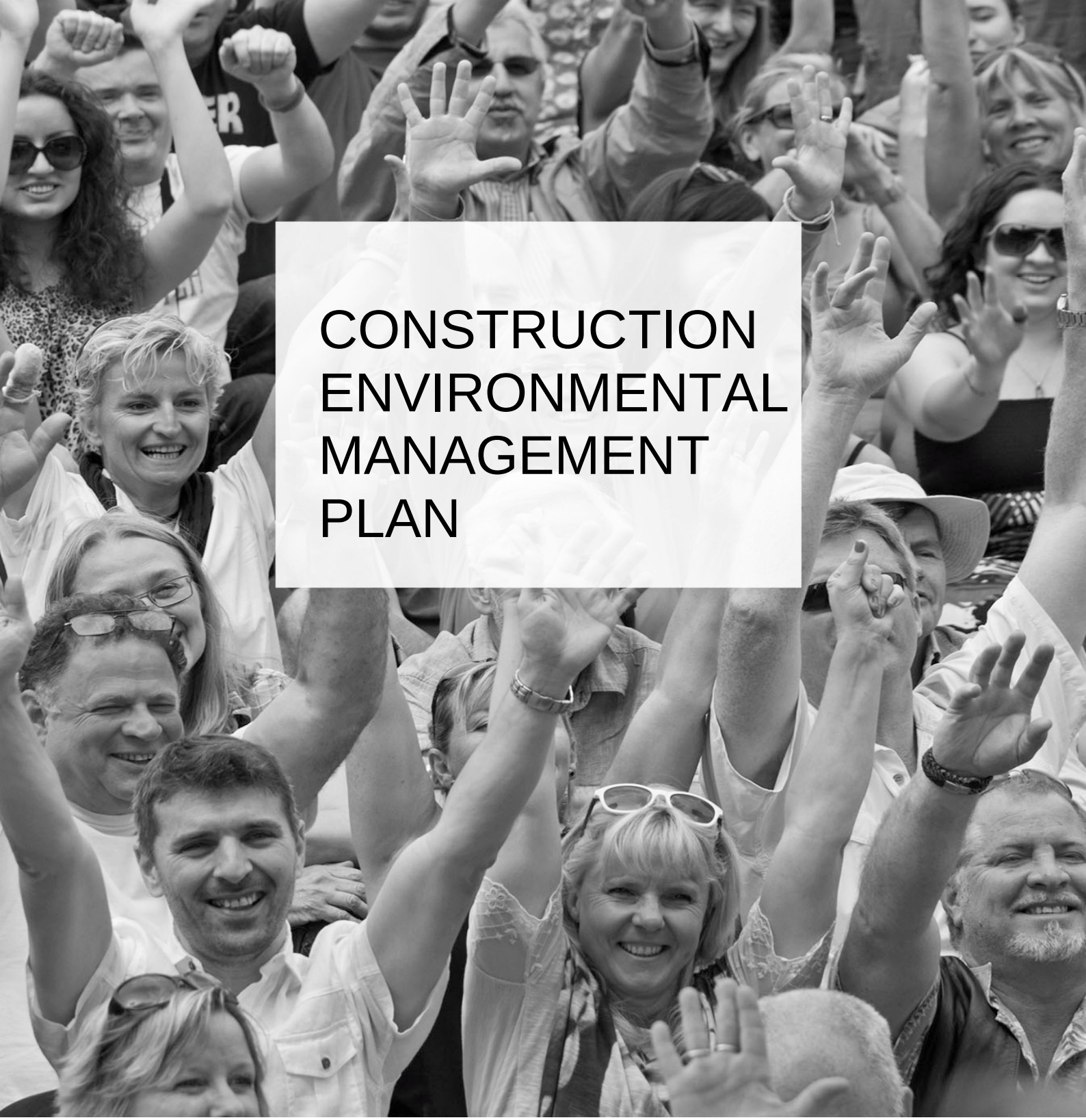


CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

REVISION STATUS

Rev	Date	Details / Description
01	14/10/16	Draft Client Issue
02	23/02/17	Updated for Stage 2 DA Submission
03	13/06/17	For Precon Review 2
04	17/08/17	Stage 2 DA – CC
04a	05/09/17	Waste management route update
04b	19/09/17	Inclusion of Parramatta City Council Comments (sect 7)

TABLE OF CONTENTS

1. INTRODUCTION

1.1 Purpose

The purpose of this Construction Management Plan (CMP) is to provide the Lendlease Site Management Team with the framework, procedures and controls to deliver the project works in a safe, efficient and environmentally responsible manner, in accordance with the project timeline and with minimal disruption to the surrounding community stakeholders.

Furthermore, the CMP will clearly define procedures that Lendlease will implement to manage the Contractor's activities for the Western Sydney Stadium Project in such a way as to:

- Complete the Contractor's activities in accordance with the contract;
- Clearly detail the management strategies to be implemented to address co-ordination and communication with INSW and its stakeholders to ensure an operational facility is delivered in accordance with the contract;
- Provide an environment of "no surprises" for INSW in the way that Lendlease will perform the Contractor's activities in compliance with the contract and relevant authorities and stakeholders; and
- Define the processes and management protocols to be adopted by all Head Contractor personnel, subcontractors, suppliers and any other personnel required to execute part of the works and in doing so are required to access the site during performance of the Contractor's activities.

The CMP has been prepared in outline form, recognising that it will be further developed to reflect the finalised scope and delivery strategy. The CMP should also be read in conjunction with the project plans further defined in Section 3.3.

1.2 Application

This outline CMP will form part of the overarching Project Management Plan (PMP) to be developed by Lendlease for the construction related activities of the Project. The scope and detail of the Project works will be as defined in the contractual requirements.

Implementation of the CMP will have regard to the requirements set out in the Contract conditions, the over-arching PMP and associated Project sub plans to be developed by Lendlease in line with preferred contractor status. The CMP will be further developed and progressively revised for re-issue where required to:

- Incorporate progressive work methodologies as developed and approved during the delivery; and
- Incorporate any amendments required by and mutually agreed with INSW during the pre-award period.

The finalisation and issue of the CMP for endorsement will be in accordance with the contractual requirements.

1.3 Project Plans

Lendlease operates an Integrated Project Management System which includes a range of Project Controls necessary to deliver projects in compliance with Lendlease's corporate policy requirements, statutory requirements and contractual requirements. The CMP will form part of the suite of management plans prepared for the project and is to be read and implemented in conjunction with all associated Management Plans and their related procedures and method statements, as progressively developed by Lendlease to reflect the delivery requirements for the Western Sydney Stadium Project. These plans may be referred to within the CMP where specific.

Contractors Management Plans - Requested	Plan Included
Construction Management Plan	Lendlease Construction Management Plan
Environmental Management Plan	Lendlease Environmental, Health and Safety Plan
Work Health and Safety Management Plan	
Stakeholder Management Plan	Lendlease Stakeholder Management and Community Engagement Plan
Community Management Plan	
Commissioning and Handover Plan	Lendlease Commissioning and Handover Plan
Project Security Plan as specified in Tender Particulars.	Lendlease Project Security Plan (FOUO as identified in Schedule G – Tenderer's Commercial-In-Confidence Information).
Design Management Plan	Lendlease Design Management Plan
Demolition Management Plan	Lendlease Demolition Management Plan
Construction Traffic Management Plan	Lendlease Construction Traffic Management Plan
Risk Management Plan	Lendlease Risk Management Plan
Quality Management Plan	Lendlease Quality Management Plan
Industrial Relations Management Plan	Lendlease Workplace Management Plan
Remediation Action Plan	Lendlease Remediation Strategy
Completion Plan	Lendlease Completion Management Plan

2. PROJECT DETAILS

2.1 Overview of the Project

The Western Sydney Stadium Project will provide the community of Western Sydney with a first-class precinct comprising of a brand new 30,000 seat stadium and an activated public realm. The venue will have the ability to service major sporting and entertainment events.

2.2 Scope

The project involves the redevelopment of the existing Parramatta Stadium, to be known as Western Sydney Stadium upon completion. This project also includes the redevelopment of public realm areas included within the site's boundaries.

The construction works generally include:

- Demolition of the existing Parramatta Stadium
- Demolition of the existing Parramatta Council Community Pool
- Excavation and remediation of the site in accordance with the RAP and remediation strategy, to achieve bulk levels aligning with the new stadium design
- Construction of a new 30,000 seat Stadium incorporating corporate suite and media facilities across a five-storey western stand
- Diversion of the existing HV services
- Infrastructure works to the existing intersection of O'Connell Street and Victoria Road
- Infrastructure upgrades as required by the final design solution
- Construction of a new on-grade carpark in the North-Western Corner of the Site
- Construction of public realm facilities.

2.3 Hours of Work

The project will comply with the Stage 2 Development Application Approval consent hours summarised below;

- Monday to Friday: 7:00am to 6:00pm
- Saturday: 8:00m to 1:00pm
- Saturday 1:00pm to 5:00pm where construction activities do not emit noise.

Works may be undertaken outside these hours where:

- the delivery of materials is required outside these hours by the Police or other authorities; or
- it is required in an emergency to avoid the loss of life, damage to property and/or to prevent environmental harm; or
- Variation is approved in advance in writing by the Secretary or her nominee.

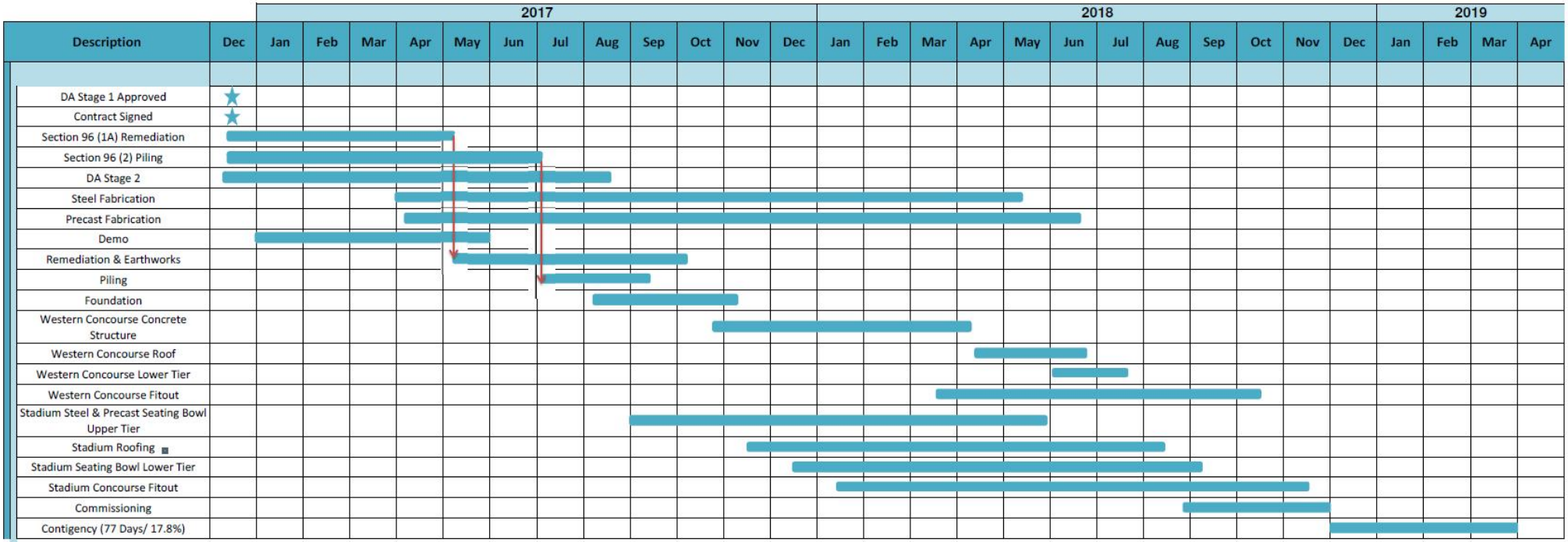
2.4 24 Hour Contract Details

Western Sydney Stadium Site Manager is contactable 24 hours a day. Contact details are as follows;

- Site Manager – Malcolm Pack
- Contact Mobile 24 hours - 0418 690 229

2.5 High Level Programme

With reference to the information within this plan, the below provides a high-level summary of key construction activities. These activities are planned based on NETT durations with the projects delay allowance shown as an activity on the back end of the programme. The project timeline commences in January 2017 and will be completed 30 March 2019.



3. ORGANISATION

3.1 Overview

Lendlease personnel including corporate and technical support personnel allocated to the Western Sydney Stadium Project are highly experienced, possessing suitable skills and competency levels necessary to manage the Project works.

The nominated personnel proposed to manage delivery of the Project and their roles are illustrated in the Project Organisation Chart included in Appendix 1. The organisational structure is dynamic and responsive to meet the demands of the project, specifically construction on multiple work fronts and engagement with the community and key stakeholders.

3.2 Site Management Team

The Site Management Team will be established progressively in a Project Office on-site to manage the delivery of the Project, namely the procurement, construction or remediation work and completion/handover phases. The objective of this team will be to promote collaboration, cohesiveness, enthusiasm, initiative and spirit of cooperation from the beginning.

The Site Management Team shall be directly supported by the NSW Senior Management Team (Refer Appendix 1 – NSW Support)

The Site Management Team will provide the following Delivery Phase requirements:

- Project Management
- Procedural and process control
- Tendering and procurement management
- Construction control
- Contract administration and cost control
- Site management and construction supervision
- Time control and programming
- Quality control, monitoring and reporting
- Environmental control, monitoring and reporting
- Safety monitoring and reporting
- Traffic and pedestrian management
- Authority and approvals coordination
- Commissioning and completion management.

4. PROCUREMENT AND SUBCONTRACTOR MANAGEMENT

Lendlease will adopt a range of approaches in the procurement and subcontractor management phases of the project. These approaches are common in the way Lendlease has delivered its most recent projects in Sydney including Darling Harbour Live and Barangaroo South. These practices include:

- Preferred trade partners who can bring expertise, value and market experience to the design and delivery of the project. Specifically, to the Western Sydney Stadium Project, Lendlease has partnered with key services and structural contractors to influence proposed solutions in a manner that provides value in the product handed to INSW at completion. Most of the trade partners have recently worked as part of a team with Lendlease on the Darling Harbour Live Project, whilst other trade specialists have been engaged due to the nature of the project and their experience corresponding experience.
- Key contractors that have the capacity to deliver the various trade packages will be invited to tender the works in a competitive environment. These contractors will be pre-qualified; and
- Strategic procurement alliances will be used for:
  - Sanitary ware
  - Vertical transportation
  - Reinforcement supply
  - Ceiling tile supply
  - Carpet tile supply
  - FF&E.

5. TRAFFIC MANAGEMENT PLAN

5.1 Purpose

This Construction Traffic Management Plan (CTMP) is an updated version of the plan issued for the Stage 1 Development Consent the SSD 7534. This plan is updated to comply with Stage 2 Development Consent conditions SSD 8175, Clause B42

The plan has evolved from submission with the tender in order to demonstrate to the NSW State Government (State) that Lendlease's project plans can be amended to suit the specific requirements of the Western Sydney Stadium project. This process ensures that our staff have a thorough understanding of how the base plans operate and what project particulars need to be implemented.

5.2 Introduction

The intended purpose of the Construction Traffic Management Plan (CTMP) is to demonstrate how Lendlease will implement and maintain the works in accordance with the traffic management and traffic safety requirements of the contract during the delivery of the WSS works package, including:

- Provision for the safe movement of vehicular and pedestrian / cycle traffic;
- Provision for the safe and efficient operation of public transport services;
- Protection from passing traffic for workers;
- Provision for maintaining existing property access points, where possible or providing alternatives, within the extent of works during construction life cycle; and
- Installation of temporary signage, road markings, lighting and safety barriers as per regulatory standards.

It is proposed that this plan be refined, continuously monitored and updated during the construction of the stadium.

5.3 Background and Existing Conditions

5.3.1 Location and Land Use

The site is located on the fringe of Parramatta CBD and is bounded by the Parramatta River to the west and south and O'Connell Street to the east.

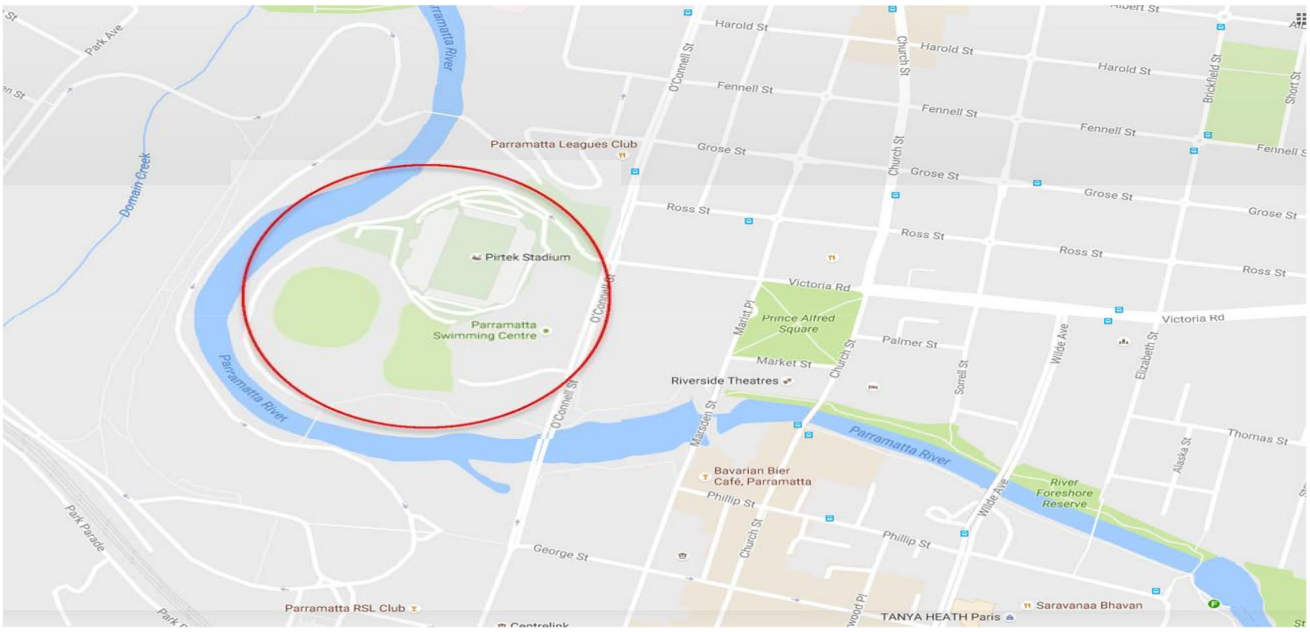


Figure1 – Site Location

The site is mostly surrounded by park and recreational land use on the south and western side and an approximate frontage of 550 meters along O'Connell Street on the eastern side between Parramatta River in the south and Grose Street in the north. Land use on the eastern side of O'Connell Street is mixed in nature, with various commercial, educational and residential uses located in the immediate vicinity of the site.

5.3.2 Road Network

The site has frontage to O'Connell Street with vehicular access provided at the existing signalised intersection with Victoria Road. There is also a mid-block pedestrian crossing on O'Connell Street located mid-way along the eastern site boundary aligning with the existing pool facility. The Parramatta Leagues Club to the north of the site has access from the Grose Street / Eels Place signalised intersection with O'Connell Street.

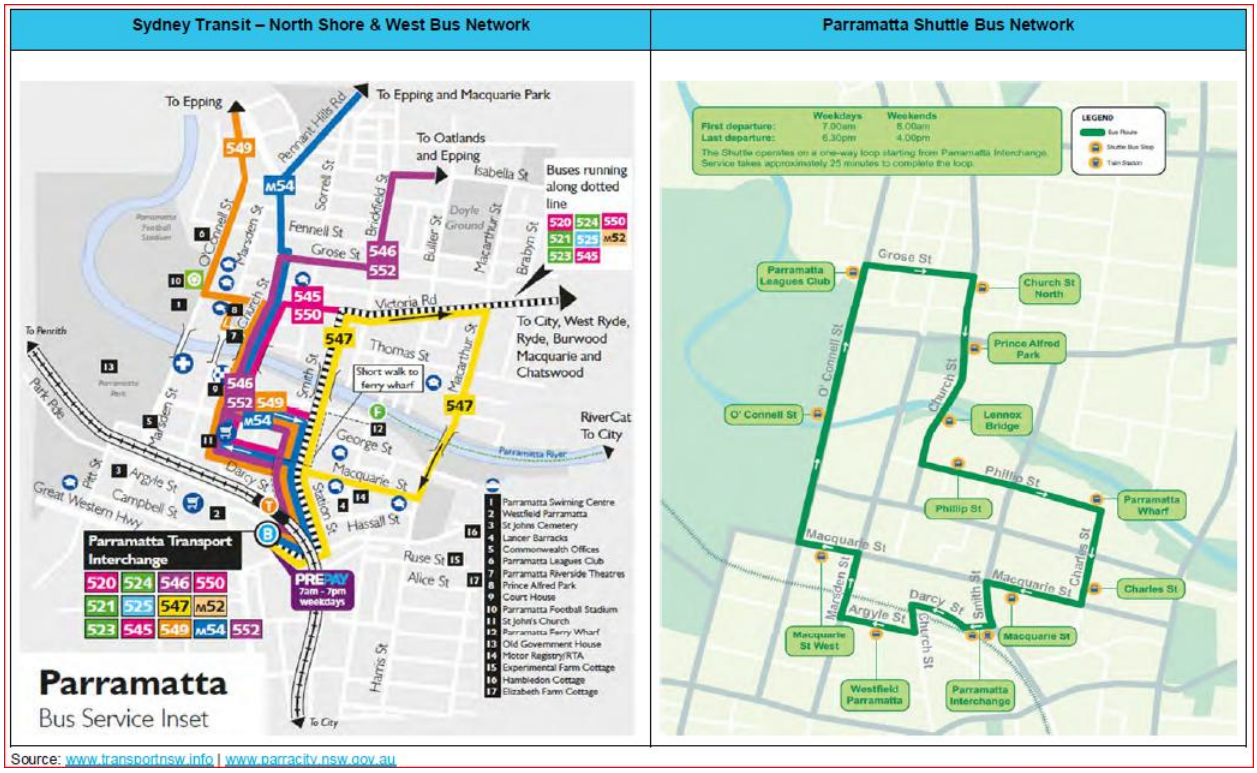
Figure 2 – Access to site and intersections along O'Connell Street

O'Connell Street is a 4-lane divided road along the site frontage with right-turning bays at the Victoria Road and Grose Street / Eels Place intersections.

O'Connell Street runs parallel to Church Street, the main north-south road through the Parramatta CBD. Church Street links with James Ruse Drive, the major arterial road, about 2.5km to the north and the Great Western Highway (A44), and M4 Western Motorway, about 1.4km and 2.4km respectively to the south.

5.3.3 Public Transport

(a) Bus routes



Source: www.transportnsw.info | www.parracity.nsw.gov.au

Figure 3 – Parramatta bus network along O'Connell Street

Figure 3 shows the Parramatta bus network for both State and Council operated services. Sydney Transit operates an extensive bus network within and connecting to Parramatta, including the following scheduled route services that provide transport links between the Parramatta CBD and Epping, via the existing stadium at stops on O'Connell Street:

- Two northbound services per hour during an average weekday AM peak, with a frequency of 20-30 minutes
- Two northbound services per hour during an average weekday PM peak, with a frequency of 15-30 minutes.
- Three southbound services per hour during an average weekday AM peak, with a frequency of 10-30 minutes.
- Two southbound services per hour during an average weekday PM peak, with a frequency of 30 minutes.
- The 900 free shuttle bus operates every 10 minutes from 7:00 to 18:30 Mondays to Fridays and 8:00 to 16:00 on Saturdays, Sundays and Public Holidays.

This means a maximum of 13 bus trips northbound along O'Connell Street per peak hour.

(b) Pedestrians

The study area from the Stage 1 DA, Appendix F report indicates the different pedestrian and transport connections around the Stadium Precinct as in Figure 4.

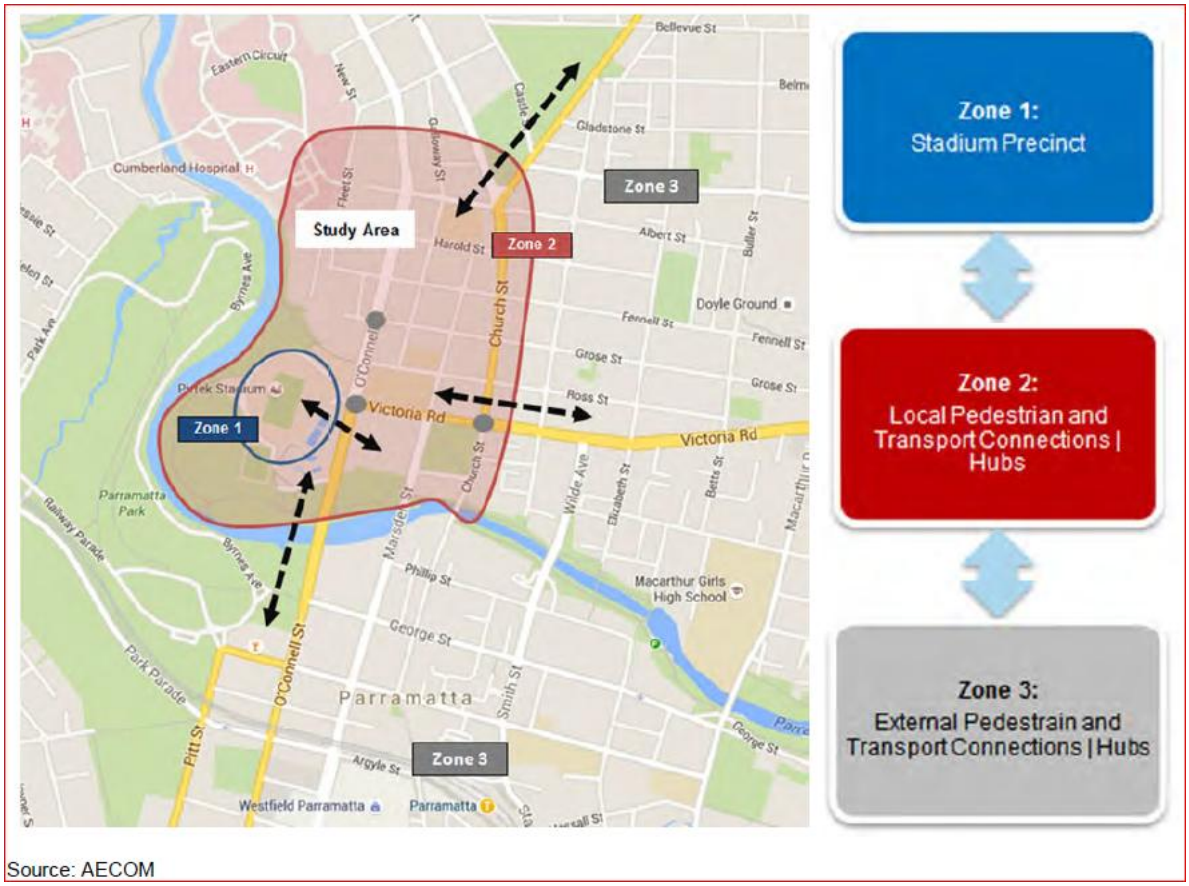


Figure 4 – Study Area – (Ref: Stage 1 DA, Appendix F – AECOM).

It is expected that pedestrian movements to and from the site will be limited during construction as current attracters will be closed. The swimming pool will be closed after Stage 1 demolition works. The main points of crossing O'Connell Street will be at the existing signalised pedestrian crossing and at the intersections with Victoria Street and Eels Place / Grose Street. Walking paths on the western side of O'Connell Street will be demarcated and signed for safe movement of pedestrians in line with RMS standards.

(c) Walking and Cycle Paths

There is an extensive pedestrian network that connects the current stadium to surrounding areas and the Parramatta CBD via footpaths on both sides of O'Connell Street.

Figure 5 highlights the shared pedestrian and cycle paths that are situated on the Parramatta River foreshore between the Parramatta CBD and Parramatta Park to the west of the existing stadium. These

facilities will remain in use during construction and no conflict with construction traffic and activities should be experienced.

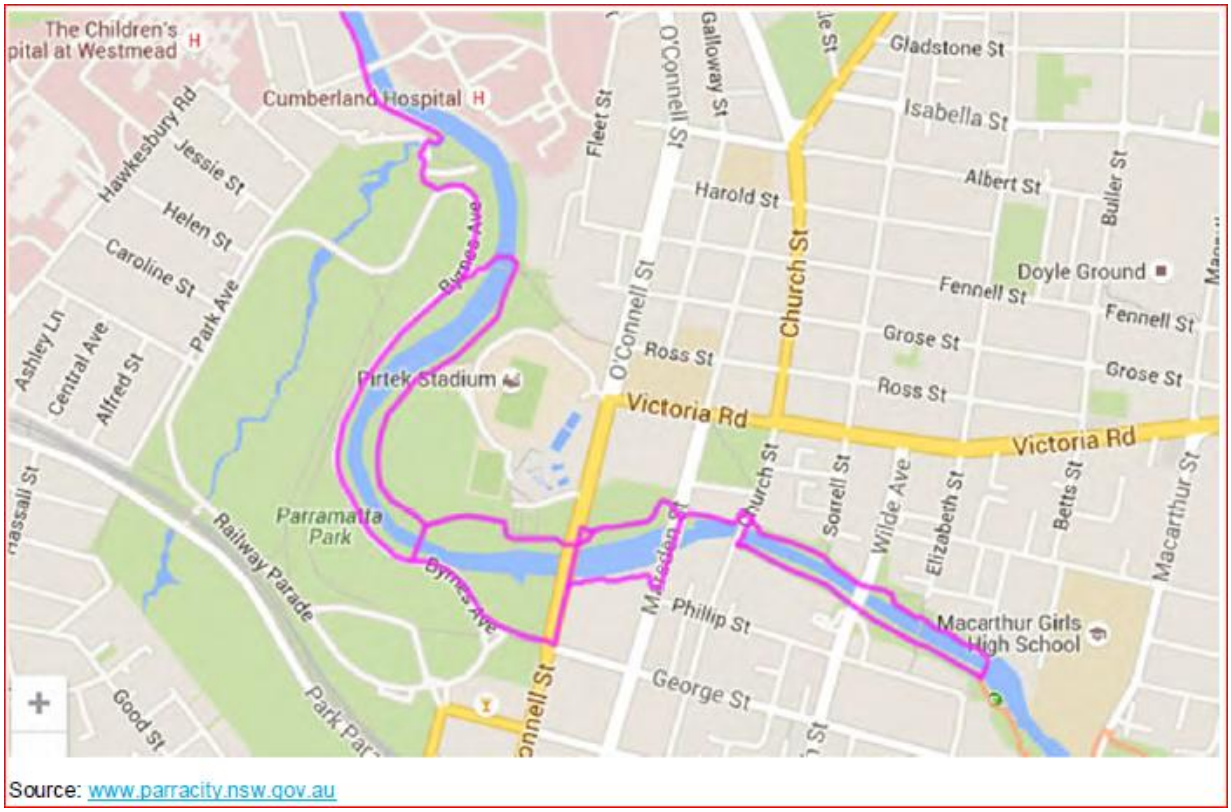


Figure 5 – Shared pedestrian and cycle path network ((Ref: Stage 1 DA, Appendix F – AECOM).

(d) Current Parking

Parking currently exists within the Site and comprises of a large at grade car park north of the stadium as well as a smaller at grade car park to the west. Further to this, parking is also permitted along the connecting access road which links the two car parks. The total number of spaces available is about 340. This comprises of 74 spaces located within the smaller car park and along the access road to the west of the stadium, as well as 266 spaces in the main northern at grade car park. This parking spaces will be closed for public use during construction.

There are no parking counts available for weekday business hours but if it is conservatively assumed that about 40% of the available parking spaces represent the inbound and outbound vehicular parking peak hour movements, it means a total of 140 vehicles in and 140 out for the peak hour. This translates to about 5 vehicles in and 5 out per traffic signal cycle during the peak hour.

(e) Truck Routes

There are two obvious route options to connect construction traffic to the main arterial road network to and from the construction site. This include the following routes as indicated in Figure 6 below:

Route A: The southbound route, right-turn from the site (at the Victoria Road intersection) onto O'Connell Street southbound to the Great Western Highway (A44). There are six signalized intersection between the site and the A44.

Route B: The route from the site via Victoria Street and northbound along Church Street towards James Ruse Drive (A28) will be a good alternative for construction traffic to link with the major arterial road network. There are eight signalized intersection between the site and the A28.

Route A is the preferred link for construction traffic as it is the shortest with less impact.

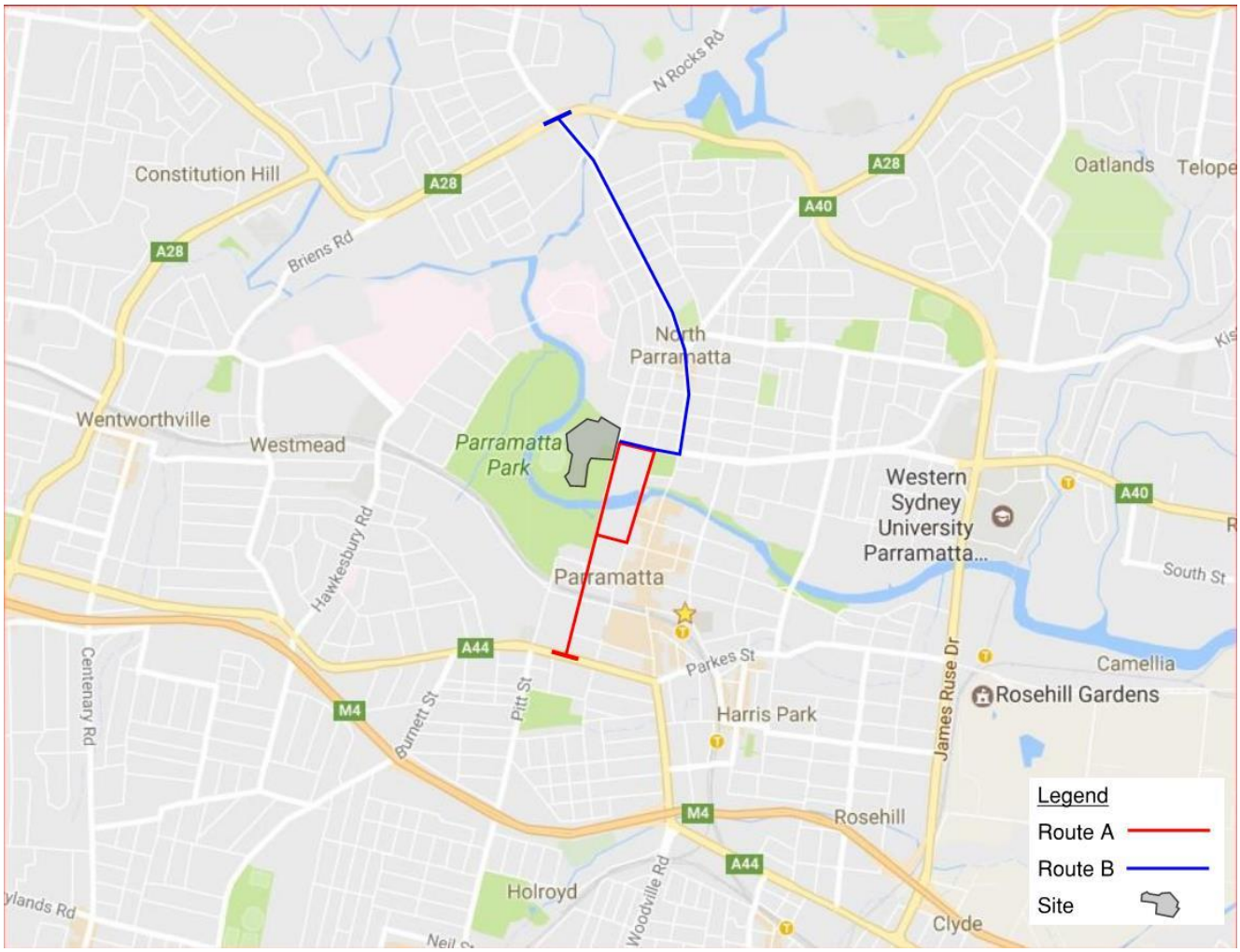


Figure 6 – Truck routes to and from site to connect with arterial road network

5.4 Site Access and Traffic Management

5.4.1 Key Focus

The project construction will involve vehicle and pedestrian movements within and around the site. This will interface with existing vehicle and pedestrian activity within the surrounding precinct.

During the work, the objective for managing traffic will be to:

- Implement an effective management plan that achieves the planned construction activities in a safe and timely manner;
- Minimise the disruption to both vehicular and pedestrian traffic, including:
  - Temporary lane or road closures, detours and other disruptions to public transport services and traffic flows including identification of additional traffic generated as a consequence of these disruptions;
  - Access for people using the precinct;
  - Access for disabled persons, pedestrians, cyclists and public transport passengers;
  - Site security, site access; and
  - Signage, including;
    - Project identification including signs to acknowledge Government initiatives;
    - Traffic (or road user) delay management;
    - Information signage, distance information and advance warning signs;
    - Speed limit signage; and
    - Changes to existing signage locations and provisions for emergency and incident response.
- Protect the environment; and
- Frequency of inspections.

5.4.2 Construction Stages

Bulk Earthworks, Piling, Foundations (May-Nov 2017) - Stage 3

During the earthworks stage peak truck loads will increase to 120 trucks per day, consisting typically of 30 tonne truck and trailers with extendable bed semi-trailers used for piling cages approximately 15m in length. The main entry/exit point remains at Gate A and an alternative entry/exit point at Gate 3 (C) and 2 (D) (left-in – left-out to and from O'Connell Street) will be used to facilitate access for the South and SE construction activities. See details as indicated in Figure 10 below. Construction deliveries through Gate 3 (C) and 2 (D) include concrete truck deliveries (daily), and reinforcement deliveries (semi-trailers, every second day).

Figure 7 - Bulk Earthworks, Piling & Foundations – Stage 3

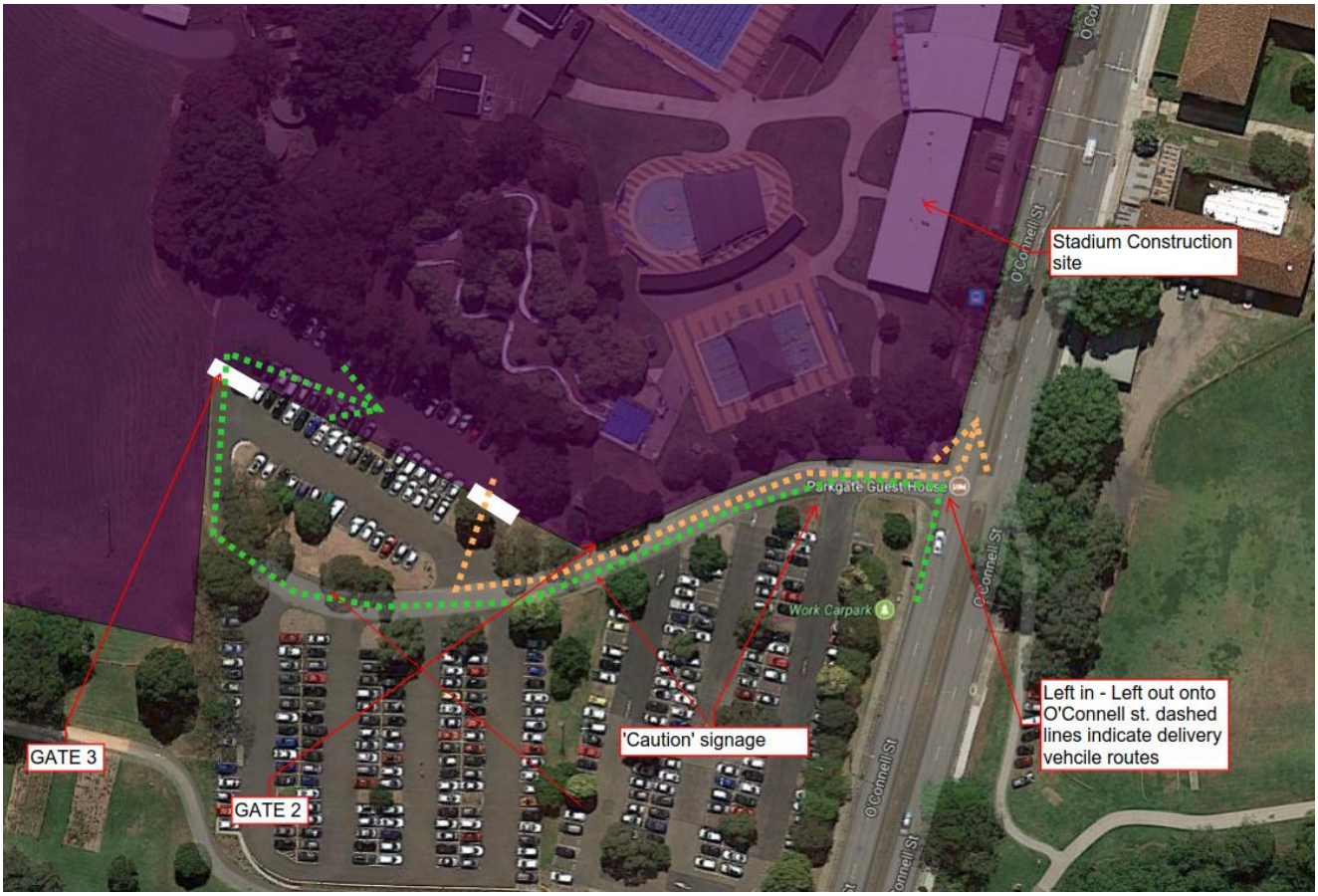


Figure 8 – Vehicle access routes within South Carpark

General Construction (Nov 2017-Mar 2019) - Stage 4

During large concrete pours and for general deliveries, peak truck loads will be 100 trucks per day, with extendable bed semi-trailers for structural steel the maximum truck size. As indicated in Figure 11 below, the main entry/exit point remains at Gate A and an alternative entry/exit point at Gate 3 (C) and Gate 2 (D) (left-in – left-out to and from O'Connell Street).

