

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

Blocks 11, 12 and 13, Section 67,
Acton, ACT, 2601

April 2021



Client: Construction Control (CC)

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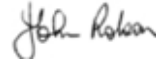
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 (CEMP)
 Blocks 11, 12 and 13, Section 67
 Acton, ACT 2601

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TABLE OF CONTENTS

1 INTRODUCTION AND BACKGROUND 6

1.1 OBJECTIVES OF THE CEMP 7

2 SITE INFORMATION 8

2.1 WORKS AREA DETAILS 8

2.2 SURROUNDING LAND USES 8

2.3 SITE TOPOGRAPHY 9

2.4 GEOLOGY 9

2.5 HYDROGEOLOGY 9

3 PROPOSED WORKS ACTIVITY 10

3.1 DESCRIPTION OF WORKS 10

3.2 PREVIOUS ENVIRONMENTAL ASSESSMENTS 10

4 ROLES AND RESPONSIBILITIES FOR CEMP IMPLEMENTATION 14

4.1 APPLICABILITY OF THE CEMP 14

4.2 CEMP LIFESPAN AND AMENDMENTS 14

4.3 RESPONSIBILITIES 14

4.3.1 *CEMP Induction* 15

4.3.2 *Environmental Consultant and Asbestos Assessor* 16

5 UNEXPECTED FINDS PROTOCOL (UFP) 17

5.1 SOIL/FILL MATERIAL CONTAMINATION 17

5.2 INDICATORS OF POSSIBLE SOIL/FILL MATERIAL CONTAMINATION 17

5.3 VISUAL DISCOLOURATION OR STAINING OF SOIL/FILL MATERIAL 18

5.4 SOIL/FILL MATERIAL TEXTURE 18

5.5 DISTINCT ODOURS EMANATING FROM SOIL/FILL MATERIAL 18

5.6 BUILDING/DEMOLITION RUBBLE 19

5.7 NATURALLY OCCURRING ASBESTOS (NOA) 19

5.8 IN-GROUND INFRASTRUCTURE CONSTRUCTED WITH HAZARDOUS MATERIALS 20

5.9 GENERAL INFORMATION ON ASBESTOS 20

5.10	ASBESTOS CONTAINING MATERIAL STRUCTURE	21
5.11	UNEXPECTED FINDS PROTOCOL.....	21
5.12	UNEXPECTED FINDS PROTOCOL DECISION PROCESS FLOW CHART	22
6	ENVIRONMENTAL MANAGEMENT ACTIVITIES AND CONTROLS.....	23
6.1	SCREENING FOR SOIL/FILL MATERIAL CONTAMINATION	23
6.2	SCREENING OF SOIL/FILL MATERIAL FOR HAZARDOUS MATERIALS	23
6.3	INDICATORS OF POSSIBLE CONTAMINATION/HAZARDOUS MATERIALS	23
6.4	MANAGEMENT OF SOIL/FILL MATERIAL DURING EXCAVATION WORKS	24
6.5	SEDIMENT AND EROSION CONTROLS	27
6.6	ASSESSMENT OF SOIL/FILL MATERIAL FOR OFFSITE DISPOSAL/BENEFICIAL REUSE ..	27
6.7	VALIDATION OF EXCAVATIONS AND STOCKPILE FOOTPRINTS.....	28
6.8	NOISE.....	28
6.9	DUST.....	29
6.10	IMPORTATION OF SOIL	30
6.11	HOUSEKEEPING AND SITE APPEARANCE	30
6.12	RECORDS AND REPORTING.....	30
7	HEALTH AND SAFETY MANAGEMENT	32
7.1	HAZARDS ASSOCIATED WITH HYDROCARBON IMPACTED SOILS	32
7.2	HAZARDS ASSOCIATED WITH ASBESTOS CONTAINING MATERIALS	32
7.3	PROJECT HEALTH AND SAFETY OFFICER	32
7.4	PERSONAL PROTECTIVE EQUIPMENT.....	33
7.5	SAFE WORK PRACTICES	33
7.6	EMERGENCY AND INCIDENT CONTROL MEASURES.....	33
	7.6.1 <i>Emergency Control Measures.....</i>	33
	1.3.1 <i>Incident Control Measures.....</i>	34
8	REFERENCES.....	36
9	ABBREVIATIONS.....	37
10	STATEMENT OF LIMITATIONS.....	39

TABLES IN TEXT

Table A:	Site Details
Table B:	Project Team
Table C:	Soil/Fill Material Colours
Table D:	Odour Descriptions
Table E:	Description of Odour Strength

LIST OF ATTACHMENTS

Report Terms and Conditions

Figures

Figure 1:	Site Location Plan
Figure 2:	Detailed Site Plan

Appendices

Appendix A:	CEMP Compliance Agreement
Appendix B	Photographs of Indicators of Soil/Fill Material Contamination
Appendix C:	ACT EPA Information Sheets 4, 5 and 6
Appendix D:	Erosion and Sediment Control Plan
Appendix E:	Material Tracking Form

1 INTRODUCTION AND BACKGROUND

Robson Environmental Pty Ltd (Robson) was engaged by Construction Control (CC) to prepare this Construction Environmental Management Plan (CEMP) for the management of potential environmental impacts during the development of Blocks 11, 12 and 13, Section 67, Acton, ACT, 2601, herein referred to as 'the site'. The site is shown on **Figures 1 and 2**.

Robson understands that CC are required to provide a CEMP to manage environmental impacts and for the management of unexpected finds specific to potential soil contamination and/or hazardous materials in soil/fill materials found across the site, as part of the development works approval process. This CEMP must detail, amongst other things, the management of identified impacts at the site, the management of any unexpected finds identified during development works under and Unexpected Finds Protocol (UFP) and the assessment and offsite reuse/disposal of excavated surplus or unsuitable soil/fill materials from the site.

The primary purpose of this CEMP is to:

- Define the roles and responsibilities of persons and organisations involved with the implementation of this plan;
- Provide procedures for managing excavated soil/fill material to protect the environment and health of workers and the public;
- Provide procedures for the management of any unexpected finds of soil contamination and/or hazardous materials identified during works on site;
- Provide details regarding the assessment and reuse of excavated soil/fill material from the site.

This CEMP has been prepared in general accordance with the following ACT legislation and ACT Environment Protection Authority (EPA) endorsed guidelines:

- ACT Environment Protection Act 1997;
- ACT EPA (2005) 'Environment Protection Regulation';
- ACT EPA (2017) 'Contaminated Sites - Environment Protection Policy';
- ACT EPA (2013) 'Environment Guidelines for Preparation of an Environmental Management Plan';
- ACT EPA (2011) 'Environment Protection Guidelines for Construction and Land Development in the ACT';
- ACT EPA (2019) Environment Protection Information Sheet 4 '*Requirements for the Re-Use and Disposal of Contaminated Soil*';
- ACT EPA (2016) Environment Protection Information Sheet 5 'Requirements for the transport and disposal of asbestos contaminated wastes';
- ACT EPA (2016) Environment Protection Information Sheet 6 'Management of small scale, low risk soil asbestos contamination';
- ACT EPA Environment Protection (Noise) Environment Protection Policy 2012;
- ACT EPA (2015) 'Policy on Institutional Controls and Enforcement of Site Management Plans required for Contaminated Sites';

- Environment ACT (2000) 'ACT's Environmental Standards: Assessment & Classification of Liquid & Non-liquid Wastes';
- National Environment Protection Council (NEPC, 1999) '*National Environment Protection (Assessment of Site Contamination) Measure 1999*' revised 2013 and herein referred to as the ASC NEPM (2013);
- Western Australia (WA) Department of Health (DoH) (2009) 'Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia', herein referred to as the WA Guidelines.

1.1 Objectives of the CEMP

The objective of the CEMP is to manage potential environmental impacts that may occur during the construction process and any unexpected finds specific to either soil contamination and/or hazardous materials encountered in soil/fill material onsite.

THIS REPORT MUST NOT BE REPRODUCED EXCEPT IN FULL AND MUST BE READ IN CONJUNCTION WITH THE REPORT TERMS AND CONDITIONS INCLUDED AFTER THE ABBREVIATIONS SECTION IN THIS REPORT.

2 SITE INFORMATION

2.1 Works Area Details

The location of the site is shown on **Figures 2**. Details regarding the site are presented in **Table A** below.

Table A: Site Details

Block and Section	Blocks 11,12 and 13, Section 67, Acton
Works Area	Block 11: Approximately 1,089 square metres (m ²). Block 12: Approximately 879 m ² . Block 13: Approximately 840 m ² .
Current Zoning	According to the ACT Territory Plan (administered by ACT Planning and Land Authority (ACTPLA)) and the ACTMapi website, the current zoning of the blocks forming the site is ' <i>DES: Designated</i> ' and is land which is administrated by the National Capital Authority (NCA). Figure 17 (titled ' <i>The Central National Area (Lake Burley Griffin & Foreshores)</i> '), of the Consolidated National Capital Plan (NCA, 2012) indicated that the site is designated as ' <i>Open Space</i> '.
Current Custodian	Environment, Planning and Sustainable Development Directorate (EPSDD)
Current Site Use	Open space
Proposed Site Use	Recreational facility

2.2 Surrounding Land Uses

The surrounding blocks are zoned as:

- **North:** The blocks to the north are zoned for Des: Designated (open space). The area immediately north of the site consists of a stand of trees, on the other side of which is an asphalt and concrete boat launching area.
- **East:** The blocks to the east are zoned for Des: Designated (open space). The area immediately east of the site consists of a concrete or asphalt bike/walking pathway, fan open area consisting of grass and trees and John Cardiff Close.
- **South:** The area to the south of the site is zoned for Des: Designated (open space). There is a medium sized building located immediately south of the site in Block 14 Section 67, Acton. This building is understood to be a storage facility for a rowing organisation. To the south of Block 14 is an open area consisting of grass and trees.
- **West:** The area to the west of the site is zoned for Des: Designated (open space). This area consists of an open area covered by grass and trees and the shoreline of Lake Burley Griffin.

2.3 Site Topography

Reference to the Land and Property Information New South Wales (2003) 1:25,000 scale Topographic & Orthophoto Map Sheet 'Canberra 8727-3N' indicates that the site is on a peninsula at an elevation of approximately 560 m above Australian Height Datum (mAHD) within an area of relatively flat terrain which slopes slightly to the west. The nearest major water body is Lake Burley Griffin which is located approximately 16 m to the west of the site.

2.4 Geology

Reference to the Bureau of Mineral Resources, Geology and Geophysics (1992) 1:100,000 scale Geological Series Sheet 'Canberra 8727', indicates that the site is underlain by both the middle to late Ordovician aged Pittman Formation, and the early Silurian aged State Circle Shale. The Pittman Formation consists of inter-bedded sandstone, siltstone shale and minor black shale, chert and impure calcareous sandstone, whereas the State Circle Shale is comprised of shale, mudstone, siltstone, and minor sandstone. The contact between the two (2) formations is indicated to be an inferred fault trending across the Black Mountain Peninsula in a northwest - southeast orientation.

2.5 Hydrogeology

Reference to the Bureau of Mineral Resources, Geology and Geophysics (1984) 1:100,000 scale map of the 'Hydrogeology of the Australian Capital Territory and Environs', indicates that the water bearing units underlying the site exist within the Ordovician to late Early Silurian rocks described as quartz arenite, siltstone, shale, sandstone, greywacke, minor black shale, quartzite, chert and granitoids.

The map also indicates there is one (1) groundwater bore located approximately 1.5 km east of the site on Acton Peninsula, and another bore located approximately 1.5 km south of the site in the suburb of Yarralumla. No details regarding these bores are provided.

The groundwater yield in this environment is indicated to be less than 0.5 litres per second (L/sec) and 1.0 L/sec, and the quality of the groundwater is indicated to have a total dissolved solid (TDS) content of less than 500 milligrams per litre (mg/L).

The direction of groundwater flow is uncertain, but it is expected to follow the natural regional topographic gradient in a westerly towards Lake Burley Griffin. Based on the proximity to Lake Burley Griffin, it is estimated that the depth to groundwater beneath the site is potentially as shallow as approximately 1 to 2 metres below ground level (mbgl).

3 PROPOSED WORKS ACTIVITY

3.1 Description of Works

It is understood that the site development is to include the following:

- Construction of a recreation facility on top of a raft slab;
- Construction of a sewer line, with a trench up to 1.8 metres below ground level (mbgl) proposed for excavation across the site;
- Associated site works.

3.2 Previous Environmental Assessments

Robson has conducted site investigations and assessments for Blocks 11, 12 and 13 in the past. A summary of the most recent reports is provided below.

Robson (2015) Phase 2 Environmental Site Assessment – Blocks 11, 12 and 13, Section 67, Acton (Robson reference 960502).

In summary, based on the results of the field works and laboratory analysis, Robson concluded the following:

- The general soil texture consisted of brown silty clay topsoil from 0 to approximately 0.2 mbgl. The topsoil was underlain by orange-brown clayey sand fill to a depth of between 1 and 3 mbgl. The colour of the clayey sand graded to grey with depth. The clayey sand fill contained varying amounts of anthropogenic landfill material such as ash, slag, glass, metal, wood, bone, organic material and fabric. The anthropogenic landfill material composed approximately 40% of the fill material in test pit (TP) TP-9. Groundwater was encountered at depths ranging between 1 and 1.7 mbgl in test pits TP-2, TP-4, TP-6, TP-7, TP-8 and TP-9;
- A rotting organic odour was observed in test pit TP-7 at a depth of 1 mbgl. No odours were observed at the other test pit locations;
- The results of the photoionisation detector (PID) screening of the soil samples indicated negligible potential for the presence of volatile ionisable hydrocarbon species;
- Air monitoring did not detect asbestos fibres during the field work at the site;
- Fragments of asbestos containing material (ACM) were observed in test pits TP1 (1.9-2.0) and TP5 (0.4-0.5), located near the northeast and southeastern areas of the site, respectively. The asbestos fragment from test pit TP1 (1.9-2.0) was composed of chrysotile, amosite and crocidolite asbestos fibres while the sample from test pit TP5 (0.4-0.5) was composed of chrysotile asbestos fibres. The soil concentration of bonded asbestos containing material (ACM) in soil exceeded the Assessment of Site Contamination National Environmental Protection Measure (ASC NEPM) 2013 criteria (0.02 % (weight / weight (w/w)) for parks, public open space and playing fields (Western Australia Department of Health (WADOH), 2009) in sample TP1 (1.9-2.0) but was not in TP5 (0.4-0.5). The ASC NEPM (2013) asbestos fines criteria (0.001 % w/w) was not exceeded in either sample;
- The analytes total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs), phenols, pesticides, polychlorinated biphenyls (PCBs), volatile organic carbon (VOCs), metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc) were analysed in soil

samples collected from the nine (9) test pits. None of these analytes exceeded the adopted assessment criteria;

- Based upon observations during the excavation of the test pits, ash, slag, glass, metal, wood, bone, organic material was present in eight (8) of the nine (9) test pits to a depth ranging between 0.1 and 3.0m, therefore it is concluded that the site is underlain by landfill material. This observation is consistent with previous observations of landfill material located to the north and south of the site.

