



**preferred concept plan application and stage 1 project application for the  
moore theological college, king street newtown**

prepared on behalf of moore theological college by TRAFFIX traffic & transport planners  
ref: 09 057 august 2010 report version 10

**transport and accessibility assessment report**

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# 1. introduction

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TRAFFIX was previously commissioned by the Moore Theological College (MTC) to undertake a traffic impact assessment of a proposed Concept Plan Application and Stage 1 Project Application for the existing Moore College precinct at Newtown. The report was prepared in support of the overall Environmental Assessment report that was prepared by JBA Urban Planning Consultants, which was an application made under Part 3A of the Environmental Planning and Assessment Act, 1979.

Following comments and submissions received, changes were made to both the Concept Application and the Stage 1 Project Application and this report documents the impacts associated with these changes.

The MTC currently has 318 students studying full time at the Newtown campus and almost 5,000 students in over 50 countries studying by external studies. There are currently 76 staff, including 24 Faculty staff. The existing facilities are not adequate to meet the future needs of the College for staff or students and to address this, the College undertook a master planning exercise to explore options for expansion of the campus and its facilities.

The objectives of the Concept Plan and Project Application remain unchanged and are to:

- protect the future physical expansion and academic development of MTC;
- build on the special qualities of MTC;
- allow development flexibility within the certainty of a structured framework;
- enhance MTC's physical identity and address;
- conserve and enhance the heritage buildings on and in proximity to MTC site;



- strengthen access within and around the campus;
- enhance the campus environment; and
- engage with the community.

With 318 students studying full time at the Newtown campus and almost 5,000 students in over 50 countries studying by external studies, the existing facilities are not adequate to meet the future expanding needs of the College. Student numbers are predicted to increase progressively to 600 students (with 110 staff) over the next decade and ultimately reaching 1,200 students (with 190 staff).



## 2. location and site

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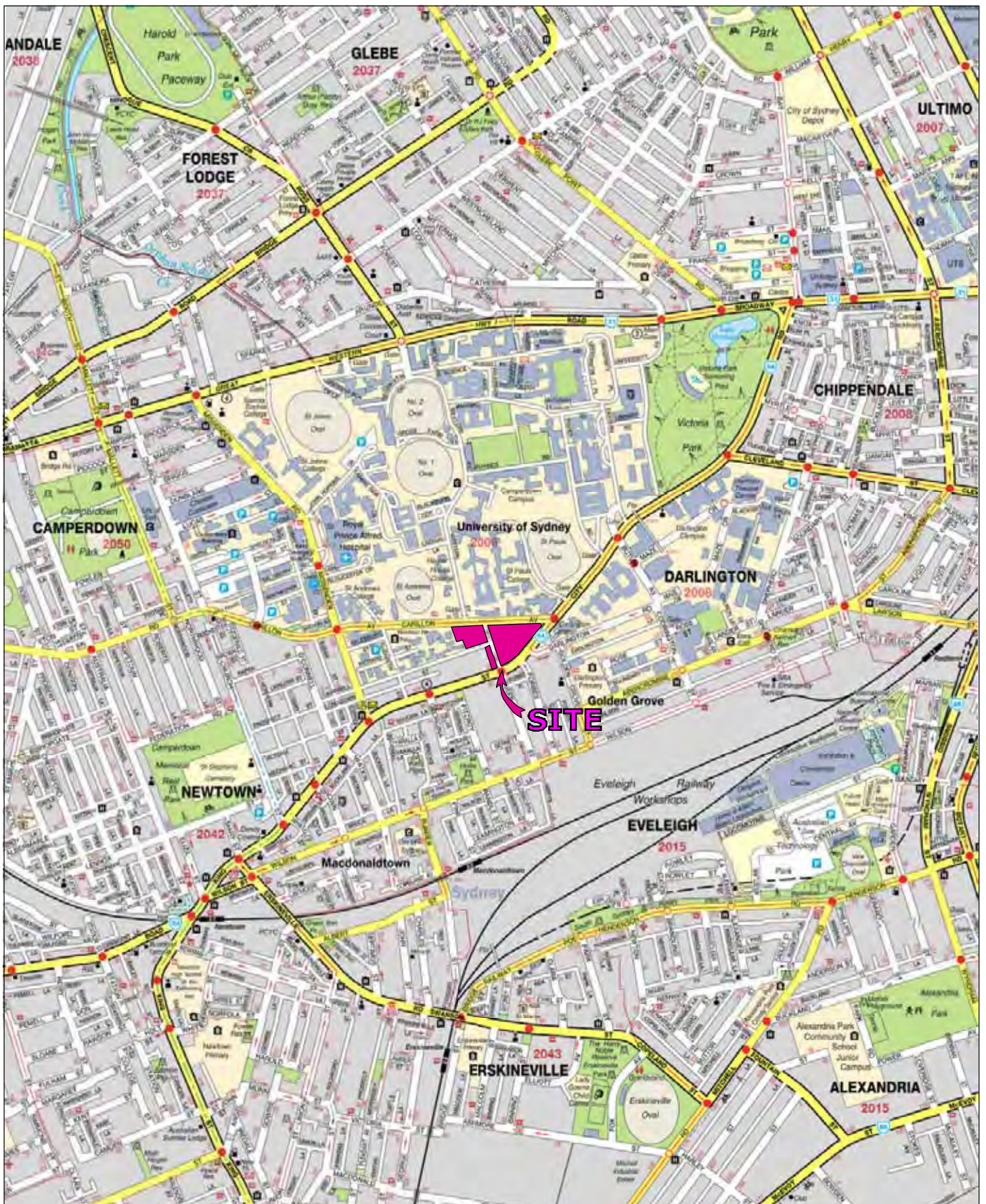
The Moore Theological College Campus is located in suburb of Newtown within the City of Sydney local government area (LGA). The site has a northern boundary to the Carillon Avenue, and southern boundary to King Street.

MTC is strategically located within the institutional hub comprising Sydney University and the Royal Prince Alfred Hospital. Broadway and the CBD are readily accessible

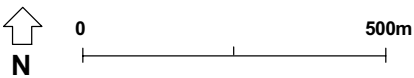
The Concept Plan site is approximately 1.31ha in area and is wedge-shaped, comprising numerous allotments occupied by various educational, residential, campus, and administration buildings. For the purposes of this Concept Plan the MTC campus has been divided into Site A, Site B and Site C, as shown in **figures 1 and 2**.

Site A comprises the majority of the MTC campus and presently includes all the academic and administration spaces, as well as some residential buildings and retail uses. The existing buildings include:

- a three storey brick library and administration building at the corner of Carillon Avenue and King Street, with parking for 12 spaces accessed via King Street;
- 3 x two storey residential semi detached buildings fronting King Street;
- a two storey academic building known as the Knox Building fronting King Street;
- 3 x two/three storey mixed use buildings containing ground floor retail fronting King Street;
- a four storey dining hall building;
- a three storey residential college fronting Carillon Avenue (former Mary Andrews College);
- 9 x two storey residential terraces and one two storey fronting Little Queen Street;



Source: UBD 2006



impact assessment: part 3A application  
 Moore College Site  
 little queen street, Newtown

figure 1  
 location

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- a two storey building known as Deaconess House;
- A four storey building; and
- a lawn and parking area within the centre of Site A, with vehicular access to the internal car park via Little Queen Street.

Site B contains 4 residential buildings associated with MTC including two single storey semis on the corner of Little Queen Street and Carillon Avenue and two single storey semis on the corner of Little Queen Street and Campbell Street. Site B also includes a two storey brick building and a weatherboard cottage fronting onto Carillon Avenue.

Site C includes a row of 10 two storey terraces which front Little Queen Street and 2 x single storey semi-detached dwellings on the corner with Little Queen Street and King Street.

Reference should also be made to the Photographic Record presented in **appendix a**, which provides an appreciation of the general character of roads and other key attributes in proximity to the site.



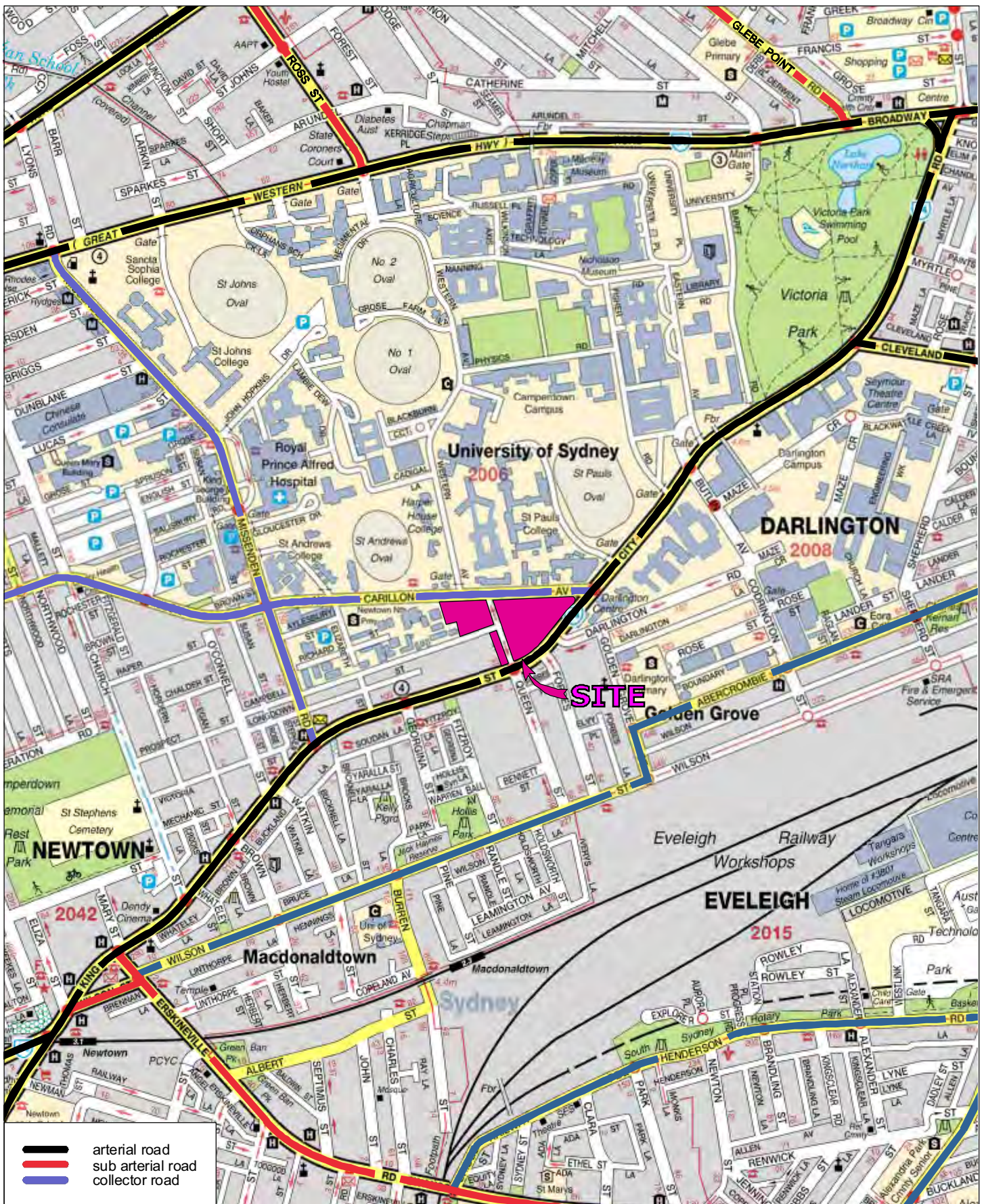
## 3. existing traffic conditions

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### 3.1 road hierarchy

The road hierarchy in the vicinity of the site is shown in **figure 3** with the following roads of particular interest:

- King Street: is an important RTA State Road (SH 1 – the Princes Highway) carrying some 22,000 vehicles per day in the vicinity of the site and serving as a vital link between the Sydney CBD and the southern suburbs. It forms the southern site boundary;
- Missenden Road: is a sub-arterial road connecting Parramatta Road in the north with King Street in the south, which lies to the west of the site. It is also an important local access to the RPA Hospital and Sydney University. It carries some 9,500 vehicles per day;
- Carillon Avenue: is a sub-arterial road connecting Missenden Road to the west and King Street to the east. It is an important local access route to Sydney University and the Moore Theological College. It carries about 11,000 vehicles per day.
- Campbell Street: is a local road providing access to the rear of properties fronting both Carillon Avenue and King Street. It also traverses through the subject site. It carries a daily traffic volume of about 350 vehicles per day.
- Little Queen Street is a local access road (a shared zone) providing a local connection between Carillon Avenue and King Street. It runs one-way northbound, north of Campbell Street (about 200



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 little queen street, Newtown

figure 3  
 road hierarchy

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vehicles per day) and one way southbound, south of Campbell Street (about 150 vehicles per day).

It can be seen from figure 3 that the site is conveniently located with respect to the arterial road system serving the region, while local access is available using the above routes.

### 3.2 overview of existing traffic conditions

King Street is a divided road that carries three lanes in each direction generally north of Carillon Avenue; and two lanes in each direction slightly to the south of Carillon Avenue in the vicinity of Darlington Road. It has clearway restrictions on both sides and forms traffic signal controlled intersections with both Carillon Avenue and Missenden Road.

The intersection of Carillon Avenue with King Street incorporates a single right turn lane (recently altered by the RTA from a dual right turn lane) for the movement from King Street into Carillon Avenue (north to west). It also includes a left turn slip lane for the movement into Carillon Avenue.

The intersection of Missenden Road with King Street is a 'T' junction which provided two lanes on all approaches, with no turn bays provided.

The intersection of Carillon Avenue with Missenden Road is a signal controlled cross intersection with two through lanes on all approaches, as well as a 30 metre right turn bay in Carillon Avenue (for movements east to north) and a 40 metre right turn bay in Missenden Road (for movements north to west).