Gate 3 (C) is used for gaining access to the high level concourse, with a ramp formed during bulk earthworks and Gate 2 (D) will be used for gaining access into the low level pitch via the vomitory below the south east corner of the stadium.

It is noted that during all stages detailed, there will be some out-of-hours wide load deliveries made for large plant. Furthermore, pedestrian access for workers to the site will be through Gate B, a separate gate located approximately 60m north along O'Connell Street from the main access (Gate A).

Figure 9 - General Construction - Stage 4

5.5 Traffic Impact during construction activities

5.5.1 Impacts Analysis

The traffic impact during the construction stages can be summarized as follow:

Traffic Element	Section	Traffic Impact and actions
Bus Routes	5.3.3 (a)	With an estimated maximum of 13 buses northbound along O'Connell Street per peak hour it means about one bus every 2nd to 3rd traffic signal cycle which will not have a noticeable impact or conflict with construction traffic in and out of the site.

Pedestrians	5.3.3(b)	Pedestrian paths adjacent to the site are not expected to be impacted as a result of the construction activity. No construction vehicles will be parked nor will material/equipment be stored on the public footpaths adjacent to the site. The site will be hoarded with A-Class hoarding along pedestrian footpaths to ensure segregation of the site from external pedestrians. Pedestrian site access (workers) will only be via the Gate B entry, which will be controlled with turnstile access and a constant security presence. Construction vehicle entry and exit at the site gates will be managed and controlled by qualified traffic controllers. Pedestrian warning signs and construction safety signs/devices will be located adjacent to these driveways, in accordance with WorkCover requirements. Pedestrian barriers/gates (subject to separate approval from Construction Regulation Unit) will be extended across the footpaths, either side of the construction access driveways to temporarily contain pedestrians when the driveways are in use (when trucks are entering and exiting the site). When the driveways are not in use, the pedestrian barriers/gates will be opened and pedestrian activity along adjacent footpath will be available. The movement of trucks entering and exiting the site, and the movement of pedestrians across the construction access driveways, when in use, will be managed and controlled by qualified traffic controllers. It is expected that pedestrian activity will still be noticeable during Stage 1 as the swimming pool will still be in operation. Pedestrian numbers will then decline from Stage 2 as the pool will be closed.
Walking & Cycle Paths	5.3.3 (c)	No additional impact is expected between walking and cycle paths as indicated in Figure 5.
Parking	5.3.3 (d)	The northern carpark will be closed for public access and become part of the construction zone at the start of Stage 1 and be used as the site accommodation area. There are about 340 parking spaces in this area. It is conservatively assumed that a maximum 40% of the available parking spaces represent the current inbound and outbound vehicular parking peak hour movements, it means a total of 140 vehicles in and 140 out for the peak hour. This translates to about 5 vehicles in and 5 out per traffic signal cycle during the peak hour which is more that the anticipated truck movements in and out of the site during these stages. The impact of truck movements on the adjacent intersections will therefore be less than vehicle movements to and from the existing carparks.
Truck Routes	5.3.3 (e)	The main access gate to the site will be Gate A (Figures 7 to 9). With Route A (see Figure 6) as the preferred route most trucks will turn left into the site from O'Connell Street and right outbound to the south. It is estimated that 40 vehicles per day will move in and out. This is a maximum of 5 to 6 trucks per hour which, coupled with the removal of carparking traffic, will have negligible impacts on intersection performance along O'Connell Street and the route southbound. Gate D will be a left-in and left-out movement only with no noticeable impact on traffic movements in and out of the site.

		Small changes, if any, to the traffic control plan at Gate A (O'Connell Street / Victoria Road intersection) might be required. This will be assessed on site early in Stage 1 and recommendations will be prepared and presented to RMS for approval. See also Section 5.6 for general notes on truck routes.
South Carpark	5.4.2	Construction vehicle access to Gates 3 (C) and 2 (D) will be through the existing south carpark which is operational to the public. The following controls will be in place to minimise traffic and pedestrian impact within the carpark; · No carpark spaces will be impacted from the proposed operations. · Signage will be installed within the carpark advising of "Caution Truck movements' to make pedestrians within the carpark aware of moving vehicles. · All deliveries will be booked in with LL prior 24 hours in order to avoid congestion. At no time will vehicles be double parked within the carpark. · All delivery drivers will be briefed at time of booking in deliveries, ensuring drivers are aware of pedestrian movements within the carpark. Pedestrians will be traversing within the carpark to and from ticket machines and existing and entering the carpark via designated footpaths. · Traffic Controllers will open and close the gates 3 (C) and 2 (D) at the time of vehicle to ensure Gates are closed at all times preventing any unauthorized entry. · Prior to vehicles exiting the Gates, Traffic controllers will ensure wheels are free of any dirt. · Full time watercart is on site during construction. As required watercart will wet down areas within the carpark should dust be generated. · Refer to figure 10a for details of vehicle access routes.

5.5.2 General Notes on Truck Routes

During demolition and construction, trucks transporting material to and from the site will be accommodated on-site.

The loading of all trucks with demolition material will be carried out from a designated onsite materials handling/loading area. Access to the on-site materials handling/loading area will be managed and controlled by qualified traffic controllers.

General traffic movements on surrounding streets associated with the continued operation of the existing adjacent premises will be maintained at all times through the construction process. Other than during the delivery and removal of large construction plant and machinery, there will be no requirement to restrict traffic arrangements on the surrounding streets in the vicinity of the site.

Truck movements will be restricted to designated truck routes and at no time during the construction process will be permitted to park on-street within the adjacent CBD.

The preferred truck route, Route A, as indicated in Figure 6 will be tested with stakeholders for approval and then confirmed as the designated truck route to and from the site which will restrict trucks to the main road network through the area. Route A is proposed to prevent trucks accessing other roads within the CBD in the vicinity of the site. Truck drivers will be advised of the designated truck route to and from the site.

It is not envisaged that the traffic control plans (TCPs) for signalised intersections along this route need to be assessed for Stages 1 & 2 (Demolition Stages), as the impact from construction traffic compared to existing traffic volumes will be minimal. The impact for Stages 3 & 4 (Bulk Earthworks and General Construction) will however be assessed as soon as traffic volume data becomes available. The outcome will be discussed with stakeholders and approved changes to TCPs (if any) will be implemented.

5.5.3 Work Zones

On-street work zones are not expected to be required adjacent to the site. The proposed construction access driveways will be managed and controlled by qualified traffic controllers, and these personnel will manage the movement of construction vehicles to and from the site and pedestrian movements adjacent to the construction activity.

5.6 Stakeholder Engagement and Approvals.

Lendlease, assisted by our transport consultants, has engaged with the City of Parramatta, Parramatta Parks Trust, and Transport for NSW, as well as RMS in order to ensure the compliance of this proposed Construction Traffic Management Plan with relevant Australian Standards and the Roads and Maritime Services' Manual for Traffic Control at Work Sites.

Project updates are provided by INSW to the local community. Should there be any impacts on road users, pedestrians or cyclists from the proposed construction works, these will be communicated. The community update is in the form of media releases, letter box drops and on the INSW website.

As the main construction entrance is through Gate A, which is a signalised intersection, enhanced safety provisions are provided. Should there be a requirement for adaptive response to any traffic or construction incident, regulatory authorities would be immediately contacted. This will be led by the Site Manager, notifying Police, Ambulance or Fire depending on the circumstances.

The Construction Traffic Management Plan is monitored by the Site Manager and Construction Manager regularly. As part of the Lendlease EHS systems requirements, this plan is reviewed every 3 months. Further to this, if there is any significant change in construction methodology changing the current traffic arrangements or future plans, then amendment to the existing plan will be undertaken. Once updated, the new plan will be communicated to the relevant Stakeholders.

6. NOISE & VIBRATION MANAGEMENT

6.1 Overview

Lendlease will endeavour to minimise noise from construction activities. Lendlease's primary objective is to:

- Comply with all statutory requirements;
- Avoid or minimise adverse noise impacts from construction, through construction methodology and appropriate management measures;
- To minimise the generation of noise and vibration from construction activities which could affect the site personnel;
- To minimise the generation of noise and vibration from construction activities which could affect neighbouring residences, businesses and associated building structures and other community members; and
- Establish and maintain good relations with the community and neighbouring sites.

The following controls may be implemented to ensure that noise related issues are controlled, addressed and resolved in accordance with regulatory requirements:

- Select employees will receive training which will enable them to recognise areas where noise levels are likely to exceed 85dBA;
- A noise assessment of the site will be undertaken prior to or at the commencement of works on site and reviewed from time to time until the task has been completed;
- As the work environment changes, additional assessments may be conducted, the timing of which will be determined in consultation with the Site Management Team, Site Safety Committee and Site EHS Coordinator;
- Warning signs shall be erected in areas where noise levels are expected to exceed 85dBA; and
- Where personnel protection equipment is required, the work areas shall be identified by signage. The appropriate noise protection devices are to be issued to all exposed persons.

6.2 Training

Training will be undertaken to ensure employees are aware of:

- Correct method of fitting ear protection muffs and plugs;
- Recognition of hearing protection areas; and
- Care and maintenance of personnel protective equipment.

If required, further training will be provided by means of video film appropriate to the topic. Ongoing training will be reviewed from time to time by the Site Safety Committee. Records of training and audiometric testing shall be retained by the Site Management Team. Noise levels of operating plant and equipment shall be determined from Plant Induction Checklists prior to commencement of work on site.

6.3 Hierarchy

The hierarchy of noise control to be applied is:

- Elimination – eliminate the source of the noise.
- Substitution – substitute source of noise for quieter plant or processes.
- Design – process or equipment to be designed with appropriate control measure.
- Engineering controls – additional or modified equipment to suppress noise.
- Administrative controls - such as rotation of effected employees or out-of-hours work.

- Personnel protection – ear plugs, ear muffs, etc.
- Materials.

6.4 Dilapidation Survey

Prior to commencement of works on site, Lendlease will undertake a dilapidation survey to record pre-existing condition of buildings and infrastructure that may be affected by construction activities. Such dilapidation survey could include access routes, pavements and site infrastructure.

6.5 Vibration and Acoustic Monitoring

Lendlease shall assess the requirement to engage a suitable acoustics and vibration consultant to carry out monitoring during construction activities. The dilapidation survey may confirm the necessity for such an appointment. Acceptable levels would be predetermined and monitoring would allow compliance to be assessed and recorded and changes to construction methodology adopted as may be required.

6.6 Working Hours

Lendlease will ensure strict compliance with approved working hours during all construction activities. Any requirement for works outside of the approved hours will be sought through the relevant authorities in conjunction with communication protocols for stakeholders and the community.

6.7 Detailed Construction Noise and Vibration management Plan

A detailed Construction Noise and Vibration Management Plan has been prepared by Acoustic Logic. A detailed assessment of noise and vibration from construction activities is presented within this report with reference 20170038.1/3008A/R2/TA, see appendix 3.

7. BIODIVERSITY

7.1 Overview

The Parramatta River Grey-headed Flying-fox camp is one of several camps monitored as part of the National Flying-fox Monitoring Program (NFMP) undertaken by CSIRO.
A biodiversity assessment report (dated February 2017 submitted with the Stage 2 DA Application) has been prepared outlining key mitigations strategies to protect the Grey-headed flying fox. The Grey-headed Flying-fox is susceptible to disturbance and stress from increased noise levels and extended duration of noise.

7.2 Mitigation controls

The following controls are being implemented by Lendlease during all construction activities;

- Incorporation of a buffer area and barrier between the demolition/construction area and the River-Flat Eucalypt Forest within the construction fence.
- Implementation of stringent sediment and erosion control measures in accordance with the erosion and sediment controls detailed in the Stormwater and Erosion management plan.
- Noise sensor is located north of the site near the Grey-headed Flying-fox camp and regularly monitored. During construction, noise levels reaching the camp should not exceed 52-57 dB(A) especially at dusk, dawn and when the colony is supporting dependant young.
- Construction work does not begin until after the bats have returned to roost and cease at least 1 hour prior to the start of the fly-out.
- Lighting is to be directed away from the Grey-headed Flying-fox camp;
- Monitoring surveys are to be undertaken weekly for the first month of the project and then monthly for the duration of the project to monitor the behaviour of individuals and assess the overall size of the of the Grey-headed Flying-fox camp in response to sustained periods of elevated noise;
- Stop work triggers are activated in the event of camp distress (declining number or diurnal dispersal) or a decrease in animal health (including increased rate of mortality) is observed. Work is to be stopped until appropriate management responses are developed in consultation with the project ecologist to minimise any risk of further harm.

8. WASTE MANAGEMENT

Demolition and construction activities required for the Project will generate waste. There will be a requirement to manage and control the incidence and handling of waste including its identification, collection, sorting and recycling. Management procedures for waste are addressed in detail in the Environmental Management Plan to achieve the required recycling percentage targets. A detailed Construction Waste management Plan has been prepared by Foresight Environmental and is attached to Appendix 4.

8.1 Waste Types and Classifications

The Project will generate wastes of varying categories. Certain wastes have the potential to present safety concerns to human health or harm to the environment. All wastes will be identified prior to disposal.

Waste types include the following:

- Recycling of concrete from demolition on site by crushing
- Recycling of all steel elements from demolition
- Landfill disposal of non-recycled elements
- Packaging of goods to be returned to suppliers
- Segregation on site of construction waste such as concrete, steel, timber, metal, and general rubbish.

8.2 Guidelines for Waste Management

The person responsible for each waste type will locate bins in a convenient place. All endeavours will be made so that recycling is made as easy as possible for workers to participate in and contribute to recycling targets.

Persons responsible for ordering materials will, where practical and appropriate:

- Order materials in the appropriate quantities;
- Give a high priority to using non-hazardous products where practical;
- Give a high priority to the use of products made with recycled materials; and
- Waste should be separated at its source by the employees and subcontractors where practical and safe to do so.

All works will be planned to minimise construction waste and contamination of the site and surroundings, encourage recycling and practise resource conservation. Lendlease will not discharge or dump any deleterious material into the drainage system, or onto any roads, hard standing or unmade area on or in the vicinity of the Site. Lendlease will separate waste into appropriate bins and arrange collections to maximise recycling of waste. No burning of waste or rubbish will be allowed.

8.3 Maintenance, Cleaning and Waste Removal

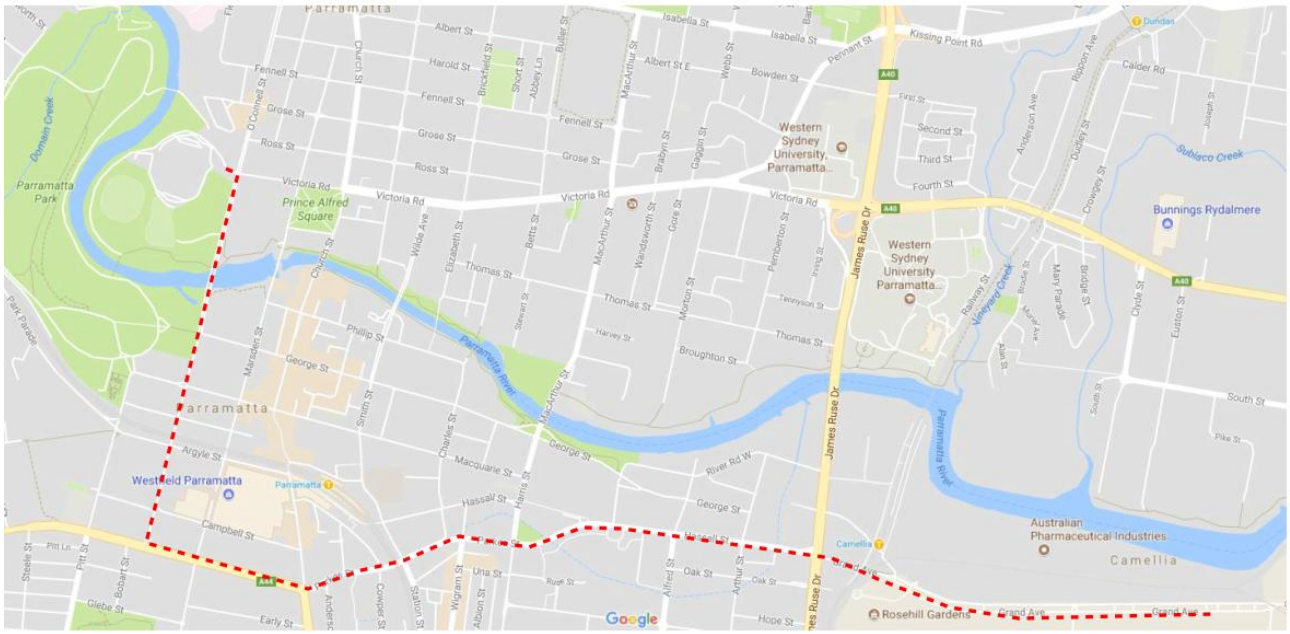
All construction personnel will be responsible for maintaining clean and tidy work sites. Subcontractors will be responsible for maintaining cleanliness of each specific work face.

Removal of waste from the work faces shall be via standard proprietary ‘wheelie’ bins. Receptacles will be located conveniently and in close proximity to work faces. Subcontractors will collect and dispose of waste in bins on a daily basis. At the end of each day or other such regular frequency, bins will be collected and emptied into central industrial waste bins for removal and disposal off-site by the waste management contractor.

All vehicles existing the site will have trailers with covers to prevent dust and debris falling.

The bulk excavation strategy for Western Sydney Stadium is to cut and fill approximately 90,000m3 of material within the site. It is envisaged that no excavation spoil will be removed from site preventing dust and debris onto roads.

DATS has been appointed as the waste management subcontractor for the project. Notification has been provided to RMS Traffic management centre of the truck routes that waste material will be transported to. Truck route is identified below. Trucks will exit the site, turn right onto O'Connell street, head to Parramatta Road, turn left, drive towards Parkes street, then follow onto Hassall St, then onto Grand avenue, then arrive at Camelia waste centre. Destination of the waste is KLF Holdings Pty Ltd 6 Grand Avenue Camellia NSW 2142.



The hazardous material on the existing site, namely bonded and friable asbestos has been remediated on site. This has been carried out under strict controls enforced by the Occupational Hygienist. Implementation of asbestos loggers have been in place daily to monitor emission of fibres in the air. This process will continue until all associated works with existing contaminated materials is complete.

8.4 Dust Control

Dust shall be suppressed where ever possible to ensure air quality, and to avoid health and safety issues and nuisance to occupants. All waste to be removed from Site shall be adequately covered by suitable means to minimise air-borne dust. Dust control measures are addressed in further detail in the Environmental Management Plan.

8.5 Works on Existing Services

The following shall be considered by the Site Management Team prior to carrying out works on engineering services:

- Carry out all work on services, including inactive services, in accordance with the requirements of the relevant authorities;
- Protect and maintain all existing active services on or adjacent to the site;
- Relocate services if required and provide temporary services during relocation as necessary; and
- Mitigate against disruption of continuous supply of services during construction.

8.6 Damage to Existing Services

In the event of damage or disruption to any services on or adjacent to the Site, the Site Management Team shall:

- Notify the Relevant Authorities;
- Cease works should the damage pose a threat to persons or property;
- Cease work in the vicinity and clear the area of people, including people in Adjacent Properties and public land as appropriate and notify the relevant emergency services;
- Not recommence works until approval has been obtained from the Relevant Authorities; and
- Provide assistance as required in connection with any such incident, involving repair, diversion, relocation, cutting, sealing or disconnection or make safe as required by the relevant authority and to maintain supply.

8.7 Litter Control

The workers site entrance to Western Sydney Stadium is located off O'Connell Street. Lendlease does not provide any facilities for workers outside the fence line. This reduces risk of generating litter within the public areas. Within the site boundary a dedicated Waste contractor has been appointed to provide waste bins for use for all construction materials and general waste.

These are regularly emptied and frequency will increase and the construction workforce increases. Lendlease construction workers carry out a daily site perimeter check of the fencing. At this time, any litter around the perimeter fencing will be disposed of appropriately.

9. SITE ESTABLISHMENT

Lendlease will commence Site Establishment as soon as practicable in January 2017. Lendlease has allocated resources to manage this process, allowing the commencement of demolition works immediately following site establishment. The site establishment process will cover the following key activities:

- Compound fencing;
- Secure site access for deliveries;
- Statutory signage;
- Temporary site office and associated amenities;
- Temporary Access Roads;
- Temporary services connections to existing infrastructure;
- Environmental controls;
- Waste management;
- Appropriate drainage of the work areas; and
- Establishment of safety, environmental, traffic and emergency procedures.

9.1 Project Perimeter Fencing

The site will be established in two clear stages;

- Stage 1 being early January 2017 (post contract award), whereby Lendlease will take possession of the site (areas currently owned and occupied by INSW). This will exclude the Community Pool, which will remain in operation until 30th March 2017; and
- Stage 2 being 1 April 2017, whereby Lendlease will take possession of the Community Pool. Figures 1 and 2 below show the two stages for Site Establishment.

Site Establishment – Stage 1

Figure 1 – Stage 1 Site Establishment 03 January 2017

The Stage 1 site boundary will be established with 3m high chain wire fencing with three layers of barb wire on the top.

The fence will be double lined with shade cloth with the opportunity for various stakeholder branding. Stage 1 establishment will exclude the pool area (currently delineated by a 2.4m fence), however 3m chain wire fencing will still be established on the Northern and Western Pool boundaries.

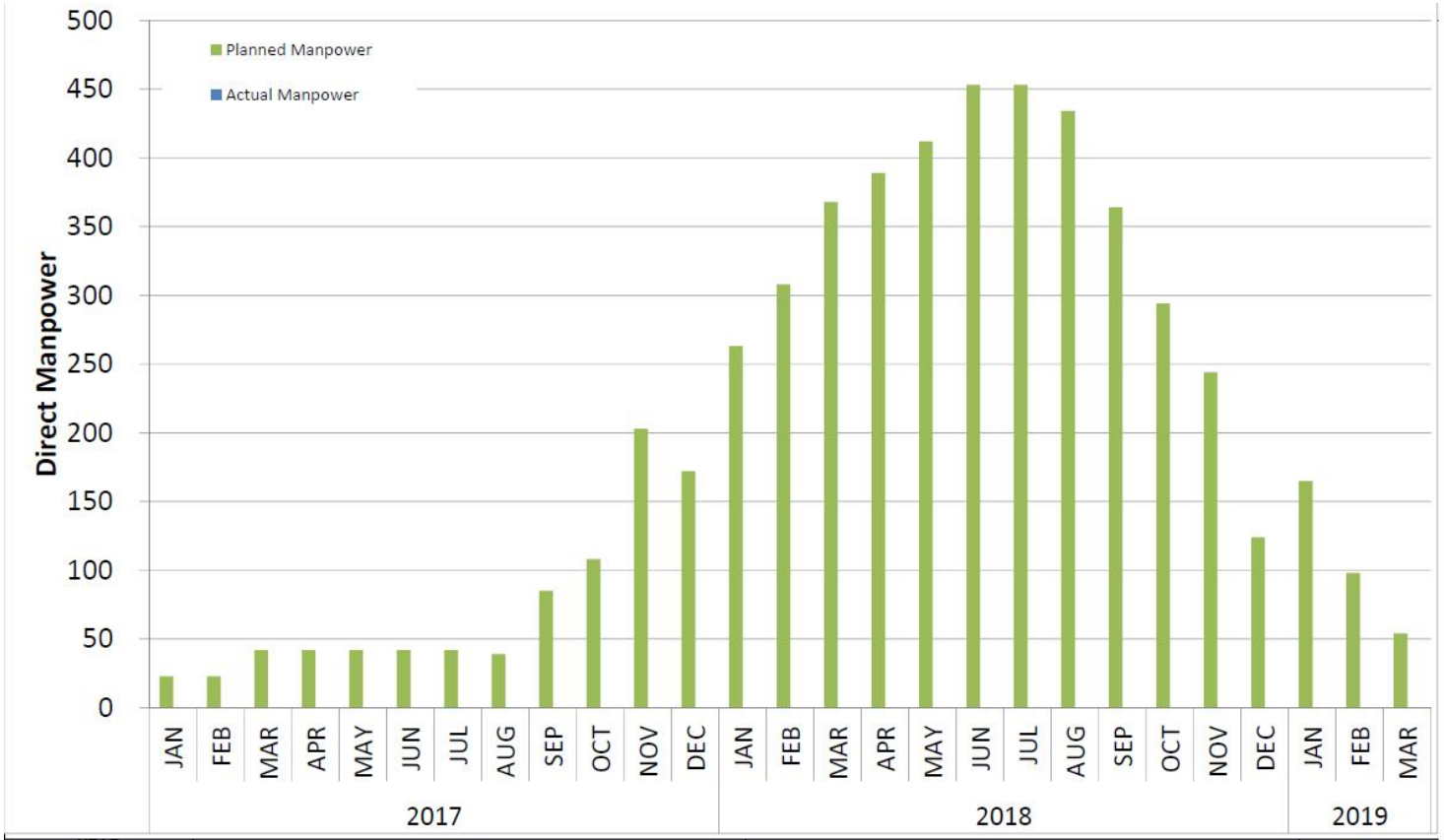
Site Establishment – Stage 2

Figure 2 – Stage 2 Site Establishment 01 April 2017

Stage 2 Site Establishment will see an extension of the 3m high chain wire fencing with three layers of barb wire at the top along O'Connell Street and the Southern Boundary of the existing pool. Again, the fencing will be lined with two layers of shade cloth.

9.2 Construction Worker Resource Projection

The construction sequencing and stadium design drives an estimated workforce requirement at peak of 330 personnel. The proposed planning approvals provide early commencement of bulk earthworks and remediation, allowing a clean handover of a remediated site to the trades undertaking 'new build' works. The proposed design lends itself to constraints around plant and equipment as opposed to industry resources in volume. This method is used for the South, Eastern and Northern elevations of the new stadium. The western stand being built concurrently has been designed more traditionally to draw on a manageable industry resource requirement (formwork, reinforcement, concrete activities). This approach minimises resource requirements to the project and reduces peak levels significantly. Figure 3 below shows the increase in resource as build works commence in September 2017. As areas are made available to services and finishes trades (March 2018), resource levels peak before being maintained just below 300 for the duration of the works.



YEAR	2017												2018												2019		
MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
Planned Manpower	23	23	42	42	42	42	42	39	85	108	203	172	263	308	368	389	412	453	453	434	364	294	244	124	165	98	54
Actual Manpower																											

Figure 3 - Estimated Site Resource Levels

9.3 Project Site Office and Construction Worker Amenities

Proposed Base Masterplan

Figure 4 – Figure 4 Proposed Masterplan

The Project Office and Construction Worker Amenities will be located within the Site Boundary, in the location ear-marked as a future development site. Lendlease will not be undertaking any build works within the ear-marked area (outline dashed in black) throughout the course of the Stadium Construction Program. The base-case and alternative masterplans proposed by Lendlease allow successful removal of Site Amenities and the Project Office pre-or post-Practical Completion (as access roads surround this future development site)

Site Layout During Construction

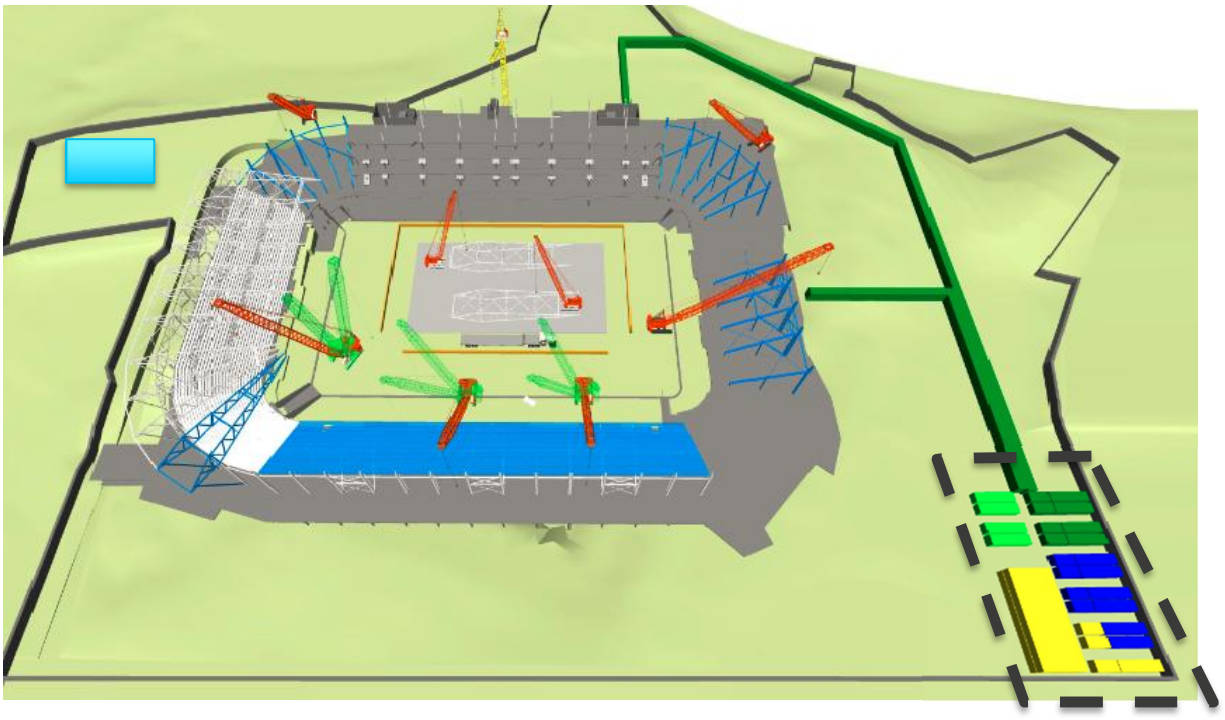


Figure 5 – Site Layout During Construction

The future development site is currently used as the Parramatta Stadium Carpark, hence exists as an asphalt hardstand, draining into the existing stormwater system. The North-Eastern corner of the site also provides access to sewer for site amenities, and is relatively close to the existing site kiosk which will be utilised for temporary power.

In addition to the amenities in the north-eastern corner of the site, satellite amenities will be positioned in the south west corner of the site. The satellite amenities will provide appropriate facilities for the site workforce in locations that retain productivity. Consideration will also be made to the specific locations of these amenities blocks with respect to plant and equipment movements around the site.

The Site Project Office and Construction Worker Amenities will be established in four stages with the last stage being driven by actual resource requirements based on the programme status in early 2018.

The future development site will cater for at least a 400-strong construction workforce, and have the ability to be extended (stacked) if additional resources are required at the back end of the project.

Figure 6 – Site Construction Amenities

9.4 Site Access - Vehicles

Access points for vehicles (being deliveries, plant & equipment, etc.) entering and exiting site are shown below in Figures 7, 8 and 9. These nominated locations allow continued operation of existing adjacent premises, existing road infrastructure and pedestrian movements.

Figures 7, 8 and 9 below also highlight the planned key routes for vehicles within the site boundary from entry and exit points to various construction zones

For further information on Traffic Management, please refer to the Traffic Management Plan.

Site Access – During Site Establishment Stage 1

Figure 7 – January 2017 to March 2017

During the initial stage of demolition, the existing pool complex remains operational and the main construction access point will be located at the current signalised intersection of the site at Gate A. This access will accommodate a peak load of 40 trucks (typically 30 tonne truck and trailers) per day as the main entry/exit gate with an alternate exit point at Gate C, utilising the left out southern parking access with O'Connell Street.

Site Access – During Site Establishment Stage 2

Figure 8 – April 2017 to May 2017

Following on from the initial stage of demolition, Stage 2 will see the pool complex closed and handed over to the contractor. The main entry/exit point remains at Gate A and the expected peak load of truck traffic remains as 20 per day. An alternative entry/exit point at Gates C and D will be used as necessary, when works staging restricts the use of Gate A.

Site Access – General Construction

Figure 9 – Base Case Traffic Management throughout Construction

During construction of the western stand and for structural steel / precast deliveries, peak truck movements will be 50 trucks per day. The maximum truck size will be extendable bed semi-trailers delivering structural steel. The main entry/exit point remains at Gate A and an alternative entry/exit point at Gate C and Gate D will be used as necessary when works staging restricts use of Gate A.

Gate C is used for gaining access to the high-level concourse, with a ramp formed during bulk earthworks and Gate D will be used for gaining access into the low-level pitch via the vomitory below the south-east corner of the stadium.

It is noted that during all stages detailed, there will be some out of hour's wide load deliveries made for large plant. Furthermore, pedestrian access to the site will be through a separate gate located approximately 60m north along O'Connell Street from the main access.

9.5 Site Access Paths – Construction Workforce & Project Staff

One of the key risks on the Western Sydney Stadium project is the segregation of plant / equipment and people, being construction workers and site project staff. Lendlease has strategically positioned the site office and amenities in the NE corner of the project, accessible from O'Connell Street, and immediately adjacent to an operational traffic intersection with signal management for traffic and pedestrians.

Within the site itself, key access paths will be provided to work areas, with the focus being on:

- Minimising the number of paths to the stadium structure itself to better control people movement;
- Applying key controls to enable plant and equipment to circulate the site as planned; and
- Having the ability to relocate / shift access paths as required without jeopardising the key controls established.

Figures 10 and 11 below highlight the key access paths to the project from the site amenities area and the strategy for maintaining a productive site whilst achieving delineated access paths.

Site Layout highlighting Access Paths 1 & 2

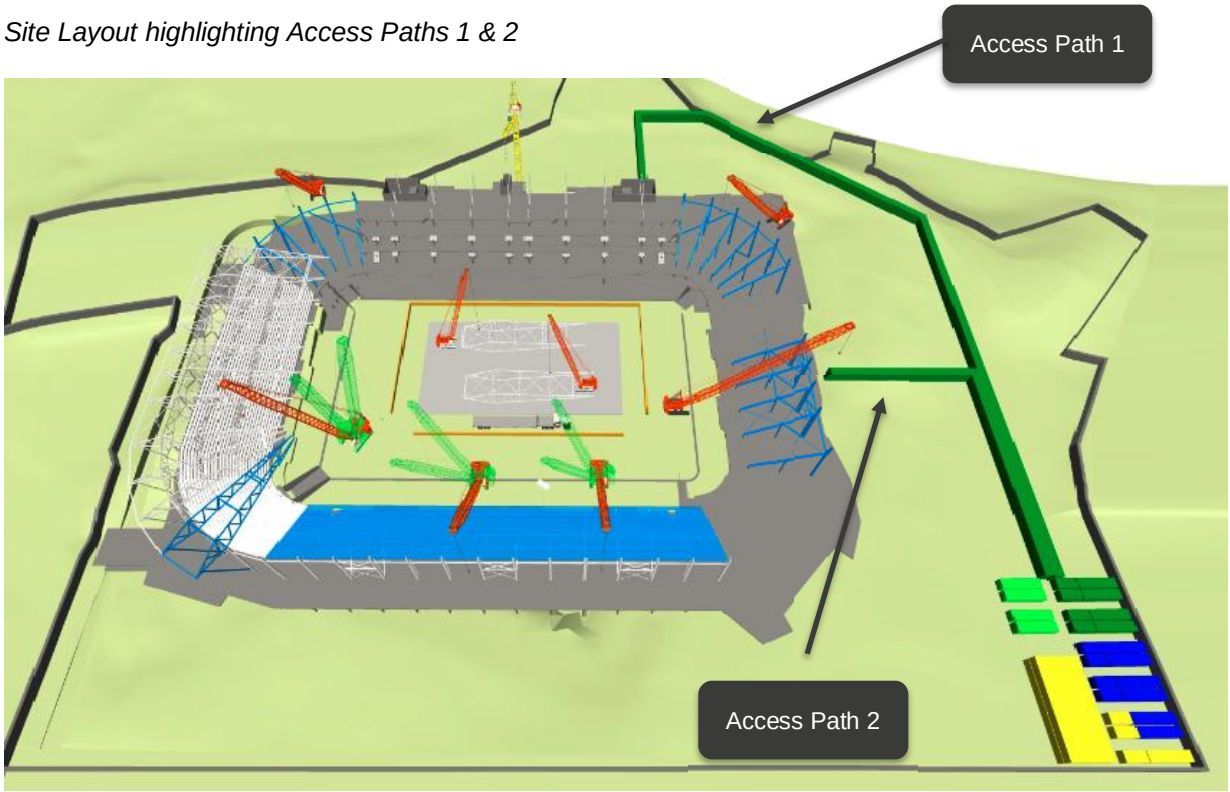


Figure 10 – Site Access Paths

Access Path 1 – Access Path 1 will be established as soon as practicable (immediately after civil works). This hardstand will provide a delineated access from the Site Amenities in the north-eastern corner of the site to the western elevation of the site, whereby piling and structure works will commence. In the location where the workforce must cross the haul road (vehicle access path), a designated crossings point will be established (use of speed humps and zebra crossings, allowing the constant flow of vehicles independent to pedestrian movements to and from their work areas.

Access Path 2 – Access Path 2 will be established at the completion of the upper bowl on the Northern elevation of site. The timing of this milestone aligns with the strip-out and removal of formwork to the western stand, allowing an undercover concourse access way to be achieved. This will enable the relocation of the Access Path 1 bridge structure to a location closer to the site accommodation. Access Path 2 will be a water-tight access path enabling services and fit-out works to be undertaken during inclement weather (where practicable).

The western stand will be built as a reinforced concrete structure. During the timeframe of the formwork, reinforcement and concrete activities, the site construction workforce will adopt Access Path 1 to reach their work area from the site amenities. At the time of structure works commencement, the bulk earthworks / remediation to this area will be completed, hence the concourse levels set. Access to the L00 (Service Level at RL 9.00) will be via 2 x stretcher stairs from the Concourse level at RL14.0. As the structure rises above the concourse level, an additional two stretcher stairs will be built servicing from the concourse level to the top floor of the structure. These stairs will remain in place until the permanent fire stairs are completed. In addition to the 2 x stretcher stairs, 1 Scando 650 Hoist will be established as the structure approaches Level 2. This hoist will initially provide a secondary means of access for the site workforce, but post formwork removal, will provide materials access from the western loading zone to the specific work level. The hoist will service from concourse level to Level 4, and remain in place until builder's lifts are brought online.

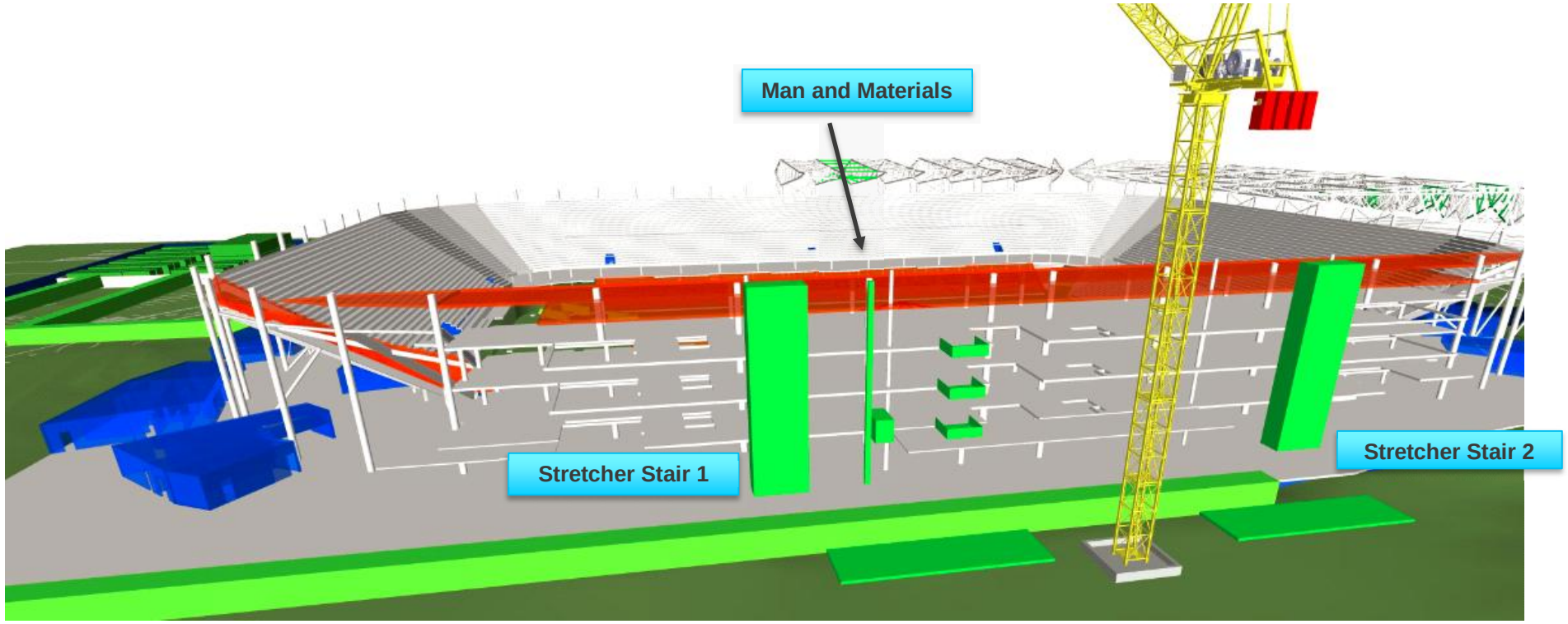


Figure 11 – Western Stand Access

9.6 Temporary Services

Temporary Power to operate the Project will be fed from one of the existing kiosks located on the Site. Analysis has been completed with regards to site power requirements, including tower cranage, hoists, site accommodation, temporary lighting to access ways and power required for build works. The required capacity to operate the site exists within the current infrastructure.

