REPORT TO

ROYAL HASKONING DHV

ON

ASBESTOS MANAGEMENT PLAN

FOR

PROPOSED SEAWALL REPAIRS

AT

SHORELINE FRONTING 148 HUDSON PARADE, CLAREVILLE, NSW

Date: 2 June 2021
Ref: E32115Brpt3-AMP-rev1

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E32115Brpt3-AMP	Final Report	16 April 2021
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Attachments

Abbreviations

Asbestos Containing Material	**ACM**
Asbestos Management Plan	**AMP**
Asbestos Removal Control Plan	**ARCP**
Detailed Site Investigation	**DSI**
Environmental Investigation Services	**EIS**
Environment Protection Authority	**EPA**
High Efficiency Particulate Air	**HEPA**
JK Environments	**JKE**
Map Grid of Australia	**MGA**
National Association of Testing Authorities	**NATA**
Personal Protective Equipment	**PPE**
Protection of the Environment Operations	**POEO**
Remediation Action Plan	**RAP**
Safe Work Method Statement	**SWMS**
Work Health and Safety	**WHS**
Work Health and Safety Plan	**WHSP**

Units

Metres	**m**
Milligrams per Kilogram	**mg/kg**
Micron	**µm**
Percentage weight / weight	**% w/w**

1 INTRODUCTION

Royal Haskoning DHV (RHDHV) ('the client') commissioned JK Environments (JKE) to prepare an Asbestos Management Plan (AMP) for the remediation of the asbestos-impacted fill material associated with the seawall repairs along a portion of the southern foreshore of Pittwater immediately to the north of 148 Hudson Parade, Clareville, NSW.

The development area (the 'site') is shown on Figure 1 and the AMP applied to the development boundaries shown on Figure 2 attached in the appendices. The AMP is to be implemented during remediation and associated seawall repair activities occurring concurrently at the site. The AMP has been prepared to support the lodgement of a development application (DA) with Northern Beaches Council.

JKE has previously completed a preliminary contamination and waste classification screening (PCS) for the proposed repairs at the site in 2019[1]. The PCS identified fill contaminated with fibre cement fragments (FCF) containing asbestos (ACM) in the investigation area. JKE has since prepared a Remediation Action Plan (RAP[2]) for the proposed seawall repairs. The AMP should be read in conjunction with the RAP prepared for the site.

JK Geotechnics (JKG) has completed a geotechnical investigation for the proposed seawall repairs at the site in January 2020[3]. JKG have since prepared reports outlining the specifications required for the seawall repairs. This AMP should be read in conjunction with the JKG reports.

This AMP is required under the Work Health and Safety Regulation 2017 (NSW) and has been developed specifically to outline the necessary requirements for the ongoing management asbestos-impacted fill during the site remediation. This includes management requirements for handling, consolidation, removal, transportation and disposal procedures (if required), temporary stockpiling and for clearance inspections. The AMP has been prepared with reference to SafeWork NSW and reflects the known site conditions relating to asbestos in soil.

1.1 Objectives

The aim of the AMP is to outline the procedures to be implemented in order to effectively manage the asbestos-impacted fill identified at the site in accordance with relevant Codes of Practice and Work Health and Safety (WHS) legislation. The objectives of the AMP are to:

- Outline the known extent of asbestos-impacted fill at the site;
- Identify the safe work procedures to undertake works in such a way as to minimise potential health effects to site workers/contractors and adjacent land users; and
- Document procedures for asbestos waste handling and transport.

[1] JKE (2019), '*Report to Royal Haskoning DHV on Preliminary Contamination and Waste Classification Screening for Proposed Seawall Reports at Shoreline Fronting 148 Hudson Parade, Clareville, NSW*', Report Reference: E32115Brpt, dated 21 June 2019 (Referred to as JKE PCS report)

[2] JKE (2021), '*Report to Royal Haskoning DHV on Remediation Action Plan for Proposed Seawall Reports at Shoreline Fronting 148 Hudson Parade, Clareville, NSW*', Report Reference: E32115Brpt2-RAP-rev1, dated 2 June 2021 (Referred to as JKE RAP report)

[3] JKG (2020), '*Report to Royal Haskoning DHV on Geotechnical Investigation for Proposed Seawall Repairs at Foreshore Area Adjacent to 148 Hudson Parade, Clareville, NSW*', Report Reference: 32115Rrpt Rev1, dated 31 January 2020 (Referred to as JKG report)

1.2 Scope of Work

The scope of work included review of the existing JKE reports, and preparation of the AMP which provides:

- Details of roles and responsibilities;
- Methodologies for protecting workers during excavation works and construction/installation of the capping system, including personal protective equipment (PPE), decontamination and surface clearance requirements; and
- Procedures and protocols to manage the asbestos related risks, minimise potential asbestos exposure risks to personnel/workers involved in the remediation and construction works, safe handling of asbestos containing materials and minimisation of potential asbestos exposure risks to the public in the vicinity of the site.

The scope of work was undertaken with reference to the NSW Government Codes of Practice: How to Manage and Control Asbestos in the Workplace (2019)[4]; and How to Safely Remove Asbestos (2019)[5]. Other guidelines and legislation/regulations have been referenced throughout the AMP where applicable.

[4] NSW Government (2019). *Code of Practice How to Manage and Control Asbestos in the Workplace*. (referred to as CoP How to Manage and Control Asbestos in the Workplace) (August 2019)

[5] NSW Government (2019). *Code of Practice How to Safely Remove Asbestos*. (referred to as CoP How to Safely Remove Asbestos) (August 2019)

2 SITE DETAILS

2.1 Site Identification

Table 2-1: Site Identification

Site Address:	172A Hudson Parade and 30-32 Delecta Avenue, Clareville, NSW
Lot & Deposited Plan:	Part of Lot 142 in DP13760
Current Land Use:	Vacant – Foreshore
Proposed Land Use:	Seawall Repairs
Local Government Authority:	Northern Beaches
Current Zoning:	RE1 – Public Recreation
Site Area (m^2):	Approx. 300m^2
RL (AHD in m) (approx.):	0-10
Geographical Location (decimal degrees) (approx.):	Latitude: -33.635235837 Longitude: 151.308547946
Site Location Plan:	Figure 1
Sample Location Plan:	Figure 2

2.2 Summary of Investigations and Remedial Approach

JKE prepared a PCS report for the proposed development in 2019. The primary aim of the PCS was to identify the potential for site contamination, make a preliminary assessment of the soil contamination conditions and provide a preliminary waste classification for the soil.

The scope of work included a review of site information; preparation of a Conceptual Site Model (CSM); design and implementation of a sampling, analysis and quality plan (SAQP); interpretation of the analytical results against the adopted Site Assessment Criteria (SAC); data Quality Assessment; and preparation of a report including a Tier 1 risk assessment.

