

# PRELIMINARY CONSTRUCTION MANAGEMENT PLAN

Loreto Kirribilli – 26 July 2017

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Loreto Kirribilli Master Plan



# Contents

Introduction.....	3
Description of Works .....	4
western precinct.....	4
northern precinct.....	5
eastern precinct .....	5
southern precinct .....	5
Site Description.....	6
Site location .....	6
Construction Methodology Plan .....	7
overview.....	7
durations .....	7
hours of operation.....	8
methodology: Stage 1.1 – Learning Hub, western connector & gynasium extension.....	8
methodology: Stage 1.2 - Connectors.....	11
methodology: Future stages .....	11
Site Layout & Logistics .....	11
site office & amenities.....	11
site access .....	12
traffic management .....	14
public safety & protection .....	15
environmental management .....	15
Impacts .....	17
School operation .....	17
neighbourhood.....	18
feedback & complaints .....	18

## Introduction

Loreto Kirribilli is preparing a State Significant Development Application for the development of Loreto campus. The development of the site will be staged and it is envisaged that the stages will take place over a period of up to 50 years.

The intent of the master plan is to update the current campus towards a more future focussed learning environment and to resolve a number of major accessibility and amenity issues across the campus. The existing building stock ranges from the existing heritage buildings of the original estate, concrete and masonry cellular teaching blocks from the 1960's and 1970's through buildings developed post 1990's.

For the purposes of the Masterplan the site has been divided into 5 precincts, each with a different character:

- ☐ Campus Core
- ☐ Western Precinct
- ☐ Southern Precinct
- ☐ Eastern Precinct
- ☐ Northern Precinct

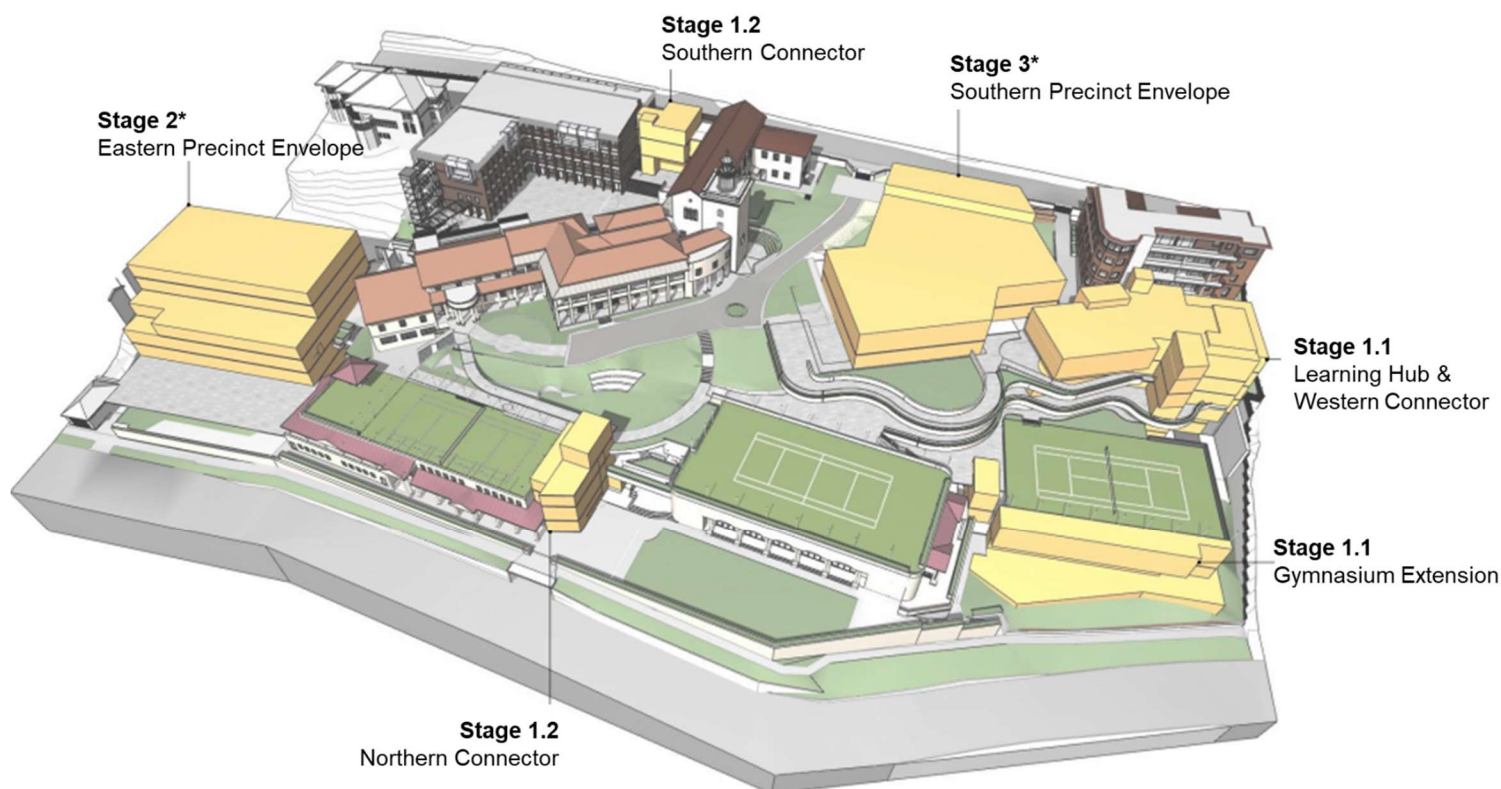
Stage 1 of the Master Plan includes the demolition of Block B and the construction of a new Learning Hub to support a STEaM curriculum. The Learning Hub interfaces with the existing Gymnasium, providing access to the Gymnasium via a new lift and stairs as well as additional teaching space comprising of a new Learning Studio, Weights Area, relocated Change Rooms, new Storage and Outdoor Learning Area.

