APPENDIX D

UTS CENTRAL PROJECT

Construction Management Plan – Phase 2

Document No: Z-RCC-PLN-

Rev Date	Rev No	Revision Description	PM's Initials (acceptance of changes)
June 2016	0	Original Issue	JA
July 2016	1	UTS Comments included	JA
April 2017	2	Figure 3 amended	KP

Project Position	Signature		Revisions			
			<Date>	<Date>	<Date>	<Date>
Project Director			<initials>			
Project Manager			<initials>			
Contract Administrator			<initials>			

Contents

Section 1 Introduction

1.1 Introduction to the Project

The Project consists of two (2) major components being developed as a single Project known as the UTS Central Project. The two (2) stages are:-

- Building CB02 Tower including Podium Renovation
- Building CB01 Podium Extension and Facade

The project is located at the corner of Broadway and Jones Streets, Ultimo. Access to site is off Broadway.

The works are the design and construction of:

- Building CB01 Podium Extension and Facade

  Extension of existing floor plates to Broadway street frontage and construction of new façade. The façade will connect with the CB02 façade as one building element.

  Podium Upgrade works will be to Levels 3-7, and will maintain the access across to building CB02 at all levels and the extension will flow through at all levels.

Contract type Amended AS – 4000 1997. There are currently four (4) Separable portions:

1. Pre Construction Services (“PCS”)
2. CB02 works, including completion of Library & Learning Commons
3. CB02 Tower Fit out
4. CB01 works including Podium extension

The project will be seeking a Green star certification.

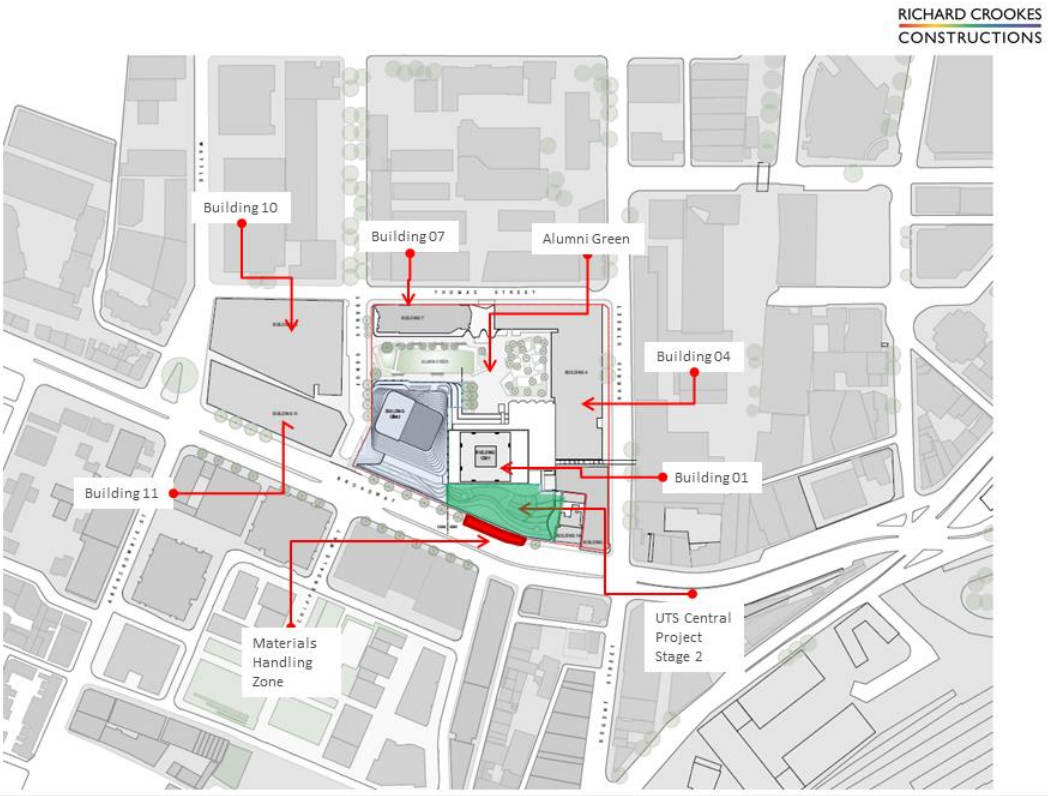
1.2 Overview of the Plan

RCC has developed a construction methodology specifically tailored to the complex requirements of the UTS Central Project Stage 2. We believe this methodology will minimise disruption to the UTS operations and allow a successful and smooth project delivery. Specifically, consideration has been given to the following;

- Site Establishment
- Demolition
- Structure
- Facade
- Services Installation
- Integrated Fit out
- Defects Management
- Commissioning Management

This Plan is to be read in conjunction with other RCC Management plans.

Figure 1 shows the location of the project and its relationship to other UTS facilities.



Cohabitation - General

Figure 1 Project location and surrounding buildings

Section 2 Decanting of UTS Operations

2.1 Levels 1 to 3

To allow the project to proceed, UTS operations will need to be relocated from the construction zones.

The occupied areas of Levels 1 to 3 that are underneath the slab extensions along Broadway will need to be vacated and their operations decanted to alternative accommodation for the duration of construction. This includes the Food Courts and Loft Bar on Level 3 and Workshops on Levels 1 and 2.

2.2 Levels 4 to 8

At the commencement of demolition, hoardings will be established internally as shown in Figure 2 to separate the southern construction zones from operational areas on Levels 4 – 7.

Once the Façade woks are completed and these levels are watertight, hoardings will be removed and UTS operations on the northern faces of Levels 4 to 7 will need to be decanted to allow renovations and refurbishment of these areas.

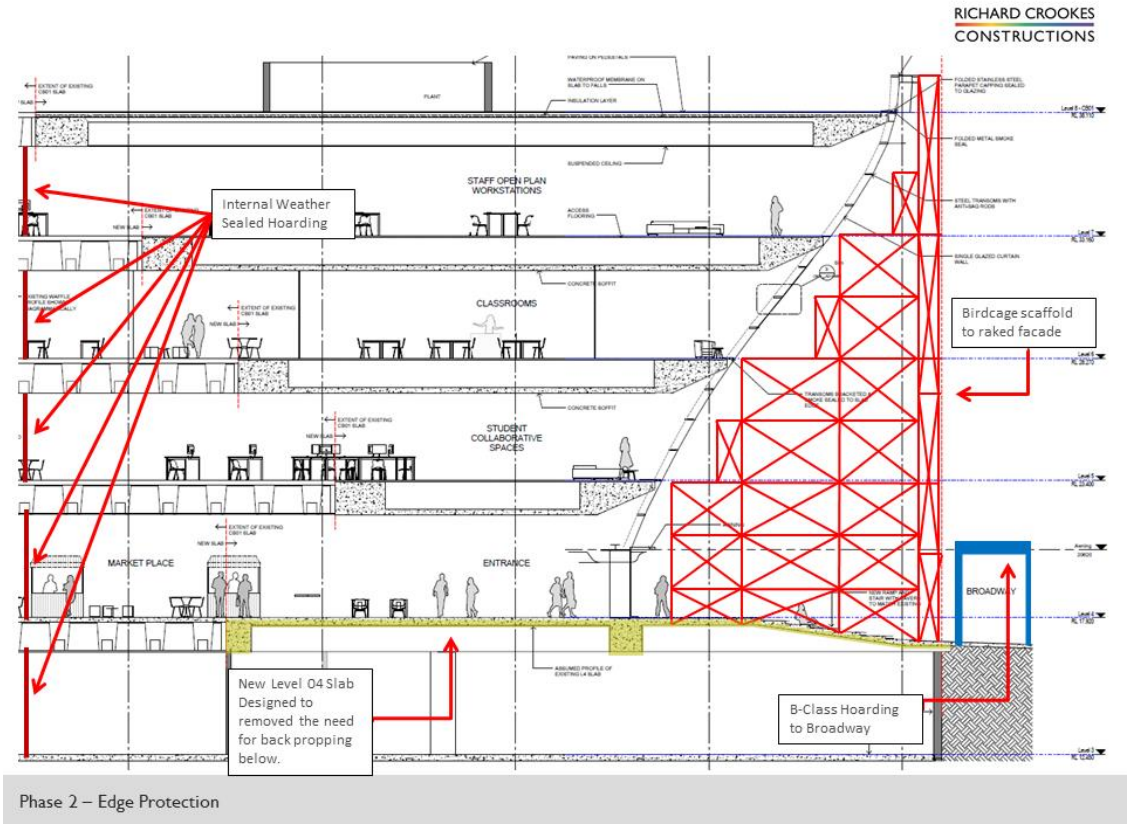


Figure 2 Internal Hoarding

Section 3 Site Establishment

3.1 Hoardings and Fences

The UTS Central Project is located in the heart of the UTS City Campus. The project location means that there will be extensive boundaries and interactions between the project and operating university. For Stage 2, the CB01 Podium Redevelopment, most of the interaction will take place on the Broadway frontage.

RCC will install a B-Class Hoarding to the Broadway frontage of Building 01. This will allow for the ongoing use of the Broadway footpath by pedestrians throughout the construction of the UTS Central Project Stage 2

RCC will also establish a materials handling Zone to the Broadway footpath as shown in Figure 3. During construction pedestrians will be redirected through the construction site around the materials handling zone via a 10kPa tunnel.