Given that the landfill is so widespread, and the nature of the surface rubbish would pose an aesthetic issue as opposed to a human health risk or environmental risk, remediation of the site is considered to be impractical. It is noted that the single occurrence of asbestos that exceeded the guideline was observed at a depth of 1.9-2.0 m in test pit TP1.

Based on the results of the assessment, Robson considered that the site was suitable for the proposed rowing facility and boat house provided the following conditions were met:

- Areas of high pedestrian traffic are sealed;
- A CEMP is prepared and endorsed by the ACT EPA prior to any construction activities at the site;
- A long-term environmental management plan (EMP) is prepared and endorsed by the ACT EPA prior to site occupancy. The EMP would be subject to an Environmental Protection Agreement with the ACT EPA.

To fulfil the conditions of the site suitability, Robson made the following recommendations:

- To prevent exposure from the landfill material in the future, Robson recommended that areas where high traffic is anticipated (e.g., around buildings etc.) are sealed surfaces (such as concrete or paving) in areas where there would be high pedestrian traffic to minimize exposure to asbestos or physical hazards such as glass found within the landfill material. Robson also recommended that the ground surface in areas between the boat houses and the water be sealed where users may access by foot;
- To manage the possible exposure risks to asbestos and other rubbish during the construction of the proposed boat shed, storage shed and administration building at the site a CEMP should be prepared and endorsed by the ACT EPA to provide information to workers about possible contamination on the site. The CEMP should provide an unexpected finds protocol (UFP) and present information about managing contaminated soil and its associated risks;
- To manage risks to the public and workers at the site during future use of the site, Robson recommended that an EMP be developed. The EMP would also provide a protocol for how the custodians of the site will respond to unexpected finds and will provide guidance on how to manage the long-term risks associated with the asbestos and physical hazards associated with the landfill material observed at the site;
- To ensure the management provisions identified in the CEMP and EMP are legally enforced, Robson recommended that the site owners agree to enter an Environmental Protection Agreement with the ACT EPA.
-
-

Robson (2020) Site Inspection and Addendum Letter to the Phase 2 Environmental Site Assessment – Blocks 11, 12 and 13, Section 67, Acton, ACT 2601 (Robson reference 11167).

In summary, during the site inspection on 28 July 2020, no major changes were observed to have occurred at the site since the Robson (2015) P2ESA. The changes which occurred since the previous site investigation were outside the site boundary (including the construction of a service facility, concrete berm and removal of trees near the lake edge). Any impact of these changes on the site was considered to be negligible.

Under the National Capital Plan (NCP), development on Black Mountain Peninsula (where the site is located) is to be limited to small scale items that help recreation and tourism. They may include commercial concessions for kiosks, refreshment rooms, restaurants, other entertainment, and hire facilities as appropriate to the area. Robson considers that from a contamination perspective, the site is suitable for its proposed and permitted uses under the NCP as described above but must be managed in accordance with the following recommendations.

Based on a review of the findings of the Robson (2015) P2ESA for the site and the site inspection conducted on 28/07/2020, Robson recommended the following be undertaken to ensure the suitability of the site from a contamination perspective for its proposed and permitted uses under the NCP:

Prior to Development

A site-specific CEMP should be developed by a suitably qualified environmental consultant (SQEC) prior to the commencement of development activities at the site. This CEMP must detail, amongst other things, the management of identified impacts at the site, the management of any unexpected finds identified during development works and the assessment and reuse/disposal of excavated materials from the site. The CEMP must also include an UFP.

Site Occupancy

Prior to the occupancy of the site by the 'Black Mountain Rowing Club', a Site Management Plan (SMP) must be developed by a SQEC and endorsed by the ACT EPA. The SMP was previously referred to as an EMP in the Robson (2015) P2ESA.

The SMP must detail (amongst other things):

- Procedures to manage potential risks associated with residual asbestos and other potential impacts at the site, due to the presence of uncontrolled fill material;
- Induction procedures;
- The institutional controls to be used to ensure legal enforcement of the SMP (these may include conditions within the crown lease and notation on title for a site); and
- The responsibility for the implementation of the SMP.

The SMP (or its revisions as approved by the ACT EPA) must be implemented until such a time as the ACT EPA agrees in writing to its cessation.

Prior to occupancy of the site, Black Mountain Rowing Club must also enter into an Environmental Protection Agreement with the land custodian to ensure appropriate

implementation and ongoing enforcement of the SMP, under Section 38 of the *Environment Protection Act 1997*.

Following occupancy, the site must be managed in accordance with the requirements of the SMP.

4 ROLES AND RESPONSIBILITIES FOR CEMP IMPLEMENTATION

4.1 Applicability of the CEMP

This CEMP applies to all excavation and construction works being undertaken on the site that are likely to disturb soil onsite. The location of the area covered by this CEMP is provided in **Figure 2** and is herein referred to as ‘the site’.

All personnel and contractors whose works require them to disturb soil/fill material onsite are required to become familiar with the information presented in this CEMP and sign-in under the plan to acknowledge that they understand the plan. The recommended management procedures are presented in **Section 6**.

4.2 CEMP Lifespan and Amendments

This CEMP must remain current during all aspects of the works at the site. In the instance where an additional work task on site arises, or working conditions change, the CEMP may be revised as more information becomes available. If a revision is issued, it may need to be reviewed and endorsed by the ACT EPA prior to implementation.

All personnel and contractors who may be required to undertake work onsite that may disturb soil/fill material are to become familiar with the information and sign-in to acknowledge that they understand the requirements of the plan. This CEMP would no longer be required after the works are completed.

4.3 Responsibilities

The project team and their associated roles and responsibilities are summarised below in **Table B**.

Table B: Project Team

Position	Contact	Role
Site Custodian	EPSDD	Primary Decision Maker for the site
Principal Construction Contractor	Construction Control	Responsible for the implementation and management of the CEMP and to ensure excavation and construction works are undertaken in accordance with the CEMP.
Nominated Suitability Qualified Environmental Consultant (SQEC) and ACT Licenced Asbestos Assessor	Robson Environmental Pty Ltd	Responsible for general environmental consultancy as required during the works. Responsible for the initial induction of site personnel on the implementation of this CEMP.

4.3.1 CEMP Induction

CC is the principal construction contractor for the works and in conjunction with the site owner (EPSDD) are the primary decision makers for matters related to excavation and construction works on the site.

As the principal construction contractor, CC are responsible for ensuring that prior to working on site all personnel and contractors who are involved in the excavation and construction works that may disturb soils onsite (including but not limited to excavation, trenching, piercing, hydrovacating, horizontal boring works, and transportation of soil/slurry etc.), are inducted into the requirements of the CEMP and sign-in acknowledging that they understand the CEMP. The CEMP Compliance Agreement is attached in **Appendix A**.

Records of all inductions would be kept and maintained on-site and should include:

- Who was inducted including their signature confirming their attendance at the CEMP induction;
- The name of their employer/organisation;
- When the person was inducted;
- The inductors name, signature and employer/organisation.

In addition, the principal construction contractor will be responsible for implementing the following:

- Ensure familiarisation of all relevant parties with the CEMP as part of the induction process, prior to working on site;
- Ensure all personnel and contractors involved with works that potentially disturb soil onsite are informed of the possible presence of potential contaminated soils and/or the presence of hazardous materials in soil on the site and the associated risks;
- Ensure a copy of the CEMP is available to all personnel and contractors undertaking work that is likely to disturb soil on the site;
- Monitoring of compliance with all aspects of the CEMP, including the engagement of appropriately qualified consultants, compliance with satisfactory implementation of mitigation measures and the undertaking of appropriate compliance assessment allowing for swift correction of non-conformities;
- Maintaining this CEMP to ensure compliance by personnel and contractors performing works that will potentially disturb soil on the site;
- Maintaining records of induction under the CEMP;
- Should the proposed works be changed, CC (through their principal construction contractor) must engage the nominated SQEC to amend this CEMP. CC will also be responsible for obtaining endorsement from the ACT EPA (if required) regarding the changes to the development configuration prior to further development of the site.

In the instance where any additional work on the site arises, or working conditions change, the CEMP may be revised during the course of the project as more information becomes available. If a revision is issued, all personnel and other contractors who may come into contact with soils on the site would be required to become familiar with the information and sign-in under the new plan to acknowledge that they understand the changes.

4.3.2 Environmental Consultant and Asbestos Assessor

Following engagement by the site principal construction contractor, a SQEC and/or an ACT licenced asbestos assessor will be responsible for the following:

- Initial induction of key site personnel (e.g., nominated person/s from the principal construction contractor) on the implementation of this CEMP and how to recognise suspicious soil/fill material that could potentially be contaminated (that is, visually impacted and/or odorous soil/fill material) or hazardous materials in soil (i.e., potential ACM pipes, service pits, ACM fragments, etc.). The nominated person/s who has undertaken the initial induction by a SQEC and/or ACT licenced asbestos assessor may then induct other site personnel and contractors on the implementation of the CEMP;
- Assist the principal construction contractor with the implementation of any conditions of approval issued by the ACT EPA for the disposal of soil offsite if required;
- If potentially contaminated soil/fill material is encountered onsite and/or soil/fill material surplus to requirements of the project requires offsite disposal, assessment of soil to facilitate offsite reuse (RU) or waste classification will be prepared. The report will be submitted to the ACT EPA for approval prior to offsite reuse or disposal of the soil/fill material at a suitably licenced facility within the ACT such as Mugga Lane Resource Management Centre (MLRMC);
- If potential hazardous materials including ACM are encountered onsite a material assessment report would need to be undertaken by a ACT licenced asbestos assessor identifying the hazardous materials and if confirmed to be ACM, recommendations for its safe removal and disposal offsite.

5 UNEXPECTED FINDS PROTOCOL (UFP)

The objective of the Unexpected Finds Protocol (UFP) is to provide a mechanism within this RAP to enable the effective management and assessment of potential unexpected finds of potential contamination encountered during site redevelopment works. The UFP flowchart shown in **Section 5.12** describes the required action if potential contamination and/or hazardous materials in soil/fill material is found onsite.

5.1 Soil/Fill Material Contamination

Soil/fill material contamination occurs when the past and/or present site use has caused the soil/fill material to be altered to a point that the soil/fill material onsite now presents a potential human health risk and/or ecological/environmental risk.

The causes of soil/fill material contamination can include (but not limited to) the following:

- Leakage or spills of chemicals/petroleum into soil/fill material from industrial processes or infrastructure (factories, refineries, research facility etc);
- Leakage or spills of chemicals/petroleum into soil/fill material from industrial storage and/or transport infrastructure (underground storage tanks (USTs), above ground storage tanks (ASTs), supply pipes etc);
- Waste products produced from the combustion of materials such as ash or slag;
- Hazardous building materials such as asbestos containing material (ACM) in structures or buildings impacting soil due to poor building, demolition and maintenance practices or by accident such as a structural fire or building collapse;
- Illegal dumping of soil from another contaminated site or hazardous building waste material;
- Importation of uncontrolled fill material for site levelling or backfilling purposes that may come from a contaminated site which is contaminated with such things as hazardous materials (e.g. ACM), hydrocarbons, heavy metals etc;
- Landfill activities such as the burial of waste materials, potentially contaminated soil or uncontrolled fill material onsite.

5.2 Indicators of Possible Soil/Fill Material Contamination

Indications of possible soil/fill material contamination may include (but not necessarily be limited to) all, some or one (1) of the following:

- Visual discolouration or staining of soil;
- Soil texture;
- Distinct odours emanating from soil;
- Building/demolition rubble;
- Naturally Occurring Asbestos (NOA);
- In-ground infrastructure constructed with hazardous materials.

Photographs of the indicators possible soil contamination are provided for reference purposes in **Attachment B**.

5.3 Visual Discolouration or staining of soil/fill material

Discolouration or staining of soil/fill material can (sometimes) be an indicator of soil/fill material contamination. Depending on the concentration or type of soil/fill material contamination there maybe a change of the colour of soil/fill material and there would be a notable difference to surrounding (non-contaminated) soils.

Usually, a darker discoloration of similar lithology (soil/fill material type) can be an indicator of potential soil contamination. However, the colour of soil/fill material may vary for a number of reasons therefore if the colour of the soil/fill material does not appear to be consistent with soils in the area, then further assessment would be required. Common soil/fill material colours and there causes are outlined below in **Table C**.

Table C: Soil/Fill Material Colours

Soil/Fill Material Colour	Potential History or Behaviour
Red	Well drained
Yellow or grey	Poorly drained
Dark soils	Higher levels of organic matter Can be an indication of ash from burning
Bluish or greenish grey (grey colours)	Waterlogged soils

Notes: Sourced from Australian Standard AS4482.1-2005 'Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil. Part 1: Non-Volatile and Semi-Volatile Compounds'.

5.4 Soil/fill material texture

The texture of soil/fill material can (sometimes) be an indicator of soil contamination. Depending on the concentration or type of soil contamination it will change the texture of the soil and there would be a notable difference to surrounding (non-contaminated) soils.

