



F07 LEES1 BUILDING

UNIVERSITY OF SYDNEY

CONSTRUCTION MANAGEMENT PLAN

Construction Management Plan

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1.0 Proposed site establishment and site setup plan

1.1 Site Accommodation

During the ECI phase RCC have further reviewed the proposed site, surrounding areas and taken in to consideration CIS response to RCC RFI No.11, and subsequent post tender direction in order to determine a preferred site accommodation location.

RCC will propose to establish temporary site accommodation on an overhead gantry located in Barff Road as follows.

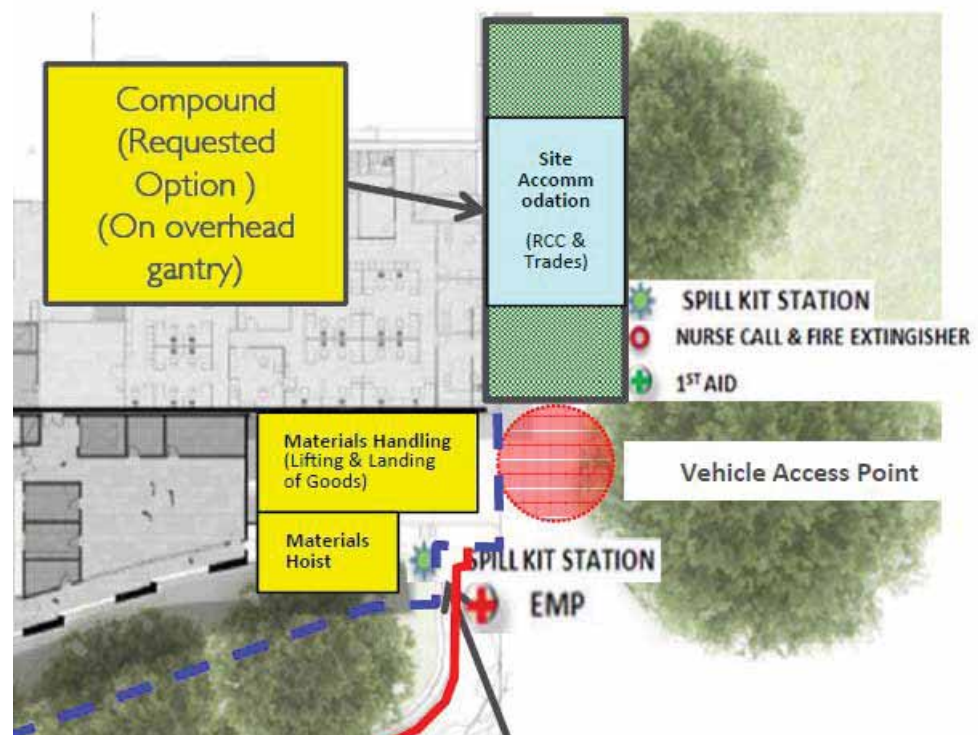


Figure 1 - Site Establishment (Barff Road) - Site Accommodation

The proposed location within Barff Road locates office and site amenities in close proximity to the site while providing pedestrian and public transport access off City Road thus minimising the number of Construction workers passing through the main university Campus. This location will still allow space for pedestrians to access the avenue, bus Stops on City Road from the university Camperdown Campus.

The compound will house all RCC and Subcontractor personnel in the locations indicated above.

Site Offices and facilities will be set up at to facilitate the RCC's works activities including:

The compound will be comprised of the following elements:

1. Perimeter hoarding, personnel gates & signage

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2. Nurse call, Emergency evacuation systems
3. Temporary power, water and lighting
4. Temporary lock-up
5. Shedding: (Double stacked)
 - Project Management Office
 - Site Management and Supervisor Offices
 - Induction & Meeting Rooms
 - Samples Room
 - Lunch Sheds
 - Change Sheds
 - Ablution & wash-up facilities
 - Water coolers, vending machines
 - Lock-ups
6. Bunded flammable goods store/lock-up
7. Covered putrescibles and non-putrescibles waste and recycling receptacles & separation area
8. High speed internet communications & data access
9. Access points and perimeter security

Our expectation is that the contractor numbers will peak at around 150 – 170 personnel during the concurrent completion of high level structure and commencement of low level façades, HL services installation and commencement of fit out phase of the project.



Figure 2 – Example of Site Establishment (Barff Road) - Site Accommodation

Please Note: For full Site Establishment Plans refer to the A3 diagrams at the end of this section.

1.2 Hoardings, Fences and Site Security

RCC propose to install A-class hoardings around the site compound area inclusive of way finding signage, intended to provide clear direction to pedestrian traffic, in accordance with the CIS External Signage Manual.

Temporary fencing inclusive of wind bracing and shade cloth with the UoS motif will be installed through the existing garden area on the South side of the LEES1 building to both delineate the work site from the protected tree/garden area whilst having a minimal impact on the retained garden/turf areas.

Both the hoardings and temporary fencing will segregate the public, staff and students from the construction site.

Pedestrian entrances will be provided off City Road/Eastern Avenue to the site compound amenities area for construction personnel, and a Vehicle gate will be provided off Barf Road in the vicinity of the proposed loading dock/existing rea access laneway.

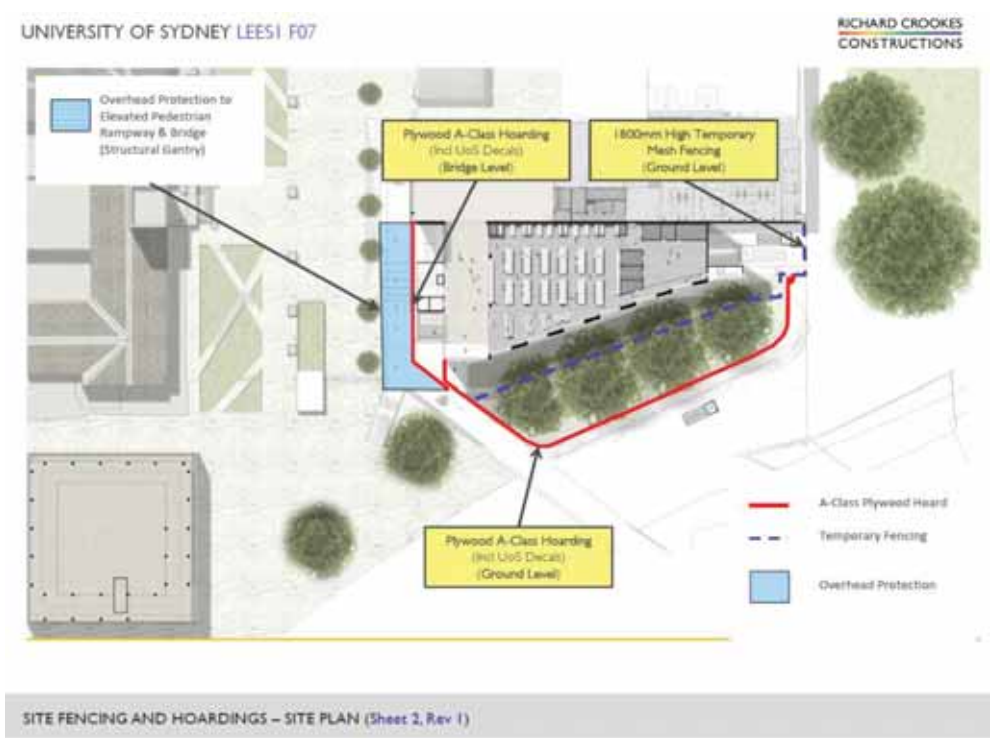










Figure 3 – Temporary Hoardings & Fences

RCC will install temporary protective fencing similar to that depicted below to suit the requirements of each particular work area, the level of security and WHS protection required to be achieved.

Elevation of general site temporary fencing.	Elevation of temporary fence / barrier used at perimeter roadway junction.	Elevation of temporary fencing where visual privacy is required.
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Elevation of general site temporary fencing.	Elevation of temporary fence / barrier used at perimeter roadway junction.	Elevation of temporary fencing where visual privacy is required.
 <p>Note: initially installed to delineate proposed work areas</p>	 <p>Note: Barrier to be water filled</p>	
Vehicle gates	Personnel gates to be used in numerous locations generally adjacent to vehicle access points	Jersey curbs used where vehicle and personnel separation are required
		
Perimeter edge protection fencing used on slab and penetration edges when scaffold is removed to allow for proceeding works eg: curtain wall installation.	Lift core opening secure gates used to prevent unauthorised access in to lift cores.	
		

RCC will install, maintain and remove on completion all site security fencing and barriers.

Additional to the above, workface specific fences and barriers will be installed to prevent unauthorised access, provide edge protection and isolate areas; temporary lift gates, roll-top fencing and jersey curbs will predominantly be used.

Subject to approval by SCC of a limited period construction zone on City Road we anticipate that a B-Class hoardings will be required along part of City Road. Subject to the above limited crane hoisting operations, for example on concrete pour days, will be able to undertaken from City Road by the site tower crane from within the building site thus mitigating any risk of falling objects.

The diagrams contained in this section identify the proposed locations, and staging, of the fencing around the perimeter of the site, the site compound, the primary waste management area together with the proposed locations of Site Office & Contractors Compound (sheds and amenities).

Additionally shown are the entry & exit gate locations for construction deliveries and personnel; the latter being separated to ensure the safe and least disruptive traffic movements to site from the existing roadway.

Below: Example of graphics for hoardings & shade cloth for temporary fencing to be installed on around the site compound and along the site boundary. We will submit the final shade cloth design to the Principal in a timely manner for approval and sign off prior to fabrication.



1.3 Overhead Protection

RCC propose to install a 10kPa catch deck over part of the existing walkway bridge over City Road where it is impacted by the construction to provide overhead protection. This catch deck will be installed during the early/enabling services diversions works to ensure that it is ready when required for the building. This catch deck will be removed when the façade is complete and the risk of falling objects is removed.

1.4 Signboard

In addition to the hoarding graphics and branded shade cloth RCC will design and install project signboard. We will seek approval for the content, and location of the signboards from the Principal prior to fabrication and erection.

1.5 Existing Services & Disruption Management

RCC recognise that careful coordination and planning is required to ensure minimal disruption to ongoing UoS operations. Above all, safety is our first priority at all times.

RCC Project Manager will have a key role in maintaining relationships with the Project Stakeholders to ensure Project objectives are achieved with minimal disruption to the University.

RCC recognises that the close proximity of the works to teaching spaces and otherwise operational areas of the University means that any disruptive construction activities must be carefully managed and unavoidable disruptions are planned and implemented to the satisfaction of all Stakeholders.

RCCs Project team is very experienced in conducting construction activities amidst operational environments and is committed to ensuring that the construction works proceed as programmed by thorough risk assessment, communication and management of the integration of the services works.

RCC will communicate with all key Stakeholders to determine and agree the optimum timing for carrying out these activities in order to minimise disruption.