This stage also includes vertical connectors located in the Eastern, Southern and Northern Precincts.

Works in the stages to follow Stage 1 include the demolition of the Mary Ward building and construction of a new Performing Arts Centre as well as the demolition of the existing Junior School and replacement with a new Junior School.

## Description of Works

Loreto Kirribilli is submitting an application for a staged development. This Preliminary Construction Management Plan addresses construction concerns for the Stage 1 development and the greater Master Plan.



**Figure 1.** Overview of proposed Master Plan works.

Works in the application can be surmised as follows and shown in the **Figure 1** overview.

### WESTERN PRECINCT

#### Stage 1

- Demolition of B-Block.
- Site excavation to the existing Gymnasium level.
- Proposed Development of a Seven storey building (2 storeys above ground - Carabella Street ) including external roof terrace. Includes a vertical connector providing accessible access to the Marian Centre, Junior School, Gymnasium and the Centenary Hall.
- Partial demolition of external stairs, landings, walkways and planters between the gymnasium, Centenary Hall and the Junior School.
- New external covered landscaped walkways providing an accessible path of travel to the new development site.
- Extension to the Junior School play terrace.
- Demolition of the northern facade of the Gymnasium.

- New facade to the gymnasium. Extended GF wing to the sports courts and outdoor terrace. Extended Upper level gallery to
- accommodate staff.

## NORTHERN PRECINCT

### Stage 1

- Partial demolition of external stairs, landings, walkways and planters in between Science and Centenary Hall
- A new five-storey (including basement) vertical connector pod consisting of a lift, stair and lockers.
- New external walkways providing an accessible path of travel between the driveway, Science, Centenary hall, carpark and Elamang Avenue.

## EASTERN PRECINCT

### Stage 1

- Partial demolition of external stairs, landings, walkways and planters in between Science and Performing Arts.
- Proposed interim connector pod consisting of accessible ramps, providing an accessible path of travel between Science and Performing Arts.

### Master Plan

- Proposed development envelope for a six story building. (Height consistent with the existing building)

## SOUTHERN PRECINCT

### Stage 1

- Partial demolition of the eastern Chapel wing.
- Demolition of external stairs and landings in the courtyard.
- Proposed development of a 4 storey vertical connector pod involving the restoration of the east Chapel wing to its original profile on Carabella Street. The connector pod will consist of a lift, learning studios and an external learning terrace. Providing an accessible path of travel between the driveway, Chapel, St Joseph's Block and the courtyard.