Soil textures vary depending on the lithology of the soil but can be an indicator of soil contamination if for example the soil has an oily texture then it may indicate the presence of contamination such as hydrocarbon products or if the soil has an irregular gritty texture, it may indicate the presence of contamination such as ash or slag inclusions.

5.5 Distinct odours emanating from soil/fill material

Distinct odours emanating from soil/fill material can (sometimes) be an indicator of soil/fill material contamination. Occasionally soil/fill material discolouration or staining will also be associated with odours emanating from the soil/fill material. Odours emanating from soil/fill material may vary in type/cause and strength as outlined below in **Table D** and **Table E**.

Table D: Odour Descriptions

Odour Description	Potential Contaminant Indicated
Characteristic sharp, pungent	Ammonia

Petroleum products	Petrol, diesel, oil
Compost	Decayed organic matter
Putrefied	Putrescible waste
Rotten egg smell (sulphurous)	Anaerobic or acid sulphate conditions
Acidic	Mineral or organic acid
Caustic	Caustic material
Septic	Decaying organic matter, sewage
Sweet, solvent type	Ketone
Aromatic	Benzene

Notes: Sourced from Australian Standard AS4482.1-2005 'Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil. Part 1: Non-Volatile and Semi-Volatile Compounds'.

Table E: Description of Odour Strength

Strength	Description
Weak	Just detectable; location difficult to determine
Distinct	Detectable immediately adjacent to source, bearable at source
Strong	Detectable 20 metre (m) from source, bearable at source
Very Strong	Detectable at distances greater than 20 m from source, pungent at source

Notes: Sourced from Australian Standard AS4482.1-2005 'Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil. Part 1: Non-Volatile and Semi-Volatile Compounds'.

5.6 Building/Demolition Rubble

Hazardous materials such as ACM is often found associated with building/demolition rubble and/or landfill material which commonly includes broken tile, brick, concrete, plastic, metal fragments etc. Building/demolition rubble can also be found within and/or on the surface of soil. Some of the more common ACM products include flat wall sheeting which may be dimpled on one side, corrugated cement roof sheeting, asbestos fencing, asbestos vinyl tiles etc. Therefore, if building/demolition rubble is encountered it is an indicator of potential soil/fill material contamination.

5.7 Naturally Occurring Asbestos (NOA)

NOA is present in many areas within NSW and may occur within the ACT region.

NOA is asbestos minerals found naturally in association with geological deposits including rock, sediment, or soil. Asbestos minerals are commonly found around the world in ultramafic

rock formations including serpentinite (chrysotile (white)) and amphibole (actinolite, amosite (brown), anthophyllite, crocidolite (blue) and tremolite) as well as in the soils where these rock types are located. Less than 1% of NSW has rock types with the potential to contain significant amounts of NOA.

5.8 In-ground infrastructure constructed with hazardous materials

In-ground infrastructure constructed with hazardous materials such as ACM could be present on the site. In-ground infrastructure generally constructed with asbestos includes pipe conduits, services pits, pipe lagging around heating pipes etc. Damaged or degraded in-ground infrastructure can cause soil contamination. Therefore, if in-ground infrastructure is encountered during works onsite and they are suspected to be asbestos containing then they should also be considered as a potential indicator of soil/fill material contamination.

5.9 General Information on Asbestos

The three (3) principal asbestos used commercially in Australia were: chrysotile, crocidolite and amosite asbestos. All have been used in sheeting.

Chrysotile

Also known as white asbestos, chrysotile is a member of the Serpentine group of minerals, so named because the fibre is curly and non-brittle. Chrysotile fibres are the most flexible of all asbestos fibres. They can withstand extreme heat, are soft and flexible, and can be spun and woven like cotton. Resistance to alkaline attack makes chrysotile a useful strengthening and reinforcing material in asbestos-cement building products. Like the other forms of asbestos, chrysotile can absorb organic materials such as resins and polymers and can be used to strengthen particulates in building materials such as cement. Chrysotile was used in asbestos cement products such as wall and ceiling sheet in wet areas which include bathrooms, toilets, laundries, etc., as external wall, eaves and corrugated roof sheet and in drainage and sewage pipes.

Crocidolite

Crocidolite is commonly known as blue asbestos and is a member of the Amphibole group of minerals. The needle-like fibres are the strongest of all asbestos fibres and have a high resistance to acids. Crocidolite was used in yarn and rope lagging from the 1880s until the mid-1960s and in preformed thermal insulation from the mid 1920s until 1950. The high bulk volume of crocidolite makes it suitable for use in sprayed insulation. Crocidolite is known to be the most dangerous of all the asbestos types. The fibres of crocidolite are straight and stiff with very fine needle-like structures, which are more likely to reach the smaller airways when inhaled than the longer, softer and curlier chrysotile fibres.

Amosite

Amosite is also known as brown asbestos and is, like crocidolite, a member of the Amphibole group of minerals. Its harsh, spiky fibres have good tensile strength and resistance to heat. In buildings, amosite was used for anti-condensation and acoustic purposes and on structural steel for fire protection. Between the 1920s and the late 1960s the use of amosite included thermal insulation to hot water and heating pipes, boilers and as insulation to structural beams. As an acronym for the Asbestos Mines of South Africa, amosite is the second most prevalent type of asbestos found in building materials behind chrysotile asbestos.

5.10 Asbestos Containing Material Structure

Non-Friable ACM

Non-friable asbestos is any material that contains asbestos firmly bound into a matrix. It may consist of cement or various resins/binders and cannot be reduced to a dust by hand pressure. As such it does not present an exposure hazard unless cut, abraded, sanded or otherwise disturbed. Therefore, the exposure risk from non-friable ACM is negligible during normal building occupation.

Friable ACM

Friable asbestos material can be crumbled or reduced to a dust by hand pressure when dry. It can represent a significant exposure hazard as a consequence of minor disturbance. Examples of friable asbestos are hot water pipe lagging, severely damaged asbestos cement sheet, limp spray to structural beams and electrical duct heater millboard.

5.11 Unexpected Finds Protocol

If any potential visual or olfactory (odorous) signs of soil contamination such as hydrocarbons or potential hazardous materials such as ACM pipes, service pits, ACM fragments in soil etc are identified during excavation works the following unexpected finds protocol should be implemented (see Appendix A):

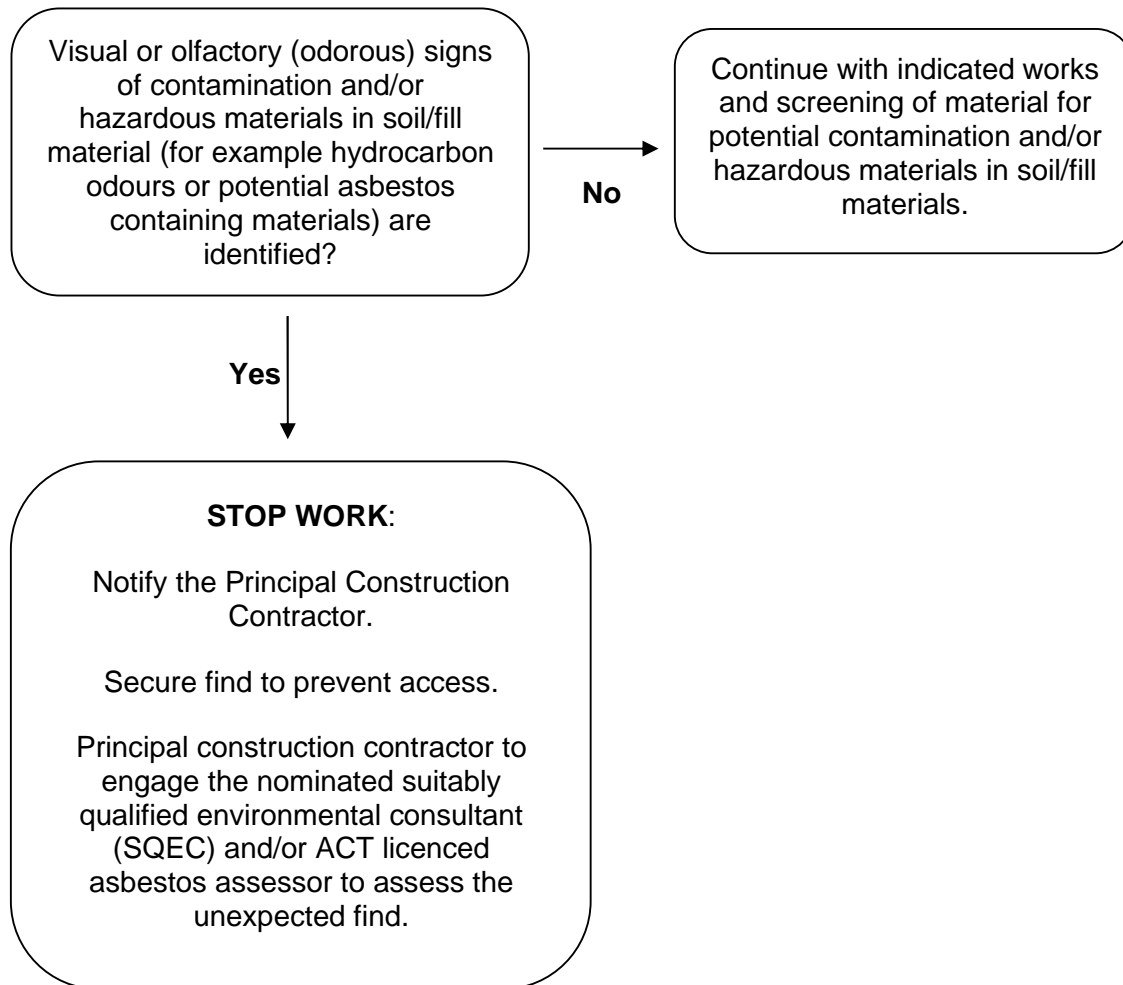
Stop works and notify the principal construction contractor. The principal construction contractor must ensure a SQEC or an ACT licenced asbestos assessor has been engaged to undertake a visual risk assessment of the site and provide advice on:

- The continuation of excavation works;
- The necessity for segregation of impacted material;
- Provide advice on further assessment of the site for the extent of soil contamination and/or hazardous materials;
- If required, the engagement of an ACT licenced asbestos removalist to be present on the site during the works to remove and manage ACM occurrences;
- Assessment of the material for suitability to remain on the site and/or for off-site BRU or waste classification.

A flow chart describing the process is shown overleaf.

5.12 Unexpected Finds Protocol Decision Process Flow Chart

A schematic flow chart of the decision processes for the unexpected finds protocol involved with the identification of potentially contaminated and/or hazardous materials in soil/fill material is provided below.



6 ENVIRONMENTAL MANAGEMENT ACTIVITIES AND CONTROLS

Robson understands that the excavation works will be minimised on site, with a raft slab proposed for the building on site. The main excavation works will be for the shallow raft slab and for a sewer line trench to a maximum depth of 1.8 mbgl. The works must be conducted in such a manner that adverse impact on human health and the environment is minimised.

Appropriate bunding should be placed around stormwater drains during excavation works to prevent in flow if an overflow/accidental discharge were to occur.

If visual or olfactory (odorous) signs of soil/fill material contamination and/or potential hazardous materials in soil/fill material are identified during excavation works, all works in that area of the site must cease and a SQEC and/or ACT licenced asbestos assessor should be contacted to provide further recommendations in accordance with the unexpected finds protocol in **Section 5**.

If significant soil/fill material contamination is observed onsite a soil assessment report would be required to be prepared and submitted to the ACT EPA for review. No soil/fill material (contaminated or non-contaminated) can be removed from the site until ACT EPA approval and acceptance of the material at the destination site has been received.

If hazardous materials such as potential ACM such as pipes, service pits, etc., then a material assessment needs to be undertaken by an ACT licenced asbestos assessor to assess if the material is asbestos containing and if positive a material assessment report issued outlining the recommendations for its safe removal and disposal offsite.

The management procedures for the any soil/fill material excavation works to be undertaken onsite are presented in the following sections below.

6.1 Screening for Soil/Fill Material Contamination

If significant soil/fill material contamination such as odours and/or obvious staining of the soil/fill material is observed during the excavation works, all works in this area must cease and a SQEC should be engaged to inspect the area and undertake screening of the soil using a Photoionisation detector (PID) and/or Four gas Lower Explosive Limit (LEL) meter where appropriate.

Additionally, personal protective equipment (PPE) such as disposable half face mask or respirator with at least a Class P2 or Class P3 cartridge or rating should be worn if significant odours/vapours or other contaminants of concern are observed.

6.2 Screening of Soil/Fill Material for Hazardous Materials

If any potential hazardous materials are observed in soil/fill material on the site during the excavation and construction works, all works in this area must cease and the area cordoned off and nominated ACT licenced asbestos assessor should be engaged to inspect the area and provide advice.

6.3 Indicators of Possible Contamination/Hazardous Materials

Indications of possible contamination/hazardous materials in soil/fill material may include (but not necessarily be limited to) the following:

- Visual discolouration or staining of soil/fill material;
- Distinct odours (e.g., petrol or diesel odours);
- Building debris including sheet material, pipe etc.

Photographs of impacted soil/fill material are provided for reference purposes in **Appendix B**.

6.4 Management of Soil/Fill Material during Excavation Works

- All soil being excavated onsite must be screened by a suitably inducted person during excavation and construction works;
- Excavated soil must be separated into obvious fill material and natural soil for the purposes of waste, RU and virgin excavated natural material (VENM) classification (if required);
- If required to be disposed offsite all soil must be covered and secured during transport off site and should be transported in suitable vehicles. No soil/fill material is to be removed from the site to any location other than the approved destination site, without prior approval from the ACT EPA;
- Soil which is visually screened to be free of any contamination or hazardous materials may be stockpiled on-site without any additional controls, prior to ACT EPA approved removal offsite;
- Sediment and erosion controls such as bunding should be placed around the stockpile/s.

