		*Area (m^2)*	*391*
Garbage	274	Rate: l/day/100m^2	10
Comingled Recycling	274	Rate: l/day/100m^2	10
Student Communal Kitchen		*Area (m^2)*	*77.5*
Garbage	434	Rate: l/day/100m^2	80
Comingled Recycling	109	Rate: l/day/100m^2	20
Student Communal Courtyard		*Area (m^2)*	*970*
Garbage	679	Rate: l/day/100m^2	10
Comingled Recycling	679	Rate: l/day/100m^2	10
Total Building Waste			
Garbage (l/week uncompacted)	19,827		
Comingled Recycling (l/week uncompacted)	10,281		

Notes –

- Residential apartments based upon boarding house waste generation rates
- Student communal spaces based upon office waste generation rates
- Student communal kitchen based upon takeaway waste generation rates
- Student communal courtyard based upon office waste generation rates
- Commingled Recycling incorporates Glass, HDPE and PET containers, paper and cardboard.

References –

- Council for the City of Sydney – Policy for Waste Minimisation in New Developments

5 RESIDENTIAL WASTE MANAGEMENT

5.1 WASTE STREAMS

Residential waste shall be sorted on-site by the residents into the following streams and associated bins –

- Garbage
- Commingled Recycling (Glass, PET, aluminium, steel, HDPE, and Paper/Cardboard)

5.2 WASTE COLLECTION

It is proposed to use a private waste collection contractor to service the student accommodation facility. Such an arrangement currently exists and successfully operates within urba**nest**'s other student accommodation facilities including Quay Street, Haymarket. The advantages of private waste collection for this facility include –

- Reduced visual impact as a result of the waste contractor accessing and removing bins from the garbage store as required eliminating the need to present multiple bins at the kerb on collection day
- Improved hygiene/amenity through the regular removal of waste
- Reduced impact on surrounding land users through the ability to utilise a smaller waste collection vehicle

5.3 RESIDENTIAL GARBAGE DISPOSAL

Residential apartments shall be furnished with plastic lined under bench storage bins located both in the bedroom and kitchen areas, with a minimum capacity of 15 litres, for the temporary holding of garbage waste. Residents shall transfer bagged garbage, as required, to the garbage store on the ground floor.

5.4 RESIDENTIAL RECYCLABLE DISPOSAL

Residential apartments shall be furnished with under bench storage bins for the temporary holding of recyclable waste with a minimum capacity of 10 litres. Residents shall transfer recyclables, as required, to the garbage store on the ground floor.

5.5 STUDENT COMMUNAL SPACES/KITCHEN/COURTYARD

The student communal spaces/kitchen/courtyard and associated amenities shall be furnished with suitable plastic lined garbage bins. Garbage bins are to be strategically placed throughout these areas for garbage disposal by students. Cleaning staff shall periodically clear bagged-garbage, using a cleaner's trolley or similar, and transfer this waste to the 1000 litre bins located in the garbage store at ground level for disposal.

Commingled recycling bins, of suitable capacity, shall be strategically placed throughout the student communal spaces/kitchen/courtyard for recycling disposal by students. Cleaning staff shall periodically clear recyclables, using a cleaner's trolley or similar, and transfer this waste to the 1000 litre bins located in the garbage store at ground level for disposal.

5.6 RESIDENTIAL WASTE COLLECTION

The collection contractor shall be provided with access to the refuse room and transfer full bins to the collection vehicle and return emptied bins to the refuse room upon completion of collection. Collections shall be conducted from Hudson Street at the rear of the development.

Daily garbage and recycling collections are envisaged. The collection of waste and recycling bins is to be performed by private contractors from Hudson Street.

5.7 RESIDENTIAL WASTE CALCULATION

Residential Garbage Requirements		
User	**Garbage**	**Commingled Recycling**
Student Accommodation (l/wk uncompacted)	18,440	9,220
Weekly Bin Equivalent Total Volume (no. 1000l bins)	18.4	9.2
Daily Waste Generation	2,634	1,317
Daily Bin Equivalent Total Volume (no. 1000l bins)	2.6	1.3
Collection Volume (No. Bins)	3.0	2.0
Collection Frequency	Daily	Daily
Spare Bins Required	3.0	2.0
Total Bins Required	6.0	4.0

5.8 COMMUNAL AREAS WASTE CALCULATION

Residential Garbage Requirements		
User	**Garbage**	**Commingled Recycling**
Student Communal Spaces (Internal)	274	274
Student Communal Kitchen	434	109
Student Communal Courtyard	679	679
Total (l/wk uncompacted)	1,387	1,061
Weekly Bin Equivalent Total Volume (no. 240l bins)	5.8	4.4
Daily Waste Generation	198	152
Daily Bin Equivalent Total Volume (no. 240l bins)	0.8	0.6
Collection Volume (No. Bins)	1.0	1.0
Collection Frequency	Daily	Daily
Spare Bins Required	1.0	1.0
Total Bins Required	2.0	2.0