In a more local context, the Concept Plan area is served by Campbell Street which traverses in an east-west direction and is situated between Carillon Avenue and King Street. It carries two-way flow along its length. It forms the stem of a 'T' junction with Little Queen Street at its eastern end. Little



Queen Street is a shared zone and presently carries one-way flow northbound (north of Campbell Street, with exits only onto Carillon Avenue) and one-way southbound (south of Campbell Street, with exits only onto King Street). As discussed further below, separate discussions have been held with Sydney City Council officers and while approval in principle has been given to the closure of the southern section of Little Queen Street (between King Street and Campbell Street) to through traffic movement, this proposal is no longer being pursued at this time.

The site is presently accessed onto all street frontages via multiple driveway crossings. This includes an access onto King Street to the immediate south of Carillon Avenue, which serves the existing at-grade parking. This is proposed to be closed under the Concept Plan Application, with consequent benefits to King Street traffic flow conditions and safety. Indeed, the opportunity is being taken under the current application to rationalise and consolidate all existing driveways.

### 3.3 existing site generation

The site presently accommodates 318 full time students and 76 staff, including 24 faculty (teaching) staff. The levels of staff and students vary significantly over the week and at different times of the day and in addition, much of their cumulative parking demands and associated traffic generation are distributed throughout the local road system and accordingly are very dispersed, with minimal on-site parking currently provided (26 spaces).

For the purpose of assessment, no attempt has therefore been made to quantify the existing traffic generation of the uses on the site, on the basis that all impacts will now be consolidated onto the site, so that in a local context these impacts will be a net increase. This is clearly a worst case scenario as in effect, this traffic is already on the road network and will create impacts at all intersections of interest, as assessed further below.



### 3.4 existing public transport services

The site benefits from excellent access to bus services as shown in **figure 4**. These services are important for both the journey-to-work as well as student and other trips, with direct services provided to the Sydney CBD, Leichhardt, Bondi Junction, Marrickville Metro, Canterbury, Kingsgrove, Tempe, Campsie and Coogee.

MTC is located at the intersection of Carillon Avenue and King Street. The College is also therefore approximately 10 minutes walk from Redfern, McDonsaltdtown and Newtown Railway stations.

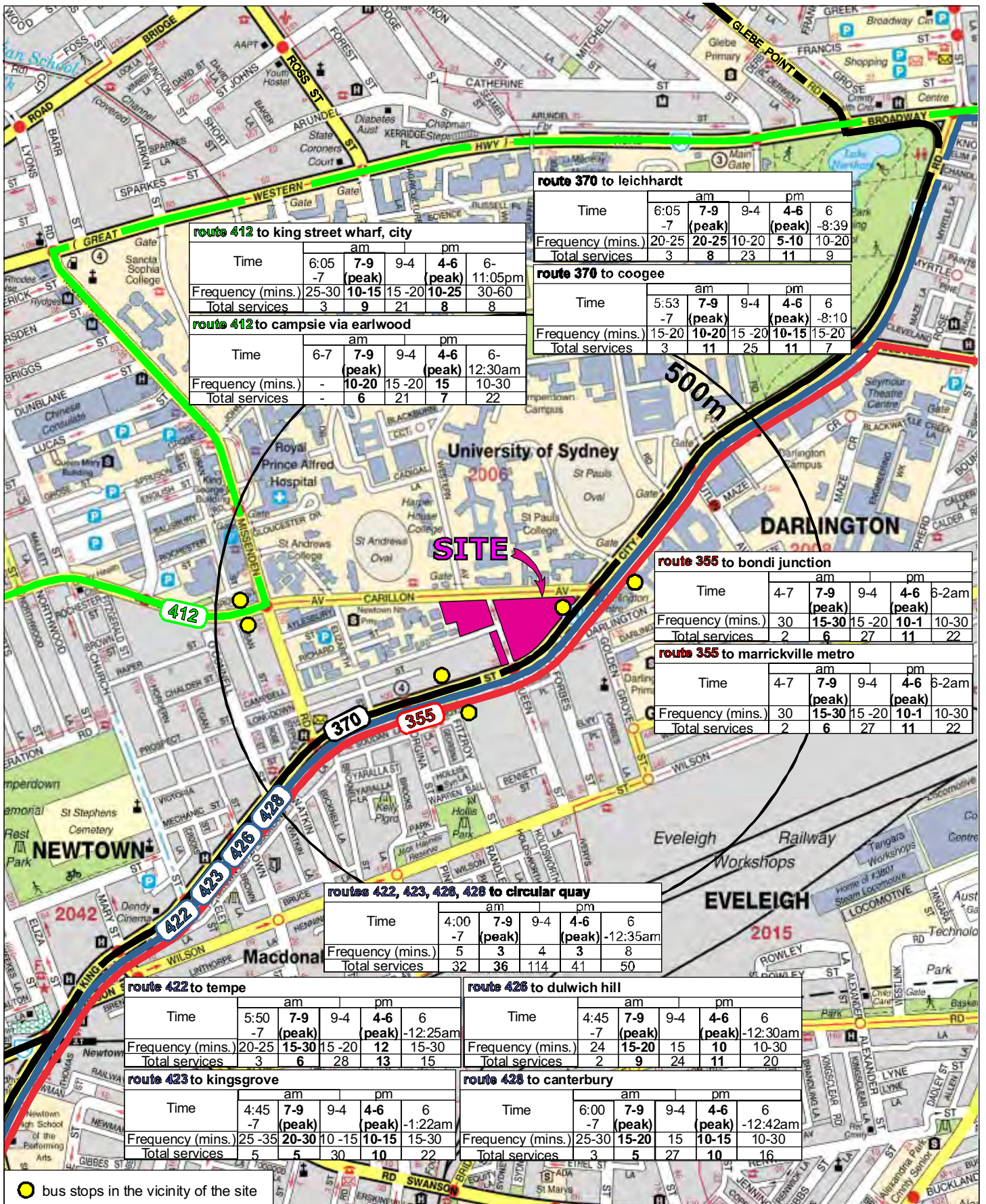
These services provide a very high level of public transport accessibility which is comparable to a CBD location in many respects. Nevertheless, the educational nature of the proposed uses and in particular issues relating to part-time staff and student travel during the evenings and on weekends require a higher level of parking than might otherwise be the case.

### 3.5 existing intersection performances

For the purposes of the assessment of traffic impacts of this development, surveys were undertaken to establish the performance of the existing road system during the AM peak period. This was established as being the more critical peak period as most students and staff in the morning coincides with the on-street peak period, while in the afternoon a more dispersed trip profile occurs.

Surveys were therefore undertaken at the following intersections between 7am and 9am on Tuesday 1<sup>st</sup> April 2009:

- King Street (City Road) and Carillon Avenue;
- King Street and Missenden Road; and
- Carillon Avenue and Missenden Road.



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 little queen street, Newtown

**figure 4**

transport routes and timetable summaries (monday to Friday)

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Surveys were also undertaken locally which covered the following intersections:

- Little Queen Street and King Street;
- Little Queen Street and Campbell Street; and
- Little Queen Street and Carillon Avenue.

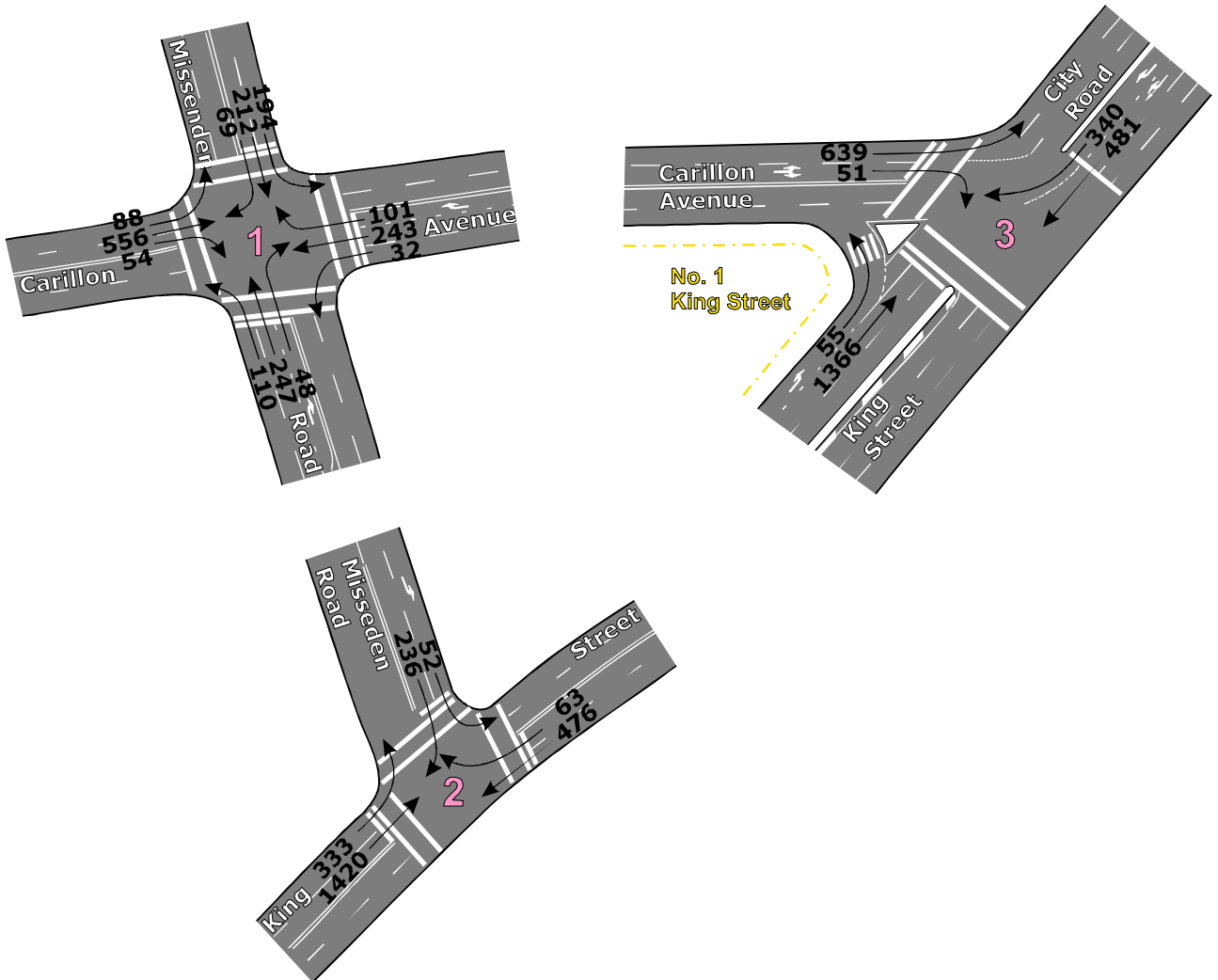
The results of the survey at the critical (signal controlled) intersections are presented in **figure 5**, which show the peak flows over the maximum hour at each intersection, typically between 7.45am and 8.45am. Based on these survey results, the above signal controlled intersections were analysed using the SIDRA computer program to determine their performance under existing traffic conditions.

The SIDRA model produces a range of outputs, the most useful of which are the Degree of Saturation (DOS) and Average Vehicle Delay per vehicle (AVD). The AVD is in turn related to a level of service (LOS) criteria. These performance measures can be interpreted using the following explanations:

**DOS** - the DOS is a measure of the operational performance of individual intersections. As both queue length and delay increase rapidly as DS approaches 1, it is usual to attempt to keep DS to less than 0.9. When DS exceeds 0.9 residual queues can be anticipated, as occurs at many major intersections throughout the metropolitan area during peak periods. In this regard, a practical limit at 1.1 can be assumed. For intersections controlled by roundabout or give way/stop control, satisfactory intersection operation is generally indicated by a DOS of 0.8 or less.

**AVD** - the AVD for individual intersections provides a measure of the operational performance of an intersection. In general, levels of acceptability of AVD for individual intersections depend on the time of day (motorists generally accept higher delays during peak commuter periods) and the road system being modelled (motorists are more likely to accept longer delays on side streets than on the main road system).

**LOS** - this is a comparative measure which provides an indication of the operating performance of an intersection as shown below:



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**figure 5**  
 existing am peak traffic volumes

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Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode
F	More than 70	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode or major treatment.

The results of the modelling for each intersection are summarised in **table 1** for all approaches. It will be noted in this regard that conditions at all other times will be improved, with lower delays.

**table 1: existing intersection performance during the am peak period**

Intersection Description	Control	Time Period	Degree of Saturation	Intersection Delay (secs)	Level of Service
King/Carillon	Signals	AM	0.977	56.7	E
King/Missenden	Signals	AM	0.849	29.9	C
Carillon/Missenden	Signals	AM	0.901	44.8	D



It is noted that the delays above relate to average delays in the case of traffic signal. It can be seen from table 1 that all the above intersections operate generally satisfactorily during the AM peak period with the exception of the intersection of Carillon Avenue with King Street which is at capacity. However, this is considered unnecessary in circumstances where the RTA has made recent changes with the dual right turn lane into Carillon Avenue being reduced to a single lane and this has caused an increase in delays and a change from Level of Service D to level of service E. The level of Service D at the intersection of Carillon and Missenden is operating near capacity but as this intersection now operates under traffic signal control, an accident study is not required. Reference should be made to the SIDRA outputs provided in **appendix d** which show the performance of individual approaches and movements at these intersections.

The local intersections identified above all experienced negligible volumes along Little Queen Street, with a maximum flow of 11 veh/hr out onto Carillon Avenue. This traffic is associated with minimal delays and single vehicle queuing.

Notwithstanding the above, it is stressed that the most relevant use of this analysis is to compare the relative change in the performance parameters as a result of the proposed development. This is discussed further in the following sections.