In isolated areas, generators may be used. No temporary boards will be positioned on the East, North and South tiered structures. Trades such as seating installers will utilise battery tools. If needed localised portable generators will be used.

Water will be provided through the existing lines that currently feeds the Parramatta Stadium. These will feed the site accommodation precinct, satellite amenities and bubblers located throughout the site.

9.7 Site Security

As noted in Section 6.1, the site perimeter will be secured with a 3m chain wire fence with barb wire on top. In addition to this, CCTV cameras will be established in select locations around the perimeter of the site, monitoring activity 24hrs of the day.

Site Access will be secure, with the use of turnstiles located in the NE Corner of the Site. A secondary turnstile will be located in the SW corner of the site, but not used for access. This turnstile will operate under free-spin when site emergency procedures are implemented. The site emergency evacuation location will be adjacent to the Parramatta River to the South of the Site. Access to site will require security passes obtained post a site induction. This security system (EIFY) is currently in use at Gosford Hospital and;

- Allows Lendlease to understand how many and who exactly is onsite at anyone point in time. This is typically used in circumstances of emergency to ensure all those present onsite prior to an evacuation have registered as present at the muster point post evacuation.
- Allows contractor insurances to be linked to site access (Public Liability and Workers Compensation)
- Allows labour statistics to be monitored daily, plus reported on accurately.

9.8 Dust & Odour management

Dust and Odour management is being controlled via the following methods:

- Utilisation of a full time water cart truck during demolition and civil activities to ensure all earth material is maintained damp to prevent dust during wind events.
- Site perimeter temporary water ring main installed to provide hose points around the site for hoses to be used in dedicated areas to control dust and odour
- When scaffold is erected for the Western structure, shadecloth will be installed to contain dust and noise during the construction of the stadium
- Geofabric is in place over temporary stockpiles to contain material from wind events and prevent dust and odour.
- Construction methodologies to efficiently bulk material and fill and compact the same day to minimise leaving un compacted material around the site.
- Water truck to wet down construction roads at all times to reduce dust.
- Use of cattle grids to ensure mud off trucks is captured and contained for removal to minimise hardening on road surfaces causing dust.

9.9 Erosion & Sedimentation Control

In accordance with Lendlease EHS systems a sub plan has been prepared to ensure appropriate Erosion and Sedimentation Controls are implemented throughout the construction of Western Sydney Stadium. Refer to Appendix 2 - Western Sydney Stormwater and Erosion Management Plan. For project specific details.

9.10 Ground Water

The site is located in close proximity to the Parramatta River. The soils at the site are noted to be

- Alluvial clayey sands, sand, and sandy clays typically in a stiff or medium dense condition
- Rock is at a depth of 9m to 13m.
- Natural soils are overlain by fill in parts of the site. Fill is noted to be contaminated.

Douglas Partners have carried out on site bore logging to verify ground conditions and water table levels. It is understood that groundwater levels vary from between RL5.0 to RL 8.0 m. The majority of construction works should not encounter groundwater as the basement slab is at RL 9.5 and concourse slab at RL 14, which is where most works are founded off. Constriction of lift pits and some inground services works may encounter ground water.

Should groundwater be encountered, the site manager will make contact with the NSW Office of Water to notify them of the works in progress. Contact will be made to the Water licensing and water management enquiries, driller's licences, and searches, t: 1800 353 104.

9.11 External Lighting

The construction boundary of Western Sydney stadium does not impact on public roadways and land. A perimeter fence is erected around the entire boundary of the precinct as indicated in the below figure.

The works have not removed any form of lighting provisions to public space outside the boundary of the development. Within the site, existing light poles are utilised to provide general lighting at night for both workers and staff.

During construction temporary lighting will be installed in and around the new stadium. Lendlease will ensure that any temporary lighting installed complies with AS4282: 1997. As the stadium is set back approximately 40m from O'Connell Street there will be no obtrusive effects of the temporary lighting on public spaces.

9.12 Unexpected finds Protocol

In accordance with Lendlease EHS systems a standard Unexpected Finds protocol is in place on all projects. This protocol is present on Western Sydney Stadium. The protocol is as follows;

Unexpected Find Protocol

1. Cease work and evacuate the area of work immediately.
2. Contact a LL representative (EHS Manager/Coordinator, General Foreman, and Construction Manager).
3. Erect barricades to isolate the immediate areas providing 10m between the suspect material and the erected barrier if possible.
4. Notify the appropriate regulatory authorities as soon as possible if applicable.
5. Prevent access to the barricaded area unless express permission has been given by the qualified environmental specialist. A clearance certificate or approval should be given in writing prior to entry.
6. Undertake sampling of the suspect material (to be carried out by an appropriately qualified environmental specialist, usually a consultant) as advised by the LL Construction Manager.

7. Determine, in consultation with the nominated environmental specialist and in liaison with LL senior site personnel and/or relevant authorities, if further remedial actions are necessary based on the sample test results. Identify appropriate treatment/handling or disposal options and procedures.
8. Obtain all required permits to carry out remedial work prior to the commencement of any new works. The nominated environmental specialist must be provided written clearance approval for entry.
9. Remove the barricade to allow work activities to resume under the direction of the LL Construction Manager.

10. MATERIALS HANDLING

10.1 Deliveries and Loading Zone Management

Overall Site Construction Loading Zone

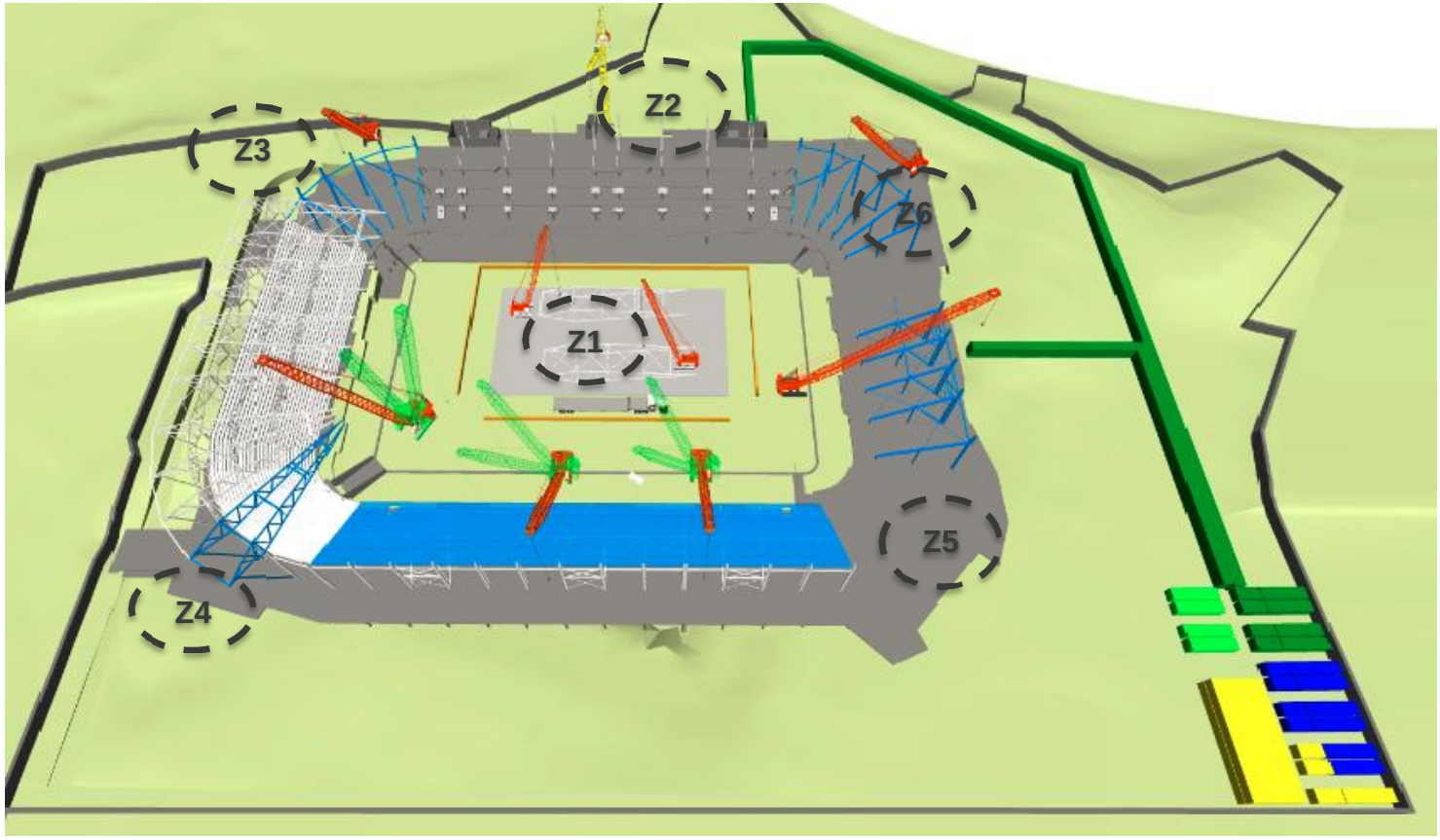


Figure 12 – High Level View of Planned Site Construction Zones

The Site will consist of a number of defined loading zones which will enable the project to operate on multiple work fronts whilst maintaining separation between plant, equipment, the site workforce and adjacent activities.

The defined construction / loading zones consist of:

- Z1 - Pitch Area – used throughout stadium structure duration. This will consist of a number of delineated zones further explained in Figure 15 below.
- Z2 – Western Stand – used throughout FRP activities and loading of façade / some finishes. This will consist of 2 loading zones, North and South of the Tower Crane
- Z3 – SE Corner External – used for Upper Tier Steel and Precast Only
- Z4 – SW Corner External - used for Upper Tier Steel and Precast Only
- Z5 – NE Corner External - - used for Upper Tier Steel and Precast Only
- Z6 – NW Corner External - - used for Upper Tier Steel and Precast Only

Construction Zone Z2 – Western Stand

The Western Stand will operate out of its own two loading zones as shown below. Throughout the structure phase, these two loading zones will accept formwork, reinforcement, PT deliveries, whilst also being used as concrete pumping zones. Exact locations of each loading zone from the edge of L01 Slab (concourse level) will be determined through input from the structural and geotechnical engineer, based on the final retaining structure design.

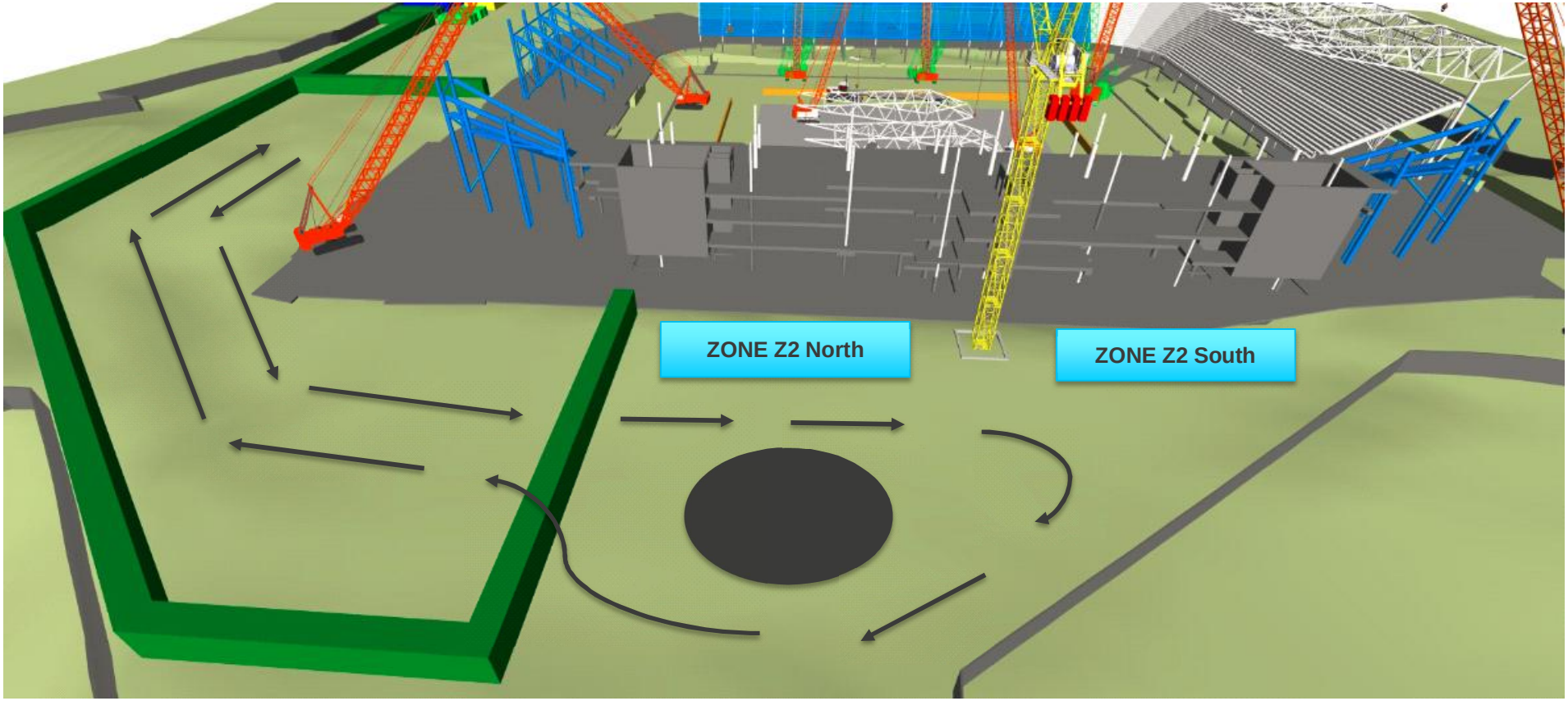


Figure 13 – Construction Zone Z2.

Construction Zone Z1 – Pitch

The Pitch Area has been defined as a single construction zone, however it will operate with a number of defined loading zones within the Z1 definition. This area will be controlled by Lendlease Supervisors. The approach to the pitch area is a defined 8m wide, one way haul road that will allow deliveries to circulate freely prior to locating the task specific loading zone. To ensure adequate separation between crane activities on the upper tier, task specific loading zones will be set with physical barriers. These zones will house crawler cranes and specific deliveries. These zones are labelled Z1a, Z1b etc. below. The area within the one-way haul road will be specifically used for Roof Truss Pre-Assembly. This zone will allow 2 roof sections to be pre-assembled at any one time.

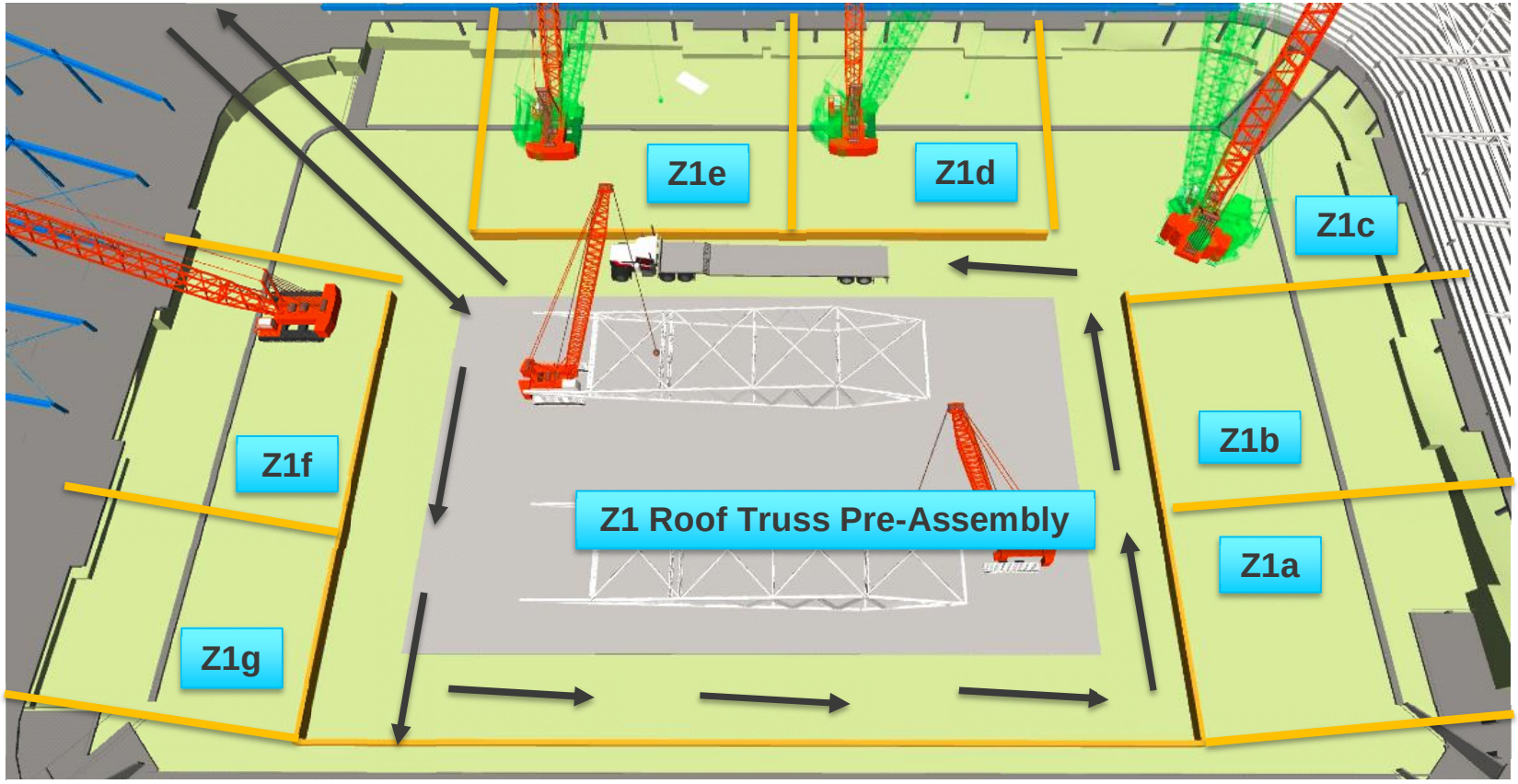


Figure 14 – Construction Zone Z1

10.2 Material Storage

During all construction phases materials for construction will be stored within the site boundary. Implementation of just – in – time delivery is the priority to minimise storage of materials on site. This enhances quality of the end product due to less deterioration and reduces wastage/loss of materials.

Where materials are stored onsite, they will be located in a defined areas segregated from the live construction vehicles and adequately secured. This may be by means of storage containers, and temporary fencing.

11. CONSTRUCTION METHODOLOGY

11.1 Demolition Staging

Immediately following Stage 1 Site Establishment, strip out of the existing stadium will commence followed by the progressive demolition of the existing stadium. The sequencing for demolition will be as follows;

- Demolition of the Western Stand (commencing in the NW Corner and working South);
- Demolition of the Eastern Stand (commencing in the NE Corner and Working South); and
- Demolition of the Northern and Southern Lower Tier Stands.

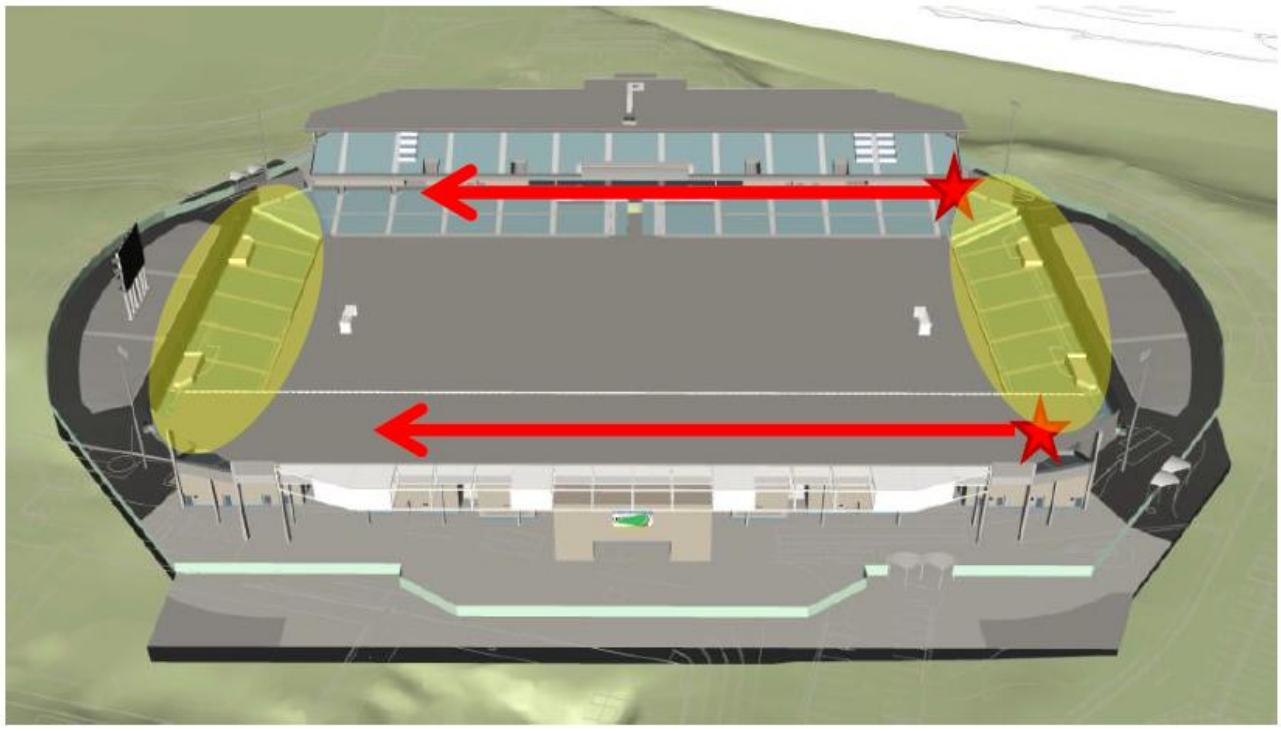


Figure 15 – Demolition Sequence

11.2 Demolition Methodology

Lendlease will undertake third party engineering reviews on the documented sequenced for demolition of the eastern and western stands of the existing Parramatta stadium. Lendlease has developed with key contractors a methodology for the safe and efficient removal of the existing structure, however this may be modified post contract award.

The East and West Grand Stand demolition methodology will be:

- Internal soft strip with bob cat and labour;
- Seats and external non-structural elements stripped with excavator;
- Bottom concrete bowl, highlighted as Stage 1 in Figure 17 below, is removed by an excavator with concrete crusher attachment;
- The roof, highlighted as Stage 2 in Figure 17 below, is removed by an excavator with steel cutting attachment cutting the roof tension columns from behind to induce the roof lowering onto the upper bowl. Figure 18 shows the position of the excavator relative to the roof lowering position;
- The upper bowel, highlighted as Stage 3 in Figure 17 below, is demolished with an excavator with concrete crusher attachment; and
- There may be opportunity to remove the southern end of the eastern stand prior to the closure of the pool area on 1 April. Safety screens and B Class hoardings above pumping equipment are examples of controls that could be adopted, along with a change in methodology for stadium roof removal in this area (removal by crane).

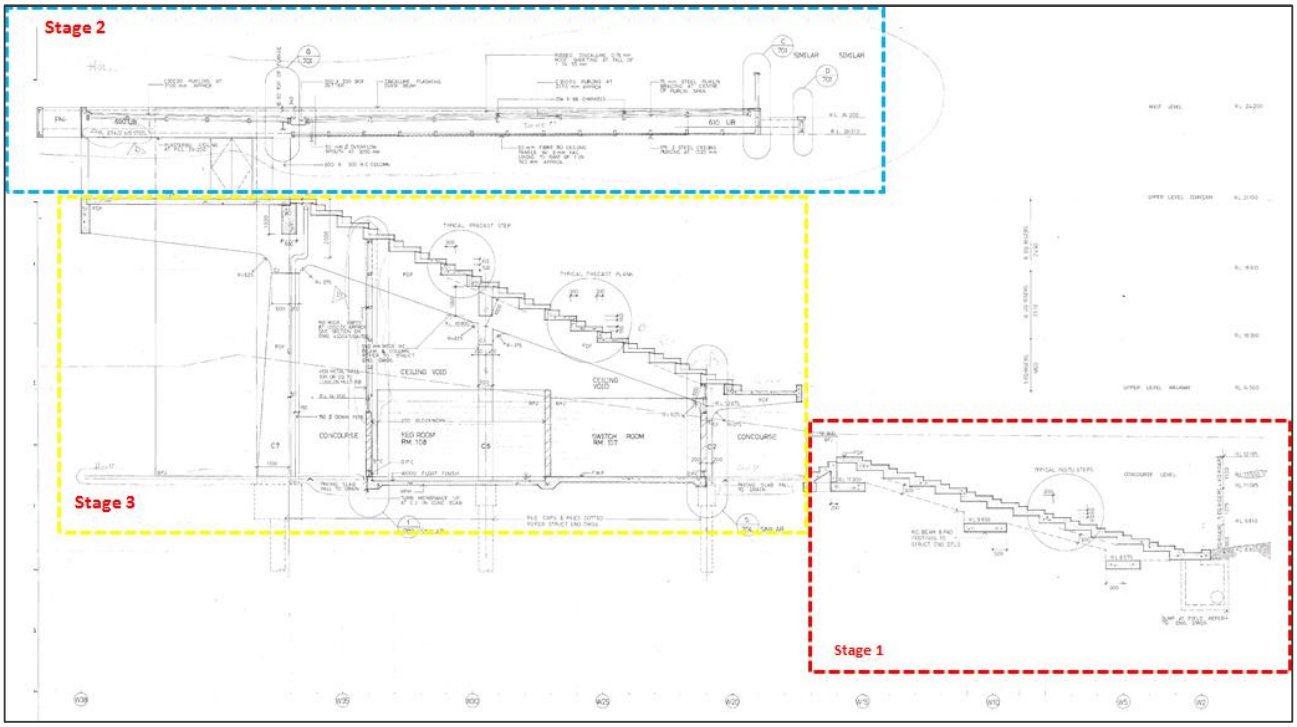


Figure 16 – Grand Stand Section

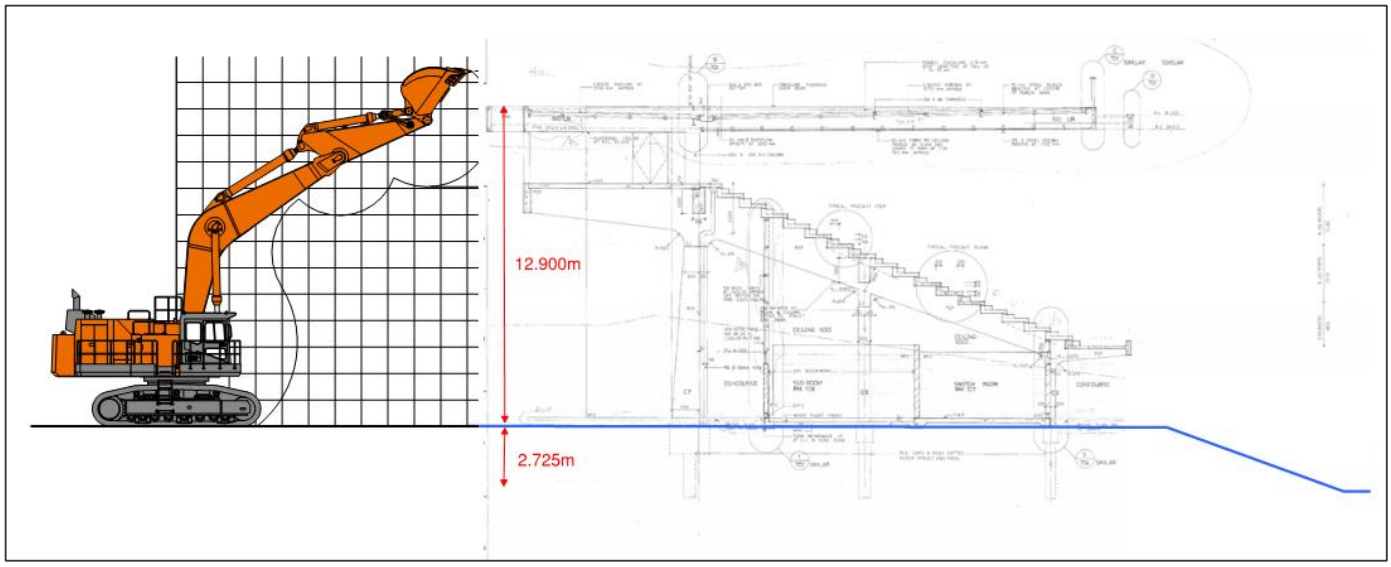


Figure 17 – Roof removal excavator location

The North and South Stand demolition methodology will be:

- Seats and non-structural elements are stripped with an excavator;
- Lower bowl slab on ground is demolished with an excavator with concrete crushing attachment; and
- The lower bowl slab, sitting directly above known areas of GSWA contamination, will be removed as late as possible allowing remediation works to immediately commence in this area.

The Swimming Pool demolition methodology will be:

- The pool is drained and surrounding buildings soft stripped and demolished with an excavator. The entry structure to the building adjacent to O'Connell Street; and
- An excavator will then batter back behind the swimming pool walls as per Figure 19 below, before breaking up the concrete slabs and walls with the excavator with concrete crushing attachments.

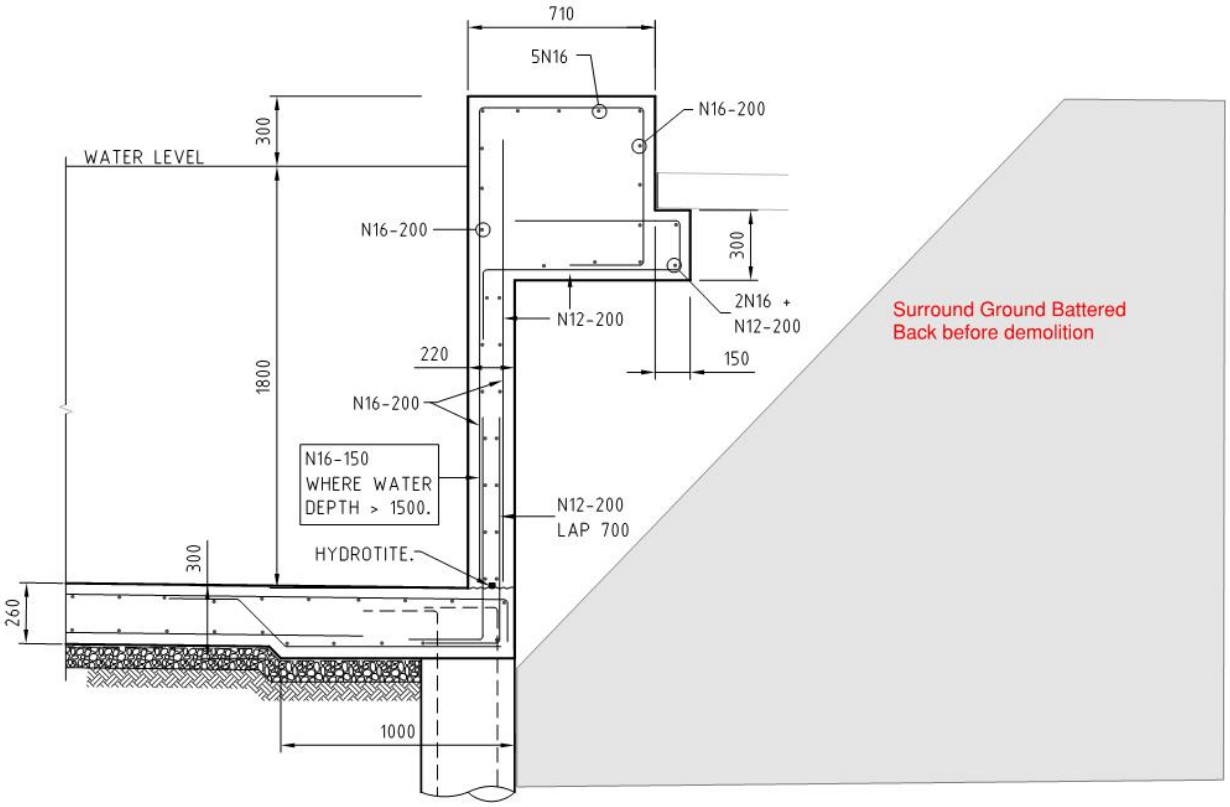


Figure 18 – Typical pool retaining wall

General

- Small external buildings will be stripped out before being demolished with an excavator; and
- Bitumen roads will be left in place for use by the bulk earthworks contractor to use as a haul road. Bitumen roads will be demolished and removed by the bulk earthworks contractor at a time convenient to bulk earthworks staging.

11.3 Bulk Excavation / Remediation Strategy

The bulk excavation / remediation strategy and thus methodology is driven by the requirements of the Site Auditor for end user sign-off prior to occupancy of the new precinct being granted. Lendlease has developed a design solution that allows the site to be remediated in accordance with the RAP, whilst eliminating the need to remove GSWA from site. The known areas of contamination exist within the areas labelled below 'Training Pitch, Service Level, Northern Carpark, Northern Mound and the Southern Area of the Existing Pitch' will be removed as required and capped within the areas marked 'main concourse' in orange below. The proposed design allows the remediation of the site to take place, with final bulk levels being set prior to major structural works commencing on the project. This is a time risk mitigation approach allowing following trades to work in a clean environment (except for some isolated areas that have been identified).

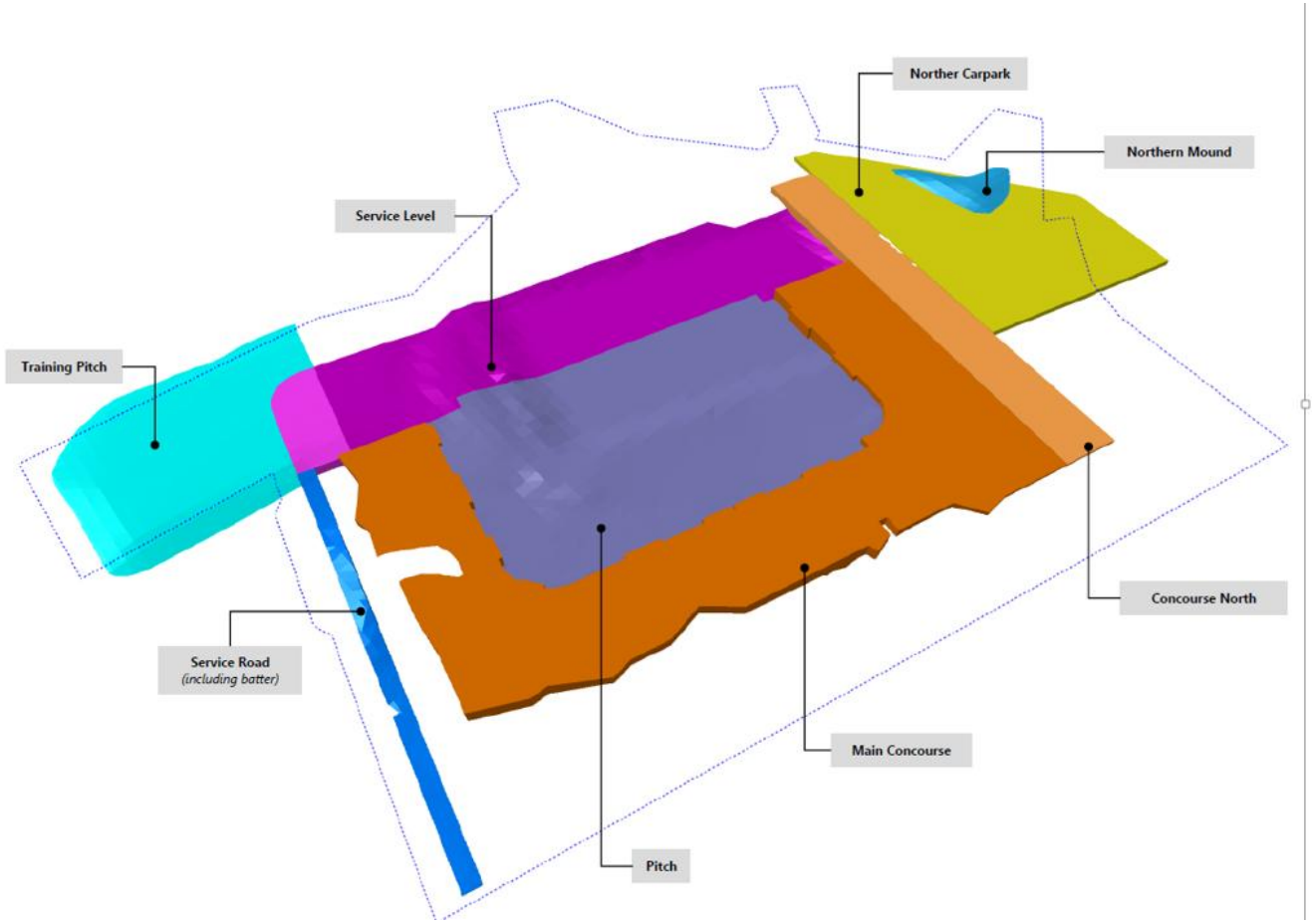
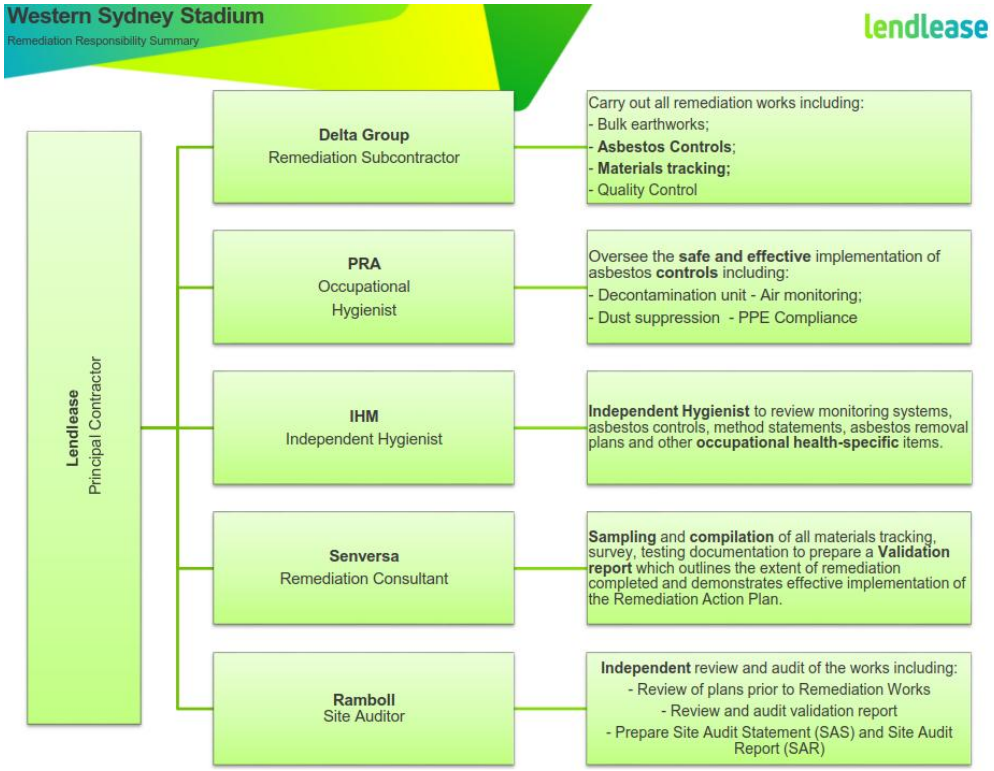


Figure 19 – Remediation Strategy

In order to effectively manage the remediation works on site, LL has engaged key industry experts. The team consists of personnel with extensive experience with dealing with asbestos on construction sites. Consultation of this approach has been communicated with Safework NSW and INSW to give assurance Lendlease is effectively managing these works.



Specific Emergency Management procedures have been prepared during the remediation works due to workers wearing specific PPE and decontamination procedures. The attached plan indicates the exclusion zone fencing and the emergency egress points for workers within the exclusion zone.

11.4 Piling

The initial approach to the piling activity was driven by minimising the generation of spoil. Driven precast piles were investigated as an option throughout contaminated zones (shaded blue below) however through the extensive tender process, it was determined that this would not be a viable solution. CFA piles are proposed throughout the project and as a result, spoil management procedures will be implemented to manage areas of contamination.