Contaminated Soil/Fill Material

- If any potential soil/fill material contamination is observed all onsite works should be stopped in the area of the unexpected find, the area cordoned off to ensure access is restricted and the nominated SQEC contacted for advice;
- The nominated SQEC would make observations of the unexpected find and screen the soil/fill material prior to undertaking further works. Further assessment of the site may be required to determine the type and extent of soil /fill material contamination;
- Any excavated soil/fill material which has visual or olfactory signs of contamination must be stockpiled separately and covered with the heavy-duty black plastic and secured daily or upon completion of works;
- The stockpiled soil would be assessed by a SQEC for RU or waste classification purposes as outlined in **Section 6.6**;
- Following assessment of the stockpile and receipt of approval from ACT EPA for offsite disposal (either RU or waste classification), the removal of the stockpile may also include a 100 mm scrape of the area underneath the plastic (stockpile footprint) to remove possible residual contamination. The stockpile footprint would then be assessed by a SQEC.
- Validation sampling of the footprint of the excavated area and the stockpile footprint may also be required if the risk of soil contamination remains as outlined in **Section 6.7**;
- No soil/fill material can removed from the site without approval from the ACT EPA and acceptance by the destination site. No liquid waste is to be removed or reused onsite without approval from the ACT EPA.

Hazardous Materials

- If any potential hazardous materials (specifically ACM) are observed, onsite works must be stopped in the area of the unexpected find, the area cordoned off with asbestos signed

barrier tape to ensure access is restricted and the nominated ACT licenced asbestos assessor contacted for advice;

- The unexpected find should be assessed in accordance with ACT EPA (2016) Environment Protection Information Sheet No. 6 *'Management of small scale, low risk soil asbestos contamination'* (attached in **Appendix C**);
- The ACT licenced asbestos assessor will undertake representative sampling and laboratory analysis of the hazardous materials find to confirm if the material is asbestos containing and its extent onsite. A material assessment report will then be issued giving recommendations on the management and/or removal of the hazardous materials.
- Until the material assessment is complete, access to the area must remain restricted;
- If the find is confirmed to be asbestos containing, then an ACT licenced asbestos removalist should be engaged to remove the ACM;
- An ACT licenced asbestos removalist should be engaged to ensure that required controls are in place and that workers conform with safety requirements considered necessary by the ACT licenced asbestos removalist;
- The removal of ACM or ACM impacted soil/fill material must be undertaken by an ACT licenced asbestos removalist as per the *'How to Safely Remove Asbestos Code of Practice'*. Removal of non-friable asbestos and asbestos impacted soils/fill material may be undertaken by either an ACT licenced Class A or B asbestos removalist;
- The ACT licenced asbestos removalist must notify WorkSafe ACT prior to any asbestos removal works commencing. The ACT licenced asbestos removalist must supply an Asbestos Removal Control Plan (ARCP) and a Safe Work Method Statement (SWMS) before commencement of removal works. The nominated ACT licenced asbestos assessor must review ARCP to ensure it addresses all safety issues relating to the planned asbestos removal works;
- Large volume of asbestos impacted soil/fill material and/or if the impacted soil cannot be removed with asbestos bags the soil may only be transported in a covered leak proof vehicle in accordance with the requirements outlined in the ACT EPA (2016) Environment Protection Information Sheet 5 *'Requirements for the transport and disposal of asbestos contaminated wastes'* (attached in **Appendix C**) under the supervision of the nominated ACT licenced asbestos removalist to an ACT licenced landfill facility;
- The removal area must be demarcated with an exclusion zone (to be determined by the ACT licenced asbestos removalist) around the perimeter of the removal works with asbestos barrier tape. A temporary fence and lockable gate should be used to demarcate the exclusion zone if the site cannot be secured;
- Warning signs are to be affixed to the barrier/fence indicating the presence of asbestos;
- Only personnel and contractors under the direction and supervision of the engaged ACT licenced asbestos removalist and are wearing the required PPE are permitted to enter the exclusion zone. The PPE required to enter the exclusion zone is as follows:
 - Disposable Tyvek Suite;
 - Respiratory Protection of either a Class P2 or Class P3 mask which conforms to Australian/New Zealand Standard AS/NZS 1716:2003 *'Respiratory Protection Devices'*;
 - Safety Boots;
 - Protective gloves.

- All personnel and contractors must be under the direction and supervision of the engaged ACT licenced asbestos removalist working on the site. Single use PPE must be taken off at the exclusion zone boundary and disposed of as contaminated waste in a hazardous waste bag to prevent any possible contamination leaving the site;
- Water spraying equipment should be available to the ACT licenced asbestos removalist during any excavation/soil disturbance activities to manage dust and minimise the potential for the release of airborne asbestos fibres;
- Airborne fibre monitoring must be implemented each day of removal works by the nominated ACT licenced asbestos assessor to assess whether dust suppression methods are suitable. Airborne fibre monitoring sampling must be undertaken in accordance with the *'Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres, 2nd Edition'* and test certificates should be NATA endorsed;
- If stockpiling of impacted soil is required, then the soil should be moistened and covered using either a geofabric or high-density black plastic prior to the site being secured by the ACT licenced asbestos removalist;
- Small volumes of soil/fill material determined to be only impacted by ACM can be removed from the site as asbestos waste by the ACT licenced asbestos removalist to an ACT licenced landfill facility;
- Once the excavation and stockpiling of impacted soil/fill material is complete the ACT licenced asbestos assessor must undertake an inspection of the excavation and stockpile footprints to ensure that no potential ACM or ACM impacted soil/fill material remains. An asbestos clearance certificate for the area would then be issued which will include the site details and include a figure clearly identifying the area on-site which has been cleared.
- Soil/Fill Material Impacted by Contamination and Hazardous Materials
- If both soil/fill material contamination and hazardous materials are observed together then both an ACT licenced asbestos removalist and SQEC should be contacted for advice;
- Soil/fill material impacted by both contamination and hazardous materials by will need to be excavated and stockpiled onsite under the supervision of both an ACT licenced asbestos removalist and SQEC;
- The stockpiled material would then be covered with the heavy duty black plastic and secured upon completion of works and/or each day by the ACT licenced asbestos removalist;
- The stockpiled soil/fill material would be assessed both by the nominated ACT licenced asbestos assessor and the nominated SQEC for RU or waste classification purposes as outlined in **Section 6.6**;
- Following assessment of the stockpile and receipt of approval from ACT EPA for offsite disposal (either RU or waste classification), the removal of the stockpile may also include a 100 mm scrape of the area underneath the plastic (stockpile footprint) to remove possible residual contamination. The stockpile footprint would then be assessed both by the nominated SQEC and ACT licenced asbestos assessor;
- Validation sampling of the footprint of the excavation and stockpile footprints may also be required if the risk of soil contamination or ACM impact remains as outlined in **Section 6.7**;
- No soil/fill material can removed from the site without approval from the ACT EPA and acceptance by the destination site. No liquid waste is to be removed or reused onsite without approval from the ACT EPA.

6.5 Sediment and Erosion Controls

Appropriate bunding should be placed around stormwater drains during excavation works to prevent inflow of sediment. Stockpiles with obvious visual or olfactory signs of contamination or hazardous materials should be bunded to prevent runoff of contaminated soil. A Sediment and Erosion Control Plan (SECP) provided by CC is included in **Appendix D**.

6.6 Assessment of Soil/Fill Material for Offsite Disposal/Beneficial Reuse

Any soil/fill material that needs to be removed offsite due to the presence of potential soil contamination and/or hazardous materials or is surplus to the requirements of the site is to be assessed in general accordance with the follow ACT EPA endorsed guidelines.

- ACT EPA (2015) Environment Protection Information Sheet 4 '*Requirements for the reuse and disposal of contaminated soil*' (attached in **Appendix C**);
- AS 4482.1: 2005 'Guide to the investigation and sampling of sites with potentially contaminated soil – Non-volatile and semi-volatile compounds';
- ASC NEPM (2013);
- Environment ACT (2000) 'Environmental Guidelines: Assessment & Classification of Liquid & Non-Liquid Wastes';
- WA Guidelines.

In general stockpile soil sampling would be undertaken in the following manner;

- If additional sampling works were required, samples would be collected at a rate of 1 sample per 25 cubic metres (m³) or a minimum of two (2) samples from each stockpile with a volume of less than 50 m³;
- Each sample would be field screened for volatile organic compounds using a PID;
- Where stockpiled soil/fill material potentially impacted with ACM fragments requires sampling, samples would be collected at a rate of one (1) per 70 m³ in accordance with the WA Guidelines;
- In accordance with the WA Guidelines a 10 litre (L) sample of soil/fill material would be collected to undertake a field assessment for fragments of ACM. In accordance with the WA Guidelines, the soil/fill material would be weighed and sieved for ACM fragments onsite. The asbestos concentration in soil/fill material at each sample location is then calculated using the formula shown below:

$$\% \text{ Soil Asbestos} = \frac{\% \text{ Asbestos Content} \times \text{ACM (kg)}}{\text{Soil Volume (L)} \times \text{Soil Density (kg/L)}}$$

- A 500 millilitre (ml) soil sample (un-sieved) would also be collected in a zip lock bag for laboratory analysis of asbestos in soil;
- Samples would be analysed for potential contaminants of concern including Total Recoverable Hydrocarbons (TRH), Benzene Toulene Ethylbenzene Xylene (BTEX), Polyaromatic hydrocarbons (PAH), Organochlorine Pesticides (OCP), polychlorinated biphenyl (PCB), Eight (8) metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc) and asbestos (if ACM in soil observed). Assessment of other contaminants may also be undertaken if the SQEC determines its presence onsite;

- Quality assurance/quality control samples (QA/QC) soil samples would be collected at a rate of one (1) duplicate and one (1) triplicate per 20 primary samples in general accordance with the Australian Standard AS4482.1-2005 *'Guide to the investigation and sampling of sites with potentially contaminated soil – Part 1: Non-volatile and semi-volatile compounds'*;
- Samples would be analysed at a National Association of Testing Authorities (NATA) accredited laboratory for identified contaminants of concern.

Upon the receipt of the laboratory results, advice as to the suitability of material for off-site RU or off-site waste classification disposal to an ACT licenced landfill facility would be provided.

As the material is to be disposed of off the site, a waste classification or RU report would be prepared and submitted to the ACT EPA for review and endorsement prior to any material being removed from the site. Soil/fill material must not be removed from the site unless the ACT EPA has provided written approval to do so.

6.7 Validation of Excavations and Stockpile Footprints

Following the excavation of areas with possible contamination, validation sampling of the soil/fill material that remains in the excavation footprint may be required to assess whether any residual contamination remains on the site. Similarly, the footprint locations where contaminated soil/fill material has been stockpiled may also need to be sampled after the stockpiled contaminated soil/fill material has been removed to assess whether any residual contamination is present in the stockpile footprint.

The assessment process for excavation and stockpile footprints would be as follows:

- Collection of soil samples for analysis of the potential contaminants of concern from the base and walls of excavated footprint or on the soil surface within stockpile footprints. Samples would be collected from the base at a rate of one (1) sample per 25 m² or a minimum of one (1) sample from areas where the area is less than 25 m². Where the depth of the excavation may be 0.5 m or greater, samples would be collected from the walls of the excavation at a rate of one (1) sample per metre deep every five (5) linear metres;
- Each sample would be field screened for volatile organic compounds using a PID;
- QA/QC samples would be collected in general accordance with the Australian Standard AS4482.1-2005 *'Guide to the investigation and sampling of sites with potentially contaminated soil – Part 1: Non-volatile and semi-volatile compounds'*;
- Samples would be analysed at a NATA accredited laboratory for identified contaminants of concern.

6.8 Noise

Noise represents a health risk to workers on the site as well as surrounding businesses and the general public in the vicinity of the site. Increased noise levels may result from the use of concrete cutting, hammering and excavation equipment and other associated plant, machines and vehicles.

In accordance with the ACT EPA Environment Protection (Noise) Environment Protection Policy 2012, building works that require approval that are located in industrial areas, city centres and town centres may only exceed the noise standard between the hours of 6 AM to 8 PM Monday to Saturday. For building works that will take longer than two (2) weeks to

complete, no noise exceeding the noise standard is permitted on any Sunday or Public holidays.

Some noise during building works is inevitable however measures are outlined in the *'Australian Standard AS 2436: Guide to Noise Control on Construction Maintenance and Demolition Sites'*. If noise impacts/complaints arise as a result of demolition/excavation works, work should cease, and a noise assessment should take place. If necessary, modifications to the work site, excavation equipment or work methods may be necessary to ensure compliance. Practical advice to reduce the potential for noise impacts includes:

- Selecting machinery that produce less noise;
- Ensure machinery is well maintained;
- Undertake works at a time that will cause least disruption to the surrounding businesses;
- Ensure all personnel and contractors do not create excessive and/or unnecessary noise;
- Personnel regularly exposed to loud noise or machinery must wear appropriate and clean hearing protection.

6.9 Dust

- Dust represents a health and aesthetic risk to workers on the site as well as surrounding area and the general public in the vicinity of the site. Dust is a generic term used to describe fine particles that are suspended in the atmosphere. Dust is formed when fine particles are taken up into the atmosphere (entrained) by the action of wind, by disturbance of fine materials, or through the release of particulate-rich gaseous emissions (primary particles). Dust can also be generated via demolition of buildings and structures and excavation of dry soils onsite.
- In addition, gases such as sulphur dioxide and oxides of nitrogen may react over time to form particles, such as ammonium sulphate and ammonium nitrate (secondary particles).
- Dust comes from a wide variety of sources, including soil, vegetation (pollens and fungi), sea salt, fossil fuel combustion, burning of biomass, and industrial activities.
- Dust is typically not classified according to its composition, but rather, its particle size, as follows:
 - Deposited matter refers to any dust that falls out of suspension in the atmosphere;
 - Total suspended particles (TSP) typically refers to particles 50µm (micrometers) (0.05mm diameter) in size or less;
 - PM10 refers to particles 10µm (0.01mm) in size or less;
 - PM2.5 refers to particles 2.5µm (0.0025mm) in size or less.
- Dust particle size is an important factor influencing dispersion and transport in the atmosphere and potential effects on human health.
- Fine particles are of size PM10 or less. Characteristics of these particles include:
 - They are easily entrained by wind or disturbances and generally take a long time to settle once airborne, although they may be washed from the air by rain or snow. For example, a recent study found that fine particles of sea salt in the Hunter Valley area originated in the Great Australian Bight;
 - They may settle permanently on land or only temporarily before being picked up and moved again, and may settle on water, dissolve in water, or both.