## 4. description of proposed development

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A detailed description of the Preferred Concept Plan application is provided in the Environmental Assessment report prepared by JBA Urban Planning Consultants. The MTC redevelopment proposal, as shown in **appendix b**, includes the following:

### ➤ demolition of:

- Mary Andrews College (18-26 Carillon Avenue)
- MTC Dining Hall (2-16 Carillon Avenue)
- 2 x 2 storey terraces (3-5 King Street)
- a 2 storey terrace (7 King Street)
- mixed use building (27-31 King Street)
- the rear of mixed use building (21-25 King Street)
- the 4 residential buildings on Site B (30-44 Carillon Avenue)
- weatherboard child care centre (48 Carillon Avenue)

### ➤ redevelopment of Site A including:

- construction of a new 6 storey Resource and Research Centre (Building A1)
- refurbishment of Buildings A3, A4, A5, A6 and A7
- construction of a new 5 storey residential college (Building A8)
- construction of the college green and associate private outdoor recreation areas
- entries and circulation thoroughfares (from King Street to Carillon Avenue)

### ➤ construction of 4 new residential college/flat buildings at Site B including:

- Building B1 (6 storeys)
- Building B2 (9 storeys)
- Building B3 (6 storeys)
- Building B4 (4 storeys)
- associated private open space



- conservation works to Site C for continued use as residential, which includes 9 existing terraces fronting Little Queen Street and 2 existing semi-detached terraces fronting King Street;
- construction of two associated basement car parks;
- construction of a temporary car park to support the staged development of Site A; and
- associated public domain improvements.

The main changes in floor areas the Preferred Concept Plan and the original Exhibited Concept Plan are in response to submissions and are shown in Table 2 as follows:

**table 2: comparison of floor area changes**

Land Use	Location	Preferred Concept GFA	Exhibited Concept GFA	Reduction in GFA
Academic	Site A	13065	14500	-1435
	Site B	0		0
	Site C	0		0
	Total	13065	14500	-1435
Retail	Site A	650	650	72
	Site B	0		0
	Site C	0		0
	Total	650	650	72
Residential (Student Accommodation)	Site A	2539	2900	-361
	Site B	9073	10900	-1827
	Site C	896	896	0
	Total	12508	14696	-2188
Total		26223	29846	-3623

Assumptions:

Residential GFA is measured as 80% of new building envelope, to allow for building articulation, balconies, stairs, lifts

Academic GFA is measured as 85% of new building envelope

Academic GFA is measured as 85% of new building envelope

All GFA for retained existing buildings is measured as 100% of measured building envelope



It is evident from Table 2 that there is a significant reduction in floor area of 3,623m<sup>2</sup>. These changes relate to:

- A reduction in the academic and library floor area from 14,500m<sup>2</sup> to 13,065m<sup>2</sup>;
- A reduction in residential dwellings on Site B from 77 units to 70 units; and
- A reduction in parking from 340 spaces to 270 spaces.

The Preferred Concept Plan generally retains the existing distribution of land uses across the site, with academic uses primarily located within Site A; a new resource centre (including library) on the corner of King Street and Carillon Avenue; teaching and office/administration uses located throughout Buildings A2, A3, A5, A7, and A8 and retail uses on the ground level of Buildings A3, A4 and A5 to provide activation to the King Street frontage. Buildings A6 and the upper levels of A8 will continue to be used for student accommodation. Sites B and C will also continue to be used for student accommodation. Two levels of basement car parking will be located on Site B. Elevated open space areas will be located between Buildings B1, B2 and B3.

The parking and traffic impacts arising from the Concept Plan are discussed in the following sections. Reference should be made to the plans submitted separately to the Department of Planning, some of which are presented at reduced scale in **appendix b** for ease of reference. It is emphasised that these plans incorporate amendments to respond to issues raised with the original Concept Plan application.

It is also noted that the above three sites have a synergy so that parking and particularly traffic generation is reduced by virtue of linked trips (where patrons will divert from their existing trips) and multi-purpose trips (where one vehicle trip will involve visits to several uses). In addition, many people using the on-site facilities will be drawn from the on-site population, so that there will be a high proportion of walking trips, thereby containing external travel demand.



## 5. transport, traffic and accessibility

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### 5.1 introduction

The traffic impact assessment undertaken in this report, as discussed in this section below, is premised upon the maintenance of very high levels of public transport utilisation as presently occurs, particularly during the day on weekdays. This is presently achieved through reliance by staff, students and visitors on the excellent bus and rail services that are available in very close proximity to the site, as discussed in Section 3 of this report.

Nevertheless, to the extent that private transport is currently used, these parking demands generally occur on-street, including within local residential areas. These demands are atypical in that they relate to peak activity levels on weekends and during the evenings, with many student placements in various suburbs around Sydney, which requires travel at times when public transport services are not as attractive as during the day on weekdays. In this respect, the College has unique travel characteristics. It is therefore emphasised that the principle objective of the Concept Plan is to remove these parking impacts to within the site, which is expected to result in a concentration of traffic activity associated with the site; but no significant increase in traffic activity in the region generally. That is, the application responds to existing demands to a significant extent, with only limited capacity to accommodate future growth.

The main traffic impacts associated with the development will therefore relate mainly to the concentration of traffic activity that is currently spread throughout the locality; to within the site. To the limited extent that the on-site parking will accommodate additional growth from the proposed expansion, the application of DCP No. 11 parking controls still achieves the suppression of travel demand generally. This is because DCP No. 11 parking rates are restrictive and less than the RTA's "unconstrained" parking rates embodied in the RTA's Guideline. The Concept Plan also proposes various initiatives as discussed below, including the provision of pedestrian and bicycle linkages (including end-user facilities), adoption of a constrained parking supply, car sharing arrangements and the formulation of a Transport Access Guide.



## 5.2 parking requirements

### 5.2.1 parking rates and provision

DCP 11 sets guideline parking rates for a range of development types. The 'nominal' parking rate applicable to the Project Application for tertiary education establishments is 1 space per 2 staff plus an additional 1 space per 20 full time students and these rates have been applied in the first instance based on reasonable assumptions as discussed. This may be regarded as the maximum level of provision and as discussed below, a lower level of provision is proposed. Consideration has been given separately to the expected requirements of the (predominantly) administrative uses on Site A including the library; and the residential and retail uses on Sites B and C.

#### **Site A Parking**

The uses on Site A include:

- ➊ 13,065m<sup>2</sup> of teaching/administration/library area which for the purpose of assessment (having regard for the dual nature of some areas) has been assumed to comprise 50% of teaching/administration area and 50% of library area. This is necessary as the teaching/administration areas and the library need to be assessed on the basis of different assumptions as outlined further below.
- ➋ 650m<sup>2</sup> of ancilliary retail area; and
- ➌ 2,539m<sup>2</sup> of residential area, excluding foyers and comprising 9 existing terraces and 13 x five bedroom dwelling units.

With regard for the teaching/administration areas, a theoretical approach has been taken in the first instance based on the application of the generic DCP rates for students and staff associated with the expected use of these areas. For students, an average density of 25 student/100m<sup>2</sup> has been assumed (resulting in , which at the DCP rate of 1 space/20 students equates to a rate of 1 space/80m<sup>2</sup>. For staff, a staff density of 2 staff/100m<sup>2</sup> (teaching and admin combined) has also been assumed (i.e. 1 staff per 12 students) which at the DCP rate of 1 space/2 staff equates to 1



space/100m<sup>2</sup>. Hence, for students and staff considered together, this equates to an average rate of 1 space/90m<sup>2</sup> which has been adopted. With an estimated 6,532m<sup>2</sup> of teaching/ancillary area this results in a need for 73 parking spaces.

The library is essentially ancillary to the main teaching use and will involve only moderate staff levels with predominantly student walking trips. It is more in the nature of a 'storage' type of use and it is therefore inappropriate to use the rate derived above. Demands will relate principally to the very low staff density that is expected, with occasional use by external students who are not on the premises for other reasons who would otherwise walk. It is considered that provision of 36 spaces (equivalent to 1 space/180m<sup>2</sup>) would be sufficient for both staff and students. This is the same rate as adopted in the original Concept Plan although the original Project Application assumed a far greater library area (10,658m<sup>2</sup> compared with 6,532m<sup>2</sup> under the Preferred Concept). Hence, the net change in library parking numbers is not relevant. This rate is more than the typical parking rate for storage areas (under many DCP's) which has a typically range in the order of 1 space/200m<sup>2</sup> to 1 space/400m<sup>2</sup>.

The retail use (650m<sup>2</sup>) attracts a requirement of 1 space/50m<sup>2</sup> (small shops) and this results in a need for 13 spaces. It is considered that as the vast majority of retail customers will walk to the site, either as students or residents, provision of 7 spaces would be sufficient, mainly for use by tenants.

The new residential component comprises 13 five bedroom units which nominally require 16 spaces, at 1.2 spaces/unit, plus 3 visitor spaces, resulting in a total of 19 residential spaces. It is considered however that this is inadequate for large units based on experience with current student needs (including use by families), and provision of a minimum of 2.0 spaces per 2 bedroom unit is more appropriate. This increases the residential parking from 19 spaces to 29 spaces.

In summary, based on the above methodology, Site A nominally requires 144 spaces, as follows:

- 72 spaces for staff and students;
- 36 library spaces;
- 7 retail spaces; and
- 29 residential spaces



In response, 140 spaces are proposed which is considered appropriate. These spaces are accessed based on the principles established in the Concept Plan concept drawings, with all access via Carillon Avenue. It is noted however that the Stage 1 Project Application proposes the construction of only 36 of these spaces in Stage 1, as discussed further in the Project Application section of this report, in support of the library building.

### **Site B and Site C Parking**

Site B includes residential uses with a total floor area of 9,073m<sup>2</sup>, comprising 70 residential units for students and faculty families, with an *indicative* mix and parking requirement under DCP No. 11 is for 98 spaces as follows:

- 34 three bedroom units at 1.2/unit 40.8 spaces
- 20 four bedroom units at 1.2/unit 24.0 spaces
- 16 five bedroom units at 1.2/unit 19.2 spaces
- 70 units visitors at 1/5 units 14.0 spaces.

As discussed above in relation to the Site A requirements, this does not take full account of the likely demands associated with the larger dwellings (3, 4 and 5 bedroom), based on experience with existing student needs. These size units are not specifically considered under DCP No. 11 and additional parking would also be permitted under the RTA's Guidelines. Accordingly, it is recommended that an average provision of 2.0 spaces per unit be provided for the larger four and five bedroom units, which results in a need for slightly increased parking as follows:

- 34 three bedroom units at 1.2/unit 40.8 spaces
- 20 four bedroom units at 2.0/unit 40.0 spaces
- 16 five bedroom units at 2.0/unit 32.0 spaces
- 70 units visitors at 1/5 units 14.0 spaces.

It can be seen that there is a need for a total of 127 spaces for the new residential dwellings and these will be provided.



Site C comprises 11 existing terraces and these presently do not have parking and this situation is not intended to change.

### ***Combined Parking Under Concept Plan for Sites A, B and C***

In summary, the overall Concept Plan proposes 270 spaces, to meet an expected demand for 144 spaces on Site A and 127 spaces on Sites B and C. This is substantially less than the 340 spaces proposed under the original Concept Plan application.

It is proposed that 100 of these be provided on Site A, with the remaining 170 spaces provided on Sites B and C. It is therefore expected that Sites B and C will ultimately accommodate the 38 residential spaces that are required to serve Site A, so that all residential parking can be consolidated.

It will also be noted that subsequent Project Applications will be able to attune parking more accurately to future needs as they become apparent, within the constraints imposed by the overall 270 space parking limit.

It is emphasised that these demands are not all additional demands as these uses already occur on-street associated with existing uses on the site, with limited on-site parking presently provided. The development will therefore result in the relocation of these existing on-street parking demands to off-street locations within the site, which will improve the amenity of residential precincts and also improve access to the locality for other businesses and institutions.

#### **5.2.2 disabled parking**

This is a matter for assessment during later Project Application/s and compliance with relevant Australian Standards is proposed. As a guide based on AS 2890.1 (in particular Table C1 of AS 2890.1-1993 to which AS2890.1-2004 defers) it is reasonable to assume that 2-3% of all parking should be provided as disabled parking (i.e. about 10 spaces across all three developments sites A, B and C) and this will need to be assessed in the context of future applications.



### 5.2.3 servicing

The road system essentially retains all existing on-street loading. The controlled use of Little Queen Street, between King Street and Campbell Street, is no longer proposed.

It is recommended that as the existing on-street demands associated with existing uses on Sites A, B and C are to be substantially removed from on-street locations, with a net improvement in parking conditions, there is an opportunity to establish a 15 metre loading area on-street within Carillon Avenue adjacent to the main lobby serving the library for use during business hours. This is a matter that requires consideration by Council's traffic committee, noting that on-street demands will reduce as a consequence of the proposed development so that even with this loading space, there will be a net improvement in parking conditions.

A loading dock is provided within the plaza area (Basement 1 Level), which is suitable for use by a standard service vehicle as required under AS 2890.2 (2002) which is an 8.8m MRV. This enables this truck to enter via Carillon Avenue, reverse into the dock, to then exit onto Little Queen Street or Campbell Street. This dock is central to all uses within Sites A, B and C. An additional 4 loading spaces are provided within the car park opposite the main entry for use by station wagons and vans.

Servicing of the residential component of the development will be accommodated on-street by Councils garbage services, which will be assessed for all relevant Project Applications.

## 5.3 pedestrians and bicycles

The existing pedestrian and bicycle network linkages, as well as pedestrian safety amenity in general, are to be improved through the following initiatives:

- ➡ Removal of all existing at-grade parking to basements, accessed via Carillon Avenue, so that pedestrian only movement is provided at Ground Level within the site;



- Introduction of a plaza within Site A to provide a predominant pedestrian function, with only occasional use by service vehicles. It is recommended that this plaza be signposted as a shared zone to reinforce its predominant pedestrian role;
- The DCP also requires that 1 bicycle space per 20 staff/students also be provided. These will be provided within the basement car parks and on campus as part of subsequent Project Applications. In addition to the secure parking areas, showers and change rooms will be provided to further encourage students to use bicycles and this will also be assessed in future applications. If it is assumed that a maximum of 600 students are on-site at any one time, this would equate to a need for 30 bicycle spaces; and
- Connectivity to all footpath systems in the locality on all public roads, with the ability to access bus services on King Street and Missenden Road, as well as rail services.

In summary, the development of the public road network within the site provides an internal system of footpaths that will allow pedestrians to move freely within and through the site. This system links with the existing pedestrian network external to the site. Safe crossing opportunities are available on all desire-lines.

It is expected that cyclists will continue to use the road carriageways that are provided as a shared on road facility. This is considered appropriate and in addition, cyclists will have access to both basement and at-grade racks.