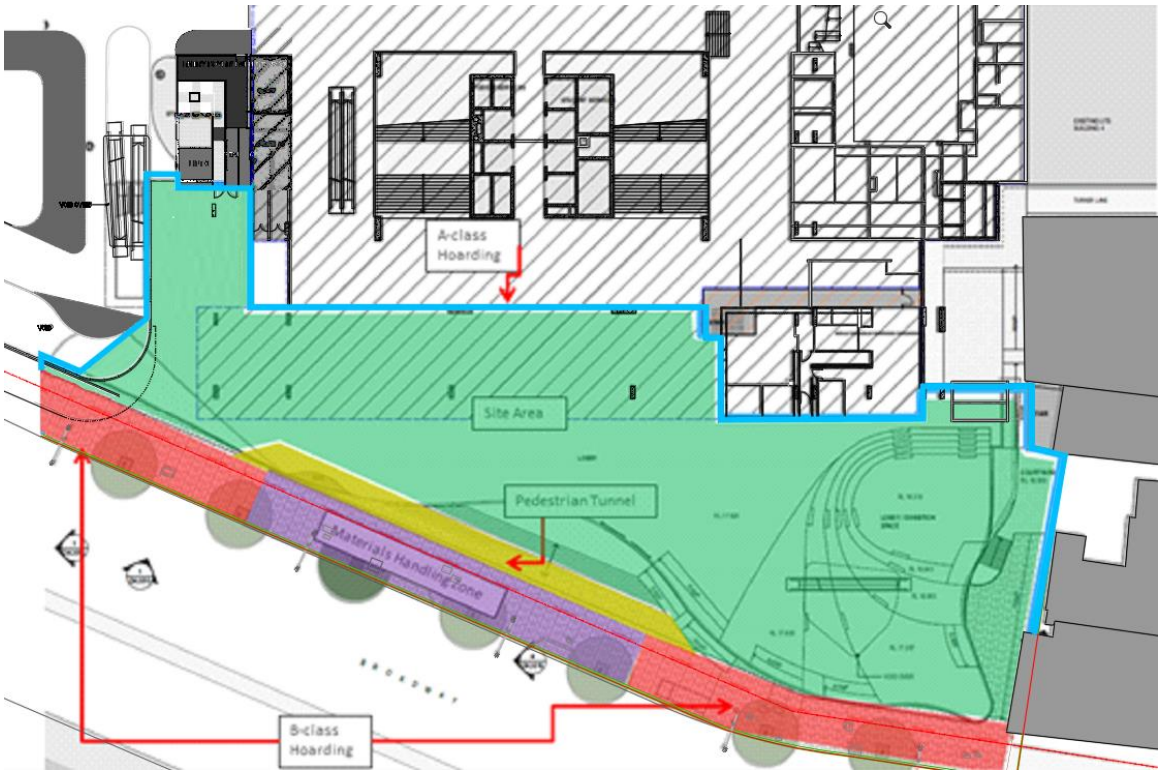


Figure 3 Site Establishment

3.2 Traffic Management

Construction Traffic will proceed east along Broadway before pulling into the Project Materials Handling Zone which will be located on the existing Broadway footpath with pedestrians being diverted through a pedestrian tunnel past this zone.

Given the location of the Construction Materials Handling Zone on Broadway, the number of vehicles on Broadway will increase slightly during times where the site is active. RCC have understood the impact of increased traffic and will ensure that the materials handling zone is large enough so that vehicles are not queued outside the site on Broadway but are brought into the materials handling zone to wait for unloading.

RCC will maintain full time traffic management staff to control both entry and exiting of trucks as well as control the pedestrians in the area.

Construction traffic flow paths are shown in Figure 4.

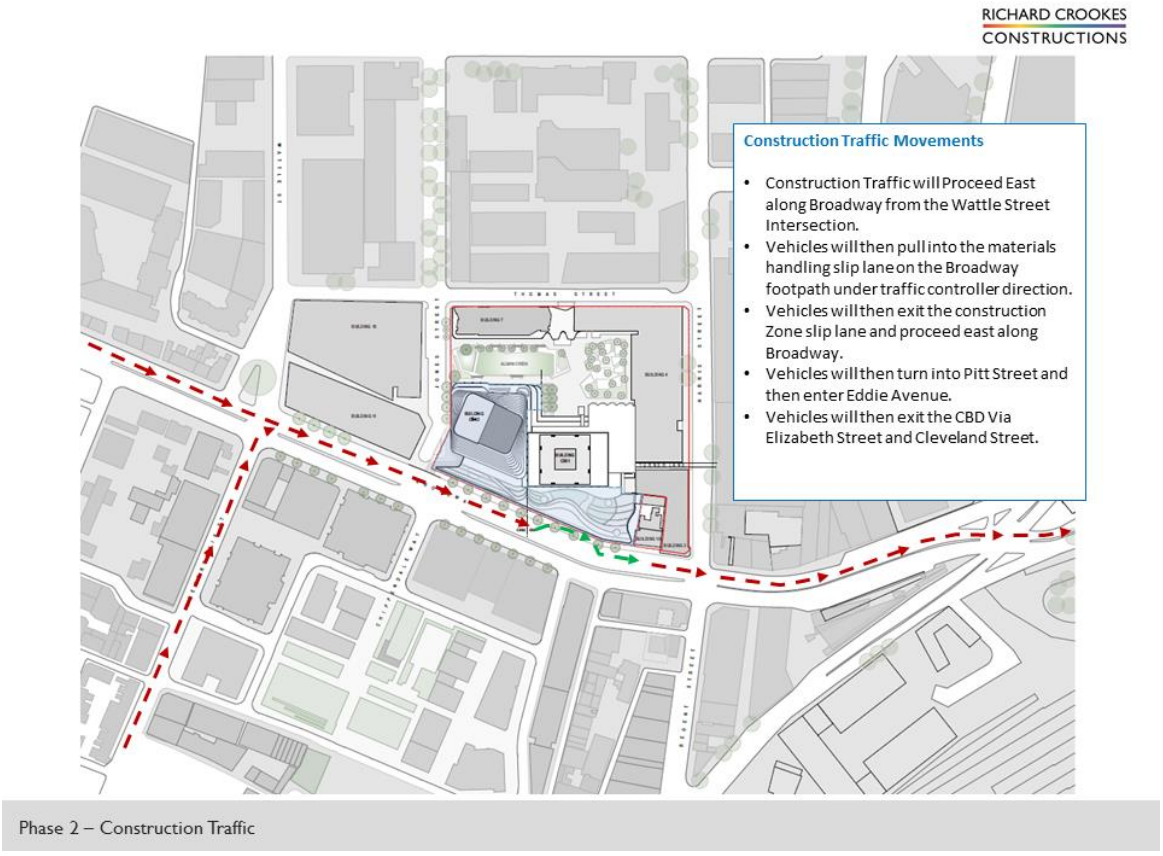


Figure 4a. Construction traffic movements

Traffic Movements

- Construction Traffic will Proceed East along Broadway from the Wattle Street Intersection.
- Vehicles will then pull into the materials handling slip lane on the Broadway footpath under traffic controller direction.
- Vehicles will then exit the construction Zone slip lane and proceed east along Broadway.
- Vehicles will then turn into Pitt Street and then enter Eddie Avenue.
- Vehicles will then exit the CBD Via Elizabeth Street and Cleveland Street.

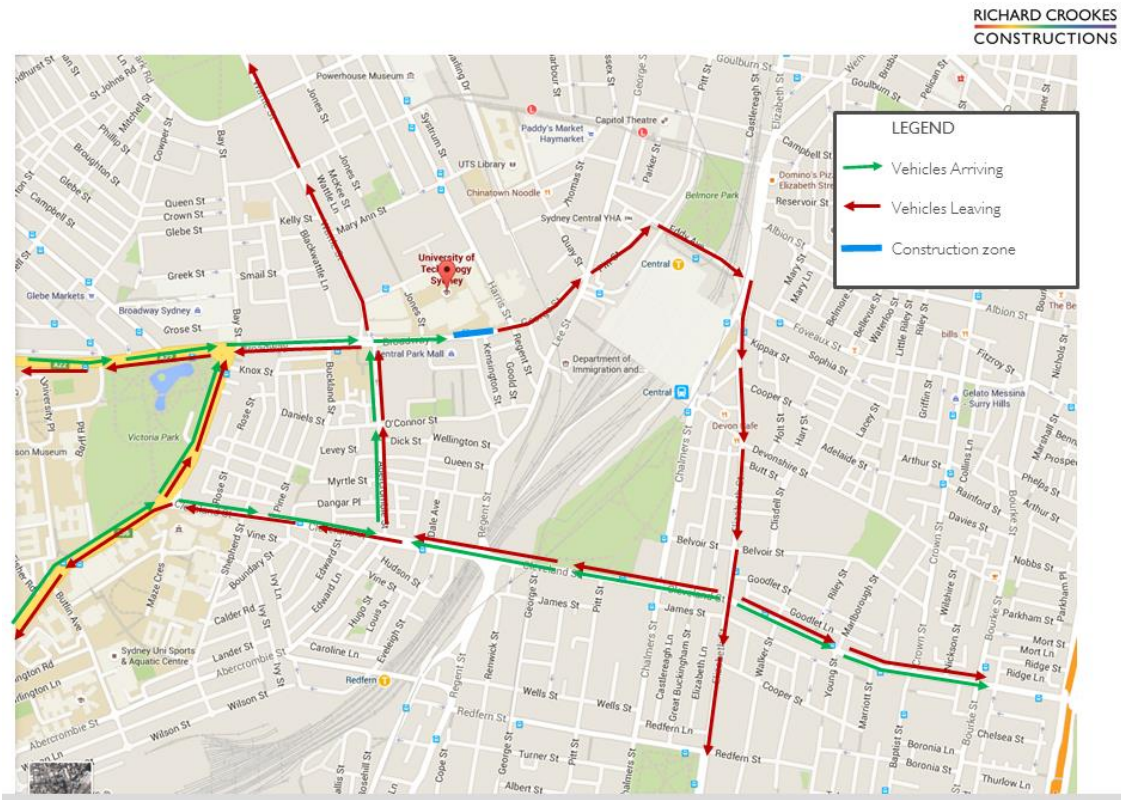


Figure 4b. Construction traffic movements

3.3 Pedestrian Management

RCC understand that as outlined in the UTS Movement and Unscheduled Activity Report (Gehl Architects 03/2013) the number of pedestrians that move around the campus is significant. The extract, shown in Figure 5, from the report identifies that approximately 21,000 people per day utilise the Broadway footpath between Quay Street and Jones Street with 9,000 per day accessing the existing Building 01 from Broadway. A further 9,000 people per day use Broadway between Jones Street and Bay Street.