### Master Plan

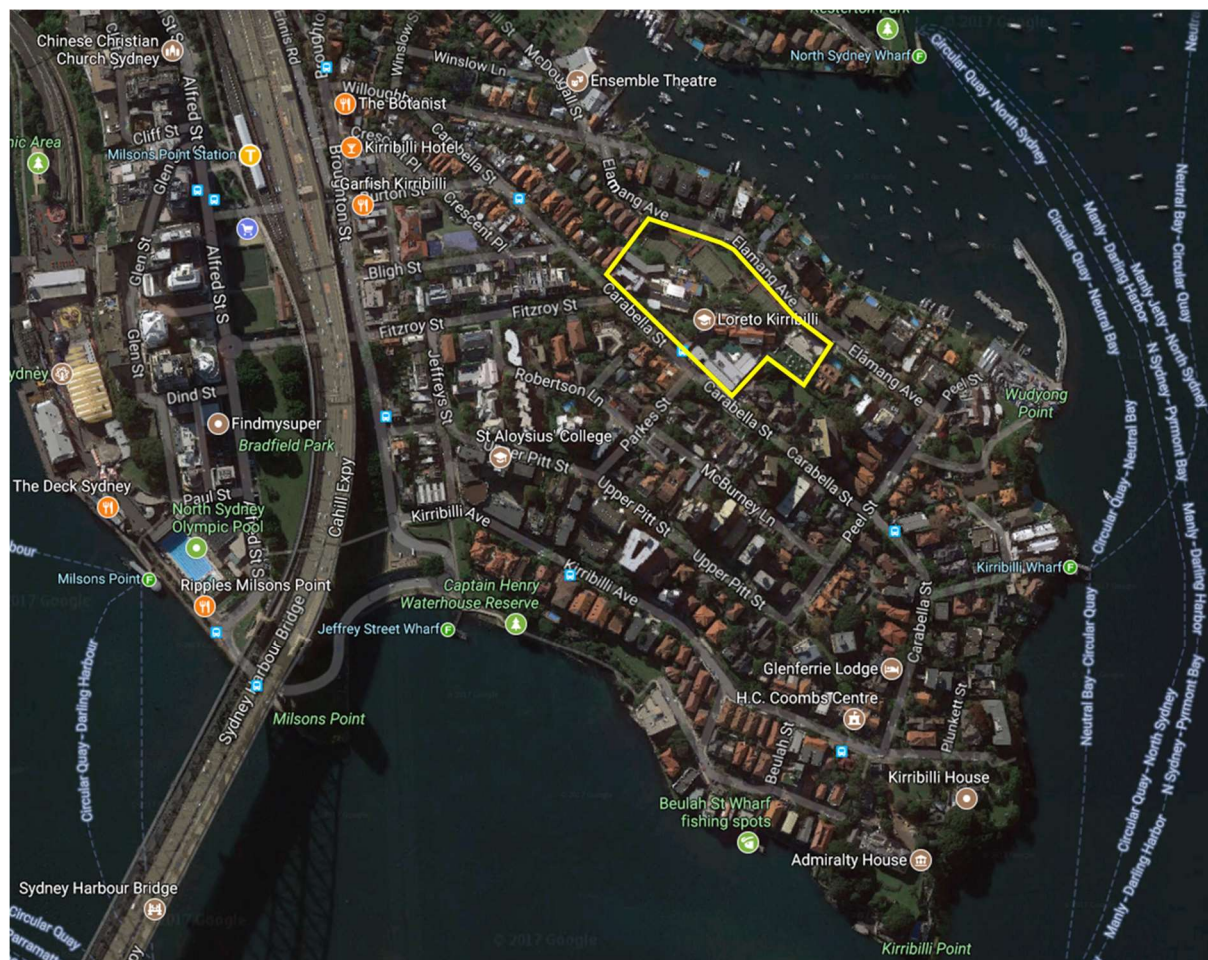
- Proposed development envelope for a six story building, which will sit two storeys above ground on Carabella Street. (Height will remain consistent with the existing building).

## Site Description

### SITE LOCATION

The address for Loreto Kirribilli is 85 Carabella Street, Kirribilli, but the site is in fact bound by Carabella Street to the south and Elamang Avenue to the north with neighbours to the east and west, as can be seen in **Figure 2**.

There is limited access to Loreto Kirribilli as the suburb is bounded by water on three sides.



**Figure 2.** Aerial view of Kirribilli, with Loreto Kirribilli indicated in yellow. [Source: Google Maps]



# Construction Methodology Plan

## OVERVIEW

The submission for the SSD includes a large scope that will be constructed in the following manner:

Stage	Scope
1.1	<b>Learning Hub &amp; Western Precinct</b> The demolition of B-Block and construction of a new
1.2	<b>Connectors</b> There are three connectors to be built in the Eastern, Northern & Southern Precincts, with some demolition works associated with each.
2*	<b>Eastern Precinct</b> Demolition of the Mary Ward building and construction of a new six story Performing Arts Centre.
3*	<b>Southern Precinct</b> Demolition of the Junior School and construction of a new Junior School in its place.

*Table 1. Staging for Loreto Kirribilli Master Plan scope of works.*

\*The sequence of stages 2 and 3 is yet to be determined.

## DURATIONS

This submission includes greater detail for Stage 1, which is to be approved for construction. A schedule of durations broken into construction phases is shown in **Table 2** and **Table 3** below.

Construction Phase	Duration
<b>S1.1 Learning Hub, Western Connector &amp; Gymnasium Extension</b>	
Site Establishment	2 weeks
Demolition	6 weeks
Earthworks, Excavation & Shoring	18 weeks
Inground Works & Substructure	5 weeks
Structure*	21 weeks
Roofing, Cladding, Façade*	18 weeks
Finishes & Services*	28 weeks
External Works & Landscaping*	8 weeks
Commissioning & Completion	6 weeks

*Table 2. Durations for Stage 1.1 works.*

Construction Phase	Duration
<b>S1.2 Connectors</b>	
Eastern Connector	10 – 16 weeks
Northern Connector	10 – 16 weeks
Southern Connector	10 – 16 weeks

**Table 3.** Durations for Stage 1.2 works.

To maximise efficiency, productivity and timeframes, items marked with an asterix (\*) will occur consecutively. Finishes and services works will be able to commence following the completion of the first nine weeks of structure works. As a result the timeframe for the Learning Hub, Western Connector and Gymnasium Extension is expected to be completed within a 19 month programme.

It is anticipated that demolition and construction works associated with each connector will take between 10 and 16 weeks to complete. It has not yet been confirmed if efficiencies from commencing works associated with Connectors would be worthwhile in terms of impact to school operations.