## 5.4 pedestrian safety

The internal design and particularly vehicle access locations has taken due account of pedestrian safety. The internal design removes all vehicular activity from within the site (other than occasional service vehicles using the plaza) with resultant safety and amenity benefits. Pedestrian movements across vehicular crossings on all road frontages are also improved. All driveways are designed as standard laybacks so that pedestrians have priority and are in accordance with AS 2890.1 and AS 2890.2, which includes the provision of appropriate sight lines.



## 5.5 travel demand measures

### 5.5.1 taxi services

Taxi services will be able to access the site directly via the existing road system. It is no longer proposed that a short taxi rank be provided in Carillon Avenue adjacent to the site. However, taxi services remain an important public transport component of the Travel Access Guide.

### 5.5.2 car share and car pool arrangements

It is considered that car share arrangements for staff could form an integral part of future Project Applications. This would be prepared having regard for relevant guidelines. In general, a parking system such as “GoGet” could be considered which has potential application to all non-resident land uses and this will be effective in reducing staff parking demands in particular. It is expected that adoption of a car share and ride share policy will also encourage reduces car dependency for non-resident trips. The implementation of a car share policy is a matter that can be conditioned having regard for relevant guidelines in association with individual applications.

It is recommended that consideration could be given to provision of an on-street car share space in Carillon Avenue. This would ensure a high level of visibility to the principle academic uses as well as the public generally and is therefore preferable to basement parking.

### 5.5.3 transport access guide

The NSW Government State Plan (November 2006) includes the following transport targets:

- Increase the mode share of public transport trips to the Sydney CBD to 75%;
- Increase journeys to work within the Sydney metropolitan region by public transport to 25% by 2016;
- Consistently meet public transport reliability targets for all forms of public transport;



- Road fatalities continue to fall relative to distance travelled;
  
- Increase the number of people who live within 30 minutes of a city or major centre by public transport in metropolitan Sydney;
  
- Maintain current travel speeds along Sydney's major road corridors despite increase in travel volumes;

Generally the primary objective of Government behind establishing a Transport Access Guide for a major development is to reduce the reliance on private vehicle usage associated with the proposed development. Increasing the number of journey to work trips by public transport is considered the most relevant State target, identified above, with regard to the subject development. A reduced target of say 10-15% is arguably more realistic and appropriate when considering that the overall metropolitan target will be significantly influenced by mode shares associated with major centres including the Sydney CBD.

In the subject case and having regard for the proposed educational uses, a target of far greater than 10% is considered achievable. Specifically, the provision of a total of 270 parking spaces on the site as now proposed (reduced from 340 spaces under the original Concept Plan Application) is expected to be responsive to existing demands associated with 318 student body (and 76 staff), as well as some of the expansion to 600 students (and 110 staff) that will occur within a decade. Beyond that the college is expected to increase to 1,200 students (and 190 staff) at ultimate capacity. These long term demands for students as well as staff clearly cannot be accommodated on-site with only 270 spaces, so that a heavy and increasing reliance on public transport and other non-car modes is expected to occur over time. The task of managing this demand will involve promoting the use of other travel modes including public transport, cycling and walking as discussed above and in addition, the preparation of a Transport Access Guide is recommended for inclusion as a condition of consent, for application to staff and students.



## 5.6 traffic impacts

### 5.6.1 trip generation

It is usual practice to adopt trip rates published by the Roads and Traffic Authority for individual land use components, as set out in the document entitled “Guide to Traffic Generating Developments”. While this is appropriate for some land uses, it is not appropriate for the proposed use which has particular and unique characteristics.

The existing staff and student body that uses the Moore Theological College (318 students) presently reside throughout the metropolitan area and commute to the College by various modes of transport, with some using private cars. These trips are spread over weekdays and weekend-days. The provision of on-site residential accommodation will therefore eliminate these student trips to a significant extent in the short term, with travel within the broader region actually being reduced. This ‘internalisation’ of trips has obvious benefits relating to reduced travel demand.

In the medium term, student numbers are expected to increase from 318 to 600 (within a decade). The proposed development will accommodate some of this growing demand, including additional staff demands.

The main traffic impact will therefore result from the consolidation of all parking within the site which will not increase traffic in the wider region, but will have the effect of focussing traffic impacts locally onto Carillon Avenue, where the access driveways are proposed.

The 100 spaces within the Site A car park relate mainly to staff and visitors. It may be assumed that about 35% of all spaces will be used by visitors, with occasional use of spaces for ‘external’ students (i.e. those not living on campus) and this accounts for some 35 spaces. Traffic activity associated with these 35 spaces will be spread throughout the day, with a maximum of 10 veh/hr during the AM peak. The balance of 65 spaces would be available for use mainly by staff. At a normal commercial premises, these spaces would generate a maximum of 0.8 trips/space/hr based on the RTA’s Guideline (2.0 veh/hr/100m<sup>2</sup>) and parking rates (2.5 spaces/100m<sup>2</sup>). With the part-time nature and variable roster times of the teaching staff in particular, a reduced rate of about 0.4 trips/space/hr is considered reasonable. The 65 spaces will therefore generate some 26 veh/hr during the AM peak.



With only 7 retail spaces proposed for use by tenants, these would generate a maximum of 4 veh/hr during peak periods.

In summary, the overall Site A car park will generate 40 veh/hr during the critical AM peak period (35 in, 5 out).

It is expected that the 70 new dwelling units associated with the total sites A, B and C will generate trips at the same rate as the RTA's 'normal' generation rate. The discount sought for the fact that most students will reside on the site (and will not be required to leave the site) is offset by the fact that there is a significant proportion of families who may generate external trips to school and workplace trips. Hence, adoption of a rate of 0.60 trips per dwelling unit/hr is considered reasonable which results in 42 veh/hr during the AM peak period (10 in, 34 out in the AM peak).. This is expected to reduce slightly in the PM peak, due to the wide spread of finishing times of students on any given day.

### 5.6.2 traffic distributions

As discussed above, the overall development under the Concept Plan is expected to generate a slightly lower level of traffic activity during peak periods, as follows:

Site A Car Park – AM Peak	35 in, 5 out	40 veh/hr
Site B Car Park – AM Peak	10 in, 34 out	44 veh/hr

These trips (84 veh/hr) compare with 90 veh/hr as assessed in the original Concept Application and this is a direct result of the reduced parking (from 340 spaces to 270 spaces), although this is compensated to some extent by the higher assumed trip rates for the larger units. Site C generates no additional traffic as these dwellings are already occupied. Hence the findings of the original traffic assessment remain valid during the weekday peak period and there is no change in levels of service at any intersection and in addition, delays are only marginally affected. Accordingly, no external road improvements are required.



### **5.6.3 environmental amenity impacts**

The assessment of environmental impacts within residential areas is an important consideration. In this regard, traffic volumes on the surrounding residential streets will reduce due to the removal of most of the existing on-street parking demands that occurs associated with the existing uses on the site. Hence, with these demands removed and accommodated on-site, the environmental amenity of the surrounding local road system can be expected to improve as a consequence of the development. This will relate to reduced parking impacts, as well as traffic impacts associated with access to this parking.

### **5.6.4 demolition traffic impacts**

It is anticipated that a detailed demolition and construction traffic management plan will be prepared as part of individual Project Applications, taking due account of proposed development stages.

### **5.6.5 site access arrangements**

The development will make reliance on the developed road system as shown on the submitted Concept Plan documentation (refer to appendix b). All accesses comply with relevant standards and will operate safely and efficiently. The following accesses are proposed:

- Car access to Site A via a combined entry-exit driveway onto Carillon Avenue. This is designed for uninterrupted two-way flow and a 6m wide driveway is sufficient in view of the moderate traffic volumes, with a peak volume of only 40 veh/hr at this access during the critical AM peak. This driveway is located 90 metres west of King Street and it will be noted from the Sidra outputs that queues extend beyond this driveway. Accordingly, it is recommended that movements be limited to left-in and left-out only;
- Car access to Site B via a combined entry-exit driveway onto Carillon Avenue. This is designed for uninterrupted two-way flow and a 6m wide driveway is sufficient in view of the moderate traffic volumes, with a peak volume of only 44 veh/hr at this access during the critical AM peak. This driveway is located about 170 metres west of King Street and while queues extend beyond this



driveway based on the Sidra outputs, the distance is sufficient to allow flexibility with the access and restricting movements to left-in and left-out movements is not considered necessary;

- Truck access to Site A via the proposed plaza, using a one-way flow through arrangement, which can be reinforced with a management plan if necessary;
- It is noted that all other driveways, including the existing car park access onto King Street south of Carillon Avenue, are to be removed and the kerblines reinstated.

Sight distances to/from the proposed driveways exceed the requirements of AS2890.1 and AS 2890.2 and all driveways will operate safely.

#### **5.6.6 internal design aspects**

The detailed design of individual Project Applications will be subject to separate assessment and compliance with AS 2890.1 and AS 2890.2 as appropriate.



## 6. conclusions – preferred concept plan

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The following matters are noteworthy:

- The original Concept Plan followed the principles discussed in the Preliminary Environmental Assessment report but with a substantially reduced level of development intensity (from 85,000m<sup>2</sup> to 30,000m<sup>2</sup>). This has been further reduced by 3,623m<sup>2</sup> in the Preferred Concept Plan;
- The proposed development is intended to provide for limited expansion, with the primary focus being the provision of residential dwelling units and improved facilities for existing and future students;
- Traffic impacts have been assessed on the basis of the land use scenario outlined in this report and can be readily accommodated, with no significant change in travel in the region but with a stronger focus of traffic activity on the Carillon Avenue frontage where driveway accesses are proposed;
- Travel demand in the region will be reduced in the short to medium term through the 'internalisation' of trips that presently involve students travelling to the college from remote accommodation. These students will be able to walk to the College;
- In the longer term (10 years and beyond) the limited on site parking (reduced from 340 spaces to 270 spaces) will require a significantly increased reliance on public transport and other alternate (non-car) travel modes. This will require travel demand measures to be implemented and this can be conditioned in relation to individual project Applications, including provision of end-user facilities, improved pedestrian linkages, improved taxi facilities, the introduction of car share arrangements and the preparation of a Transport Access Guide for all users;
- The containment of adequate parking on-site will remove the present reliance on on-street parking in the locality by both staff and students, so that the amenity of these residential areas



will be improved. This includes 100 spaces on Site A and 170 spaces on Site B, with much of this demand already occurring but involving on-street and other public parking;

- The proposed access driveways comply fully with the requirements of AS2890.1 and will operate satisfactorily with minimal conflicts;
  
- The access and internal design arrangements will be able to comply with the requirements of AS 2890.1 and AS 2890.2, subject to further assessment in subsequent Project Applications.

It is therefore concluded that based on this Transport and Accessibility report and having regard for the matters raised by Council, the RTA and the DoP, the Preferred Concept Plan is supportable on traffic and transport planning grounds. The Plan establishes a comprehensive framework to facilitate subsequent staged Project Application/s.

The assessment of the Stage 1 (Library) Project Application is considered in the following section.



## 7. project application

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### 7.1 introduction

A separate Project Application has been prepared and also forms part of this report. It is concerned with the construction of a 6 storey Research and Resource Centre and other uses on Site A as outlined in the Project Application report. The proposal is consistent with the Concept Plan application principles as discussed in the previous sections of this report. The proposed uses are as follows:

- site preparation works including:
  - demolition of the existing structures on the site;
  - removal of 11 trees;
  - excavation;
- construction of a 6 storey Resource and Research Centre including library, teaching and administration spaces, and 2 basement levels including archive / storage spaces, and plant;
- associated landscaping and public domain works; and
- construction of a temporary car park containing 36 spaces on part of Site B.

Plans relating to the Project Application are provided in **appendix c**.

### 7.2 parking

The overall area breakdown for the Project Application is as follows:



- 13,065m<sup>2</sup> of teaching/administration/library area, of which (for assessment purposes) 50% has been assumed to be teaching/administration area and 50% library area;
- 650m<sup>2</sup> of ancilliary retail; and
- 2,539m<sup>2</sup> of residential area, excluding foyers and comprising 13 x five bedroom dwelling units.

Based on the methodology discussed in the Concept Plan Application, Site A nominally requires 144 spaces, as follows:

- 72 spaces for staff and students;
- 36 library spaces;
- 7 retail spaces; and
- 29 residential spaces

In response to this 140 spaces are to be provided under future Project Application/s, including 100 spaces within Site A and 40 spaces within Sites B and C. Hence, these demands will be fully met in the medium to long term.

Nevertheless, the staged parking arrangement proposes no parking for Stage 1, with all parking provided in subsequent stages. This is not considered fatal to the Stage 1 Development as Council's DCP requirements are generally regarded as maximum levels of provision and the inability to provide parking will result in a higher level of public transport use than would otherwise occur for a period of time. It does however place a burden on the site operations generally, which will require a managed solution to minimise car use, following the general principles of the Travel Access Guide.

The Stage 1 Project Application includes 'temporary' at-grade parking areas with capacity for 36 spaces as shown on the plans provided in **appendix c**. The car park is designed in full compliance with AS 2890.1 and incorporates a driveway onto Carillon Avenue (serving 17 spaces); and a driveway onto Campbell Street (serving 19 spaces). It is proposed that all 36 spaces will be allocated so that there is no requirement for a turning facility.



The redevelopment of Project Application within Site A will result in the loss of 10 spaces currently located in the at-grade car park adjoining King Street and 10 spaces to the rear of 1 King Street. As there is currently an under provision of car parking on the site these spaces must be relocated elsewhere on the Campus during the interim period between construction of the Project Application and the Concept Plan basement car parking.

The logical place for the car spaces to be relocated is on the section of Site B which at this point in time is used for car parking for approximately 16 cars. The temporary car park will consolidate the two at-grade car parks, into one formalised car park. The car park will directly accommodate the loss of car parking on Site A and will not result in any additional car parking spaces on the Campus

### 7.3 traffic generation

The 36 spaces within Site B which are part of the Stage 1 Project Application are accessed via Carillon Avenue (17 spaces) and Campbell Street (19 spaces). These generate minimal traffic and in any event, much of this traffic is already on the road network.