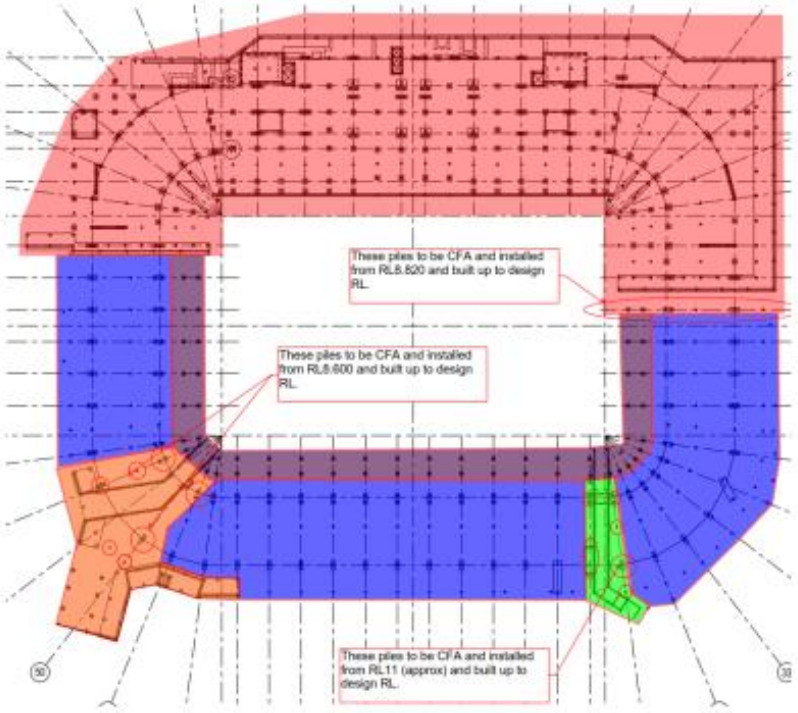


Figure 21 – Piling Strategy / Methodology

The area highlighted in red represents the extent of the western stand service level at a FFL of on or about RL 9.00. Following the remediation/ bulk excavation activity, and based on bore log information, all spoil produced from this area will be 'clean'. This will also apply to the lower bowl (purple), South East PAV (orange) and North East PAV (Green).

The area highlighted in blue represents the extent of the concourse level (on ground – no service level) at on or about RL14.7.
This is the area where much of the GSWA will being placed and capped. As a result, there will be some contaminated spoil generated in the piling activity. This spoil will be managed by the civil Subcontractor and buried in another cell on site (approximately 1,300m3) Upon completion of the piling works, the area will be re-validated prior to detail excavation and in-ground services works commencing.

There will be 2 piling rigs operating on the project, with anticipated production of 12 piles per day on the West, and 8 per day on the North, East & South.

Piling works in contaminated areas will be managed with a separate exclusion zone and extensive monitoring to ensure safe exposure levels are maintained. The Site occupational Hygienist will be onsite during these works to oversee activities and advise on suitability on controls.

It is anticipated that the entire piling duration will be approximately 45 days.

Figure 20- Piling Strategy / Methodology

The piling activity will be undertaken at separate levels. All piles to the western stand and all piles to the lower bowl and Pitch Access Vomitories (PAVs) will be completed at approximately RL 8.900.

All piles to the level 1 concourse slab (North, East and South stands only) will be completed from approximately RL 14.400.

A reinforced batter will allow for a steep (1:1 - 1.5:1) batter that enables the piles at both the upper concourse level and the lower bowl level to be installed in the one mobilisation without significant re-grading of the batters between piling activities.

The batter will need to be slightly adjusted prior to installation of precast rakers and plats but can remain in place throughout piling, slab on ground and in-ground services

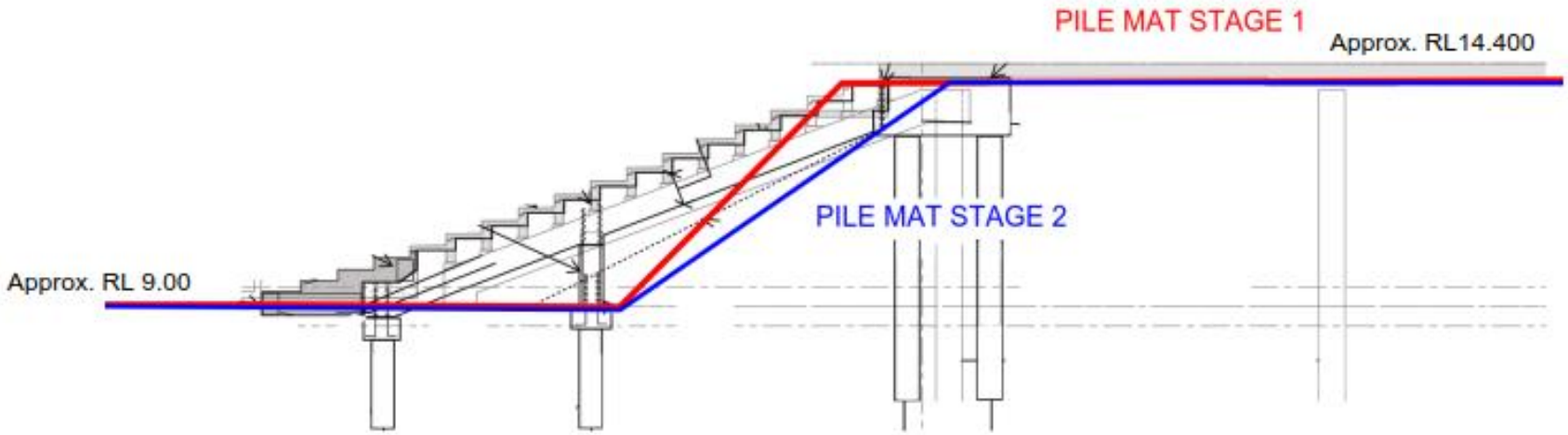
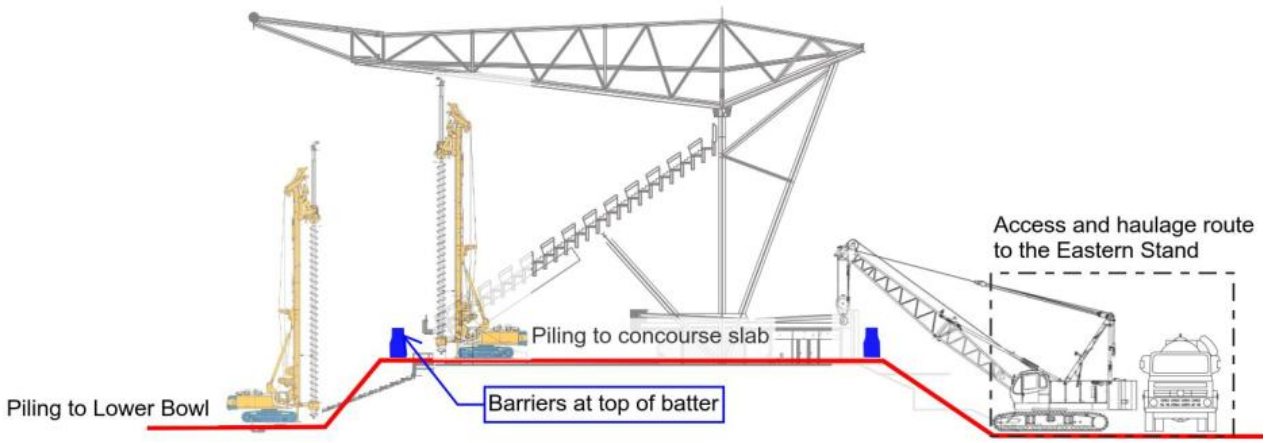


Figure 22 – Staged Approach to Piling Activity

The East elevation concourse piling will require edge protection during various stages. As the batter slope varies from north to south of the site, access for materials handling will become necessary from below the batter. This will be typical from Gridline 41-50.

Figure 21- Staged Approach to Piling Activity



Western Stadium Structure

The western stand will be constructed traditionally with formwork strutting heights ranging from 4.5m to 6m in height. The western stand is 5 levels in height, hence from a materials handling perspective the structure will effectively be built, then temporary supports (formwork) stripped, prior to services trades commencing. Given the cranage demand will be limited solely to structure during this phase, one Tower Crane with a 70-80m jib length will be established on the Western Stand to facilitate this activity. Supplementary mobile cranage may be adopted across the first two floors, purely to load formwork materials.

The construction sequence will run across two fronts as the structure commences the 2nd suspended deck. Edge protection will be in the form of a perimeter scaffold, based off the concourse level, and then the formed and poured levels as the tiers set-back level by level. The concrete cores (lift shafts and stair shafts) will be constructed using prefabricated shutters craned into and out of position progressively through the build programme of this element.

Tower Crane and **Materials Hoist** locations are positioned on the west elevation. Due to the structure profile along the west, the location of the hoist is in a position where the slab profile is at the same alignment over all suspended floors.

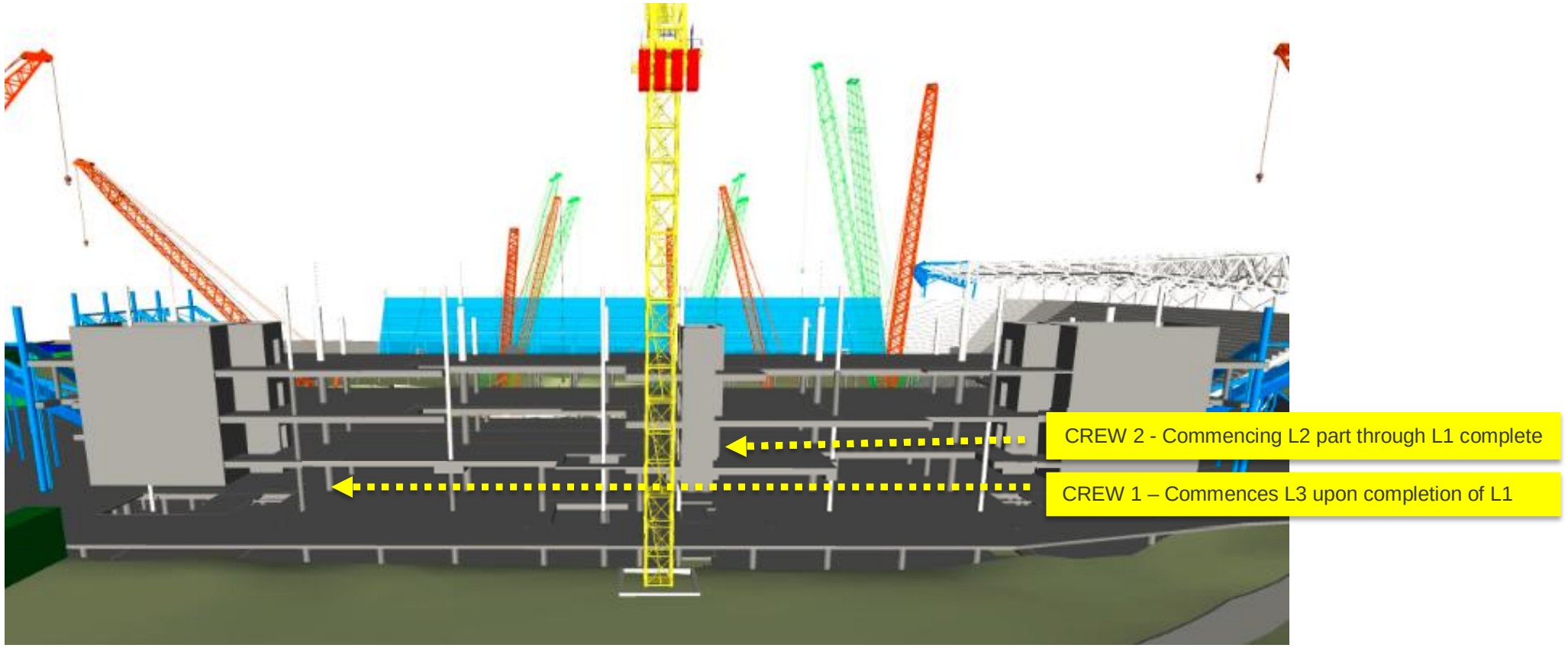
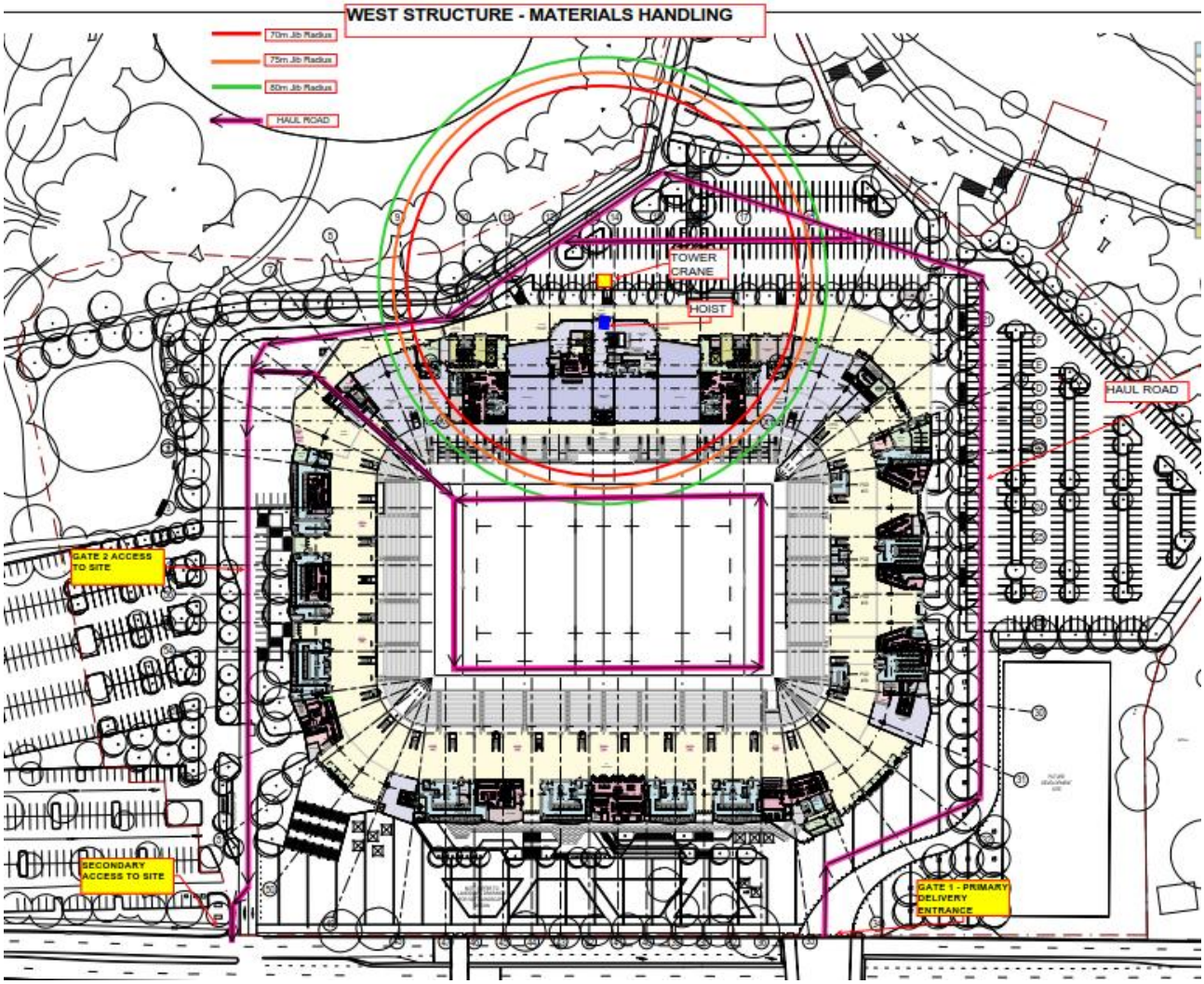


Figure 22– Western Stand Structure

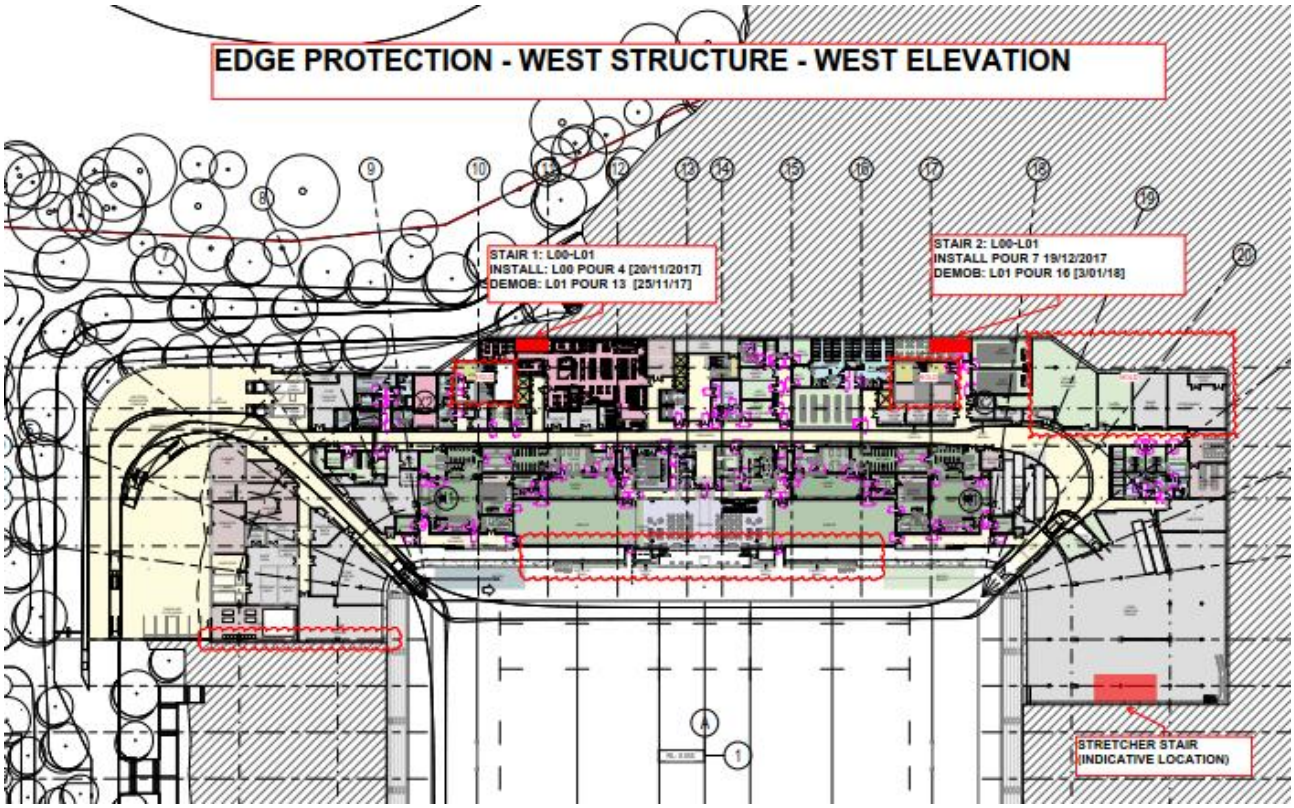
Materials handling for the West structure will be primarily from Gate 1. Formwork, reo and concrete deliveries will enter and exit this gate utilising the haul road around the northern part of the site.



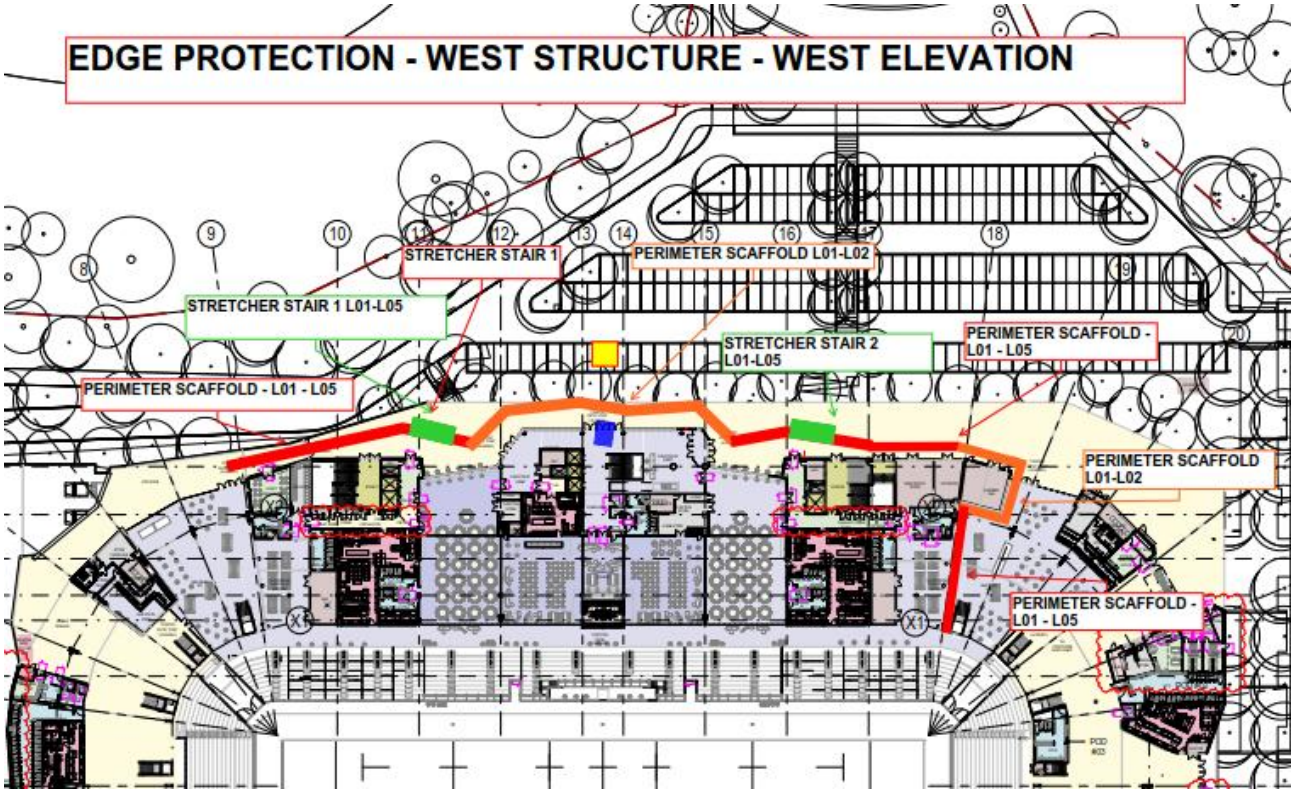
Concrete pour sizes vary from 350m3 to 650m3. Most pours will consist of 2 mobile concrete pumps with 2 truck feeds. This will average 40m3 per hour which will give greatest efficiency for labour on site. We will expect up to 90 concrete truck movements for a concrete pour. Mobile pumps will be positioned on the West elevation in the materials handling zone.

Edge Protection for the Western structure will be Scaffold along the West façade. Leading edges will be formwork handrails by form worker including the east elevation. Prior to stripping formwork, handrails will be installed and slab to soffit netting along the West elevation. Handrail protection will be installed to the East elevation slab edges with netting only to level 4-5 along the east. Façade install will be by mobile equipment from the west due to the slab profile not being favourable to scaffold.

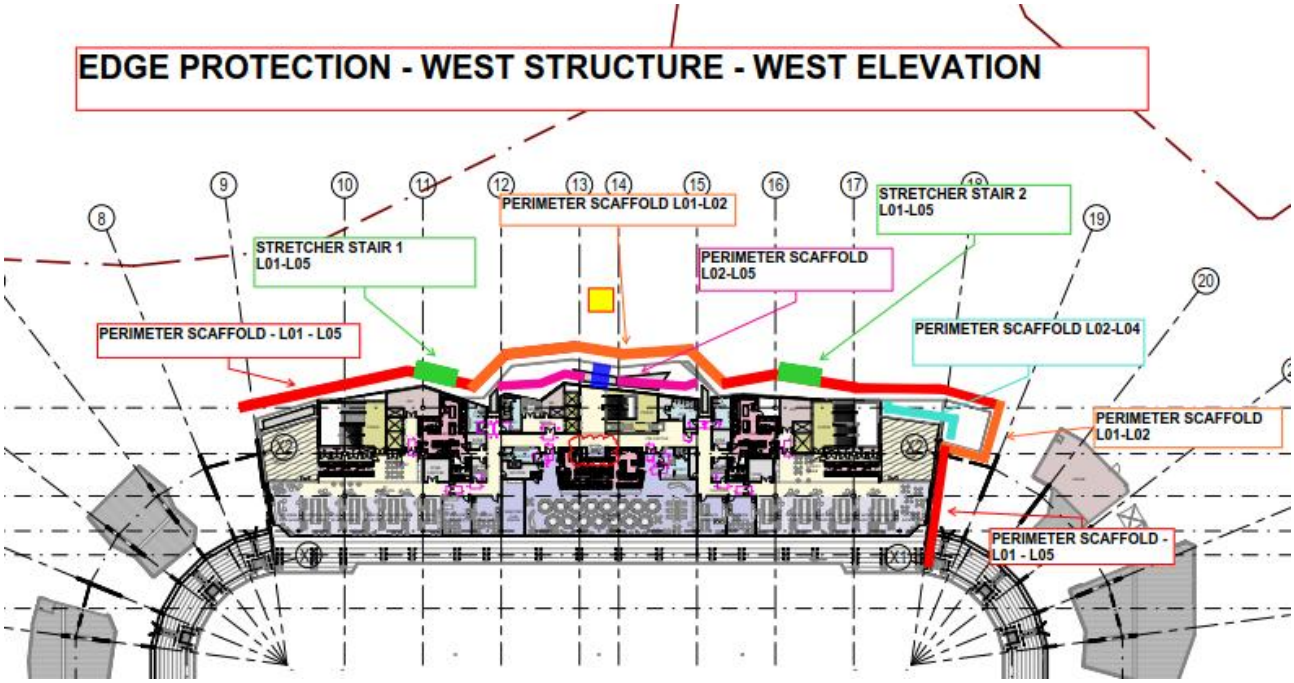
Stair access will be provided along the West elevation by Stretcher Stair access. Stretcher Stair access will be provided on the Level 1 Concourse North to provide access to Level 00 allowing workers access to 00 for fitout works.



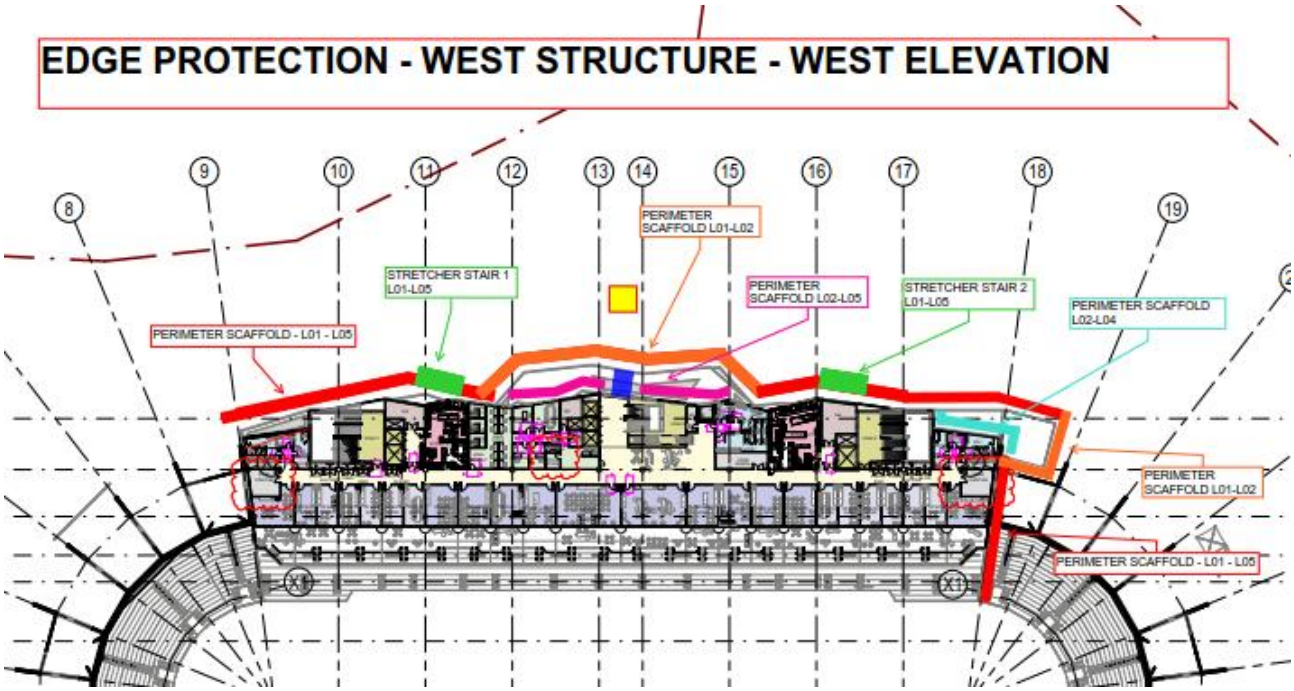
Level 00



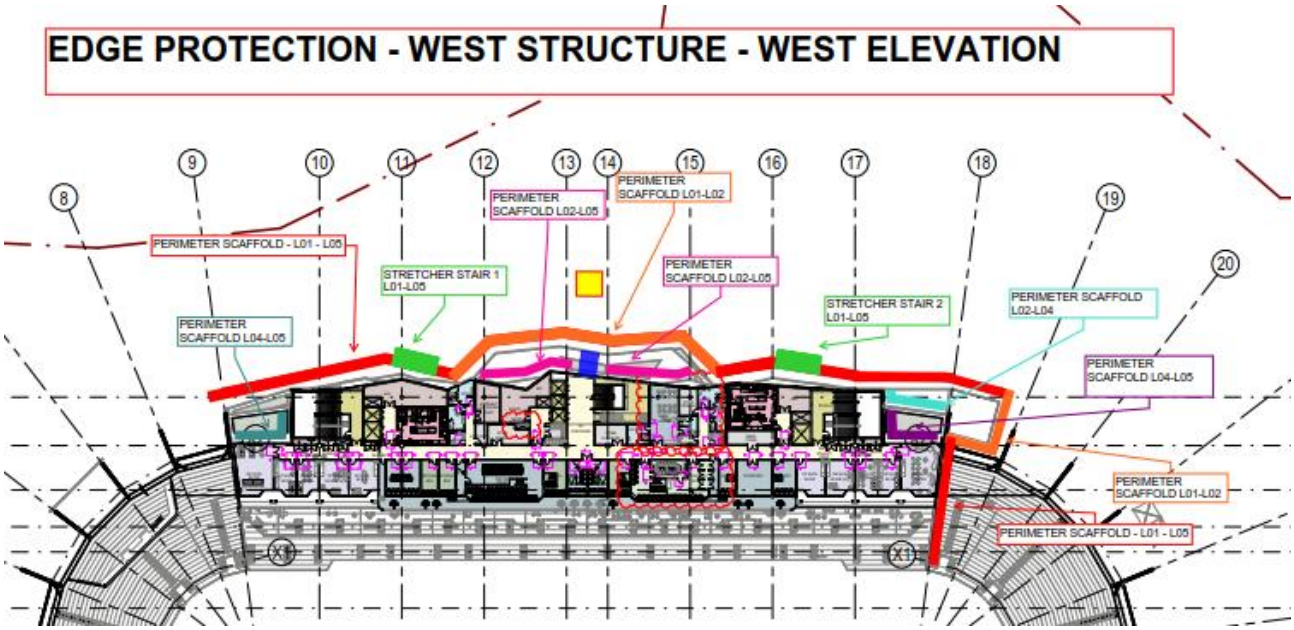
Level 01



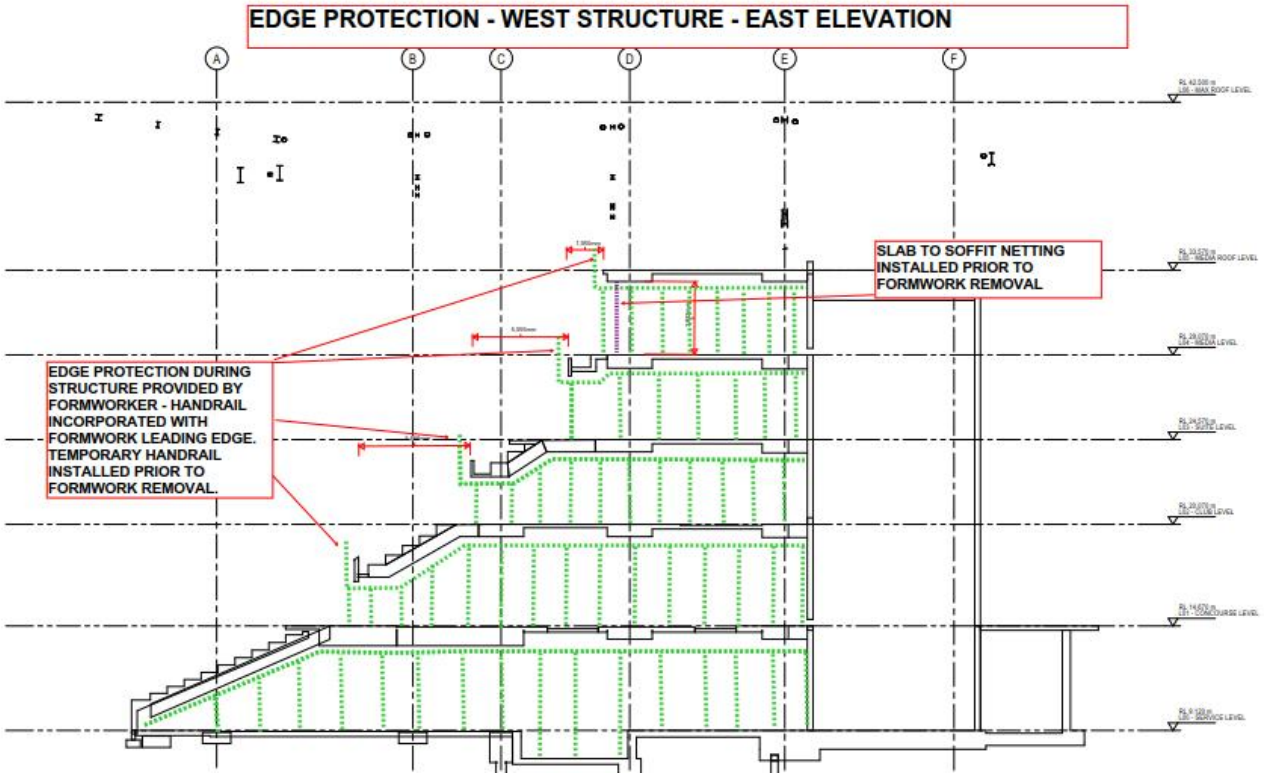
Level 02



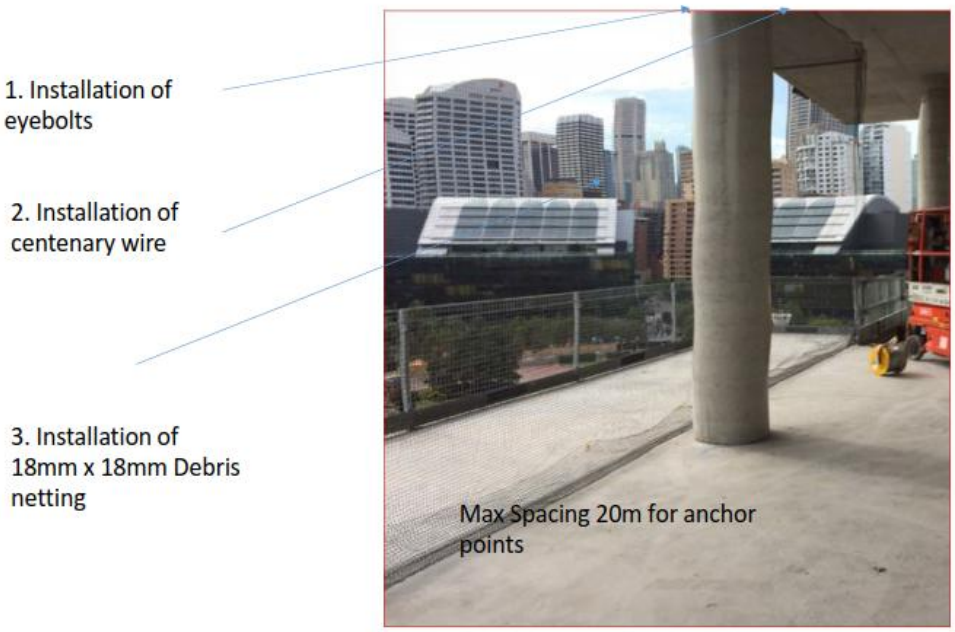
Level 03



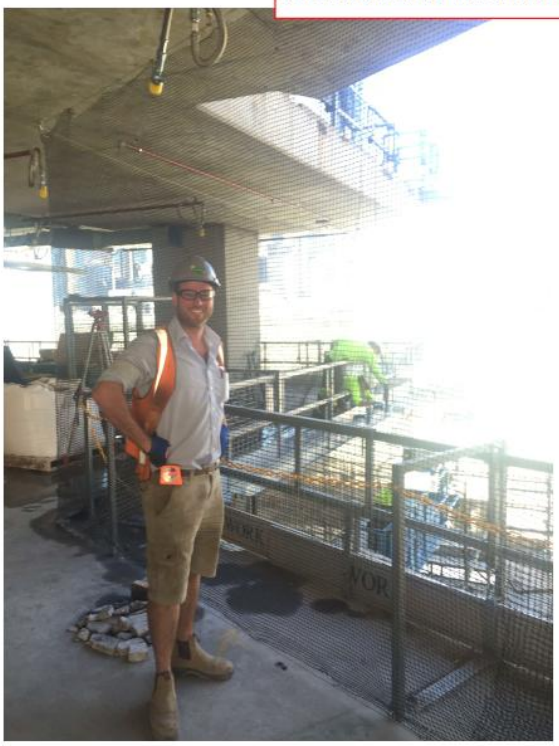
Level 04



EDGE PROTECTION - WEST STRUCTURE - WEST ELEVATION



EDGE PROTECTION - WEST STRUCTURE - WEST ELEVATION



11.5 North / South / East Stadium Bowl Structure

The North, South and East Elevations of the Tier 2 Stadium will be constructed on three work fronts. The ‘straight runs’ will be constructed from the pitch construction zone utilising independent teams of steel, precast and cranage crews. The four corners will be split into two work fronts with dedicated riggings crews and cranage being allocated to the Southern and Northern corners. These will be constructed from the outside of the bowl. Tier 1 precast will be installed at completion of Roof Steel and fabric due to boom and crane access requirements.