Where works proposed to be undertaken involve any services or have the potential to impact the University's operation, RCC will implement a structured Disruptive Works Notice Notification for the Project. The DN process will generally involve the following steps;

- Works which are planned that will or may interrupt operations. These are generally received from specific trade Subcontractors who will provide methodologies associated with their work.
- RCC will analyse the request and thereafter prepare a detailed DN.
- The DN generally requires significant investigative work in order to collate comprehensive details which includes the following;
 - Description of the nature of the Works to occur.
 - The planned location/s (marked up drawing included).
 - The reason for the Works.
 - The proposed date of the Works.
 - The proposed duration of the Works (start and finish times).
 - The services and areas of the facility which will be directly and/or indirectly impacted.
 - The nature of those impacts including services interrupted, noise, vibrations, dust, fumes, access/egress restrictions (public, staff, patients, traffic etc.).
 - The control measures/precautions/mitigations that will be put in place.
 - A detailed description of the Work steps involved with particular focus on potential operational impacts and risks.
 - Out of hours works and associated risk and controls, supervision, contact details
 - Authority notifications as applicable.
 - Relevant CIS Authorisation

Although DN will primarily be submitted for services shut-downs and disruptions there may be a need to submit DN for activities which may potentially disrupt the adjacent Carlaw operations for example noise and vibration in particular.

RCC will review the DN to ensure all details are comprehensively detailed prior to submission. However, prior to formal submission, any areas of concern are followed up in discussions with CIS and the relevant User Group(s) in the regular site coordination meetings.

The final agreed DN will generally be submitted a minimum of 14 days prior to the Works occurring as required for the Project or as otherwise directed by CIS. During the review period prior to Works taking place, further opportunities exist to review/modify the DN as deemed necessary.

RCC will maintain a detailed DN register to provide as much early warning for future DN. Additionally, RCC will provide regular communications to all Stakeholders providing details on upcoming construction activities. If as a result of this consultation, an activity is deemed to have the potential to cause a disruption, the DN process will be followed.

RICHARD C
CONSTRU

Hornsby Ku-Ring-Gai Hospital Redevelopment - Main Works - Job No. 975
Disruption Notice Register

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An example DN form follows:



Application for Disruption to Services

A minimum of 14 days notice is to be given for any works that may interfere with the operation of the University.

Disruption Notice no.

To:			
From:			
Date:		Date Access Required:	
<u>Description of Activities to occur:</u>			
Dates of Works	Start date		
	Finish date		
	Duration in Days		
<u>Reasons for work:</u>			
Work Method Statement Attached:	<input type="checkbox"/> YES		
Control measures, precautions, monitoring, reporting to be undertaken			
Locations of activity / area affecting: (attach location plan if required)			



EFFECT:	YES	NO
Noise (noisy work to be completed prior to.....)		
Vibration (to be completed prior to.....)		
Dust (to be contained within site)		
Fumes		
Restricted Access to students / public / staff		
Interruption to traffic		
Interruption to pedestrian access		

DESCRIPTION AND DETAILED BREAKDOWN OF ACTIVITIES	FROM		TO	
	DATE	TIME	DATE	TIME

CONTACT SCHEDULE

	Rep's Name	Contact Phone No.
Head Contractor		
Project Manager:		
Sub Contractor:		



ENDORSEMENT

We the undersigned have reviewed the details of the proposed disruption to services and have made an assessment of the proposed work methods, allocation of tasks and risk mitigation methods and endorse the application as follows:

Representatives	Signature	Date	Approved	Amend / Resubmit
Head Contractor – RCC.				
Project Manager - CIS				
Other (<i>insert</i>)				

ARE UoS / CIS representatives to be present during work: ☐ YES ☐ NO

COMMENTS

(if insufficient space attach a separate numbered page)

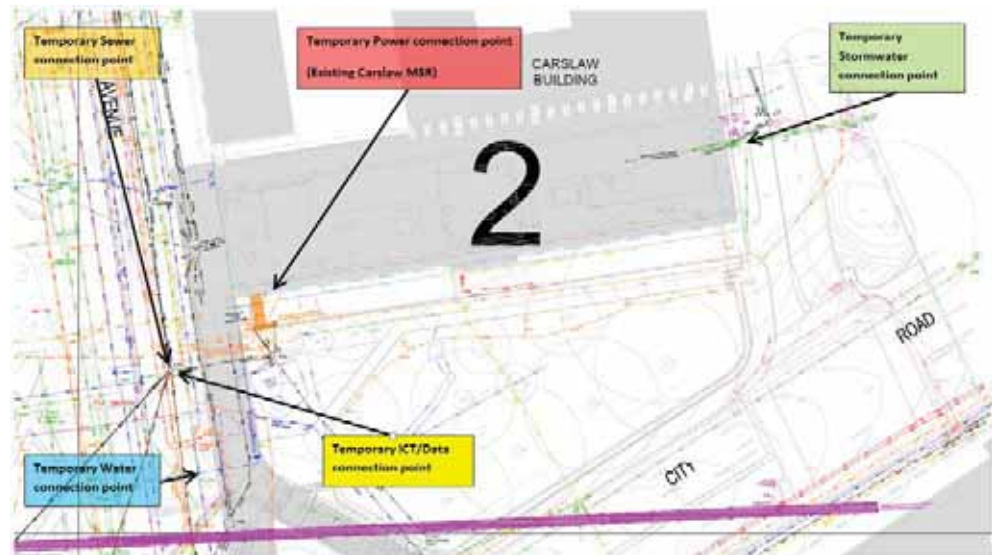
In the event that existing previously ‘unidentified’ services (such as drains, watercourses, public utilities, telecommunications and other services) are found to be obstructing the Works, or if damaged in the course of the Contract, RCC will deal with them in the following manner:

1. if the service is to be continued: repair, divert, relocate as required;
2. if the service is to be abandoned: cut and seal or disconnect and make safe as required;

Notwithstanding we shall notify CIS immediately upon discovering services that obstruct the Works and are not known to date.

1.6 Temporary Services

On commencement of works, RCC will establish temporary electrical and hydraulic services necessary for the execution of the works. Our temporary services will include the works associated with temporary accommodation and provisions for electrical distribution, hydraulic water, drainage and stormwater discharge control points.



RCC will arrange, coordinate and pay for all temporary services, unless otherwise agreed in writing, necessary to carry out and complete the Works

RCC proposes to connect to the existing services within the Campus. Sub metering can be installed at all points for the services to provide an accurate means of reporting and monitoring usage.

1.7 Dilapidation Recording

Upon possession of the LEES1 site, RCC will initially survey the works and all adjoining facilities and compile Dilapidation Reports

The survey involves recording the physical condition of those properties, both internally and externally, including such items as access routes, walls, ceilings, roof, structural members and other similar items. The record will be in both hard copy & electronic format and uploaded to Aconex. Additionally another dilapidation survey will be completed upon completion of our Works.

1.8 Noise, Dust and Vibration Management

RCC has recent and relevant experience with the management of noise, dust and vibration generated by construction activities in health, research and learning precincts – most recently on the UTS Thomas Street Project, Kinghorn Cancer Centre and St Vincent's Hospital O'Brien Building at Darlinghurst, ADFA Redevelopment (Canberra) and UNSW Kensington Colleges.

We understand that noise and vibration can have significant impacts on the ability of the adjoining facilities (and the facility users) to operate effectively; not only from a user environment, but also from an equipment operating environment i.e. highly sensitive equipment.

We understand that noise, dust and vibration can impact via two formats:

- Brief, intrusive exposure
- Long term background exposure

A systematic approach to the mitigation of vibration and noise emissions on the LEES1 Project will be required. In order to ensure that noise and vibration emissions are minimised and adequately addressed, RCC will engage a specialist consultant (noise and vibration) to assist in the preparation of the Construction Noise and Vibration Management Plan as well as implement monitoring as required.

RCC's Construction Noise and Vibration Management Plan will have a simple yet effective structure.

- Gather information
- Formulate actions
- Agree and communicate recommendations
- Implement everything.
- Review and communicate.

Prior to any works beginning on site, RCC will undertake background monitoring to understand what the current parameters are and to set the parameters by which RCC and their subcontractors will complete their works. Adequate notification will be provided to relevant stakeholders. This provides the project with 'control' data to measure any future readings. The subsequent commencement of construction works allows all party's to assess the impact of the work of surrounding neighbours.

Data loggers / noise and vibration will record in strategic locations around the site, firstly to establish benchmark data for the site prior to the commencement of construction activity and secondly to monitor noise and vibration periodically during construction. Excessive noise and vibration will be easily identified by the monitors allowing RCC to assess the cause and implement management strategies to remove the risk.

1.9 Construction Generating Activities

Noise and vibration impacts from the proposed construction activities will be determined from the expected equipment to be used at the site.

The A-weighted sound power levels for all activities to be used on the site are outlined in the table below along with potential maximum levels of vibration generated by expected activities based on experience on similar construction sites.

Table 1 - Sound Power Levels and Potential Maximum Vibration

EQUIPMENT /PROCESS	SOUND POWER LEVEL - dB(A)	POTENTIAL VIBRATION LEVELS
Hydraulic Hammers	115	Up to 8mm/s @ 10m
Concrete Saw Cutting	114	Up to 2mm/s @ 5m
Excavator (without hammer)	98	Up to 3mm/s @ 10m
Drill Pilling equipment	105	Up to 2mm/s @ 5m
Truck	96	Minimal vibration impact
Bobcat	89	Minimal vibration impact
Angle Grinders	114	Minimal vibration impact
Electric Saw	111	Minimal vibration impact
Drilling	94	Minimal vibration impact
Hammering	110	Minimal vibration impact
Concrete Vibrator	100	Minimal vibration impact
Cement Mixing Truck	105	Minimal vibration impact
Concrete Pumps	107	Minimal vibration impact

The noise levels presented in the above table are derived / verified from the following sources, namely:

1. On-site measurements
2. Table D2 of Australian Standard 2436-1981
3. Data held by this office from other similar studies.

1.10 Noise and Vibration Management

The following table presents the required noise and vibration strategies, treatments to ensure impacts at receivers within close proximity to the construction site are minimised.

Table 2 - Recommended Noise and Vibration Controls

EQUIPMENT /PROCESS	RECEIVER	DISCUSSION
Hydraulic Hammering	Administrative offices, Student ICT space, Lower Level Laboratory Teaching space within the Carlsaw building	Acoustic treatments to the windows of the offices opening directly onto the laneway which is to excavated will be conducted. Windows will be screened using a solid material such as plasterboard or plywood. In the event natural light is required Perspex could be used, however this will result in a reduction in the acoustic separation to construction activities.

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EQUIPMENT /PROCESS	RECEIVER	DISCUSSION
		<p>Separate building elements to be demolished from building to be maintained prior to hammering of structure. Separation of the air conditioning platform & laneway pavement will be conducted outside of the operating times of the university or with close consultation with the university including measurement of vibration.</p> <p>During excavation saw cutting of the perimeter of bedrock stratum abutting the Carslaw Bldg will be conducted to the depth of the excavation. Alternatively methods such as ripping and the like, will be adopted where possible.</p>
		Ripping of material will be maximised where possible.
	Upper level Teaching Laboratories within the Carslaw Bldg.	<p>Acoustic treatments to the windows of the laboratory areas opening directly onto the City Rd elevation which is to excavated may be Installed. Windows will be screened using a solid material such as plasterboard.</p> <p>Vibration isolation of the microscopy equipment may need to be conducted at a local level with items such as vibration tables or installing additional vibration isolation to table or equipment.</p>
Drill / Piling equipment	Administrative offices, Student ICT space, Lower Level Laboratory Teaching space within the Carslaw building	<p>Acoustic treatments to the windows of the offices opening directly onto the laneway which is to excavated will be conducted.</p> <p>Windows will be screened using a solid material such as plasterboard or plywood. In the event natural light is required Perspex could be used, however this will result in a reduction in the acoustic separation to</p>
	Upper level Teaching Laboratories within the Carslaw Bldg.	No acoustic controls to these facilities or vibration controls to neighbouring buildings are required due to higher proximity.