It is noted that the 19 Campbell Street spaces will generate less than 10 veh/hr and these will be split into both arrivals and departures, so that the impact on any one section of Campbell Street itself will be negligible. In addition, these trips will be removed in subsequent stages so that any impacts will be temporary in nature.

### 7.4 access design

No vehicular access is provided to Site A and all driveways will be closed under the Concept Application. Both access driveways serving the 36 spaces proposed under this Project Application (on Site B) are also temporary, with one onto Carillon Avenue (serving 17 spaces) and one onto Campbell Street (serving 19 spaces). These will both be closed under subsequent Project Applications made under the Concept Plan and replaced with a single driveway onto Carillon Avenue, further to the west.



## 7.5 internal design

The internal design is in accordance with the requirements of AS 2890.1 and will operate safely and efficiently. The temporary car park complies fully with AS 2890.1 so that no swept path analysis is required.

## 7.6 bicycles

A bike store is provided on Basement Level 1 for use by staff and students, with capacity for up to 50 bikes. It is recommended that some bike racks also be provided on Level 1 (Ground Floor) for use by visitors and this can be conditioned to ensure compliance with the requirements of Council. Change room facilities are also provided.



## appendix a

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photographic record



View looking south-west along King Street at Little Queen Street.



View north south-west along King Street on approach to Missenden Road.





View looking north along the site frontage to King Street approaching Carillon Avenue.



View looking east along Carillon Avenue towards King Street.





View looking west along Carillon Avenue towards Missenden Road.



View looking east along Carillon Avenue on approach to Missenden Road.

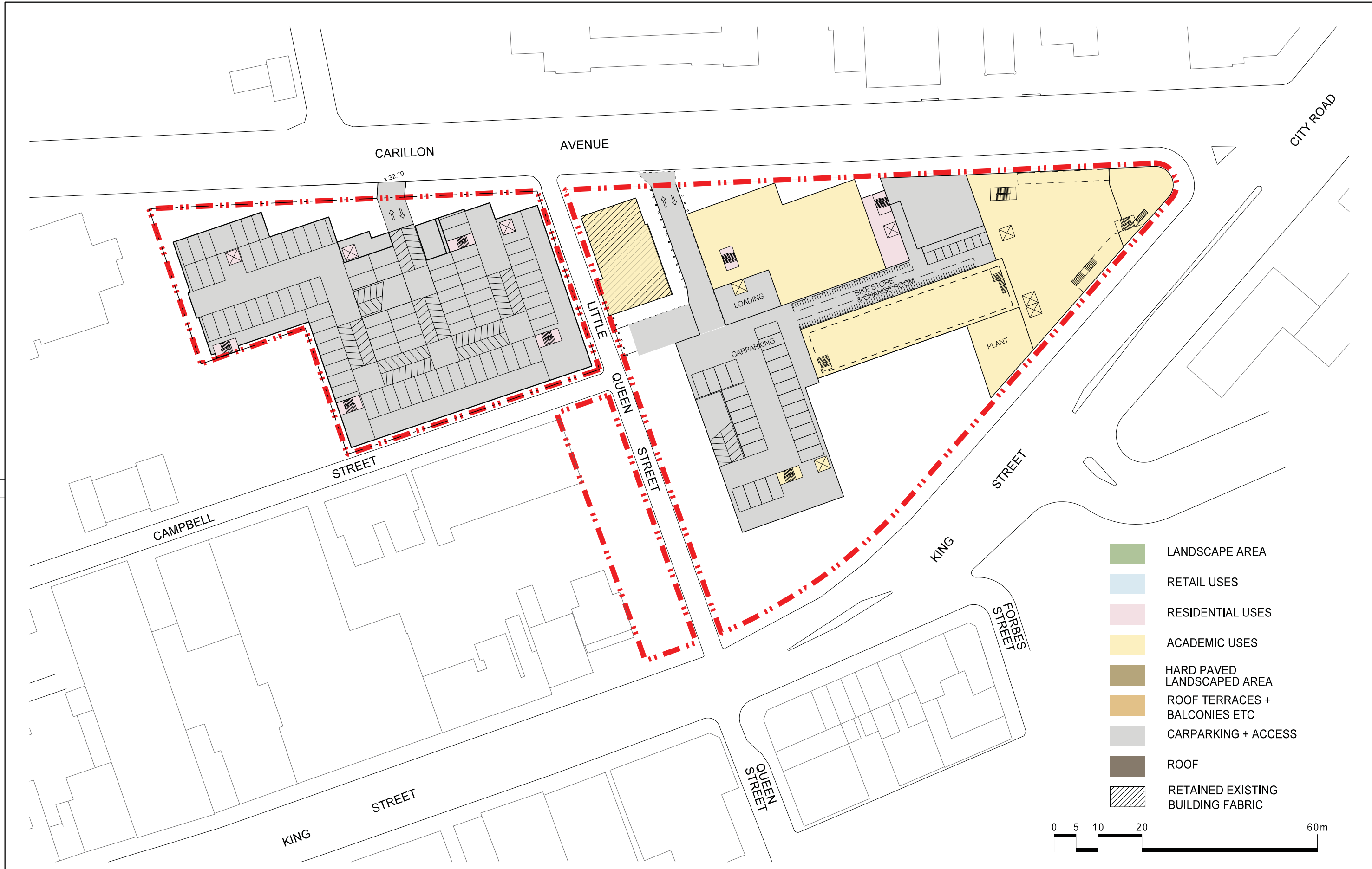




## appendix b

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concept plan (extracts)



- LANDSCAPE AREA
- RETAIL USES
- RESIDENTIAL USES
- ACADEMIC USES
- HARD PAVED LANDSCAPED AREA
- ROOF TERRACES + BALCONIES ETC
- CARPARKING + ACCESS
- ROOF
- RETAINED EXISTING BUILDING FABRIC



Revisions		Ver	App'd
No	Date	Description	
01	01/07/10	CONCEPT PLAN	CC ML
02	21/07/10	CONCEPT PLAN	CC ML

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Client

MOORE THEOLOGICAL COLLEGE

Drawing Status

**NOT FOR CONSTRUCTION**

Project

MOORE THEOLOGICAL COLLEGE  
CONCEPT PLAN

NEWTOWN

Drawing Title

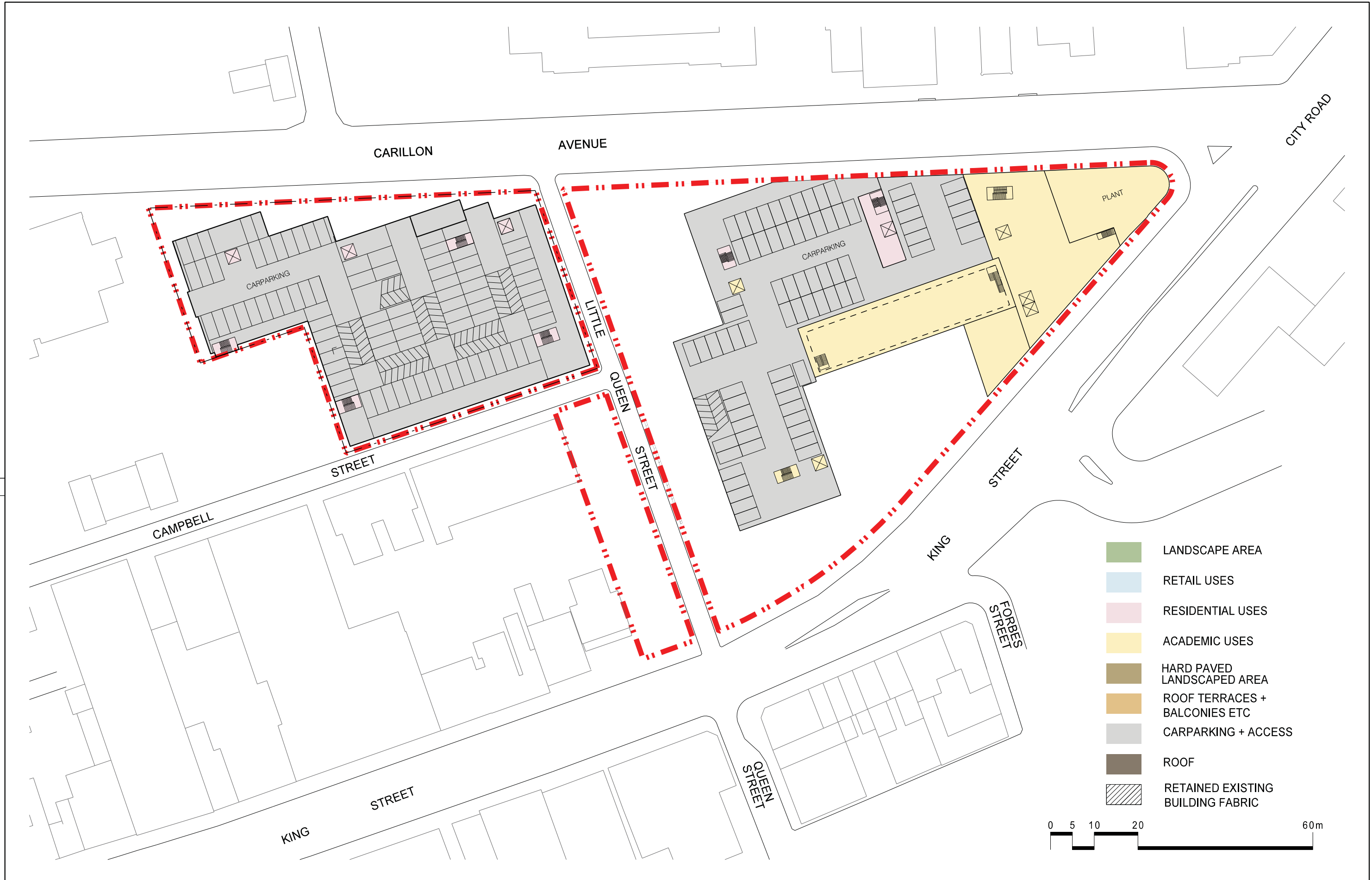
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Proj No. | Scale at A3 | Drawing No | Issue

07075 | 1:800 | CP2001 | 02

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- LANDSCAPE AREA
- RETAIL USES
- RESIDENTIAL USES
- ACADEMIC USES
- HARD PAVED LANDSCAPED AREA
- ROOF TERRACES + BALCONIES ETC
- CARPARKING + ACCESS
- ROOF
- RETAINED EXISTING BUILDING FABRIC



NORTH

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Client

**MOORE THEOLOGICAL COLLEGE**

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Drawing Status

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Project

**MOORE THEOLOGICAL COLLEGE  
CONCEPT PLAN**

NEWTOWN

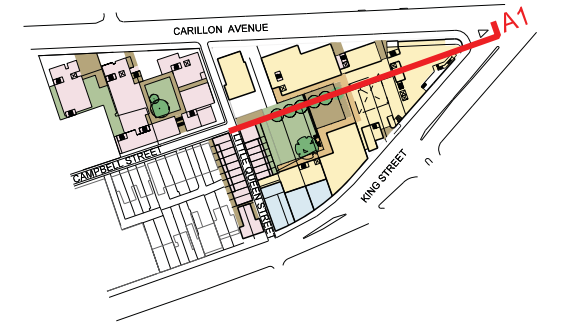
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**BASEMENT 2 PLAN**

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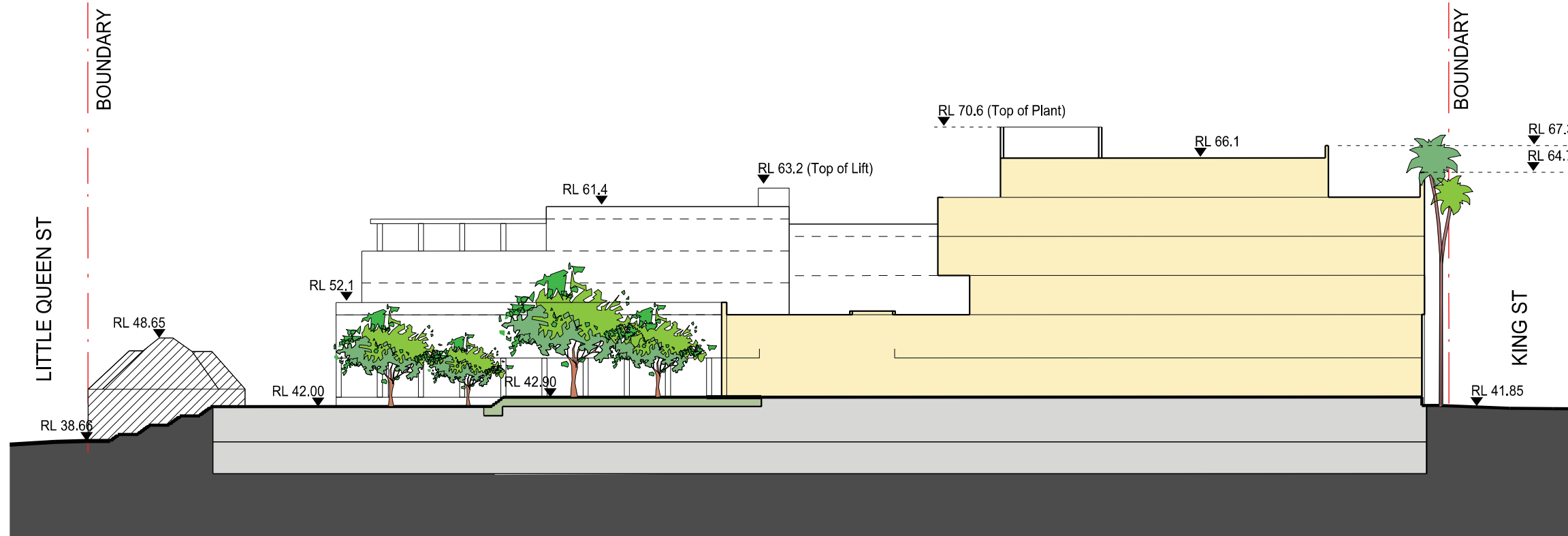
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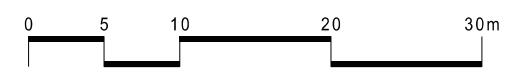
LEGEND