RCC's proposed pedestrian access plan around the site reflects the current main pedestrian routes as set out in the UTS Movement and Unscheduled Activity Report.

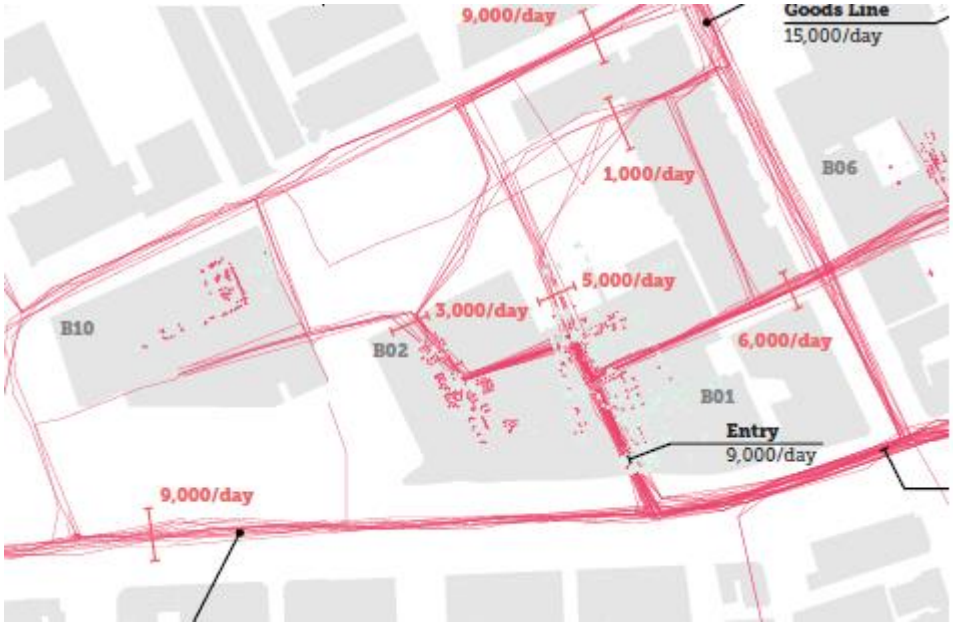
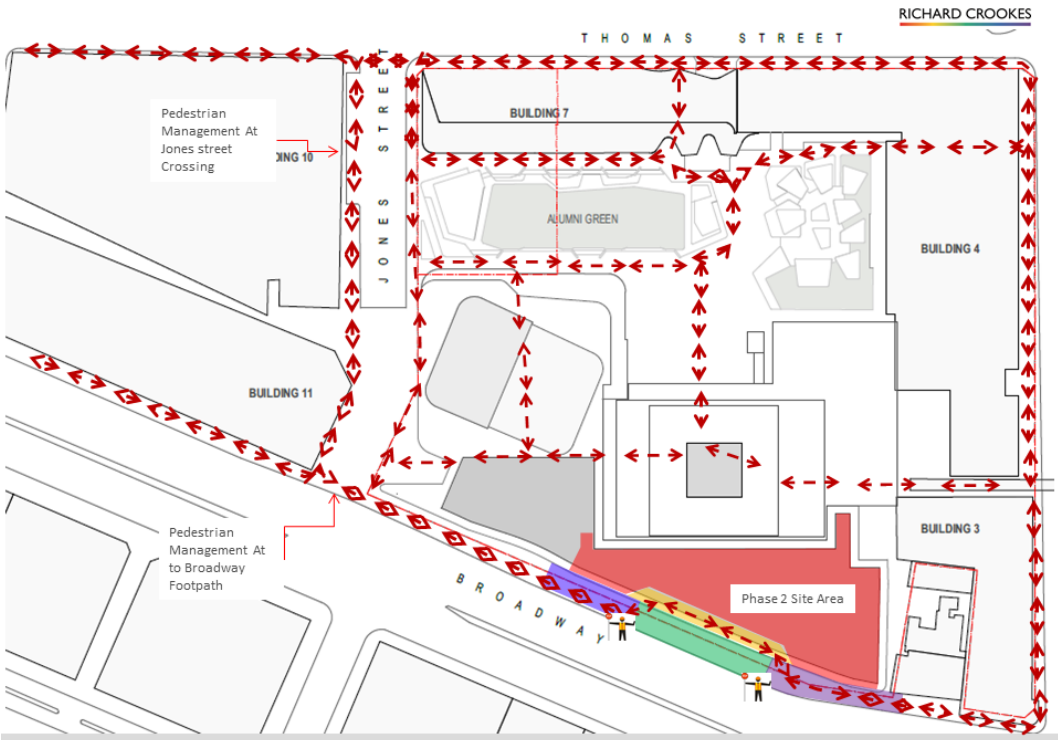


Figure 5 Extract from UTS Movement and unscheduled activity report

The main points where pedestrians will be impacted will be along Broadway where the materials handling zone will be located. Thus RCC has proposed to ensure that full time pedestrian management personnel are positioned at these locations to mitigate any potential incidents.

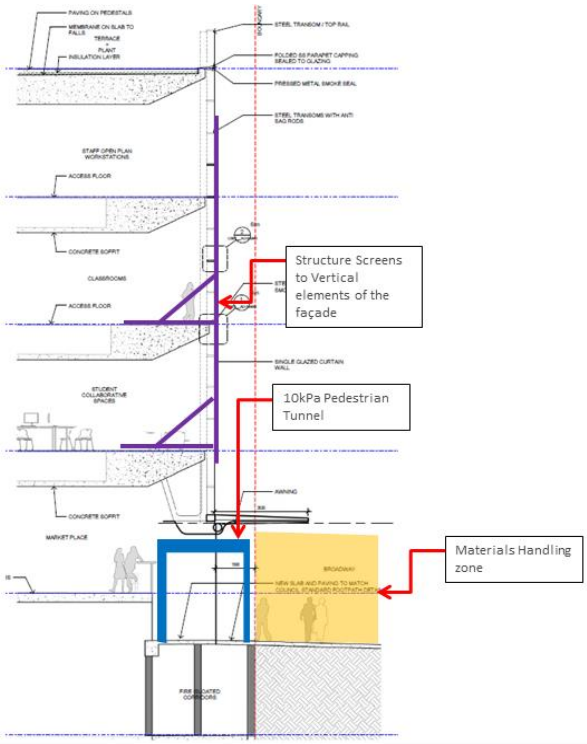
The project will establish clear signage and maintain access along the Broadway footpath as shown in Figure 6. RCC will establish a B-Class hoarding to the Broadway footpath to provide overhead protection to all pedestrians, as shown in Figure 7.

Access to all other footpaths and buildings will not be impacted by the project. However, in the event that a change is required, this change will be communicated to the UTS Project Management Office by the Project Stakeholder Manager, and this Management Plan will be updated.



Phase 2 - Pedestrian Management Plan

Figure 6 Pedestrian movement around the Project



RICHARD CROOKES CONSTRUCTIONS

Phase 2 – Edge Protection

Figure 7 Pedestrian tunnel adjacent material handling zone

3.4 Site Accommodation

RCC propose to use the site accommodation that was established for the Phase 1 works located in the cold shell area of CB02, level 02. This will provide access to the amenities from Jones Street as well as dry access to the work front via Level 02. In the event that this is not available, RCC will work with UTS to develop a plan for the accommodation of the workforce.

RCC envisage a peak workforce of approximately 250 workers. The accommodation in the cold shell areas of CB02 level 02 will be approximately 900m^2 to provide sufficient area. This accommodation will be accessible via the new fire egress route from level 02 to Jones Street where a Pedestrian gate will be installed.

The area proposed for this site accommodation is shown in Figure 8.

