

Please note that these values represent a 'worst case' scenario where the source is at the closest possible distance to the receiver and not incorporating any mitigation measures, except where stated. It is likely that noise levels are lower than these 'worst case' predictions.

Table 9. Predicted Construction External Noise Levels to Noise Sensitive Receivers

	L _{eq} Sound Pressure Level at Receivers			
Activity	Wentworth Primary School: Playground (Distance: ~30m)	Wentworth Primary School: Classrooms (Distance: ~40m)	17 Wentworth Place Apartments (Distance: ~40m)	
Piling (Piling rig and tracked excavator running simultaneously)	< 75 dBA	< 75 dBA (Avg. 67 dBA @ 80m)	< 75 dBA (Avg. 70 dBA @ 70m)	
Excavation (Tracked excavator and dump truck running simultaneously)	77 dBA	< 77 dBA (Avg. 71 dBA @ 80m)	< 77 dBA (Avg. 72 dBA @ 70m)	
Concrete Pouring (4 trucks running simultaneously)	76 dBA	< 76 dBA (Avg. 67 dBA @ 80m)	< 76 dBA (Avg. 68 dBA @ 70m)	
Material Transport (Truck pass-by)	86 dBA (Pass-by Max)	< 77 dBA (Pass-by Max) (Avg. 71 dBA @ 80m)	< 77 dBA (Pass-by Max) (Avg. 72 dBA @ 75m)	
Façade / Fitout works (Noise primarily from mobile crane as fitout works enclosed by façade)	64 dBA	61 dBA (Avg. 56 dBA @ 70m)	61 dBA (Avg. 55 dBA @ 80m)	

There is a 3~4-metre-tall dirt bund along the site boundary, between the area of works and the playground, which is expected to act as a natural noise barrier (should it remain intact). It is predicted that this will reduce construction noise levels by between **4-9 dB** where there is no line-of-sight between the receivers and machinery (i.e. effectiveness will depend on the location of the receiver and source in relation to the dirt bund). However, it is understood that the bund will be removed during the early stages of works and has not been accounted for in this assessment.

It is noted that due to the receiver height of the residential tower at 17 Wentworth Place, noise barriers will be ineffective at this location unless direct line-of-sight from noisy activities is removed.



5 NOISE MITIGATION MEASURES

5.1 Site Specific Noise Mitigation

From the predicted noise levels shown in Section 4.4 above, it is recommended that noise mitigation measures are put in place to minimize the effects of construction noise to neighbouring properties.

5.1.1 Piling

As the dirt bund will not be intact during piling activities, we recommend localized barriers/hoarding (where practical) to minimise noise emissions to the Wentworth Point Primary School playground and classrooms. A minimum barrier height of **2m** is recommended to replace the bund during piling.

5.1.2 Excavation

We recommend localized barriers/hoarding to minimise noise emissions to Wentworth Point Primary School when the dirt bund is being excavated. A minimum barrier height of **2m** is recommended to replace the bund during excavation. It is understood that these works will entail the removal of the dirt bund.

5.1.3 Concrete Pouring

For this assessment, a worst-case scenario of 4 concrete trucks running simultaneously has been allowed for. To minimise noise emissions, it is recommended that the number of concrete trucks and pumps running simultaneously is minimised where possible. It is understood that these works will be completed after removal of the dirt bund.

5.1.4 Material Transport

Due to the ability of trucks to move around site, a noise barrier/bund is not expected to provide much noise mitigation when equipment is located far away from the barrier. It is recommended that vehicle acceleration and engine idling is minimised as far as practical along the material transport path.

Should barriers near the noise sources be impractical, an alternative option would be to erect noise barriers near the ground level receivers (such as the nearest classrooms). This mitigation method is recommended upon confirmation of noise levels obtained by site measurement.

5.1.5 Façade / Fitout Works

Where internal works are to occur, it is recommended that noisy work (such as concrete cutting and grinding) is to be done on floors where the building envelope is enclosed to minimise noise emissions. Solid/plywood hoarding is recommended for noisy works in areas not enclosed by the building façade.



5.1.6 Predicted Construction Noise Levels after Noise Mitigation Methods

With the above noise mitigation methods in place, Table 10 predicts the expected noise levels at the noise sensitive receivers.

Table 10. Predicted Construction Noise Levels to Noise Sensitive Receivers with Noise Mitigation

	L _{eq} Sound Pressure Level at Receivers				
Activity	Wentworth Primary School: Playground (Distance: ~30m)	Wentworth Primary School: Classrooms (Distance: ~40m)	17 Wentworth Place Apartments (Distance: ~40m)		
Piling (Piling rig and tracked excavator running simultaneously)	69 dBA	< 69 dBA (Avg. 65 dBA* @ 80m)	< 75 dBA (Avg. 70 dBA @ 70m)		
Excavation (Tracked excavator and dump truck running simultaneously)	73 dBA*	< 74dBA* (Avg. 69 dBA @ 80m)	< 74dBA* (Avg. 70 dBA @ 70m)		
Concrete Pouring (2 trucks running simultaneously)	73 dBA	< 73 dBA (Avg. 67 dBA @ 80m)	< 73 dBA (Avg. 68 dBA @ 70m)		
Material Transport (Truck pass-by)	86 dBA (Pass-by Max)	< 77 dBA (Pass-by Max) (Avg. 71 dBA @ 80m)	< 77 dBA (Pass-by Max) (Avg. 72 dBA @ 75m)		
Façade / Fitout works (Noise primarily from mobile crane as fitout works enclosed by façade)	64 dBA	61 dBA (Avg. 56 dBA @ 70m)	61 dBA (Avg. 55 dBA @ 80m)		

^{*}Predicted noise level should a noise barrier be used effectively where practical, either at the source or receiver locations.

Due to the ability of the dump truck and tracked excavator to move around site, a noise barrier/bund is not expected to provide much noise mitigation when equipment is located far away from the barrier. We also note that these noise levels will also reduce as the distance between the equipment and receiver increases.

5.2 General Noise Mitigation Measures

In addition to measures for mitigating noise exceedances outlined in Section 5.1, general guidelines should be followed to minimise overall noise.



Measures will be put in place where necessary to mitigate construction noise to affected neighbouring properties. The mitigation measures which are likely to be put in place include:

- Selection of quiet / muffled equipment
- Trucks and other vehicles should use non-tonal reversing alarms
- Vehicle warning devices such as horns will not be used as signalling devices
- Dropping equipment/materials from a height or into trucks is to be avoided

Affected neighbours should also be given the contact details of the nominated person who will be responsible for the implementation of the Construction Noise Management Plan. The nominated person/s is listed in Section 5.2.4.

The complaints procedure set out in Section 9 shall be adhered to and in line with the Community Communication Strategy.

5.2.1 Time Management of Activities

Limiting the amount of time each equipment is able run will further reduce noise emissions. For example, halving the running time, such as allowing the piling rig to run 7 minutes for every 15 minutes will provide a further **3 dB** reduction.

5.2.2 General Site Activity

When noisy equipment (for example but not limited to angle grinders, jack hammers, hammering) is to be used on site near the occupied buildings, this may potentially breach noise limits. If site conditions are proved to be more difficult and construction becomes noisier as a result, a further method of mitigating noise effects is to reduce the percentage of running time for key equipment.

5.2.3 Material Handling

Care should be taken when loading and unloading materials such that no excessive noise is produced.

5.2.4 Methods of Noise Management

This section sets out written procedures that will, if properly implemented by the identified responsible persons, ensure that noise emissions are controlled to appropriate levels.

1. The relevant authority/Roberts Co. shall be provided with the name(s) and contact telephone number(s) of the Site Manager or other identified person(s) who will be responsible for the implementation of the Construction Noise Management Plan (the nominated Roberts Co. personnel to be confirmed at a later date).

Name of person responsible for implementing CNVMP	ТВС	
Cellular phone number:	0447 237 186	
Email address:	adam.greentree@au.roberts.co	
Name of person responsible for implementing CNMP	Adam Greentree	

2. The implementation of the Noise Management Plan shall be included in the written job description of the identified responsible person(s). At least one responsible person shall be present on site at all times.



- 3. The identified responsible person(s) shall ensure that:
- Noise from the construction works is measured and assessed in accordance with:
 - NSW EPA Interim Construction Noise Guideline
 - All identified noise measures are in place and effective at all times
 - Any noise complaints are responded to in a prompt and reasonable manner, following the methodology set out below.
- 4. Measured or available reference noise levels for additional equipment not covered in this report shall be used to predict the levels of noise that will be generated at identified sensitive receivers.
- 5. Where the predicted noise levels exceed the recommendations of NZS 6803:1999, options for safe, practicable and cost-effective additional noise control measures shall be identified by a suitably qualified person.
- 6. In the event that any complaint is received due to the construction noise, this shall be monitored by a suitable trained person under the direction of an identified responsible. Additional measurements shall be taken to reduce the noise impact. Please refer to Section 6 for details.
- 7. Suitable noise monitoring locations shall be identified that are representative of the most equipment surrounding residential premises. The location of monitoring will be determined on a case-by-case basis, taking into consideration the receiver, location of activity deemed noisy and the recommendations contained within this Construction Noise and Vibration Sub Plan.
- 8. In the event that the measured noise levels are found to exceed the construction noise limits the Site Manager or other responsible person shall be advised. Options for further noise control measures shall be investigated and implemented where and as soon as possible. The relevant authority/Schools Infrastructure NSW will be informed of the exceedances and any noise control measures and recommendations provided by a suitably qualified person shall be implemented.
- 9. The Site Manager shall require all contractors to maintain road-going vehicles in a roadworthy condition at all times and ensure that all relevant noise control equipment is fitted and operating effectively.
- 10. A complaint record log shall be kept at the site office and in the event of a complaint being received relating to noise, the identified responsible person should be the site Foreman, and in line with the Community Communication Strategy.
- 11. If activities are identified that are considered to be generating excessive noise, the identified person shall take appropriate all practicable action to reduce noise to a reasonable level and contact the complainant and advise them of the outcome of the investigation and make a written note of the event and the outcome in accordance with the Community Communication Strategy and log the complaint on the complaint register.
- 12. In situations where engineering controls are rendered ineffective or not feasible, Administrative Noise Control Measure will be utilised. These may include:
 - Job rotation
 - Job redesign, and rosters
 - Redesign of plant and methodology of work
 - Sound barriers/materials
- 13. It is advisable to carry on a training and education procedures for all construction personnel on good noise management practices.



5.3 Noise Barrier Construction

5.3.1 Required Barrier Height 2m or Less

Where required barrier height is 2m or less, noise barriers should be of minimum 2.5kg/m² surface mass, 25mm thickness, and height of 2m. Echo Barriers are a viable option for installation should the barrier height required (from mitigations) be 2m or lower. These should be located between the activity and nearest receiver as depicted below. The activity should occur at a distance 5m or less from the noise barrier in order to maximise effectiveness of the barriers.