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EQUIPMENT /PROCESS	RECEIVER	DISCUSSION
Concrete Saw Cutting	Administrative offices, Student ICT space, Lower Level Laboratory Teaching space within the Carslaw building	Acoustic treatments to the windows of the offices opening directly onto the laneway which is to excavated will be conducted. Windows will be screened using a solid material such as plasterboard or plywood. In the event natural light is required Perspex could be used, however this will result in a reduction in the acoustic separation to construction activities.
	Other Receivers	No acoustic controls required
Excavators – Including all excavators up to and including 35 tons	Administrative offices, Student ICT space, Lower Level Laboratory Teaching space within the Carslaw building	Acoustic treatments to the windows of the offices opening directly onto the laneway which is to excavated will be conducted. Windows will be screened using a solid material such as plasterboard or plywood. In the event natural light is required Perspex could be used, however this will result in a reduction in the acoustic separation to construction activities.
		Vibration isolation of the microscopy equipment may need to be conducted at a local level with items such as vibration tables or installing additional vibration isolation to table or equipment.
	Other Receivers	No acoustic controls required
Truck (including the loading of materials	All Receivers	No acoustic controls required
Bobcat	All Receivers	No acoustic controls required
General Construction including - Angle Grinders, Electric Saw, Drilling, Hammering etc	Administrative offices, Student ICT space, Lower Level Laboratory Teaching space within the Carslaw building	Subject to further field testing acoustic treatments to the windows of the offices opening directly onto the laneway which is to excavated will be conducted. Windows will be screened using a solid material such as plasterboard or plywood. In the event natural light is required Perspex could be used, however this will result in a reduction in the acoustic separation to
	Other Receivers	No acoustic controls required providing care is taken with materials movement loading and unloading such that excessive vibration is not generated from the impact of materials with the ground and buildings.

EQUIPMENT /PROCESS	RECEIVER	DISCUSSION
Concrete Pumps	All Receivers	Concrete pumping lines to be vibration isolated from the building structure using portable mounts. This activity is infrequent in nature and although may exceed assessed threshold, can be coordinated during less invasive timeslots.

1.11 Dust Control

Dust monitors are typical used during site excavation activities. The most effective means of dust control is through water suppression. RCC's temporary hydraulic scope of services includes provision for hose taps at the primary and secondary entrances. In addition, RCC will utilise water carts in difficult to access areas.

Our experience shows that if we comply with the agreed Construction Noise and Vibration Management Plan, the successful management of noise, dust and vibration aspects of the LEES1 Project will be achieved.

1.12 Fuel and Hazardous Materials Storage

RCC do not intend to store fuel or other hazardous materials on site other than those listed below:

- Fuel: Limited quantities for onsite portable power generators & portable fuel powered plant e.g.: hand held concrete saws, compactors and compressors,
- Oxy/Acetylene: Limited cylinders for plumbing works, and steel cutting,
- Propane/Butane: Limited quantities for pipe and cable soldering, welding, and gas charged fastening devices,

The liquids & gas fuels will be stored in segregated, well ventilated, and secure enclosures with a surrounding fully closed watertight bund to ensure that contamination of the surrounding ground through potential spillage does not occur.

Major plant refuelling will be carried out by mobile mini-tanker facilities within an isolated dedicated area; this is to avoid stockpiling and cartage of bulk fuels on site.

Spill kits and appropriate hazmat signage will be located both at the materials stores & project office in the event of spillage occurring.

1.13 Hazardous Substances Management

RCC believes that minimal hazardous materials will be encountered on LEES1 Project as the bulk excavation will be completed in clean material.

Should unexpected hazardous material be encountered the processes and steps outlined in the RCC LEES1 Project Work Health and Safety Management Plan - Section 4.9 will apply. An abstract of which follows:

Section 4.9 - Discovery of Hazardous Substances on Site

If at any time RCC discovers the presence on the Site of any material suspected of containing or likely to contain a substance defined or listed in the National Occupational Health and Safety Commission's ("NOHSC") Guidance Notes (NOHSC 1008:2004: "Approved Criteria for Classifying Hazardous Substances" and NOHSC 1005:1999: "List of Designated Hazardous Substances") it will not disturb the material under any circumstances. RCC will contact and inform Principal's Representative of the existence of the material on site and ensure that all persons are protected from exposure to the material until the nature of the material has been competently determined. The Principal's Representative will inspect the Site and issue directions to RCC in respect of further action to be taken.

Hazardous Substance means a substance that is listed in the document entitled List of Designated Hazardous Substances published by Worksafe Australia; or a substance that fits the criteria for a hazardous substance set out in the document entitled Approved Criteria for Classifying Hazardous Substances published by Worksafe Australia.

Asbestos, material containing asbestos, polychlorinated biphenyl (PCB) and lead based paints are recognised as hazardous substances. Other substances in certain situations are also considered hazardous and therefore require controlled handling. Examples of these include glues, solvents, cleaning agents, paints, and water treatment chemicals.

With the initial notification or as soon as practicable thereafter, we will submit details, including:

- Type of substance.
- Location of the substance.
- Additional work and resources we estimate to be necessary to deal with the substance so that work and the subsequent use of the Works may proceed safely and without risk to health.
- Other details reasonably required by The Principal's Representative.
- In planning and carrying out any work dealing with the substance we will take all reasonable steps:
- To carry out the work concurrently with other work wherever possible.
- To minimise the effects of the work on the Contractual Completion Dates.

1.14 Waste Management & Recycling

In recent years the waste management industry has responded positively to industry pressure and government legislation. As a result RCC is able to ensure accurate reporting is available and efficient management of waste separation for recycling is assured thus assisting in achieving the relevant Green Star points for this Building. RCC proposes to locate waste management facilities within the construction site boundary.

RCC believe that a well-managed, neat and tidy site not only promotes good impressions to the public but also instils and sets a standard and expectations within our workers.

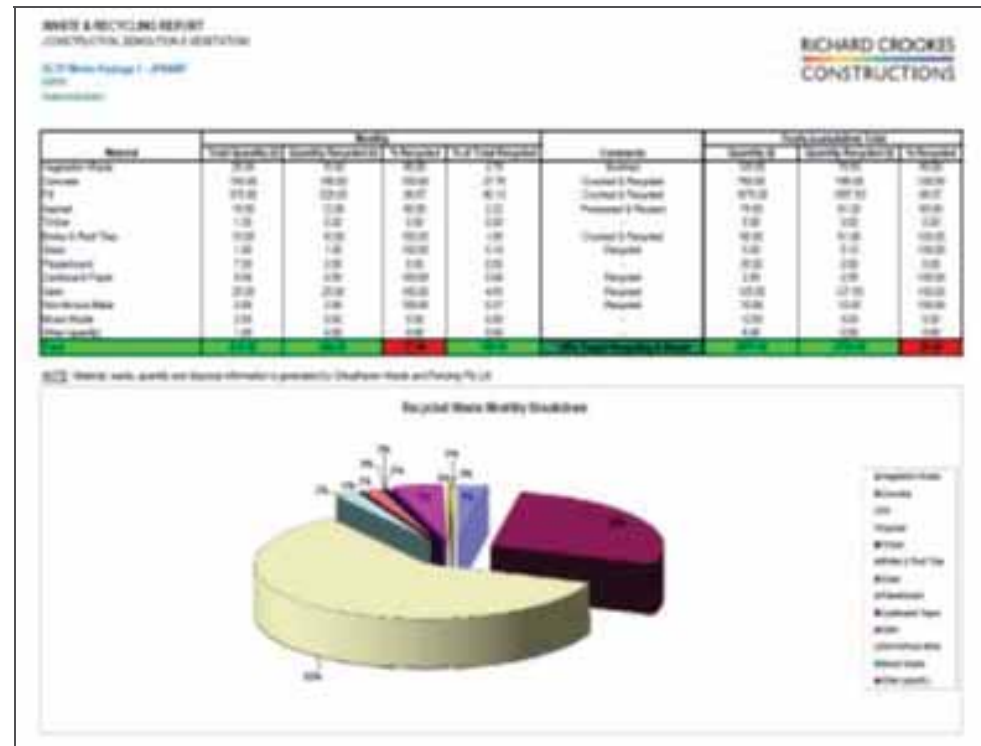
RCC has in place waste management procedures; including strategies, reporting and monitoring protocols for the management of waste materials generated through our construction processes including demolition, earthworks, construction and through to completion and operational maintenance.

We have established a goal of at least 80% of materials generated to be reused or recycled on our projects with project specific waste management plans being implemented on each project.

A sample 'Recycling' report follows demonstrating 87% recycling & reuse (above target 80%). Note: similar reports will be included in the monthly reports furnished to the CIS if requested.

Key areas that will be targeted in the Waste Management Procedures/Plan include:

- Avoidance of waste or deleterious material becoming uncontrolled, e.g.: such as when high winds occur, and becoming a potential site issue
 - **Strategy:** use of appropriately screened and contained waste receptacles in designated areas together with regular housekeeping.
- Avoidance of discharging or dumping of deleterious materials into the drainage system, roadways, hardstands or unmade areas in or around the site
 - **Strategy:** gross pollutant trapping of stormwater drains and kerb inlet pits (with geotextile sausages and/or pit lining) and siltration controls (geotextile fabric, hay baling, bunding etc.) to downhill sides of civil works, vehicle shaker grids / rumble bars, covered loads, road/pavement sweeping when required.
- Separation of waste in to categories that can be regionally reused and/or recycled to achieve a 80% (or better) by weight recycling target
 - **Strategy:** targeted placement of waste receptacles where likely forms of waste will be generated e.g.: steel and concrete recycling bins where concrete works occurring, brick recycling bins where masonry works occurring, cardboard/ paper/ glass/ aluminium/ PET recycling bins at administration and amenity areas.



1.15 Emergency Management

All construction personnel will be required to undertake a site induction which will include safety and emergency evacuation requirements prior to commencing work on working. RCC and all subcontractors will be required to maintain a daily site diary/log recording personnel on site that can be used as a checklist in the event off an emergency evacuation of the site. A designated evacuation point will be identified as part of the safety procedures / induction and clearly displayed in prominent positions on site.

1.16 Construction Traffic & Pedestrian Management

In considering our Construction Traffic Management Plan (TMP), RCC has considered;

- Congestion issues external and internal to site;
- Limiting the use of internal road network;
- Pedestrian Safety;
- Use of controls to manage traffic flow

General construction vehicle traffic would have origins / destinations throughout Sydney. Most construction vehicles, including trucks would use the State Road Network with the main entry being off City Road.

Construction traffic generation would primarily be associated with the following construction activities:

- Concrete pours - trucks and pumps
- Delivery of building materials using an mixture of small rigid and heavy rigid trucks
- Small trade deliveries and services using vans and utilities.

RCC estimate the traffic generation for the LEES1 Project would peek at six (6) trucks per hour. An increased traffic flow of six (6) vehicles per hour would have very little impact on the adjacent traffic network; however internal roads typically do not typically carry heavy construction vehicles as such they will need to be coordinated to ensure the impact on campus operations is minimised. Consideration will also be given the current demands on Barff road for the existing Carlaw and Law buildings. RCC will ensure that access via Barff road to these locations is maintained.