Given that the design for the Southern and Eastern Precinct envelopes has not yet been detailed, it is difficult to confirm the duration of works for these stages. However, it is reasonable to assume that the extent of demolition will be similar, with reduced timeframes for excavation and slightly extended durations for structure and fitout leading to an overall programme time of 18 months to 2 years for each stage.

## HOURS OF OPERATION

In line with the Interim Construction Noise Guideline (2009) produced by the NSW Department of Environment and Climate Change, hours of typical construction work are as per **Table 4**.

Day/s	Construction Hours
Monday to Friday	7am to 6pm
Saturday	8am to 1pm
Sundays & Public Holidays	No Works

**Table 4.** Construction hours as outline in the Interim Construction Noise Guideline (2009).

## METHODOLOGY: STAGE 1.1 – LEARNING HUB, WESTERN CONNECTOR & GYMNASIUM EXTENSION

### Demolition

The project involves the demolition of the existing Block B and sundry structures adjacent to the site access interface. Demolition will be undertaken in the following sequence;

1. Remove staircases/paths to Junior School & isolate the Junior School.
2. Scaffold Block B on the west boundary.
3. Create access to eastern side of Block B.
4. Commence internal strip out of walls, ceilings etc. Remove debris from site using trucks/truck and dogs, reversing from Carabella street.
5. Commence demolition of brick walls and slabs with the use of plant.



6. Remove demolition material to allow excavation to begin.

Demolition works will commence slowly with the internal strip out of walls, ceilings and services, before increasing with the demolition of the structure. Overall, it is expected that 100 truck or truck and dog combination vehicles will be needed in the demolition for the B Block. The larger trucks minimise the potential disruption to the site and adjoining buildings and minimise the total number of truck movements thus mitigating project risks.

Demolition material will be disposed of as follows:

- Recyclable materials (brick & concrete) will be transported to Greenwood Landfill and Waste Recovery at St Ives.
- Non-recyclable and restricted waste will be transported to Veolia Environmental Services at Horsley Park.

A site inspection has identified that potential hazardous materials may be present, such as the expansion material in the brick face, old glue from old vinyl floors, asbestos containing materials (ACMs) in eaves linings and lead paint. It is recommended that prior to the commencement of demolition an updated hazardous material inspection report is prepared.

Controls will need to be put in place to minimise the impact of noise, vibration and dust in the demolition process. The controls will need to consider the impact both on the operation of the school and the amenity of the neighbourhood. Controls are outlined in the following section of this report as they will be applicable to demolition at all stages of the Master Plan.

### Earthworks, Excavation & Shoring

A Geotechnical Assessment has been prepared by JK Geotechnics (dated 10 July 2017) and provides details of the expected site geology, shoring systems, excavation techniques, ongoing analysis and risk factors. The report is based on site investigations and a single bore log located in the pavement between the Marian Centre and B Block. The findings are consistent with the visible signs onsite from the exposed sandstone retaining walls.

Based on the information in this report the excavation material encountered will be predominantly high strength sandstone typical of the Kirribilli area. This material will need to be sawn then ripped or broken up for removal. It has been assumed as part of this exercise that 20m<sup>3</sup> of material will be retained for reuse in the new works.

Access to the excavation zone will be via a ramp system. **Figure 3** shows the extent of ramps expected during excavation. Trucks will access the excavation zone using the ramp and will be loaded at the excavation face. It will be possible to allow the trucks to enter the site in a forwards orientation then turn around within the excavation zone to maintain a forward orientation during egress. It is envisaged that the excavation works will occurring the following sequence:

1. Excavate platform alongside gym building to maximise turning area for trucks,
2. Remove soil/fill down to rock from entire site,
3. Saw cut building line on all boundaries,
4. Rip, hammer rock and load out continually as material is generated. Saw cut to be kept lower than the rock level being hammered to minimise vibration to neighbouring buildings,
5. Blocks required to be kept should be inspected to ensure the best stone is utilised,
6. Remove crib walls from tennis court boundary as required,
7. Grind floors to required bulk earthworks level, and

8. Excavate ramp on the “way out” utilising trucks reversed into the driveway.



**Figure 3.** Establishment plan for works during earthworks, excavation & shoring. [Plan prepared by Grindley Constructions].

Ramp removal would be kept to a minimum and if required the tower crane would be utilised to remove any material which cannot be reached from the top of the excavation. (The tower crane will be required for construction of the new structure as well).

The excavation will generate approximately 750 truck movements in total (15 – 20 per day approximately) for excavation works associated with Stage 1.1 being predominantly truck and dog. The larger trucks minimise the potential disruption to the site and minimise the total number of truck movements thus mitigating project risks. It will be in the best interests of the contractor to avoid bringing trucks in as peak drop off and pick up times. As such, the estimated times for trucks entering and exiting the site are as follows:

- First round of trucks between 7:00am – 8.15am
- Second round of trucks between 10:00am – 11:00am
- Third round of trucks between 1:00pm – 2:00pm

Each truck would be onsite for approximately 8 – 10 minutes and will have a designated marshalling area and called to site as required to prevent any trucks blocking local roads. Work Zones on Carabella Street will be required for this marshalling process. A zone of approximately 20 metres to the west of the site entry and a zone of 10 metres on the eastern side of the site entry would be required.