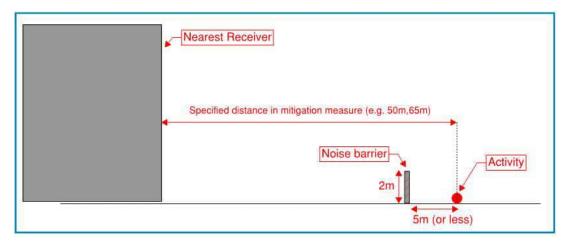


Figure 4. General Noise Barrier Installation

5.3.2 Required Barrier Height Greater than 2m

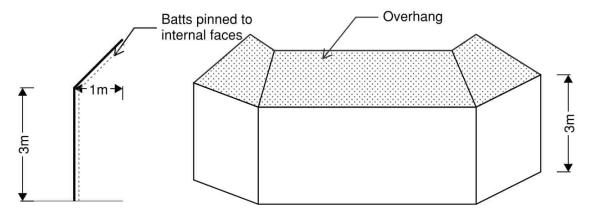
Where required noise barrier heights exceed readily available products, a larger custom screen will need to be erected. This should be 17mm plywood or 9mm minimum thickness cement sheet (minimum 12 Kg/m2), with no gaps between the panels (or approved equivalent). There should also be absorption in the form of 75mm thick, minimum 32 kg/m², fibreglass or polyester batts pinned to the internal faces of the screen. The absorption will prevent 'bouncing' of the noise and prevent it reflecting behind the equipment.

The screen should also have an overhang placed at no more than 1m from the noisiest part of the equipment.

The overhang is a way of increasing the effective height of the barrier, particularly for areas where a nearby receiver located at a higher floor may overlook the plant. The diagram below should illustrate the effect we are looking to achieve. The noise source should be located such that the overhang breaks direct line-of-sight between the noise source and nearby receiver.



Figure 5. Depiction of Localised Noise Barrier



Alternatively, a full enclosure can be considered to absorb noise in all directions.



6 CONSTRUCTION NOISE MONITORING

Monitoring of noise is an important part of managing noise emissions from construction sites. We recommend noise monitoring to be undertaken in the event of any complaints received (the results of which shall be submitted to Schools Infrastructure NSW/Roberts Co within one week of receiving the complaint) and aligning with the Community Communication Strategy.

6.1 Location

Noise monitoring may occur at the facade of any neighbouring building, such as outside the classrooms of Wentworth Point Primary School or at 17 Wentworth Place apartments. Should noise monitoring outside classrooms be impractical, the noise logger may be placed within the site boundary as close as possible to the classrooms.

Noise trigger levels will then be determined by the location of the logger and be set subsequent to a site assessment during deployment.

6.2 Extent of Monitoring

We would suggest that the best means of conducting measurements is to utilise qualified acoustic engineers with Type 1/Class 1 hand-held sound level meter. When reporting results, the engineer should exclude traffic noise from construction noise to establish the actual level of noise being produced by the site. Furthermore, they can identify what types of equipment are creating the most noise and if needed, advise the Site Manager on additional mitigation measures and whether the complaint management procedures are required (Refer to Section 9).

In the event that complaints are received, the degree and duration of monitoring should reflect the extent of complaints and compliance. Permanent logging stations are available but are an expensive and often ineffective method of policing compliance. While they have the ability to continuously record noise levels 24-7, and even issue alerts if certain levels are exceeded, they are not able to easily identify whether the noise source in question was due to a construction activity or some other localised event unrelated to construction. This makes the data gathered copious but generally unusable for enforcement.

The following procedure is proposed for noise monitoring:

- Noise monitoring is to be undertaken if a complaint is received
- Monitoring to be conducted as per the NSW EPA Interim Construction Noise Guideline
- Results of routine monitoring shall be submitted to Schools Infrastructure NSW. Results of monitoring in the event of any complaints shall be submitted to the Project Manager, Project Director and Senior Project Director within 1 week of receiving the complaint



7 CONSTRUCTION VIBRATION

Due to the construction types proposed and average distances between the works and receivers, we do not anticipate any significant vibration effects with regards to DIN 4150-3 compliance for the protection of building structures. The most intensive activity is expected to be the piling works.

We do not anticipate that there will be issues with regard to compliance with the vibration limits presented in the criteria above.

If problems and/or complaints arise on site, these should be dealt with as per the requirements for noise, i.e. any vibration complaints should be followed up by monitoring to establish the cause and levels of vibration, with any necessary mitigation measures taken following this.

If it is not practical to measure within adjacent dwellings, we propose that the vibration assessment be made at ground level either outside or inside the dwellings (whichever is possible), with prediction methodologies used to establish whether vibration levels are either near, or clearly well below, compliance limits.

7.1 Preliminary Vibration Assessment

It is important to note that construction vibration levels depend on several factors. These include the activity, the machine, the geology of the ground and the distance between the building and the source. Surface works are expected to have a lower vibration impact than ground compacting/piling works.

Compliance with vibration limits is expected based on ensuring ground compacting equipment is selected to adherer to minimum safe working distances. While these magnitudes do not predict cosmetic/structural damage, it is anticipated that human response/comfort would be impacted at these distances. The current RMS Construction Noise and Vibration Guideline sets safe working distances for vibrating plant and equipment. These are summarised below in Table 11.

Table 11. RMS Plant Vibration Safe Operating Distances - Construction Noise and Vibration Guideline 2016

Plant Item	Rating / Description	Minimum working distance		
		Cosmetic damage (BS 7385)	Human response (OH&E Vibration Guideline)	
Small Hydraulic Hammer	(300 kg - 5 to 12t excavator)	4 m	7 m	
Large Hydraulic Hammer	(1600 kg – 18 to 34t excavator)	44 m	73 m	
Jackhammer	Handheld	2 m (nominal)	2 m	
Pile Boring	< 800 mm	2 m (nominal)	4 m	
Vibratory Pile Driver	Sheet piles	2 m to 20 m	20 m	
Vibratory Roller	< 200 kN (Typically 4-6 tonnes)	12 m	40 m	

Based on the required construction activities to be undertaken as part of the project, as well as the proximity of the surrounding receivers to the site, the resulting construction vibration is unlikely to negatively impact on any of the surrounding receivers. NDY's SSDA response is attached in the appendix at the end of this report.



8 COMMUNITY LIAISON

An important part of managing construction noise is to manage community expectations.

It is important for all personnel on construction sites to maintain good relations with their neighbours and to respect the rights of these neighbours to live or work nearby without being subjected to unreasonable or excessive noise.

Consultation and co-operation between Schools Infrastructure NSW (SINSW)/Roberts Co, the contractor and the neighbours before commencement of work, and the removal of uncertainty, helps reduce adverse reactions to noise. It is understood that, at the time of writing, this process is underway and will align with the Community Communication Strategy that has been prepared.

It is recommended that this is completed as per SINSW standard processes, such as but not limited to:

- Information sessions
- Information booths
- Notifications
- Online resources and contacts
- Contact cards

It is recommended that a public relations person/team is identified for the project who will be responsible for overseeing the community liaison process, in line with the Community Communication Strategy.

We note that the following community engagement activities have been completed:

- Roberts Co have consulted and are continuing to have communication with the Wentworth Point Primary School, Principle and Teachers to discuss activities that have high noise generation.
 - Roberts Co have informed the school about upcoming construction works and when high noise
 activities will occur during the construction period, such that school can prepare in advance any
 activities that may be impacted by loud noise.



9 COMPLAINTS MANAGEMENT SYSTEM

For this project, it is noted that School Infrastructure NSW manages all enquires and complaints for the project.

As outlined in the Community Communication Strategy, should complaints be raised during construction, they will need to be logged, managed, closed out and resolved by SINSW within the timeframes outlined in the Community Communication Strategy.

The contractor and School are to refer all complaints through SINSW so they can be recorded and managed appropriately.

Please refer to the following SINSW community contact card details for further information.





10 CONCLUSION

Main works construction noise for the Wentworth Point new high school development has been reviewed to form a CNVMP for the purposes of meeting the NSW Interim Construction Noise Guideline. On review, the following conclusions were made:

- Construction activities, when assessed at the shortest possible distances (worst-case scenario) to both
 noise sensitive receivers, is predicted to exceed the 'Highly Noise Affected' noise levels. However, when
 assessed based on average distances, noise levels from all assessed activities are predicted to comply.
- As the dirt bund is removed, excavation and material transport activities without noise mitigation are expected to produce ~77 dBA at the external façade of the Wentworth Point Primary School classrooms (when activities are happening at the closest distance to the school). When assessed based on an average distance from the construction site to the face, this predicted noise level reduces to ~71 dBA.
- Localised barriers/hoarding to the western site perimeter is recommended during the excavation of the bund
- Localised barriers at the closest affected classroom façades are recommended to be explored upon confirmation of noise levels by site measurement.
- Incorporation of noise mitigation strategies outlined in this document is expected to allow construction works to be undertaken whilst comply with the NSW Interim Construction Noise Guideline.



APPENDIX - VIBRATION PRE-CONSTRUCTION SURVEY RESPONSE



APPENDIX - ACOUSTIC CONSULTANT CV



KANVIN CHEN | ACOUSTICS SECTION MANAGER - SENIOR ENGINEER



YEARS EXPERIENCE

5 +

EXPERTISE

Acoustics

QUALIFICATIONS

Bachelor of Engineering (Hons)

PROFESSIONAL AFFILIATIONS

MIEAust CPEng NER, Member of the Australian Acoustical Society (MAAS)

OFFICE LOCATION

Melbourne

After completing his mechanical engineering degree at The University of Auckland, Kanvin joined NDY to pursue his career as an Acoustic Engineer.

With his attention to detail and self-motivation, Kanvin has added value to the Acoustic Team by providing well thought-out and quality solutions to ensure client needs are always satisfied.

Kanvin's interest in Acoustics stems from his passion for improving the quality of living and efficient use of the spaces which surround us, aligning with NDY's core value of "making spaces work".

CAREER HISTORY

Acoustic Project Consultant - Norman Disney & Young, Melbourne, VIC

October 2019 - Present

Roles & responsibilities:

- Project leadership of medium to large projects
- ▶ Research and development projects from inception to completion
- ▶ Field measurements of noise and vibration
- Advanced acoustic analyses of building services equipment
- ▶ 3D modelling of noise and reverberation environments
- ▶ Advanced building acoustics assessments
- ▶ Reporting of acoustic advice for presentation to external stakeholders

Acoustic Consultant - Norman Disney & Young, Auckland, NZ

June 2017 - September 2019

Roles & responsibilities:

- ▶ Field measurements of noise and vibration
- Acoustic analyses of building services equipment
- ▶ Building acoustics assessments
- ▶ Reporting of acoustic advice for presentation to external stakeholders
- ▶ Project leadership of small projects

CORRECTIONS & JUSTICE

Chisholm Road Prison, Lara, VIC (2020)

New maximum-security prison with approximately 1200 beds. The state-of-the-art facility will feature the highest and most stringent level of security. Key features include new health, education, and recreation facilities | Acoustic Engineer

Hopkins Correctional Centre, Lara, VIC (2021)

New maximum-security prison with approximately 1200 beds | Acoustic Engineer

311 Spencer Street - Victoria Police, Melbourne, VIC (2021)

65,000 m² NLA office and integrated fitout for Victoria Police | Acoustic Engineer

FDUCATION

United Building 110 Fitout, Auckland, NZ (2018)

Refurbishment of a former library to create new office and learning spaces \mid Lead Acoustic Engineer

Australian National University, College of Arts & Social Sciences (RSHA), Canberra, Australian Capital Territory, Australia (2019-2020 | \$70 m)



The 10,000m² facility includes 3,000m² of specialist laboratory spaces and 7,000m² of staff/student areas. It will provide will become a permanent home for the operational functions of the School of Archaeology and Anthropology (SAA), School of Literature, Languages and Linguistics (SLLL) and Humanities Research Centre (HRC).