- LANDSCAPE AREA
- RETAIL USES
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- ACADEMIC USES
- HARD PAVED LANDSCAPED AREA
- ROOF TERRACES + BALCONIES ETC
- CARPARKING + ACCESS
- ROOF
- RETAINED EXISTING BUILDING FABRIC



DEACONESS HOUSE      CAMPUS GREEN      COLONNADE      LIBRARY

**01** SECTION A1  
SITE A      1:500



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B	05/11/09	CONCEPT PLAN	CC	ML
C	30/03/10	PREFERRED PROJECT REPORT	CC	ML
D	15/07/10	PREFERRED PROJECT REPORT	CC	ML

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Drawing Status

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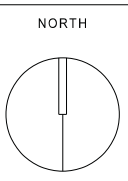
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CONCEPT PLAN

NEWTOWN

Drawing Title

SITE A  
SECTION A1

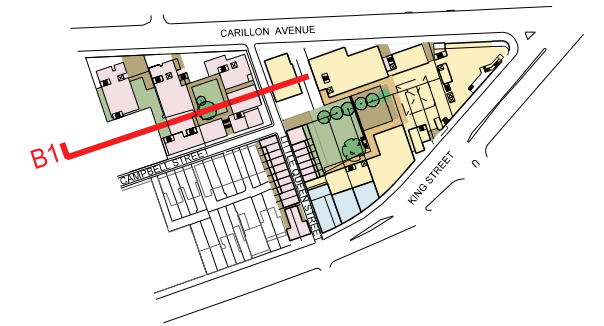


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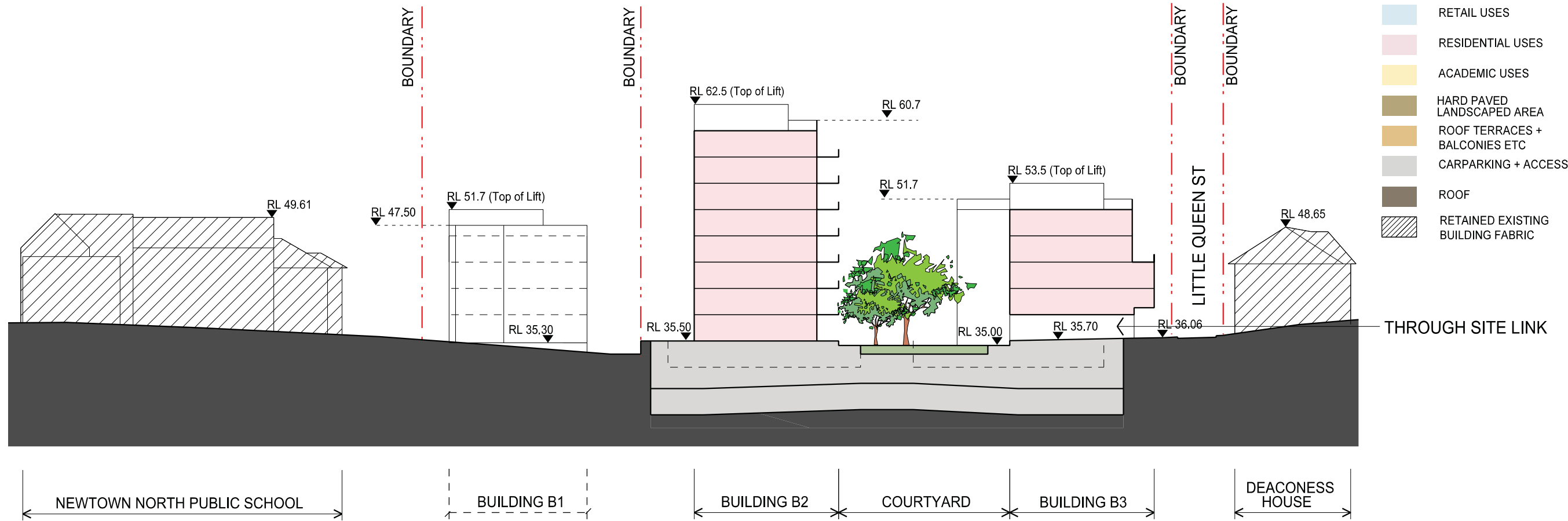
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KEY PLAN

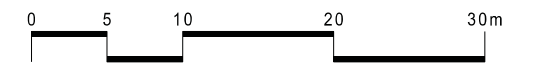


LEGEND

- LANDSCAPE AREA
- RETAIL USES
- RESIDENTIAL USES
- ACADEMIC USES
- HARD PAVED LANDSCAPED AREA
- ROOF TERRACES + BALCONIES ETC
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- ROOF
- RETAINED EXISTING BUILDING FABRIC



**01 SECTION B1**  
SITE B 1:500



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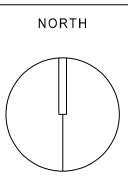
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Client  
 MOORE THEOLOGICAL COLLEGE

Drawing Status  
**NOT FOR CONSTRUCTION**

Project  
 MOORE THEOLOGICAL COLLEGE  
 CONCEPT PLAN  
 NEWTOWN

Drawing Title  
**SITE B  
 SECTION B1**



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## appendix c

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project plans – library (extracts)

# DRAWING LIST

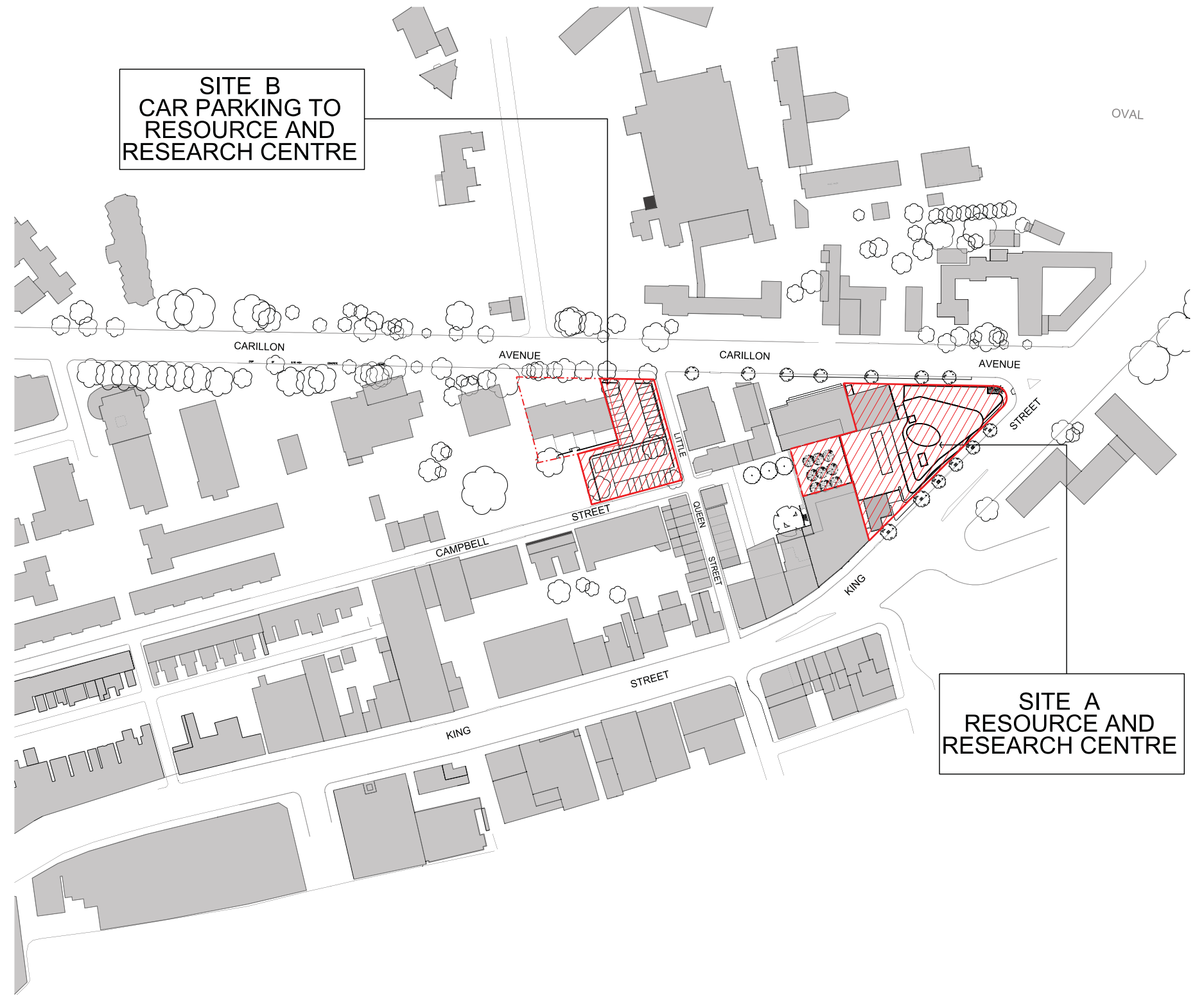
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PA 1000	SITE PLAN EXISTING	1:400
PA 1001	SITE PLAN PROPOSED	1:400
PA 1100	DEMOLITION PLAN	1:400

## SITE A: RESEARCH AND RESOURCE CENTRE

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PA 2002	B 2 FLOOR PLAN	1:200
PA 2003	B 3 FLOOR PLAN	1:200
PA 2101	LEVEL 1 PLAN	1:200
PA 2102	LEVEL 2 PLAN	1:200
PA 2103	LEVEL 3 PLAN	1:200
PA 2104	LEVEL 4 PLAN	1:200
PA 2105	LEVEL 5 PLAN	1:200
PA 2106	LEVEL 6 PLAN	1:200
PA 2107	LEVEL 7 PLAN	1:200
PA 2108	ROOF PLAN	1:200
PA 2800	AREA SUMMARY	N.T.S
PA 3100	ELEVATIONS	1:200
PA 3101	ELEVATIONS	1:200
PA 3200	SECTIONS	1:200
PA 3201	SECTIONS	1:200
PA 3202	ESD SECTION	1:200
PA 3300	PHOTOMONTAGE 1	N.T.S
PA 3301	PHOTOMONTAGE 2	N.T.S
PA 3302	PHOTOMONTAGE 3	N.T.S
PA 3800	SHADOW DIAGRAMS 1	N.T.S
PA 3801	SHADOW DIAGRAMS 2	N.T.S
PA 3802	SHADOW DIAGRAMS 3	N.T.S
PA 4200	MATERIALS BOARD	N.T.S

## SITE B: CARPARKING TO RESEARCH AND RESOURCE CENTRE

PA 2120	GROUND FLOOR PLAN	1:250
PA 3120	ELEVATIONS AND SECTION	1:250
PA 4120	PHOTOMONTAGE 1	N.T.S
PA 4121	PHOTOMONTAGE 2	N.T.S



**SITE B  
CAR PARKING TO  
RESOURCE AND  
RESEARCH CENTRE**

**SITE A  
RESOURCE AND  
RESEARCH CENTRE**

No	Date	Description	Var	App'd
A	08/10/09	PROJECT APPLICATION ISSUE	JG	ML
B	16/07/10	ISSUED FOR REVIEW	SN	ML
C	28/07/10	UPDATED	SN	ML

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Nominated Architects: Keith Cotter AM 2266, Glynn N Evans 2839, Michael Heenan 5264, Peter Ireland 6661, Reginald Smith 3312, Peter Stronach 3372.

Site Location Plan

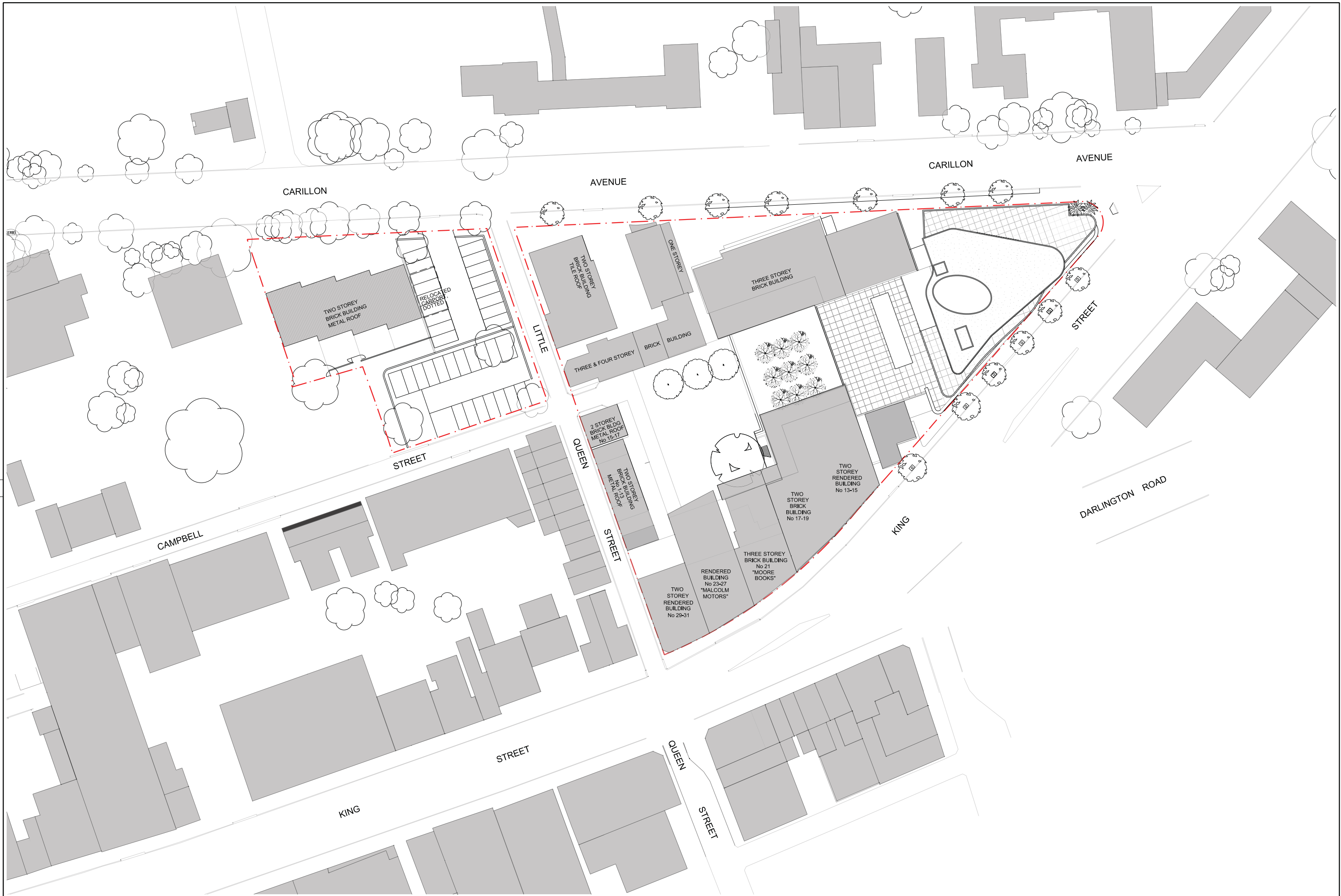
Client  
**MOORE THEOLOGICAL COLLEGE**

Architect  
**AJ+C**  
ALLEN JACK + COTTER  
79 Myrtle Street Chippendale NSW 2008 AUSTRALIA  
ph +61 2 9311 8222 fx +61 2 9311 8200 ABN 53 003 782 250

Project  
**MOORE COLLEGE RESOURCE AND RESEARCH CENTRE**  
1 KING STREET NEWTOWN  
Proj No. 07075

Drawing Title  
**COVER SHEET + SITE LOCATION**  
Drawing Status  
PROJECT APPLICATION

Scale  
NTS  
Drawing No  
**PA0000**  
Issue  
**C**  
0 10 20 50 80mm



No	Date	Description	By	App'd
A	08/10/09	PROJECT APPLICATION ISSUE	JG	ML
B	28/06/10	UPDATED	SN	ML
C	16/07/10	ISSUED FOR REVIEW	SN	ML
D	21/07/10	UPDATED	SN	ML
E	28/07/10	UPDATED	SN	ML

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Nominated Architects: Keith Cotter AM 2264, Glynn N Evans 2839, Michael Heenan 5264, Peter Ireland 6661, Reginald Smith 3312, Peter Stronach 3372.