- Any activities undertaken onsite such as demolition and/or excavation works should be undertaken in a way that will either prevent, reduce or mitigate dust production as a result of site activities.
- Dust mitigation such as dust suppression via water hoses or using dust suppressant chemicals may be employed. Additionally, if wind conditions or site activities are generating significant dust product from the site then site activities should be stopped and the works reassessed to prevent or reduce dust production and/or increase dust mitigation employed.
- If required, the collection of dust samples will be collected following the Australian Standard AS 3580.1.1 *Method for sampling and analysis of ambient air- Part 1.1: Guide to siting air monitoring equipment*. The laboratory analysis of the dust samples will follow the AS 3580.10.1 *Determination of particulate matter – Deposited matter - Gravimetric method*. The dust samples will be analysed against EA141 – *Total Insoluble Matter and the EA142 – Total Solids methods*. The dust analytical results will then be compared to the National Environmental Protection Measure (NEPM) for Ambient Air Quality.

6.10 Importation of Soil

Prior to the importation of soil, the principal construction contractor must ensure that the soil is suitable for the current and/or the proposed land use specific to the site. This is generally achieved by the soil supplier providing either an ACT EPA endorsed RU report and/or VENM certificate stating that the soil is suitable for the proposed land use. In the case where the site custodian as accepting RU material the site custodian must write a letter to the ACT EPA accepting responsibility for the reuse of the soil prior to its importation.

6.11 Housekeeping and Site Appearance

- External areas of the site will be maintained in a clean, tidy and litter free condition;
- All signage will be of a professional appearance and maintained in clean and good order so that it is legible;
- Internal roads will be regularly inspected, and maintenance programs implemented to keep them in clean and good order;
- Measures will be implemented to control pest and vermin populations, and weeds.

6.12 Records and Reporting

Detailed records must be kept regarding excavation works on the site. Therefore, the principal construction contractor will maintain the following records:

- Records regarding the volume of material transported off site including type of material (slurry/soil), volume/tonnage, date and method of transport (Hydrovac, covered truck etc.) must be kept. A material tracking form (see **Appendix E**) is to be completed for all soil or material removed/relocated during site works;
- Records regarding onsite importation of approved VENM or RU material such as ACT EPA approvals, volumes of soil imported to the site and transport tracking information;
- Records regarding offsite movement of approved soil/fill material as RU or waste classification such as ACT EPA approvals, volumes of soil removed from the site, landfill receipt dockets and transport tracking information;

- Records regarding CEMP inductions (compliance agreement). An example of a CEMP compliance agreement is presented in **Appendix A**;
- Details of any environmental issues/complaints and associated corrective measures;
- Records regarding amendments to the CEMP.

7 HEALTH AND SAFETY MANAGEMENT

The CEMP has been prepared to provide guidance for all personnel and contractors and to establish safe work practices to protect against possible adverse exposure to contaminants and/or hazardous materials in soil/fill material. The CEMP is to be made available to all personnel and contractors during the site works.

7.1 Hazards Associated with Hydrocarbon Impacted Soils

The most common hazard associated with hydrocarbon impacted soils/fill materials are vapours which can cause respiratory distress and present the greatest risk in confined spaces. As the works are to be undertaken in open areas this is not considered to be of high risk. However, the work area should be ventilated as much as practicable, and care should be taken regarding potential ignition sources. Due to the risk of hydrocarbon vapours, no smoking is to occur within the work area.

As previously noted in **Section 5**, if significant hydrocarbon odours are observed during the works the works should be stopped and the nominated SQEC should be contacted to screen the area using a PID and/or Four Gas LEL meter during further works. Additional PPE such as half face mask or respirator with at least a Class P3 cartridge shall be worn if significant odours/vapours are observed. Gloves should be used when handling potentially hydrocarbon impacted soils.

7.2 Hazards Associated with Asbestos Containing Materials

There are three (3) principal types of asbestos used commercially in Australia include Chrysotile, Crocidolite and Amosite asbestos. Asbestos bound within a stable matrix by various binders and resins which is then referred to as non-friable ACM.

The most common hazard associated with asbestos is the risk that asbestos fibres may become airborne and maybe inhaled by site personnel or contractors. The inhalation of asbestos fibres may cause asbestos related diseases such as asbestosis, mesothelioma or lung cancer.

Significant asbestos fibre release only occurs if the non-friable ACM is severely abraded. This may occur if the material was cut or abraded with power tools such as circular saws, drills or sanders or damaged by excavation equipment. In an unweathered state, non-friable ACM cannot be crushed by hand when dry.

7.3 Project Health and Safety Officer

A designated project work health and safety (WHS) officer is to be on-site at all times when work is being performed. The WHS officer must be trained in First Aid and hold a current First Aid Certificate from a legitimate organisation (for example St John's Ambulance). The WHS officer for the project will be nominated by the Principal Construction Contractor prior to the commencement of works at the site.

All personnel and contractor(s) are to provide a list of nominated personnel who will be the WHS officer for their company while operating on site.

7.4 Personal Protective Equipment

PPE plays a major role in ensuring that all personnel are protected against exposure to asbestos, hydrocarbons and other potential contaminants of concern. The follow PPE is required to be worn as part of the minimum PPE requirements set for the site:

- A hard hat;
- Safety glasses;
- Steel toed safety boots;
- Long-sleeved shirt and long pants;
- High visibility vest/clothing;

The recommended PPE that should be available on-site to all personnel/contractors undertaking remedial activities on site include:

- Gloves (cut proof/nitrile type) are to be worn whenever there is the possibility of contact with contaminated soil that contains asbestos;
- Dust masks to protect against inhalation of dusts and asbestos fibres (for example a Class P2 (or P3 vapor filter if odour/vapour volatiles are encountered) mask conforming to Australian/New Zealand Standard AS/NZS 1716:2003 'Respiratory Protection Devices';
- Tyvek suit to protect skin and clothing from coming in contact with asbestos and other contaminants of concern.

Other occupational PPE to that listed above may also be required for specific occupational tasks (for example, ear plugs and heavy-duty chemical protective gloves).

7.5 Safe Work Practices

Eating, drinking, chewing gum or tobacco, smoking or any other practice that involves hand to mouth transfer, increases the risk of ingesting foreign matter (including water and/or soil that contains contaminants of potential concern) into the body.

Hands must be washed thoroughly before eating, drinking or smoking. Clothing that becomes dirty from on-site work should be washed separately from other clothing. A first aid kit must be present on site at all times during field work.

7.6 Emergency and Incident Control Measures

7.6.1 Emergency Control Measures

An emergency condition is considered to exist if:

- Any personnel are involved in an accident or experience any adverse effects or symptoms of exposure while on the site;
- A condition is discovered that suggests the existence of a situation more hazardous than anticipated;
- Fire, bomb threat, failure of a structure and/or an explosion.

In the event of an emergency or accident-causing injury at the site, the procedure below would be followed:

1. Stop work and remain calm.
2. Work together to:
 - *Control* the emergency within capabilities of training (i.e., shut down all equipment and evacuate the area).
 - *Contain* the emergency within capabilities of training (i.e., stop any spills or fire from spreading and/or provide first aid to injured parties).
 - *Clean Up* once approved by the Principal Construction Contractor, client, or authorities, clean-up activities would be undertaken to prevent further incidents or emergencies.
3. All personnel shall leave the work zone they are present in.
4. Report to the central emergency assembly area (for example main gate entry to the site). If this location is not considered safe or not as yet specified, then an alternate location will be provided that is specific to the site. The location should be nominated by the Principal Construction Contractor.
5. Refer to Safety Data Sheets (SDS) of chemicals associated to the emergency.
6. Await further instructions from the on-duty project safety officer.

No project personnel or visitors are to leave the assembly area unless advised to do so by the project safety officer.

In the event of a fire or life-threatening emergency services are to be contacted on **000** or **112** (mobile phones only). The Principal Construction Contractor shall be contacted, who would then notify the client and / or other necessary parties.

The closest medical facility with an emergency room is the Canberra Hospital or Calvary Hospital. Contact details for the nearest hospitals and a map illustrating the route from the site to the hospitals by the Principal Construction Contractor.

1.3.1 Incident Control Measures

Any accident, incident or dangerous occurrence that occurs on site would be reported to the Principal Construction Contractor within one (1) hour of the incident. The Principal Construction Contractor shall ensure that reports for any accidents, incident, or dangerous occurrence that occurs during the remediation works to either personnel or other contractors, are completed within 24 hours and are submitted to the appropriate authorities (WorkCover, Safe Work, EPA etc.).

Any incidents, accidents, near misses and/or dangerous occurrences will also be reported to the client's representative by the Principal Construction Contractor. All contractors involved with the site validation and remediation works are required to report any accidents, incidents, or dangerous occurrences to any field personnel or if they are unavailable to the Principal Construction Contractor.

The Principal Construction Contractor would investigate the cause of the accident, incident, or dangerous occurrence to enable changes in work procedures.

In the case of an injury, the Principal Construction Contractor shall take appropriate first aid measures or direct a responsible person to take such matters.

All incidents shall be managed in a manner that conforms to all requirements of relevant legislation and minimises the adverse effects of the incident.

8 REFERENCES

ACT *Environment Protection Act 1997*.

ACT *Environment Protection Regulation 2005*.

ACT EPA (2017) '*Contaminated Sites – Environment Protection Policy*'.

ACT EPA (2013) '*Environment Guidelines for Preparation of an Environmental Management Plan*'.

ACT EPA (2019) Contaminated Sites Information Sheet 4 '*Requirements for the Re-Use and Disposal of Contaminated Soil*'.

ACT EPA (2016) Environment Protection Information Sheet 5 '*Requirements for the transport and disposal of asbestos contaminated wastes*'.

ACT EPA (2016) Environment Protection Information Sheet 6 '*Management of small scale, low risk soil asbestos contamination*'.

ACT EPA (2015) '*Policy on Institutional Controls and Enforcement of Site Management Plans required for Contaminated Sites*'.

ACT EPA (2011) '*Environment Protection Guidelines for Construction and Land Development in the ACT*';

ACT EPA Environment Protection (Noise) Environment Protection Policy 2012

ACTPLA website (Territory Plan) <http://www.actmapi.act.gov.au/>

Bureau of Mineral Resources, Geology and Geophysics (1984) 1:100,000 scale map '*Hydrogeology of the Australian Capital Territory and Environs*'.

Bureau of Mineral Resources, Geology and Geophysics (1992) 1:100,000 scale Geological Series Map Sheet '*Canberra 8727*'.

Environment ACT (2000) '*ACT's Environmental Standards: Assessment & Classification of Liquid & Non-liquid Wastes*'.

NEPC (1999) '*National Environment Protection (Assessment of Site Contamination) Measure 1999*' (ASC NEPM (2013)).

Robson (2015) *Phase 2 Environmental Site Assessment – Blocks 11, 12 and 13, Section 67, Acton* (Robson reference 960502).

Robson (2020) Site Inspection and Addendum Letter to the Phase 2 Environmental Site Assessment – Blocks 11, 12 and 13, Section 67, Acton, ACT 2601 (Robson reference 11176).

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

9 ABBREVIATIONS

ABBREVIATIONS	
ACM	Asbestos Containing Material
ACT	Australian Capital Territory
ACTPLA	ACT Planning and Land Authority
AHD	Australian Height Datum
AS/NZ	Australian and New Zealand Standard
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
CC	Construction Control
CEMP	Construction Environmental Management Plan
DoH	Department of Health
EPA	Environment Protection Authority
ES	Environmental Standards
EPD	Environment and Planning Directorate
km	Kilometres
L	Litres
LEL	Lower Explosive Limit
L/sec	Litres per Second
m	Metres
mg/L	Milligrams per Litre
ml	Millilitres
mm	Millimetres
m ²	Square Metres
m ³	Cubic Metres
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure

ABBREVIATIONS	
NSW	New South Wales
OCP	Organochlorine Pesticides
PAH	Polyaromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
PID	Photo-Ionisation Detector
PPE	Personal Protective Equipment
QA/QC	Quality Assurance/ Quality Control
RU	Reuse
SWMS	Safe Work Method Statement
SQEC	Suitably Qualified Environmental Consultant
TAMs	Territory and Municipal Services
TDS	Total Dissolved Solids
TRH	Total Recoverable Hydrocarbons
TSP	Total Suspended Particles
UFP	Unexpected Find Protocol
VENM	Virgin Excavated Natural Material
WA	Western Australia
WHS	Work Health and Safety Officer

10 STATEMENT OF LIMITATIONS

This CEMP provides details for the environmental management of excavation works to be undertaken at Blocks 11, 12 and 13, Section 67, Acton, ACT, 2601.

THIS REPORT MUST NOT BE REPRODUCED EXCEPT IN FULL AND MUST BE READ IN CONJUNCTION WITH THE REPORT TERMS AND CONDITIONS INCLUDED AFTER THE ABBREVIATIONS SECTION THIS REPORT.

Report Terms and Conditions

Contaminated Site Report

While Robson Environmental Pty Ltd (Robson) has taken all care to ensure that this report includes the most accurate information available, samples were taken where applicable, from the location indicated within the report and Robson is unable to comment on the existence or otherwise of any contaminants otherwise within the site.