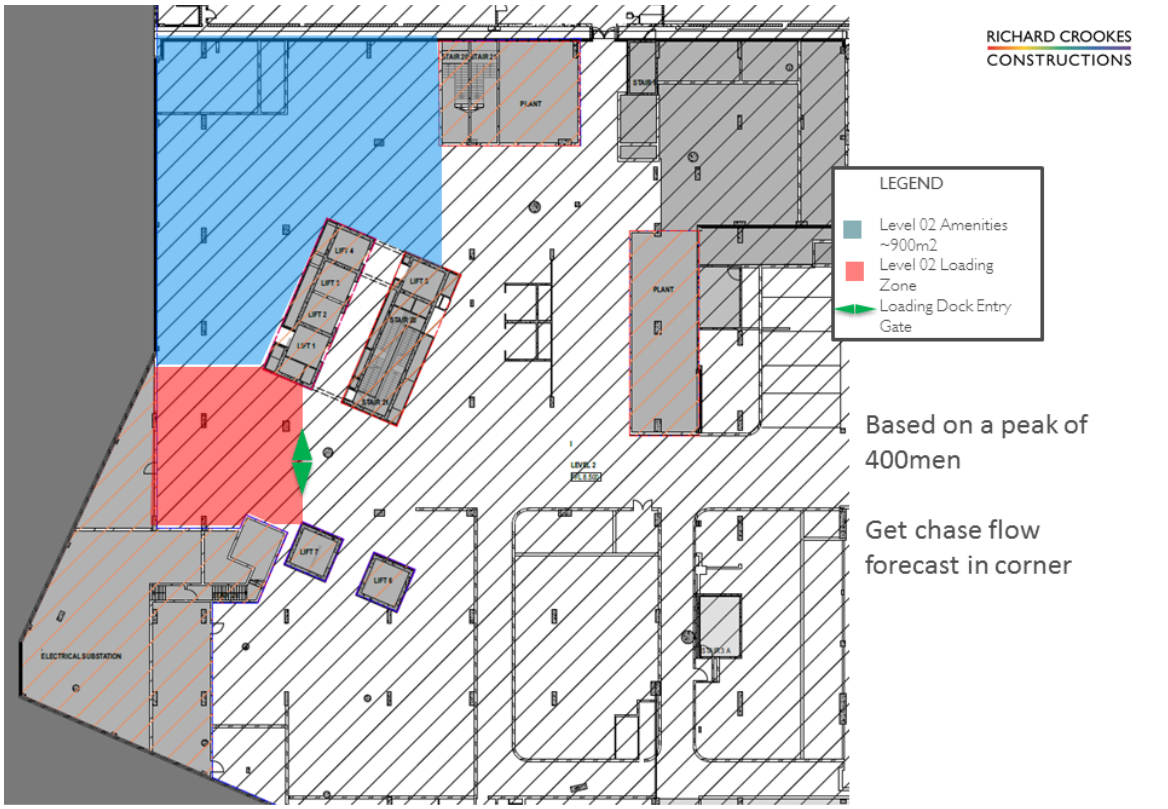


Figure 8 Level 02 Accommodation

Temporary services for the project will be taken from the existing power, water and gas supplies to the UTS Campus. These will be taken from single points and reticulated throughout the project. Each connection to UTS services will have a separate meter to track use.

RCC has assessed the service requirements for the new project and have determined that the current capacity within the campus will suffice for the construction needs without having an effect on the daily operation of the campus.

The project will establish a muster point in the adjacent Jones Street pedestrian area where in the event of an emergency on site, the site population will gather as shown in Figure 9.

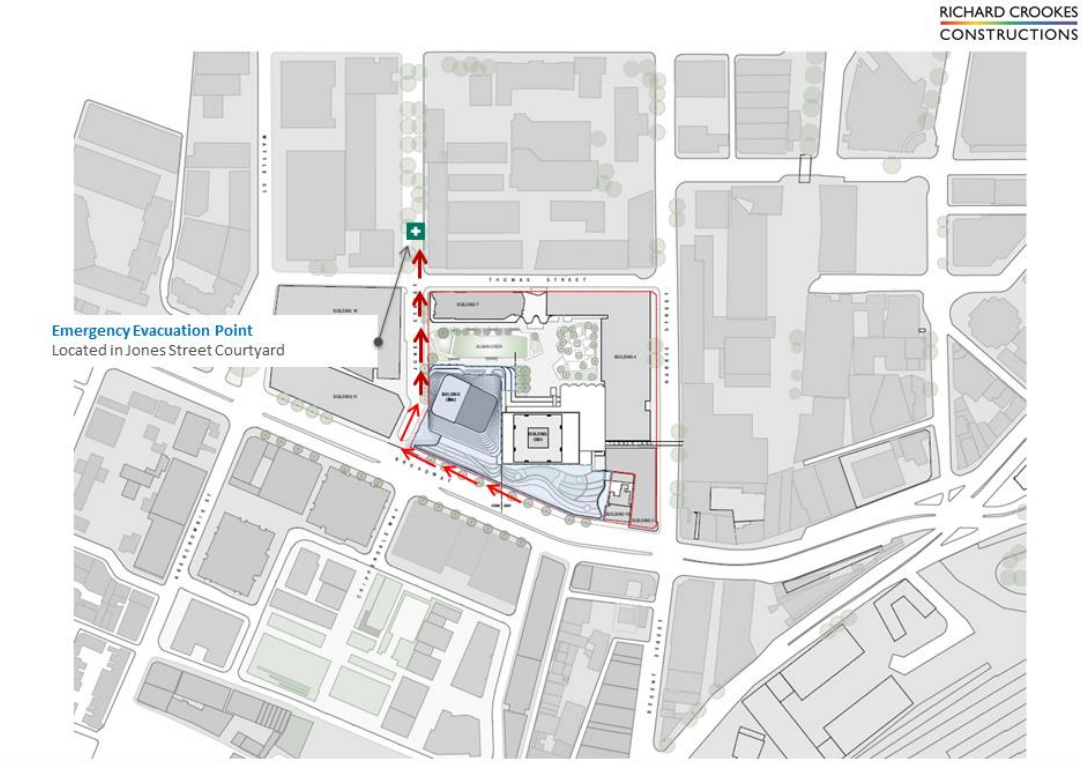


Figure 9 Site Emergency Evacuation Point

Section 4 Demolition

4.1 Enabling works

To enable commencement of works on site, adjustments to the existing fire egress from the lower levels of CB01 will be required, where fire egresses may be impacted by the works. These works will be completed prior to the commencement of major works to ensure that the remaining occupied CB01 building can remain in use during the main works.

4.2 Level 02 Loading Dock

The Level 02 Loading dock will be an area shared by both RCC and UTS for the duration of the UTS Central Project. The loading Dock will be augmented to provide areas for use by both UTS and RCC in such a way that will be both safe and facilitate the needs of both parties.

RCC will provide a Dock Manager who will manage all RCC vehicles utilising the Level 02 Loading dock for access. This person will work closely to maintain all pedestrian walkways, hoardings and access ways including all signage installed to the area.

Segregation between the construction site and the loading dock will be provided by a full height hoarding with operable and lockable gates. This gate will be kept shut at all times when construction vehicles are not using the loading dock. Construction Traffic will be required to follow all traffic signals and speed limits of the existing loading dock.

The proposed Loading Dock arrangements are shown in Figure 10.

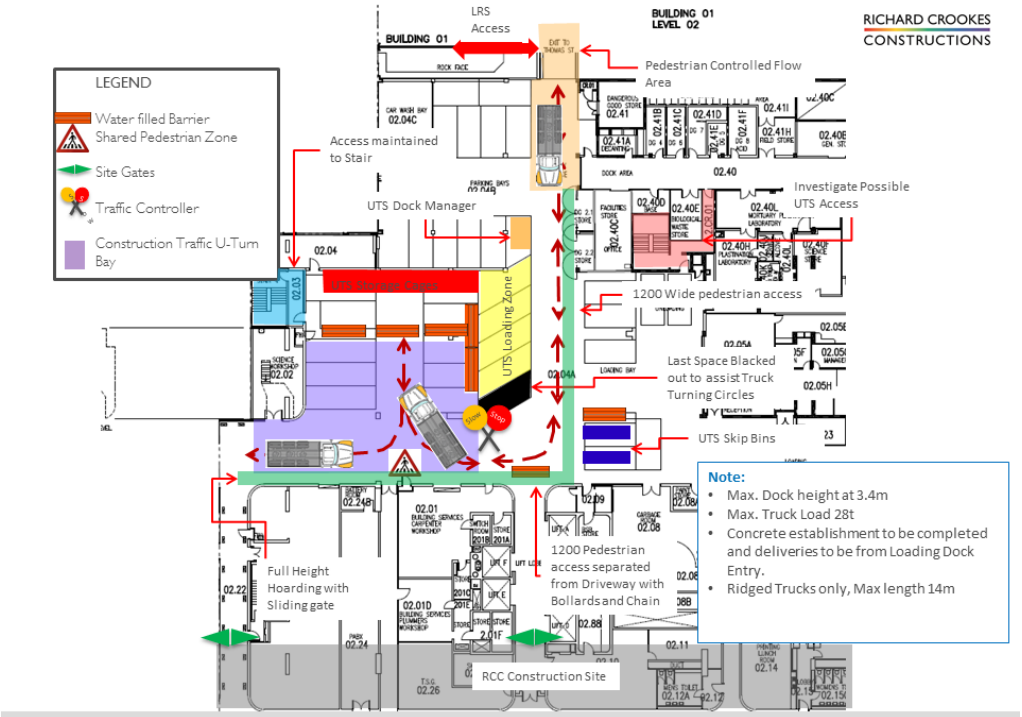


Figure 10 Loading Dock Establishment

4.3 Services Diversions

There will be some services in Building 01 both in the lower levels below ground and the higher levels that will need to be diverted or capped. Where services cannot be diverted, then they will be protected and monitored throughout the project.