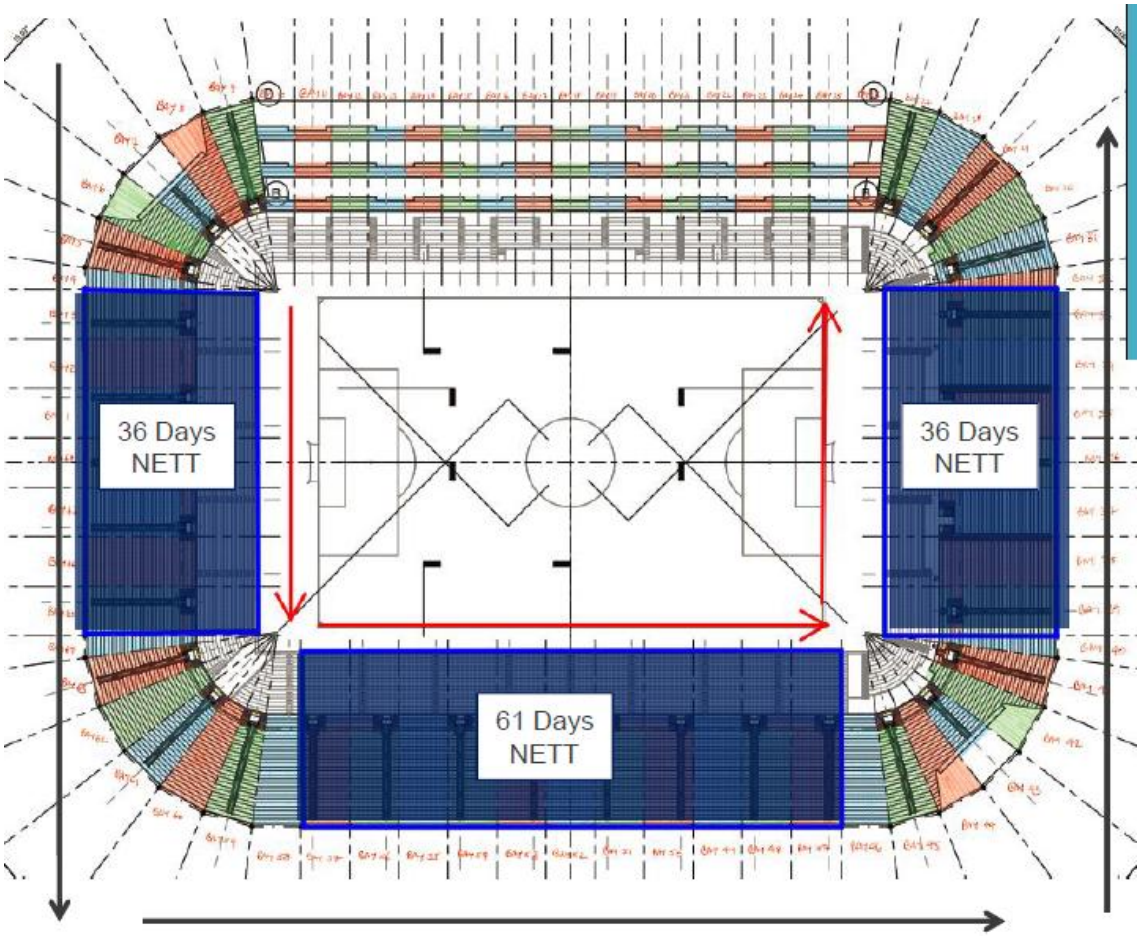
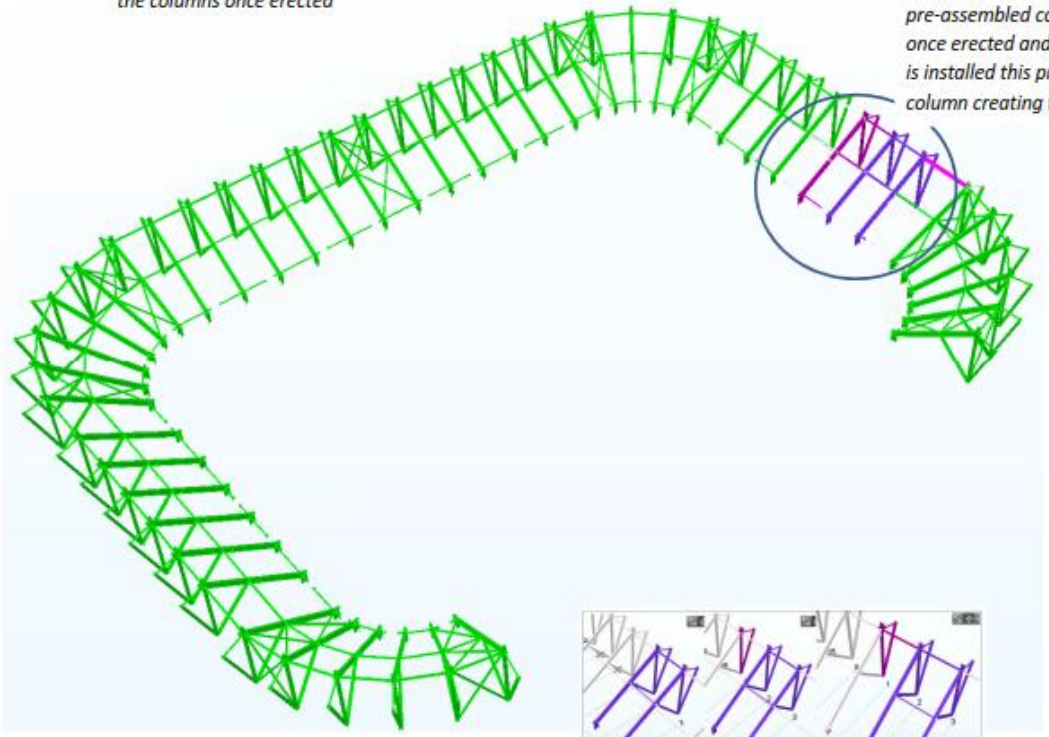
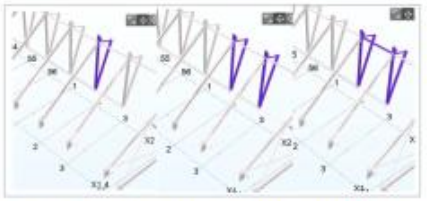


Figure 23 – North / South / East Stadium Bowl Sequence

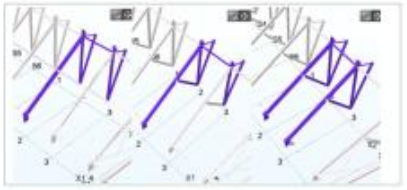
Structural Steel – Bowl Erection Methodology

Bowl steel to be erected utilising two cranes, this will allow bracing members to be installed without temporary steel being used to support the columns once erected

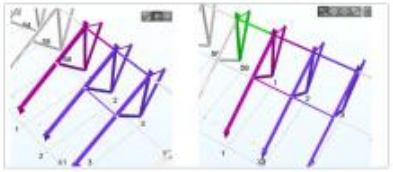




Erection works commence with the lifting of the pre-assembled columns and rear stay beams, once erected and secured the horizontal member is installed this provides lateral stability to the column creating the braced bay.



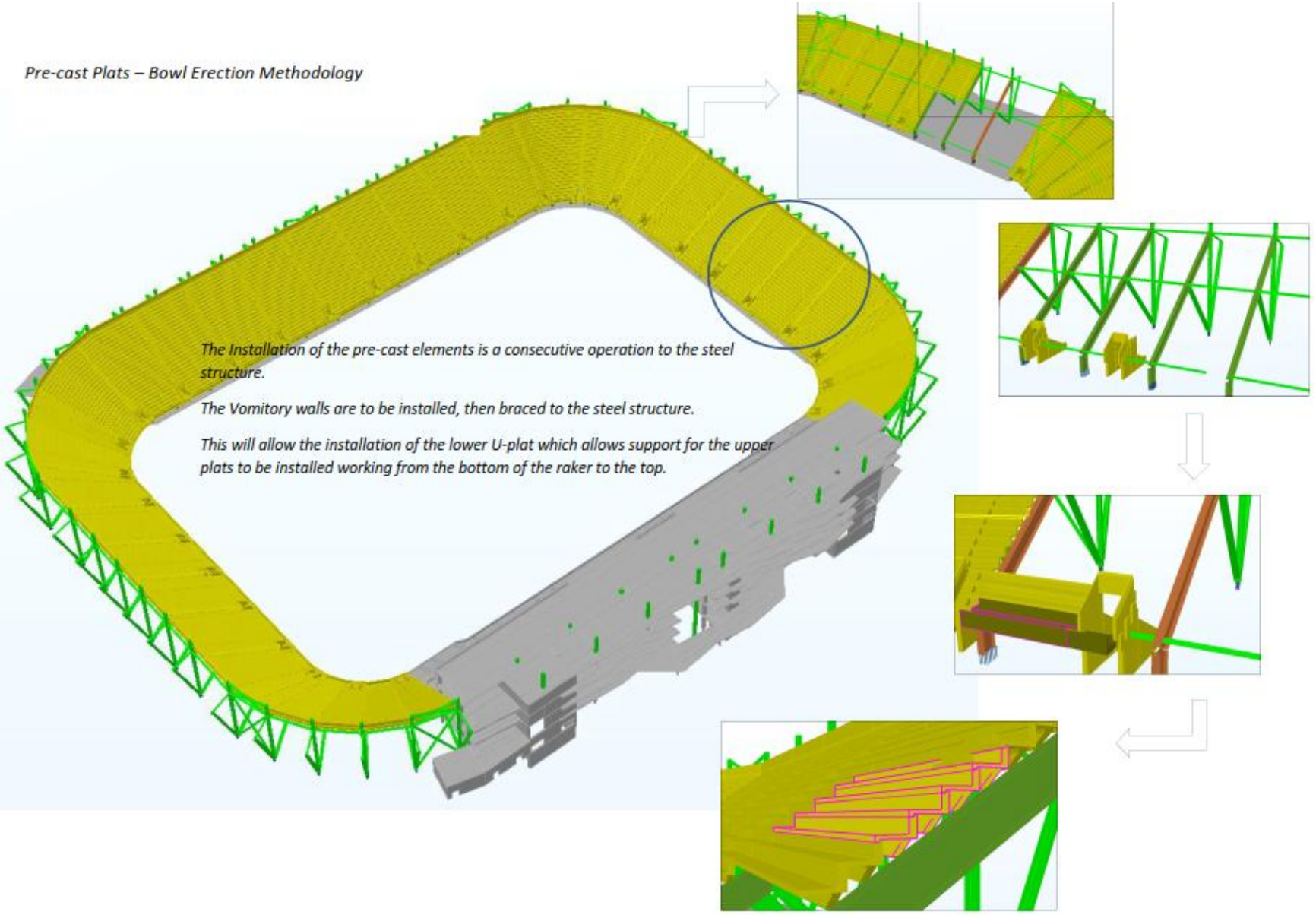
Once the raker beams are pre-assembled and bolted, it is lifted into position over its hold down bolts and then secured to the column connection.



Survey will be carried out at this stage to ensure plumbness and correct elevation at baseplates and horizontal brace connections prior to the installation of the remaining bracing.

Follow the procedure to the proceeding bay ensuring that the horizontal bracing is installed prior to releasing the crane from the column pre-assembly.

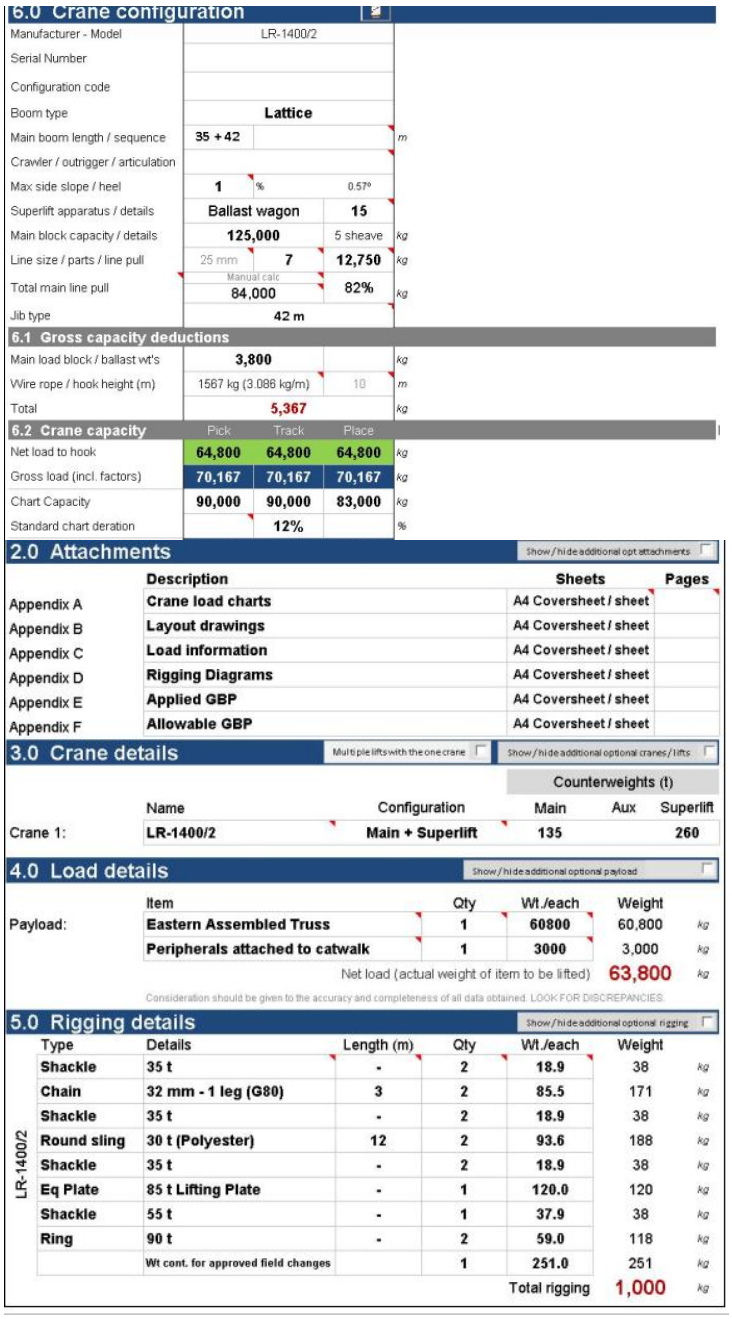
Pre-cast Plats – Bowl Erection Methodology



11.6 Roof Structure

The steel roof trusses supporting the roof fabric will be pre-assembled onsite within the pitch area as explained in Section 7. The roof truss is typically formed through the use of 310UC Sections bolted together to form a 2D Truss Section. The trusses will be assembled in jigs within the pitch area into 3D preassembled bays.

During the planning of the installation pre-assembled modules, detailed lift studies are undertaken by an independent heavy lift engineer. This document provides crucial information for the erection crew to ensure safe lifting practice is followed.



6.0 Crane configuration

Manufacturer - Model	LR-1400/2			
Serial Number				
Configuration code				
Boom type	Lattice			
Main boom length / sequence	35 + 42			m
Crawler / outrigger / articulation				
Max side slope / heel	1	%	0.57°	
Superlift apparatus / details	Ballast wagon		15	
Main block capacity / details	125,000		5 sheave	kg
Line size / parts / line pull	25 mm	7	12,750	kg
Total main line pull	Manual calc 84,000		82%	kg
Jib type	42 m			

6.1 Gross capacity deductions

Main load block / ballast wt's	3,800			kg
Wire rope / hook height (m)	1567 kg (3.086 kg/m)		10	m
Total	5,367			kg

6.2 Crane capacity

	Pick	Track	Place	
Net load to hook	64,800	64,800	64,800	kg
Gross load (incl. factors)	70,167	70,167	70,167	kg
Chart Capacity	90,000	90,000	83,000	kg
Standard chart deration		12%		%

2.0 Attachments — Show / hide additional opt attachments

	Description	Sheets	Pages
Appendix A	Crane load charts	A4 Coversheet / sheet	
Appendix B	Layout drawings	A4 Coversheet / sheet	
Appendix C	Load information	A4 Coversheet / sheet	
Appendix D	Rigging Diagrams	A4 Coversheet / sheet	
Appendix E	Applied GBP	A4 Coversheet / sheet	
Appendix F	Allowable GBP	A4 Coversheet / sheet	

3.0 Crane details — Multiple lifts with the one crane — Show / hide additional optional cranes / lifts

	Name	Configuration	Counterweights (t) Main	Aux	Superlift
Crane 1:	LR-1400/2	Main + Superlift	135		260

4.0 Load details — Show / hide additional optional payload

	Item	Qty	Wt./each	Weight	
Payload:	Eastern Assembled Truss	1	60800	60,800	kg
	Peripherals attached to catwalk	1	3000	3,000	kg
			Net load (actual weight of item to be lifted)	63,800	kg

Consideration should be given to the accuracy and completeness of all data obtained. LOOK FOR DISCREPANCIES.

5.0 Rigging details — Show / hide additional optional rigging

	Type	Details	Length (m)	Qty	Wt./each	Weight	
LR-1400/2	Shackle	35 t	-	2	18.9	38	kg
	Chain	32 mm - 1 leg (G80)	3	2	85.5	171	kg
	Shackle	35 t	-	2	18.9	38	kg
	Round sling	30 t (Polyester)	12	2	93.6	188	kg
	Shackle	35 t	-	2	18.9	38	kg
	Eq Plate	85 t Lifting Plate	-	1	120.0	120	kg
	Shackle	55 t	-	1	37.9	38	kg
	Ring	90 t	-	2	59.0	118	kg
		Wt cont. for approved field changes		1	251.0	251	kg
					Total rigging	1,000	kg

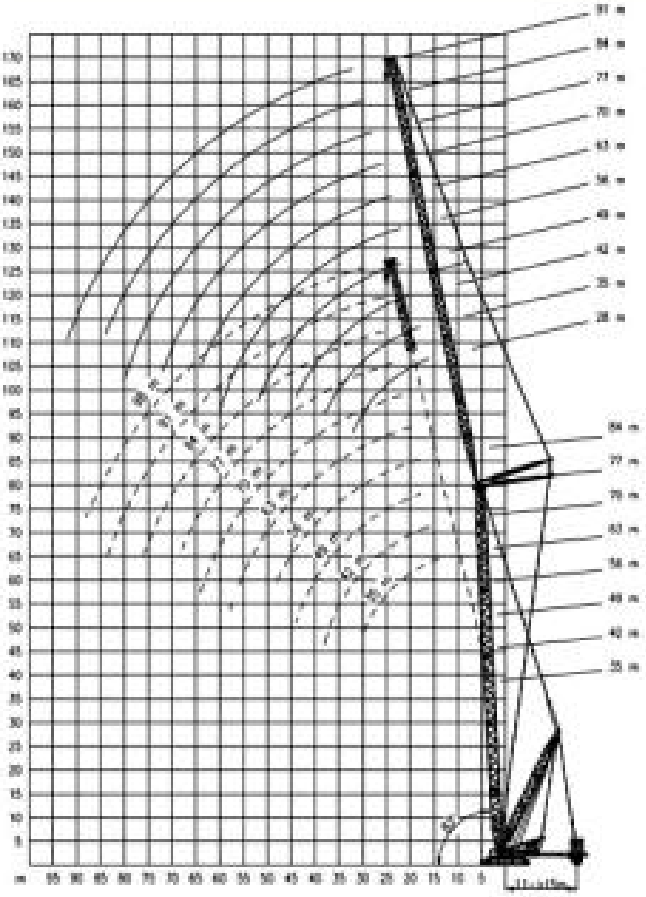
The crane being used for the installation of the roof steel work is a Leibherr LR 1400/2.

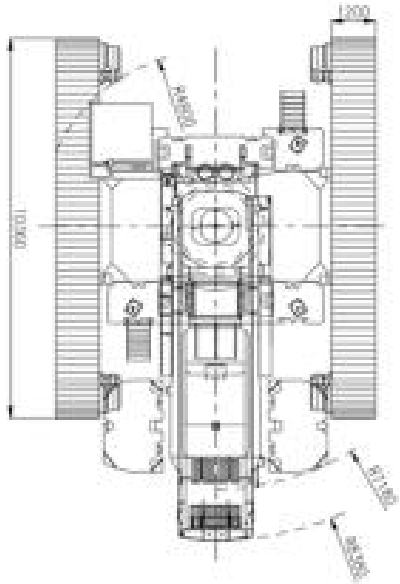
This machine has a lifting capacity of 400tonnes.

For the lifting of the pre-assembled roof modules the crane will be in its super-lift configuration with an additional 260 tonnes counter weight with an off-set jib.

This machine was chosen as it allowed us the capability to install the roof modules from inside of the bowl, whilst working at a radius which does not impact on the in-ground piling works which have been carried out in advance for the lower bowl terracing.

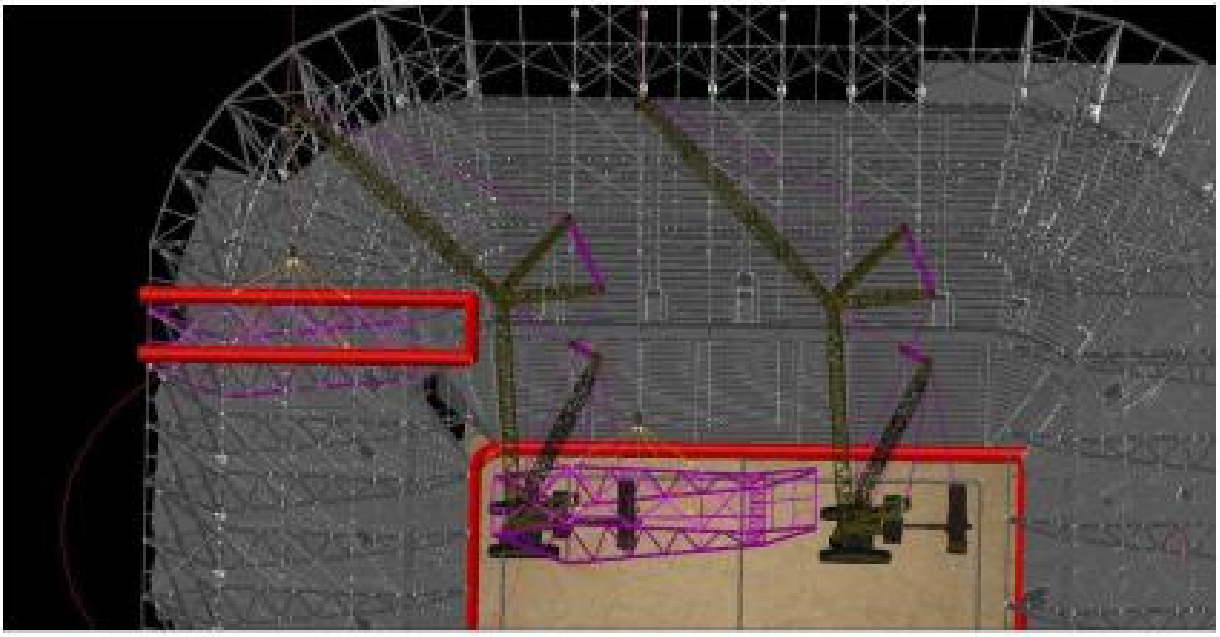
LEIBHERR LR 1400/2	400 TON





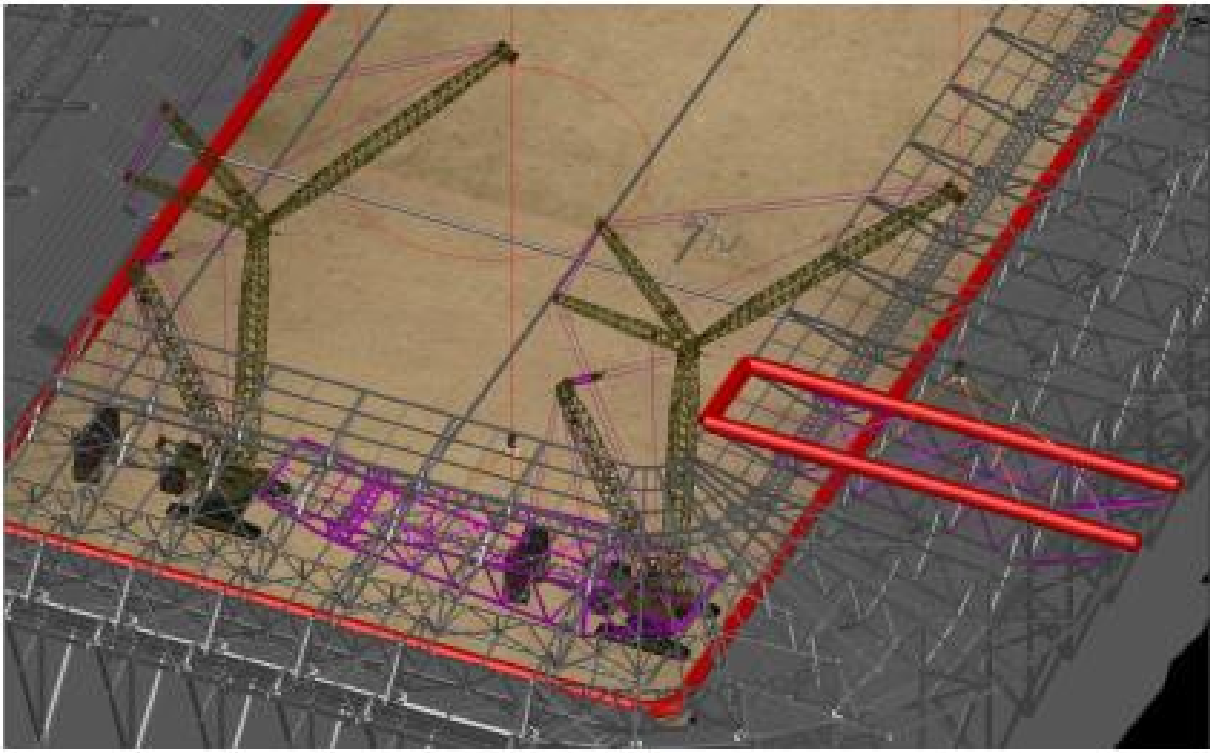
	S 35 m											
	W 28 m				W 35 m				W 42 m			
	SDW	SDWBW 260t			SwO	SwOBW 260t			SwO	SwOBW 260t		
	0t	11m	13m	15m	0t	11m	13m	15m	0t	11m	13m	15m
m	t	t	t	t	t	t	t	t	t	t	t	t
14.0	130.0	180.0	180.0	180.0	-	-	-	-	-	-	-	-
16.0	114.0	168.0	168.0	168.0	109.0	144.0	144.0	144.0	96.0	120.0	120.0	120.0
18.0	99.0	157.0	156.0	156.0	97.0	138.0	138.0	138.0	93.0	117.0	117.0	117.0
20.0	87.0	148.0	149.0	149.0	86.0	132.0	132.0	132.0	84.0	115.0	115.0	115.0
22.0	77.0	136.0	140.0	140.0	78.0	127.0	127.0	127.0	77.0	111.0	111.0	111.0
24.0	69.0	126.0	132.0	132.0	69.0	121.0	121.0	121.0	67.0	108.0	108.0	108.0
26.0	62.0	120.0	120.0	120.0	62.0	115.0	115.0	115.0	61.0	104.0	104.0	104.0
28.0	57.0	109.0	109.0	109.0	56.0	108.0	108.0	108.0	55.0	100.0	100.0	100.0
30.0	52.0	99.0	99.0	99.0	51.0	98.0	98.0	98.0	51.0	96.0	96.0	96.0
32.0	-	-	-	-	47.0	90.0	90.0	90.0	46.0	90.0	90.0	90.0
34.0	-	-	-	-	43.5	84.0	84.0	84.0	42.5	83.0	83.0	83.0
36.0	-	-	-	-	40.5	78.0	78.0	78.0	39.5	78.0	78.0	78.0
38.0	-	-	-	-	37.5	70.0	70.0	70.0	37.0	73.0	73.0	73.0
40.0	-	-	-	-	-	-	-	-	34.5	68.0	68.0	68.0
44.0	-	-	-	-	-	-	-	-	29.5	60.0	60.0	60.0

The Eastern truss assembly is placed parallel to its final position from the pre-assembly area, it is picked and a carried before lowering into connection points.

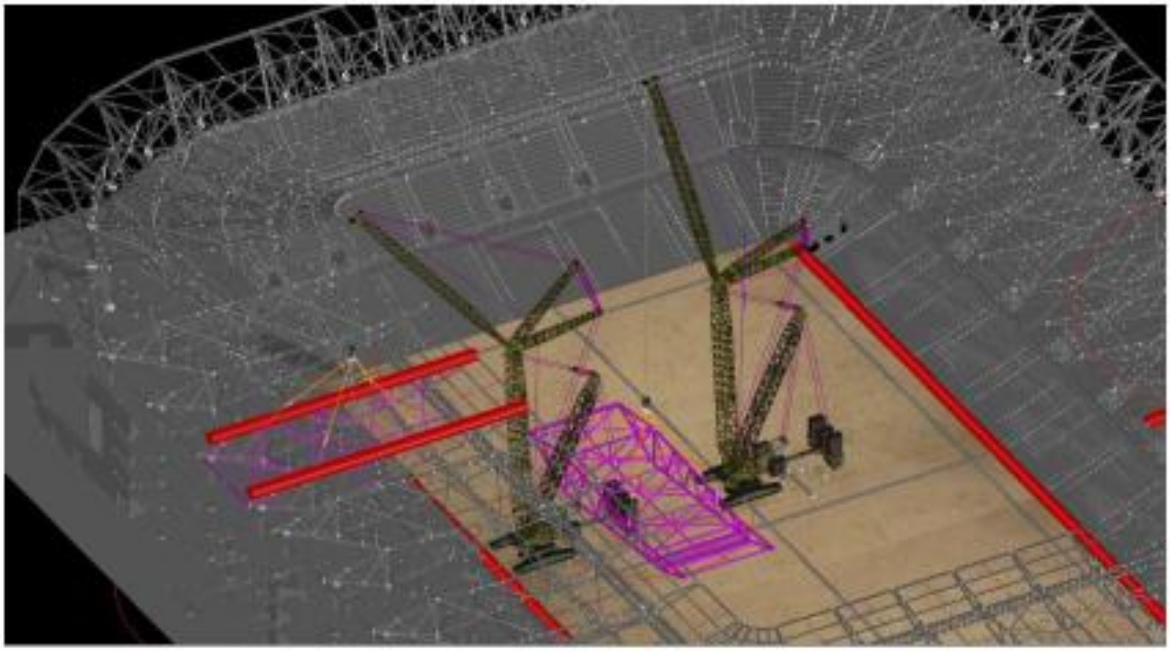


The Northern, Southern & Eastern roof bays are narrower and lighter than the Western stand.

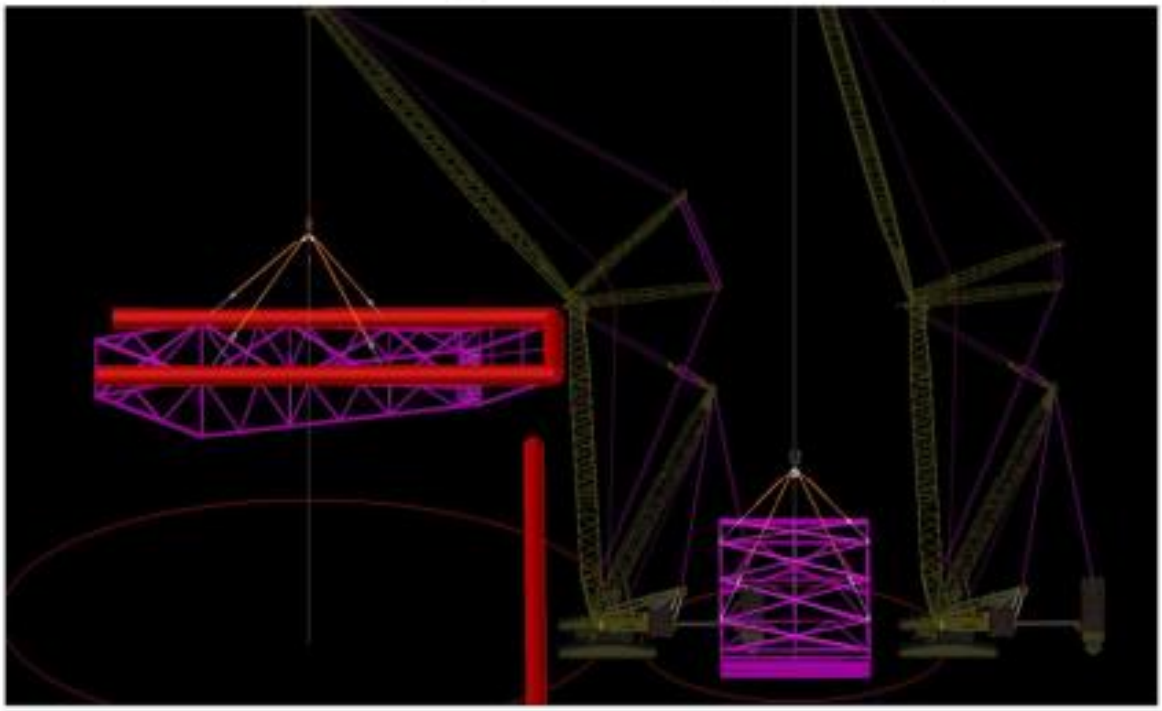
These pre-assembled bays are 10.2 metres wide by 47 meters long weighing approx. 55 tonnes, the western bays are 15.7metres wide by 47 metres long weighing approx. 73 tonnes.



Western truss installation requires the modules to be pre-assembled perpendicular to its final position, to allow the crane to be at a shorter radius due to the mass of the load.

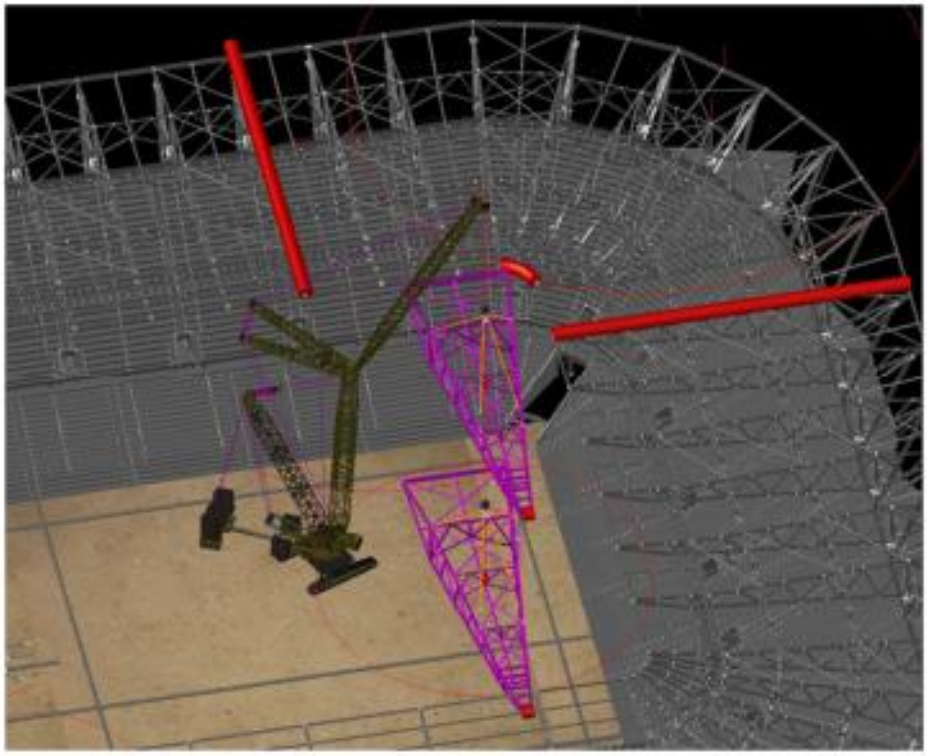


This will allow us to track the crane into position, before luffing down and rotating the module.

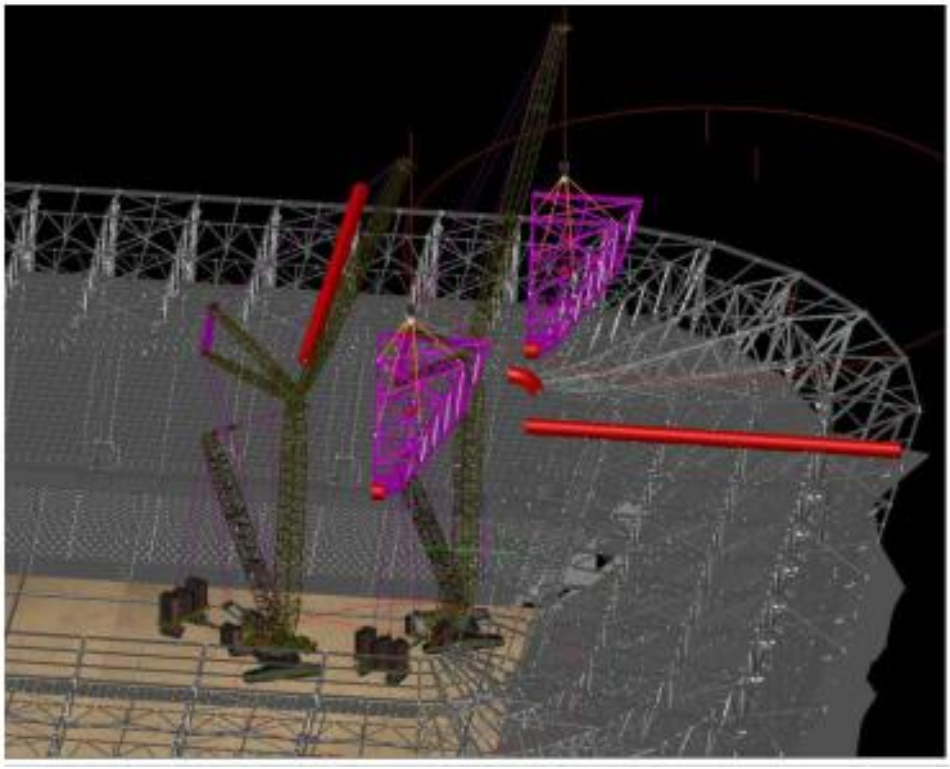


Western truss installation requires the modules to be pre-assembled perpendicular to its final position, to allow the crane to be at a shorter radius due to the mass of the load.

Due to a change in the configuration of the crane, we are now able to install the corner roof trusses as fully pre-assembled bays.



This decreases the amount of high-risk activities that will be carried out at height.

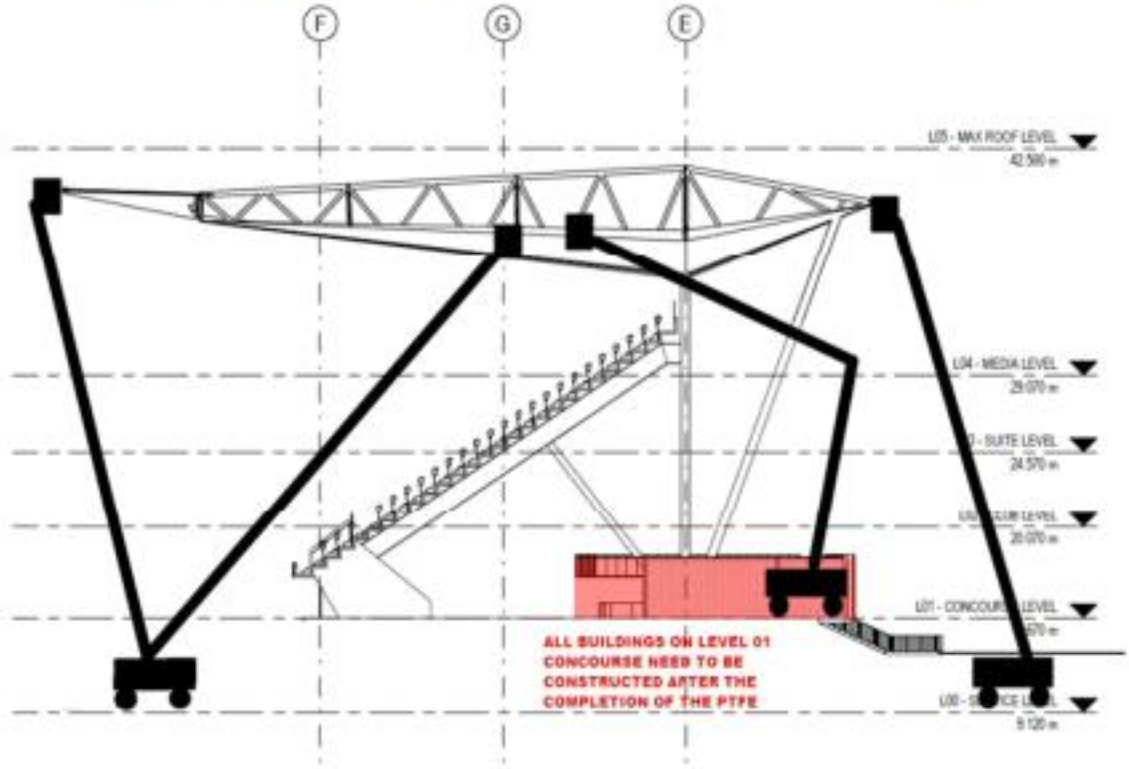


11.7 Roof Fabric

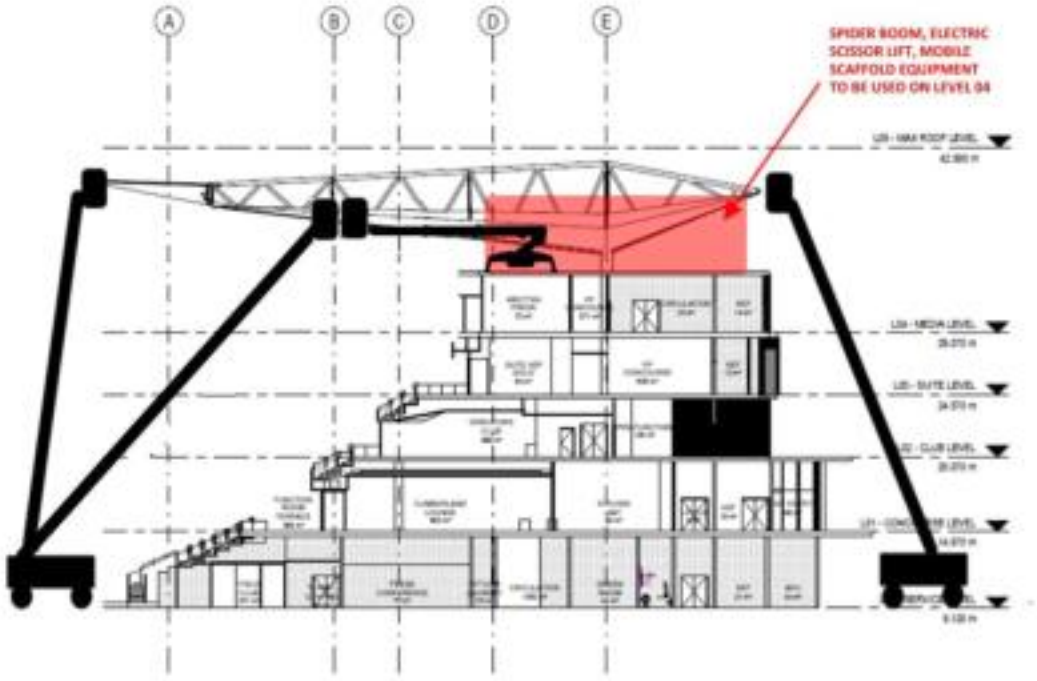
The installation of the roof fabric will occur post installation of the roof steel structure.

Access for the Installation of The Roof Steel shall be via 135ft EWP's.

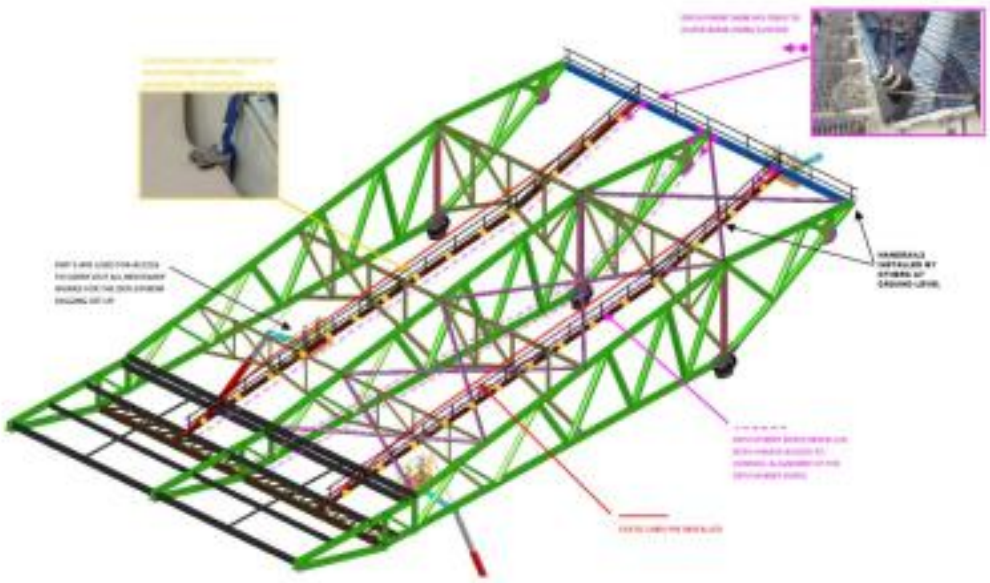
Roof access for the Northern, Southern & Eastern stand will be from the levels detailed below.