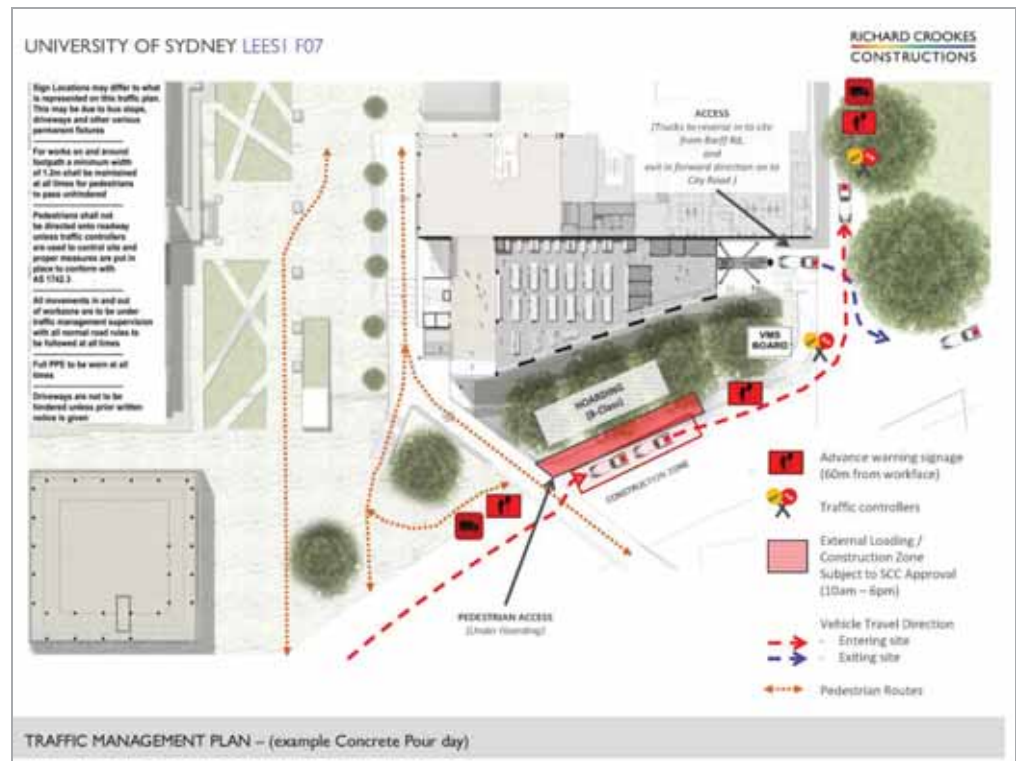


Figure 4 – Concrete Pour Traffic Management Plan

Traffic controllers will be available on site to allow trucks to safely enter and exit the site. It is the aim of the traffic controller to ensure that traffic does not queue along City Road or Barff Road, hindering the progress of other road users. In addition, traffic controllers will provide management protection for pedestrians using the surrounding footpaths.

1.17 Traffic Management;

1.18 Planning

RCC will provide all traffic management, safety warnings and signage as required for the safe movement of all constructional plant, equipment and vehicles in and around the site including such persons as necessary to direct traffic as required by AS1742.

RCC will engage a traffic consultant to assist in the production of an Construction Traffic Management Plan to ensure the construction traffic including RCC employees, subcontractors, suppliers and any other persons connected to the works, strictly adhere to the access routes to the site detailed agreed and approved by CIS.

Given the site has direct access to City road all drivers will be required to comply with NSW road rules.

RCC will obtain all necessary approvals for the transport of any waste material and building materials. In respect of this we propose to implement the following procedures to effectively manage traffic associated with our contract works.

Access to the surrounding businesses and to the road network will be maintained throughout construction. The planning and management of safe and efficient access and circulation on

and around the site will be RCC's responsibility, and RCC will be responsible for ongoing coordination and communication with all relevant authorities.

Particular areas for which RCC must maintain safe and efficient access include but are not limited to:

- unhindered access to and from the bus pick-up/drop-off points and bus shelters on the City Road
- vehicular and pedestrian the City Road and Barff Road will not be impeded and such measures as traffic controls, pedestrian protection and pedestrian diversion will be implemented as necessary
- vehicular access at all times in the vicinity of the site will not be impeded; call-in sequencing of vehicles eg: concrete trucks and the like will be undertaken
- if necessary large/wide load and all other irregular construction vehicular circulation, standing and parking in neighbouring streets will be planned and controlled by RCC in consultation with the Police, RMS, SCC other relevant authorities and agencies, the surrounding university activities may be affected by the construction traffic, and CIS representative.

RCC will undertake all necessary ongoing liaison, planning and coordination with all relevant organisations and individuals to fully and properly manage all access and circulation related to or affected by the construction activities in this busy urban location and on and around this project.

The Traffic Management Plan (TMP) will be fine-tuned to maximise construction efficiency and minimise disruption to traffic and pedestrians. The TMP will focus on safety and workability through careful planning and a commitment to collaboration and cooperation in proactively addressing traffic management issues.

Specific traffic management targets and strategies include:

- authority approvals for staging, location and traffic controls
- identify truck queuing area (located away from site)
- planned delivery schedules for materials
- signage and installation of approved barriers
- installation and capacity of road plates (where required)
- emergency procedures
- avoidance of work near roads in peak hours
- construction parking
- encouraging construction workers to use public transport

Trained personnel appropriately equipped with approved traffic management signage will manage all traffic ingress and egress to the site.

Oversize load deliveries will be restricted to outside peak traffic periods.

1.19 Material Deliveries

RCC will co-ordinate and advise suppliers and subcontractors of site access arrangements which will form part of the order documentation/attachments. On entering the site drivers and vehicles details will be noted and the vehicle will be assisted by RCC personnel.

Our site personnel will:

- Check the delivery docket or consignment note & verify the vehicle for contents
- Advise nominated recipient of vehicles location
- Direct vehicle to unloading area to await further direction to unload/pick-up

Once the vehicle the construction area the following will apply:

- All vehicles must adhere to nominated speed limit and directions of RCC personnel
- Materials will only be unloaded to within the site area, in designated unloading areas; unloading at the workface will only be allowed if previously arranged with RCC
- Operators proposing to use mechanical means to load/unload goods or equipment i.e.: by hiab, forklift will first be checked for competency and undergo a brief induction together with the equipment for correct serviceability
- Where unloading of vehicles is to be undertaken by RCC this will be done by either site tower crane (in the case of from the loading dock area or construction zone) or Manitou, crane or by hand (from within the loading dock)

For goods and plant leaving the site reverse of the above procedure will apply and all loads are to be reliably stacked on vehicles and securely fastened.

1.20 Cleaning of Construction Routes

RCC will maintain the construction routes used by construction vehicles; adjacent to and within the site. RCC will ensure that roadways are cleaned regularly to the satisfaction of UoS and the SCC by our site personnel or street sweeping subcontractor.

1.21 Pedestrian Management

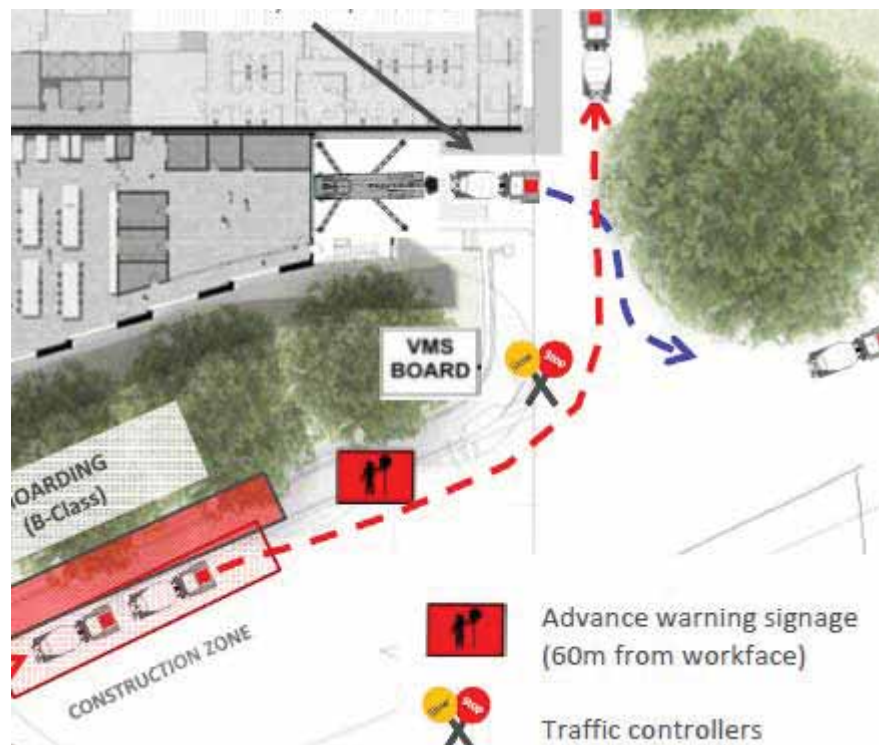
The additional traffic for the Project will have a moderate impact on the adjacent traffic network. However, due to the alterations with in the university grounds, primarily due to temporary facilities/sheds/compound in Eastern Avenue & trucks entering/existing via Barff Road, due consideration will have to be given to internal traffic and pedestrian movements.

As the works are generally confined to a single site area RCC have indicated the proposed traffic and pedestrian management/methodology on the staging diagram.

An example showing pedestrian routes: For full details refer to the attached Appendices.



An excerpt from the Traffic Management Plan follows: For full details refer to the attached Appendices.



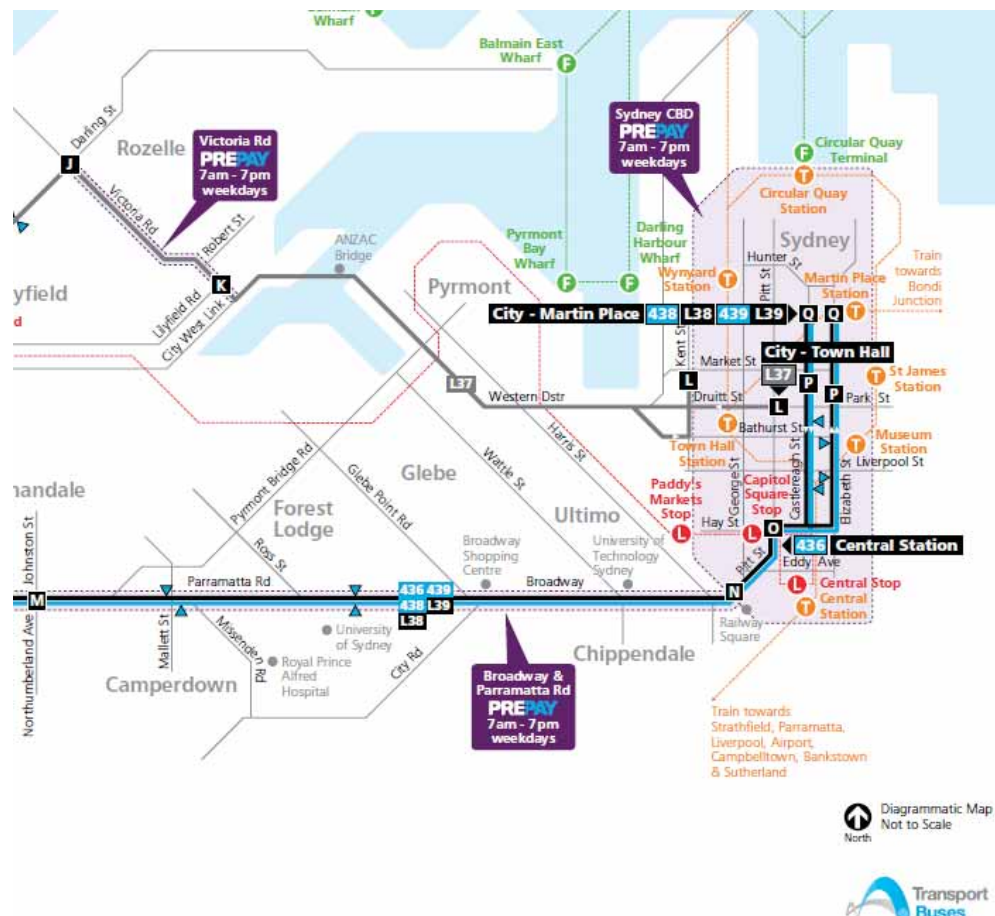
1.22 Construction Parking & Public Transport