While it is difficult to confirm at this stage, it is envisaged that the majority of the virgin excavated material will be transported to a landfill site located in or around Kellyville or

Kenthurst depending on demand at the time of the works. Any non-recyclable and restricted waste found will be transported to Veolia Environmental Services at Horsley Park.

Shoring works are considered necessary for the works associated with the Learning Hub, however, the design has not yet progressed sufficiently to identify the best methodology for shoring. Consideration for noise impact will be given when determining the most appropriate method.

### **Structure & Fit Out**

Construction of the structure will commence with pouring of the lift and stair wells and base slabs and move up from there. Concrete pours will likely be facilitated by a concrete pump set up in the laneway adjacent to the Marian Centre.

The structure will have a nine week head start, before strip out of the lower level scaffolding, formwork and falsework will allow internal fitout and services installation to commence. Typically, internal fit out and services installation will follow completion of each structure level.

Materials handling will be a significant challenge for servicing the fitout of the Learning Hub and associated works. It is proposed to have two options for servicing the site with deliveries:

- Through the laneway adjacent to Marian Centre, with access off Carabella Street.
- With the installation of a crane as shown in **Figure 3**, it will be possible to transport deliveries from a Work Zone in Elamang Avenue to the work site.

### **METHODOLOGY: STAGE 1.2 - CONNECTORS**

All three vertical Connector projects have reasonable access to either Carabella Street or Elamang Avenue. We have allocated a work zone on these streets to allow the lifting of equipment and materials into the specific work zones. Access via the school internal routes is not practicable and we envisage these works will be completed with smaller machines and lightweight materials lifted into position adjacent each work front.

Minimal craneage requirements are anticipated for the construction works associated with the Connectors. However, if necessitated, mobile cranes will likely be utilised from Work Zones in either Carabella Street or Elamang Avenue.

### **METHODOLOGY: FUTURE STAGES**

Stage 2\*: Eastern Precinct and Stage 3\*:Southern Precinct will involve similar construction phases to Stage 1.1 in that there will be elements of the demolition, excavation and then the rebuild (structure and fitout). The impacts of such are further outlined below with the proposed control methods also considered.

## **Site Layout & Logistics**

### **SITE OFFICE & AMENITIES**

For Stage 1.1 works, a small space within the Marian Centre will be occupied as a site office. Once construction ramps up on site, it is proposed to establish site amenities on the tennis court atop the gymnasium. The tennis court will be protected for the duration of the works with the surface repaired or replaced during demobilisation if required. The Site Establishment layout

will need to be confirmed based on the structural limitations (4kpa live load strength) as outlined by structural engineers.

Dependent on sequencing for remaining connector works for Stage 1.2, the same area with in the Marian Centre may well be occupied as a site office. Smaller containers may be utilised as tool and materials storage nearer to each work site.

For demolition works associated with Stage 3\* and the Junior School, again the office location in the Marian Centre could be utilised, with additional site infrastructure to be established on the Gymnasium or Centenary Hall tennis courts as appropriate for the function of the school.

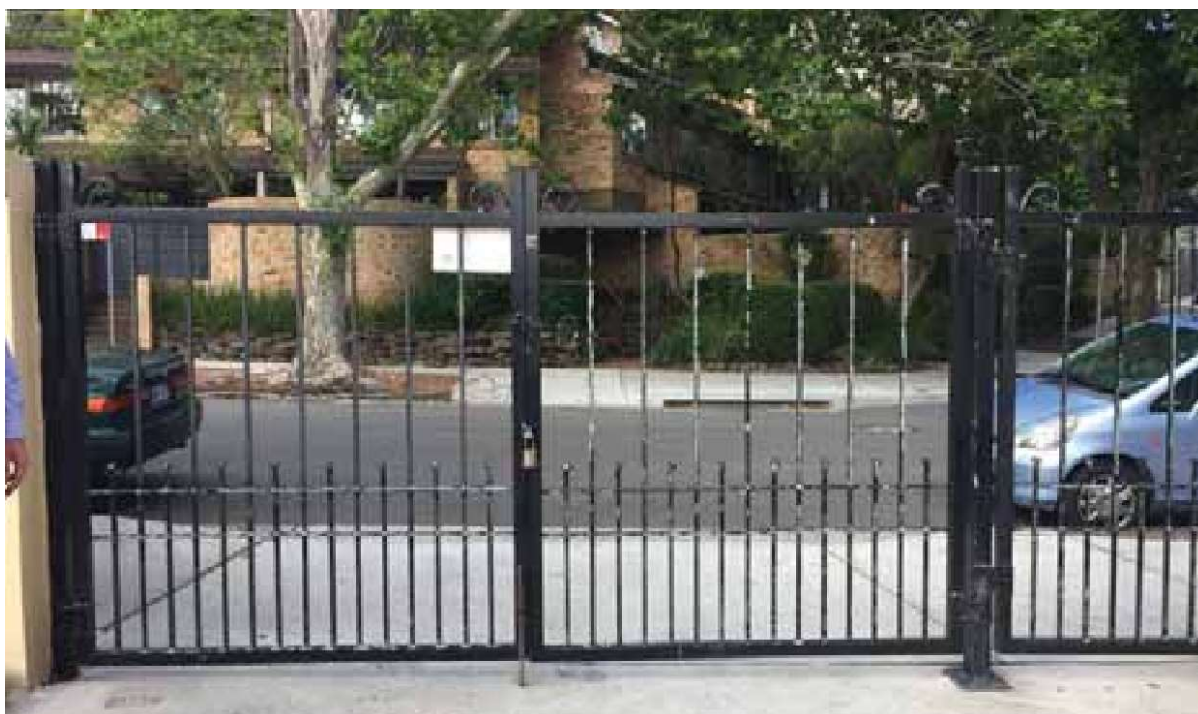
Stage 2\* is on the opposite side of the campus and alternate arrangements will need to be made to ensure amenities are close to the site. Likely the best location for amenities will be on the Elamang Avenue street frontage within the grounds of the school.