4.4 Structural Strengthening

As outlined in the AECOM due diligence report, there will be a need to both strengthen the existing structure below level 03 as well as the requirement to introduce new structural elements to allow for the loads of the new building above. RCC will complete these works below ground while the façade of CB01 is being removed with access via the level 02 loading dock. The level 04 slab will remain in place as long a possible to provide separation between the two work fronts.

The new elements of the CB01 Level 04 slab will poured to a strength such that it will allow for the early removal of all props for the fit out below level 04 to commence while works are commenced above level 04.

During this phase, the level 02 Loading dock will be used as the main materials handling location for both demolition materials being removed and new materials being installed below ground. The loading Zone on Broadway will be used for all works above ground.

4.5 Edge Protection

The existing facade to the CB01 Podium will need to be enclosed in a scaffold based out on each balcony to allow for the safe removal of the scaffold and the precast concrete hand rail. This scaffold can be progressively removed to allow for the new structure to be completed.

Indicative demolition scaffold is shown in Figure 11.

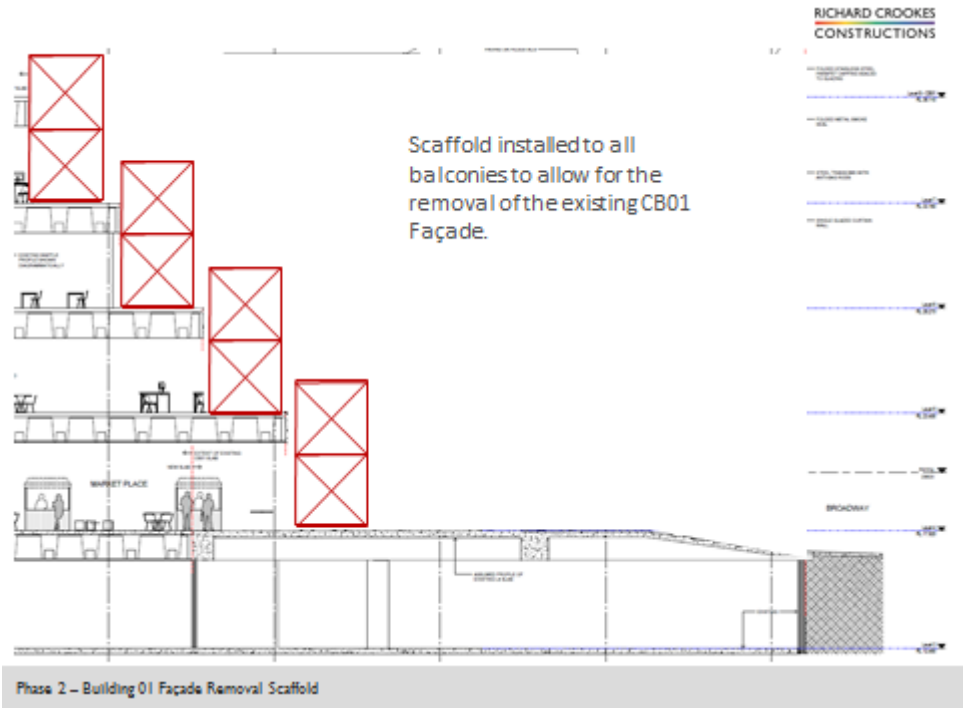


Figure 11 CB01 Demolition Scaffold

Internal hoardings will be established along the boundary of CB01 podium Levels to segregate the buildings for demolition and subsequent construction.

Section 5 Structure

5.1 Craneage

RCC plan to install a single Luffing Crane to the project. This crane will be able to reach the entire project as well as the materials loading zone on Broadway. The aim will be to install the crane off grillage to the level 03 slab with back propping as required.

Proposed crane location is shown in Figure 12.

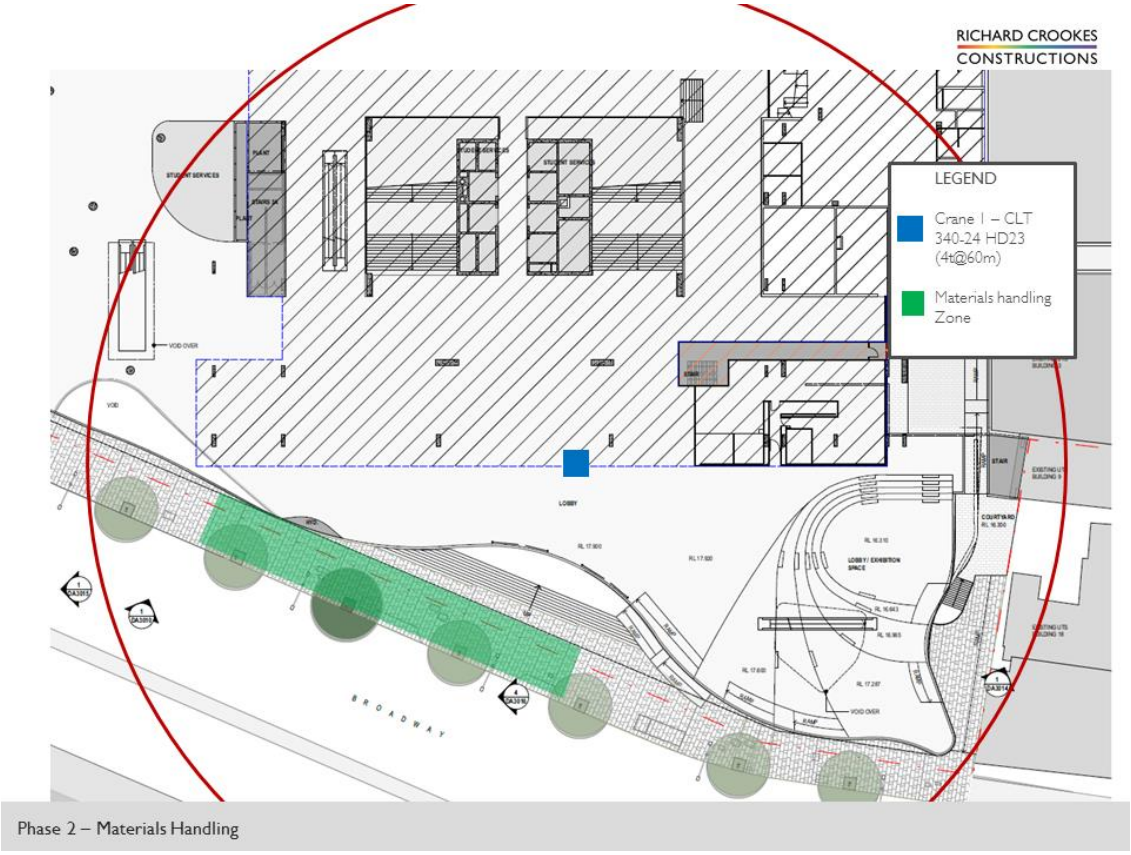


Figure 12 Project Tower Cranes

5.2 Plant and Equipment

The project will make use of man and materials hoists and a materials formwork hoist. Locations are shown in Figure 13.

The man and materials hoist will be installed with in a penetration of the new structure. RCC envisage demolishing sections of the level 02 structure to allow it service this level too.

A formwork hoist will also be provided between the first and second pours. This will be removed progressively as the structure is competed.

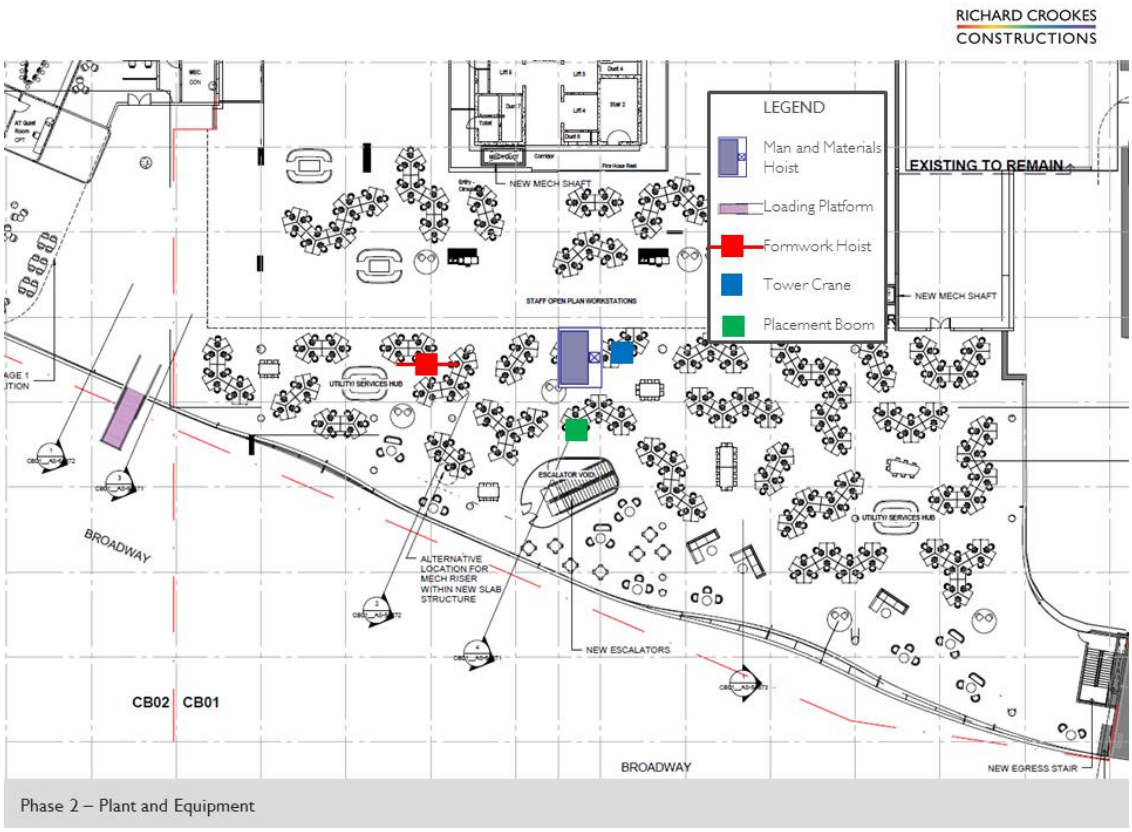


Figure 13 Project Hoists and Loading Platforms

The project will also utilise loading platforms. These will be installed to the western end of the south facade where the facade tends to be more vertical.