6 BIN REQUIREMENTS

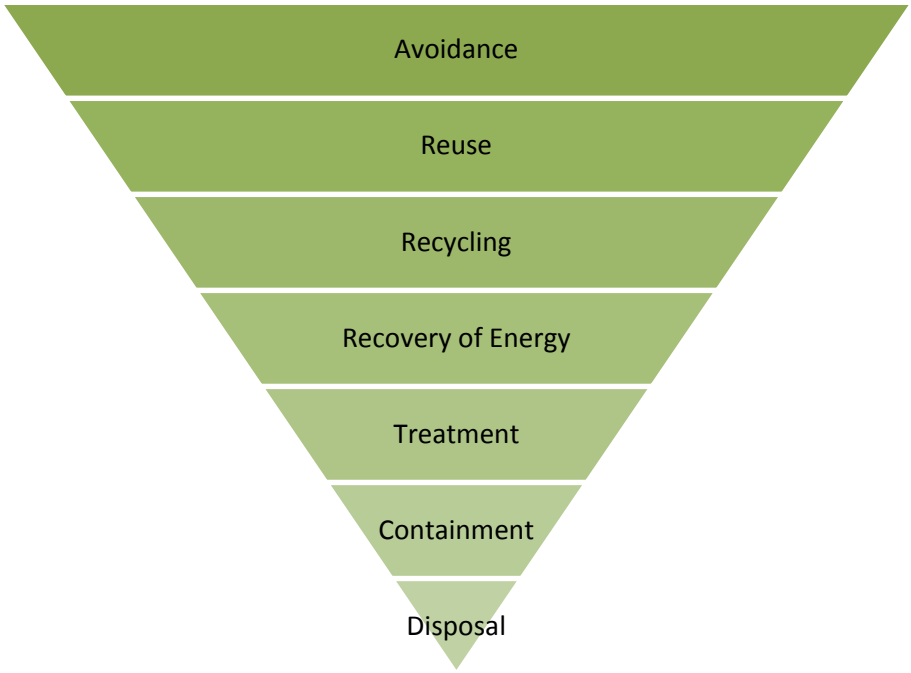
The table below and the attached plan indicates the quantity, required area and the location of the bins proposed according to this waste management plan.

Garbage Store Requirements				
Bin Type	**Length**	**Width**	**Quantity**	**Area Required**
1000 litre	1160mm	1360mm	10	15.8m^2
240 litre	749mm	580mm	4	0.9m^2
Total Area Identified on Plan				69.0m^2

As indicated in the table above and on the plan, the proposed garbage store provides sufficient area for the storage and manoeuvrability of the required number of bins.

7 WASTE MINIMISATION STRATEGIES

The building manager will be responsible for the education of residential and commercial tenants in the practices of waste reduction/minimisation to divert waste from landfill. This will be achieved by the following –



- Document and distribute details of the waste management system that is in place on site to all tenants and residents
- Distribution of notices to all tenants and residents encouraging waste separation
- All bins to be labelled and colour coded stating types of waste that can be deposited i.e. paper/cardboard bins, container recycling bins, garbage bins
- Residential tenants will be provided with a manual detailing items that can be disposed of in accordance with the waste management plan
- Any future change to regulatory requirements or to the developments' waste generation rates will be addressed through a waste audit and revised waste management system

8 ADDITIONAL WASTE MANAGEMENT INFORMATION

Items unsuitable for disposal via garbage or recycling bins would need to be disposed with the assistance of the building manager. This would include: large, heavy, and liquid waste items.

To minimise security, vandalism, odour/visual impact, and health/safety issues, the following shall be implemented –

- Transferring waste and shifting bins shall require the minimum possible manual handling. The operator will assess manual handling risks as per regulatory requirements and provide appropriate documentation to the building manager
- Signage and usage labels for the garbage and recycling bins will be provided by the operator
- The garbage stores are secure and vermin proof
- The garbage store will be accessible 24/7 and will have appropriate lighting
- The garbage store will be ventilated in accordance with Australian Standard AS 1668.2
- A bin wash area comprising a tap and floor drain with trap and sewer connection is located within the garbage stores
- The building manager shall keep clean the bin store, keep bin lids closed and wash bins regularly
- The collection contractor will ensure prompt return of empty bins once collection has occurred
- The building manager shall prepare operational instructions and an operational health and safety procedure for site staff
- A traffic management plan and collection-vehicle safe operation procedure shall be prepared by the operator of the development in consultation with the private collection contractors, when appointed

Appendix A –

Ground Floor Plan

1 DA 2.001 Ground Floor Plan
1 : 200

Schedule of Room Types for L00

4 x Studios (8 Student Beds)
1 x 4 Bed Apartment (4 Students)
3 x 5 Bed Apartment (15 Students)
2 x 6 Bed Apartment (12 Students)
Total : 39 Student Beds

urbanest student accommodation

Revision	Date	Description	Initial	Checked
6	14.11.11	For DA Submission	JK	CD
5	11.11.11	Issue for information	JK	CD
4	24.10.11	Issue for information	JK/DS	GL
3	21.10.11	Issue for information	JK/DS	GL
2	19.10.11	Issue for information	JK/DS	GL
1	06.10.11	Request for DGR's	JK/DS	GL

Student housing
157 Cleveland Street Chippendale

Plans Ground Level 00

Scale	1 : 400 @ A3 1 : 200 @ A1	
Drawn	JK/DS	Checked CD
Project no.	s11341	
Status	Development Application	
Plot Date	14/11/2011 11:44:00 AM	
Plot File		
Drawing no.	DA 2.001	Revision 6

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