### SITE ACCESS

The main focus when setting up a construction site is minimising the impact on the operating school, existing road network and surrounding residential neighbours.

Carabella Street will be used for access during Stage 1.1, 1.2 and 3\* works. It is proposed to use Carabela street to access a laneway that is located between eh Marian Centre & Junior School, indicated in **Figure 3**. This access lane will require some minor modifications to accept site traffic. The following items will need attention prior to commencement of works:

1. Removal of the entrance security gates and support piers to maximise the entrance width and open up view lines for managing pedestrian movements. Refer to **Figure 4**.



**Figure 4.** The existing security gate and adjacent support piers will need to be removed as part of preparation for construction works.

2. Removal of the planter bed adjacent the Marian Centre to maximise access width and to allow the installation of protective/acoustic barriers. These works would



include the relocation of wall lighting and air conditioning systems as required. Refer to **Figure 5**.

3. Modify the planter bed at the bottom of the access lane on the right hand side to create the transition and interface with the construction site and the proposed ramping road required to access the excavation face. This may involve the re-routing of services (fire Hydrant, electrical services, other) in this area subject to further investigation. Refer to **Figure 5**.
4. Demolition of the elevated pedestrian access link between the Marian Centre and Block B and the deck area.
5. Demolition and modification of the pedestrian access route, walkways, stairs, and planters adjacent to the Junior School and the installation of suitable protective/acoustic barriers and hoardings. Hoardings will be arranged to minimise noise transmission to the Junior School, maintain emergency egress from the Junior School and allow access for site amenity to the existing toilets on the lower ground level. Services will need to be located, identified and marked in this area and relocated or isolated where required. This zone will provide the start of the excavation ramp allowing heavy machinery to access the excavation face as it progresses downward to the design bulk earthworks levels.



**Figure 5.** Existing driveway adjacent to the Marian Centre will need to be adjusted to be fit for construction vehicles.

Stage 1.1 will most likely include the use of the an established tower crane (refer to **Figure 3**) which will allow deliveries to come via Elamang Avenue as well as Carabella Street. Greater detail on this aspect is provided below.

For Stage 2\*, access will be facilitated through Elamang Avenue only. A tower crane, if needed, will work to the Elamang Avenue street frontage.

## TRAFFIC MANAGEMENT

A Construction Traffic Management Plan (25 July 2017) has been prepared by McLaren Traffic Engineers shows an indicative haulage route. Given that Kirribilli is somewhat restricted in terms of road access due to the waterways, there is one key access route in and out via the Cahill Expressway, Clark Road, Broughton Street and Willoughby Street to Elamanag Avenue and Carabella Street.

Since Block B / new Learning Hub is isolated from the surrounded streets, direct access to the site will be limited to the laneway adjacent to the Marian Centre. This same access point will be utilised for Stage 3\* works as well. For Stage 1.1, Work Zones will be required on both Carabella Street for marshalling of vehicles on a restricted site as well as for deliveries.

Work Zones will be necessary for all stages of the development and a high level is shown in **Table 5**.

Detailed traffic control plans will be delivered for each stage and site and key activities within those development timeframes. The traffic control plans will assess risks and implement the necessary controls in terms of managing local vehicle traffic and pedestrian movements.

Site management will be responsible for scheduling construction traffic such as deliveries. Given the increase in traffic associated with school drop off and pick up periods, construction traffic will likely be scheduled to arrive or leave site outside of these periods where possible.

### Work Zones

It is proposed that Work Zones on either or both Carabella Street and Elamanag Avenue will be needed at stages in accordance with **Table 5**. Whilst it is anticipated that Work Zones will be necessary at all stages, the length on imposition will be significantly less for works associated with Stage 1.2 and the connectors.