The project will require the use of a concrete placement boom. This boom will be located to allow access to all areas of the concrete decks. Concrete pumps and trucks will be located in the Broadway materials handling zone following the previously identified construction traffic management plan.

Plant and Equipment are shown in Figure 13.

5.3 Pour Break Ups

The project will consist of a total of 15 major Concrete Pours from levels 04 to Level 08. Podium levels (L04 to L08) will be broken into 3 pours. The main factor for determining the number of pours relates to both the areas of each pour as well as the ability to pump the quantity of concrete on any given day given the site establishment.

Indicative pour break ups are shown in Figure 14.

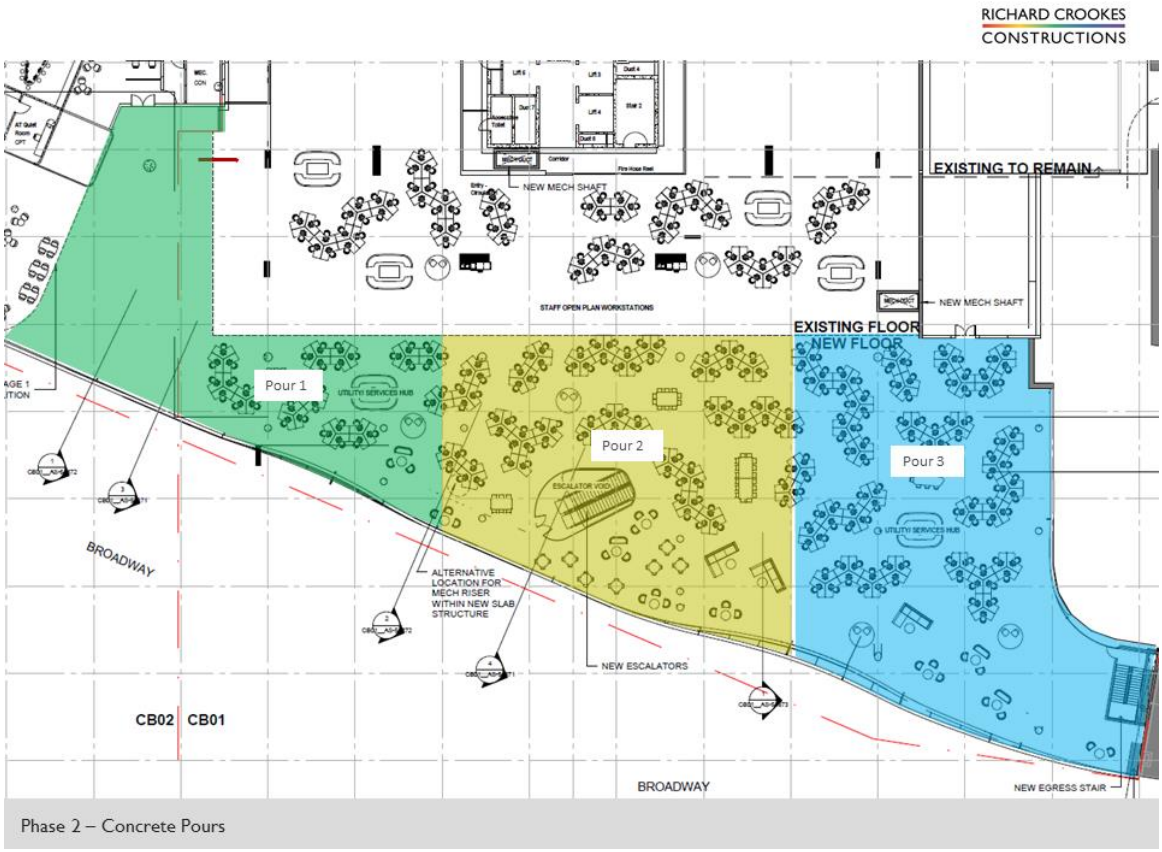
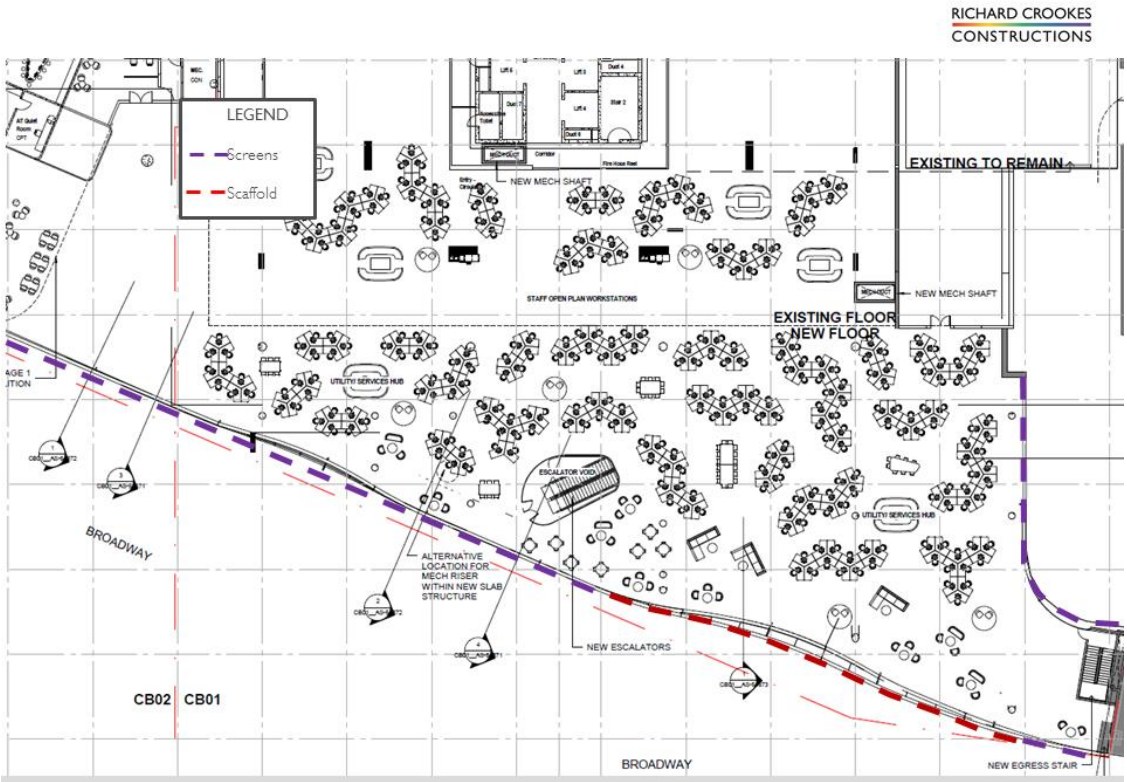