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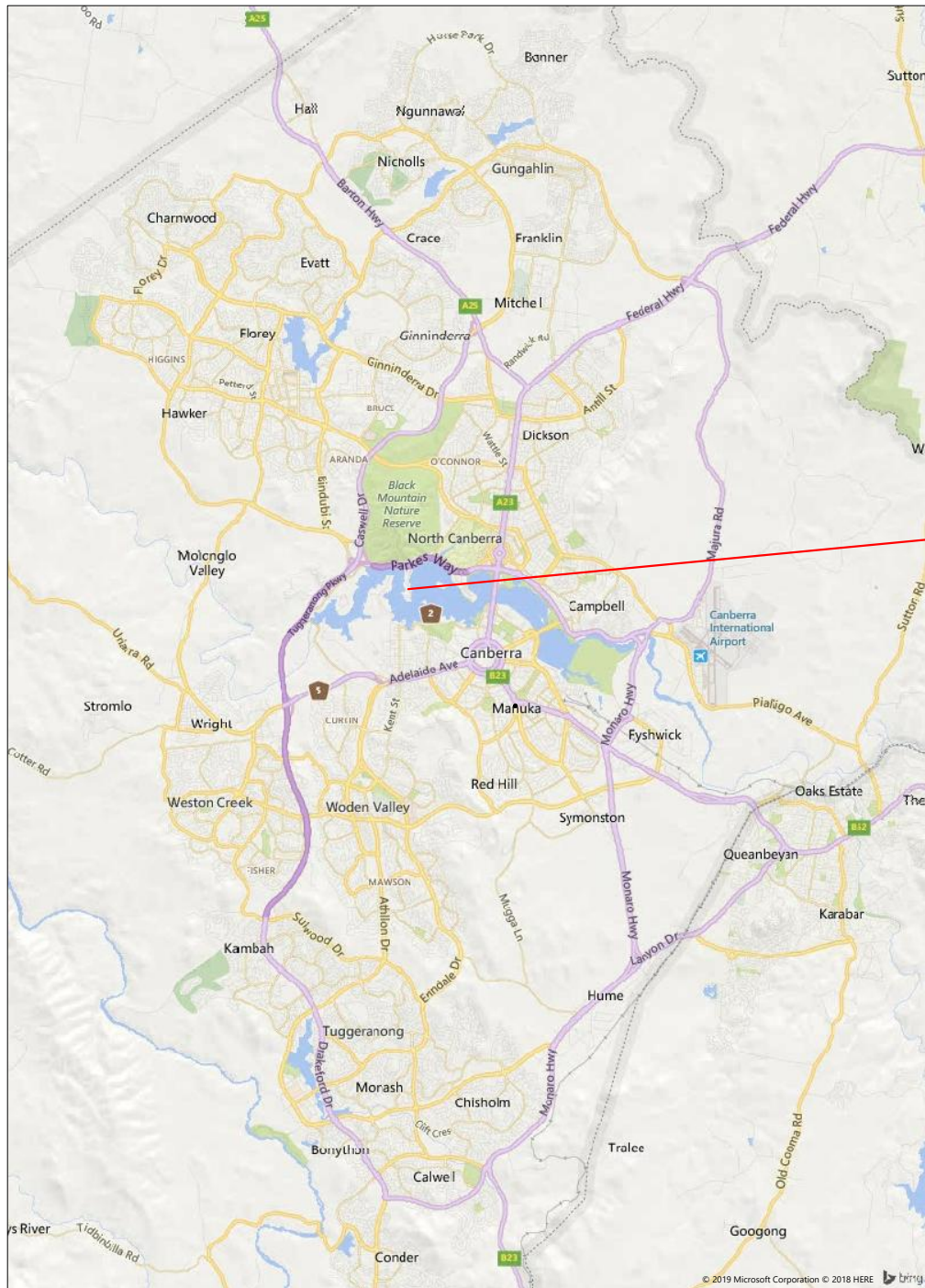
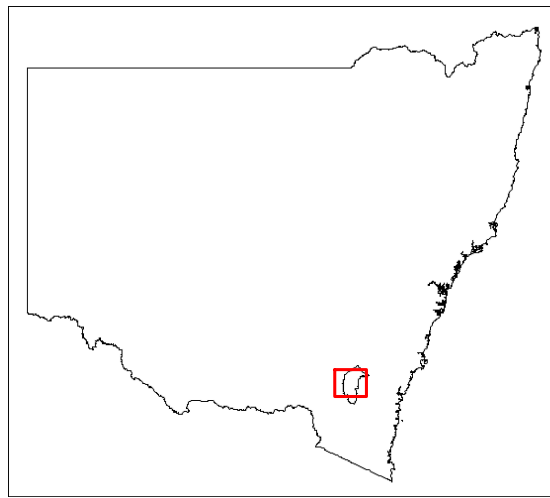
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HSEQ Management System			
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FIGURES



LEGEND

SITE BOUNDARY

NOTES

Scale, locations, and boundaries are approximate only.



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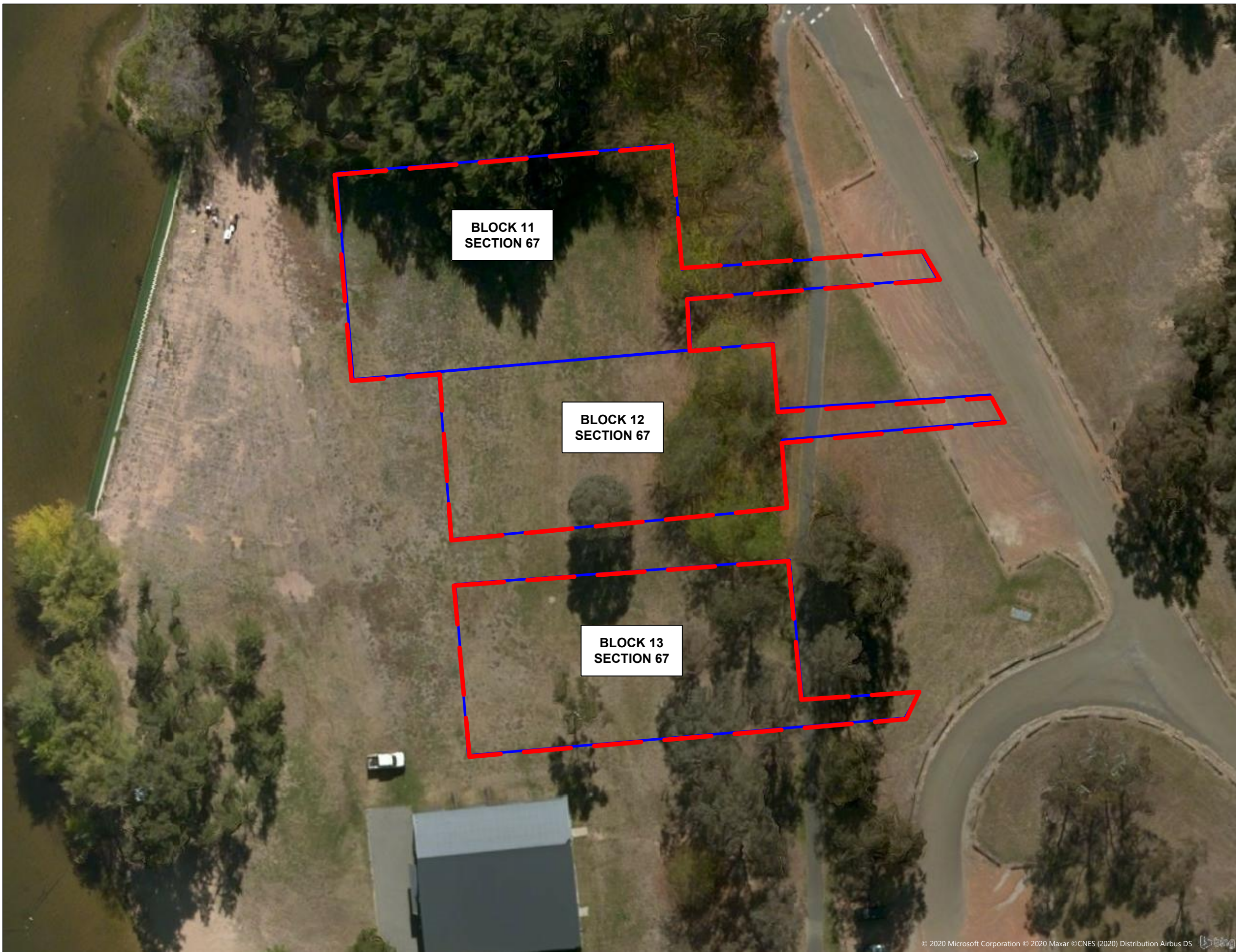
CLIENT:	CONSTRUCTION CONTROL
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SITE:	BLOCKS 11, 12 AND 13 SECTION 67 ACTON ACT 2601
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PROJECT:	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN
TITLE:	SITE LOCATION PLAN


SCALE (m):	0 25 50
REF:	MICROSOFT 2020 HERE 2020


DRAWN:	SJ <i>Demison</i>	FIGURE:	1	DATE:	25/02/2021
CHECKED:	BK <i>BSK</i>	PROJECT:	11276	REV:	A



LEGEND

 BLOCK BOUNDARY

 SITE BOUNDARY



NOTES

Scale, locations, and boundaries are approximate only.

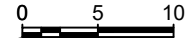

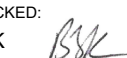


KEY PLAN - INSET

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CLIENT: CONSTRUCTION CONTROL	SITE: BLOCK 11, 12 AND 13 SECTION 67 ACTON ACT 2601	PROJECT: CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	SCALE (m): 	DRAWN: SJ 	FIGURE: 2	DATE: 25/02/2021
		TITLE: GENERAL SITE PLAN	REF: NEARMAP 2020	CHECKED: BK 	PROJECT: 11276	REV: A

APPENDICES

Appendix A

CEMP Compliance Agreement

Construction Environmental Management Plan Compliance Agreement

I have been inducted to the site specific (Blocks 11, 12 and 13, Section 67, Acton) CEMP for the development works undertaken at the site.

I understand the purpose of the CEMP and agree to comply with all its provisions. I understand I could be prohibited from working on the site for violating any of the reporting requirements specified in this CEMP.

Initial induction provided by nominated SQEC and/or an ACT licenced asbestos assessor:

Name	Position	Organization	Signature	Date

Authorised key personnel inductors (e.g., nominated person/s from the principal construction contractor) :

Name	Organization	Signature	Date	Inducted by

Inductees

Name	Organization	Signature	Date	Inducted by

Appendix B

Photographs of Indicators of Soil/Fill Material Contamination



Photograph 1: Example of discoloured or stained soil.



Photograph 2: Example of discoloured or stained soil.



Photograph 3: Example of oily texture due to hydrocarbon products.



Photograph 4: Example of irregular gritty texture due to ash and slag waste.



Photograph 5: Example building/demolition rubble in soil.



Photograph 6: Example building/demolition rubble with ACM in soil.



Photograph 7: Example of non friable ACM fragment in soil.



Photograph 8: Close up of non friable ACM fragment in soil.



Photograph 9: Example close up of friable ACM insulation lagging in soil.



Photograph 10: Example in-ground ACM lagged heating pipes.



Photograph 11: Example of NOA outcrops.



Photograph 12: Example of NOA outcrops.

Appendix C

ACT EPA Information Sheets 4, 5 and 6

REQUIREMENTS FOR THE REUSE AND DISPOSAL OF CONTAMINATED SOIL IN THE ACT

This Information Sheet outlines the Environment Protection Authority's (EPA) requirements for the classification of known and potentially contaminated soil for reuse and disposal in the ACT. For the purposes of clarification material being assessed under the provisions of this Information Sheet must meet the definition of 'non-liquid' as defined in the ACT's *Environmental Standards: Assessment and Classification of Liquid and Non-liquids Wastes June 2000*.

Background

The key objective of this information sheet is to ensure that the environment and human health are protected during the management and disposal of contaminated soil.

This information sheet also supports the objects of the [Environment Protection Act 1997](#) and the core waste management targets of the [ACT Waste Management Strategy 2011–2025](#).

The EPA encourages effective waste management by promoting onsite reuse, where appropriate, as the preferred option for dealing with contaminated soil. In accordance with the ACT Waste Management Strategy there is an established hierarchy for waste management.

The hierarchy for waste management is:

Most preferred	> avoidance
	> reduction
	> reuse
	> recycling
	> recovery
Least preferred	> disposal

The EPA will assess reuse options and disposal of contaminated soil on a case-by-case basis.

Assessment Requirements

The procedures for assessing contaminated soil for reuse or disposal are as follows:

Waste Disposal

For the purposes of waste classification contaminated soil must be excavated and stockpiled prior to assessment.

In-situ sampling will not generally be supported for waste classification purposes. If in-situ sampling is proposed written agreement from the EPA must be obtained **prior** to the commencement of sampling.

- At least one sample per 25 cubic metres (two samples per stockpile if stockpiles are less than 25 cubic metres) must be collected and analysed for waste classification purposes.

3-dimensional systematic samplings must be applied to account for any spatial variability of impacts within the stockpile and must be clearly demonstrated in the waste classification report.

Reuse

- For off-site reuse assessments sampling must be undertaken in general accordance with the 'Sampling Guidelines' section of the EPA Victoria guidance titled [Industrial Waste Resource Guidelines IWRG 702 - Soil Sampling](#) dated June 2009. Where it cannot be demonstrated that material is homogeneous sampling must be undertaken at **minimum** rate of one sample per 25 cubic metres.

In all cases the number of samples to be taken is to be based on the anticipated bulked volume of material. **Appropriate justification for the number of samples taken must be included in the reuse assessment report.**

Sampling and Analysis

- **All samples collected must be analysed for total concentration of contaminants of concern** and, if relevant:
 - leachable concentration of contaminants using Toxicity Characteristics Leaching Procedure (TCLP) for waste classification purposes;
 - leachable concentration using the Australian Standard Leaching Procedure (ASLP) where a sensitive receiving environment is adjacent to a proposed reuse site. The leachate criteria must be chosen so as to be protective of groundwater quality and aquatic ecosystems both at the receiving site and the adjacent sensitive receiving environment. If in doubt please contact the EPA on 13 22 81.

- The sampling and analysis must be conducted in accordance with a method approved under Section 65 of the [Environment Protection Regulation 2005](#).

All sampling and the assessment of results must be performed by a suitably qualified environmental consultant specialising in contaminated sites assessment (see ACT EPA Contaminated Sites Environment Protection Policy 2017).

- Analysis must be performed by a person employed as an analyst in any of the following organisations:
 - a laboratory operated by or on behalf of the ACT, the Commonwealth, or another State or Territory
 - an Australian University or
 - a laboratory accredited by the National Association of Testing Authorities.

Assessment Report

- For reuse and waste disposal applications the results of the sampling and analysis must be provided to the EPA in the form of a brief report.