The location of Work Zone may impact on existing street parking and bus stop locations and will be determined in consultation with Council procedures.

Stage	Scope	Work Zones	Location
1.1	Learning Hub, Western Connector & Gymnasium Extension	Carabella St	Work Zone to sit out the front of Marian Centre and Junior School.
		Elamang Ave	Work Zone to sit in front of the Gymnasium.
1.2	Eastern Connector	Elamang Ave	Work Zone to sit in front of the existing car park.
	Southern Connector	Carabella St	Work Zone to sit in front of J-Block.
	Northern Connector	Elamang Ave	Work Zone to sit in front of Centenary Hall.
2*	Eastern Precinct Envelope	Elamang Ave	Work Zone to sit in front of the existing car park.
3*	Southern Precinct Envelope	Carabella St	Work Zone to sit in front of the existing Junior School.

**Table 5.** Proposed Work Zones for all stages of the Loreto Kirribilli Master Plan.

## Craneage

For the excavation and construction of Stage 1.1, a tower crane will be erected as shown in **Figure 3**. The location, reach and capacity of the crane has been selected to allow loading from Elamang Avenue which is a much easier and less disruptive area from which to load and should assist in dispersing construction traffic from the Carabella Street entrance to Loreto Kiribilli. The tower crane should have, as a minimum, the ability to lift 1.4t at a 60m reach (Potain MC 175B or similar) to service the project.

## PUBLIC SAFETY & PROTECTION

For each construction site established at Loreto Kiribilli, temporary hoardings and fencing will be erected around the works to protect students, staff and visitors to the campus. Access to the sites will be through limited gates, which should either be manned or locked to prevent entry by unauthorised persons.

Appropriate signage shall be displayed on the outside of the fences to identify construction hazards, such as deep excavations, as well as the minimum personal protective equipment requirements.

## ENVIRONMENTAL MANAGEMENT

Measures and controls to manage the environment at each stage will be dependent on activity. This section aims to outline the measures and controls that will be implemented across all stages of the development.

### Dust Control Measures

On construction sites, dust is a common problem not only for the surrounding community but for the health and safety of site workers. Management of dust is considered in terms of construction phases in the below **Table 6**.

Construction Phase	Control
Demolition	<ul style="list-style-type: none"> <li>▪ Cover loads of trucks removing demolition material from site.</li> <li>▪ If using a pneumatic hammer In particular weather conditions, continually wet down area to suppress dust creation.</li> <li>▪ "Cattle grid" or similar at site entrance point.</li> </ul>
Excavation	<ul style="list-style-type: none"> <li>▪ Cover loads of trucks removing spoil from site.</li> <li>▪ Cover stockpiles of spoil that remain in place for greater than ten days.</li> <li>▪ Wet down areas with hoses and/or sprinklers in particular weather conditions.</li> <li>▪ "Cattle grid" or similar at site entrance point.</li> <li>▪ Road sweeper to be utilised to clean up dust and debris from site vehicles as necessary.</li> </ul>
Structure	<ul style="list-style-type: none"> <li>▪ Maintain a clean site encouraging good house keeping practices amongst the trades. For instance, regularly emptying site bins and sweeping work areas.</li> </ul>



Construction Phase	Control
	<ul style="list-style-type: none"> <li>Road sweeper to be utilised to clean up dust and debris from site vehicles as necessary.</li> </ul>
Fitout	<ul style="list-style-type: none"> <li>Maintain a clean site encouraging good house keeping practices amongst the trades. For instance, regularly emptying site bins and sweeping work areas.</li> <li>Review options for off-site manufacturing for finished elements to reduce the likelihood of generating dust on site.</li> <li>Road sweeper to be utilised to clean up dust and debris from site vehicles as necessary.</li> </ul>

**Table 6.** Controls to be used during specific construction phases for dust control.

### Erosion & Sediment Control

The standard control measures for managing erosion and sediment on construction sites are listed in **Table 7**.

Construction Phase	Control
General	<ul style="list-style-type: none"> <li>Protection of kerb-side or on site storm water inlets with geofabric socks and gravel bags. Regularly install and check installation.</li> <li>Prepare and maintain silt fences along site boundaries.</li> <li>Road sweeper to be utilised to clean up dust and debris from site vehicles as necessary.</li> </ul>
Demolition & Excavation	<ul style="list-style-type: none"> <li>"Cattle grid" or similar at site entrance point.</li> <li>Check vehicles leaving site have tyres clear of mud and dirt. Wash down as necessary.</li> <li>Set up stock piles away from drainage inlets,</li> </ul>
Structure	<ul style="list-style-type: none"> <li>Set up concrete wash out areas and locate away from drainage inlets.</li> </ul>

**Table 7.** Controls to be used during specific construction phases for erosion and sediment control.

### Noise & Vibration Control Measures

The Operation & Construction Noise & Vibration Assessment prepared by Renzo Tonin (18 July 2017) provides greater detail on noise and vibration considerations for Stage 1 in its entirety. This section covers more generally the implications and the control measures that can be implemented to reduce impact and inconvenience.