The CSM identified the following areas of environmental concern (AEC) on the site:

- Fill material (entire site) – The site appears to have been historically filled to achieve the existing levels. The fill may have been imported from various sources and could be contaminated. The boreholes drilled for the investigation encountered fill ranging in depth from approximately 0.3m to 1.2m below ground level (BGL). ACM were encountered at the surface;
- Use of pesticides – Pesticides may have been used at the site for pest control; and
- Hazardous Building Material – Hazardous building materials may be present as a result of former building and/or demolition activities. These materials may have been imported onto the site with the fill.

Soil samples for the PCS were collected from five locations. Two ACM were obtained for the site surface. The sampling locations are shown on Figure 2.

The laboratory results identified the following:

- Slight detections of Total Recoverable Hydrocarbons (TRH) F1, ethylbenzene and total xylenes were encountered in fill sample BH5 (0-0.1m). A natural soil sample analysed from the same borehole at a depth of approximately 0.4-0.5m did not detect these Contaminants of Potential Concern (CoPC) indicating the impact is confined to the fill soil. These CoPC are not limiting (NL) under the NEMP 2013 Public open space human health SAC. Considering that no buildings or confined spaces are proposed for the development, the SAC is considered applicable to the development; and
- ACM was detected at the surface. The majority of the ACM were detected in the top (south) section of the site in the vicinity of BH5 as shown on the attached Figure 2. The ACM is considered to pose a risk to human receptors and will require remediation.

Based on the findings of the assessment, the PCS concluded that the ACM encountered at the site poses a risk to human receptors and will require remediation. The PCS recommended the following:

- Undertake a Stage 2 Environment Assessment (ESA) or Detailed Site Investigation (DSI) to identify and map the extent of ACM at the site;
- Prepare a RAP for the proposed development;
- Prepare an Asbestos Management Plan (AMP) for the proposed development works; and
- Prepare a Site Validation Report for the remediation works undertaken at the site.

The JKE RAP identified that the preferred option for remediation was consolidation and capping the asbestos-impacted soils on-site beneath a suitably designed capping system and management via a Long-Term Environmental Management Plan (LTEMP). This option was considered to be appropriate on the basis that the strategy aligns with the remediation hierarchy and NEPM principals for minimising unnecessary disturbance of asbestos contaminated soils (i.e. in contrast to a strategy where all asbestos contaminated fill was to be excavated and disposed to landfill). However, some removal of contaminated material and disposal to appropriate facilities may be required as part of the seawall repair works.

As a duty of care, the RAP recommended clearing the site surface of asbestos followed by a surface clearance from an SafeWork NSW Licensed Asbestos Assessor.

2.3 Proposed Development

JKE were provided with the following information for the PCS:

- A site survey plan (Plan No A1 – 10981D1B, dated 16 October 2018) prepared by Byrne and Associates;
- A document (Ref PA1900 – 100NT001, dated 1 August 2018) prepared by RHDHV detail the results of a site meeting held with Council representatives; and
- A report on the condition of the seawall (Project No 30014279, Register No SI – ST001, dated 29 May 2018) prepared on behalf of Council by SMEC.

The SMEC 2018 report recommended a range of short and long term remediation options in order to improve safety which included four potential methods of improving the stability of the existing seawall. Based on the results of the site meeting between RHDHV and Council, a permanent seawall stabilisation solution was required by Council, which addressed the following design consideration: 50 year design life; safety in design; site access constraints; cost effective design; structural integrity; durability; local and global stability; minimum demolition/excavation; erosion of the bedrock in front of the wall; acceptable tenure arrangements; environmental impact; and new stairs to the east of the seawall.

3 ASBESTOS CONTAMINATION INFORMATION

3.1 Contamination Extent

Asbestos is relatively widespread in fill/soil and, for the purpose of this AMP, is considered to extend across the development area as shown in Figure 2 attached in the appendices.

3.2 Exposure Pathways and Risk

The exposure pathway for asbestos is via inhalation of airborne asbestos fibres. Exposure to asbestos fibres poses a potential risk to human health.

The asbestos impacts at the site are associated with ACM within the fill soil. The asbestos-impacted fill is not considered to pose an immediate risk to human receptors while it remains un-disturbed. However, the potential for release and transport of asbestos fibres via disturbance of soil containing asbestos will increase during the proposed seawall repairs. The human receptors most at risk of asbestos fibre release during the remediation works and soil disturbance activities include construction workers during the development, intrusive maintenance workers and off-site land users.

Asbestos fibres can range in size from 0.1 to 10 microns (µm) (one tenth the size of a grain of sand) and are a potential particulate respiratory hazard. The small fibres gain relatively easy access to the lung airways and air sacs. Damage to the respiratory tract generally tends to be time/dose dependent. An individual exposed to high doses of asbestos for long periods of time will have an increased risk of developing asbestos related diseases. In addition, the effects of asbestos related diseases are usually not detectable for 1 to 30 years after the initial exposure. This is called the latency period, and is a distinguishing feature of asbestos related diseases.

4 APPLICATION OF THE AMP AND RESPONSIBILITIES

4.1 Application of the AMP

This AMP shall apply from the commencement of ground disturbance works within the site until appropriate surface clearances and/or capping of asbestos-impacted soil occurs. The AMP is not intended to be a long-term management plan and as such it will cease to apply on completion of the remediation and validation. However, as detailed in the RAP, a long-term Environmental Management Plan (LTEMP) is required to manage potential future disturbance of the capped asbestos-impacted soils following completion of the development and for ongoing use of the site.

4.2 Remediation Contractor

The Remediation Contractor, is foreseen to be the party responsible for the day-to-day implementation of this AMP and shall fulfil the responsibilities of the 'Principal Contractor' (Person Conducting a Business or Undertaking [PCBU]) as defined by SafeWork. It is noted that the Remediation Contractor may appoint appropriately qualified subcontractors or sub-consultants to assist in fulfilling the requirements or the procedures outlined in this AMP. The Remediation Contractor may appoint a Site Manager to be responsible for site activities. In addition to the implementation of this AMP it will be the Remediation Contractor's responsibility to:

- Obtain specific, related approvals as necessary to implement the earthworks, including for example, permits for removal of asbestos-impacted soils, SafeWork notification, etc.;
- Take reasonable steps so that all site works and other related activities are undertaken in accordance with this AMP;
- Maintain all site records related to the implementation of the AMP;
- Take reasonable steps so sufficient information is been provided to engage or direct all required parties, including sub-contractors, to implement the requirements of the AMP other than those that are the direct responsibility of the Principal Contractor;
- Manage the implementation of any recommendation made by those parties in relation to work undertaken in accordance with the AMP;
- Inform, where required, the relevant regulatory authorities of any non-conformances with the procedures and requirements of the AMP in accordance with the procedures outlined in this document;
- Retain records of any contingency actions;
- Review the AMP records on completion of the project for completeness and update the records as necessary; and
- Recommend any modification to general documentation that would further improve the intended outcomes of this AMP.