The report must contain, as a minimum, the following information:

- a brief site history;
- the source and type of contamination;
- the sampling methods used including a sketch/figure showing the 3-dimensional distribution of samplings undertaken ;
- **justification for the number of samples taken and the analytes chosen;**
- appropriate quality assurance/quality control;
- for waste disposal applications an assessment against the [ACT's Environmental Standards: Assessment and Classification of Liquid and Non-liquids Wastes June 2000](#) and a clear statement as to the classification of the waste;
- for per-and poly-fluoroalkyl substances (PFAS) impacted soil an assessment in accordance with the [PFAS National Environmental Management Plan 2018](#) (as updated from time to time). Sampling must include total and leachable concentrations. **As PFAS do not occur naturally in the environment, applications for off-site reuse will only be supported in exceptional circumstances based on a detailed risk assessment of the source and reuse sites.** Contact the EPA on 13 22 81 for further information on current disposal options in the ACT;
- a summary table of test results;
- the original laboratory results, chain of custody forms etc.;
- a copy of the EPA's written acceptance of the change in sampling rate and/or methodology for waste classification assessments, where appropriate;

- for all off-site reuse requests a letter of acceptance from the land custodian (unleased land) or owner (leased land) of the proposed reuse site;
- For reuse applications an assessment against the criteria in Table 1 of this Information Sheet and a clear statement that the material is suitable for reuse at the nominated reuse site. Aesthetic impacts, for example anthropogenic impacts, odour and staining, must also be considered in all reuse applications; and
- If off-site reuse is being considered details of the soil assessment procedures used and full details of the intended reuse location for the soil must be included in the reuse report.

NOTE: The reuse of contaminated soil assessed under this Information Sheet will only be considered for reuse off-site at **industrial land use sites or for the purposes of road construction or similar uses.**

Applications and Approvals

Waste disposal applications must be submitted on-line using a [Notice of application or approval for disposal to landfill SmartForm](#). The waste classification report must be attached to this application.

Reuse applications and reports along with a request for EPA review and approval must be forwarded to ContaminatedSites@act.gov.au

The applications will be assessed and you will be advised of the EPA's decision within 10 working days.

NOTE: Waste disposal and reuse reports **must** be submitted separately.

No material is to be removed off-site for reuse or disposal without EPA approval.

References

Additional references to consider when assessing contaminated soil in the ACT include:

- [ACT EPA Contaminated Sites Environment Protection Policy, 2017](#)
- [Assessment of Site Contamination National Environment Protection Measure 1999 \(as updated 2013\)](#)
- [PFAS National Environmental Management Plan, 2018 \(as updated from time to time\)](#).

For more information

Contact the Environment Protection Authority by calling Access Canberra on 13 22 81 Go to www.accesscanberra.act.gov.au for more information relating to Contaminated Land.

Last updated April 2019

Table 1¹ –Reuse Criteria

Contaminant	Maximum total concentration (mg/kg) dry weight
Arsenic	20
Barium	300
Beryllium	2
Cadmium	3
Chromium (total)	50
Chromium (VI)	1
Cobalt	100
Copper	100
Lead	100
Manganese	500
Mercury (total)	1
Molybdenum	10
Nickel	60
Selenium	10
Silver	10
Tin (total)	50
Zinc	200
Tributyltin (reported as Sn)	0.005
Other pesticides ²	2
DDT + DDD + DDE	2
C ₆ to C ₉ petroleum hydrocarbons	65
C ₁₀ to C ₃₆ petroleum hydrocarbons	1000
Benzene	1
Toluene	1
Ethylbenzene	3
Xylene (total)	14
Naphthalene	3
Benzo(a)pyrene	0.2
Polycyclic aromatic hydrocarbons (total)	20
Polychlorinated biphenyls (PCB)	2
Phenols	25
Cyanide (total)	32
Fluoride	300

¹ Criteria have been derived from EPA publications nationally with the most conservative criteria generally adopted for application in the ACT. The EPA will consider each application for reuse on a case by case basis and in the context of the nature of the contaminants within the soil and the receiving environment which may warrant more stringent criteria to those detailed in Table 1.

² Other pesticides means Aldrin, Dieldrin, Chlordane, Heptachlor, Hexachlorobenzene (HCB), Lindane, and Benzene Hexachloride (BHC)

REQUIREMENTS FOR THE TRANSPORT AND DISPOSAL OF ASBESTOS CONTAMINATED WASTES*

The provisions below apply to any activity that involves the transportation, collection, storage, or disposal of any type of asbestos waste, regardless of whether the activity is required to be licensed.

Transportation requirements for asbestos waste are:

- > Any type of asbestos waste must not be transported unless it is conveyed in a covered leak proof vehicle so as to prevent any spillage or dispersal of the waste.
- > If asbestos waste that is in the form of stabilised asbestos waste in bonded matrix is to be transported and the waste is not stored in a bag in accordance with the requirements for collection and storage
- > (see below), the waste must be wetted before it is transported.
- > Any vehicle used to transport any type of asbestos waste must be cleaned before leaving the landfill site at which the waste is disposed of, so as to ensure that all residual asbestos waste is removed from the vehicle.

Collection and storage requirements for asbestos waste are:

- > Asbestos waste that is in the form of asbestos fibre and dust waste must be covered in such a manner as to prevent the emission of any dust.
- > Asbestos waste that is in the form of asbestos fibre and dust waste must not be collected and stored except in accordance with the following procedures:
 - the waste must be collected and stored in impermeable bags
 - each bag must be made of heavy duty low density polyethylene of at least 0.2mm thickness, and have dimensions of no more than 1.2 metre in height and 0.9 metre in width
 - each bag must be sealed in accordance with the NOHSC Code of Practice for the Safe Removal Of Asbestos 2nd Edition guidelines, and contain no more than 25kg of waste and
 - each bag must be marked with the words 'CAUTION ASBESTOS' in letters that are of not less than 40mm and that comply with Australian Standard AS 1319— Safety Signs for the Occupational Environment.
 - If asbestos waste in any form is stored in a bag, the following procedures must be followed:
 - the bag must be placed in a leak proof container that is used only for the purposes of storing asbestos waste

- the container must be marked with the words 'DANGER-ASBESTOS WASTE ONLY— AVOID CREATING DUST' in letters that are of not less than 50mm and that comply with Australian Standard referred to in paragraph above and
 - the container must have a close fitting sealed cover so as to prevent any spillage or dispersal of the waste.
- > Asbestos waste in any form must not be stored except in accordance with the following procedures:
- the waste must be stored in a secure area so as to prevent entry by unauthorised persons and to prevent the risk of environmental harm and
 - the waste must, if it is practicable to do so, be stored separately from other types of waste.
- > If asbestos waste that is in the form of stabilised asbestos waste in bonded matrix is stored otherwise than in a bag (as detailed above), the following procedures must be followed:
- if it is practicable to do so, the waste must be wetted so as to prevent the emission of any dust
 - in wetting the asbestos waste, care must be taken to ensure that the wetting process does not cause any emission of dust or lead to any discharge of polluted water and
 - the waste must be kept covered at all times.

Disposal requirements for asbestos waste are as follows:

Asbestos waste in any form must be disposed of only at a landfill site that may lawfully receive the waste.

Disposal of asbestos waste in any form must be by way of burial.

Before disposal of the asbestos waste, arrangements must be made with the occupier of the landfill site for the purposes of ensuring that the asbestos waste will be covered:

- initially to a depth of at least 0.5 metre, and
- finally to a depth of at least 1 metre (in the case of stabilised asbestos waste in bonded matrix) or 3 metres (in the case of asbestos fibre and dust waste) beneath the planned final land surface of the landfill site.

- > The asbestos waste must:
 - be disposed of in accordance with the arrangements in the paragraph above and
 - be buried to the initial depth on the same day it is received at the landfill site.
- > In disposing of asbestos waste in any form at a landfill site, the waste must:
 - be unloaded in such a manner as to avoid the creation of dust
 - not be compacted before it is covered and
 - not come into contact with any earthmoving equipment at any time.

This Information Sheet prohibits the use of asbestos waste in any form as road making material.

** Information reproduced in part from the Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-liquid Wastes, Storing, handling, transporting and disposing of asbestos wastes, NSW EPA*

For more information

Contact the Environment Protection Authority by calling Access Canberra on 13 22 81.

Go to www.accesscanberra.act.gov.au for more information relating to Environment Protection Authority.

Last updated October 2016

MANAGEMENT OF SMALL SCALE, LOW RISK SOIL ASBESTOS CONTAMINATION*

PURPOSE

This Information Sheet provides guidance on the assessment and management of single residential blocks, or similar small scale sites, which have soil asbestos contamination resulting from poor demolition practices or dumping. It is intended to be primarily used by Access Canberra staff and industry professionals, in consultation, as necessary, with the Environment Protection Authority (EPA) and ACT Health.

BACKGROUND

Asbestos building products were widely used in the Australian Capital Territory (ACT) from the 1940s to the 1980s, and many of the buildings and structures involved are now being demolished for infill developments. If the demolition is not properly conducted, then asbestos debris will often remain on site or be dumped on other sites. This can pose a risk or community concern that ACT regulatory agencies are frequently called upon to resolve.

The main legislation in the ACT relating to contaminated sites is the *Environment Protection Act 1997* (the Act), administered by the Environment Protection Authority (EPA). For contamination issues the EPA has developed the *Contaminated Sites Environment Protection Policy* (Contaminated Sites EPP) and specifically for asbestos issues has endorsed the Western Australia Department of Health, *Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia* (2009) (the Guidelines).

The removal of asbestos from building structures is regulated under the *Building Act 2004*, with asbestos related work practices regulated under the *Dangerous Substances Act 2004*. All asbestos related works at a site containing soil asbestos contamination must be undertaken by consultants suitably licensed in the ACT.

The full application of the Act, Contaminated Sites EPP and the Guidelines, which can be expensive and protracted, is not warranted in certain low risk situations where acceptable simpler regulatory measures may be sufficient. Soil asbestos contamination resulting from poor demolition practices or dumping on a single residential block are often low risk situations where the following regulatory process is recommended. However, with EPA agreement, the approach may also be suitable for other low risk applications such as for commercial sites.

SIMPLE SITE ASSESSMENT AND MANAGEMENT PROCESS

This process is for asbestos containing materials (ACM) where the asbestos is bound in a matrix such as cement (bonded asbestos), and there is little free fibre present. The ACM would mainly appear as fragments, pieces or sheets. Asbestos in these forms is not likely to release appreciable amounts of free asbestos fibre, which presents the main risk from asbestos through inhalation.

The general sequence of steps is to:

- > halt potential contaminating or contamination disturbing activities at a site
- > identify the presence of asbestos
- > assess the extent of contamination and select a clean up option
- > provide notice of what is required and
- > monitor and validate the clean up.

At various stages, it may be necessary to inform other agencies such as the EPA or ACT Health.

CONTAMINATION PREVENTION

Any incorrect handling or disturbance of ACM on a site should be halted as soon as possible. The activity may be posing a real-time risk to adjacent properties or site personnel, or may be scattering and burying ACM which may pose a future risk.

ASBESTOS IDENTIFICATION

ACM may be able to be identified based on experience, but confirmation is recommended by submitting representative ACM pieces for laboratory analysis. If in doubt, assume it is asbestos.

SITE ASSESSMENT AND MANAGEMENT SELECTION

The site assessment will primarily depend on a visual inspection. Other useful information includes: building license records; demolition development applications; hazardous materials surveys, asbestos removal or waste plans; asbestos disposal receipts; and often interviews with site personnel, the owner or neighbours. Important topics include: age and condition of building or structures; the likely amount of asbestos in them; the method of demolition and safeguards; and details of earth-disturbing activity.

The “walkover” should be systematic and preferably on a grid basis. For instance, a 4m by 4m area might be inspected, taking note of the total sheet area of ACM found. Small location flags may be helpful. It is then possible to determine the average ACM total sheet area per m² of surface, for each grid area. As an example, 3 x 1cm², 1 x 6cm² and 1 x 20cm² ACM pieces found in that grid would equate to a total of 29cm² divided by 16 (the grid area) which equals about 2cm² of ACM per m².

If there is just a “hotspot” of contamination, eg. many pieces of ACM in a localised area, then a smaller grid size may have to be used. If there are just a few large ACM pieces sitting cleanly on the surface, then just their managed removal would be adequate, without resorting to calculations.

Actions will normally depend on the estimated level of asbestos contamination per m² of surface as follows:

- > ACM total sheet area <10 cm² (eg. 3 x 3 cm) and with little associated past soil disturbance – very low risk – remove all visible ACM, including, if practical, the gentle fine raking of wetted soil to a 10cm depth to expose ACM fragments.
- > ACM total sheet area >10 cm², or ACM occurrences with significant soil disturbance, or buried asbestos – low risk – consult EPA with the expectation of excavation the impacted soil and possibly all other soil down to the depth of likely ACM penetration.
- > For larger quantities of ACM, the risk may be higher and the site may need to be reported to the EPA under the Act.

DISPOSAL OF ASBESTOS

The EPA has developed *Contaminated sites Information Sheet 5 – Requirements for the Transport and Disposal of Asbestos Contaminated Wastes* which provides guidance on the disposal of soil contaminated with asbestos.

The disposal of all other forms of asbestos is regulated under the Act and the *ACT’s Environmental Standards: Assessment & Classification of Liquid & Non-liquid Wastes* (the Standards). Under the Standards asbestos material is assessed and classified as industrial waste and must be disposed of only at a landfill site that is lawfully authorised to receive the waste. Mugga Lane Resource Management Centre is authorised to receive this waste.

For asbestos material being transported interstate it is considered a controlled waste under the *National Environment Protection (Movement of Controlled Waste between States and Territories) Measure* [Controlled Waste NEPM] and the waste producer must obtain all required approvals/authorisations prior to any movement. Once the appropriate approvals/authorisations have been obtained the waste must be collected and transported by an appropriately licensed or authorised transporter for treatment at an appropriately licensed/authorised

facility. The EPA has developed a document titled the *Responsibilities of the Controlled Waste Producer in the ACT* under the NEPM that details the responsibilities of the waste producer. Contact the EPA for more information.