It is to be expected that excavation in the ground type identified at Loreto Kirribilli in the Geotechnical Assessment prepared by JK Geotechnics will generate noticeable noise and vibration. Some impact can be reduced by considering different methodologies, such as saw cutting along the boundary before using heavy plant for removal.

Given the proximity of works for the Learning Hub to the Marian Centre, it is anticipated that vibration effects from demolition methods, excavation and foundation building will most severely impact on the Marian Centre. Therefore monitoring the Marian Centre in terms of vibration extremes should be indicative of the impacts experienced by adjacent properties.

With each subsequent stage where construction methodologies will involve plant that causes vibration, the closest building will need to be assessed in terms of vibration impact.

The latest machinery and building techniques will be utilised to assist in minimising noise and limit the possibility of damage to surrounding areas.

In terms of noise management in the peak noise periods, (demolition, excavation, concrete pours) the best control is to eliminate the line of sight from the emanating source. Given the location of the Learning Hub site with regards to neighbouring apartment blocks, this will be most difficult to achieve with the higher level units, where ground level acoustic barriers such as hoardings and temporary stockpiles will not be as effective.

### **Dilapidation**

In relation to the impact of vibration, dilapidation studies should be conducted prior to and following construction on existing school buildings nearest to construction, as well as neighbouring properties and Council infrastructure such as roads and pavements.

### **Waste Management**

A site specific waste management plan should be developed for each stage of the development with the aim that the majority of construction waste should be reused, reprocessed or recycled.

### **Tree Protection**

An Aboricultural Impact Appraisal & Method Statement has been prepared by Naturally Trees (dated 24 November 2016) regarding the trees that will need to be removed due to the proposed development. All other trees will need to be protected during the works.

Dependent on the stage, the remaining trees and street trees should be protected in accordance with AS4970-2009 Protection of Trees on Development Sites. Tree protection zones fenced off to prevent storage of materials and/or plant. The tree protection measures shall be monitored and maintained on a regular basis throughout construction works.

## **Impacts**

### **SCHOOL OPERATION**

Holiday periods at the school follow the pattern described in **Table 8**.

Season	Month/s	Duration
Easter	March or April	2 weeks
Winter	June to July	3.5 weeks
Spring	September to October	2 weeks
Summer	December to January	8 weeks

**Table 8.** Typical school holiday periods at Loreto Kirribilli.

Construction works for all stages, even the Connectors with the shortest programmes, will exceed even the longest school holiday period. However, particularly disruptive works such as

demolition can be timed to coincide with the beginning of the school holiday periods to avoid disrupting learning as much as possible.

Typical school operations will need to be considered in the day to day running of the construction sites, particularly with regards peak pick up and drop off activities and respite periods from hammering or particularly noisy activities.

## NEIGHBOURHOOD

Strategies to ease the impact of construction works on the surrounding neighbourhood have been outlined in the preceding contents of the report, but are repeated here in summary.

On the local roads of Kirribilli, traffic from construction related vehicles has the largest potential to disrupt the function of the neighbourhood. It is predicted that excavation periods related to all stages will introduce the peak volumes of construction related traffic. To avoid overwhelming the network, marshalling areas will be established on either Elamang Avenue or Carabella Street as appropriate in the form of Work Zones and the need for vehicles will be timed to avoid busy periods surrounding school drop off and pick up.

In periods of busy construction traffic, mainly restricted to heavy demolition, excavation and concrete pours, traffic controllers will be in position to manage local traffic and pedestrian movements in a safe manner and in accordance with traffic control plans developed specifically for certain activities.

Noise and dust also have the potential to impact the neighbourhood, though it is noted that this will effect the neighbours in the immediate vicinity to a greater degree. The controls outlined above firstly consider the occupational health and safety of those working on site and as such, noise and dust levels will be within the guidelines set out. Further to this, works will be planned to occur within the environment of a functioning primary and secondary school. All efforts will be undertaken to minimise the impact of noise and dust to the closest receivers. In the instance of the Learning Hub, this is the Junior School and Marian Centre at Loreto Kirribilli and the apartment blocks at 111 Carabella Street and 22 Elamang Avenue.

Due to the relative density of the block on which Loreto Kirribilli sits, the potential disruption of vibration will firstly be considered in terms of impact on the nearby structures by the works being undertaken. For instance, if an excavator hammer is required for demolition of excavation works or a vibration roller is required for foundation works, then it would be necessary to consider the impacts of such works on the nearest structures. With all stages of the development, it is likely that the nearest structures will be within the school grounds and as such vibration detection measures can be implemented on site to detect the worst case scenario and react accordingly. Prior to any works commencing with the potential for high vibration, existing in ground infrastructure should be investigated to determine if there any items that could act as conduits for vibration, such a stormwater pipelines that run underneath or near to multiple buildings.

## FEEDBACK & COMPLAINTS

A feedback and complaints procedure should be developed by the contractor in conjunction with Loreto Kirribilli for managing community commentary. The procedure should dictate response timeframes as well as an escalation framework for responding to complaints.