4.3 Asbestos Contractor

The Asbestos Contractor will be responsible for undertaking all licensed asbestos removal work involving any ACM or asbestos-impacted soils. The Asbestos Contractor must hold a Class A (friable) asbestos removal licence issued by SafeWork NSW.

Engagement of Class A licensed asbestos removal contractor is required due to the potential for identification of friable asbestos at the site. The Asbestos Contractor can be the same entity as the Remediation Contractor. The Asbestos Contractor's responsibilities include:

- Preparation of a site-specific Asbestos Removal Control Plan (ARCP) prior to any asbestos removal works being completed;
- Ensuring compliance with relevant legislation and the conditions of this AMP and ARCP;
- Handling and management of ACM or asbestos-impacted fill at the site in accordance with relevant legislation;
- Undertaking asbestos air-fibre monitoring via designated asbestos sub-contractor or Licensed Asbestos Assessor;
- Taking reasonable steps so appropriate environmental and safety controls outlined in this AMP are maintained for the duration of the works; and
- Assisting the Remediation Contractor and all subcontractors, where required, in complying with relevant legislation and the procedures outlined in this AMP.

4.4 Licensed Asbestos Assessor (or Validation Consultant)

The Licensed Asbestos Assessor is to provide advice on WHS issues for asbestos-related works. The Licensed Asbestos Assessor is to be independent of the Asbestos Contractor and will hold a NSW Asbestos Assessor Licence. The Licensed Asbestos Assessor can be the same entity as the Validation Consultant. The Licensed Asbestos Assessor will be responsible for:

- Undertaking asbestos clearance inspections (as required);
- Undertaking asbestos sampling and assessment (as required);
- Notifying their client with the results of any assessments in a timely manner;
- Providing advice and recommendations arising from monitoring and/or inspections (if engaged to do so by the client);
- Examining and providing comment on WHS documentation with respect asbestos assessment, management and control (if engaged to do so by the client); and
- Notifying the client of any observed or documented non-compliance with this AMP.

4.5 Site Workers and Subcontractors

All subcontractors are to be inducted onto the site and informed of their responsibilities in relation to this AMP as part of the induction. Signing of the site induction is to include agreement by the subcontractors to abide by the AMP requirements. Where necessary, subcontractors are also to be trained in accordance with the requirements of this document. All subcontractors must conduct their operations in accordance with this AMP as well as all applicable regulatory requirements.

4.6 Validation Consultant

The Validation Consultant is responsible for providing advice in relation to the implementation of the RAP and AMP, and for validating the remediation.

5 LEGISLATIVE REQUIREMENTS

5.1 Legislative Requirements and Regulations/Guidelines

All works must be undertaken with regards to (but not limited to) the following:

- Protection of the Environment Operations (POEO) Act 1997 (NSW);
- POEO (Waste) Regulation 2014 (NSW)
- Work Health and Safety Act 2011 (NSW);
- Work Health and Safety Regulation 2017 (NSW);
- Contaminated Land Management Act 1997 (NSW);
- CoP How to Manage and Control Asbestos in the Workplace;
- CoP How to Safely Remove Asbestos;
- National Occupational Health and Safety Commission (NOHSC), (2005). Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition (NOHSC:3003 [2005]);
- NOHSC, (2005). Guidance Note on the Interpretation of Exposure Standards for Atmospheric Contaminants in the Occupational Environment 3rd Edition (NOHSC:3008 [1995]);
- AS/NZS 1715:2009 Selection, Use and Maintenance of Respiratory Protective Devices; and
- AS/NZS 1716:2012 Respiratory Protective Devices.

5.2 Non-Compliance with the AMP

Where a non-compliance with this AMP is identified, the Remediation Contractor should be informed of the non-compliance. The Remediation Contractor is to inform the non-complying party in writing of the non-compliance. The non-compliant party will be required to rectify the non-compliance as soon as possible.

Details of the action taken to rectify the non-compliance shall be provided to the Remediation Contractor. Where a non-compliance cannot be rectified, the AMP is to be reviewed, and revised if required.

5.3 SafeWork Notification

SafeWork NSW must be notified five calendar days in advance of any licensed asbestos removal work. JKE are of the opinion that the notification should be lodged even if off-site “removal” of asbestos does not occur and to prevent delays in the event that offsite removal of asbestos-impacted soil is required. It should be assumed that friable (Class A) asbestos work in being undertaken for the purpose of the notification.

Before commencing licensed asbestos removal work, the Asbestos Contractor is to inform the Remediation Contractor that licensed asbestos removal work is to be carried out at the workplace, and inform them of when the work is to commence.

A copy of the notification is to be provided to the Remediation Contractor and Validation Consultant.

6 ASBESTOS MANAGEMENT

6.1 Asbestos Remediation

Remediation is to occur in accordance with the JKE RAP. Prior to the commencement of any works on-site that involve disturbance of the soil, this AMP is to be reviewed by all relevant parties and steps are to be taken to implement the management and WHS procedures throughout the work.

The work on site will involve:

1) Site establishment and implementation of asbestos control measures;
2) Excavation and off-site disposal of fill soils for installation of the new sea wall (as required);
3) Capping of contamination fill over the entire site; and
4) Validation of the works to occur progressively throughout the remediation program

6.1.1 Summary of Remediation Works

Remediation is primarily based around the installation of an appropriate capping system over the asbestos contaminated soil. This capping system will extend over the entire site shown on Figure 2 where fill material is present. Capping is not considered necessary in the north section of the site, in the foreshore area where exposed bedrock or natural soil is evident at the surface along the foreshore.

The capping specification is outlined in the RAP and example conceptual cross-sections included in the JKG reports prepared for the seawall specifications are attached in Appendix B. In the event that the capping specification is to be altered following the initial consultation, this must be documented by JKE in an addendum to the RAP and AMP if required.

6.1.2 Management of Excavated Material

All material excavated during the repairs should be conducted under the asbestos management controls outlined in this AMP. Any changes to the management of spoil should be discussed with the Validation Consultant. An addendum to the AMP may be required to appropriately capture significant changes to the proposed works.

6.2 Clearance Inspections / Certificates

All parts of the proposed development area will be deemed to be an asbestos-impacted work area until a surface clearance inspection of the capping materials/surface is undertaken and a surface clearance certificate is provided by the Licenced Asbestos Assessor.

In circumstances where an area of the site has been inspected/cleared, but subsequently undergoes further disturbance/excavation, such disturbance/excavation will be deemed to be within an asbestos-impacted work area. On completion of the disturbance, another surface clearance inspection is to be undertaken and a surface clearance certificate is to be provided by the Licenced Asbestos Assessor in order to exclude the area from the asbestos-impacted work area.