Figure 14 Podium Pours

5.4 Structure Edge Protection

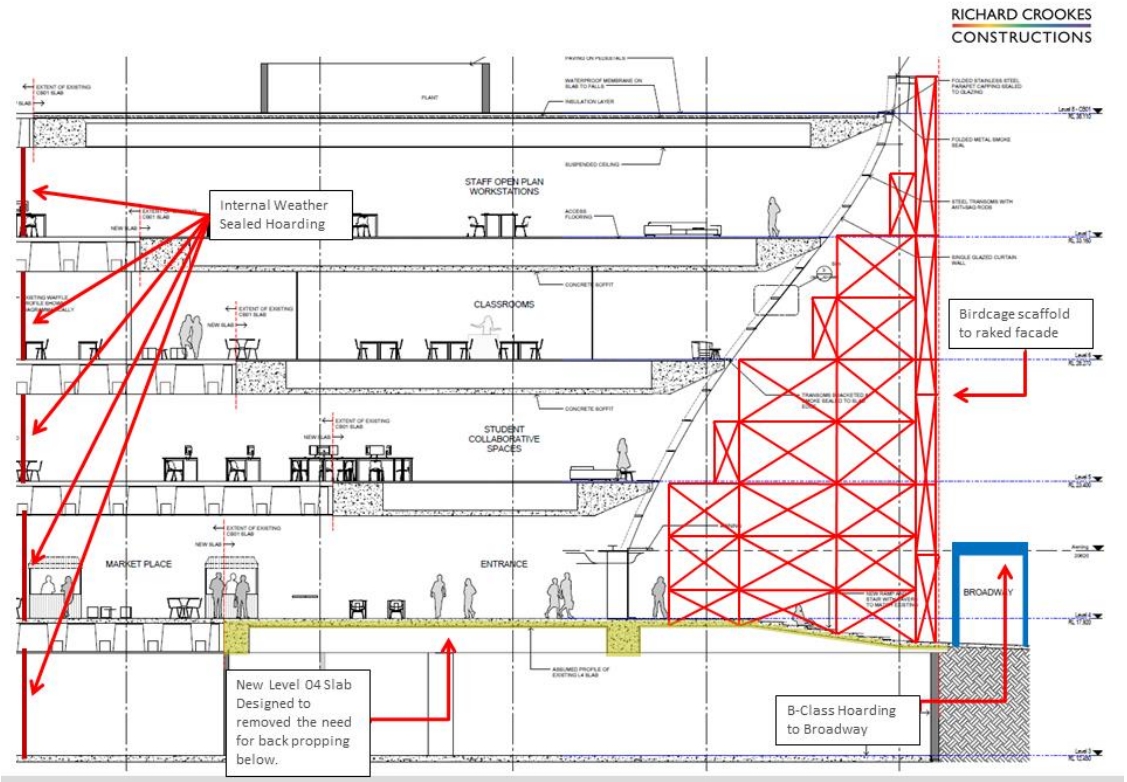
The project will use a combination of both structure screens and scaffold to provide edge protection for the installation of the structural elements as shown if Figures 15, 16 and 17.

Screens will be used on the podium where the façade appears to be vertical. However, on the eastern side of the southern elevations where a miss alignment occurs, scaffold will be installed given the significant cantilevers from one level to the next.



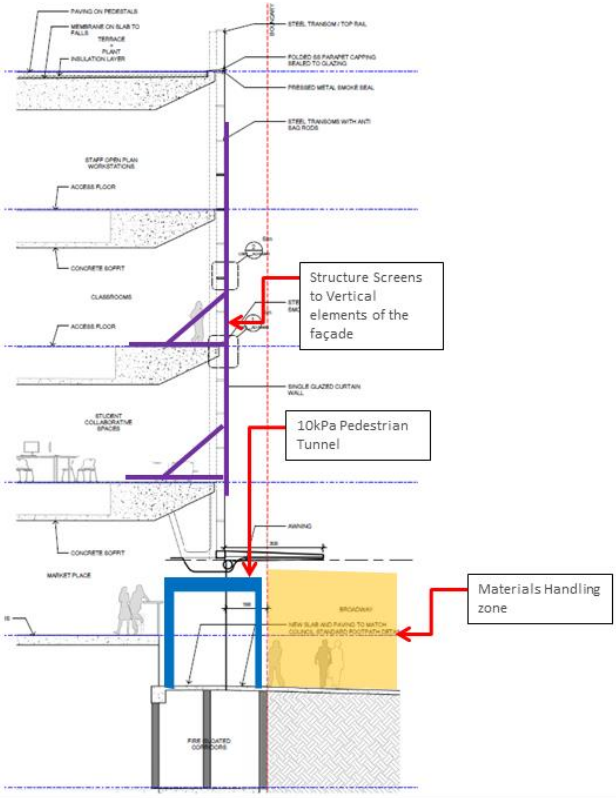
Phase 2 – Edge Protection

Figure 15 Edge Protection



Phase 2 – Edge Protection

Figure 16 Scaffold edge Protection



Phase 2 – Edge Protection

Figure 17 Screen edge Protection

Once the back propping is removed from the podium levels, all screens and scaffolds will be removed and replaced with a handrail to allow for the installation of the façade elements.

Section 6 Facade

6.1 Façade Design Assumptions

RCC has assumed that the Façade to the CB01 extension will be a combination of curtain wall style façades to the vertical elements as well as structural steel with specialty glazing to the concaved cantilevered elements.

Thus an installation and sequencing process used for similar projects has been assumed using a secondary crawler crane for the installation of the main façade components. A similar approach for edge protection, handrails and infilling to locations of loading platforms and like has also been assumed.

6.2 Façade Edge Protection

Given the nature of the Façade, the installation will need to be completed behind a hand rail with all other screens and scaffolds removed. A modified work wright hand rail will be installed. This hand rail will be retractable to allow it to be used for both the completion of the works to the external ledges and the vertical facade elements as shown in Figure 18.

Figure 18 Work Wright Handrail

6.3 Façade Installation Process

To complete the installation, the façade contractor will provide craneage to install the panels. This will be in the form of a crawler crane, which will be positioned on level 08 with installers below lowering each panel into place as shown in Figure 19.

Where the cantilever exists, a combination of the crawler crane being on level 04 and the use of chain blocks fixed to the level 08 slab will be used.

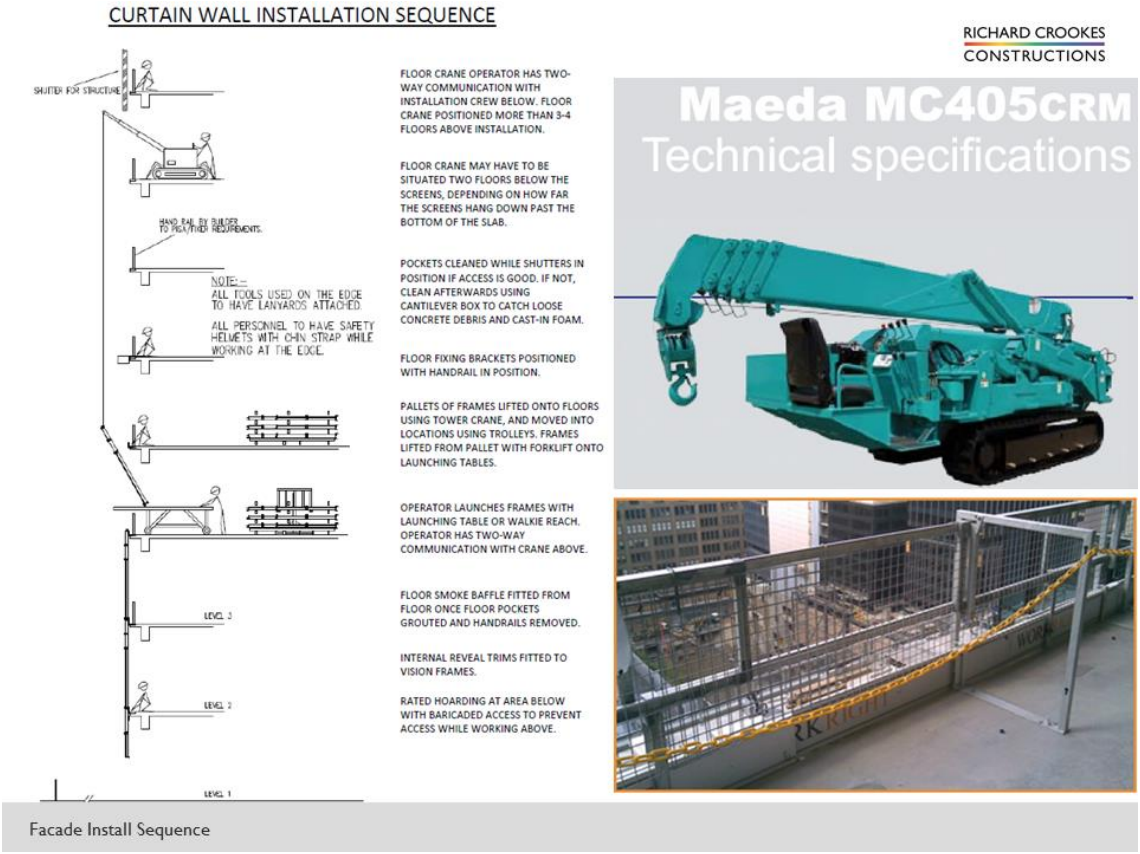


Figure 19 Façade install Process

6.4 Façade Infills

Given that there will be both hoists and loading platforms located on the western side of the facade elevation, there will be façade elements that will be installed later at a time when the hoists and loading platforms are removed.

Section 7 Services, Fitout and Commissioning

7.1 Services, Fit out and Commissioning Assumptions

RCC has assumed that the level of finishes will be similar to those for Stage 1 Design (CB02). RCC has also assumed that there will be new fitout of the southern extent of level 03 to 08, and that there will be refurbishment of the existing areas of levels 03 to 07 of Building 01, with the full extent still to be defined.

The fit out of the refurbished areas to the northern extent of the floors will be completed after the completion of the southern work areas. These areas for refurbishment will be taken progressively with a full cohabitation and staging plan to be developed cooperatively with UTS once the design is developed and finalised. The sequence for the completion of the refurbishment will be similar to that for the new build areas.

7.2 Services Installation

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 include 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.

7.3 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 productively 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. RCC use quality assurance hold points in delivering a best practice interior fitout. In conjunction with the PMO 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

7.4 Defects Management

RCC endeavours to reach defect-free completion on all of its projects. Our aim is to get it right first time, this is clearly a more efficient and effective strategy, and one that our clients appreciate. Of course, you can't get everything right first time and we have a rigorous process of inspections, tracking and reporting to ensure that defects, once identified, are recorded, monitored and rectified as quickly as possible.