Design of two new academic buildings (RSHA and CBE Buildings), with one involving CLT construction.

Kanvin was the lead acoustic engineer on this project and his responsibilities included providing design input around the sound insulation performance of the building fabric and acoustic reverberation treatment of internal learning spaces. Specialist advice was provided around the lecture theatre and laboratory design to ensure that the sound and vibration insulation requirements were met.

Murdoch University - New Academic Building (NAB), 90 South Street, Murdoch Western Australia, Australia (2019 to Current | \$135 m)

Norman Disney & Young were been engaged to undertake the design of the Mechanical, Electrical, Communications, Security, Fire Protection, Fire Engineering, Hydraulic, Acoustics, Environmental Sustainability, Audio Visual briefing and Vertical Transportation Services. This building forms an integral part of transitioning Discovery Way as the primary arrival gateway for the University. A linear four storey academic building is proposed as a concrete structure for the lower-level stories, with an innovative engineered timber frame for the upper three stories. The 'New Academic Building' (NAB) will provide Murdoch University with over 15,000m² of contemporary collaborative learning space, informal peer-to-peer learning, academic workplace and campus landscape.

Kanvin was the lead acoustic consultant on this project, providing substantial design input around the sound insulation performance of the lightweight cross laminated timber structure and acoustic reverberation treatment of internal learning spaces.

Sydney Olympic Park New High School, Sydney, New South Wales, Australia (2020 to current | \$100 m)

The new high school is being developed to cater for the growing population in the Sydney Olympic Park, Wentworth Point and Concord West communities.

The project consists of a new 9-stream high school for 1520 students designed and built over two stages located on Burroway Rd, Wentworth Point. Currently, the following areas are proposed:

- Outdoor spaces including landscaped recreation areas, playing field and games courts
- Multi-purpose hall for sports and performance
- Library and canteen facilities
- New performing arts spaces.
- Science and laboratory spaces
- Wood & metal workshop areas

Kanvin is the lead acoustic engineer on this project, providing design input around the acoustic separation between the various spaces and spatial acoustic treatment to critical areas, ensuring that the design is fit for purpose.

DEFENCE

HMAS Harman JIWF, Canberra, ACT (2020)

Joint Information Warfare Facility | Acoustics Engineer

OFFICES NEW

Emporium Melbourne Co-working Hub, VIC (2019 | \$30M)



The growing diversity in Emporium Melbourne's offering sees the conversion of the existing Level 4 Myer tenancy repurposed into a space suitable for co-working office tenants, with an additional 3 levels of space constructed (utilising new CLT floor slabs) behind the Myer heritage façade on Lonsdale Street. The conversion of 10,000 sq m of office NLA over 4 levels included design considerations that remained sensitive to the heritage façade, navigation of sustainability requirements and assisting with the Melbourne Fire Brigade (MFB) approvals process | Lead Acoustic Engineer

Geelong Civic Accommodation Precinct, Geelong, Victoria, Australia (2019 - 2022 | \$90 m)

Currently under construction, the Geelong Civic Accommodation Precinct will be a purpose-built commercial hub. The premium building comprises a Lower Ground secure carpark, Ground floor customer service area and end-of-trip facilities, and 5 office levels with a total NLA of approximately 9,400 m².

Kanvin is the lead acoustic engineer on this project to ensure that the acoustic project performance requirements were met and provided validation of value management options.

60-80 Moorabool Street, Geelong, Victoria, Australia (2021 | \$45 m)

10,000m² NLA 8 storey office development including integrated fitout for GMHBA. The building comprises two basement levels including end-of-trip facilities, a ground floor lobby and retail areas targeting 5 Star Green Star and 5 Star NABERS Energy ratings.

Kanvin was the lead acoustic engineer on this project, providing the necessary acoustic practices and treatment to ensure that the project achieved the targeted performance and sustainability requirements.

311 Spencer Street, Melbourne, Victoria, Australia (2021 | \$650 m)

40-storey commercial office building accommodating Victoria Police. 65,500 m² NLA, 110,000 m² GFA with secure basement level car parking for 600 cars and end-of-trip facilities. A helipad is included at rooftop level, whilst a public forecourt acts as a continuation of the external spaces and public realm with the adjacent 313 Spencer Street. PCA A Grade, 5 Star Green Star As-built and 4.5 Star NABERS energy and water.

Kanvin was an acoustic engineer on this project providing acoustic detailing/construction reviews on-site assistance.

EXISTING ASSETS

181 William Street, Melbourne, VIC

Lobby Refurbishment | Acoustic Engineer

INTERIORS

120 Spencer Street, Melbourne, VIC (2019)

Mechanical services review and noise investigation for the WeWork fitout | Acoustics Engineer

HOTELS

1 Queen Street Intercontinental Hotel, Auckland, NZ (2022)

Conversion of the existing HSBC 20 story office building located in a prominent position on the Auckland CBD waterfront into a 21-story building with seven office levels, 14 level of 5-star hotel (243 rooms), and a rooftop bar. The building will be fully integrated into the larger Commercial Bay development currently being built adjacent (also an NDY project), which is made up of a 39-story office tower and a three-level retail mall providing pedestrian connection to surrounding buildings (including 1 Queen Street) | Lead Acoustic Engineer. Kanvin, was responsible for interior acoustics and mechanical services for a premium hotel experience and integration of commercial

Wirra Wirra Vineyard Resort, SA (2020)



The Wirra Wirra Winery Hotel is a project to build the first five-star accommodation of scale in the McLaren Vale wine region and the first integrated winery resort of its type in South Australia. The hotel concept was built around a theme of health and wellness, targeting international and domestic travelers. The hotel GLA will be in the order of 5,000 m² | Lead Acoustic Engineer. Kanvin took the role as Acoustic design Lead of the boutique guestrooms and common spaces to ensure comfortable acoustic environments for guests

Cordis Hotel, Auckland, NZ (2019)

The Cordis Hotel (by Langham) is a 5-star upscale hotel that is located in the heart of Auckland, offering contemporary accommodations with modern amenities, dining venues and event spaces. NDY acoustics have teamed up with Cordis in the upgrade of the existing building facade to improve the overall acoustic comfort of the guestrooms from the bustling city streets of Auckland. Kanvin assisted in redevelopment of the building façade to minimize noise ingress to hotel guestrooms | Acoustics Engineer

RESIDENTIAL

Kainga Ora (Formerly Housing New Zealand) Developments, Auckland, NZ (2017-2019)

Development of efficient State Housing projects – Cost effective building design to maintain the acoustic privacy and amenity of residents

- > 3184-3188 Great North Road, Auckland, NZ
- ▶ 2 Cracroft Street, Auckland, NZ
- > 2 Wilson Road, Auckland, NZ
- ▶ 12-14 Hillcrest Road, Auckland, NZ
- ▶ 20-22 Lynton Road, Auckland, NZ
- ▶ 4 Jordan Avenue, Auckland, NZ
- ▶ 432 Onehunga Mall, Auckland, NZ
- 139 Greys Avenue, Auckland, NZ

AGED CARE & SENIORS LIVING

Kew Gardens Aged Care, Kew, VIC (2020)

Acoustic advice for the refurbishment of an Aged Care facilty | Acoustic Engineer

HOSPITALS

Centenary Hospital for Women and Children, Canberra, ACT (2019)

Acoustic advice for the expansion of new health facilities | Acoustic Engineer

St Vincents Private Hospital, Melbourne, Victoria, Australia (2020)

Redevelopment of the St Vincent's Private Hospital involving the expansion of existing facilities and a new hospital wing. The building will house a range of facilities including 106 new acute medical/ surgical and maternity beds, 7 extra operating theatres (inc. 1 hybrid), medical imaging, CSSD, retail, pharmacy, expanded Day Procedure, staff & conference areas.

It also features a 3-level expansion to the multi-level car park to the north of the current Private Hospital. Approximately 150 extra car spaces are envisaged.

Kanvin was as acoustic engineer on this project aiding in the design of the sound insulation performance of the building fabric, reverberation control and mechanical services noise treatment.

PRIMARY CARE CENTRES

WDHB Collingwood Clinic, Hamilton, NZ (2020)

Involvement in the acoustic design to ensure the privacy of large clinical and office spaces | Lead Acoustic Engineer



DISTRIBUTION CENTRES

Foodstuff Distribution Centre, Auckland Airport, NZ (2021)

Development of the base build acoustics of the new distribution centre and head office for Foodstuffs New Zealand | Acoustic Engineer

MANUFACTURING

Monkeytoe, New Plymouth, NZ (2019)

Research and Development of the HushMonkey acoustic screening system | Acoustic Engineer

CRITICAL FACILITIES

Equinix, 32 Walsh Street, West Melbourne, VIC (2021)

Investigation of potential noise arising from proposed chiller upgrades and the effects on the surrounding environment \mid Acoustic Engineer



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United Kingdom: London

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Appendix F Construction Waste Management Sub-Plan

Appendix G Construction Soil and Water Management Sub-Plan

Appendix H Construction Flood and Emergency Sub-Plan



Construction Flood Emergency Management Plan

Wentworth Point New High School

Prepared for Roberts Co / 20 October 2022

211266

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1.0 Preamble

As per the 2022/2023 budget papers, this project is now referred to as "Wentworth Point new high school". Future documentation relating to this project, including this document, will be labelled accordingly.

Due to the SSD-11802230 application being submitted as "Sydney Olympic Park new high school", the project name will remain the same on the Planning Portal and future documentation may reference this.

Please also note 'Wentworth Point new high school' is the placeholder name for the school. The school naming will occur closer to opening, following a community consultation process.

2.0 Introduction

Taylor Thomson Whitting (TTW) has been engaged by Roberts Co to prepare a Flood Emergency Management Plan (FEMP) to be implemented during the construction of the proposed Wentworth Point new High School at 7 Burroway Road, Wentworth Point.

TTW and Schools Infrastructure NSW (SINSW) representative Roberts Co have consulted the relevant NSW State Emergency Services (SES) officers in developing an operational plan between 28 July and 04 August 2022. The consultation is also relevant to developing a plan for the construction phase. Minutes of the consultation are appended to this report.

The purpose of this FEMP is to summarise the flood risks within the site during construction, identify preparation measures that should be undertaken, and provide an action plan with steps to be completed during a flood event.

2.1 Reference Documents

The FEMP has been prepared with reference to the following:

- NSW Government Floodplain Development Manual (2005);
- NSW Government Floodplain Risk Management Guidelines;
- NSW State Emergency Service (SES) guidelines, and;
- FloodSafe guidelines and the relative FloodSafe Tool Kits.