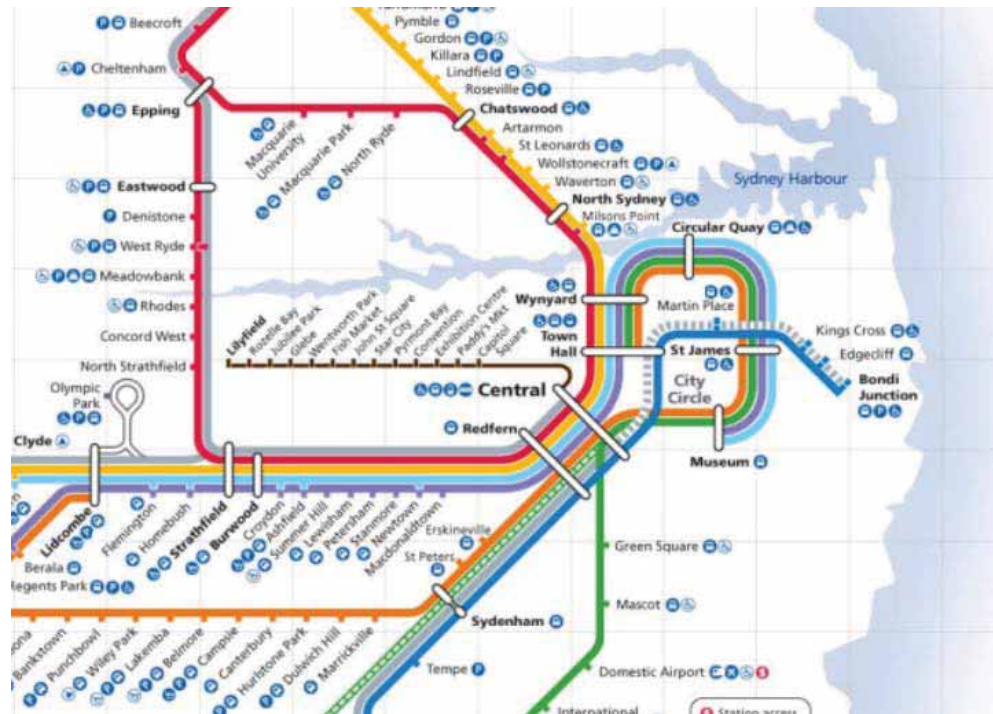
RCC recognises that parking within the vicinity of the site is limited at best.

The construction of the Project will generate an influx of workforce, tradesman and construction deliveries.

Due to limited parking within the area and general congestion, to minimise the impact this will have to the area RCC will include outline the construction workforce on the options available to minimise congestion around the university and for travelling to and from site at the Site Induction:

- Provide a temporary material drop-off area work area in possession by RCC
- Park their vehicles away from the university, so that the areas immediately close to the university remain clearer.
- Encourage the Subcontractors and Consultants to Car pool
- Promote the use of public transport including bus and train networks located nearby.
- Post public transport information (maps and time tables) on the site notice board.



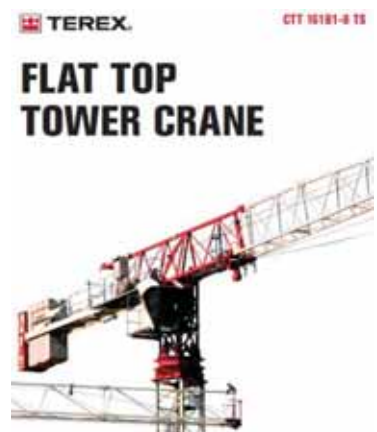


2.0 Materials handling

2.1 Craneage

On the commencement of substructure works, RCC proposes to erect an electric hammer head tower crane (equivalent to Terex CTT331). In developing and selection of the tower crane, RCC has considered;

- Noise impacts on neighbours are to be of primary concern. An electric hammer head crane will significantly reduce the noise generated from the tower crane;
- Sydney Airport Authority Flight Path (NOTAM) requirements eg: navigational lighting;
- Lifting weights of key elements including, formwork boxes, post tensioning spools, façade elements including precast, structural Steel and curtain walling;
- Limiting the impact of crane penetrations on the structure; and
- Erection and disassembly mobile crane lifting capacity and disassembly/loading locations (namely off City Road, along Barff Road)



RCC propose to erect the tower crane (vertical tower mast) within the Goods Lift lift shaft. This location will both minimise the need for penetrations throughout the structure and additionally provide good rainwater control which could

otherwise track down the tower section and potentially impact progress on the floor plates and damage completed works.

Further, locating the crane in this position provides good coverage & lifting capacity to the entire building footprint as well as allowing picking up of goods from both the proposed loading dock area and City Road construction zone (subject to approval) without necessitating slewing loads over the occupied Carslaw Bldg or pedestrian thoroughfares.

The elevation of the tower crane boom will be such that there is no likelihood of clashing with the significant trees located within the Tree Protection Zone (parallel to City Road) no any existing developed or building elements located on the Carslaw Bldg.

RCC have identified the requirement for a single man and materials hoist. This will be installed once the structure reaches level 03 and will be removed once the goods lift can be commissioned as a builders lift. RCC have identified two possible options for the hoist location and depending on the Crane location the Hoist Location will be positioned.