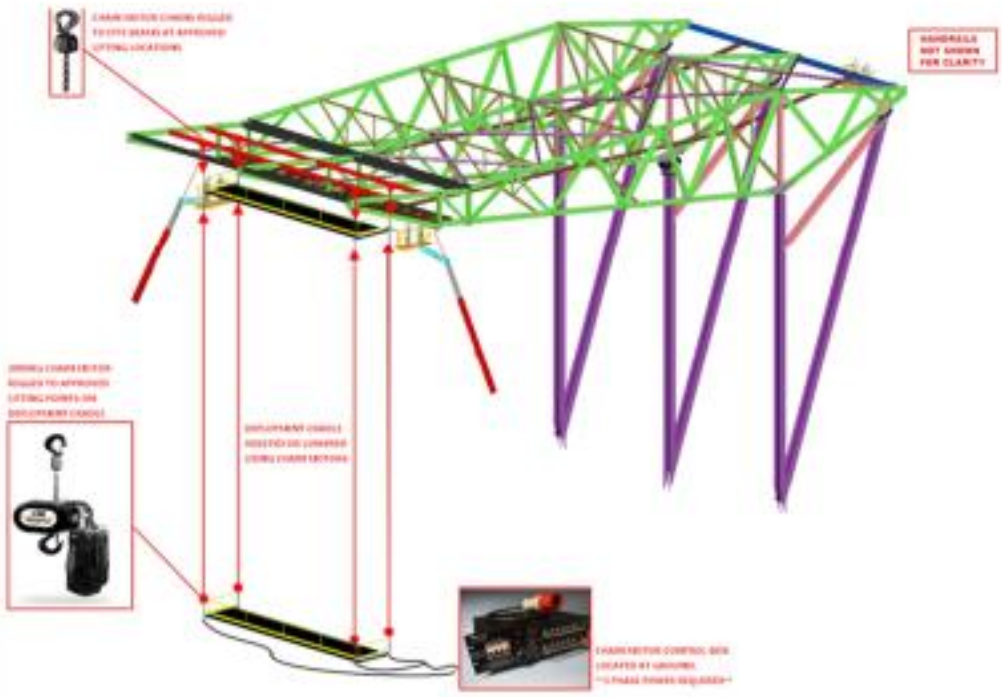
Access to the Western Stand roof will be via 135ft EWP's, however due to the western stand lower terracing being installed other provisions have been made to access via the level 5 roof media roof.



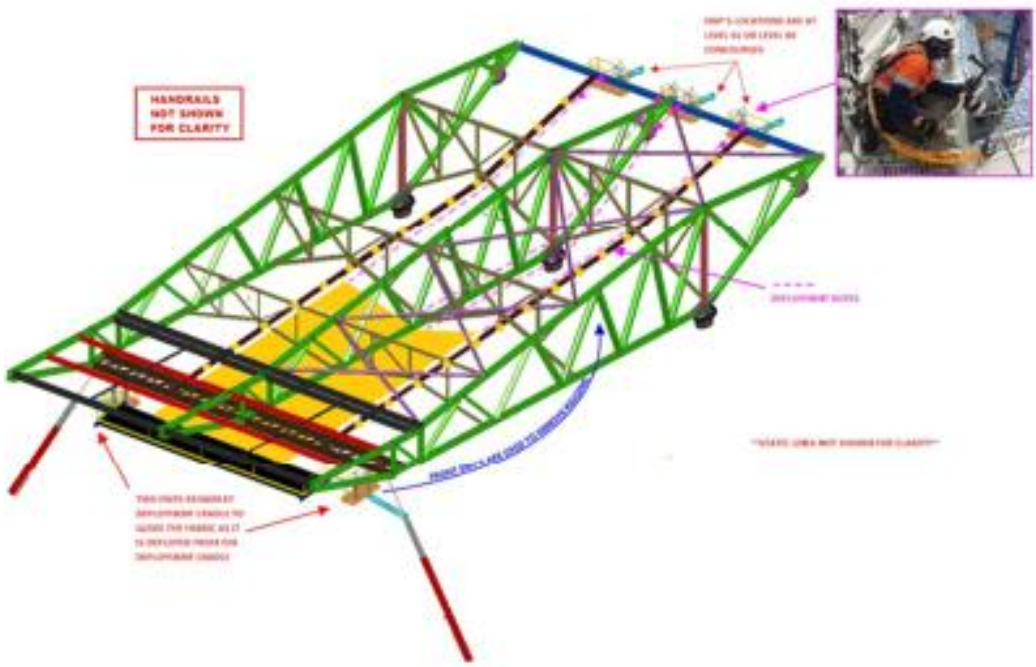
During the pre-assembly process safety rails will be fitted to the trusses whilst on the ground to allow safe access to the roofing personnel after the fabric is deployed.



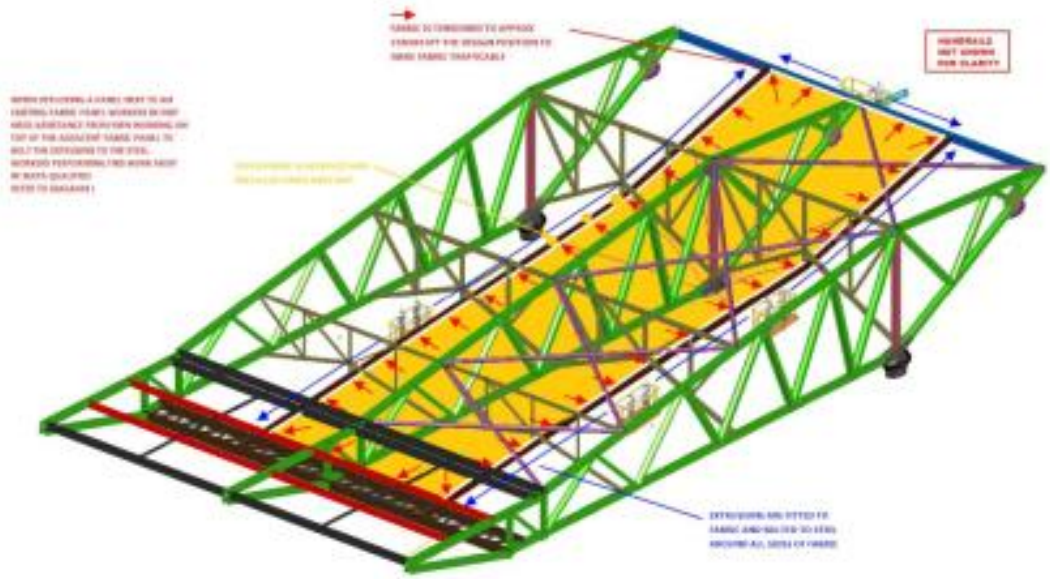
To enable the fabric to be deployed, a bespoke engineered and manufactured gantry will be installed to the structure. This allows the material to be pulled along the length of the roof trusses smoothly and safely.



The fabric is deployed by using 3 winches attached to along the rear edge beam of the roof. It is then pulled along the bottom of the truss whilst being guided through Aluminium extrusions which are installed on the ground during pre-assembly.



Once it is fully deployed the clamp plates are installed along the extrusion to hold the fabric firmly in place. At this stage the fabric is partially tensioned to allow the installation crew access to work from the top.



Upon all the extrusion/clamp plates being Installed, final tensioning commences.

Large clamp plates are installed in the corners and bolted to the structure, these are then tightened to achieve tension final tension in the fabric.

11.8 Infrastructure Works – Electrical / Water / Communications / Gas / Sewer

The Project's electrical infrastructure requires upgrading, hence High Voltage Mains will need to be run from the site (in the approximate location of O'Connell Street / Victoria Road Intersection) to the North Parramatta Zone Substation, in the order of 1km in distance. It is possible conduits exist already, but the worst case is that trenching will need to be carried out to install the upgrade. Based on the final outcome, road closures and footpath closures will be sought and obtained through the City of Parramatta Council.

These works will not be critical from a programming perspective, based on the indicative date for the chamber substation energisation, located in the service level (L00) of the Western Stand.

The Low Voltage feed across the Parramatta River to will be cut over post the chamber substation energisation. Relevant stakeholder engagement activities will support this process.

Supply of water to the new precinct will come off the existing main located on the eastern side of O'Connell Street. This work will require approximately 600mm of trenching across O'Connell Street, and again will be coordinated through the City of Parramatta Council for relevant permits and approvals.

A series of communications pits are located in the NE corner of the existing site. These will be utilised as a means of feeding the new precinct and upgrading communications infrastructure.

The connection point for gas infrastructure is located on the western side of O'Connell Street. This work will require footpath closure and potentially a single lane closure of O'Connell Street. Again, this will be coordinated with the City of Parramatta Council.

The sewer connection point is located in the SE corner of the site. The connection will be in the order of 6m in depth from the existing levels in the area. The location for connection is within the landscaped area, hence there will be minimal disruption to the new build programme during the course of these works. It is also important to note that the new stadium structure will be built over the existing sewer line. This is a common situation whereby structural design solutions will inform the approval process through Sydney Water. (the authority).

11.9 Concourse Finishes

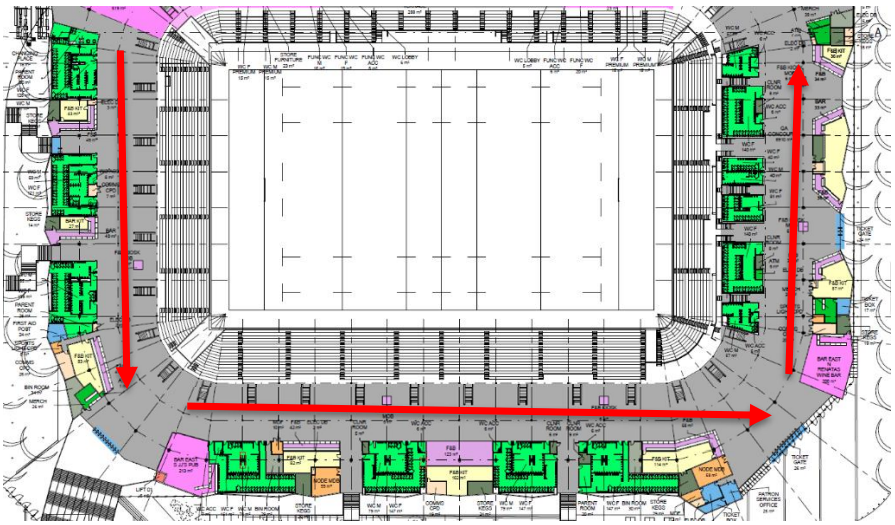


Figure 24– Plan of South, East and Northern Concourse

The concourse food, beverage and amenities blocks will be in full construction following the successful installation of the Southern, Eastern and Northern Tier 2 Structural Steel and Precast Elements.

This activity of works will naturally follow the general build sequence, hence commence within the southern concourse working east and towards the north. These works will be coordinated with the roof truss and fabric installation above to ensure adequate separation and exclusion zones are maintained.

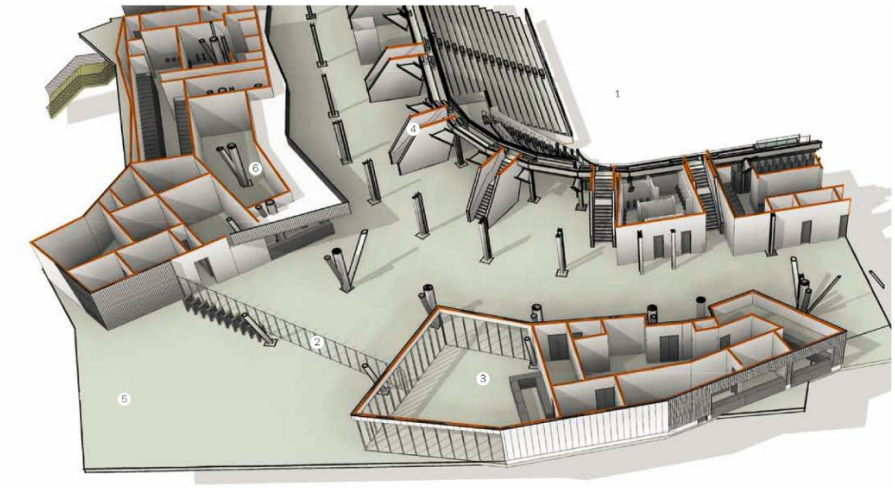


Figure 25 – Render of Concourse Amenities plus Food and Beverage

This component of work will largely feature blockwork requiring working scaffolding around the perimeter, and within for dividing blockwork walls. Areas of scaffolding will be maintained for roofing works prior to removal for wall finishes off MEWP's.

11.10 Internal Finishes

Post completion and strip out of the concrete structure to the Western Stand, services rough-in and internal finished works will commence. These works will be facilitated through materials movement by hoist (Scando 650) and as required through cranage via loading platforms to the western elevation of the western stand. Once the Builders lifts (Lift 4 & 7) are online, the materials hoist will be decommissioned and the lifts will be used for materials movement. Fit-out works will be prioritised based on lead time of joinery and kitchens, with the overarching concept of working from the Northern and Southern ends of each level back towards the location of materials entry points to the floors (hoist location and goods lift location).

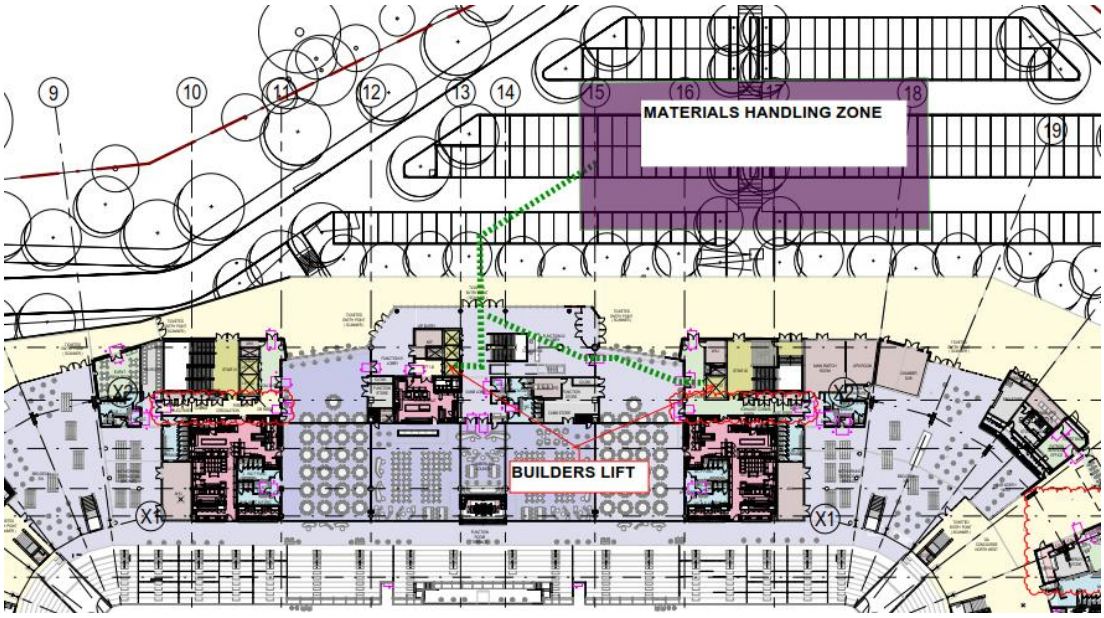


Figure 26 –Materials Handling to West Stand Fitout

The Fitout of each floor is as follows:

- **Level 00** – Service Level inclusive of Change rooms, Warmup Facilities, Kitchens, Storerooms, plantrooms and holding areas
- **Level 01** – Concourse level inclusive of Lounge room, Function Lobby, Amenities, & associated Plantrooms
- **Level 02** – Club Level inclusive of Directors Club, Corporate suites, F&B & Amenities, & associated Plantrooms
- **Level 03** – Suite level inclusive of Suites, Offices, and Amenities and associated Plantrooms.
- **Level 04** – Media Level inclusive of Suites, Media rooms, Kitchens, Amenities and associated Plantrooms.

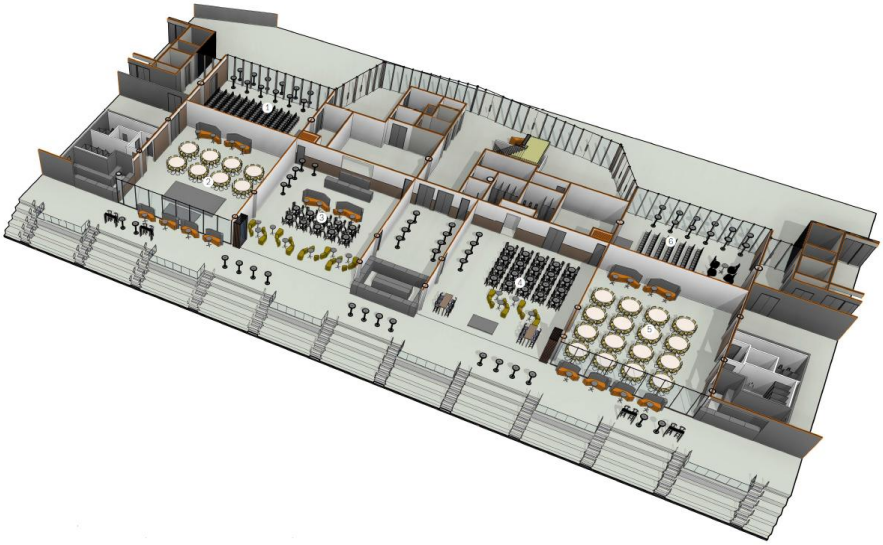


Figure 27 – Level 01 Cumberland Lounge

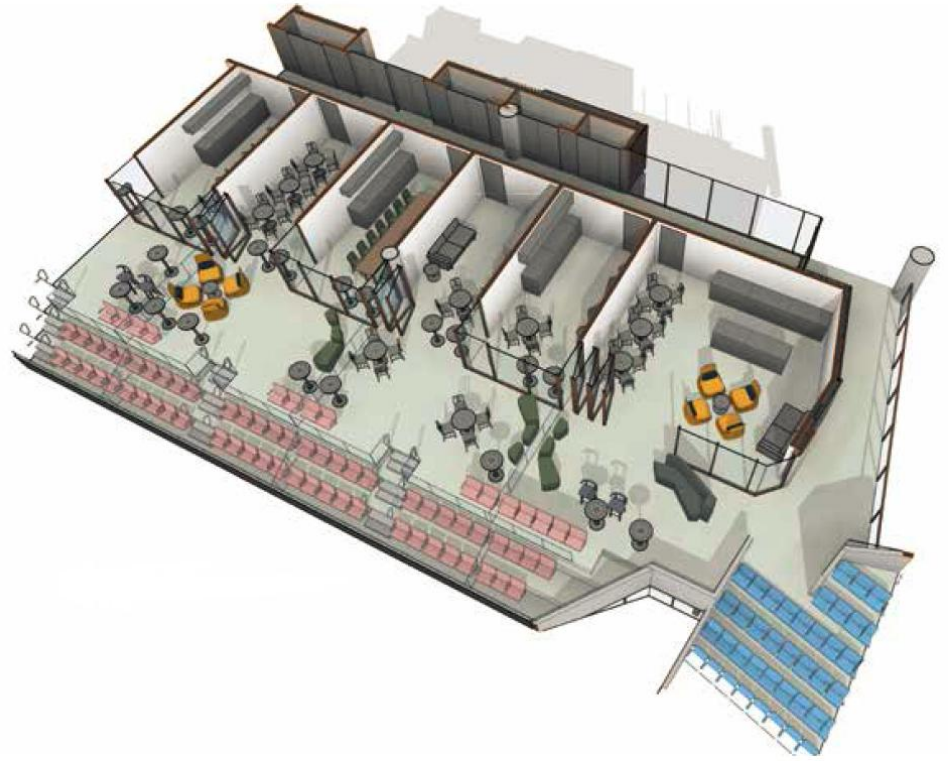


Figure 28 – Level 3 Suites, Pitch side Veranda

11.11 Service Level 00

The service level (Level 00) of the Western Stand resides at approximately RL9.0 (pitch level). This work area consists of 6m high blockwork, key precinct infrastructure plantrooms including 1 x chamber substation, chiller, boiler and generator plantrooms all located in the southern end of the service level. Construction Works in this area will work from North to South allowing materials to be delivered to the future loading dock area feeding the build works throughout. The key service plantrooms will be accelerated in order to mitigate any time risk associated with commissioning of systems throughout precinct.

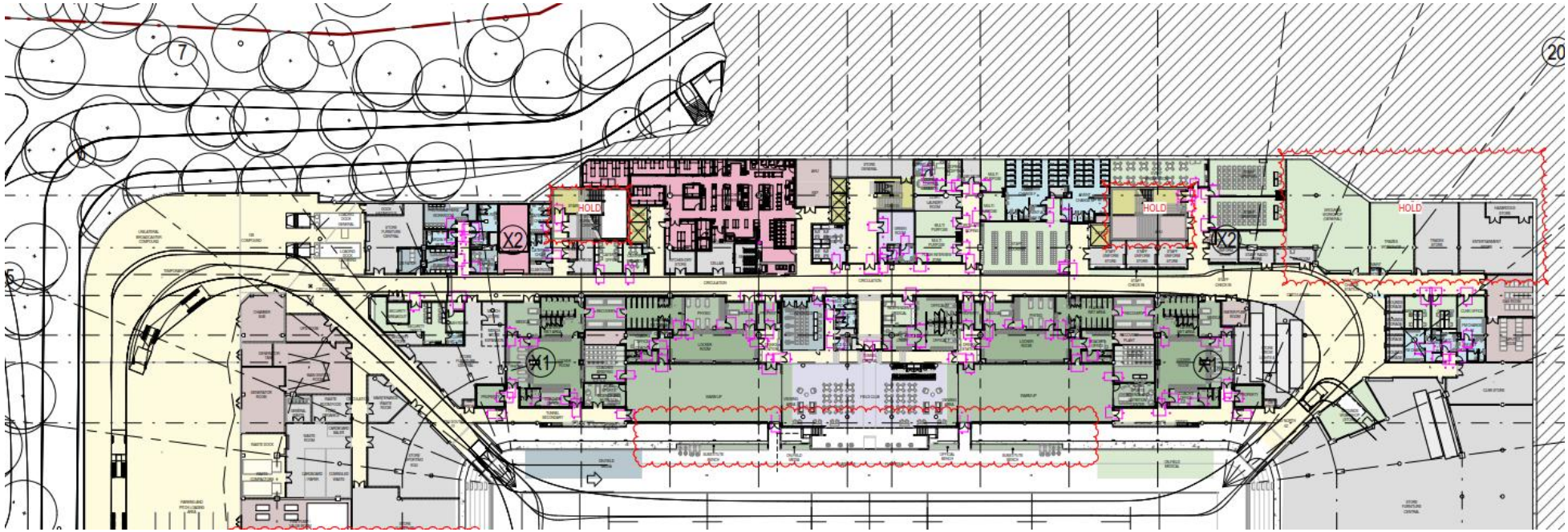


Figure 29 – Level 00 Service Level – Western Stand

11.12 Playing Field

The construction programme allows commencement of the pitch sub-grade, in-ground drainage and turf laying following the completion of Tier 1. As highlighted earlier in this CMP, Tier 1 will follow the completion of the Roof Truss Installation and works in the general direction from the south through the east to the north.

Figure 30 – Pitch Sequencing

Current design of the pitch is being finalised and whether a sub-surface ventilation system is required. There have been several pitch failures in Stadia, and its important flexibility and control is provided to maintain the pitch standards during weather changes and transition changes.

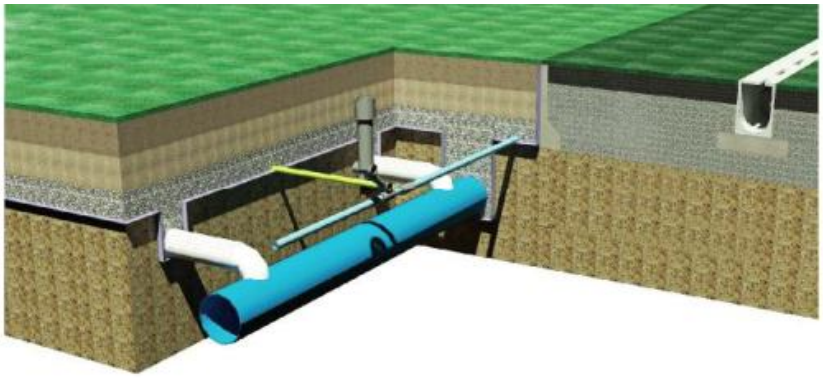


Figure 31 – standard sand over gravel construction – indicated in Brief

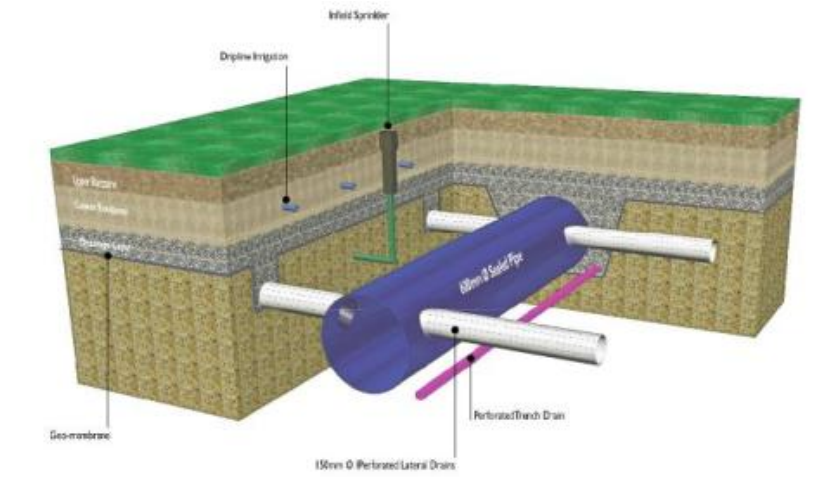
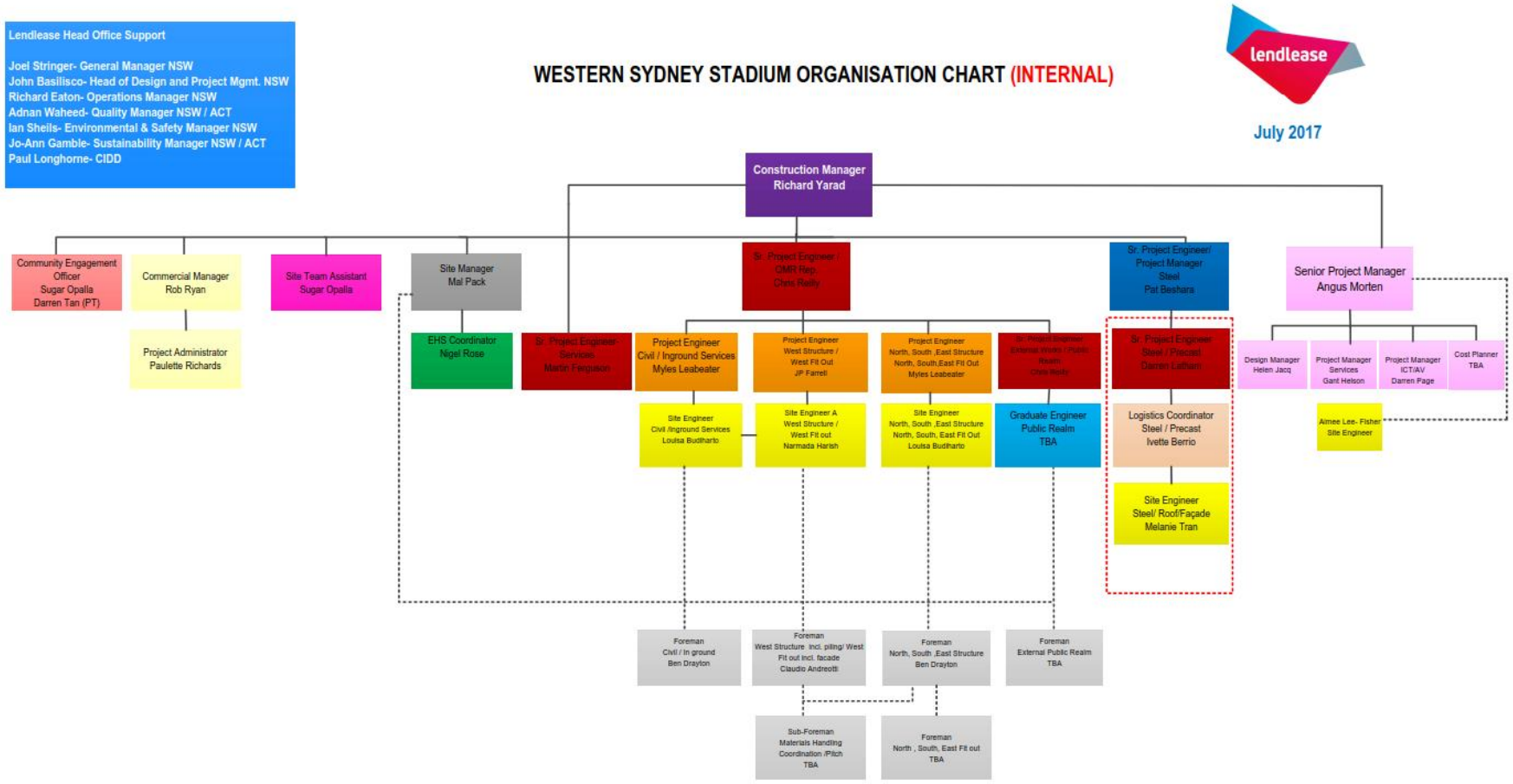


Figure 32 – Sub-surface pitch air circulation system schematic

Figure 33 – Pitch Construction

APPENDIX 1 - ORGANISATION CHART



APPENDIX 2 – LENDLEASE BUILDING EROSION & SEDIMENTATION CONTROL SUB PLAN

LEND LEASE BUILDING PTY LTD | 97 000 098 162

WESTERN SYDNEY STADIUM
MANAGEMENT PLAN - STORMWATER AND EROSION

14/08/2017 | Revision No: 3

Sub Plan Revision Status				
Date	Revision (in numbers)	Purpose and Summary of Amendments	Reviewed by	Approved by
05/01/2017	1	For issue	Damian Vella	Graeme Mauger
30/04/2017	2	General update including LLB GMR and legislative amendments – New Template	Paul Lonergan	Richard Yarad
14/08/2017	3	General update including relevant GMR reference and revision inserted into footer	Ian Sheils	Richard Yarad

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1. SCOPE OF PROJECT AND SUB PLAN

Project Details	
Scope of the Sub Plan	This Storm water, Erosion and Sedimentation Management Sub Plan provides strategies and mitigation measures to manage disturbed areas of the site. It outlines appropriate measures to ensure that activities including excavated soil, storm water, erosion, and sedimentation are managed appropriately during site establishment and construction of the project. It describes measures to be implemented during relevant construction activities and defines discharge protocols and treatment procedures that enable control of the impacts of the construction activities on potentially affected areas of adjacent water bodies. Refer to Section 1.1 and 3.1 of the Project EHS Management Plan for clarification on how the EHS Sub Plans form part of the Lend lease Building (LLB) EHS management system.
Objectives of the Sub Plan	• To avoid erosion, contamination and sedimentation occurring, resulting from construction or demolition activities with a concentration on controls to minimise dust and vehicular mud-tracking. • To control the quality of storm water leaving the construction site, so that no unacceptable impact will intrude upon the natural watercourses and/or storm water drains. • To minimise disturbance of the surrounding hydrological regime • To maximise opportunities for storm water recycling on site. • To effectively manage the bulk excavation and associated dewatering activities to minimise impact on any adjacent water bodies. • Erosion and sediment controls are to be effective and properly maintained at all times. • Water treatment procedures to treat collected /retained storm water to achieve acceptable water quality criteria. • To monitor the effects of activities and the effectiveness of mitigation measures
Scope of Works	This Sub Plan has been prepared based on the following scope of works: • Site establishment including vegetation removal, topsoil stripping, office and compound setup; • Demolition of the existing Parramatta Stadium, Parramatta Pool and adjoining structures. • Excavation of site including cut and fill of contaminated materials.

	• Piling works for the new structure inclusive of CFA piles • Construction of the new Western Sydney Stadium and surround carparks and road networks. • Site contains bonded and friable asbestos contained in two elevated mounds to the north and south of the site. This will be cut and filled in locations on the site. The scope is to not remove asbestos material off site. The asbestos will be capped with a 500mm layer which will be utilised for piling mat. Senversa has prepared a RAP and the works will be under the supervision of PRA, Occupational Hygienist.
Key Issues and Risks	The site is located in close proximity to the Parramatta River. The soils at the site are noted to be • Alluvial clayey sands, sand, and sandy clays typically in a stiff or medium dense condition • Rock is at a depth of 9m to 13m. • Natural soils are overlain by fill in parts of the site. Fill is noted to be contaminated. It is EXPECTED that groundwater will be encountered at RL5.0 to RL 8.0 m. The works required on site will involve significant ground disturbance creating the potential for erosion, sedimentation, runoff and environmental pollution, if appropriate controls are not implemented and maintained. The activities with the greatest potential to impact on the local environment and community from a storm water, erosion and sedimentation perspective are considered to be: • Site clearing, establishment and operation including storage areas; • Bulk and detailed excavation and spoil generation; • Stockpiling; • The loading and haulage of materials off-site; • Storm water and groundwater detention and dewatering; and • Waste disposal (spoil, sediment and water). The impacts of these works may include: • Cause of potential flow into storm water system and/or adjacent surface water bodies from sediment laden water originating from the site. • Storm water with excessively high or low pH values could potentially run-off from selected stockpile stabilisation areas. • Pollution of local ecosystems and waterways due to uncontrolled site runoff; • Pollution associated with the discharge of sediment laden or contaminated water during dewatering activities;

	● Vehicles exiting construction site potentially depositing dust/dirt/mud on public roads after rain periods. ● Localised flooding during high intensity storm events. ● Site contamination and contamination to surrounding areas could occur due to the potential overflow of fuel/chemical storage containers. The implementation of the control measures identified in the EHS Plan and Storm water, Erosion and Sedimentation Management Sub Plan are intended to prevent or mitigate these impacts. AECOM's Water Cycle Management and Flooding Working Paper dated 13th July 2016 reviews the existing overland flows in the area. It identified that much of the overland flows in the area are collected in swales/playing fields with minimal risk of flowing into the river. One area was identified where water may enter the site from O'Connell Street, and flow through the site ending up at the Parramatta river. This will need to be addressed during site set up and monitored to ensure no run off escapes the site.
Legislation and Guidelines	**Federal/National:** The 'Blue Book' (Managing Urban Stormwater Soils and Construction) – Landcom, Fourth Edition (2004) 'White Books' - IECA 2008. Best Practice Erosion and Sediment Control. Books 1-6.International Erosion Control Association (Australasia) Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 Australian Guidelines for Water Quality Monitoring and Reporting 2000 **State:** NA **Local:** NA **Lendlease Requirements:** · GMR: 3.2 Establishing Locations · GMR 4.8 Excavation and Stockpile Collapse · GMR 4.13.1 Storm water, Sediment and Erosion Control · GMR: 4.15 Uncontrolled Release of Stored Energy (non-electrical) · Lendlease Building Workplace Delivery Code (WDC)

Summary of Site Controls	Works must be planned and implemented in accordance with the Lendlease GMRs, the Project EHS Plan, this Sub Plan and the Lendlease Building WDC. These documents detail Lendlease's approach and commitment to pro-active and responsible site management. Site specific controls, monitoring, reporting and performance measurements have been identified in this Sub Plan to prevent or minimise the impacts of construction on the environment and community. These include but are not limited to: ● Preventing erosion through minimal ground disturbance; ● The installation of erosion and sedimentation controls; ● Covering of stockpiles; ● The use of controls to trap sediment close to its source and prevent migration off site; ● The control and maintenance of site access and egress points to prevent tracking and off-site pollution; and ● The identification of acceptable detention, testing, treatment and dewatering processes. A Storm water, Erosion and Sedimentation Management Diagram (EMD) will be prepared prior to any site activities commencing including clearing and earthworks. Construction stage storm water, erosion and sedimentation requirements must be included in relevant specifications, contract agreements, quality assurance documents, and subcontractor work method statements. Site inspections, monitoring and reporting will be undertaken by Lendlease and subcontractors as detailed in the EHS Plan and the following implementation table.

2. IMPLEMENTATION OF THE SUB PLAN

Control Measure	Timing	Methodology	Responsibility	Monitoring and Reporting	Performance Measurement
Planning and Site Establishment					
Include information in the Site Induction about the risks and potential impacts of stormwater runoff, erosion and sedimentation on the local environment and community.	Prior to works commencing and ongoing	Revise Lendlease standard induction package to include site specific information. Deliver induction material.	CM SM	WMS prepared by subcontractors to address stormwater, erosion and sedimentation	Site induction delivered to all workers on site.
Prepare a stormwater, erosion and sediment Environmental Management Diagram (EMD) showing the location of stormwater inlets, drains, stockpile locations and erosion and sediment control measures.	At site establishment and prior to works commencing	Review Environmental Management Diagram (EMD Appendix 1). Prepare diagram showing details of stormwater infrastructure and controls. Provide controls for all disturbed areas of the site and around/ within existing stormwater infrastructure.	CM SM	EMD reviewed. Diagram prepared prior to works commencing. Diagram updated every 6 weeks.	Diagram prepared containing all relevant details and communicated. Diagram updated to reflect changes in site conditions. Controls implemented in accordance with the EMD.
Limit ground disturbance to the area required for immediate construction.	Areas of clearing identified prior to works commencing	Detail excavation requirements on staging/sequencing program. WMS prepared by subcontractor. Identify and fence off trees/vegetation to be retained. Communicate details.	SM/Foreman /EHS	Review of program. Daily surveillance to assess condition of fencing. Weekly/monthly inspection checklist. Inspection after a rain event.	No unnecessary land disturbance. Vegetation protection fencing and signage maintained.

Install stormwater, erosion and sediment controls as per the EMD.	Prior to works commencing	Undertake a site inspection to verify the correct location of controls. Install controls in accordance with EMD, design/engineers documentation.	SM	Daily surveillance to assess effectiveness and condition. Weekly/monthly inspection checklist.	EMD reviewed every 6 weeks. Controls modified or new controls installed as required.
Establish stable site exit points, parking areas, internal roads and turning areas to prevent the tracking of material off-site onto public roads.	Prior to works commencing. Maintain at all times	Retain existing hard surfaces where possible. Construct stable site entry/exit points and roadways using appropriate materials. Obtain clearance certificates for any imported (stabilising) material before receiving it on site.	SM Foreman	Daily surveillance and maintenance. Weekly/monthly inspection checklist. Inspection of imported materials.	No tracking onto public roads or dust. Clearance certificates for all imported materials.
Install a vehicle/wheel wash bay or shaker facility at the site exit.	Prior to construction commencing	Assess requirement in IHRA. Maintain shaker grid/wheel wash or employ high pressure drive-thru wash bay for site heavy duty plant. WMS to be prepared by subcontractor including a maintenance program. Engage sweeper. Limited hosing of hard surfaces only.	SM/Foreman	Daily surveillance. Weekly/monthly inspection checklist.	No mud/silt tracked onto roadways.
Provide sediment basins/detention areas/tanks to capture/store site runoff.	Prior to commencing works	Size and construct sediment basins/detention areas to meet authority requirements (i.e. project approval or Blue Book) as required.	CM/SM	Daily surveillance to assess condition and capacity.	Appropriately designed and maintained detention areas/facilities.