2.2 SSDA Conditions of Consent

Item	Condition	Section Reference
	The Construction Flood Emergency Management Sub-Plan must address, but not be limited to, the following: (a) Be prepared by a suitably qualified and experienced person(s)	Appendix A
	(b) Address the provisions of <i>Floodplain Risk Management Guidelines</i> (EHG)	1.0 – 9.0
	(c) Include details of:	
B19	 The flood emergency responses for both construction phases of the development; 	i. 3.0, 5.0
	ii. Predicted flood levels;	ii. 2.1
	iii. Flood warning time and flood notification;	iii. 3.0
	iv. Assembly points and evacuation routes;	iv. 5.0
	v. Evacuation and refuge protocols; and	v. 5.0, 6.0, 7.0
	vi. Awareness training for employees and contractors, and users/visitors	vi. 6.0
	Prior to the commencement of construction, the Applicant must prepare and implement for the duration of construction;	00.40
B22	(a) Flood warning and notification procedures for construction workers on site	3.0, 4.0
	(b) Evacuation and refuge protocols	5.0

3.0 Flood Behaviour

The flood analysis within this report has been based on a flood study assessment conducted by Sinclair Knight Merz (SKM) on behalf of Parramatta City Council. The following section provides a summary of the findings of the assessment and TTW's analysis.

3.1 Peak Flood Levels

Design flood levels obtained from the study conducted by SKM for the 5% AEP, 1% AEP and Probable Maximum Flood (PMF) events corresponding to the development area are specified in Table 1.

Table 1 - Design Flood Levels - Extract from Lower Parramatta River Study and Plan (2005)

Flood Event	20% AEP	5% AEP	2% AEP	1% AEP	PMF
Design Flood Level (mAHD)	1.27	1.34	1.39	1.42	2.42

Based on this, the peak flood levels for the site are 1.42m AHD for the 1% Annual Exceedance Probability (AEP) storm event and 2.42m AHD for the Possible Maximum Flood (PMF) event. A minimum Finished Floor Level of 4m AHD has been adopted for the site which exceeds both the flood planning level (1% AEP level + 0.5m freeboard) and the PMF from mainstream riverine flooding from the adjacent Parramatta River.

As the Wentworth Point road network is generally located above the 1% AEP flood level, there is no concern with flood risk in this event. The flood evacuation procedures in the following sections of this report should be followed where flood warnings advise of imminent flooding above the 1% AEP flood level and up to the PMF.

The duration of PMF inundation is likely to be longer than a day as flood levels subside slowly. Therefore, shelter-in-place emergency responses are unsuitable as the primary flood emergency strategy. In the event of a forecasted flood emergency, the contractor shall close the site and advise all workers to stay home.

We note that there is currently no formal response flood warning system in place for the lower Parramatta River. However, the Upper Parramatta river section has a formal flood warning system in place with the closest one being in Silverwater Rd bridge. As per our consultation with SES, the head contractor is to monitor flood warnings from SES, the Bureau of Meteorology (BoM), Parramatta Council, and media outlets (televisions, radio stations) instead as a source of flood warning for the site which is generally received up to 7 days in advance prior to a flood commencing. Consequently, there would be sufficient time prior to a flood event to:

- Prepare for a flood
- · Respond when a flood is likely
- Respond during a flood
- Recover after a flood
- Close the site
- · Notify workers to stay home

The road network to the south of site is of low hazard as shown in Figure 1 where it is subject to shallow flooding where able-bodied people would be able to wade safely. Trucks could also be used to assist evacuation.

Currently, earthworks are scheduled for a short duration of one month to be undertaken during summer. The risk is therefore low as these conditions are unlikely for flooding.

Pipuro 3-4 Lower Paramatta River Eastern Area Mazard Map

Legend

| Call other values>
| Hazard | High |
| Low |
| Medium |

Figure 1 - Flood Hazard Classification (Extract from Lower Parramatta River Study and Plan (2005))

4.0 Flood Warnings and Notifications

4.1 Flood Watches and Warnings

Severe weather and thunderstorm warnings are issued by the Bureau of Meteorology (BoM). These warning are continually updated with descriptions of the likely conditions, including predicted extreme rainfall depths.

Flood warnings are issued by the BoM when flooding is occurring or is expected to occur in an area. Warnings may include specific predictions of flood depths dependent on real-time rainfall and river level data. These warnings are distributed BoM councils, police and the relevant local State Emergency Services (SES), as well as being available on the BoM website.

A **Standard Emergency Warning Signal** (SEWS) will be used by SES to precede all *Top Priority* Flood Warnings and all Evacuation Warnings. Once activated Evacuation Orders are broadcast over the radio stations.

A **Flood watch** is issued by the BoM up to four days prior to a flood event. A watch is generally updated daily and may be issued before, during or after rainfall has occurred.

Flood warnings are issued by the BoM when flooding is occurring or expected to occur in a particular area. Warnings may include specific predictions of flood depths dependent on real-time rainfall and river level data. These warnings are distributed to Council, Police and the relevant local SES, as well as being available on the BoM website, through telephone weather warnings and radio broadcasts.

SES Evacuation Warning is a warning message from SES advising the community to prepare for likely evacuation. The warning advises people what to do and what to prepare to take with them.

A **Flood Evacuation Order** is a notification to the community, authorised by the SES, when the intent of an Incident Controller is to instruct a community to immediately evacuate in response to an imminent threat. It also advises where people should go and may advise which evacuation route to take.

Visual Observation - Site management must visually monitor the flood levels on Burroway Road during severe rainfall events and initiate flood response procedures in the event of flood levels appearing to approach inundation.

4.2 Coordination of Flood Evacuation Warnings and Orders

The overall coordination of the road evacuation routes will be conducted by the SES. The head contractor is to communicate warning messages and orders from the SES to personnel and workers on site.

4.3 Public Address System

The site will have an alert system for workers on site in the event of an emergency. The site will have an Evacuation Procedure with one or multiple assembly points as part of the Emergency Management Plan. As the quadrangle is to be at RL 4.0m AHD, this is a suitable assembly point location. The location of the assembly point is subject to change throughout the course of construction.



Figure 2 - Quadrangle assembly point

Across the proposed site, the ground floor level has been set at RL 4.00m AHD and majority of external areas are located above the PMF flood level. As such, the assembly point can be anywhere within the site after earthworks have been completed. Before this point, the assembly point shall be set at the high point of the site.

5.0 Flood Response

5.1 Contractor Responsibilities

Once the site is in operation the roles and responsibilities in Table 2 below will need to be delegated to specific personnel. In the event of a severe flood, it is the responsibility of the head contractor to ensure these tasks are undertaken.

Table 2 - Contractor Flood Responsibilities

Role	Location	Responsibilities
Head Contractor Site Manager / Foreman	On site	 Inform site personnel of flood risk Coordinate flood evacuation drills Decide if evacuation is required prior to warnings from SES Liaise with SES
Head Contractor First Aid Officer	On site	 Coordinate assistance for less able workers and personnel during evacuation Prepare a Flood Emergency Kit that includes a portable radio, torch, spare batteries, first aid materials, emergency contact numbers, candles, waterproof matches, waterproof bags and required medications.
Head Contractor Site Personnel	On site	- Coordinate evacuation of workers and assist in evacuation

5.2 Key Contact Details

In the event of a severe flood, key telephone numbers have been listed in Table 3.0 below.

Table 3 - Key Contact Numbers

IMPORTANT TELEPHONE NUMBERS				
Contractor				
Foreman	Refer to CEMP for details			
Site Office				
First Aid Officer				
OUTSIDE SITE CONTACTS				
** Ambulance / Fire – Call Office r	numbers shown above to contact			
State Emergency Services	132 500			
Busways	1300 692 929			
Burwood Bus Depot	131 500			
Concord Hospital	9767 5000			
Police – Ryde	9808 7401			

6.0 Assembly Point and Evacuation Routes

6.1 Emergency Assembly Point

An Emergency Assembly Point will be nominated that is within and central to the site. Before earthworks have been completed on site, the assembly point will be the high point of the site. Once earthworks have been completed, the site will be higher than the PMF level and the assembly point can therefore be nominated anywhere within the site.

As it is intended that the flood evacuation warning will be provided prior to flooding occurring, egress from the site can occur on Burroway Road to the south of the site.

6.2 Evacuation Routes

<u>The following information is provided for information only. For "Flood Response Actions" – refer to Section 7 of this FEMP for details.</u>

As per consultation with SES, if necessary, evacuation to higher ground is the most appropriate route in such proximity to the river. As shown in Figure 1 above and Figure 3 below, all workers or personnel on site are to assemble at the quadrangle and evacuate to higher ground at Bennelong Parkway or across Bennelong Bridge.

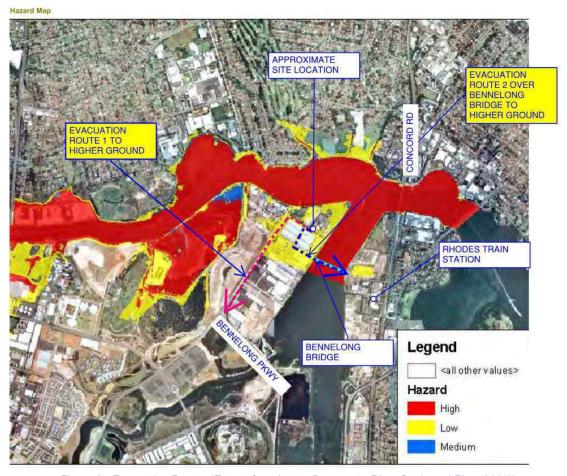


Figure 3 - Evacuation Routes (Extract from Lower Parramatta River Study and Plan (2005))

7.0 Preparation for Flood Response

7.1 Education

7.1.1 Site Personnel

As part of the preparation for a flood event, those with responsibilities within this Plan should review and be familiar with their roles. Inductions should be held to educate personnel on their role during a flood event.

7.1.2 Workers

To increase awareness on site, it is recommended that all inducted workers are made aware of the potential flood risk and actions that will be undertaken during a flood event. Evacuation drills should be undertaken regularly to ensure that all workers are aware of the procedures for evacuation.

7.2 Evacuation Drills

It is recommended that evacuation drills be held at a minimum of twice yearly to ensure all personnel and workers are aware of and familiar with their flood response actions, the sound of the alert and the location of the assembly point.

7.3 Flood Emergency Kit

A Flood Emergency Kit should be prepared prior to a flood event taking place and regularly checked to ensure that supplies within the kit are sufficient and in working condition. This check could occur after the evacuation drill takes place to provide a regular schedule. The Kit should include:

- Radio with spare batteries;
- Torch with spare batteries;
- First aid kit and other medicines:
- Candles and waterproof matches;
- Waterproof bags;
- A copy of the Site Emergency Management Plan; and
- Emergency contact numbers.

This Emergency Kit should be stored in a waterproof container and is the responsibility of the First Aid Officer.