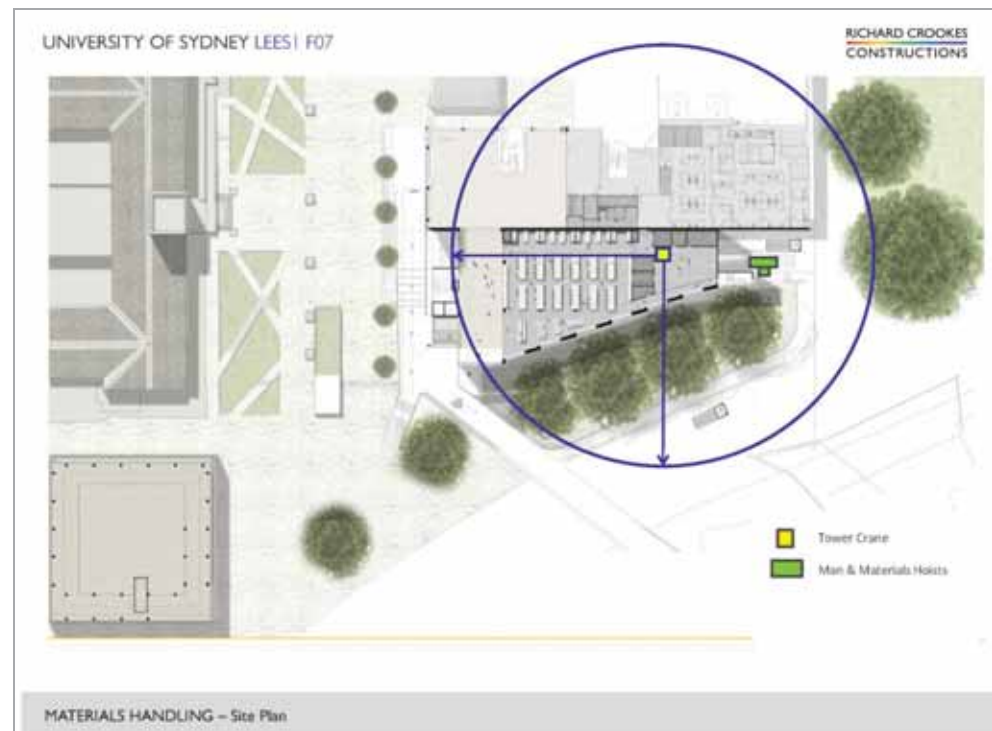


Figure 5A – Craneage Site Plan

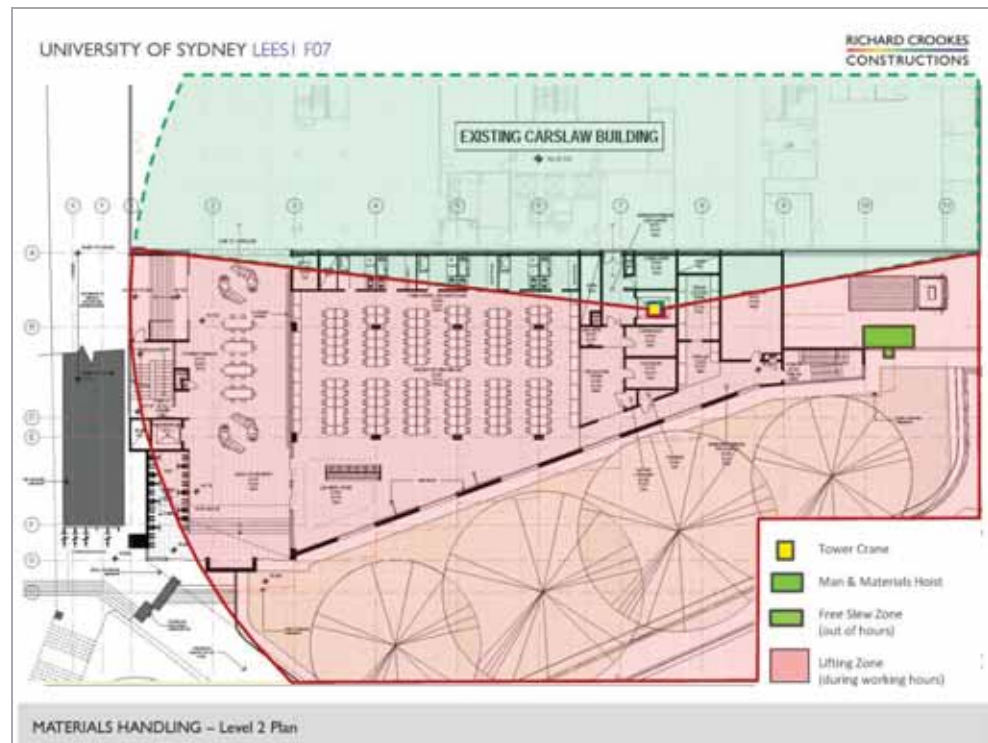


Figure 5A – Craneage Level 2 (Ground Level) Plan

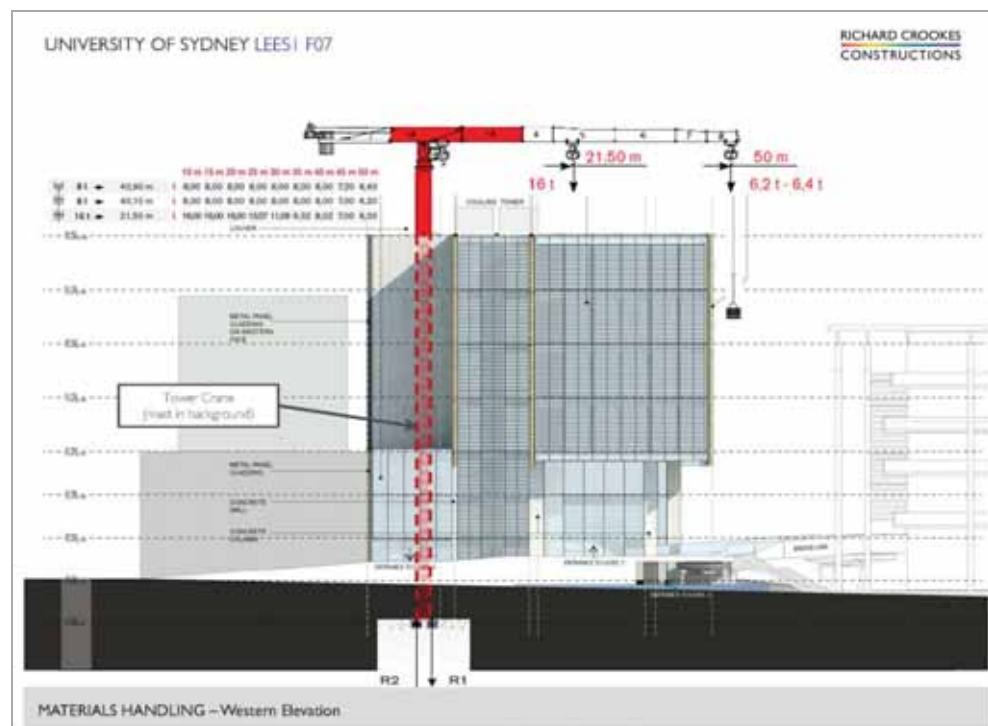


Figure 6 – Craneage Western Elevation

The primary loading zone for the LEES1 site will be on the eastern side of the building along Barf Road. Due to the tight entrance constraint, RCC believe a secondary loading zone will be required for material loads with excessive carriage. RCC propose to locate the secondary loading zone in front of the Physics Building. Traffic controllers will be used to manage the

segregation of public, staff and students from construction activities when the secondary loading zone is in operation.

2.2 Hoisting

By the time the structure reaches Level 3 a high capacity man & material hoist will be installed to service building from the proposed loading dock area adjacent to Barff Road (eastern side of Level 1).

The hoist will supplement the material handling from the tower crane during its tenure.

The hoist will remain in operation until such time as the tower crane is removed and the goods lift is placed in to operation as a “builders lift”. The lift would be fitted out with an internal protecting shell and rebalanced and commissioned prior to completion and placement in to operational service for the UoS.



Figure 7: Hoist location

The following photo depicts a similar use of an internally house tower crane (tower) and externally mounted hoist.



Hornsby Hospital – Internally located tower crane & Externally mounted man / material hoist (both serviced from



the proposed loading dock location)

As part of the building scaffold erection, which occurs in advance of the formwork deck, temporary loading platforms will be constructed to allow materials to be preloading at each floor level.

Whilst both the Crane and Hoist will be in service during the structure construction, façade installation and well in to the fitout, as the facade is completed, the perimeter scaffold to the building will be progressively removed to allow curtain wall installation and façade detailing.

2.3 Loading / Staging Areas

The primary loading zone for the LEES1 site will be on the eastern side of the LEES1 building along Barff Road. Due to the tight entrance constraints, RCC believe a secondary loading zone will be required for material loads with excessive carriage.

Initial investigation indicates that a limited construction zone will be permitted between 10am – 6pm weekdays located long long City Road.

Traffic controllers will be used as necessary to manage the segregation of public, staff and students from hoisting activities when the secondary loading zone is in operation.

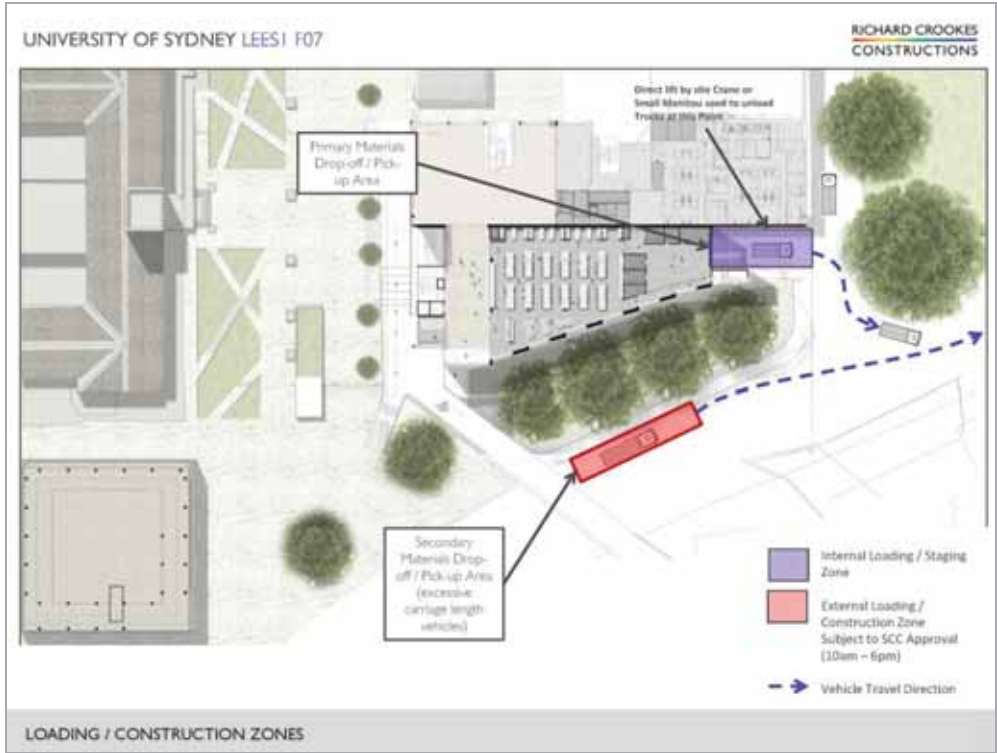


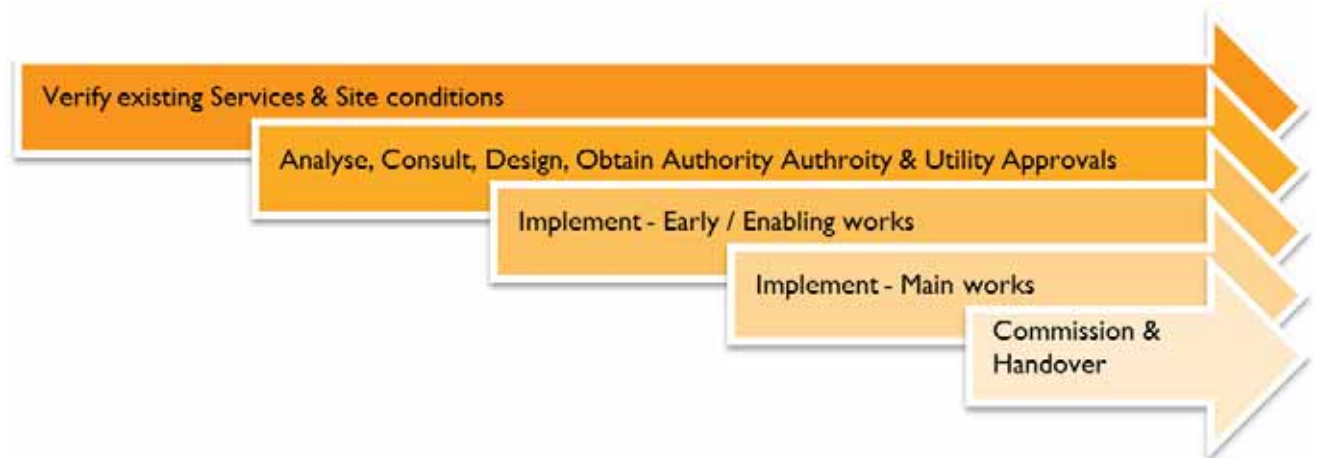
Figure 8: loading / construction zone locations

3.0 Project staging

3.1 Construction Methodology & Staging

The following provides a brief overview of the construction methodology including staging that will be implemented at the LEES1 Project.

Simply put RCCs approach to delivering the project is as follows:



3.2 Early / Enabling Works

Following engagement and the satisfaction of the conditions precedent to site access RCC will commence planning for the early & enabling works in parallel with design finalisation.

During this initial phase we will focus on the following works:

- Verification of all identifiable inground services that are impacted by the works
- Verification and recording of all identifiable inground obstructions eg: retain wall and Carslaw Bldg footing etc. that impact the civil works
- Detail and plan the permanent and temporary protection measures for the Carslaw Bldg incl. window, louvre, ventilation and mechanical services alterations
- Construct the alternative temporary loading dock access route
- Commence engagement with the utility authorities, in conjunction with CIS, and prepare design documentation and applications for the services alterations including power, water and gas.

General

The site boundary and access point will be established during the Early Enabling Works phase. RCC will be responsible for establishing tree protection to the four Morton Bay Fig trees adjacent the building structure while also establishing a Tree Protection Zone as outlined in the tender documents.

Existing / New Services

The other critical element to be considered for the early works will be the services relocations that currently intersect the building foot print; the Sydney Water main (including backflow device), gas meter and line relocations are proposed to be undertaken prior to issuing of the Construction Certificate (CC) in order that demolition and ground works are not delayed once CC is issued.

In order to achieve this RCC will work in collaboration with CIS and the relevant authority, and in parallel to the main building works design finalisation, to submit to the relevant authority design documentation eg: water main design to expedite the enabling works.

The only exception to this will be the Level 1 electrical substation work, which although the Level 3 electrical substation design will be progressed, the works will be subject to construction of the new chamber substation room; accordingly the old-to-new changeover will occur well into the main works construction phase (which we understand has been agreed in principle between Ausgrid and CIS previously).