Site Location Plan

Client  
**MOORE THEOLOGICAL COLLEGE**

Architect  
**AJ+C**  
 ALLEN JACK + COTTER  
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Project  
**MOORE COLLEGE RESOURCE AND RESEARCH CENTRE**  
 1 KING STREET NEWTOWN  
 Proj No. 07075

Drawing Title  
**SITE PLAN PROPOSED**

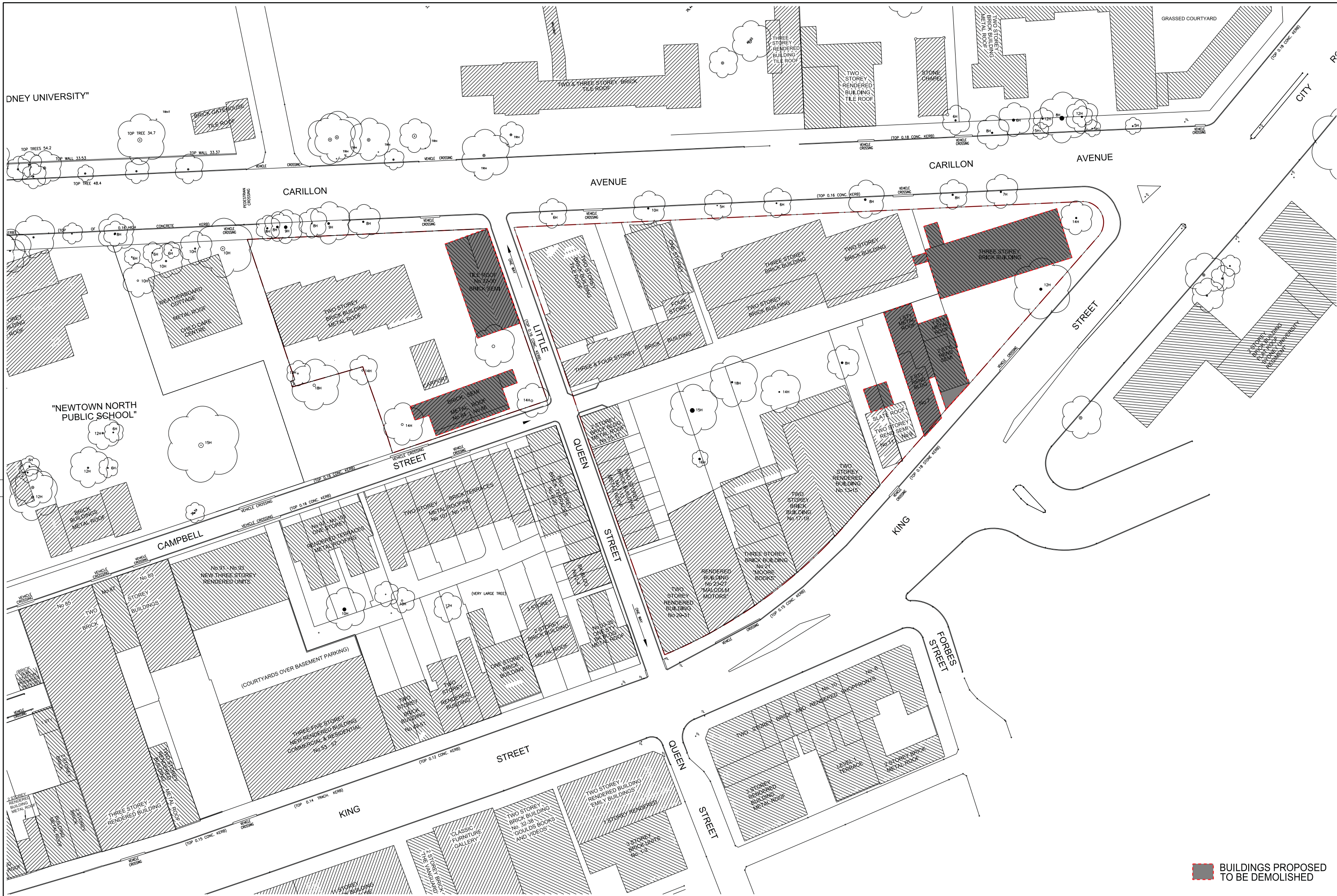
Drawing Status  
**PROJECT APPLICATION**

Scale  
**1:400**

Drawing No  
**PA1001**

Issue  
**E**

DNEY UNIVERSITY"



"NEWTOWN NORTH PUBLIC SCHOOL"

**BUILDINGS PROPOSED TO BE DEMOLISHED**

No	Date	Description	Var	App'd
A	08/10/09	PROJECT APPLICATION ISSUE		JG ML
B	16/07/10	ISSUED FOR REVIEW		SN ML
C	21/07/10	UPDATED		SN ML
D	28/07/10	UPDATED		SN ML

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Nominated Architects: Keith Cotter AM 2266, Glyn N Evans 2839, Michael Heenan 5264, Peter Ireland 6661, Reginald Smith 3312, Peter Stronach 3372.

Site Location Plan

Client: MOORE THEOLOGICAL COLLEGE

Architect: AJ+C  
ALLEN JACK + COTTER  
79 Myrtle Street Chippendale NSW 2008 AUSTRALIA  
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Project: MOORE COLLEGE RESOURCE AND RESEARCH CENTRE

1 KING STREET NEWTOWN

Proj No. 07075

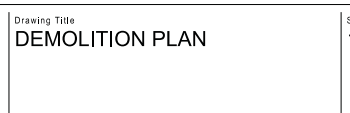
Drawing Title: DEMOLITION PLAN

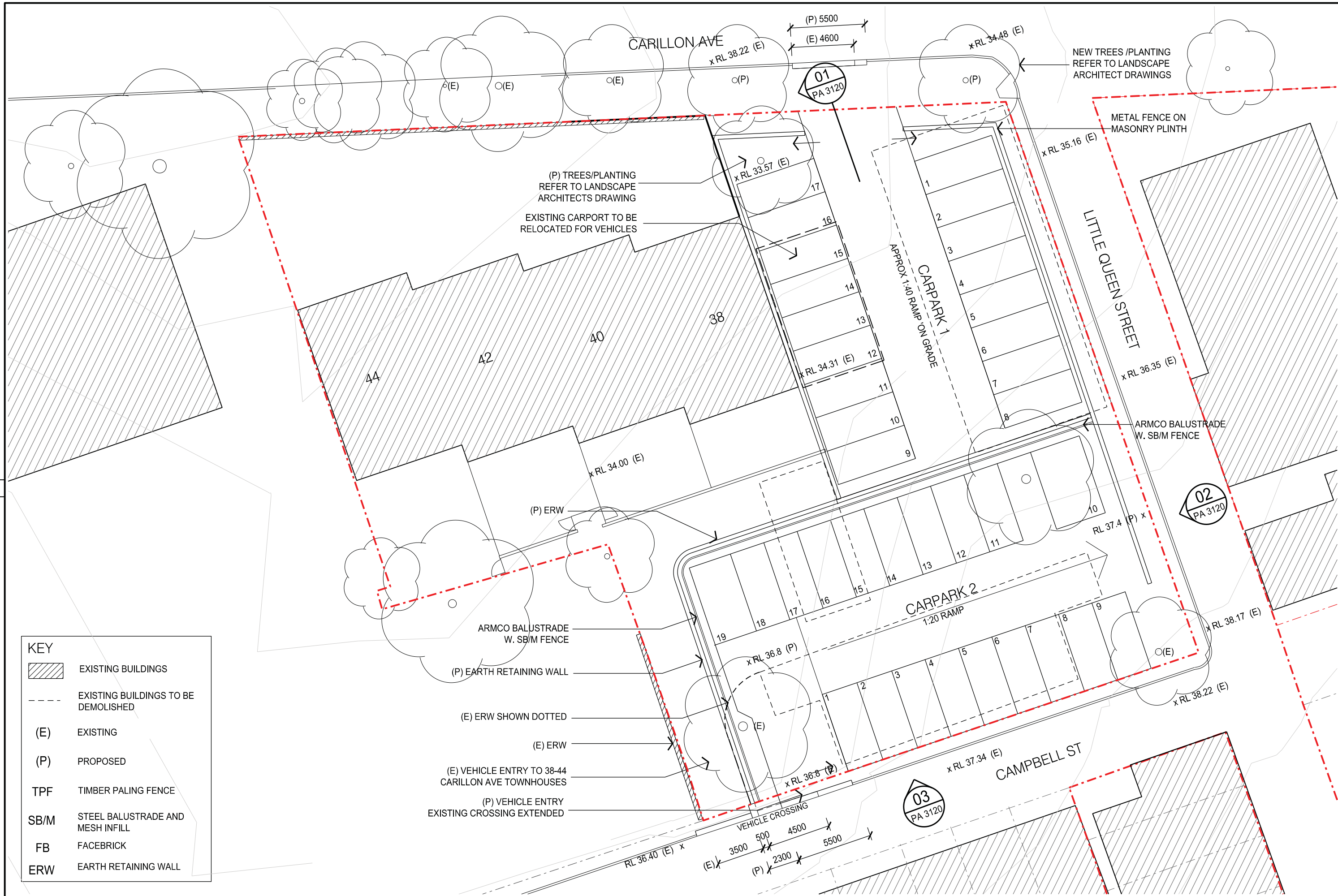
Drawing Status: PROJECT APPLICATION

Scale: 1:400

Drawing No: PA1100

Issue: D





**KEY**

	EXISTING BUILDINGS
	EXISTING BUILDINGS TO BE DEMOLISHED
(E)	EXISTING
(P)	PROPOSED
TPF	TIMBER PALING FENCE
SB/M	STEEL BALUSTRADE AND MESH INFILL
FB	FACEBRICK
ERW	EARTH RETAINING WALL

**Revisions**

No	Date	Description	Yr	App'd
A	09/10/08	PROJECT APPLICATION ISSUE	JG	ML
B	29/06/10	AMENDED	SN	ML
C	16/07/10	ISSUED FOR REVIEW	SN	ML
D	29/07/10	UPDATED	SN	ML

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Nominated Architects: Keith Cotter AM 2266, Glyn N Evans 2839, Michael Heenan 5264, Peter Ireland 6661, Reginald Smith 3312, Peter Stronach 3372.