8.0 Flood Response Actions

8.1.1 When A Flood Watch Is Issued

The following actions should be undertaken:

- 1. Ensure the emergency kit is ready to use.
- 2. Listen to the local radio station for updates on forecasted flood heights and timings.
- 3. Call SES for an update and possible evacuation advice.
- 4. Notify all workers of the flood watch and assist availability of workers to assist with emergency actions if required.
- 5. Ensure workers are familiar with the safe flood evacuation route.

8.1.2 When A Flood Warning Is Issued

The following actions should be undertaken:

- 1. Undertake the actions nominated under the "flood watch".
- 2. During Site Hours:
 - For life-threatening emergencies phone 000 immediately.
 - Coordinate the safe return of workers in consultation with SES and transport operators to their homes.
 - Call Busway (Bus Operator is to be confirmed) and coordinate the required transport resources for evacuation of non-able-bodied personnel/workers.
 - Send SMS to emergency contacts
 - Direct All workers to the Assembly point within the site before the property is flooded.
 - Evacuate workers and personnel

NOTE: Avoid driving or walking through floodwaters. These are the main causes of death during flooding. Although the site may not be flooded, safe travel arrangements for workers to go home is likely to be disrupted by flooding and/or road closures.

- 3. Outside of Site Hours:
 - Close the site and notify workers of the temporary closure of the site.

9.0 Limitations and Revision of the Flood Emergency Response Plan

This FEMP only addresses the evacuation strategies during extreme flooding events for workers on site during construction and is considered a guide only. It does not cover individual safe travel for workers when their safe travel arrangements may be disrupted by flooding and/or road closures.

It is the head contractor's responsibility to ensure this FEMP is current and updated as necessary to be in line with relevant standards, directorate, legislation, and the Regional's State Emergency Management Plan to ensure the health, safety and welfare of all personnel, workers and others.

10.0 Recommendations

- 1) Head contractor to liaise with The Transport Services Functional Area for Buses resources allocation and arrangement for non-able-bodied personnel prior to commencing construction on site.
- Prepare Emergency Management Plan that addresses the recommendations of this FEMP for the ongoing requirements of the site, particularly Section 4.0.
- 3) Include and update the important telephone numbers in Section 4 of this Report and include in the Emergency Management Plan for the operation of the site.
- 4) Flood-educate personnel and workers through Education and Evacuation Drills as detailed in the Section 6 of this FEMP.
- 5) Head contractor to review and update this FEMP as necessary once a year and in accordance with the consent requirements for review of plans, programs and strategies.
- 6) All personnel and workers to be familiar with Flood Response Actions as detailed in the Section 7 of this FEMP.

Prepared by

TTW (NSW) PTY LTD

WILLIAM BEVER
Graduate Civil Engineer

Reviewed & Authorised By

TTW (NSW) PTY LTD

NEMESIO BIASON JR.

Associate Director

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Appendix A

Consultation Record

Nemesio Biason Jr

From: Nemesio Biason Jr

Sent: Thursday, 4 August 2022 9:41 AM

To: Elspeth O'Shannessy

Cc: David McDonnell; Georgia Sedgmen; Sandra Lim

Subject: RE: Sydney Olympic Park high School

Hi Elle,

As per our latest correspondences, below is the updated minutes of our meeting/consultation.

- SES Flood data portal flood mapping is based on the Parramatta Council's adopted flood study being the SKM's "Lower Parramatta River Floodplain Risk Management Flood" study 2005
- BOM do not provide flash flood warning system but provide potential for flash flooding for a very large scale area as part of their detailed severe thunderstorm warning.
- The site is considered Lower risk than other sites that SES has reviewed—The school is elevated high at 4.0mRL and dry, well above the PMF flood level of 2.42mRL.
- No current flood warning area that covers Lower Parramatta River catchment. The closest one is at Silverwater Rd Bridge. Department of Education (DoE) is to monitor any flood warnings from SES, BOM, Parramatta Council, Media outlets (television, radio stations) instead as a source of flood warning for the site.
- There are risks associated with sheltering in place which is why it is the preferred strategy for schools to
 close prior to commencing the school day or prior to inundation of the roads. For example secondary
 emergencies (e.g. fire or medical), complexities with resupply and given the age of the student potential for
 them or carers to enter the dangerous floodwater.
- Primary priority is the closure of school in any road closure within the Precinct and ahead of any major flooding.
- Second Priority is school closure upon receiving any flood warning and evacuate out prior to PMF flood
- Make sure there is enough time to evacuate, Look at depth and velocity
- Evaluate the peak critical PMF storm event which could be hours to a day.
- Only need to evacuate if it is a PMF, and students being high school students can self-evacuate or guided by guardians to higher grounds.
- In the worst case scenario, or couldn't evacuate The site is safe as an "On-site refuge" being at 4.0RL being 1.58m above the PMF flood level.
- It was suggested to Check Glenwood School's flood emergency response plan.

Regards Nemesio

Appendix B





Experience

2019 – Current Associate Director, TTW

> 2013 – 2019 Associate, TTW

2004 – 2013 Senior Civil Engineer, TTW

2003 – 2004 Design Engineer, BMD Consulting Pty Ltd

2002 – 2003 Civil Design Engineer, Cardno Willing Pty Ltd

2001 – 2002 QA/Design Engineer, Cootamundra Shire Council

Associate Director, Nemesio Biason joined TTW in 2004 as a highly technical civil engineer. He has detailed knowledge of construction projects which spans across commercial, retail, residential, industrial, educational, healthcare and public buildings. Including experience with legal expert witness, water sensitive urban design, stormwater design, flood study, earthworks, pavement and masterplanning.

He brings a practical and adaptive approach to his work, understanding that every project is unique and requires a responsive and collaborative solution. He has a strong network of clients and works cohesively with architect, client and contractors.

Nemesio Biason

Associate Director

BE CPEng, NER

nemesio.biasonjr@ttw.com.au

Accommodation

Iglu Redfern
233 Johnston Street, Annandale
Block G, Wentworth Point
7-9 Kent Road, Mascot
ILU, Croydon
7 Cremorne Point Road, Cremorne
Trades Hall, Sydney
Zenith Apartments, Kings Cross
7-9 Kent Road, Mascot

Commercial

Balikpapan, Indonesia – Stormwater Design

100 Pacific Highway, North Sydney – Civil Design

16-40 Mount Street, North Sydney – Civil and Public Domain Design for the 5 Green Star Project Dubai Airport Roof Drainage 7-9 Kent Road, Mascot

Retail

Fairy meadow Shopping Centre Development – Civil Design Hobart Parliament Square Charlestown Square North Piazza

Sports + Leisure

Australian Rugby Development
Centre, Moore Park – Civil Design
Strathfield Golf Course – Civil Design
Wollongong Leisure Commercial
Development – Civil Design
Aerial Rope Park, St Mary's
Moorebank Sports Club extension
and Car Park

Art + Culture

Orange Regional Museum – Civil Design (Winner of NSW AIA – NSW Premier's Prize and Sulman Medal)
Anzac Memorial Education and Interpretation Centre – Civil Design (\$40m) Rooty Hill Performing Arts Centre NSW Art Gallery Storage Facility, Lilyfield – Civil Design
Burelli St, Wollongong (Salvation Army Site) – Civil Design

Education

Macquarie Library, Macquarie University LEES1 Project, University of Sydney – Civil Design

Wallace Wurth Redevelopment, UNSW – Civil Design

Macquarie University – South Precincts Danebank Anglican Girls School North Sydney TAFE, Westbourne Street Entrance

Hurlstone Hawkesbury High School
UNSW Electrical Engineering Building
Capital Renewal & modernization Project
St Marks, Stanhope Gardens
Wenona School, North Sydney
Glenfield Agriculture High School
Building Education Revolution (BER)
Schools – Leonay, Wyoming, James
Erskine, Blaxland, Pymble, Llandlo,
Cambridge Park, Ellison, Luddenham and
Werrington County Public Schools
Glenfield High School
Danebank School Redevelopment

Healthcare + Research + Aged Care

Sir Moses Montefiore Jewish Home, Randwick Graythwaite Rehabilitation Centre, Ryde Hospital Blue Haven Community Centre Condobolin Retirement Village Prince of Wales – Neuroscience Research Precinct Stage 2A BUPA Sutherland Northshore Private Hospital



Nemesio Biason

What is it about the industry that motivates you?

It motivates me to see the engineering and construction industry thriving in its ability to meet client and community expectations despite working in highly-constrained time and financial parameters, and yet still delivering high-end and innovative projects.

Government + Public

Wynyard Walk, Sydney (Winner of NSW CIA Excellence in Infrastructure Projects)

80 Alfred Street, Milsons Point – Public Domain Works Design

5-11 Meriton Street, Gladesville – Public Domain Works Design

15 Strathford, Cammeray – Public Domain Works Design

Block 8, Central Park – Public Domain Works Design

207-211 Darlinghurst Road,
Darlinghurst – Public Domain Works

20 Alfred Street, Milson's Point Willoughby Council Kerb and Gutter and Drainage Design, Castle Cove

Civil

Accessways + Car Parks

Westpoint Shopping Centre, Blacktown – Alpha Street New Carpark Entry/Exit Design Macquarie University – Gumnut Childcare Car Park – Design and Project Management

Flood Mitigation

Superlot 5, Little Bay – Stormwater, Civil, and Flood Assessment

Merrylands City Central Project – Civil Design and Flood Advice

Bass Hill Plaza – Flood Damage Investigation (Peer Review)

Wynyard Walk, Sydney – Stormwater Expert Witness

434-444 Elizabeth Street, Surry Hills

Roads + Stormwater

Echuca RSL Club – Stormwater Analysis

Stage 1, St. Mary's Leagues Club - Civil and Stormwater Design

18a Bradleys Head Road, Mosman – Stormwater Design

Phoenix Theatre Gallery, Chippendale

– Stormwater and Public Domain

Works Design

Rooty Hill RSL, Rooty Hill – Civil Design and Flood Study

Civil Continued

Flood Mitigation (Cont'd)

176-184 George Street, Concord – Flood Management

10-20 McEvoy Street, Waterloo – Flood Study

Macquarie Park Cemetery – Stormwater, Prioritisation Analysis 37 ha Catchment

Emirates 6-star Resort Development, Wolgan Valley – Flood Study (18,525ha catchment)

Dunmore Stable, Dunmore – Flood Study (11,500ha catchment)

47& 57 Princes Hwy Albion Park Rail – Flood Study (10,700ha catchment)

Baker Street, Banksmeadow Industrial Development - Flood Study

1 – 3 Dunning Avenue, Roseberry – Flood Study

Railway Parade, Burwood – Stormwater Analysis (11ha catchment)

10-20 McEvoy Street, Waterloo – Flood Expert Witness

New South Head Rd, Double Bay – Flood Study (240ha catchment)

ACT Prison – Catchment and Overland Flowpath Analysis

Jakarta International School – Flood Study (27ha catchment)

Richard Johnson Anglican School – Sites Detention Basin Analysis

Claremont, Nyngan - Flood Analysis

Subdivision + Infrastructure

Berkeley Industrial Subdivision

Burroway Road – Road and Drainage Design

Macquarie University – Campus Wide Infrastructure (Road works, Stormwater, Sewer and Water), Masterplanning for 2031 and Flood Studies