In addition to our Project Manager and Site Manager conducting regular quality inspections, regular quality audits will be undertaken by our Business Systems Manager and our Defects / Maintenance Manager. The findings of these inspections are recorded (in the project Defects Register), and then progress monitored until defects have been rectified.

We understand the importance of a smooth handover. We will progressively inspect and sign-off installations on a stage/area/room basis in order to minimise delays due to installation defects being identified at commissioning time.

The defects rectification process requires defects inspections by RCC, consultants and subcontractors. Rectification of all defects identified by that initial inspection would then be carried out ready for inspections.

The company's defect management process is shown in Figure 20.

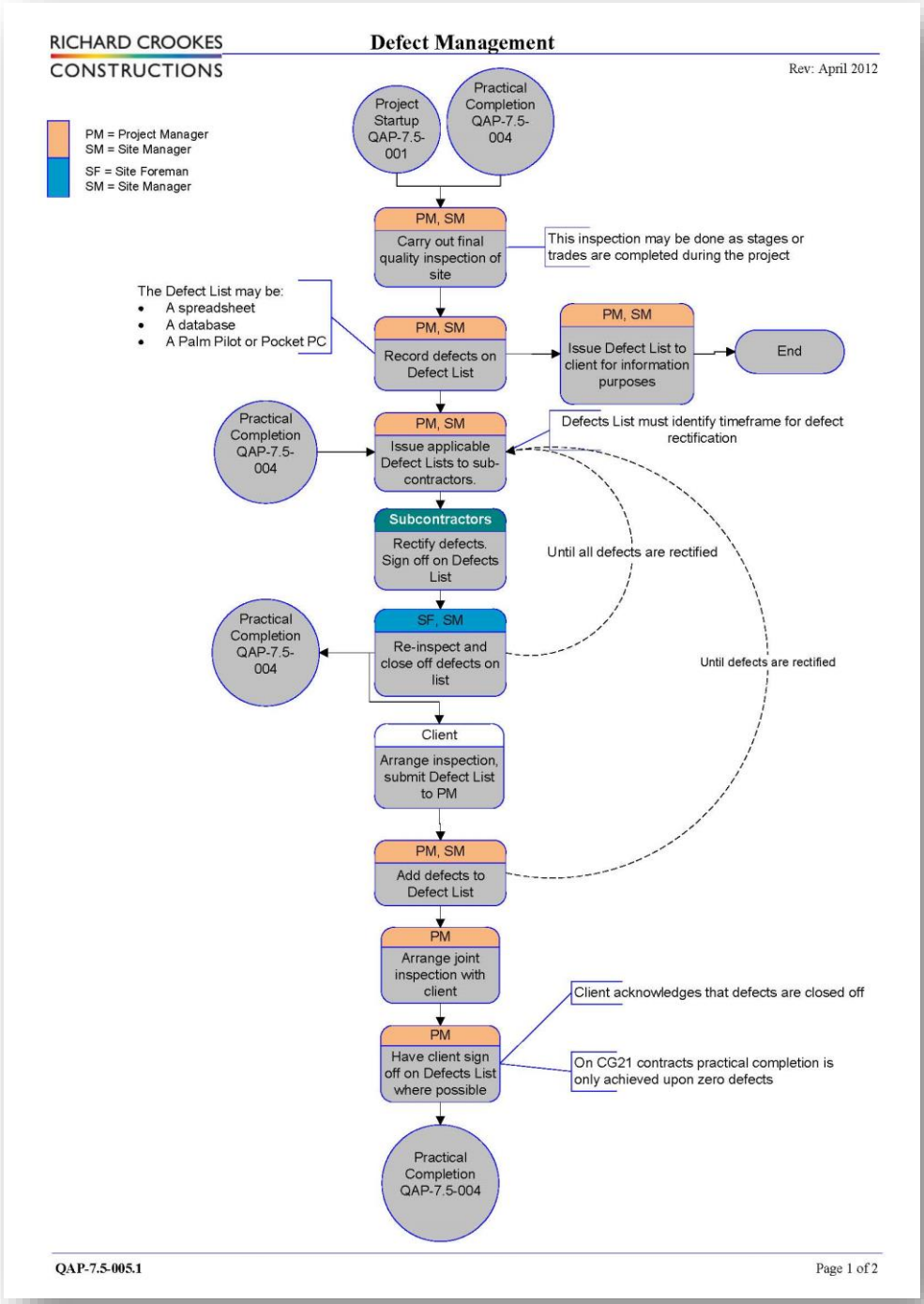


Figure 20 Defect Management

7.5 Commissioning

The processes involved in completing, commissioning and handing over a building, ready for use, with occupants trained and ready to use the building for its intended purpose is a critical element of any project. RCC understand the importance of this phase and have formal processes in place to ensure the necessary activities are identified and addressed efficiently.

Our aim will be to ensure that the completed works are handed over on time and in a smooth and efficient manner.

As part of our PMP, a Commissioning and Handover Plan will be prepared, in conjunction with the PMO and relevant UTS operational and maintenance staff. RCC propose to engage UTS's Fire Safety Compliance contractor, Key Services, to provide specialist technical services input throughout all phases of the project - their input through the commission and handover phase will be invaluable.

The following section is an outline of our approach to the Commissioning and Handover Plan

Requirements for Building Handover & Commissioning

RCC's minimum requirements for Building Handover & Commissioning are as follows:

Arrange, chair and minute a Handover and Commissioning working group meetings and preparing the Commissioning and Handover Plan.

The plan is to include but not be limited to the following:

- Program - Key dates & meeting schedule
- Access control commissioning processes
- Air Conditioning commissioning processes
- Asset data capture content and structure
- BCA Certification documentation
- Construction Subcontractors and Suppliers Contact Register
- Defects Identification and Rectification
- FF&E Schedules
- IT Cabling commissioning processes
- Master Keying Schedule
- Orientation plan and details
- Telephone commissioning processes
- Project Contact Register
- Test results & commissioning details – e.g.: mechanical, electrical & communications, security, EWIS, lifts, etc
- Training plan and details
- Warranties and Guarantees

Prepare handover deliverables including:

- End user training
- 'As-Built' Drawings (in both PDF & AutoCAD format)
- Commissioning reports including test results and certificates (in both hard and soft copy versions)
- Plant and equipment data
- Operation and maintenance manuals (Web Base System)
- Builders users guides
- Warranties
- Certification
- Training for maintenance contractors

Commissioning Scope of Works

Commissioning involves the testing of all systems and sub-systems to ensure they operate according to the design intent and verifying that they are fit for purpose in accordance with the contract documents.

Commissioning will be undertaken both during and at the end of the construction process. Subcontractors will prepare and provide their own Commissioning plans for those items, plant, machinery, processes etc detailed in the specifications.

RCC will manage and monitor these processes through inspection and test plans and commissioning schedules.

Commissioning Meetings

RCC will hold progressive subcontractor meetings and inspections throughout the construction phase for commissioning. These meetings will coincide with the various staged completion processes for each of the services and building elements. Following this the handover commissioning meeting will be convened prior to the project reaching handover.

At this stage, final issues, recommendations, reports and results will be tabled, based on the progressive commissioning meetings and inspections carried out prior to this point. This will be the opportunity to consolidate the overall commissioning prior to building handover and the building tuning phases during the DLP. This meeting will be attended to by the PMO, FMO, Faculty of Science Users and Service Manager and the Building Contractor.

Client commissioning meetings are to commence after completion and before handover.

Commissioning Issues Procedure

RCC will progressively inspect and sign-off installations on a stage/area/room basis in order to minimise delays due to installation defects being identified at commissioning time.

We will build on the progressive inspection process outlined above, to ensure the defect process at completion is minimised.

After the commissioning of all plant and equipment, RCC will request the Principal to undertake its inspections. This will be carried out by the Principal's Project Manager, Design Consultants and RCC. Rectification of all defects identified will be completed and confirmation of such rectification issued to the Principal's Project Manager.

To aid in the verification and completion process the contractor will provide:

- Method statements for all commissioning and testing
- Testing and commissioning pro-forma for each system to be tested
- A draft testing and commissioning schedule for all systems for review and comment by consultant
- Completed testing and commissioning forms verifying completion
- Warranties as applicable
- Final operation and maintenance manuals (prior to Practical Completion)

Commissioning Schedule

We will develop a commissioning schedule, which will be subject to revision with the award of the services subcontracts and periodic amendment throughout the construction process.

Each new amended version of the commissioning schedule will be issued to the Project Manager.

Owner/Operator Staff Training Handover

During the commissioning and handover phases of the Works, RCC shall manage, co-ordinate and provide separate comprehensive training in the correct and efficient operations of all systems, components, plant, equipment and controls as detailed in the operation and maintenance manuals.

RCC will provide a program and schedule of training requirements in conjunction with the key stakeholders outlining the minimum time required for the training. Where such training cannot be provided prior to Completion due to the nature of the equipment RCC will return to site at a later mutually agreed date to complete all training.

Operational and services staff will be granted access to the facility prior to handover as required, and as notified to RCC, to undertake the necessary preparation of facility systems.

Trained instructors (made up from qualified subcontractors and manufacturers representatives), who are both knowledgeable in the installations and project requirements, and the overall operation and maintenance aspects of the works or stage, will conduct the training sessions. Training sessions will explain and demonstrate (as necessary) to all attendees the purpose, operation and maintenance requirements of each installation.

Upon completion of the required training RCC will issue the PMO a training record for each stage, showing participants and topics covered.