6.3 Site Management and WHS

6.3.1 Overview and Required Plans

All site work must be undertaken in a controlled and safe manner with due regard to potential hazards, training / licencing requirements and safe work practices. To assist in achieving this and in addition to this AMP, the following documents, as a minimum, shall be developed by the Principal Contractor (or the relevant subcontractors and provided to the Principal Contractor for approval):

- Work Health and Safety Plan (WHSP) detailing the WHS procedures for the site, this may incorporate or include references to the details in this AMP;
- Safe Work Method Statements (SWMS) which are to be specific to individual tasks undertaken at the site;
- Asbestos Removal Control Plan (ARCP); and
- Emergency Response Plan.

The above documents are to comply with regulatory requirements, including the WHS Regulation and SafeWork NSW requirements.

The ARCP must include:

- Details of how the asbestos remediation works will be carried out, including the method, tools, equipment, PPE to be used and washdown/decontamination facilities; and
- Details of the asbestos-impacted fill to be disturbed, including the known location and where it is to be placed (or removed if required).

The licensed Asbestos Contractor must retain the ARCP in accordance with the WHS Regulation.

6.3.2 Isolation, Barricading and Signage

The Asbestos Contractor will ensure that the necessary measures are in place for the effective exclusion of unauthorised persons to asbestos-impacted work area. The asbestos removal area is to be adequately isolated and must be signposted with warning signs, or labels, as appropriate to ensure personnel are not unknowingly exposed to asbestos when undertaking operational activities.

The location, type and positioning of signs and labels must be decided, or authorised, by a competent person. Asbestos warning signs must comply with the requirement of AS 1319-1994 Safety Signs for the Occupational Environment and the CoP How to Manage and Control Asbestos in the Workplace, for size, illumination, location and maintenance. Warning signs may include some of the following examples:

In-text Figure A: Example signage

6.3.3 Restriction of Access to Asbestos Work Area / Zone

Access to the asbestos-impacted work area(s) will be restricted to:

- Workers engaged in the asbestos remediation works;
- Other persons associated with the asbestos remediation work such as the Licensed Asbestos Assessor and Validation Consultant; and
- Anyone allowed under the WHS Regulation or another law to be in the asbestos works area.

6.3.4 Induction

All site personnel must be inducted by the Remediation Contractor. The induction is to include, but not be limited to, general hazards associated with construction works, hazards specific to the site including asbestos, evacuation and emergency response plans, first aid provisions and providers, what to do in the case of finds of additional asbestos and any aspects of this AMP applicable to their tasks.

6.3.5 Personal Protective Equipment

As a minimum, all personnel on site will be required to wear the following PPE at all times during asbestos remediation works:

- Steel-capped boots (preferably lace-less);
- Hard hat meeting relevant standards;
- High visibility clothing;
- Gloves;
- P2 rated half-face respirator fitted with an appropriate particulate filter in compliance with the relevant standards. Respiratory Protective Devices and be used in accordance with AS/NZS 1715:2009. P2 disposable face masks are not suitable for use during earthworks at this site;
- Disposable coveralls that prevent tearing and penetration of asbestos fibres (e.g. coveralls type 5, category 3 per EN ISO 13982–1 or equivalent); and
- Disposable boot covers made of a material consistent with the disposable coveralls.

Care should be taken to ensure PPE compatibility and that a suitable degree of worker comfort is maintained. Regardless of the PPE adopted, asbestos removal workers must undertake appropriate personal decontamination upon leaving the asbestos work area as outlined in the CoP How to Safely Remove Asbestos.

Workers in enclosed excavator cabins equipped with High Efficiency Particulate Air (HEPA) filtered air conditioning systems may not require use of certain PPE (such as masks/respirators) but should have appropriate PPE on hand for general egress and emergency purposes.

Other/additional PPE may be adopted as required by task-based SWMS.

6.4 Air Monitoring

During all soil disturbance of asbestos-impacted soil and for the duration of the works, airborne asbestos fibre monitoring is to be undertaken by an appropriate subcontractor using calibrated portable air sampling pumps. Monitoring locations shall be determined in agreement with the Licensed Asbestos Assessor, Validation Consultant and Remediation Contractor and shall include consider the surrounding the work area/site boundary. At the end of each monitoring period, the pump and attached filter will be collected and analysed at a NATA-accredited laboratory.

Air monitoring works shall be conducted in accordance with NOHSC Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition (NOHSC:3003 [2005]). The results of air monitoring are to be made available prior to the commencement of work on the following business day (with exception to weekend monitoring). Daily air monitoring reports shall be displayed in a common area outside of the asbestos work area (e.g. site office or lunch shed) or be able to be produced upon request.

The following action levels will be applied upon receipt of daily results:

- Reading of less than 0.01 fibres/mL – control measures in place are working effectively, site works to continue;
- Reading between 0.01 and 0.02 fibres/mL a review of control measures shall be completed in the work area; and
- Reading greater than 0.02 fibres/mL works shall cease until the cause of contamination is identified and rectified and SafeWork shall also be notified.

6.5 Wet Methods

A constant low-pressure water supply is required for wetting down asbestos-impacted soils. This may be achieved via mains or tanker supplied water fitted to a garden hose with a pistol grip (i.e. fogging nozzle). If no water supply is readily available, a portable pressurised vessel, such as a pump-up garden sprayer, may be suitable for small areas. Should potable water be used, Sydney Water should be contacted prior to commencement to establish whether any further approvals are required in the context of the current water restrictions.

6.5.1 Decontamination

When exiting the asbestos work area, which is to be via the one entry / exit point, each person is to undertake personal decontamination. The personal decontamination zone/unit must be located on the edge of the

barricaded work area and include an asbestos waste bin, wet rags/wet wipes, bucket or shower with detergent solution and a sink with soap to wash hands. Personal decontamination involves the following:

- A damp rag or wet wipe is used to wipe down the exterior surface of the overalls and boot covers;
- Removal of boot covers and placing in appropriate plastic bags within the provided disposal bin located at the decontamination zone;
- Rinsing boots in a bucket or shower with detergent solution in the decontamination zone to remove residual soil from the boots, or alternatively, wiping down with a wet rag;
- Removing overalls and gloves and placing in appropriate plastic bags within the provided disposal bin located at the decontamination zone. For privacy this can be undertaken in a designated decontamination area surrounded by black plastic or in a decontamination unit;
- Removing of P2 respirator and wiping down with damp rag or wet wipe; and
- Thoroughly washing of hands (including under nails) with water and detergent.

This procedure should comply with Table 3 Personal Decontamination as presented in the CoP How to Safely Remove Asbestos. A water supply for decontamination purposes is to be maintained at the entry / exit point at all times.

With respect to any plant or equipment used in the asbestos work area, these are to be appropriately decontaminated at the edge of the asbestos removal area on a designated area overlain with geofabric. Vehicles, excavators, etc. are to be inspected and clods of soil are to be removed. Where deemed necessary, plant can also be wetted down with a fine mist/water spray. The amount of water generated from these decontamination activities is not expected to be significant and hence will infiltrate into the surface within the exclusion zone. However, if the volume of water used causes surface migration then the exclusion zone is to be bunded to an appropriate height to prevent water migrating outside the exclusion zone. In this regard changes to the delineated exclusion areas and other entry / exit points within the site and hence any changes to the decontamination point are to be made aware to site personnel by the Remediation Contractor.