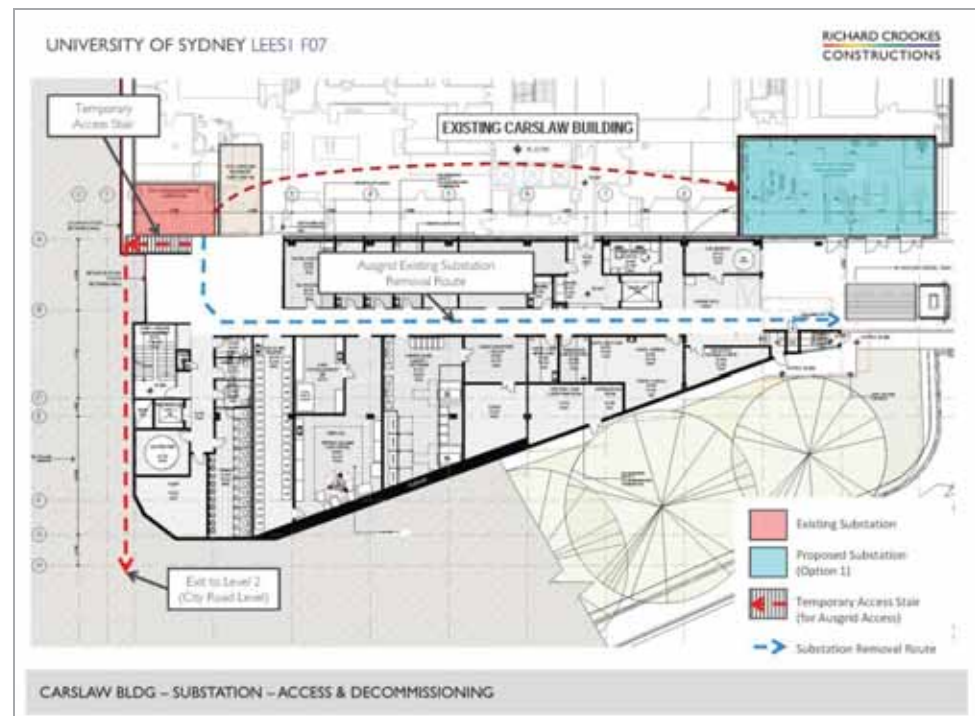


Figure 9: Carlaw – temporary access / design around existing substation

With regards to the existing substation located in the south west corner of the Carlaw building, RCC will maintain access to this until such time as the alternative substation can be installed and commissioned. To facilitate this RCC have designed the structure effectively isolated (straddled) from the incoming and outgoing services electrical services route. Further, a temporary access stair will be provided from Eastern avenue to access the substation during the build till such time as the new substation is complete and commissioned. The existing transformer can then be removed on grade through Level 1 and the proposed loading dock.

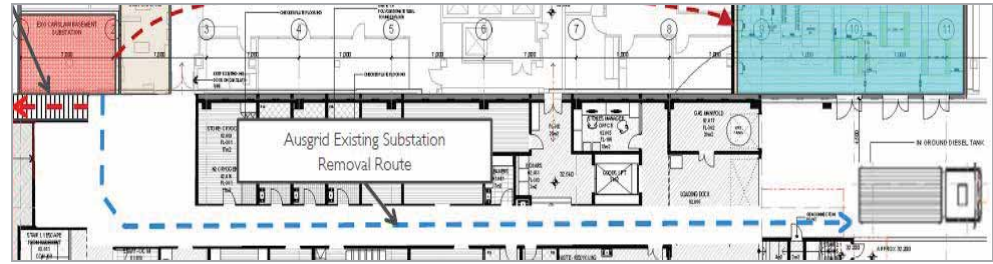


Figure 10: Carlsaw – existing transformer removal route

3.3 Carlsaw Bldg

In addition to the temporary access, tree protection and services diversion works noted above it is proposed to undertake both permanent and temporary works within the Carlsaw Bldg in advance of the building works proper.

Works proposed to be undertaken include:

- Permanent acoustic sealing up of the eastern elevation windows facing the LEES1 site on Level 2-4,
- Temporary protection of windows on Level 5-7,
- Provision of mechanical ventilation of Level 2-4 by way of supply & exhaust air from the northern external balcony walkways,
- Establishment of a temporary alternative route (in lieu of the existing loading dock laneway) for the cartage of goods to/from the building via Level 2

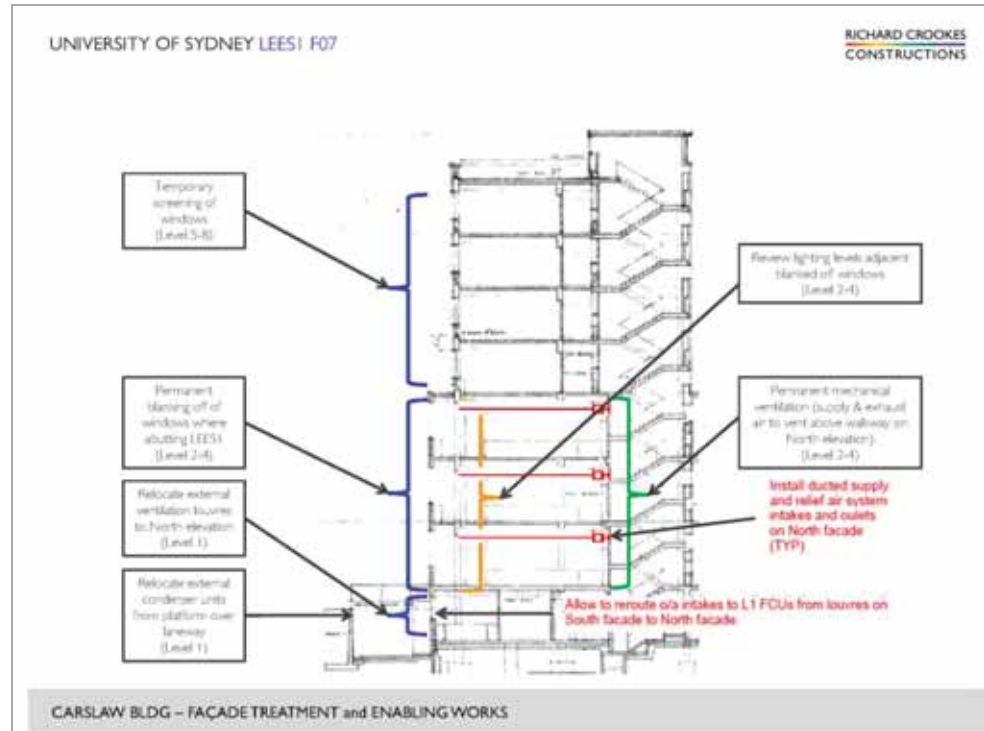


Figure 11: Carslaw facade treatment & enabling works

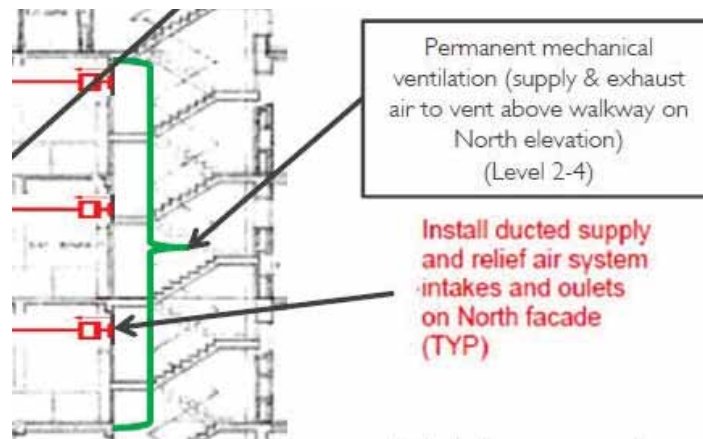


Figure 12: Carslaw ventilation

These modifications, including checking lighting levels and making good of affected existing surfaces and finishes would be proposed to occur either during the Semester 1-2 break or on weekends so as not to impact the teaching services and amenity.

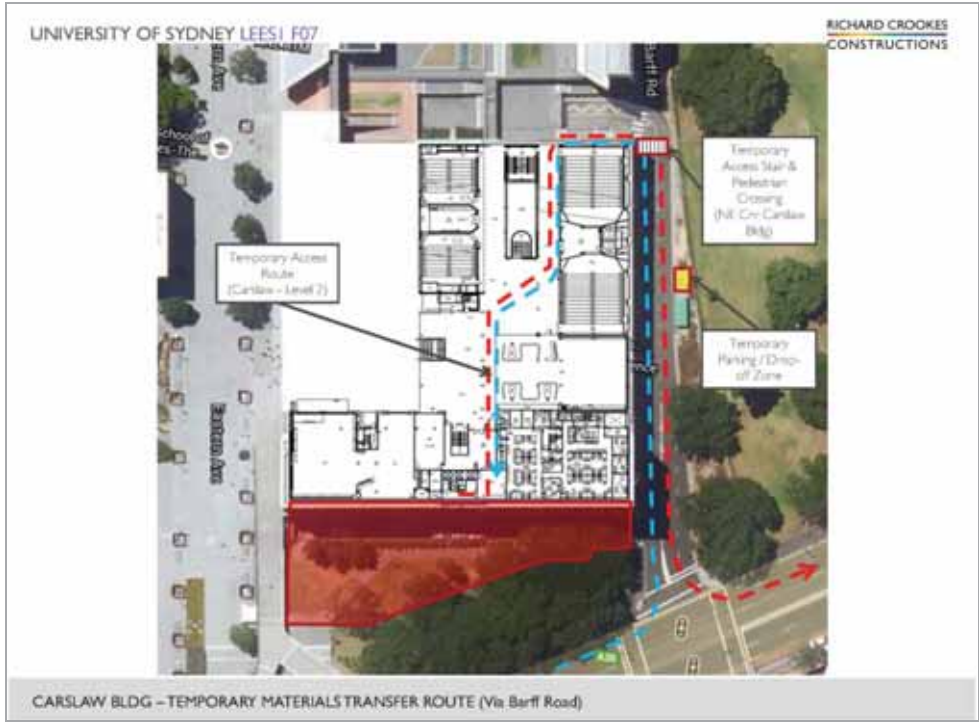


Figure 13: Temporary alternative loading route

3.4 Ground works, Substructure and Superstructure

Ground works and substructure will commence following RCC possession of site.

RCC will commence with the piling works followed by the Bulk Excavation works.

Formwork boxes are the preferred construction technique for the core structures (lifts and stairs) due to their size and limited height. The construction of lift and stair pits will be prioritised above other foundations to limit their impact on following trades.

Foundations will be installed from the western side of the site to the eastern side working towards the site access point.

In-ground services trades will access the site following the completion of the foundations prior to the commencement of the substructure.

RCC notes that the works to relocate the Sydney Water main, the high pressure gas meter and line are proposed to be completed prior to commencing the in ground works and structure. In the event this is not the case then RCC in collaboration with the relevant authority will develop a process / contingency plan where works can commence around the relevant service and leave behind non critical elements of the structure such as slab on grounds. If these elements left behind will then be completed upon completion of the service relocations when the relevant authority has provided approval to do so. RCC has had extensive experience in such areas on projects such as the Kinghorn Cancer centre, Neuroscience Research Australia and the UNSW Kensington Colleges.

The substructure concrete pour sequence will follow the logic established during the foundation construction. Ground slabs with deep slab thickness and/or slabs that are set down in relation to adjacent structures will be poured as a priority.

The pour sequence will enable concrete trucks to access areas adjacent the ground slab being poured.

The hammer head tower crane will be established prior to the commencement of the concrete superstructure. This will be established in the location best suited from the previously mentioned options pending further investigation during the ECI phase of the project.

The superstructure concrete pour sequence will follow the logic established during the foundation construction. The installation of the western cantilever will depend on approval of the innovations proposed by RCC for this item. In the event that this innovation is approved, then these works will be completed on completion of level 08 and the cantilever being installed from levels 05 to 08. If not then the install will simply follow the rest of the structure as it cycles up the building.

Concrete slabs will be poured and back propped until the minimum strength is reached with propping removal sequences (and pour breaks) agreed with the structural engineer.

RCC proposes to setup the concrete pumps and trucks on the eastern side of the project at the Barff Road access point.