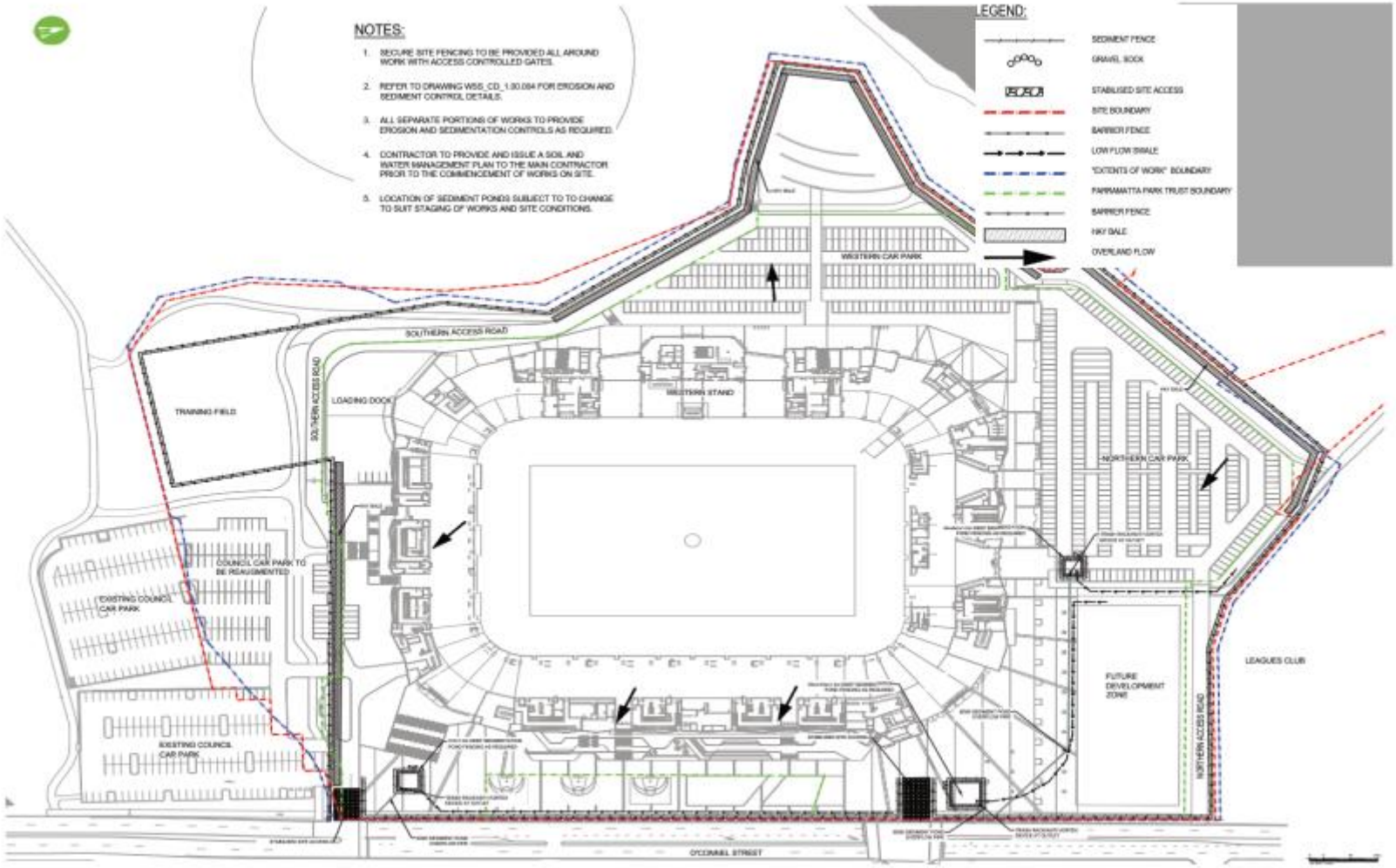
		Operate and maintain in accordance with design/ engineering documentation.		Weekly/monthly inspection checklist. Inspection during and immediately after rain.	No overtopping under design conditions.
Erosion and Sediment Control During Construction					
Maintain erosion and sediment controls in an operable condition.	At all times and after rain events	Check the condition of controls. Remove accumulated sediment and debris and dispose. Undertake maintenance as required. Install new controls as new work areas open.	SM/Foreman	Daily surveillance. Weekly/monthly inspection checklist. Post rain inspections. EMD updated.	Silt collected at base of fence. No breach of fence line.
Maintain stormwater pipes, pits and other controls (e.g. plugs).	At all times	WMS prepared by subcontractor. Check the condition and operation of stormwater infrastructure and controls. Remove debris and sediment and dispose. Monitor for blockages.	SM/Foreman	Daily surveillance. Weekly/monthly inspection checklist.	Free flowing pipes capable of discharging maximum flows.
Cover all loads leaving site to minimise the potential for spillage and tracking.	At all times	WMS prepared by subcontractor to address covering of loads and prevention of tracking. Loads and the condition of trucks/tailgates checked by subcontractor before leaving site.	SM/Foreman	Daily surveillance. Weekly/monthly inspection checklist	No uncovered loads No non-conformances identified.

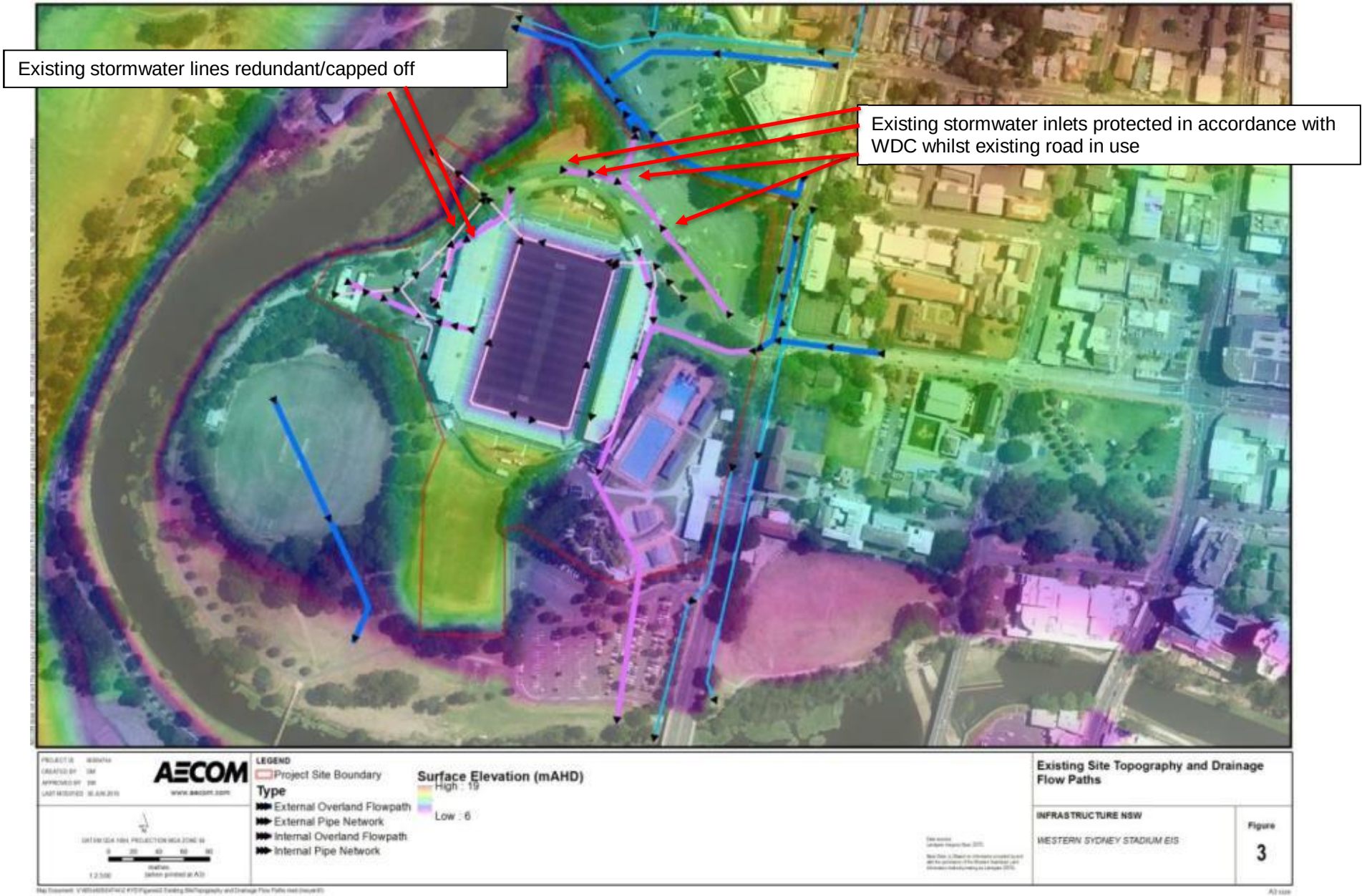
Locate stockpiles away from drainage lines, watercourses, sensitive ecosystems and flood prone areas.	At all times	Stockpile locations identified on EMD diagram. WMS prepared by subcontractor addresses stockpile management.	SM/Foreman	Daily surveillance. Weekly inspection checklist.	No uncontrolled stockpiles. No stockpiled material runoff into the stormwater system.
Cover soil stockpiles and provide bunding and sediment controls around the base.	At all times	WMS prepared by subcontractor to address. Subcontractor to implement as part of soil management and monitoring on site.	SM/Foreman	Weekly/monthly inspection checklist.	Pre-construction check. No release of material.
Stabilise stockpiles with a soil binder, sealant or sterile cover crop (grass).	Maximum 1 month after stockpile placement (if the material is remaining on site)	Establish appropriately located and sized stockpiles in designated areas only. Stabilise in accordance with manufactures specifications and application procedures. Stabilise or cover stockpiles left for >4 weeks.	SM/Foreman	Weekly/monthly inspection checklist.	No erosion or dust generated from stockpiles.
Maintain erosion and sediment controls until the potential for erosion and sedimentation has been eliminated.	At all times	Maintain controls in accordance with SESC diagram. Do not remove controls prior to any area being deemed stable.	SM/Foreman /EHS	Weekly/monthly inspection checklist Inspections during rain events.	Controls effective and in good condition. No uncontrolled discharges of sediment off-site or into waterways.

Stormwater Detention and Dewatering					
Inspect basins/tanks, detention facilities and stormwater treatment devices and remove any build-up of debris.	Ongoing. Within 24hrs of a rain event	Retain capacity in detention facilities for storm events. Inspect the site within 24hrs of a 1 in 5-year Average Recurrence Interval (ARI) event including sediment basins/detention areas and stormwater treatment devices. WMS to be prepared by sub-contractor to address inspection, testing and dewatering.	SM	Inspection within 24hrs of nominated rain event. Weekly/monthly inspection checklist.	Detention areas and capacity of facilities maintained in operational condition. No uncontrolled discharges under design conditions.
Test, treat and reuse collected stormwater on-site for dust suppression, truck and plant washing (in designated areas only).	Ongoing	WMS prepared by subcontractor to address this option. Undertake water quality testing and treatment of stormwater. Meet required water quality criteria prior to reuse.	CM	Metering and recording of stormwater reused on site. Water quality test results from a NATA accredited laboratory.	Water treatment and dewatering undertaken in accordance with documented site procedure and Workplace Delivery Code. No discharge to exceed authority criteria.
Test, treat and discharge collected stormwater off-site if it cannot be reused on site.	Ongoing	WMS prepared by subcontractor to address this option. Confirm that water quality testing, treatment and dewatering methods satisfy the requirements of the relevant statutory authority. Undertake water quality testing and treatment of stormwater.	SM Sub-contractor	Water quality test results from a NATA accredited laboratory. Dockets for off-site disposal where the water is not acceptable for discharge.	Water treatment and dewatering undertaken in accordance with documented site procedure and Workplace Delivery Code. No discharge of non-compliant water or off-site pollution.

		Meet specified water quality criteria prior to discharge. As a minimum : No chemical contamination and water quality must comply with any specific requirements of the Statutory Authority criteria. Water quality must meet the following criteria: · pH is between 8.5 and 6.5 · Suspended solids is less than 50 mg/L, To discharge to offsite / stormwater system			
Site Stabilisation					
Implement site stabilisation works and landscaping progressively to rehabilitate disturbed ground.	Progressively during construction	Stabilise and seal disturbed areas in accordance with the design/engineering/landscape plans and scope of works.	CM/SM/EHS	Weekly/monthly inspection checklist Project planning and design meetings.	Stabilisation of all disturbed work areas. No uncontrolled runoff containing sediment or contaminants.

APPENDIX 1: Environmental Management Diagram – to be implemented in accordance with construction programme sequencing.




Existing stormwater lines redundant/capped off
Existing stormwater inlets protected in accordance with WDC whilst existing road in use
AECOM
www.aecom.com
LEGEND
Project Site Boundary
Type
External Overland Flowpath
External Pipe Network
Internal Overland Flowpath
Internal Pipe Network
Surface Elevation (mAHD)
High : 19
Low : 6
Existing Site Topography and Drainage Flow Paths
INFRASTRUCTURE NSW
WESTERN SYDNEY STADIUM EIS
Figure
3

APPENDIX 3 – DEMOLITION, EXCAVATION & CONSTRUCTION NOISE & VIBRATION MANAGEMENT PLAN

MANAGING DIRECTORS
MATTHEW PALAVIDIS
VICTOR FATTORETTO

DIRECTORS
MATTHEW SHIELDS
BEN WHITE

Western Sydney Stadium

Demolition, Excavation & Construction Noise & Vibration Management Plan

SYDNEY
A: 9 Sarah St Mascot NSW 2020
T: (02) 8339 8000
F: (02) 8338 8399

SYDNEY MELBOURNE BRISBANE CANBERRA
LONDON DUBAI SINGAPORE GREECE

ABN: 11 068 954 343

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1 EXECUTIVE SUMMARY

The Management Plan outlines the development of controls and safeguards that would be applied to all activity on the Western Sydney Stadium site during the demolition, excavation and construction phases. The objective of these controls is to ensure that all work is carried out in a highly controlled and predictable manner that will minimise emissions and protect the amenity of the sensitive receivers surrounding the site including residential, commercial, educational and places of worship.

This review has been conducted in accordance with Stage 1 and Stage 2 consent conditions. Further reviews will be undertaken through the construction period, as required, in response to revised methods and equipment, as well as in response to the monitoring and evaluation of actual impacts. This management plan outlines the procedures that would be adopted by the contractor during the detailed construction planning and execution phases.

2 INTRODUCTION

This document presents the demolition and construction noise and vibration plan that will be used to manage noise and vibration from the demolition of the existing structures, excavation of footings and construction of new structures.

3 PROJECT DESCRIPTION

3.1 GENERAL

The proposal is to construct a new 30,000 seat rectangular stadium on the site of the existing Pirtek Stadium at Parramatta. It is proposed that the existing Pirtek Stadium is completely demolished and the new Western Sydney Stadium be constructed in its place.

3.2 THE SITE AND POTENTIALLY MOST IMPACTED RECEIVERS

The site is bounded to the north by the Parramatta Leagues Club with Residential Aged Care Facilities and residential properties located on O'Connell Street. To the west of the site, across Parramatta River, are residential properties located on Queens Road and Park Avenue. To the south of the site, are residential properties located Lichen Place and Parkside Lane. To the southeast of the site is the Parramatta CBD. St Patricks Cathedral, Our Lady of Mercy College, and small residential properties are located to the east of the site.

These receivers represent the nearest potentially affected locations for demolition, excavation and construction noise emissions from the Western Sydney Stadium site.

The area the proposed works is presented in Figure 1.

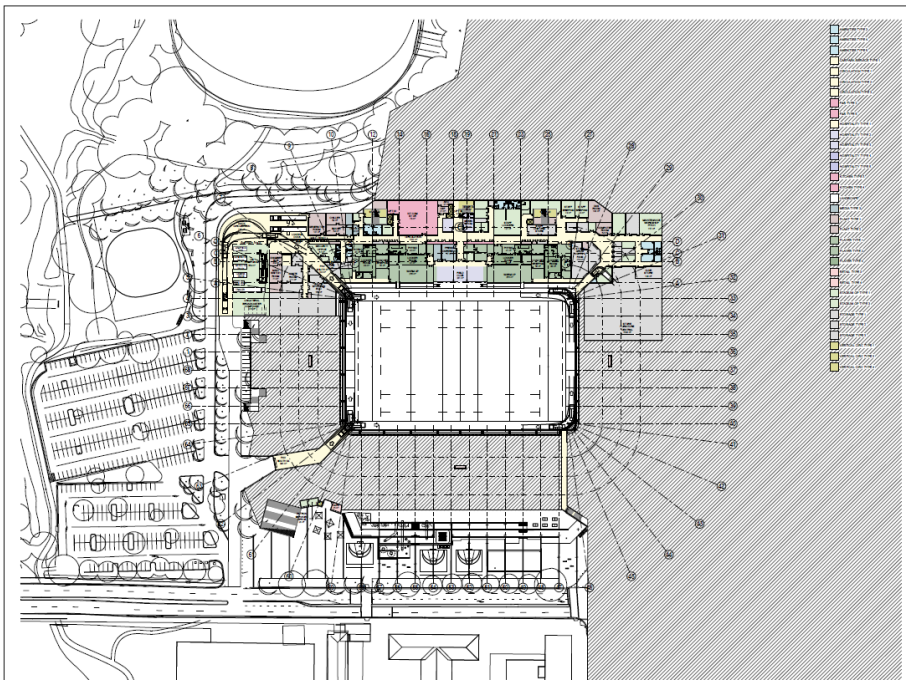


Figure 1 – Western Sydney Stadium Site

3.3 ACTIVITIES AND METHODOLOGY

Following is a description of the activities and methodology proposed to be employed to complete the various project phases.

3.3.1 EAST AND WEST STAND (DEMOLITION)

- Internal soft strip with bob cat and labour;
- Seats and external non-structural elements stripped with excavator;
- Bottom concrete bowl, is removed by an excavator with concrete crusher attachment;
- The roof is removed by an excavator with steel cutting attachment cutting the roof tension columns from behind to induce the roof lowering onto the upper bowl.
- The upper bowl is demolished with an excavator with concrete crusher attachment; and
- South East corner of the stand closest to the pool will have a scaffold screen installed to protect debris from falling into the operational swimming pool.

3.3.2 NORTH AND SOUTH STAND (DEMOLITION)

- Seats and non-structural elements are stripped with an excavator;
- Lower bowl slab on ground is demolished with an excavator with concrete crushing attachment; and
- The lower bowl slab, sitting directly above known areas of GSWA contamination, is demolished last, once the area is ready for establishment of asbestos controls, due to the risk of pulling up GSWA with asbestos from the ground below.

3.3.3 SWIMMING POOL

- The pool is drained and surrounding buildings soft stripped and demolished with an excavator; and
- An excavator will then batter back behind the swimming pool walls, before breaking up the concrete slabs and walls with the excavator with concrete crushing attachments.

3.3.4 BULK EXCAVATION / REMEDIATION STRATEGY

Lendlease has developed a design solution that allows the site to be remediated, whilst eliminating the need to remove GSWA from site. The known areas of contamination exist within the areas labelled below 'Training Pitch, Service Level, Northern Carpark, Northern Mound and the Southern Area of the Existing Pitch. These areas will be redirected as required and capped within the areas marked 'main concourse' as highlighted in orange on the diagram following. The proposed design allows the remediation of the site to take place, with final bulk levels being set prior to major structural works commencing on the project.

This is a time risk mitigation approach, allowing following trades to work in a clean environment, avoiding any industrial concerns during the build phase of the project.

3.3.5 PILING

The fundamental approach to the Piling activity is driven by the remediation strategy, being that the site is handed over to the following trades (the first being piling) 'clean' and do not require any means of asbestos related controls during the process of carrying out the following activity. The management or the avoidance of spoil created through the piling activity has driven Lendlease's methodology. Lendlease's approach to the foundations under the western stand service level could be a combination of Bored, Precast and CFA Piles in this area. Based on the bore log information,

there is no concern with bringing spoil to the surface in this area. The remainder of the 'new' build will be used to contain and cap GSWA from other areas of the site. Creation of spoil in this zone is not preferable considering clean fill has been specifically brought into this area to provide a clean zone for service trades to undertake concourse in-ground service trenching. It is for this reason, precast piles will be adopted in this zone.

3.3.6 WESTERN STADIUM STRUCTURE

The western stand will be constructed traditionally with formwork strutting heights ranging from 4.5m to 6m in height. The western stand is 4 levels in height hence from a materials handling perspective, the structure will effectively be built, then temporary supports (formwork) stripped, prior to services trades commencing. Given the crane demand will be limited solely to structure during this phase, 1 Tower Crane with approximately 70m in jib length will be established on the western stand to facilitate this activity. Supplementary mobile cranes may be adopted across the first two floors, purely to load in formwork materials.

The construction sequence will run across two fronts as the structure commences the 2nd suspended deck. Edge protection will be in the form of a perimeter scaffold, based off the concourse level, and the formed and poured levels as the tiers set-back level by level.

3.3.7 NORTH / SOUTH / EAST STADIUM TIER 2 CONSTRUCTION

The North, South and East Elevations of the Tier 2 Stadium will be constructed on three workfronts. The 'straight runs' will be constructed from the pitch construction zone utilising independent teams of steel, precast and crane crews. The four corners will be split into two workfronts with dedicated rigging crews and crane being allocated to the Southern and Northern Corners. These will be constructed from the outside of the bowl.

3.3.8 ROOF STRUCTURE

The lifting of Pre-Assembled Roof Sections in thirds minimises the size of crane requirements to a maximum capacity of 350t Crawler Crane. This size of crane maintains the ability to operate in the pitch area without increased safety risk. Each section of roof will be approximately 25 tonnes and has been designed with bolted splice connections only (no welding required). The construction methodology has also driven the design to eliminate the need for temporary supports during the installation process. Once two bays have been successfully installed, the infill steel sections (area in yellow) will be fixed into place. Preassembly durations have been built up through multi activity planning at 5 days, with installation being 3 days (1 day per roof section). This allows 2 days of crane redundancy to complete the section highlighted in yellow.

3.3.9 INFRASTRUCTURE WORKS – ELECTRICAL / WATER / COMMUNICATIONS / GAS

The future sites electrical infrastructure requires upgrading, hence High Voltage Mains will need to be run from the site (in the approximate location of O'Connell Street / Victoria Road intersection) to the North Parramatta Zone Substation in the order of 1km in distance.

It is possible conduits exist already, but in the worst case, trenching will need to be carried out to install the upgrade. Based on the final outcome, road closures and footpath closures will be sought and obtained through the City of Parramatta Council. These works will not be critical from a programming perspective based on the indicative date for chamber substation energisation located in the service level (L00) of the Western Stand. The Low Voltage feed across the Parrramatta River will also be cut over post chamber substation energisation. Relevant stakeholder engagement will support this process. Supply of water to the new precinct will come off the existing main located on

the eastern side of O'Connell Street. This work will require approximately 600mm trenching across O'Connell Street, and again will be coordinated through the City of Parramatta Council for relevant permits and approvals. The existing site has located in the NE Corner a series of communications pits and these will utilised as a means of feeding the new precinct and upgrading communications infrastructure.

The connection point for gas infrastructure is located on the western side of O'Connell Street. This work will require footpath and potentially single lane closures of O'Connell Street. Again, this will be coordinated with City of Parramatta Council. The sewer connection point is located in the SE Corner of the site. The connection will be in the order of 6m in depth from the existing levels in the area. The location for connection is within the landscaped area, hence there will be minimal disruption to the new build programme during the course of these works.

3.3.10 CONCOURSE FINISHES

The concourse food, beverage and amenities blocks will be constructed following the installation of the Southern, Eastern and Northern Tier 2 Structural Steel and Precast Elements. This activity of works will naturally follow the general build sequence, starting with the southern concourse working east and towards the north. These works will be coordinated with the roof truss and fabric installation above to ensure adequate separation and exclusion zones are maintained. This component of work will largely feature blockwork requiring working scaffolding around the perimeter, and within for dividing blockwork walls.

3.3.11 INTERNAL FINISHES

Post completion and strip out of the concrete structure to the Western Stand, services rough-in and internal finished works will commence. These works will be facilitated through materials movement by a hoist and as required through cranes via loading platforms to the western elevation of the western stand. Fit-out works will be prioritised based on lead time of joinery and kitchens, with the overarching concept of working from the Northern and Southern ends of each level back towards the location of materials entry points to the floors (Hoist location and Goods Lift location).

3.4 NOISE SOURCE LEVELS

The A-weighted sound power levels for typical equipment/processes anticipated to be used during these works are outlined in Table 1 below.

Table 1 - Sound Power Levels

EQUIPMENT /PROCESS	SOUND POWER LEVEL dB(A)**
Excavator/ Bulldozer	114
Concrete crusher	114
Bobcat	105
Hydraulic Hammer on 20-60t Excavator	125*
Hydraulic Hammer on 5t Excavator	120*
Rock/Masonry Saw on Excavator	110
Piling Rig	115
Rock Anchor Drill Rig	110
Pneumatic Hammer	115*
Electric Hammer	105*
Concrete Pump	110
Concrete Truck	110
Truck	108
Forklifts	100
Angle grinders	113*
Electric Saw	111*
Drilling	94
Hammering	120*
Site Crane	105
Impact drill	105
Remediation Plant	115
Air compressor	86
Concrete Float/Vibrators	105

* - includes 5 dB(A) addition for characteristics of noise source.

** - The noise levels presented in the above table are derived from on-site measurements, Table A1 of Australian Standard 2436-2010 and data held by this office from other similar studies.

3.5 CONSTRUCTION TRAFFIC

Arrival and departure routes have been outlined in a Construction Traffic Management Plan (CTMP) dated 9 January 2017.

Heavy vehicle traffic will include large rigid and articulated trucks. It is anticipated that the largest vehicle to be used will be a large semi-trailer as described in the RMS Guidelines (16.9m by 2.5m).

Following on from the initial stage of demolition, Stage 2 will see the pool complex closed and handed over to the contractor. The main entry/exit point remains at Gate A, and the expected peak load of truck traffic remains as 40 per day. An alternative entry/exit point at Gates C and D will be

used spontaneously when works staging restricts use of Gate A. Construction vehicles will be restricted to left-in – left-out movements at the southern carpark access from O'Connell Street when using Gates C and D. Given the existing number of vehicle and heavy vehicle movements on the existing local road network, and because off-site disposal of excavated material is to be minimised by reusing on the site, no adverse impacts are expected from the expected number of vehicle movements on local streets.

3.6 HOURS OF WORK

The proposed hours of work are:

> *C1. The hours of construction, including the delivery of materials to and from the Subject Site, must be restricted as follows:*
>
> *a) between 7 am and 6 pm, Mondays to Fridays inclusive;*
>
> *b) between 8 am and 1 pm, Saturdays;*
>
> *c) between 1 pm and 5 pm, Saturdays, where construction activities do not emit noise:*
>
> *i) that exceeds 5 dBA above the day period rating background noise level measured at the boundary of the most affected residences;*
> *ii) that exceeds the construction noise 'management levels' set out in Table 3 in the Interim Construction Noise Guideline for sensitive land uses (other than residences);*
> *iii) that exhibits tonal, intermittent, impulsive or low frequency characteristics, as defined in the New South Wales Industrial Noise Policy; and*
>
> *d) no work on Sundays and public holidays.*
>
> *Works may be undertaken outside these hours where:*
>
> *i) the delivery of materials is required outside these hours by the Police or other authorities; or*
> *ii) it is required in an emergency to avoid the loss of life, damage to property and/or to prevent environmental harm; or*
> *iii) variation is approved in advance in writing by the Secretary or her nominee.*

4 CONSTRUCTION NOISE AND VIBRATION GOALS

4.1 NOISE

The applicable guidelines and standards are:

- EPA Interim Construction Noise Guideline. This guideline nominates a methodology for assessing and managing construction noise (and vibration) impacts.

  A quantitative assessment is undertaken involving the prediction of likely noise levels from activities at sensitive receivers, and these noise levels are compared to noise "goals". This process identifies the processes causing emissions that may exceed the goals, so that feasible and reasonable management of those processes can be assessed and implemented to these processes.

- Australian Standard 2436-2010 "Guide to Noise Control on Construction Maintenance and Demolition Sites".

  AS 2436 states that care shall be taken in applying criteria that normally would be used to regulate noise emitted from industrial, commercial and residential premises to construction, particularly for those activities which are transitory and of short duration. The principles of AS2436 are as follows:

  - A reasonable suitable noise criterion is established;
  - All practicable measures be taken on the building site to regulate noise emissions, including the siting of noisy static processes on parts of the site where they can be shielded, selecting less noisy processes, and if required regulating construction hours.
  - The undertaking of noise monitoring where non-compliance occurs to assist in the management and control of noise emission from the building site.

AS 2436 and the EPA largely adopt the same broad objectives, except that the EPA Guideline is more detailed in its recommendations. Based on these the following procedure will be used to assess noise emissions:

- Develop noise management levels for sensitive receivers around the site to broadly achieve EPA guidelines and objectives.

- Assess noise levels produced by construction activities at the sensitive receivers.

- If noise levels exceed EPA "Noise Affected" Management Level (NAML) (rating background noise level + 10 dB(A) for residential receivers) investigate and implement all reasonable and feasible techniques to limit noise emissions.

- If noise levels exceed EPA "Highly Noise Affected" Management Level (HNAML) (75dB(A) for residential receivers) after applying all practical engineering controls to limit noise emissions investigate time management and other techniques to further mitigate noise emissions.

As per the EPA Interim Construction Noise Guideline, the external noise management level for commercial / retail outlets should be 70 dB(A) L_{eq} externally. The noise management level for the Our Lady of Mercy College should be 55dB(A) externally (assuming windows open). It is noted that the most recent building on the Our Lady of Mercy Site is the Ailsa Mackinnon Centre which has a fixed façade and shields the majority of the existing school from the Western Sydney Stadium site.

The external noise goal for the Alisa Mackinnon Centre is 65dB(A) (which assumes a 20dB(A) reduction from a modern façade to achieve 45dB(A) internally within classrooms as per the EPA ICNG)

The noise management level for the Parramatta should be 65dB(A) L_{eq} as it would be deemed an "active recreational area".

4.2 VIBRATION

It is proposed to adopt the following vibration guidelines, namely:

- German Standard DIN 4150-3 (1999-02): *"Structural Vibration – Effects of Vibration on Structures"* – which will be used to assess and limit building damage risk.

- EPA Interim Construction Noise Guideline – which contains guidelines to assess and limit impacts on building occupant's amenity based on the "Assessing Vibration: A Technical Guide".

The criteria and the application of this standard are discussed in separate sections below.

German Standard DIN 4150-3 (1999-02) provides vibration velocity guideline levels for use in evaluating the effects of vibration on structures. The criteria presented in DIN 4150-3 (1999-02) are presented in Table 2.

It is noted that the peak velocity is the absolute value of the maximum of any of the three orthogonal component particle velocities as measured at the foundation, and the maximum levels measured in the x- and y-horizontal directions in the plane of the floor of the uppermost storey.

Table 2 – DIN 4150-3 (1999-02) Safe Limits for Building Vibration

TYPE OF STRUCTURE		PEAK PARTICLE VELOCITY (mms^{-1})			
		At Foundation at a Frequency of			Plane of Floor of Uppermost Storey
		< 10Hz	10Hz to 50Hz	50Hz to 100Hz	All Frequencies
1	Buildings used in commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8

4.2.1 Assessing Amenity - EPA NSW "Assessing Vibration: A Technical Guideline"

EPA NSW "Assessing Vibration: A Technical Guideline" (Feb 2006) is based on the guidelines contained in BS 6472:1992. This guideline provides procedures for assessing tactile vibration and regenerated noise within potentially affected buildings.

The recommendations of this guideline should be adopted to assess and manage vibration from the site. Where vibration exceeds, or is likely to exceed, the recommended levels then an assessment of reasonable and feasible methods for the management of vibration should be undertaken.

Table 3 – EPA Recommended Vibration Criteria

		RMS acceleration (m/s^2)		RMS velocity (mm/s)		Peak velocity (mm/s)	
Place	Time	Preferred	Maximum	Preferred	Maximum	Preferred	Maximum
Continuous Vibration							
Residences	Daytime	0.01	0.02	0.2	0.4	0.28	0.56
Offices, Schools, Places of Worship		0.02	0.04	0.4	0.8	0.56	1.1
Workshops		0.04	0.08	0.8	1.6	1.1	2.2
Impulsive Vibration							
Residences	Daytime	0.3	0.6	6.0	12.0	8.6	17.0
Offices, Schools, Places of Worship		0.64	1.28	13.0	26.0	18.0	36.0
Workshops		0.64	1.28	13.0	26.0	18.0	36.0

5 ASSESSMENT OF POTENTIAL NOISE EMISSIONS

5.1 INTRODUCTION AND INTENT

The purpose of the assessment of noise emissions is to highlight those activities that have the potential to exceed the NAML, so that management of those activities can be assessed in accordance with the ICNG. **The noise levels presented in the assessment are worst case noise levels without any management that may be possible (eg physical controls, time scheduling, selection of alternative process, etc that are proposed as part of this management plan).**

There will be some addition of noise levels as a result of concurrently operating equipment, however because the predicted noise levels are “worst case”, the cumulative effect will not be represented by the addition of the presented noise levels.

It is noted that this is a preliminary construction noise and vibration management plan and a full analysis will be conducted once construction processes become more defined.

5.2 POTENTIALLY AFFECTED RECEIVERS

A survey of nearest potentially affected sensitive commercial and residential receivers has been conducted and the following locations have been identified:

- O’Connell Street Residential Properties,
- Parramatta Leagues Club,
- Queens Road and Park Avenue Residential Properties,
- Lichen Place and Parkside Lane Residential Properties,
- Parramatta CBD Commercial Properties,
- St Patricks Cathedral,
- Our Lady of Mercy College, and
- Parramatta Park

As these are the nearest affected properties, any construction management controls applied for these locations will be applicable for properties located further from the site.

5.3 EXTERNAL NOISE GOALS

Noise generated by construction plant and equipment throughout the duration of the project will be managed in accordance with the management levels, and for the afternoon periods on Saturdays in accordance with the noise criteria at residences.

In order to establish noise goals specific to receivers, background noise levels were measured at all locations representing the most sensitive receiver groups.

Daytime background noise levels have been established during the stage one DA phase and have been presented in the AECOM report with reference 60504744. The daytime background noise level at these locations are summarised in the following table.

Table 4 - Measured Daytime Background Noise Levels and Corresponding Noise Goals/Management Levels

Location	Background Noise Level dB(A) L_{90}		"Noise Affected" Management Level dB(A) L_{eq}	
	7am – 6pm	Sat 1pm – 5pm	7am – 6pm	Sat 1pm – 5pm
O'Connell Street Residential Properties	54	55	64	60*
Queens Road and Park Avenue Residential Properties	40	40	50	45*
Lichen Place and Parkside Lane Residential Properties	43	44	53	49*
Parramatta Leagues Club	N/A (commercial)		70	70*
Parramatta Park	N/A (active recreational area)		65	65*
St Patricks Cathedral	N/A (place of worship)		55	55*
Our Lady of Mercy College	N/A (school)		55	55*
OLMC (Ailsa Mackinnon Centre)	N/A (school)		65	65*

*noise limit rather than NAML.

5.4 PREDICTED NOISE LEVELS

Noise levels have been predicted at various locations representing the range of potentially affected receivers around the site. The worst care noise level has been predicted based on the minimum working distances between the source and receiver that is likely to occur.

The predicted noise levels assume that the activity will be occurring continuously and that there is no screening between the source and the receiver. As plant items will generally be spread around the site, and the plant will not operate continuously for the entire day, the upper limit noise levels indicated in the tables would generally only be reached for limited periods and represent the absolute worst case.

The predictions take into account the nominated sound power levels, corrected for distance losses, screening losses (if applicable), air absorption, and time of continuous use.

5.4.1 O'Connell Street Residential Properties

The following tables present a summary of noise levels which will occur at the residential receivers located to the north on O'Connell Street as a result site construction.

Table 5 – Predicted Noise Levels

EQUIPMENT /PROCESS	PREDICTED NOISE LEVEL dB(A) L_{eq}	RECEIVER NOISE MANAGEMENT LEVEL dB(A) L_{eq}
Bobcat	50	**NAML 64** **Sat 1pm to 5pm Noise Limit – 60** **HNAML 75**
Hydraulic Hammer on 20-60t Excavator	**70**	
Hydraulic Hammer on 5t Excavator	**65**	
Rock/Masonry Saw on Excavator	55	
Piling Rig	60	
Rock Anchor Drill Rig	55	
Pneumatic Hammer	60	
Electric Hammer	50	
Concrete Pump	55	
Concrete Truck	55	
Truck	53	
Forklifts	45	
Angle grinders	58	
Electric Saw	56	
Drilling	39	
Hammering	**65**	
Site Crane	50	
Impact drill	50	
Remediation Plant	60	
Air compressor	31	
Concrete Float/Vibrators	50	

Predictions indicate that in worst case situations hammering with the hydraulic hammer on a 20-60t excavator works will exceed the NAML. Noise emissions from these activities should be minimised by adopting the process indicated in CNVMP to ensure that noise emissions are managed. Noise emissions from excavator-mounted hammering will exceed the Saturday 1pm to 5pm noise limit, and therefore these operations should not occur during this period. Noise emissions from other plant items (excluding hammering) are generally within the NAML at all times.

See Section 5.5 for recommendations.

5.4.2 Queens Road and Park Avenue Residential Properties

The following tables present a summary of noise levels which will occur at the residential receivers located at Queens Road and Park Avenue.

Table 6 - Predicted Noise Levels

EQUIPMENT /PROCESS	PREDICTED NOISE LEVEL dB(A) L_{eq}	RECEIVER NOISE MANAGEMENT LEVEL dB(A) L_{eq}
Bobcat	40	**NAML 50** **Sat 1pm to 5pm Noise Limit - 45** **HNAML 75**
Hydraulic Hammer on 20-60t Excavator	60	
Hydraulic Hammer on 5t Excavator	55	
Rock/Masonry Saw on Excavator	45	
Piling Rig	50	
Rock Anchor Drill Rig	45	
Pneumatic Hammer	50	
Electric Hammer	40	
Concrete Pump	45	
Concrete Truck	45	
Truck	43	
Forklifts	35	
Angle grinders	48	
Electric Saw	46	
Drilling	29	
Hammering	55	
Site Crane	40	
Impact drill	40	
Remediation Plant	50	
Air compressor	21	
Concrete Float/Vibrators	40	

Predictions indicate that in worst case situations hammering with the hydraulic hammer on a 20-60t excavator works will exceed the NAML. Noise emissions from these activities should be minimised by adopting the process indicated in CNVMP to ensure that noise emissions are managed. Noise emissions from excavator-mounted hammering will exceed the Saturday 1pm to 5pm noise limit, and therefore these operations should not occur during this period. Noise emissions from other plant items (excluding hammering) are generally within the NAML at all times.

See Section 5.5 for recommendations.

5.4.3 Lichen Place and Parkside Lane

The following tables present a summary of noise levels which will occur at the residential receivers located at Lichen Place and Parkside Lane.

Table 7 - Predicted Noise Levels

EQUIPMENT /PROCESS	PREDICTED NOISE LEVEL dB(A) L_{eq}	RECEIVER NOISE MANAGEMENT LEVEL dB(A) L_{eq}
Bobcat	34	**NAML 53** **Sat 1pm to 5pm Noise Limit - 49** **HNAML 75**
Hydraulic Hammer on 20-60t Excavator	54	
Hydraulic Hammer on 5t Excavator	49	
Rock/Masonry Saw on Excavator	39	
Piling Rig	44	
Rock Anchor Drill Rig	39	
Pneumatic Hammer	44	
Electric Hammer	34	
Concrete Pump	39	
Concrete Truck	39	
Truck	37	
Forklifts	29	
Angle grinders	42	
Electric Saw	40	
Drilling	23	
Hammering	49	
Site Crane	34	
Impact drill	34	
Remediation Plant	44	
Air compressor	15	
Concrete Float/Vibrators	34	

Predictions indicate that there will be a marginal exceedance (1-3dB) of the noise management level when hydraulic hammering is occurring using the excavator mounted hydraulic hammer on the southernmost boundary. Noise emissions from this activity should be minimised by adopting the process indicated in NVMP to ensure that noise emissions are managed. See Section 5.5 for recommendations.

5.4.4 Parramatta Leagues Club

The following tables present a summary of noise levels which will occur at the Parramatta Leagues Club.

Table 8 – Predicted Noise Levels

EQUIPMENT /PROCESS	PREDICTED NOISE LEVEL dB(A) L_{eq}	RECEIVER NOISE MANAGEMENT LEVEL dB(A) L_{eq}
Bobcat	60	**NAML 70** **HNAML 75**
Hydraulic Hammer on 20-60t Excavator	80	
Hydraulic Hammer on 5t Excavator	**75**	
Rock/Masonry Saw on Excavator	65	
Piling Rig	70	
Rock Anchor Drill Rig	65	
Pneumatic Hammer	70	
Electric Hammer	60	
Concrete Pump	65	
Concrete Truck	65	
Truck	63	
Forklifts	55	
Angle grinders	68	
Electric Saw	66	
Drilling	49	
Hammering	**75**	
Site Crane	60	
Impact drill	60	
Remediation Plant	70	
Air compressor	41	
Concrete Float/Vibrators	60	

Predictions indicate that in worst case situations hammering with the hydraulic hammer on a 20-60t excavator works will exceed the NAML. Noise emissions from these activities should be minimised by adopting the process indicated in CNVMP to ensure that noise emissions are managed. Noise emissions from excavator-mounted hammering will exceed the Saturday 1pm to 5pm noise limit, and therefore these operations should not occur during this period. Noise emissions from other plant items (excluding hammering) are generally within the NAML at all times.

5.4.5 Parramatta Park

The following tables present a summary of noise levels which will occur at the Parramatta Park as a result of construction activity.

Table 9 - Predicted Noise Levels

EQUIPMENT /PROCESS	PREDICTED NOISE LEVEL dB(A) L_{eq}	RECEIVER NOISE MANAGEMENT LEVEL dB(A) L_{eq}
Bobcat	48	**NAML 65** **HNAML 75**
Hydraulic Hammer on 20-60t Excavator	**68**	
Hydraulic Hammer on 5t Excavator	63	
Rock/Masonry Saw on Excavator	53	
Piling Rig	58	
Rock Anchor Drill Rig	53	
Pneumatic Hammer	58	
Electric Hammer	48	
Concrete Pump	53	
Concrete Truck	53	
Truck	51	
Forklifts	43	
Angle grinders	56	
Electric Saw	54	
Drilling	37	
Hammering	63	
Site Crane	48	
Impact drill	48	
Remediation Plant	58	
Air compressor	29	
Concrete Float/Vibrators	48	

Predictions indicate that there will be a marginal exceedance (3dB) of the noise management level when hydraulic hammering is occurring using the excavator mounted hydraulic hammer on the southernmost boundary. Noise emissions from this activity should be minimised by adopting the process indicated in NVMP to ensure that noise emissions are managed. See Section 5.5 for recommendations.