Any water collected as part of the above decontamination works (or asbestos works more generally) is to be placed in a suitable leak-proof receptacle and disposed of as asbestos containing waste by a suitable licensed liquid waste contractor.

Any other equipment (e.g. shovels) leaving the exclusion zone are to be decontaminated. Where possible this should be done with a detergent solution within the exclusion zone. If not possible to decontaminate equipment, then the equipment must be sealed in a suitable container until it is next used for asbestos removal purposes. Such containers must be appropriately labelled to warn of the asbestos risk and the exterior of the container decontaminated prior to it leaving the asbestos removal area.

6.5.2 Dust Control / Management

Given the potential for friable asbestos at the site, it is important to mitigate risk through appropriate dust control measures and that such measures are adhered to. The following is provided as a guide to control dust during earthworks and whilst soils remain exposed at the ground surface:

- Erection of dust screens around the perimeter of the site;

- Dampening with water of the proposed excavation area prior to commencement of excavation;
- Prior to movement of stockpiled soils, dampening with water across the stockpile surface;
- During soil movement the materials should be kept sufficiently damp to minimise the emission of dust;
- Ceasing works during periods of high winds;
- If trucks are required to enter the asbestos work area, the wheels of the trucks and the sides of the body should be washed down before the truck leaves the asbestos work area; and
- Securely covering all loads entering or exiting the site.

The excavation surface should be continually monitored and the surface wet down as drying occurs. This process should continue until the remediation works is complete and the areas are successfully validated.

The above method relies on the following factors:
- Use of water fogging nozzle (not high-pressure hoses); and
- Constant vigilance of trained operators/contractors.

Water used for dust suppression is to be only the minimum required to prevent dust generation and must not to be allowed to escape the confines of the works areas. If dust is unable to be appropriately managed at any time, works are to cease until the dust is sufficiently suppressed.

6.6 Stockpile Management

Any temporary stockpiles must be kept damp (not flooded) and covered by secured heavy duty plastic (200µm) or geofabric as soon as practical. Stockpiles should not remain exposed/uncovered overnight or during periods of high winds or where site works have ceased.

All stockpiles should be appropriately bunded. All stockpiles must be maintained within an asbestos-impacted zone and managed accordingly. Where a stockpile is removed from an area, the ground surface beneath the stockpile may require a surface clearance inspection.

6.7 Unexpected Finds Protocol

It is acknowledged that ground conditions between previous sampling points may vary, and further hazards may arise from unexpected sources and/or in unexpected locations during site works. The nature of any residual hazards which may be present at the site are generally detectable through visual (e.g. significant friable types of asbestos) or olfactory (e.g. stained soil or hydrocarbon odours in soil) means. In the event of an unexpected find, work in the area should cease and the Validation Consultant should be contacted to inspect the find and provide further advice.

6.8 Surplus of Asbestos-Contaminated Soil

In the event that there is a surplus of asbestos-contaminated fill that cannot be consolidated and capped on-site, the surplus material will need to be assigned a waste classification in accordance with the NSW EPA guidelines and disposed of to a licenced facility, or an alternative strategy will need to be developed by the

Validation Consultant. Dependant on the outcome of the alternative approach, an addendum AMP may need to be provided for the works to continue.

6.9 Waste Management

6.9.1 Asbestos Waste (consumables and ACM fragments)

All asbestos waste, including any identified ACM fragments, used disposable coveralls, boot covers, gloves, respirators, plastic sheeting and items deemed contaminated with asbestos are to be kept damp until they can be placed in double-sealed, 200µm thick plastic sheeting, asbestos waste bags or another suitable receptacle. The sealed waste shall be appropriately labelled as containing asbestos and removed from site as soon as practicable.

Asbestos waste shall not be allowed to accumulate excessively within the work area and shall be bagged or placed in appropriate receptacles as the work proceeds.

Controlled wetting of waste shall be used to eliminate asbestos dust emission during bag sealing or in case of subsequent rupture of a bag. Bags and sheeting which have contained asbestos material shall not be reused, and bags and sheeting marked as asbestos waste shall not be used for any other purpose.

Asbestos waste bags shall not be filled more than half full, in order to minimise the risk of bag tearing / splitting and to assist in manual handling of bags. The neck end of each bag shall be twisted tightly, folded over and the neck secured in the folded position with wire ties, adhesive tape or another effective method. Sealed asbestos waste shall be detailed clean of any visible asbestos residue before being removed from the asbestos removal area.

All drums or bins used for the storage and disposal of asbestos waste are to be in a good condition, with lids and rims in good working order, and free of hazardous residues. The drums or bins should be lined with plastic (minimum 200µm thickness), and labels warning of the asbestos waste should be placed on the top and side of each drum or bin, with the words, ‘Danger: Asbestos. Do not break seal’ (or similar). If the drum or bin is to be re-used, the asbestos waste must be packed and sealed so that when the drum or bin is emptied there is no residual asbestos contamination.

Controlled wetting of the waste should be used to reduce asbestos dust emissions. Where possible, the drums or bins should be placed in the asbestos work area before asbestos work begins. The drums or bins should have their rims sealed and their outer surfaces wet wiped and inspected before they are removed from the asbestos work area. If it is not possible to locate the drums or bins inside the asbestos work area, they should be located as close to the work area as possible. Routes for moving the waste from the asbestos work area to the waste drums or bins should be designated prior to the commencement of each task. Drums or bins used to store asbestos waste should be stored in a secure location within the site when they are not in use.

If the volume or size of the asbestos waste cannot be contained in asbestos waste bags, drums or bins, a waste skip, vehicle tray or similar container that is in good condition can be utilised. The asbestos should be

sealed in double-lined, heavy duty polyethylene sheeting (minimum 200µm thickness) or double bagged before it is placed in the skip, tray or similar container. Non-friable asbestos waste may be placed directly into a skip or vehicle tray that has been double-lined with polyethylene sheeting, provided it is kept damp to minimise the generation of airborne asbestos.

Once the skip, tray or similar container is full, its contents should be completely sealed with the polythene sheeting. If the skip is emptied at a waste disposal site, waste disposal procedures which prevent the tearing of the polythene lining should be developed. If asbestos waste cannot be disposed of immediately, the skip may be used for storing the asbestos waste on site over a period of time, provided that the contents are secured (i.e. using a lockable lid or locating the skip in a secure area) to prevent unauthorised access.

Current requirements for asbestos waste disposal must be adhered to and copies of asbestos waste disposal certificates / receipts must be provided.