Site Location Plan

Client: MOORE THEOLOGICAL COLLEGE

Architect: **AJ+C**  
ALLEN JACK + COTTER  
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Project: MOORE COLLEGE RESOURCE AND RESEARCH CENTRE  
1 KING STREET NEWTOWN

Drawing Title: GROUND FLOOR PLAN

Scale: 1:250 @A3

Drawing No: PA 2120

Issue: D

Drawing Status: PROJECT APPLICATION - SITE B

Proj No: 07075

Site Location Plan

Client: MOORE THEOLOGICAL COLLEGE

Architect: **AJ+C**  
ALLEN JACK + COTTER  
79 Myrtle Street Chippendale NSW 2008 AUSTRALIA  
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Project: MOORE COLLEGE RESOURCE AND RESEARCH CENTRE  
1 KING STREET NEWTOWN

Drawing Title: GROUND FLOOR PLAN

Scale: 1:250 @A3

Drawing No: PA 2120

Issue: D

Drawing Status: PROJECT APPLICATION - SITE B

Proj No: 07075

0 2 4 10m

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PLOT DATE & TIME: 29/07/2010 02:29:07 PAPER PLOTTED & CHECKED: BPI Norton





## appendix d

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sidra analysis



## Movement Summary

### King St (Princes Hwy) / Missenden Rd

#### AM - Existing

Signalised - Fixed time

Cycle Time = 130 seconds

#### Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
<b>King St (east)</b>										
5	T	501	3.0	0.837	34.7	LOS C	189	0.76	0.74	27.2
6	R	66	1.5	0.837	57.2	LOS E	189	1.00	1.00	21.0
<b>Approach</b>		<b>567</b>	<b>2.8</b>	<b>0.837</b>	<b>37.3</b>	<b>LOS C</b>	<b>189</b>	<b>0.79</b>	<b>0.77</b>	<b>26.3</b>
<b>Missenden Rd (north)</b>										
7	L	55	1.8	0.217	46.3	LOS D	28	0.85	0.73	23.6
9	R	248	2.0	0.704	60.7	LOS E	116	0.99	0.86	20.3
<b>Approach</b>		<b>303</b>	<b>2.0</b>	<b>0.704</b>	<b>58.1</b>	<b>LOS E</b>	<b>116</b>	<b>0.97</b>	<b>0.84</b>	<b>20.8</b>
<b>King St (west)</b>										
10	L	351	2.0	0.849	31.1	LOS C	305	0.87	0.92	28.6
11	T	1495	3.0	0.849	21.1	LOS B	359	0.86	0.82	33.1
<b>Approach</b>		<b>1846</b>	<b>2.8</b>	<b>0.849</b>	<b>23.0</b>	<b>LOS B</b>	<b>359</b>	<b>0.87</b>	<b>0.84</b>	<b>32.1</b>
<b>All Vehicles</b>		<b>2716</b>	<b>2.7</b>	<b>0.849</b>	<b>29.9</b>	<b>LOS C</b>	<b>359</b>	<b>0.86</b>	<b>0.82</b>	<b>29.0</b>

#### Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate
P3	211	49.1	LOS E	1	0.87	0.87
P5	211	11.6	LOS B	0	0.42	0.42
P7	211	49.1	LOS E	1	0.87	0.87
<b>All Peds</b>	<b>633</b>	<b>36.6</b>	<b>LOS C</b>	<b>1</b>	<b>0.72</b>	<b>0.72</b>

Symbols which may appear in this table:

Following Degree of Saturation

# x = 1.00 for Short Lane with resulting Excess Flow

\* x = 1.00 due to minimum capacity

Following LOS



# Movement Summary

## King St (Princes Hwy) / Missenden Rd

### AM - Existing + Development

Signalised - Fixed time

Cycle Time = 130 seconds

### Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
<b>King St (east)</b>										
5	T	503	3.0	0.842	35.2	LOS C	191	0.76	0.74	27.0
6	R	66	1.5	0.842	58.1	LOS E	191	1.00	1.01	20.8
<b>Approach</b>		<b>569</b>	<b>2.8</b>	<b>0.842</b>	<b>37.8</b>	<b>LOS C</b>	<b>191</b>	<b>0.79</b>	<b>0.77</b>	<b>26.1</b>
<b>Missenden Rd (north)</b>										
7	L	55	1.8	0.217	46.3	LOS D	28	0.85	0.73	23.6
9	R	251	2.0	0.713	61.0	LOS E	117	0.99	0.87	20.2
<b>Approach</b>		<b>306</b>	<b>2.0</b>	<b>0.713</b>	<b>58.4</b>	<b>LOS E</b>	<b>117</b>	<b>0.97</b>	<b>0.84</b>	<b>20.8</b>
<b>King St (west)</b>										
10	L	357	2.0	0.856	32.2	LOS C	314	0.88	0.94	28.2
11	T	1504	3.0	0.856	21.8	LOS B	368	0.87	0.83	32.7
<b>Approach</b>		<b>1861</b>	<b>2.8</b>	<b>0.856</b>	<b>23.8</b>	<b>LOS B</b>	<b>368</b>	<b>0.87</b>	<b>0.85</b>	<b>31.7</b>
<b>All Vehicles</b>		<b>2736</b>	<b>2.7</b>	<b>0.856</b>	<b>30.6</b>	<b>LOS C</b>	<b>368</b>	<b>0.87</b>	<b>0.83</b>	<b>28.7</b>

### Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate
P3	211	49.1	LOS E	1	0.87	0.87
P5	211	11.6	LOS B	0	0.42	0.42
P7	211	49.1	LOS E	1	0.87	0.87
<b>All Peds</b>	<b>633</b>	<b>36.6</b>	<b>LOS C</b>	<b>1</b>	<b>0.72</b>	<b>0.72</b>

Symbols which may appear in this table:

Following Degree of Saturation  
 # x = 1.00 for Short Lane with resulting Excess Flow  
 \* x = 1.00 due to minimum capacity

Following LOS



# Movement Summary

## City Rd (Princes Hwy) / Carillon Ave

### AM - Existing

Signalised - Fixed time

Cycle Time = 120 seconds

### Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
<b>King St (southwest)</b>										
1	L	58	1.7	0.057	7.8	LOS A	6	0.27	0.60	42.2
2	T	1438	3.0	0.900	47.9	LOS D	318	1.00	1.06	24.2
<b>Approach</b>		<b>1496</b>	<b>2.9</b>	<b>0.900</b>	<b>46.4</b>	<b>LOS D</b>	<b>318</b>	<b>0.97</b>	<b>1.04</b>	<b>24.6</b>
<b>City Rd (northeast)</b>										
8	T	506	3.0	0.350	10.5	LOS A	91	0.46	0.48	45.3
9	R	358	2.0	0.917	47.3	LOS D	94	0.98	0.94	25.2
<b>Approach</b>		<b>864</b>	<b>2.5</b>	<b>0.917</b>	<b>25.7</b>	<b>LOS B</b>	<b>94</b>	<b>0.68</b>	<b>0.67</b>	<b>34.0</b>
<b>Carillon Ave (west)</b>										
10	L	673	1.9	0.892	57.9	LOS E	224	0.95	1.01	21.7
12	R	54	1.9	0.891	62.8	LOS E	224	1.00	1.08	20.8
<b>Approach</b>		<b>726</b>	<b>1.9</b>	<b>0.892</b>	<b>58.3</b>	<b>LOS E</b>	<b>224</b>	<b>0.96</b>	<b>1.02</b>	<b>21.6</b>
<b>All Vehicles</b>		<b>3086</b>	<b>2.6</b>	<b>0.917</b>	<b>43.4</b>	<b>LOS D</b>	<b>318</b>	<b>0.88</b>	<b>0.93</b>	<b>25.7</b>

### Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate
P1	105	47.7	LOS E	0	0.89	0.89
P7	53	26.0	LOS C	0	0.66	0.66
<b>All Peds</b>	<b>158</b>	<b>40.4</b>	<b>LOS C</b>	<b>0</b>	<b>0.81</b>	<b>0.81</b>

Symbols which may appear in this table:

Following Degree of Saturation  
 # x = 1.00 for Short Lane with resulting Excess Flow  
 \* x = 1.00 due to minimum capacity

Following LOS  
 # - Based on density for continuous movements



# Movement Summary

## City Rd (Princes Hwy) / Carillon Ave

### AM - Existing + Development

Signalised - Fixed time

Cycle Time = 120 seconds

### Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
<b>King St (southwest)</b>										
1	L	67	1.5	0.068	8.0	LOS A	7	0.28	0.60	42.0
2	T	1438	3.0	0.919	53.0	LOS D	335	1.00	1.10	22.9
<b>Approach</b>		<b>1505</b>	<b>2.9</b>	<b>0.919</b>	<b>51.0</b>	<b>LOS D</b>	<b>335</b>	<b>0.96</b>	<b>1.08</b>	<b>23.3</b>
<b>City Rd (northeast)</b>										
8	T	506	3.0	0.350	10.5	LOS A	91	0.46	0.48	45.3
9	R	367	1.9	0.890	43.8	LOS D	91	0.98	0.91	26.3
<b>Approach</b>		<b>873</b>	<b>2.5</b>	<b>0.890</b>	<b>24.5</b>	<b>LOS B</b>	<b>91</b>	<b>0.68</b>	<b>0.66</b>	<b>34.7</b>
<b>Carillon Ave (west)</b>										
10	L	676	2.1	0.903	59.3	LOS E	231	0.96	1.03	21.4
12	R	56	1.8	0.903	65.3	LOS E	231	1.00	1.10	20.3
<b>Approach</b>		<b>732</b>	<b>2.0</b>	<b>0.904</b>	<b>59.7</b>	<b>LOS E</b>	<b>231</b>	<b>0.96</b>	<b>1.03</b>	<b>21.3</b>
<b>All Vehicles</b>		<b>3110</b>	<b>2.6</b>	<b>0.919</b>	<b>45.6</b>	<b>LOS D</b>	<b>335</b>	<b>0.88</b>	<b>0.95</b>	<b>25.0</b>

### Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate
P1	105	47.7	LOS E	0	0.89	0.89
P7	53	26.7	LOS C	0	0.67	0.67
<b>All Peds</b>	<b>158</b>	<b>40.6</b>	<b>LOS C</b>	<b>0</b>	<b>0.82</b>	<b>0.82</b>

Symbols which may appear in this table:

Following Degree of Saturation

# x = 1.00 for Short Lane with resulting Excess Flow

\* x = 1.00 due to minimum capacity

Following LOS

# - Based on density for continuous movements



# Movement Summary

## Missenden Rd / Carillon Ave

### AM - Existing

Signalised - Fixed time

Cycle Time = 120 seconds

### Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
<b>Missenden Rd (south)</b>										
1	L	116	1.7	0.585	15.7	LOS B	20	0.56	0.71	36.3
2	T	260	1.9	0.368	29.7	LOS C	90	0.78	0.66	29.1
3	R	51	2.0	0.469	67.5	LOS E	31	1.00	0.76	19.1
<b>Approach</b>		<b>426</b>	<b>1.9</b>	<b>0.585</b>	<b>30.5</b>	<b>LOS C</b>	<b>90</b>	<b>0.75</b>	<b>0.69</b>	<b>28.8</b>
<b>Carillon Ave (east)</b>										
4	L	34	2.9	0.349	59.5	LOS E	24	0.94	0.73	20.6
5	T	256	2.0	0.859	62.2	LOS E	121	1.00	1.00	20.0
6	R	106	1.9	0.645	58.0	LOS E	53	0.95	0.81	20.9
<b>Approach</b>		<b>396</b>	<b>2.0</b>	<b>0.859</b>	<b>60.8</b>	<b>LOS E</b>	<b>121</b>	<b>0.98</b>	<b>0.93</b>	<b>20.2</b>
<b>Missenden Rd (north)</b>										
7	L	204	13.9	0.211	35.9	LOS C	12	0.71	0.69	26.8
8	T	223	1.0	0.884	31.4	LOS C	222	0.56	0.60	21.2
9	R	73	1.4	0.885	62.5	LOS E	222	1.00	1.07	19.9
<b>Approach</b>		<b>499</b>	<b>1.8</b>	<b>0.884</b>	<b>36.2</b>	<b>LOS C</b>	<b>222</b>	<b>0.63</b>	<b>0.67</b>	<b>21.3</b>
<b>Carillon Ave (west)</b>										
10	L	93	2.2	0.469	37.8	LOS C	46	0.76	0.75	26.2
11	T	585	2.0	0.901	51.4	LOS D	283	0.99	1.06	22.3
12	R	57	1.8	0.899	58.6	LOS E	283	1.00	1.08	20.8
<b>Approach</b>		<b>736</b>	<b>2.0</b>	<b>0.901</b>	<b>50.2</b>	<b>LOS D</b>	<b>283</b>	<b>0.96</b>	<b>1.03</b>	<b>22.6</b>
<b>All Vehicles</b>		<b>2057</b>	<b>1.9</b>	<b>0.901</b>	<b>44.8</b>	<b>LOS D</b>	<b>283</b>	<b>0.84</b>	<b>0.85</b>	<b>22.9</b>

### Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate
P1	105	53.2	LOS E	0	0.94	0.94
P3	105	31.5	LOS D	0	0.73	0.73
P5	105	30.1	LOS D	0	0.71	0.71



# Movement Summary

## Missenden Rd / Carillon Ave

### AM - Existing + Development

Signalised - Fixed time

Cycle Time = 120 seconds

### Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
<b>Missenden Rd (south)</b>										
1	L	116	1.7	0.585	15.7	LOS B	20	0.56	0.71	36.3
2	T	260	1.9	0.368	29.7	LOS C	90	0.78	0.66	29.1
3	R	57	1.8	0.546	68.3	LOS E	34	1.00	0.77	18.9
<b>Approach</b>		<b>432</b>	<b>1.9</b>	<b>0.585</b>	<b>31.1</b>	<b>LOS C</b>	<b>90</b>	<b>0.75</b>	<b>0.69</b>	<b>28.6</b>
<b>Carillon Ave (east)</b>										
4	L	36	2.8	0.354	59.5	LOS E	24	0.94	0.73	20.5
5	T	258	1.9	0.871	63.4	LOS E	124	1.00	1.02	19.7
6	R	108	1.9	0.657	58.3	LOS E	54	0.95	0.82	20.8
<b>Approach</b>		<b>402</b>	<b>2.0</b>	<b>0.871</b>	<b>61.7</b>	<b>LOS E</b>	<b>124</b>	<b>0.98</b>	<b>0.94</b>	<b>20.1</b>
<b>Missenden Rd (north)</b>										
7	L	211	13.9	0.211	35.9	LOS C	12	0.71	0.69	26.8
8	T	223	1.0	0.894	32.0	LOS C	229	0.55	0.60	20.8
9	R	73	1.4	0.894	64.4	LOS E	229	1.00	1.09	19.6
<b>Approach</b>		<b>505</b>	<b>1.8</b>	<b>0.894</b>	<b>36.8</b>	<b>LOS C</b>	<b>229</b>	<b>0.62</b>	<b>0.68</b>	<b>20.9</b>
<b>Carillon Ave (west)</b>										
10	L	93	2.2	0.473	37.8	LOS C	47	0.76	0.75	26.2
11	T	592	2.0	0.908	52.9	LOS D	290	0.99	1.08	21.9
12	R	57	1.8	0.909	60.2	LOS E	290	1.00	1.10	20.4
<b>Approach</b>		<b>742</b>	<b>2.0</b>	<b>0.908</b>	<b>51.5</b>	<b>LOS D</b>	<b>290</b>	<b>0.96</b>	<b>1.04</b>	<b>22.3</b>
<b>All Vehicles</b>		<b>2081</b>	<b>1.9</b>	<b>0.909</b>	<b>45.7</b>	<b>LOS D</b>	<b>290</b>	<b>0.84</b>	<b>0.86</b>	<b>22.6</b>

### Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate
P1	105	53.2	LOS E	0	0.94	0.94
P3	105	31.5	LOS D	0	0.73	0.73
P5	105	30.1	LOS D	0	0.71	0.71