Macquarie University – Balaclava Road Extension and Roundabout Design

697 Anzac Parade, Maroubra – Stormwater Diversion

Blacktown Showground Project – Stormwater Design

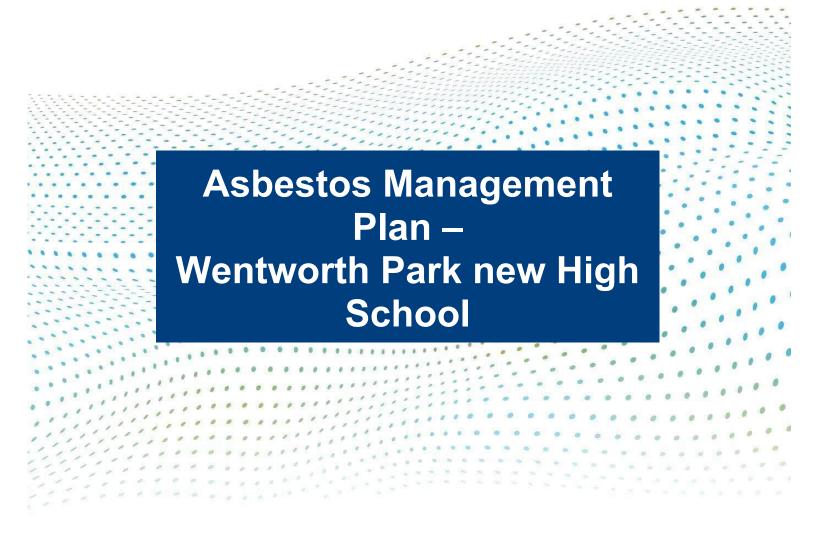
Berkeley Road Industrial Subdivision Stage 2, Berkeley – Flood Study (46ha catchment) and Civil Design



Appendix I Asbestos Management Plan



engineers | scientists | innovators



7 Burroway Road, Wentworth Point, NSW 2127

RobertsCo 21 October 2022 AU122229 CEMP App I



Quality Management

Document Distribution

Issue/Revision	Issue 1	Revision 1	Revision 2
Remarks	DRAFT	FINAL	
Date	23 September 2022	21 October 2022	_
Prepared by	Cissillia Young	Hayden Davies Licensed Asbestos Assesson LAA001437	r
Reviewed by	Lange Jorstad	Lange Jorstad	
Signature	DRAFT	lange Jstad	
File reference	AU122229 Draft AMP 15Sept22	AU122229 FINAL AMP 210ct22	
Distribution	RobertsCoGeosyntec Electronic File	RobertsCoGeosyntec Electronic File	

This report was prepared in accordance with the scope of services set out in the contract between Geosyntec Consultants Pty Ltd (ABN 23 154 745 525) and the client.

Geosyntec Consultants Pty Ltd ABN 23 154 745 525 www.geosyntec.com.au



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Appendices

Appendix A Figures

Appendix B Asbestos Register



1 Introduction

1.1 Background

Geosyntec Consultants Pty Ltd (Geosyntec) was engaged by RobertsCo Pty Ltd (the Client), to prepare a Construction Environmental Management Plan (CEMP) for the Wentworth Point new High School redevelopment project, located at 7 Burroway Road, Wentworth Point, NSW (the project site). The site location is presented in Figure 1 and the site layout is presented in Figure 2, Appendix A.

As per the 2022/2023 budget papers, this is now referred to as "Wentworth Point new high school". Future documentation relating to this project, including this document, will be labelled accordingly.

Due to the SSD-11802230 application being submitted as "Sydney Olympic Park new high school", the project name will remain the same on the Planning Portal and future documentation may reference this.

Please also note 'Wentworth point new high school' is the placeholder name for the school. The school naming will occur closer to opening, following a community consultation process.

Based on review of current spatial data, the site is legally identified as Lot 1 in DP 121276305, and occupies an area of approximately 1 ha. The site is currently vacant land which has been partially capped with up to 2m of certified Virgin Excavated Natural Material (VENM). The proposed redevelopment is understood to include school buildings and open space areas within the development footprint, and is consistent with the definition of 'HIL C' as presented in Schedule B1 of National Environment Protection (Assessment of Site Contamination) Measure (1999) as amended in 2013 (NEPM 2013), which includes public open space land use and secondary schools.

Mr Andrew Lau from JBS&G, an NSW EPA accredited Contaminated Land Auditor, has been appointed by Schools Infrastructure NSW to conduct an audit of the proposed school development with respect to land contamination. This is to ensure that the investigations and any remedial works are undertaken in accordance with the requirements of the NSW Contaminated Land Management Act (1997) so that the land is fit for purpose, and meet requirements of **SSD-11802230**.

The site is impacted with contaminants associated with previous light industrial land use, filling, hazardous building materials, and suspected petroleum storage and infrastructure.

A Remediation Action Plan (RAP) was prepared by Parsons Brinckerhoff (PB) in 2015 for a portion of land identified as Area 1 (part of a wider area known as Stage 1), which included the site.

In 2019, Stage 1 remediation works were undertaken on the wider peninsula site which involved the placement of a cap on part of the area occupied by the proposed school site. The capping works were undertaken by Landcom with Zoic Environmental being the environmental consultant and Mr Andrew Lau appointed as the NSW EPA accredited Site Auditor for these works. Details of the capping works were presented in the following document:

 Zoic Environmental (March 2020) Interim Validation Report Early Works Package Headland Park Wentworth Point Development, 7, 9 and 11 Burroway Road, Wentworth Point, NSW 2127 (Ref: 18170 EW VAL).

The report confirms the placement of capping material in the same configuration that is presently located in this area with the completed works being endorsed by the Site Auditor.

In March 2022 Geosyntec (formerly Zoic) prepared a RAP addendum, to advise on required additions / amendments to the approved PB (2015) RAP, to enable the site to be remediated to



meet the suitable of the revised end use of the site as a school. The RAP addendum required: validation criteria udpates, remediation requirements for identified underground storage tanks and other infrastructure, validation works sampling and analysis plan, requirements for reinstatement of the marker and capping layer following excavations, management measure for the previously placed cap in the western portion of the site, and discussion of ground gas protection systems.

The RAP addendum was endorsed by the Site Auditor, and **condition C32(c) of the SSD** states the recommendations of the Remedial Action Plan Addendum (1 March 2022 prepared by Geosyntec) must be complied with.

The preferred remedial strategy as presented in the PB (2015) RAP, and addendum Geosyntec (2022) RAP, included development of a CEMP for implementation through the remediation and redevelopment works for the infrastructure phase of the project. This CEMP has been prepared in general accordance with the requirements as described in the PB (2015) RAP, the addendum Geosyntec (2022) RAP, and the draft SSD conditions, and has been adapted to meet the requirements of the site.

1.2 Objectives

This AMP form part of the Construction Environmental Management Plan for the SOPHS redevelopment works at the site.

The objective of this AMP is to provide guidance and strategies for the handling, management and treatment of asbestos including the removal, transport and disposal of asbestos-impacted soils from the site if required, in order to protect the health of onsite workers, visitors and potential offsite receptors and prevent potential spread of asbestos contamination offsite.

Specific aims of this AMP are to:

- Outline safe working conditions for workers;
- Outline procedures to manage works where asbestos may be encountered during development activities, including excavation of potential asbestos-impacted soils;
- Outline measures for the safe onsite storage and (where required) disposal of asbestos containing material (ACM) and asbestos-impacted soils in accordance with relevant legal and statutory requirements; and
- Outline ongoing management requirements to ensure that risk posed by potential asbestos contamination is appropriately managed.

1.3 Regulatory Framework

All asbestos-related works including asbestos remediation works will be undertaken in accordance with, but not limited to, all relevant sections of the following guidelines and regulations:

- Work Health and Safety Act 2011.
- Work Health and Safety Regulations 2017.
- Protection of the Environment Operations Act 1997 and associated Regulations.
- WorkCover NSW (now SafeWork NSW) (2014) 'Managing Asbestos in or on Soil', March 2014.
- NSW EPA (2014) 'Waste Classification Guidelines, Part 1: Classifying Waste'.
- National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended in 2013 (NEPM, 2013).



 WA DoH (2009) 'Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia'.

The above guidelines and regulations have been considered in the preparation of this AMP.

All parties involved in site works must ensure that they currently, and for the duration of the project, hold all appropriate licences, approvals and permits for working with asbestos, including excavation, transport and disposal of asbestos waste. These may include, but are not limited to:

- Notification to SafeWork NSW (required 10 days before licensed asbestos removal work is commenced). Notification for friable asbestos removal work, if required, should be accompanied by an Application for Permit for friable asbestos removal works.
- Permit from SafeWork NSW for any removal work involving friable asbestos (if relevant or required)

1.4 Certification and Approval

This AMP is to be reviewed and endorsed by the Site Auditor. Once endorsed by the Site Auditor, the AMP is to be submitted to relevant statutory authorities.

1.5 Project Description

The proposed redevelopment is understood to include school buildings and open space areas within the development footprint.

The Wentworth Point new high school (previously known as the Sydney Olympic Park new high school) is a new high school for 1530 students.

The project was originally to be developed in 2 stages – Stage 1 a Stream 5 school for 850 students, and Stage 2 upgrade to a Stream 9 school for 1530 students.

Development of the school will be in 2 phases:

- Phase 1 to construct all teaching spaces,
- Phase 2 to complete the multipurpose hall, sports courts, and landscaping (once TfNSW/Landcom's peninsula masterplan is amended and the road relocation approved).

With Waterfront views, maritime access and green parkland surrounds, Sydney Olympic Park High School will be a landmark educational facility for SINSW. This future high school has the responsibility to contribute to this growing suburb and be the heart of Wentworth Point's culturally diverse community.

The adjoining land to the east (being developed under separate approval) includes the redevelopment of Burroway Road along the eastern boundary of the school, which will provide car parking, drop off zones, and delivery for the school.



2 Site Identification and Description

2.1 Site Identification

The site location is shown in Figure 1, with the site layout plan in Figure 2, Appendix A. Information in the following section was sourced from the Zoic Environmental Pty Ltd (Zoic) (2019) SAQP – Headland Park (File reference: 18170 SAQP Peninsula Park Landcom 19Feb19 Final) for 7, 9 and 11 Burroway Road, Wentworth Point, NSW 2127, which encompassed the site. The site identification and land use details include:

Table 2.1: Site Identification

Title	Details	
Street Address:	7 Burroway Road, Wentworth Point, NSW 2127	
Property Description:	Lot 1 DP 1276305 (formerly parts of Lots 202, 203 and 204, DP 1216628)	
Current Site Ownership:	NSW Department of Education	
Geographical Coordinates:	Lat: -33.824002° Long: 151.080528°	
Property Size:	Approximately 0.7 hectares	
Local Government Area:	City of Parramatta Council (formerly Auburn City Council)	
Zoning – Existing:	B1 Neighbourhood Centre and R4 High Density Residential	

2.2 Surrounding Land Use

Land uses immediately adjoining the Site are described as follows:

Table 2.3: Immediate Site Surrounds

Title	Details	
North:	Vacant land comprising part of the proposed Wentworth Point Peninsula Park redevelopment area followed by Parramatta River.	
East:	Vacant land comprising part of the Wentworth Point Marina and Rowing Club redevelopment area followed by Homebush Bay.	
South:	Burroway Road followed by a construction site.	
West:	Wentworth Point Public School followed by Marina Square Shopping Mall.	