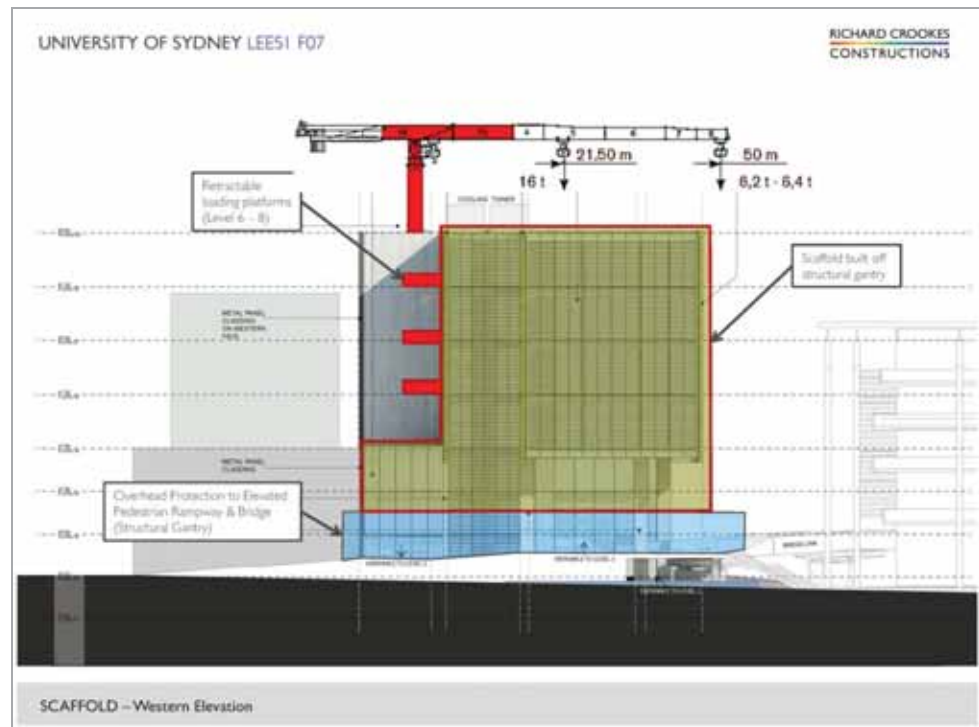


Figure 14: Scaffold

3.5 Facade

The facade team will commence works following the clearing of formwork from the leading edge of the building. The facade team will work to minimise the duration scaffolding is required on the project. Many of the Facade elements including Louvers and cladding will be constructed via elevated work platforms (EWP's) and the project perimeter scaffold.

In the case where Curtain walls are installed to elements of the South and West Facades, these will be completed using both the site tower crane and a smaller crawler crane from the upper levels and be installed from within the building line.



3.6 Services

Once formwork is removed from a typical floor, the external walls and high level services rough-in will commence. Services rough-in typically commences in conjunction with the facade works as the two tasks have minimal impact on each other from a location view point; subsequently productivity and the ability to complete the work areas is not compromised.

In addition, the facade finishes do not require significant landing areas and handling space on typical floors allowing these works to coordinate effectively with each other.

Services trades will use mobile scaffolding, EWP's, duct lifters etc to complete the rough-in works.

Survey marking will be provided to the services trades by the partitioning contractors to outline the location and type of wall construction. Critical high level services elements such as fire dampers will be installed as a priority across the floor, in many cases adjacent services will be installed to ensure the partitioning contractor can access all sides of the services during the wall construction.

Service rough in will continue following the installation of wall framing and single side lining of walls. Again critical walls such as walls containing fire dampers may be sheeted on both sides at a high level, prior to the rough in of services within the wall for quality and inspection purposes.

An inspection of both in-wall and in-ceiling services rough-in shall be carried out prior to the closure of these elements. The inspection shall included sign off from all services trades verifying the satisfactory completion of their own works as well as fitout dependent works such as noggin installation. RCC will also inspect the works to cross verify the subcontractor installation and check the rough in against the room data sheet.

Subsequent to the installation of wall and ceiling finishes, services will be fitted off. The inspection process will be repeated at this stage prior to final paint and clean to ensure no rework is required for the works to comply with the final design.

3.7 Integrated Fitout

Internal non-load bearing walls and ceilings will commence following the installation of the high level services rough in. The wall set out, completed by the partition subcontractor, plays a key role in the services trades' ability to complete their works.

The fitout works are dependent on the facade installation for protection against wind and rain. Whilst wall framing may commence while facade elements are incomplete, internal partitions are susceptible to damage as a result of high winds and/or water ingress.

Critical fire and smoke walls will be completed as a priority on each floor enabling the services trades to maintain their productivity and stay ahead of the main fitout.

Internal trades will use RCC provided scaffolding in atriums and provide their own mobile scaffolding, EWP's etc to complete their works.

Fitout subcontractors are key participants in successful projects and are of particular importance on services intensive buildings such as the LEES1 Project. RCC are a firm believer in the importance of quality assurance hold points in delivering a best practice interior fitout. In conjunction with the Principals Representative and the fitout subcontractors, we will agree an ITP/hold point regime that will be strictly monitored. We will ensure that the three critical fitout "hold points" are rigorously enforced. These are;

- Specialist Wall Hold Points - Confirm installation of fire, smoke and clean wall construction
- Ceiling Hold Point – Confirm installation of all in-ceiling noggin supports, specialist services, FF&E framing support and door frame support
- In-wall Hold Point – Confirm installation of all in-wall services installation, services in-wall support framing, services fitout noggin installation and FF&E noggin installation

RCC has considered the complex nature of laboratory design for both teaching labs on the scale presented here on the LEES1 project in a similar nature to those completed on the UTS

Thomas Street Project and the UTS CB04 Science building Refurbishment as well as research laboratories completed at these projects to as well as The Kinghorn Cancer Centre;

- The floors and walls of the laboratory shall be smooth, easy to clean, impermeable to liquids, and resistant to commonly used reagents and disinfectants.
- Structural joints, where required, shall be durable, impermeable, easy to clean and shall resist deterioration due to commonly used cleaning agents and, where applicable, exposure to ultraviolet radiation.
- Internal fittings and fixtures, such as lights, air ducts and utility pipes shall be selected and fitted to facilitate cleaning of any horizontal surfaces on which dust can settle.
- Bench tops shall be able to withstand heat generated by general laboratory procedures, e.g. flaming loops and heating of media.
- Open spaces between and under benches, cabinets and equipment shall be accessible for cleaning to prevent build-up of material providing refuge for invertebrates and microorganisms.
- Windows in the laboratory shall be closed and sealed.
- Hooks or storage facilities for laboratory gowns that prevent cross-contamination shall be provided within the laboratory, near the exit.

RCC has through its experience built a successful working relationship with companies such as Asia Pacific Consulting, who specialise in laboratories of all levels. Together RCC with this relationship will complete inspections for the laboratories during construction and on completion to ensure that they comply with current requirements to allow certification of the PC2 labs by the university.

RCC anticipate the following hold points during construction of the LEES1 Project

- During heavy works where vibration controls is critical to neighbours;
- Prototype testing for example: Facades, Specialist Rooms, Construction materials sampling for clean rooms;
- Structural tolerances for example: Concrete frame;
- Pressure services for example: gas, water, med gas;
- Prior to closing up all wall surfaces;
- Risers & Penetrations;
- Load & Pull testing for example: hanging elements and rope access points;
- Services during commissioning but prior to mechanical completion and placement into service;
- Finishes;
- Landscaping;

Authorities – Energy, Council (Stormwater, Roadways etc.), Gas, Water and finally Fire Brigade;

RCC anticipates the following testing points during construction of the LEES1 Project

- Progressive pressure testing prior to closing up of built surfaces for example: walls, ceiling;

Construction Management Plan

- Progressive sealing of mechanical ductwork as the works progress i.e.: to avoid debris/dust settling in ductwork, together hygienic cleaning of internal services (and recording or witness inspections thereof);
- Progressive commissioning & handover planning starting from site meeting No.1, which involves the FM services contractor or Engineering Services Dept; and
- Close liaison & involvement with the key stakeholders & building manager long before completion to ensure the User Group requirements (which do progressively change) are fulfilled;

Construction Management Plan

3.8 Commissioning

With Projects as technical as the LEES1 Project commissioning is a vital component that will need to be completed progressively throughout the construction process given the varied nature of services and systems that needs to be implemented from ICT and Security to Fume Cupboards and Building Management Systems.

Commissioning and Handover planning will commence during the early stages of Construction and will include external services that are the subject of alteration / augmentation of this Project.

RCC will ensure that all subcontractors selected for the project have the capability to complete such tasks and have the experience and processes to do so. Coupled with RCCs own intensive ITP and commissioning schedule, we will ensure that systems are fully commissioned on completion.

After experience gained on projects such as Neuroscience Research Australia, Ingham Reasearch Institute and Hornsby Hospital (STAR) we propose that RCCs Services Manager lead the commissioning team for the project. His role will be to review all commissioning data provided by the subcontractors and ensure that all requirements within the project PPR in regards to services functionality and operation are being achieved. We will then provide CIS all testing and commissioning records to verify that the desired commissioning result have been achieved.

The basic formula for successful building commissioning involves a design team developing a commissioning scope and plan, as well as reviewing the design documents, developing checklists and training plans for delivery by the services subcontractors, plus witness and test reports during the construction phase, and performing functional testing progressively as the Project nears completion.

Building commissioning planning manages processes for methodically verifying that all of the building systems (including mechanical, hydraulic, electrical, laboratory gases, lifts, fire/life safety systems, building facade, interior systems (e.g. AV), utility plants, lighting, wastewater, controls, ICT and building security) meet the performance requirements as intended within the design documents. Some mechanical systems will also need to be recommissioned to retune the building as the full seasonal cycle passes.

For handover the following deliverables will be presented:

- operation and maintenance manuals
- training for end users and maintenance contractor
- as-constructed drawings (in both PDF & AutoCAD format)
- commissioning reports, including test results and certificates (hard and soft copies)
- system details, including plant and equipment data
- balancing
- defects identification and closeout
- builder's users guides
- warranties
- certification
- post-completion certification (if required)

Construction Management Plan

The following steps will take place to successfully manage commissioning, handover and Project completion:

- Develop and agree the BCH methodology.
- Develop and agree a BCH programme and schedule
- Explain the BCH process and timeline to the stakeholders.
- Define the deliverables and milestones for each element of the plan.
- Outline the proposed commissioning team.
- Ensure early identification and rectification of defects and non-conformances.
- Develop and agree the procedure for document approval, acceptance of the completed works and handover
- Establish a maintenance plan for preventative maintenance, warrant and defects rectification management during the Defects Liability Period.
- Outline the witness points prescribed in the Contract documents.
- Complete operations and maintenance manuals and electronic uploads.
- Outline compliance deliverables in accordance with the Building Code of Australia.
- Provide training to nominated representatives on the building operations, equipment and systems as part of the commissioning to meet contract compliance.

Construction Management Plan

Attachments:

Site Establishment

Site Fencing and Hoarding (Sheets 1 & 2)

Overhead Protection

Traffic Management Plan

Loading and Construction Zones

Materials Handling – Site Plan

Materials Handling - Level 2 (Ground Level) Plan

Materials Handling – Western Elevation

Scaffold

Carslaw Building - Façade Treatment and Enabling Works

Carslaw Building – Substation Access and Decommissioning

Carslaw Building – Temporary Materials Transfer Route