6.9.2 Loading, Transport and Disposal of Asbestos Waste

A waste classification is required for any waste soil containing asbestos in accordance with the Waste Classification Guidelines 2014. Once the waste classification is complete, a waste classification report is to be prepared. Asbestos waste can only be disposed of to a waste facility licensed by the NSW EPA to receive asbestos waste. The nominated landfill should be contacted to obtain the required approvals prior to commencement of excavation and or loading of asbestos waste.

Part 7 of the POEO Waste Regulation set outs the requirements for the transportation and management of asbestos waste and Clause 79 of the POEO Waste Regulation requires waste transporters to provide information to the NSW EPA regarding the movement of any load in NSW of more than $10m^2$ of asbestos sheeting, or 100 kilograms of asbestos waste. To fulfil these legal obligations, asbestos waste transporters must use WasteLocate.

Clause 78 of the POEO Waste Regulation requires that a person who transport asbestos waste must ensure that:

- Any part of any vehicle in which the person transports the waste is covered, and leak-proof, during the transportation; and
- If the waste consists of bonded asbestos material—it is securely packaged during the transportation; and
- If the waste consists of friable asbestos material—it is kept in a sealed container during transportation; and
- If the waste consists of asbestos-contaminated soils—it is wetted down.

Clause 81 of the POEO Waste Regulation stipulates that a person must not cause or permit asbestos waste in any form to be re-used or recycled.

7 DOCUMENTATION REQUIREMENTS

Documentation is to be maintained by each party throughout the project and provided to other relevant parties to meet the validation and regulatory requirements for the site. The documentation relevant to each part is discussed in the following subsections:

7.1 Remediation Contractor Requirements

The Remediation Contractor (or their nominated subcontractor) is to maintain (or prepare, where relevant) the documentation outlined below:

- Any licences and approvals required for the works which are the responsibility of the Remediation Contractor to provide;
- All asbestos awareness training records and registers;
- Tracking of asbestos waste and asbestos-impacted fill from cradle-to-grave is required by the Remediation Contractor and the records are to be provided to the Validation Consultant. For waste materials disposed off-site, this will require the documentation of an appropriate tracking register outlining all dates/times of waste movements, registration numbers of vehicles, a summary of any waste classification relating to the waste, the tonnage of each load of waste, load characteristics, destination, waste docket (i.e. the weighbridge docket from the landfill) number and WasteLocate tracking number;
- Records of any non-compliance or implementation of contingency actions;
- All surface clearance documentation and air monitoring results; and
- Incident reports.

7.2 Asbestos Contractor

The Asbestos Contractor is to provide the following documentation to the Remediation Contractor:

- SafeWork notification (approval);
- ARCP and SWMS/WHSP;
- All surface clearance documentation and air monitoring results they arrange via their nominated asbestos sub-contractor; and
- Any records in relation to unexpected finds or non-compliance with the AMP.

7.3 Licensed Asbestos Assessor (or Validation Consultant)

The Licensed Asbestos Assessor is to provide the following documents to the Asbestos Contractor:

- Clearance certificates;
- Any other laboratory reports for additional testing (if undertaken); and
- Written notices of any non-compliance with the AMP.

7.4 Validation Consultant

In the context of the AMP, the Validation Consultant is to be provided with copies of all records and documents listed above for review and inclusion in the final site validation report.

8 LIMITATIONS

- JKE accepts no responsibility for any unidentified contamination issues at the site. Any unexpected problems/subsurface features that may be encountered during future development or maintenance works should be inspected by an environmental consultant as soon as possible;
- Previous use of this site may have involved excavation for the foundations of buildings, services, and similar facilities. In addition, unrecorded excavation and burial of material may have occurred on the site. Backfilling of excavations could have been undertaken with potentially contaminated material that may be discovered in discrete, isolated locations across the site during future work;
- This report has been prepared based on site conditions which existed at the time of the due diligence investigation and subsequent validation assessment; scope of work and limitations outlined in the JKE proposal; and terms of contract between JKE and the client (as applicable);
- Subsurface soil and rock conditions encountered between investigation locations may be found to be different from those expected. Groundwater conditions may also vary, especially after climatic changes;
- The preparation of this report has been undertaken in accordance with accepted practice for environmental consultants, with reference to applicable environmental regulatory authority and industry standards, guidelines and the assessment criteria outlined in the report;
- Where information has been provided by third parties, JKE has not undertaken any verification process, except where specifically stated in the report;
- JKE has not undertaken any assessment of off-site areas that may be potential contamination sources or may have been impacted by site contamination, except where specifically stated in the report;
- JKE have not and will not make any determination regarding finances associated with the site;
- Additional investigation work may be required in the event of changes to the proposed development or land use. JKE should be contacted immediately in such circumstances;
- Material considered to be suitable from a geotechnical point of view may be unsatisfactory from a soil contamination viewpoint, and vice versa; and
- This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose.

Appendix A: Figures

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM, 28 DEC 2018.

This plan should be read in conjunction with the Environmental report.

Title: **SITE LOCATION PLAN**

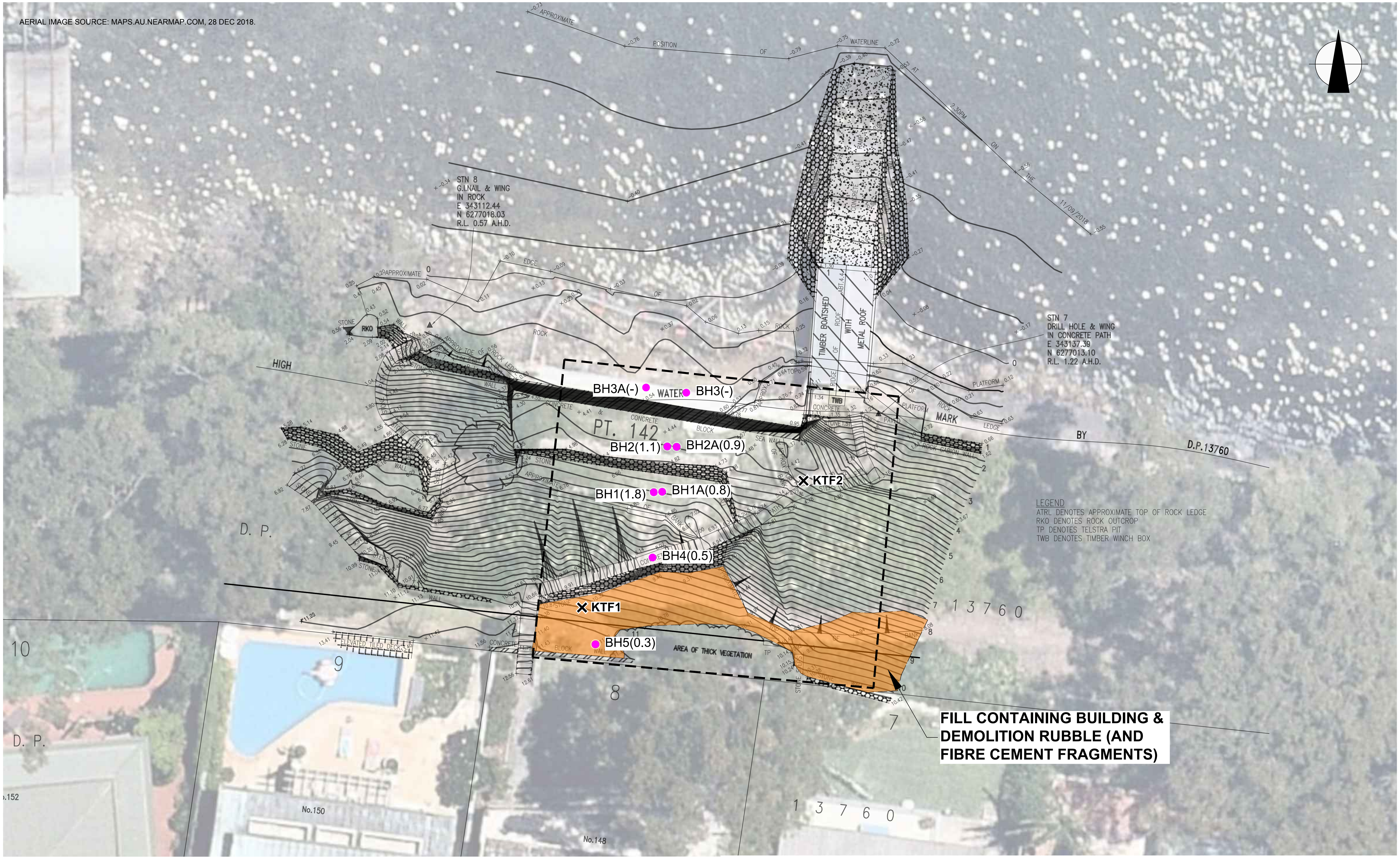
Location: 148 HUDSON PARADE
CLAREVILLE, NSW