2.3 Site Conditions

The site condition is based on published information and a review of past reports and is presented in Table 3.1.

Table 2.2: General Site Conditions

Title	Details	
Topography and Drainage:	The site is approximately less than 10m Australian Height Datum (AHD). In general, the site is relatively level and has been subjected to historical filling associated with land reclamation which has altered topography.	
	Surface water is expected to infiltrate into unsealed areas or consist of overland flow and ultimately drain to the Parramatta River or Homebush Bay which are located to the north and east of the site respectively.	
Site Surface & Vegetation:	The site surface consists of concrete slabs in the centre and eastern portions, and previously placed VENM material in the western portion.	
	Vegetation at the site comprises some trees and shrubs growing between the concrete slabs and some grasses growing on the VENM material.	
Condition of Buildings & Roads:	There are currently no buildings or roads onsite.	
Relevant Local Sensitive Environments:		



3 Asbestos Register

The PB (2015) RAP provided a summary of contamination issues at the site. The RAP identified asbestos (bonded and friable) as a contaminant of potential concern (COPC) within the fill material across the wider Stage 1 area, which encompasses the site.

An asbestos register including previous detections within the site from the PB (2015) RAP is provided in Appendix B.



4 Implementation of This AMP

This AMP is applicable for the development activities within the site, where potential ACM could be present.

4.1 Roles and Responsibilities

4.1.1 Roles

Description of the key roles of involved parties is provided below.

Principal Contractor (RobertsCo)

Under the provisions of the Work Health and Safety Regulation 2017 prepared under the Work Health and Safety Act 2011, the Principal Contractor must be appointed as the "person conducting a business or undertaking" (PCBU).

The Principal Contractor has the responsibilities set out in the Work Health and Safety Act and Regulations and the Safe Work Australia Codes of Practice.

The Principal Contractor will also be responsible for co-ordinating health and safety activities related to asbestos for the project.

Competent Person or Licensed Asbestos Assessor

A Competent Person or an Asbestos Assessor shall be engaged to assess any suspected asbestos containing materials encountered during the remediation, validation and development works and provide advice on appropriate procedures for its handling, treatment or management.

A Competent Person is defined in SafeWork Australia (2011a) as "a person who has acquired, through training, qualification or experience, the knowledge and skills to carry out the task" – in this case the task is asbestos identification.

An Asbestos Licensed Assessor is a person who holds an asbestos assessor licenced by SafeWork NSW.

Given friable asbestos may be potentially present at the site, airborne asbestos monitoring and dust monitoring during any asbestos works should be completed by an Asbestos Assessor. Laboratory analysis for air monitoring is discussed in Section 5.3.5.

Licensed Asbestos Removalist

A SafeWork NSW licensed asbestos removalist will be required to undertake asbestos removal as follows:

- Class A (friable) licensed asbestos removal contractor shall be engaged if friable asbestos is identified.
- Class B (non-friable) licensed asbestos removal contractor if more than 10 m² of non-friable asbestos is identified for removal or if there is doubt about the total quantity.

For smaller quantities of non-friable asbestos, a suitably trained and experience contractor is required to conduct the removal work.

The asbestos removal contractor will remove ACM or asbestos impacted soils from the site and remediate or dispose of them to a suitably licensed waste facility or transfer the material to an onsite containment area (if available). The licensed asbestos removal contractor will be the primary person responsible for works on site involving ACM or asbestos impacted soils.



Given friable asbestos may be potentially present at the site, asbestos removal works should be completed by a Class A (friable) licensed asbestos removal contractor.

4.1.2 Responsibilities

Description of the key roles and responsibilities of involved parties in relation to this AMP is provided below in Table 4.1.

Table 4.1. Key roles and responsibilities of involved parties in relation to this AMP

Role	Responsibility
Principal Contractor	Approval of the AMP.
	Provision of safe working environments relating to asbestos.
RobertsCo	 Ensure that all persons involved with the project have undertaken the appropriate workplace health and safety training and have been inducted into the CEMP.
	Ensure that all persons involved with asbestos in asbestos restricted areas have been inducted into this AMP.
	• Ensure that all persons working on the project have been provided with the appropriate workplace health and safety training relating to asbestos, asbestos awareness and identification of asbestos containing materials (ACM).
	 Ensure that all persons working in the project area are appropriately trained for the specific works they undertake.
	Keep all training and induction records relevant to this AMP for persons involved in this project.
	• Ensure that a site-specific safety plan for works in areas where potential asbestos contamination may be encountered is prepared for the site.
	Ensure that any subcontractors provide adequate SWMS for activities where asbestos may be encountered.
	Monitor the compliance with this AMP and relevant regulations, codes and guidelines.
	Control access into areas where asbestos is known to exist.
	Be responsible for the project work at all times until all works are completed.
	Maintain and update the Asbestos Register for this project.
	Auditing compliance with the AMP.
	Manage accident and emergency procedures related to asbestos.
	Inform the Asbestos Assessor of new asbestos finds.
	 Engage a suitably experienced and licensed asbestos removalist and ensure they maintains appropriate licences and permits.
	 Maintain material tracking records relating to the excavation, stockpiling and disposal of asbestos containing materials.
	Keep air monitoring records.
	• Compliance with all other applicable statutory responsibilities related to management of asbestos in the workplace.
Subcontractor(s) and their	Understand the requirements of the CEMP and this AMP.
Supervisor(s) To be Engaged	 Prepare SWMS, as required by the Principal Contractor, for specific activities undertaken within the project where asbestos may be encountered.
	Take reasonable care for their own safety and the safety of others.
	 Attend site inductions, asbestos awareness training and identification of ACM training, and, follow all site rules and work instructions related to asbestos.
	Take immediate action to rectify asbestos hazards that should arise during the course of the work.
	• Immediately report unexpected finds (including asbestos) to site supervisor.
	• Comply with the CEMP, this AMP, SSP, SWMS and other relevant OHS legislation and industry standards.
	Establish and maintain a positive safety climate on the project.
	 Compliance all other applicable statutory responsibilities related to management of asbestos in the workplace.
Licenced Asbestos Removalist To be Engaged	Notify SafeWork NSW in writing at least five days before removal work commences in accordance with Safe Work Australia (2011b).



Role	Responsibility	
	 Obtain Permit from SafeWork NSW for any friable asbestos removal works. 	
	 Undertake asbestos removal work in accordance with Safe Work Australia (2011a & 2011b). 	
	 Compliance with all other applicable statutory responsibilities related to management of asbestos in the workplace. 	
Suitably Qualified	Provision of safe working environment.	
Environmental Consultant / Asbestos Assessor	• Issue this AMP and coordinate works to review/update the AMP, as necessary.	
Geosyntec	Provide onsite supervision of all potential asbestos works.	
Сосодино	 Provide air monitoring services, when required by the SafeWork Australia Codes and/or the Principal Contractor and arrange for display of daily results for information of workers. 	
	 Engage suitably qualified and competent staff and/or contractors to manage works in areas impacted with asbestos. 	
	 Provide advice on handling, management and treatment of potential asbestos impacted material. 	
	Be available, if required, for consultation with regards to conditions and requirements of this AMP.	
	 Provide validation of excavation, waste classification and other advice in relation to asbestos. 	
	Other activities that may be required by the Principal Contractor from time to time.	

4.2 Training and Induction

The Principal Contractor shall ensure that:

- Workers undertaking work onsite must be trained and be given appropriate occupational health
 and safety training in relation to asbestos, asbestos awareness training and training in the
 identification of asbestos containing materials (ACM) which may be encountered during their
 work
- Workers undertaking work within the site must be inducted into the CEMP
- Workers undertaking work in areas where asbestos may be encountered must be inducted into this AMP
- Other visitors entering the site understand the site safety provisions, including those covered in the CEMP and this AMP, as required
- Persons undertaking site induction acknowledge that they have understood the requirements of the site safety and environmental obligations related to asbestos
- Records of the site induction relating to asbestos must be kept

4.3 Audit and Revision of this AMP

The implementation of this AMP should be audited at regular intervals throughout the duration of construction works to confirm that the requirements of the AMP are understood and being implemented and to assess its ongoing suitability.

The audit shall include a site walkover and an assessment of induction, tracking and monitoring records prepared under this AMP. Should the review identify inconsistencies, these shall be documented in a review report and recommendations made for correcting these inconsistencies. The audit shall be documented in a brief audit report which will include recommendations for revisions to the AMP.



In the event that site conditions are substantially different than previously observed and/or the audit process recommends revision of this AMP, this AMP should be updated.

4.4 Non-Conformance to this AMP

In the event of a non-conformance to this AMP, the source and nature of the event will be investigated, the effectiveness of the existing controls reviewed and modified where practical, and necessary strategies will be implemented to minimise further impacts.

If necessary, the AMP will be updated as required to rectify non-conformance with the AMP.



5 Management Plan for Asbestos Impacted Soil

5.1 Asbestos Types, Risk and Potential Exposure Pathways

At the time of preparation of this AMP, friable and non-friable ACM had been identified within the fill material within the wider Stage 1 area which encompasses the site, as detailed in the PB (2015) RAP.

Non-friable ACM is defined by SafeWork Australia (2011b) as "... material containing asbestos that is not friable asbestos, including material containing asbestos fibres, reinforced with a bonding compound." This includes bonded asbestos fragments found in soil.

Friable asbestos is defined by SafeWork Australia (2011b) as "... material that is in a powder form or that can be crumbled, pulverised or reduced to a powder by hand pressure when dry, and contain asbestos." This includes soil impacted with asbestos fibres or fibre bundles, or asbestos fragments which can easily produce asbestos fibre or fibre bundles.

Mechanical disturbance of non-friable asbestos may result in the production of friable asbestos.

Asbestos poses a human health risk through the inhalation of its fibres (WA DoH 2009). If deposited in the lungs, the fibres can initiate diseases which may produce major health effects, such as asbestosis, lunch cancer and/or mesothelioma.

Potential exposure pathways for asbestos relevant to this AMP are considered to be:

- Inhalation of asbestos fibres by workers/visitors during excavation of asbestos containing soil
- Inhalation of asbestos fibres by workers/visitors from stockpiled material containing asbestos
- Inhalation of asbestos fibres by workers or others onsite or offsite during transport of asbestos containing material

5.2 Health and Safety Management

5.2.1 Safe Work Method Statements (SWMS)

The Principal Contractor or subcontractors undertaking works must prepare site specific job hazard assessment and relevant safe work method statements for the work undertaken. The SWMS must include activities where asbestos may be encountered and strategy to minimise exposure to asbestos in accordance to this AMP, including requirements of personal protective equipment (PPE).