5.4.6 St Patrick's Cathedral

The following tables present a summary of noise levels which will occur at façade of St Patricks Cathedral

Table 10 - Predicted Noise Levels

EQUIPMENT /PROCESS	PREDICTED NOISE LEVEL dB(A) L_{eq}	RECEIVER NOISE MANAGEMENT LEVEL dB(A) L_{eq}
Bobcat	52	NAML 55 HNAML 75
Hydraulic Hammer on 20-60t Excavator	**72**	
Hydraulic Hammer on 5t Excavator	**67**	
Rock/Masonry Saw on Excavator	**57**	
Piling Rig	**62**	
Rock Anchor Drill Rig	**57**	
Pneumatic Hammer	**62**	
Electric Hammer	52	
Concrete Pump	**57**	
Concrete Truck	**57**	
Truck	55	
Forklifts	47	
Angle grinders	**60**	
Electric Saw	**58**	
Drilling	41	
Hammering	**67**	
Site Crane	52	
Impact drill	52	
Remediation Plant	**62**	
Air compressor	33	
Concrete Float/Vibrators	52	

Predictions indicate that there will be exceedances of the NAML. See Section 5.5 for recommendations. All noise emissions are predicted to be in compliance with the HANML at all times.

5.4.7 Ailsa Mackinnon Centre (Our Lady of Mercy College)

The following tables present a summary of noise levels which will occur at the Alisa Mackinnon Centre as a result of construction activity.

Table 11 - Predicted Noise Levels

EQUIPMENT /PROCESS	PREDICTED NOISE LEVEL dB(A) L_{eq}	RECEIVER NOISE MANAGEMENT LEVEL dB(A) L_{eq}
Bobcat	59	NAML 65 HNAML 75
Hydraulic Hammer on 20-60t Excavator	**79**	
Hydraulic Hammer on 5t Excavator	**74**	
Rock/Masonry Saw on Excavator	64	
Piling Rig	**69**	
Rock Anchor Drill Rig	64	
Pneumatic Hammer	**69**	
Electric Hammer	59	
Concrete Pump	64	
Concrete Truck	64	
Truck	62	
Forklifts	54	
Angle grinders	**67**	
Electric Saw	65	
Drilling	48	
Hammering	**74**	
Site Crane	59	
Impact drill	59	
Remediation Plant	69	
Air compressor	40	
Concrete Float/Vibrators	59	

Predictions indicate that there will be exceedances of the NAML. See Section 5.5 for recommendations. Noise emissions from excavator-mounted hammering will exceed the Saturday 1pm to 5pm noise limit, and therefore these operations should not occur during this period. Noise emissions from other plant items (excluding hammering) are generally within the NAML at all times.

5.5 DISCUSSION

Predicted worst case noise levels at various potentially affected receivers are presented above. Residential premises surrounding the site will receive noise levels exceeding the noise management level when these items are close to the site boundaries. These are primarily as a result of excavator mounted hydraulic hammers. Other operations would generally comply with the noise affected management levels at the residential receivers surrounding the site.

Specific treatments to items of plant will be developed in conjunction with Lendlease in an ongoing acoustic review of construction methodology. These reviews will be undertaken regularly and when more detailed planning regarding including possible actual plant locations, actual plant being used, etc are known.

The following potential site specific treatments are being proposed at this stage, however these will be updated as details about construction planning are available:

- During the undertaking of remediation soil treatment works on site, the treatment processes will typically be undertaken within enclosures (where practicable) which will aid in noise reduction.

- As the excavation reaches depths, the surrounding retention systems will act as barriers to noise generation equipment within the excavation.

- Where practicable, positioning major mobile temporary plant such as concrete crushers, concrete pumps, concrete trucks and the like as far as possible from sensitive receivers. The strategic positioning of these items can result in construction noise levels not exceeding the NAML around the site.

- Where possible the maintaining of buffer/separation zones at various stages of the works between the key noise generating activities and receptors such as the Alisa Mackinnon Centre should be adopted.

- Onsite crushing and screening of concrete for reuse on site thereby potentially reducing material transported offsite to landfill and reducing traffic on public roads and associated noise.

The noise and vibration assessment indicates that exceedances of the noise and vibration management goals would primarily be caused by excavator-mounted hydraulic hammer operations. Hence these activities should be managed as follows:

- Hammering should only be undertaken where non-percussive extraction method is not feasible or reasonable.

- Where hammering is undertaken it should be performed according to the following:

    - Using the smallest equipment as is practical provides benefits in terms of the noise/time to complete balance. (In other words a smaller hammer may be quieter but may result in significantly extended period of operation, leading to no overall benefit.)

    - Using hammers with low-noise heads or wrapping the head to minimise radiated noise.

    - Where practical and effective erect, temporary barriers consisting of heavy carpet lined 1.8m mesh barricades placed close to the work face to screen most affected receivers.

      In this regard, site hoardings and sheds where possible should form imperforate barriers and be placed to screen the most affected receivers being the Alisa Mackinnon Centre and the O'Connell Street residences on the north eastern boundary. It is noted that these barriers would be effective only for low level receivers.

    - Where noise emissions exceed the "highly noise affected management level" the location of this equipment around the site should be varied throughout the day such that noise is shared between the receivers.

    - The local community should be informed via a liaison committee (or other method as appropriate) as to the nature, period and times of hammering. Community response may be used to formulate impact minimisation strategies. For example, hammering close to the Alisa Mackinnon Centre may be avoided during the exam periods, or other sensitive periods.

5.6 RECOMMENDATIONS

Demolition and excavation activities are typically the loudest construction activities on site. Given the close proximity to existing developments, strict compliance with noise affected management levels (as set out in section 4) will not be possible at all times.

We note the following:

- While the demolition and excavation period will potentially generate higher noise levels than those recommended in Section 4, the period of the proposed works are relatively modest.

- The equipment to be used (excavator and bored piles) means the noise generated will be quieter than that often generated in excavation/typical piling.

- Substantial restrictions on times of use are likely to be of little benefit:

    - It would prolong the overall construction/excavation/demolition period.

    - Respite periods are likely to be of relatively minimum benefit as this will provide little benefit to residential receivers during the day.

5.6.1.1 Saturday Works

The following items of equipment should not be used on site between 1pm to 5pm on Saturdays:

- Hydraulic hammering; and
- Rock-breaking equipment;

It is noted that noise emissions from the piling rigs, pneumatic hammers, angle grinders and electric saws marginally exceed the Saturday 1pm to 5pm noise limit. However, these processes will be managed so that operations only occur on the southern and western boundary of site so that continued, compliant operation will occur during these periods. Additionally, noise and vibration monitors have been installed on site to record noise and vibration levels to ensure the ongoing compliance of the site.

6 ASSESSMENT OF VIBRATION

As the proposed piling method is bored piling, the only activity that has the potential to produce significant ground vibration would be the excavation of rock using hydraulic hammers. Due to the significant distance separation between the activities and most sensitive structures or occupancies and the nature of the works being undertaken, predictions indicate that the recommended vibration levels will not be exceeded and additional mitigation methods will not be required.

7 GENERAL MITIGATION METHODS THAT WOULD BE APPLIED TO MANAGE NOISE/VIBRATION EMISSIONS

The procedures that will be applied to regulate noise and vibration impacts are summarised in the following flow chart.

7.1 NOISE CONTROL METHODS

The determination of appropriate noise/vibration control measures will be dependent on the particular activities and demolition appliances. This section provides an outline of available methods.

7.1.1 Selection of Alternate Appliance or Process

Where a particular activity or demolition appliance is found to generate noise levels that exceed the criteria, it may be possible to select an alternative approach or appliance. For example; the use of a hydraulic hammer on certain areas of the site may potentially generate high levels of noise. By carrying out this activity by use of pneumatic hammers or pulverising techniques lower levels of noise will result.

It is proposed to use “low noise” hydraulic hammers either proprietary hammers, retro-fitted encased hammers or pulverising techniques.

7.1.2 Acoustic Barriers

Barriers or screens can be an effective means of reducing noise. Barriers can be located either at the source or receiver.

The placement of barriers at the source is generally only effective for static plant (tower cranes). Placing barriers at the source cannot effectively attenuate equipment which is on the move or working in rough or undulating terrain.

Barriers can also be placed between the source and the receiver. The degree of noise reduction provided by barriers is dependent on the amount by which line of sight can be blocked by the barrier. If the receiver is totally shielded from the noise source reductions of up to 15dB(A) can be effected. Where only partial obstruction of line of sight occurs, noise reductions of 5 to 8dB(A) may be achieved. Where the barrier does not obstruct line of sight, generally no noise reduction will occur.

As barriers are used to provide shielding and do not act as an enclosure, the material they are constructed from should have a noise reduction performance which is approximately 10dB(A) greater than the maximum reduction provided by the barrier. In this case the use of a material such as 12mm plywood would be acceptable for the barriers.

It is proposed to utilise portable carpet faced plywood barriers to screen the affected receivers from hammering point wherever practicable.

7.1.3 Silencing Devices

Where construction process or appliances are noisy, the use of silencing devices may be possible. These may take the form of engine shrouding, or special industrial silencers fitted to exhausts.

7.1.4 Material Handling

The installation of rubber matting over material handling areas can reduce the sound of impacts due to material being dropped by up to 20dB(A).

7.1.5 Treatment of Specific Equipment

In certain cases it may be possible to specially treat a piece of equipment to reduce the sound levels emitted. These may take the form of engine shrouding, or special industrial silencers fitted to exhausts.

7.1.6 Establishment of Site Practices

This involves the formulation of work practices to reduce noise generation. This includes locating fixed plant items as far as possible from residents as well as rotating plant and equipment to provide respite to receivers.

Construction vehicles accessing the site should not queue in residential streets and should only use the designated construction vehicle routes. Loading of these vehicles should occur as far as possible from any sensitive receiver.

7.1.7 Introduction of Construction Joints

Construction joints will prevent the direct transmission of vibration from work spaces to sensitive spaces. It is noted that transmission of vibration may still occur via other connections and less direct structural paths.

7.1.8 Strategic Positioning of Processes On-Site

Where practicable, particular processes of activities can be located in particular positions on site to minimise noise to surrounding sensitive receivers.

For example, stationary plant may be positioned where direct line of sight shielding can be achieved using natural barriers, or may maximise the distance to the nearest sensitive receiver. This may also be applicable to the demolition of building structures where the façade closest to residential receivers is left until last to provide barrier screening for the demolition of the other parts of the building.

7.1.9 Combination of Methods

In some cases it may be necessary that two or more control measures be implemented to minimise noise emissions.

7.1.10 Establishment of Direct Communication with Affected Parties

In order for any construction noise management programme to work effectively, continual communication is required between all parties that may be potentially impacted upon, the builder and the regulatory authority. This establishes a dynamic response process that allows for the adjustment of control methods and criteria for the benefit of all parties.

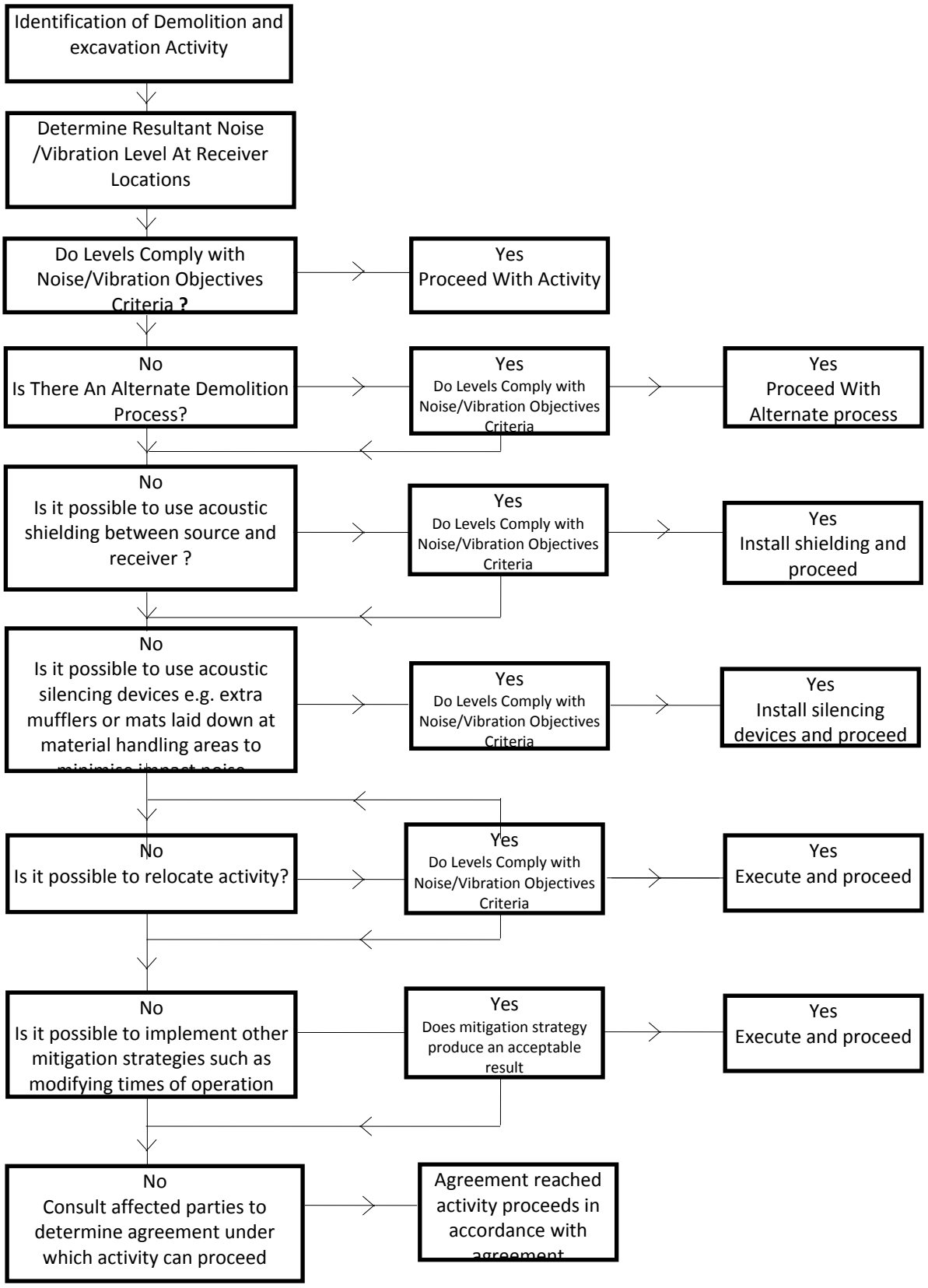
The objectives of the consultation process are to:

- Inform and educate the groups about the project and the noise controls being implemented.
- Increase understanding of all acoustic issues related to the project and the options available.
- Identify group concerns generated by the project, so that they can be addressed.

7.1.11 Management Training

All site managers should be made aware of noise and vibration limits, applicable control measures and methods. They should ensure that all agreed noise and vibration measures are carried out by employees and sub-contractors.

CONTROL OF NOISE FLOW CHART



8 MONITORING

Noise and dust monitoring is currently being undertaken in the following locations to ensure the ongoing compliance of the site:

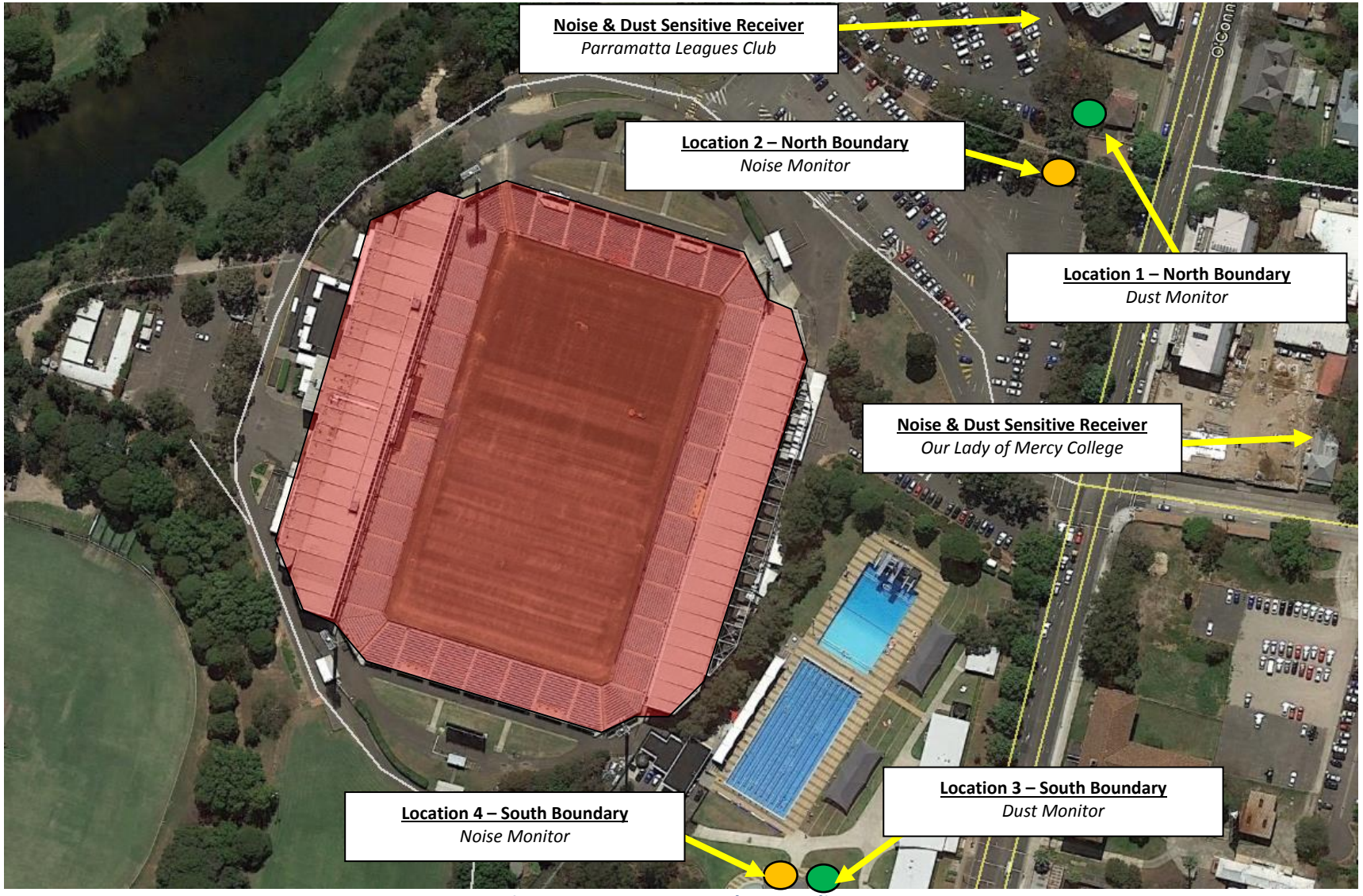


Figure 2.1 – Western Sydney Stadium

9 COMMUNITY INTERACTION AND COMPLAINTS HANDLING

9.1 ESTABLISHMENT OF DIRECT COMMUNICATION WITH AFFECTED PARTIES

In order for any construction noise management programme to work effectively, continuous communication is required between all parties which may be potentially impacted upon, Lendlease and the regulatory authority. This establishes a dynamic response process which allows for the adjustment of control methods and criteria for the benefit of all parties.

The objective in undertaking a consultation processes is to:

- Inform and educate the groups about the project and the noise controls being implemented;
- Increase understanding of all acoustic issues related to the project and options available;
- Identify group concerns generated by the project, so that they can be addressed; and
- Ensure that concerned individuals or groups are aware of and have access to the Complaints Register which will be used to address any construction noise related problems should they arise.

An additional step in this process is to produce a newsletter informing nearby residents of upcoming activities that are likely to generate higher noise/vibration levels.

9.2 DEALING WITH COMPLAINTS

Should ongoing complaints of excessive noise or vibration criteria occur immediate measures shall be undertaken to investigate the complaint, the cause of the exceedances and identify the required changes to work practices. In the case of exceedances of the vibration limits all work potentially producing vibration shall cease until the exceedance is investigated.

The effectiveness of any changes shall be verified before continuing. Documentation and training of site staff shall occur to ensure the practices that produced the exceedances are not repeated.

If a noise complaint is received the complaint should be recorded on a Noise Complaint Form. The complaint form should list:

- The name and address of the complainant (if provided);
- The time and date the complaint was received;
- The nature of the complaint and the time and date the noise was heard;
- The name of the employee who received the complaint;
- Actions taken to investigate the complaint, and a summary of the results of the investigation;
- Required remedial action, if required;
- Validation of the remedial action; and
- Summary of feedback to the complainant.

A permanent register of complaints should be held.

All complaints received should be fully investigated and reported to management. The complainant should also be notified of the results and actions arising from the investigation.

The investigation of a complaint shall involve where applicable;

- noise measurements at the affected receiver;
- an investigation of the activities occurring at the time of the incident;
- inspection of the activity to determine whether any undue noise is being emitted by equipment; and
- Whether work practices were being carried out either within established guidelines or outside these guidelines.

Where an item of plant is found to be emitting excessive noise, the cause is to be rectified as soon as possible. Where work practices within established guidelines are found to result in excessive noise being generated then the guidelines should be modified so as to reduce noise emissions to acceptable levels. Where guidelines are not being followed, the additional training and counselling of employees should be carried out.

Measurement or other methods shall validate the results of any corrective actions arising from a complaint where applicable.

10 CONTINGENCY PLANS

Where non-compliances or noise complaints are raised the following methodology will be implemented.

1. Determine the offending plant/equipment/process
2. Locate the plant/equipment/process further away from the affected receiver(s) if possible.
3. Implement additional acoustic treatment in the form of localised barriers, silencers etc. where practical.
4. Selecting alternative equipment/processes where practical
5. If necessary, setup noise/vibration and dust monitoring devices at locations representing the nearest noise/vibration and dust affected receivers and provide data for each complain time period. Analysis is required to determine suitable mitigation measures.

Complaints associated with noise /vibration and dust generated by site activities shall be recorded on a Complaint Form. The person(s) responsible for complaint handling and contact details for receiving of complaints shall be established on site prior to construction works commencing. A sign shall be displayed at the site indicating the Site Manager to the general public and their contact telephone number.

11 CONCLUSION

A demolition, excavation and construction noise and vibration management plan has been developed that will be used by the contractor to manage impacts from the Western Sydney Stadium construction activities.

The assessment of noise and vibration emissions indicates that:

- For at least part of the site demolition and excavation period, some processes are likely to generate noise levels that will require additional management according to the procedures outlined in the Management Plan. Adoption of the elements of the Noise and Vibration Management Plan will ensure that noise and vibration impacts will be minimised.

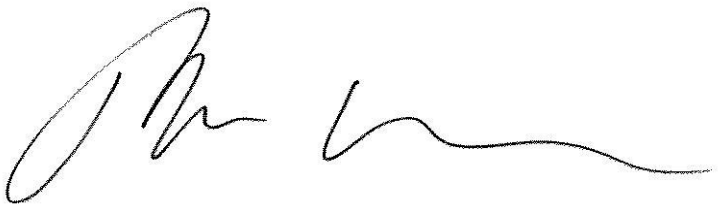
- Recommendations are made to safeguard existing structures immediately adjacent to the site.

The management plan outlines the development of controls and safeguards that would be applied to all activity on the site. The objective of these controls is to ensure that all work is carried out in a highly controlled and predictable manner that will minimise emissions and protect the amenity of the sensitive receivers surrounding the site.

The controls and safeguards implemented as a result of the analysis recommended in the Plan would be reviewed at a number of stages as required to respond to local conditions, revised methods and equipment, as well as in response to the monitoring and evaluation of actual impacts. This management plan outlines the procedures that would be adopted during the planning and execution phases by the contractor.

Further reviews would be undertaken through the demolition and construction period, as required, in response to revised methods and equipment, as well as in response to the monitoring and evaluation of actual impacts.

Prepared by



ACOUSTIC LOGIC CONSULTANCY PTY LIMITED
Tom Aubusson MAAS

APPENDIX 4 – STAGE 2 CONSTRUCTION WASTE MANAGEMENT PLAN

FORESIGHT ENVIRONMENTAL

Western Sydney Stadium

Stage 2 – Construction Waste Management Plan

Prepared by Foresight Environmental
e. info@foresightenvironmental.com
w. www.foresightenvironmental.com

This report is based on information provided by Lend Lease coupled with Foresight Environmental's knowledge of operational waste generation practices and the waste industry in general. To that extent this report relies on the accuracy of the information provided to the consultant. It has been compiled by Foresight Environmental on behalf of Lend Lease.

This report is not a substitute for legal advice on the relevant environmental related legislation, which applies to businesses, contractors or other bodies. Accordingly, Foresight Environmental will not be liable for any loss or damage that may arise out of this project, other than loss or damage caused as a direct result of Foresight Environmental's negligence.

The contents of this report should be treated at all times as confidential, unless permission from Lend Lease is received.

The contents of this document may not be referenced or used in any way by parties other than Lend Lease without the written permission of Foresight Environmental.

Revision No.	Issue date	Author	Reviewed by	Reason/comments
1	17/2/17	Scott Ebsary	Patrick Arnold	Initial draft for review
2	3/3/2017	Scott Ebsary	Patrick Arnold	Update with current photos and standard text
3	21/4/2017	Scott Ebsary		Updated to address NSW EPA feedback
4	1/9/2017	Patrick Arnold	Scott Ebsary	Updated to address draft DA conditions

Table of Contents

1. Introduction

This report supports a State Significant Development (SSD) Development Application (DA) submitted to the Minister for Planning pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The Application (referred to as SSDA16_8175) follows the approval of a Stage 1 SSD DA (SSDA16_7534) in December 2016. The Stage 1 SSDA sets out a Concept Proposal for the redevelopment of the Western Sydney Stadium and future supporting uses. In summary, the Stage 1 Consent includes the following components:

- Concept Proposal for the Western Sydney Stadium, including building envelopes, a new 30,000 seat stadium, 500 surface car parking spaces, access, ancillary infrastructure and landscaping; and
- Detailed works for staged demolition and removal of the existing stadium and associated infrastructure and the Parramatta Swimming Centre

This document details the way in which the proposed Western Sydney Stadium (WSS) development will manage the waste and recycling generated from the Stage 2 construction activities of the stadium in line with industry best practice and in accordance with the relevant development controls.

2. Overview of Proposed Development

The proposal relates to a detailed ('Stage 2') DA for the detailed design and construction of the stadium. This SSD DA seeks approval for the following components of the development:

- Detailed design of the stadium, public domain and car parking spaces;
- Construction and use of the 30,000 seat stadium including:
    - General Admission Facilities including bars, food and drink stalls, amenities and viewing areas;
    - A function centre and kitchen facility;
    - Associated Stadium facilities including player and coaching facilities, media and press conference rooms, security and stadium managers facilities;
    - Waste storage and loading dock;
- Construction and embellishment of the public domain including;
    - Outdoor sporting and recreation facilities;
    - Public plazas and entertainment areas;
    - General landscaping works;
- Provision of up to 500 car parking spaces with vehicle access to the development from O'Connell Street and internal roads for vehicular circulation;
- Provision of signage zones, lighting and other ancillary stadium elements;
- Pedestrian access and footpath upgrades along O'Connell Street; and
- Extension and augmentation of physical infrastructure / utilities as required.

3. Background

Stadia Strategy

The stadium is the first project to be delivered under the NSW Government's $1.6 billion Stadia Strategy, the largest investment in sporting infrastructure since the 2000 Olympics. The new Western Sydney Stadium will:

- Be able to cater for bigger crowds, provide an improved game day experience and bring major benefits to the Western Sydney economy
- Generate approximately 1,200 jobs during construction and between 600 and 900 jobs once operational for sporting event days and major events
- Cater for a range of sporting and community uses within the precinct.

Concept Proposal (SSDA 16_7534)

Infrastructure NSW (iNSW) on behalf of Venues NSW submitted a State Significant Development Application (SSDA) for the Stage 1 concept proposal and demolition of the existing stadium in July 2016. Consent for the Stage 1 SSDA was granted by the Minister for Planning on 7 December 2016 and includes:

- a maximum total GFA of approximately 60,000 m^2 (excluding the playing pitch) for the stadium development, including:
    - additional seating for approximately 10,000 more spectators in a seating bowl with 30,000 seats, including 27,000 general admission seats and 3,000 corporate seats;
    - playing pitch;
    - five levels of premium box/terrace, function/lounge offerings and a number of suite offerings;
    - flood lighting, stadium video screens and other ancillary fittings;
    - additional facilities for team, media, administration and amenity, including:
        - police facility and security office;
        - players changing rooms;
        - ticket gates and ticket boxes;
        - media interview rooms;
        - green room;
        - production suite and joint operation control room;
        - event briefing rooms;
        - hirers office and patron services offices;
        - first aid facilities;
        - loading docks for deliveries; and
        - food, beverage and retail facilities.
    - a maximum GFA of approximately 20,000 m^2 for future development of ancillary uses within the northern corner of the Site;
    - transport, parking and accessibility;
    - public domain elements; and
    - landscaping elements throughout the Site.

Design Excellence and Project Tender Phase

Since receiving the development consent for Stage 1, Venues NSW have appointed Lendlease as the contractor for the Stage 2 detailed design and the demolition and construction of the stadium. The tender process also served as a competitive design process in accordance with the Director General's Design Excellence Guidelines and Clause 7.10 of the Parramatta Local Environmental Plan 2011.

Site Establishment works Modification

A modification application (MOD 1) was made to the Stage 1 DA pursuant to Section 96(2) of the EP&A Act in February 2017. The modification seeks to expand the approved range of site preparation works to include piling and remediation/earthworks, as outlined below:

Remediation works comprising the excavation and storage of contaminated materials and bulk excavation. Contaminated materials will be stored on site and capped below ground in accordance with the recommendations outlined in the Remedial Action Plan.

Piling works which will comprise the driving and drilling of concrete piles to establish foundations for the construction of a stadium located within the Stage 1 building envelope

The modification application is currently under assessment by the Department of Planning and Environment (DPE) and is awaiting determination.

4. Site Description

The Western Sydney Stadium is located at 11-13 O'Connell Street, within the Parramatta Park on the north-eastern edge of the Parramatta CBD. It is bound to the south and west by the Parramatta Park and the Parramatta River, the Parramatta Leagues Club to the north and O'Connell Street to the east. The Site is located within the City of Parramatta local government area (LGA). A locational context plan is provided at Figure 1 below.

Figure 1 – Site context Plan

The site has an area of approximately 95,000m^2 and owned by Venues NSW and The Parramatta Park Trust. The site is irregular in shape and is illustrated in Figure 2 below.

Figure 2 – Site Aerial Plan

5. Waste Generation Estimate

The aim of this Plan is to ensure that all waste resulting from construction and demolition activities is managed in an effective and environmentally aware manner. Specifically,

- To maximize the reuse and recycling of demolition and construction materials
- To reduce the volume of materials going to landfill
- To maximise waste material avoidance and reuse on site
- To ensure that where practicable, an efficient recycling procedure is applied to waste materials
- To ensure efficient storage and collection of waste

5.1 Construction

The quantity of waste materials to be generated onsite are estimates based on the information provided to Foresight Environmental and therefore the systems that will be put in place need to incorporate flexibility to allow for variation in the total quantities generated. Active site management during the construction phase will ensure all waste/recyclable materials are disposed of appropriately and that all waste receptacles are of sufficient capacity to manage onsite activities.

Table 1 below details the estimated composition by area or volume of construction waste to be generated.

Table 1 - Composition of construction waste by volume

Material	M^3
Fill/excavation	237,185
Concrete	1,557
Metal	1,017
Plasterboard	267
Tiling	191
Paint	143
Glazing	141
Carpet	115
General residual	50
Recycling residual	50
Total	240,716

6. Waste Management Strategy

The following waste hierarchy will be used as a guiding principle:

Avoid and Reduce

Minimise the production of waste materials in the construction process by

- Assessing and taking into consideration the resultant waste from different design and construction options
- Purchasing materials that will result in less waste, which have minimal packaging, are pre-cut or fabricated.
- Not over ordering products and materials

Reuse

Ensure that where ever possible, materials are reused either on site or offsite

- Identify all waste products that can be reused
- Put systems in place to separate and store reusable items
- Identify the potential applications for reuse both onsite and offsite and facilitate reuse

Recycling

Identify all recyclable waste products to be produced on site

- Provide systems for separating and stockpiling of recyclables
- Provide clear signage to ensure recyclable materials are separated

- Process the material for recycling either onsite or offsite

Note: In some cases it may be more economical to send the unsorted waste to specialised waste contractors who will separate and recycle materials at an offsite location.

Disposal

Waste products which cannot be reused or recycled will be removed and disposed of. The following will need to be considered:

- Ensure the chosen waste disposal contractor complies with OEH requirements
- Implement regular collection of bins

6.1 Hazardous Wastes

It is not anticipated that any hazardous wastes will be present, however During any demolition and material recovery activities, one should beware of potentially hazardous materials. Hazardous construction materials should be disposed of in accordance with EPA guidelines in order to protect the environment.

This document recognises the importance of waste management and draws from the following legislations:

- Protection of the Environment Operations Act 1997
- Protection of the Environment Operations (Illegal Waste Disposal) Act 2013
- Protection of the Environment Operations (Waste) Regulation 2014
- Waste Avoidance and Resource Recovery Act 2001
- NSW Waste Minimisation and Management Regulation 1996

Within the above legislations hazardous waste includes dangerous goods, poison, liquids and other waste containing hazardous components. Hazardous wastes in a C&D environment may include:

- Fluorescent tubes and HID lamps (in commercial quantities)
- Industrial and laboratory chemicals
- Mercury, NiCad and Lithium Hydride batteries
- PCBs
- Asbestos
- Pesticides and herbicides
- Contaminated soil

During any demolition and material recovery activities, one should beware of potentially hazardous materials. Hazardous construction materials should be disposed of in accordance with EPA guidelines in order to protect the environment.
The EPA can require the waste generator, transporter, and receiver to clean up and pay for waste to be taken to a lawful place. It is recognised that the penalties related illegal waste management practices include:

- If waste is illegally dumped and harms the environment, the maximum penalty is $5 million or seven years jail.
- The maximum penalty for unknowingly supplying false or misleading information about waste is $250,000 for a corporation or $120,000 for an individual.
- The maximum penalty for knowingly supplying false or misleading information is $500,000 for a corporation or for an individual $240,000 or 18 months imprisonment, or both.

In order to avoid risk to the environment and any breach of legislation this development endeavours to uphold the following practices:

- Early identification and reporting of hazardous waste
- Reporting of any suspicious activities of involved stakeholders (waste generator, transporter or receiver) to including handling waste unlawfully or illegally dumping waste through the Environment Line on 131 555.
- Ensure waste is transported to a place that can lawfully accept it under Section 143 of the Protection of the Environment Operations Act 1997.
- Take reasonable precautions and exercised due diligence to prevent commission of the offence.
- Keep accurate written records such as:
    - who transported the waste (company name, ABN, vehicle registration and driver details, date and time of transport, description of waste)
    - copies of waste dockets/receipts from the waste facility (date and time of delivery, name and address of the facility, its ABN, contact person).

7. Waste Management Systems

7.1 Onsite and Offsite Systems

Table 2 details the expected waste materials and management systems for the construction phase of the project.

Table 2 – Waste management systems (construction)

Material	Estimated volume (m^2 or m^3 where indicated)	Onsite (re-use or recycle)	Offsite (recycling contractor)	Disposal (contractor and landfill site)
Fill	237,185m^3	Suitable soil to be reused where appropriate for onsite landscaping/fill	Separated where possible and taken to appropriate C&D facility for processing/reuse	
Concrete	1,557m^3		Separated where possible and taken to concrete recycling facility – deposited onsite directly into skips or trucks to be removed from site.	
Metal	1,017m^3		Stockpiled and collected as required by specialty metal recycler or taken to appropriate C&D facility for separation and recycling	
Plasterboard	267m^3		Stockpiled onsite and collected by plasterboard supplier/recycler or taken to appropriate recycling facility	
Tiling	191m^3		Stockpiled and collected as required by specialty metal recycling contractor for recycling/resale	
Paint/	143L		Clean tins recycled by metal recycler where possible	Residue/wash-off hardened and disposed appropriately
Glazing	141m^3		Stockpiled and collected as required by specialty glass recycler or taken to appropriate C&D facility for separation and recycling	
Carpet	115m^3		Stockpiled and collected as required by carpet supplier for recycling contractor	Unsuitable material will be taken to landfill for disposal
Residual general recyclables	50m^3		Collected by contractor and disposed at appropriate recycling facility	
Residual general waste	50m^3			Collected by contractor and

				disposed at appropriate landfill

Note: The quantities of construction and demolition waste materials have been estimated using industry guides for predicting waste quantities[1]. The figures in Table 3 and 4 above are estimates and are used as a guide for designing the waste management systems on site. These figures will be adjusted according to the final building material selection and quantities. The waste management systems will be adjusted as necessary.

It should be noted that there are multiple offsite recycling/disposal facilities available for the appropriate processing of the materials detailed above and the facility choice will depend largely on the waste contractor/supplier engaged.

7.2 Contracts and Purchasing

Each subcontractor working on the site will be required to adhere to this Waste Management Plan.
The Head Contractor will ensure each subcontractor:

- Takes practical measures to prevent waste being generated from their work
- Implements procedures to ensure waste resulting from their work will be actively managed and where possible recycled, as part of the overall site recycling strategy or separately as appropriate
- Ensures that the right quantities of materials are ordered, minimally packaged and where practical pre fabricated. Any oversupplied materials are returned to the supplier
- Implements source separation of off cuts to facilitate reuse, resale or recycling.

The Site Manager will be responsible for:

- Ensuring there is a secure location for on-site storage of materials to be reused on site, and for separated materials for recycling off site.
- Ensuring all skips/bins/stockpiles are clearly labeled identifying which material is suitable for each receptacle
- Engaging appropriate waste and recycling contractors to remove waste and recycling materials from the site
- Co-coordinating between subcontractors, to maximise on site reuse of materials
- Monitoring of bins on a regular basis by site supervisors to detect any contamination or leakage
- Ensuring the site has clear signs directing staff to the appropriate location for recycling and stockpiling station/s. And that each bin/skip/stockpile is clearly sign posted
- Providing training to all site employees and subcontractors in regards to the WMP as detailed in section 5.3 below.
- Should a subcontractor cause a bin to be significantly contaminated, the Site Manager will be advised by a non-conformance report procedure. The offending subcontractor will then be required to take corrective action, at their own cost. The non-conformance process would be managed by the Head Contractors' Quality Management Systems
- Retaining demolition and construction waste dockets to confirm and verify which facility received the material for recycling or disposal.

[1] McGregor Environmental Services (2000) Predicting C&D waste quantities in the Inner Sydney Waste Board Waste Planning Guide for Development Applications-Planning for Less Waste (1998) NSW Waste Boards

7.3 Training and Education

All site employees and sub contractors will be required to attend a site specific induction that will outline the components of the WMP and explain the site specific practicalities of the waste reduction and recycling strategies outlined in the WMP.

All employees are to have a clear understanding of which products are being reused/recycled on site and where they are stockpiled. They are also to be made aware of waste reduction efforts in regards to packaging.

The site manager will post educational signage in relation the recycling activities on site in breakout areas, lunch rooms etc.

7.4 Site waste control and management

To ensure adequate site environmental standards are maintained, is recommended that the following controls be implemented and enforced by the proponent:

1. All waste generated during the project is assessed, classified and managed in accordance with the "Waste Classification Guidelines Part 1: Classifying Waste" (DECCW, December 2009)
2. The body of any vehicle or trailer, used to transport waste or excavation spoil from the premises, is covered before leaving the premises to prevent any spill or escape of any dust, waste or spoil from the vehicle or trailer
3. Mud, splatter, dust and other material likely to fall from or be cast off the wheels, underside or body of any vehicle, trailer or motorized plant leaving the site, is removed before the vehicle, trailer or motorized plant leaves the premises.

7.5 Waste Storage and Collection

A designated waste storage area will be allocated for the collection of all waste and recyclables. The waste storage area shall have appropriate signage to clearly identify the area to construction workers and to prevent unauthorised access to the area.

Stockpile size should be minimised by regular removal of waste from site and construction staging plans must allow for the waste storage area to move within the site as the development progresses.

The construction waste storage area does not have to be enclosed. However, containers should be covered where possible to prevent odour, wind impacts, vermin and vandalism or theft. Containers will be stored on a hardstand area with appropriate sediment control measures implemented to mitigate run-off into stormwater. Any spillages in the waste storage area should be treated immediately using a spill kit. Contaminated or hazardous wastes should be stored in a secure area with appropriate signage.

7.6 Waste Truck Routes

refer to page 29 of CEMP for details

A detailed Construction Traffic and Pedestrian Management Plan has been prepared and outlines the primary truck routes in and out of the site. Notification has been provided to the RMS Traffic management centre of the proposed truck routes for transporting waste. The primary routes is outlined in the figure below and as

follows: trucks will exit the site and travel east on Victoria Rd, turn right into Macarthur St, turn left into Hassall St, cross James Ruse Drive and enter Grand Drive. The primary destination of the waste is KLF Holdings Pty Ltd, 6 Grand Avenue Camellia NSW 2142.

Figure 3 – Waste truck route out of site