Report No: E32115B

Figure No: 1

JKEnvironments

PLOT DATE: 29/05/2019 11:31:09 AM DWG FILE: S:\S EIS\SC EIS JOBS\32000'S\E32115B_CLAREVILLE\CAD\E32115B.DWG



AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM, 28 DEC 2018.
BH3A(-)
BH3(-)
BH2(1.1)
BH2A(0.9)
BH1(1.8)
BH1A(0.8)
BH4(0.5)
BH5(0.3)
KTF1
KTF2
PT. 142
D.P. 13760
AREA OF THICK VEGETATION
FILL CONTAINING BUILDING & DEMOLITION RUBBLE (AND FIBRE CEMENT FRAGMENTS)
STN 8 G.I.NAIL & WING IN ROCK E 343112.44 N 6277018.03 R.L. 0.57 A.H.D.
STN 7 DRILL HOLE & WING IN CONCRETE PATH E 343137.39 N 6277013.10 R.L. 1.22 A.H.D.
LEGEND
ATRL DENOTES APPROXIMATE TOP OF ROCK LEDGE
RKO DENOTES ROCK OUTCROP
TP DENOTES TELSTRA PIT
TWB DENOTES TIMBER WINCH BOX
TIMBER BOATSHED WITH METAL ROOF
No.150
No.148

LEGEND

APPROXIMATE SITE BOUNDARY

BH (Fill Depth) BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)

KTF1 FIBRE CEMENT FRAGMENT (FCF)

SCALE 0 2 4 6 8 10 METRES 1:200 @A3

This plan should be read in conjunction with the Environmental report.

Title: **SAMPLE LOCATION PLAN**

Location: 148 HUDSON PARADE CLAREVILLE, NSW

Report No: E32115B

Figure No: 2

JKEnvironments

PLOT DATE: 29/05/2019 11:30:21 AM DWG FILE: S:\5 EIS\5C EIS JOBS\32000'S\E32115B_CLAREVILLE\CAD\E32115B.DWG

Appendix B: JKG Seawall Repair Specification

LEGEND

- ● BOREHOLE
- ⊗ ROW 5 RL1.0m
  ROW 4 RL2.4m
- × ROW 3 RL4.4m
- × ROW 2 RL6.4m OR ABOVE STEP AT REAR OF SLIP
- × ROW 1 RL8.7m

NOTES:

1. ACTUAL BOLT PLACEMENT DEPENDANT ON LOCALISED GEOMETRY & TO BE SET OUT BY GEOTECHNICAL ENGINEER.
2. ROW 4+5 BASED ON ELEVATIONS @ CHAINAGES:
   0.6m, 2.5m, 8.0m, 9.5m, 12.25m, 15.0m, 16.5m, 19.25m AND 22.0m.