Safe Work Method Statements must:

- Describe how work is to be carried out;
- Identify the safety risks;
- Describe the control measures that must be applied to the work;
- Describe the equipment used in the work;
- Describe any standards or codes applicable to the work; and
- Training and qualifications required of persons undertaking the work.

SWMS prepared by the contractors must be reviewed and approved by the Principal Contractor.



5.2.2 Site Access Control, Barriers and Signage

The overall construction area will be secured by fencing, which limits access to public. The Principal Contractor shall also maintain site access control in areas where ACM has been identified or may potentially be present ('restricted asbestos area'). Site access to restricted asbestos areas will be determined by the Site Supervisor. Only authorised and appropriately inducted and trained persons are to be permitted in restricted asbestos areas.

Appropriate warning signs and/or barriers are to be placed around restricted asbestos areas maintaining at least 3m buffer from the impacted area, in accordance with the following regulations and guidelines:

- Standards Australia (1994) 'AS 1319-1994: Safety Signs for the Occupational Environment';
 and
- Safe Work Australia (2011b) 'Code of Practice: How to Safely Remove Asbestos', December 2011

Given asbestos was generally identified to be present within the fill material across the wider Stage 1 area encompassing the site, it is anticipated that areas that are being excavated are generally considered as 'restricted asbestos area'. Access to restricted asbestos areas will be controlled and permitted by the Principal Contractor only after persons entering the site have been advised of the potential contamination hazards. This shall at least include notification of the potential presence of asbestos containing materials and asbestos impacted soils.

Any authorised person accessing the restricted asbestos area should do so in accordance with health and safety requirements as indicated in this AMP. The implementation of the health, safety and environmental requirements should be administered by the Principal Contractor. Site access will not be allowed until workers have been inducted, have signed in, and if entering the restricted asbestos areas must use the required PPE (Section 5.2.3). Upon exiting the site, personnel must remove and dispose of/clean the PPE in the provided decontamination area.

Restricted asbestos area boundaries shall be determined by the Principal Contractor in consultation with the Asbestos Assessor and will vary according to the location and size of the required daily activities. Any restricted asbestos area boundaries will be designed to allow other site works not involving significant intrusive works to continue without being required to adhere to this AMP.

It may be found that restricted asbestos area boundaries require to be assigned to the site boundaries, in which case all site workers must adhere to the requirements of this AMP.

Workers entering restricted asbestos areas must be inducted to this AMP.

5.2.3 Personal Protective Equipment (PPE) Requirement

Requirements of PPE will be determined by the Principal Contractor, depending on the type of work for each activity, and must be covered in the site specific SWMS.

In areas where asbestos containing materials or asbestos impacted soils are not exposed, no additional PPE is required above the standard construction site PPE outlined by the Principal Contractor for the site.

Should suspected ACM be identified outside the restricted asbestos areas, then the Asbestos Assessor should be contacted. If the presence of asbestos is confirmed the additional items of PPE are required in addition to the standard construction site PPE outlined by the Principal Contractor for the site, and applies for any ground workers within the restricted asbestos areas.

The minimum level of additional PPE required for onsite personnel working in a restricted asbestos area is listed below:



- Body Protection. Fluorescent or white disposable coveralls (Tyvek suits) are to be worn during
 excavation activities. For workers undertaking work in the restricted area for asbestos,
 disposable Tyvek suits must be worn. Disposable gloves should also be worn for workers
 contacting soils. Disposable Tyvek coveralls and gloves must be removed when leaving the
 restricted asbestos area and are to be considered as potentially contaminated with asbestos
 and will therefore need to be disposed as asbestos contaminated waste.
- **Respiratory Protection.** Respiratory protection is required to prevent inhalation of airborne dusts. A minimum of a P2 rated disposable mask or respirator fitted with a P2 rated cartridge will be used in the restricted asbestos area.
- Foot Protection. Steel toed boots are to be worn by personnel working on-site.

Eating, drinking, chewing gum or tobacco, smoking or other practices that involves hand to mouth transfer increases the probability of ingestion of foreign matter into the body. Hands must be thoroughly washed before eating, drinking or smoking. Smoking, drinking or eating is not permitted onsite.

Plant operators must close cabin doors and windows when operating within restricted asbestos areas for asbestos.

5.3 Asbestos Management During Construction Works

5.3.1 General intrusive works in areas where asbestos has not been identified

Management of general intrusive works during the construction in areas where asbestos has not been identified is as follows:

- Intrusive work onsite in areas where asbestos has not been identified shall only be carried out
 by suitably qualified and experienced contractors, who have received asbestos awareness
 training and have been trained in the recognition of asbestos;
- Intrusive works can be undertaken in a manner similar to that normally undertaken on similar construction projects, although the ground conditions should be carefully observed by the operator and/or others noting the presence of any evidence of ACM;
- If no visual evidence of ACM is observed works can continue as normal.
- If visual evidence of ACM is observed and/or ACM is encountered (i.e. new asbestos finds), works should cease and the Supervisor informed and should be managed as described in Section 5.3.3 below.

5.3.2 Intrusive Works in Areas where Asbestos Contaminated Fill Materials are not Exposed

Management of general intrusive works during the construction in areas where asbestos contaminated fill materials are not exposed (see Section 3) is as follows:

- In areas where asbestos contaminated fill materials are not yet exposed shall only be carried
 out by suitably qualified and experienced contractors, who have received asbestos awareness
 training and have been trained in the recognition of asbestos;
- A spotter who has received asbestos awareness training and have been trained in the recognition of asbestos should be present to observe the soils being disturbed in the intrusive excavation;
- Intrusive works can be undertaken in a manner similar to that normally undertaken on similar
 construction projects, although the ground conditions shall be carefully observed by the
 operator and the spotter noting the presence of any evidence of ACM;



- If visual evidence of ACM is observed and/or ACM is exposed, works should cease and the Supervisor informed and should be managed as described in Section 5.3.3 below.
- Where excavations occur in the area capped with virgin excavated natural material (VENM)
 located in the west of the site, the above points apply. If excavations proceed beyond the
 marker layer present beneath the VENM cap into underlying site fill soils, the work area is
 classified as a restricted asbestos area and the below sections apply. The marker layer and
 VENM cap must be reinstated following completion of such works, with photographic records of
 reinstatement kept.

5.3.3 Intrusive Works in Areas Classified as Restricted Asbestos Areas

Areas where asbestos has been identified in previous contamination investigations are described in Section 3 are for the purpose of this AMP defined as restricted asbestos areas.

Management of intrusive work in areas classified as restricted asbestos areas will be as follows:

- Intrusive work onsite within restricted asbestos area shall only be carried out by suitably
 qualified and experienced contractors, who have received asbestos awareness training and
 have been trained in the recognition of asbestos, which may be encountered during their work.
- Access to the restricted asbestos area must be controlled as per Section 5.2.2.
- Excavation work within the restricted asbestos area must be observed by an Asbestos Assessor.
- Stockpile management of asbestos impacted material shall be undertaken in accordance with Section 5.3.6.
- Transport and disposal of asbestos impacted material shall be undertaken in accordance with Section 5.3.7.
- An asbestos decontamination area must be present within the restricted asbestos area.
 Decontamination of asbestos shall be undertaken in accordance with Section 5.3.8.

Specific management controls during intrusive work within the restricted area for asbestos are as follows:

Prior to work commencing

- SafeWork NSW should be notified for all asbestos removal work comprising: any friable asbestos removal; and non-friable asbestos removal >10m2 or if there is doubt about the total area. Notifications must be submitted at least 5 days prior to any asbestos being disposed of offsite.
- A SafeWork NSW Permit is required for all friable asbestos removal works. The SafeWork NSW Permit shall be sought by the licenced asbestos removal contractor. Friable asbestos removal permits must be submitted at least 7 days prior to any friable asbestos being disposed of offsite.
- An observation of the surface soil in the area of the excavation should be undertaken. If a small number of ACM fragments are observed, they shall be picked up by a licenced asbestos removalist (if practicable) and placed into a labelled asbestos waste bag and stored in a designated waste storage area for offsite disposal by a licenced asbestos removalist. If significant number of ACM fragments is observed, they shall be dealt with during the excavation as described by the following section. Records of the ACM finds should be maintained in the Asbestos Register for the site by the Principal Contractor (attached in Appendix B).



During excavation

- Personnel undertaking work within the restricted asbestos area must wear minimum PPE as listed in Section 5.2.3. Air monitoring must be undertaken within or adjoining the restricted asbestos area in accordance with Section 5.3.5.
- The excavation shall be kept damp by water spraying during excavation works to reduce the potential of dust generation in accordance with Section 5.3.9.
- Any open excavation shall be covered with HDPE sheeting or similar and secured at the end of each working day.
- Management of potential asbestos impacted soil shall be decided by an Asbestos Assessor in accordance with guidance provided in the PB (2015) RAP, National Environment Protection Measure (NEPM) (as amended 2013), SafeWork NSW (2014) and other appropriate guidelines.

Post excavation

Given that 'cap and contain' has been selected as the preferred remediation strategy for the wider Wentworth Point redevelopment area, remediation of asbestos restricted areas is not required.

5.3.4 New Asbestos Finds and Determination of New Restricted Areas

The strategy for new asbestos finds encountered during the construction is as follows:

- If suspected ACM is encountered in areas outside an existing asbestos restricted area, work must cease within 10m radius of the area. The suspected ACM must be left onsite and appropriately isolated (e.g. by covering) until the area is inspected by the Asbestos Assessor. The Asbestos Assessor will confirm the presence or absence of asbestos. The handling, treatment and/or management of ACM and potentially ACM impacted soil will be decided by a Licensed Asbestos Assessor. If the presence of asbestos is confirmed, the area of at least within 10m radius of the find must be included in the asbestos restricted area and managed as per Section 5.3.3 of this AMP for the remaining duration of the works. Such areas can only be considered as 'cleared' once the material has been capped in accordance with the PB (2015) RAP.
- Records of the ACM finds should be maintained in the Asbestos Register for the site by the Principal Contractor (attached in Appendix B).

5.3.5 Air Monitoring

Asbestos air monitoring is to be carried out by an Asbestos Assessor during any works within a restricted asbestos area which results in disturbance of the ground surface. The purpose of the air monitoring is to verify that the control measures in place to minimise the generation of asbestos fibres into the air are working satisfactorily and that there is no exposure of asbestos fibres to adjacent areas. The air monitoring devices will be placed at the boundaries of the restricted area for asbestos determined as appropriate by the Asbestos Assessor or a Competent Person. The Asbestos Assessor may also consider it to be appropriate to include monitoring on individuals or monitoring on machinery – this would only be carried out following consultation with the Principal Contractor.

Sample collection and analysis will be conducted in accordance with the National Occupational Health and Safety Commission (NOHSC) 'Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition, 3003 – 2005'.

The analysis will be performed by a NATA registered laboratory and reported on endorsed certificates. The results of air monitoring shall be available on a 24-hour turnaround time basis. Daily air monitoring reports shall be kept by the Principal Contractor or site supervisor who should