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

0 2 4 6 8 10

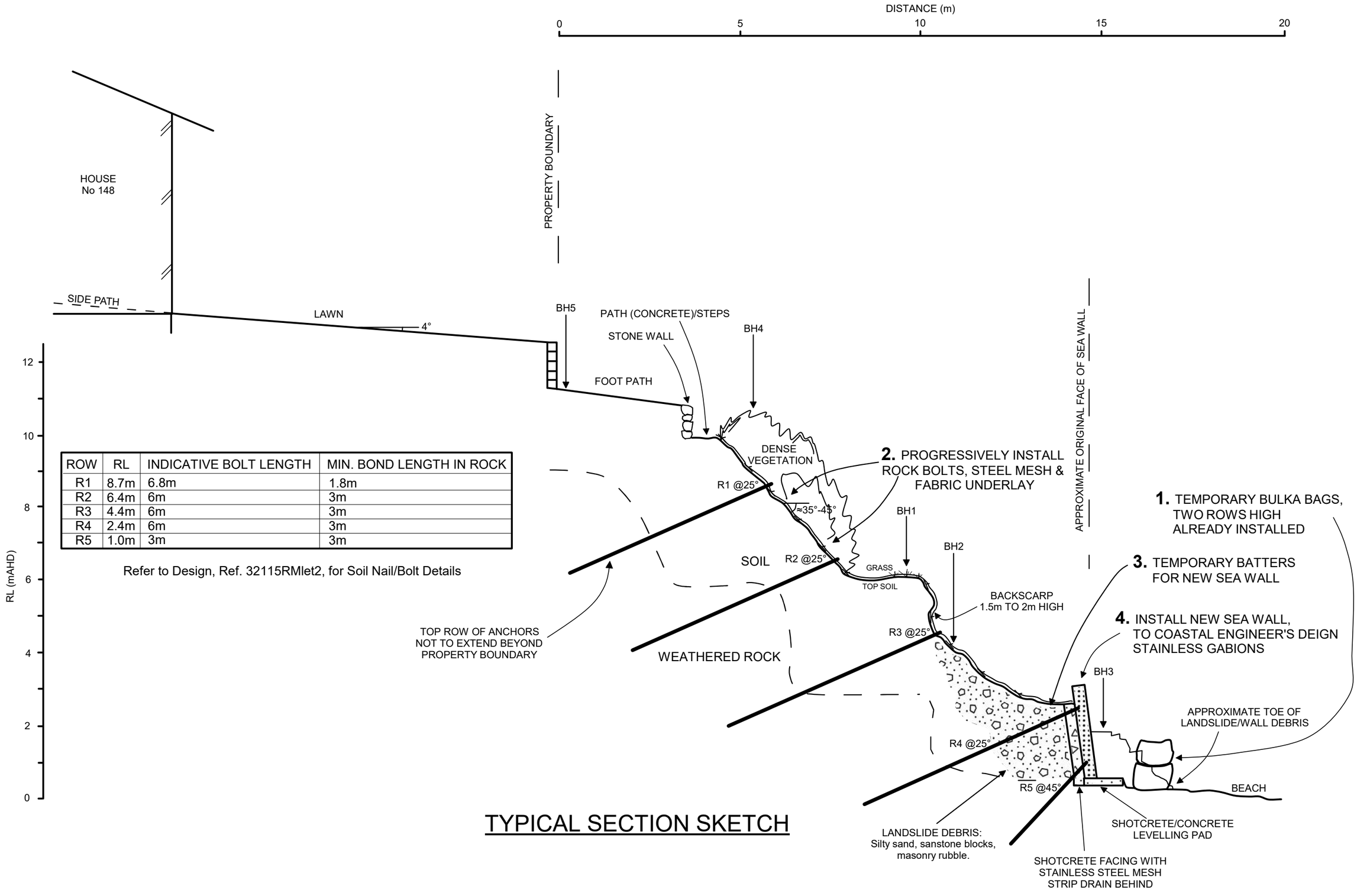
SCALE 1:200 @A3 METRES

This plan should be read in conjunction with the JK Geotechnics report.

Title:	**SITE PLAN INDICATING PROPOSED ROCK BOLTS**
Location:	148 HUDSON PARADE CLAREVILLE, NSW
Report No:	32115RMspecRev1
Figure No:	1

JKGeotechnics

PLOT DATE: 1/06/2021 11:57:58 AM DWG FILE: Y:\32000'S\32115R CLAREVILLE\CAD\32115RMSPECREV1.DWG



ROW	RL	INDICATIVE BOLT LENGTH	MIN. BOND LENGTH IN ROCK
R1	8.7m	6.8m	1.8m
R2	6.4m	6m	3m
R3	4.4m	6m	3m
R4	2.4m	6m	3m
R5	1.0m	3m	3m

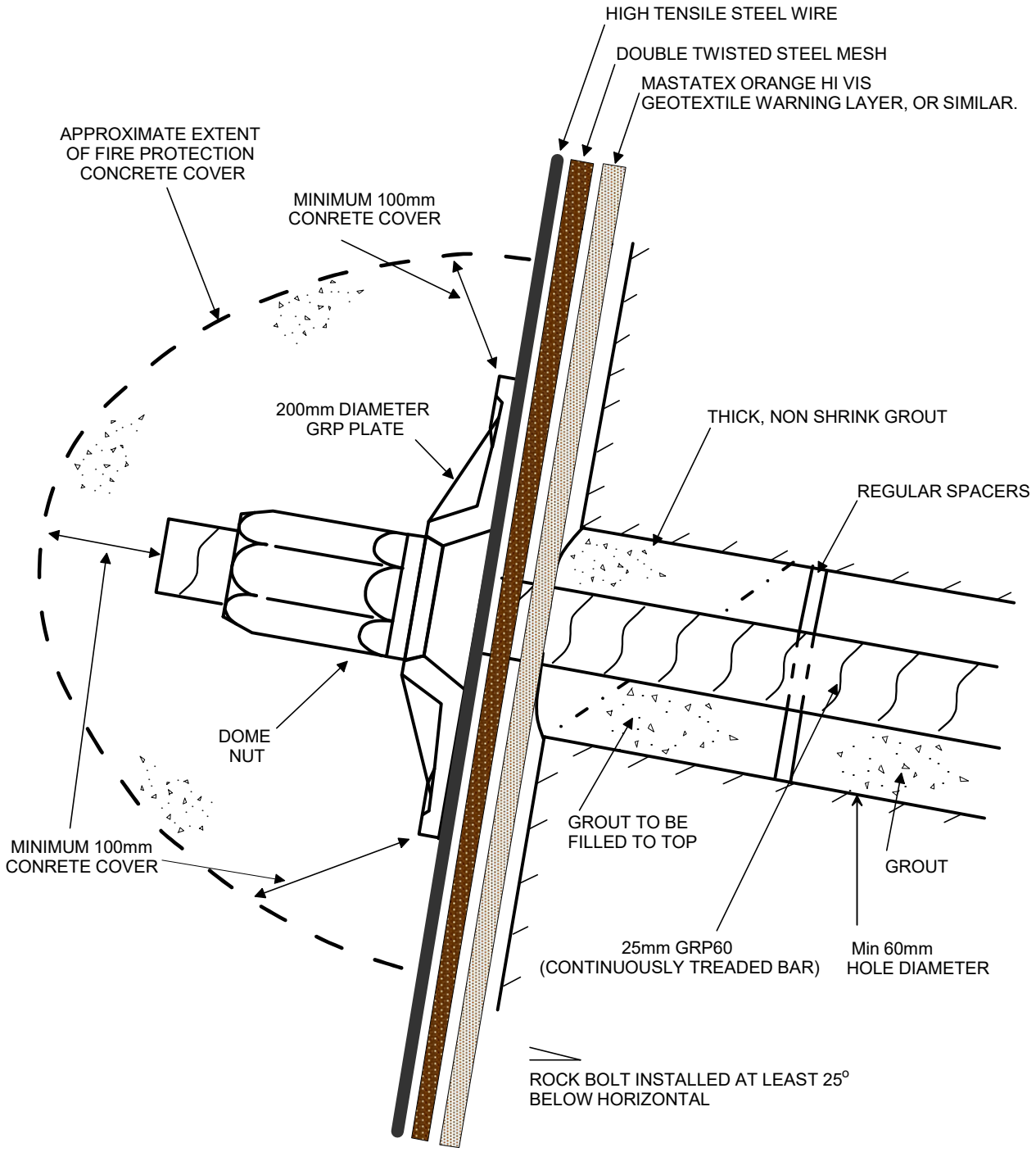
Refer to Design, Ref. 32115RMlet2, for Soil Nail/Bolt Details

TYPICAL SECTION SKETCH

0 5
Scale 1:100 @A3 Metres

JKGeotechnics

Report No. 32115RMspecRev1 Figure No. 2



TYPICAL ROCK BOLT HEAD DETAIL SUPPORTING STEEL MESH FACING

NOTE: REFER TO TEXT OF SPECIFICATIONS FOR FURTHER DETAILS.

NOT TO SCALE

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Report No. 32115RMspec Rev1 Figure No. 3