REPORTING AND COMMUNICATION

For sites containing ACM total sheet area <10 cm² per m² of surface a clearance certificate for these sites can be issued by an ACT licensed asbestos assessor. The clearance certificate must be submitted to the EPA for endorsement prior to any work commencing on the site.

For sites containing ACM total sheet area >10 cm² per m² of surface, or ACM occurrences with significant soil disturbance, or buried asbestos, a final site validation report and a clearance certificate for the site must be issued by a suitably qualified environmental consultant specialising in contaminated sites assessment. Any report to the EPA should include details of the contamination, including location, cause, character and photographic evidence of the extent of contamination. The report and clearance certificate must be submitted to the EPA for endorsement prior to any work commencing on the site.

CLEAN UP MANAGEMENT

The asbestos assessor/environmental consultant must observe the clean-up, check the final surface for contamination and inspect disposal documentation. If in the asbestos assessor’s/environmental consultant’s opinion clean-up was inadequate then another remediation round or higher level of action may be necessary.

During any removal of asbestos soil contamination, the material must be handled by an ACT licensed asbestos removalist and management measures instituted to minimise the release of asbestos fibres, and thus protect site personnel and the public. For advice on health concerns site workers and the general public are advised to contact ACT Health.

As a minimum, gloves and P1/P2 dust masks should be worn and ACM double wrapped in heavy plastic (0.2mm thick). If soil is to be excavated, then the following additional measures are recommended: dust suppression methods such as spraying with a suitable wetting agent; securing the site and erecting warning signs; informing neighbours about activities; and covering transported impacted soil. All contaminated material must be disposed to an approved landfill site.

If the responsible party is not willing to implement the appropriate actions then it may be necessary to report the site to the EPA under the Act and take other actions as deemed necessary, including managing any real or perceived risks in the meantime. The EPA may then take regulatory action under the Act to have the site assessed and/or remediated.

CONTACTS

ACT Health

Howard Florey Centenary House
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Phone: (02) 6205 1700

Email: HealthACT@act.gov.au

Environment Protection Authority (EPA)

Dame Pattie Menzies House
16 Challis Street, Dickson ACT 2602

Phone: 13 22 81

Email: ContaminatedSites@act.gov.au

**Information reproduced in part from the Western Australia Department of Health, Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia (2009) with permission of the Western Australia Department of Health.*

For more information

Contact the Environment Protection Authority by calling

Access Canberra on 13 22 81

Go to www.accesscanberra.act.gov.au for more

Information relating to Environment Protection Authority

Last updated October 2016

Further Information | Phone: Access Canberra on 13 22 81 | Email: environment.protection@act.gov.au | Web: act.gov.au/accesscbr

Note: This guidance material has been prepared using the best information available to Access Canberra. Any information about legislative obligations or responsibilities included in this material is only applicable to the circumstances described in the material. You should always check the legislation referred to in this material and make your own judgement about what action you may need to take to ensure you have complied with the law. Accordingly, Access Canberra extends no warranties as to the suitability of the information for your specific situation.

Appendix D

Sediment and Erosion Control Plan



Date: 24-March-2021
 Project No: 200771
 Project: ROWING BOAT SHED
 BLOCK 11 SECTION 67 ACTON, ACT
 Issued By: AM

Reason	Method	Type
I Information	E eMail	D DWG
P Preliminary	H Hand	P PDF
A Approval	F FTP Site	
D Detailed Design		
T Tender		
C Construction		
W Work As Executed		

Revision History	
24.03.21	

Reason	Method	Type
A	E	P

Company	Name	Number of Copies
Construction Control		1

Miscellaneous Documents	Current	Miscellaneous Documents Revisions

Sketches	Current	Sketch Revisions

Drawings	Current	Date Of Drawing Revision
GENERAL		
200771-DRG-CIV-GN-0001		COVER SHEET, DRAWING INDEX - AND LOCALITY
200771-DRG-CIV-GN-0002		GENERAL NOTES - AND LEGEND
200771-DRG-CIV-GN-0003		CONCRETE NOTES
ALIGNMENT		
200771-DRG-CIV-AL-0101		GENERAL ARRANGEMENT PLAN
200771-DRG-CIV-AL-0111		ALIGNMENT - TYPICAL CROSS SECTIONS
200771-DRG-CIV-AL-0121		ALIGNMENT - CONTROL AND GRADING PLAN
200771-DRG-CIV-AL-0131		ALIGNMENT - HORIZONTAL SETOUT TABLES
200771-DRG-CIV-AL-0141		ALIGNMENT - ROAD LONGITUDINAL SECTIONS
EARTHWORKS		
200771-DRG-CIV-EW-0201		EARTHWORKS - CUT AND FILL VOLUMES PLAN
200771-DRG-CIV-EW-0211		EARTHWORKS - LONGITUDINAL SECTIONS
PAVEMENT		
200771-DRG-CIV-PV-0301		PAVEMENT PLAN
200771-DRG-CIV-PV-0311		PAVEMENT CONCRETE JOINTING - PLAN
200771-DRG-CIV-PV-0321		PAVEMENT DRIVEWAY JOINTING - PLAN
200771-DRG-CIV-PV-0331		PAVEMENT DETAILS - SHEET 1
200771-DRG-CIV-PV-0332		PAVEMENT DETAILS - SHEET 2
STORMWATER		
200771-DRG-CIV-DR-0400		STORMWATER NOTES AND DETAILS
200771-DRG-CIV-DR-0401		STORMWATER AND SUBSOIL DRAINAGE - PLAN
200771-DRG-CIV-DR-0411		STORMWATER - STRUCTURE SETOUT SCHEDULE
200771-DRG-CIV-DR-0421		STORMWATER - LONGITUDINAL SECTIONS
200771-DRG-CIV-DR-0431		STORMWATER - DETAILS
200771-DRG-CIV-DR-0491		WATER SENSITIVE URBAN - DESIGN PLAN
UTILITIES		
200771-DRG-CIV-UT-0501		SEWER AND WATER PLAN
200771-DRG-CIV-UT-0511		UTILITIES - DETAILS
RETAINING WALLS		
200771-DRG-CIV-RW-0601		RETAINING WALLS - ALIGNMENT CONTROL AND F
TRAFFIC CONTROL DEVICES		
200771-DRG-CIV-TC-0701		TCD PLAN
TEMPORARY TRAFFIC MANAGEMEN		
200771-DRG-CIV-TM-0800		COVER SHEET, DRAWING INDEX - AND LOCALITY
200771-DRG-CIV-TM-0801		TRAFFIC MANAGEMENT PLAN
200771-DRG-CIV-TM-0802		TRAFFIC MANAGEMENT PLAN PROJECT - OVERVI
200771-DRG-CIV-TM-0803		TRAFFIC MANAGEMENT PLAN - RISK MATRIX
200771-DRG-CIV-TM-0811		VEHICLE MOVEMENTS PLAN
200771-DRG-CIV-TM-0831		TRAFFIC GUIDANCE SCHEME
200771-DRG-CIV-TM-0851		CONSTRUCTION PARKING PLAN
ENVIRONMENTAL MANAGEMENT		
200771-DRG-CIV-EV-0900	A	LANDSCAPE MANAGEMENT - NOTES AND LEGEND
200771-DRG-CIV-EV-0901	A	LANDSCAPE MANAGEMENT AND - PROTECTION P
200771-DRG-CIV-EV-0910	A	SEDIMENT EROSION CONTROL - NOTES AND LEG
200771-DRG-CIV-EV-0911	A	SEDIMENT EROSION CONTROL - PLAN
DEMOLITION		
200771-DRG-CIV-DM-1101		DEMOLITION - PLAN
VEHICLE TURNING PATHS		
200771-DRG-CIV-TP-2201		VEHICLE TURNING PATHS PLAN - SHEET 1
200771-DRG-CIV-TP-2202		VEHICLE TURNING PATHS PLAN - SHEET 2
WASTE MANAGEMENT		
200771-DRG-CIV-WM-2301		WASTE MANAGEMENT PLAN
200771-DRG-CIV-WM-2331		TYPICAL WASTE ENCLOSURE - DETAIL SHEET 1
200771-DRG-CIV-WM-2332		TYPICAL WASTE ENCLOSURE - DETAIL SHEET 2

LANDSCAPE MANAGEMENT & PROTECTION NOTES

GENERAL ENVIRONMENTAL MANAGEMENT

- BEFORE COMMENCING WORKS, THE COORDINATOR SHALL ADVISE TRANSPORT CANBERRA CITY SERVICES (TCCS) IN WRITING THAT THE PROTECTIVE MEASURES HAVE BEEN INSTALLED IN ACCORDANCE WITH THE APPROVED LANDSCAPE MANAGEMENT PROTECTION PLAN (LMPP). RANDOM AUDITS WILL BE UNDERTAKEN BY TCCS TO ENSURE COMPLIANCE. FAILURE TO COMPLY MAY INCUR THE ISSUE OF A STOP WORK NOTICE.
- ALL WORKS SHALL BE CONTAINED WITHIN THE AUTHORISED SITE EXCEPT FOR APPROVED SERVICE CONNECTIONS IN THE VERGE OR OTHER APPROVED EXCEPTIONS.
- DURING THE PROGRESS OF THE WORKS ALL EXISTING VERGE GRASS COVER SHALL BE MAINTAINED IN ITS PRE-EXISTING CONDITION. PROTECTIVE MEASURES SHALL INCLUDE REGULAR WATERING TO MAINTAIN GRASS AND TREES IN GOOD CONDITION.
- WHERE THE SURFACE IS GRASS OR BARE SOIL WITHOUT TREES, NO PROTECTION IS REQUIRED. WHERE TOPSOIL AND GRASS OR OTHER APPROVED SURFACES, ARE INSTALLED AT THE COMPLETION OF THE WORKS IN ACCORDANCE WITH THE "STANDARD SPECIFICATION FOR URBAN INFRASTRUCTURE WORKS".

SUPERVISION

- FOR ALL WORKS, OTHER THAN MINOR WORKS (I.E. MINOR IN COMPLEXITY AND/OR SCOPE OF WORKS AND CONFIRMED AS MINOR WORKS BY TCCS), AND UNLESS OTHERWISE APPROVED BY TCCS, A SUITABLY QUALIFIED LANDSCAPE ARCHITECT OR HORTICULTURIST SHALL BE EMPLOYED TO ENSURE THAT THE WORK IN THE VERGE MEETS THE REQUIREMENTS. THE ARCHITECT/HORTICULTURIST SHALL ALSO BE PRESENT DURING ANY CULTIVATION OR RESTORATION OF THE VERGE WHICH AFFECTS PLANT MATERIAL AND SHALL PROVIDE CERTIFICATION, ENDORSED BY THE COORDINATOR, THAT ALL WORK, CULTIVATION AND RESTORATION HAVE BEEN PERFORMED TO INDUSTRY STANDARDS.

STORAGE OF CONSTRUCTION MATERIALS

- THE STORAGE OF CONSTRUCTION MATERIALS AND THE PARKING OF VEHICLES OR EQUIPMENT ON VERGES OR ADJACENT PUBLIC OPEN SPACES IS NOT PERMITTED WITHOUT PRIOR APPROVAL FROM TCCS. WHERE THERE IS NO ALTERNATIVE AVAILABLE OTHER THAN TO USE THESE AREAS FOR STORAGE AND/OR PARKING, THE COORDINATOR MAY LODGE AN APPLICATION WITH THE LMPP REQUESTING APPROVAL FOR THE USE OF PUBLIC LAND FOR THE DESIGNATED PURPOSES. APPROVAL MAY BE GIVEN BY TCCS SUBJECT TO CERTAIN TERMS AND CONDITIONS OF USE.

SITE ACCOMMODATION

- SITE SHEDS, STORAGE SHEDS, SITE AMENITIES OR BILLBOARDS ARE NOT TO BE ERECTED ON VERGES OR PUBLIC OPEN SPACES WITHOUT PRIOR APPROVAL. SHOULD THERE BE NO ALTERNATIVE, THE COORDINATOR MAY LODGE AN APPLICATION WITH THE LMPP REQUESTING APPROVAL TO ERECT SUCH A STRUCTURE ON PUBLIC LAND. THE ERECTION OF SITE ACCOMMODATION MAY BE APPROVED SUBJECT TO THE COORDINATOR'S AGREEMENT TO COMPLY WITH THE TERMS AND CONDITIONS SPECIFIED BY TCCS AND OBTAINING A PERMIT UNDER THE ROADS AND PUBLIC PLACES ACT 1937 FROM TCCS.

PROTECTIVE FENCING

- ALL TEMPORARY PROTECTIVE FENCES ERECTED TO PROTECT EXISTING ASSETS SHALL BE IN ACCORDANCE WITH THE APPROVED LMPP DRAWING. FENCING SHALL BE ERECTED BEFORE THE COMMENCEMENT OF ANY SITE WORKS AND REMOVED AT THE COMPLETION OF ALL CONSTRUCTION ACTIVITY EXCEPT DURING VERGE RESTORATION. THE FENCE SHALL REMAIN IN PLACE THROUGHOUT THE CONSTRUCTION PERIOD.
- EXISTING TREES, PLANTINGS AND GRASS SHALL BE FENCED OFF TO ENCLOSE THE STREET VERGE, PUBLIC OPEN SPACE OR UNLEASED TERRITORY LAND AREA. UNLESS OTHERWISE APPROVED BY TCCS, PROTECTIVE FENCING SHALL BE LOCATED:
 - ALONG THE DRIP-LINE OF EACH TREE (AS A MINIMUM), AND
 - 1.2m FROM THE BACK OF THE KERB FOR THE FULL FRONTAGE OF THE LEASE, ALONG THE PROPERTY BOUNDARY AND ALONG THE APPROVED DRIVEWAY ACCESS TO ENSURE THAT THE VERGE IS COMPLETELY ENCLOSED.
- USE OF TEMPORARY 1800MM TALL CONTINUOUS MESH FENCE SUPPORTED BY STEEL POSTS WITH CONCRETE BASES, OR PREFABRICATED FENCING PANELS WITH CONCRETE BASES, IS MANDATORY. ANY VARIATION FROM THIS REQUIREMENT SHALL BE ACCOMPANIED BY WRITTEN APPROVAL FROM TCCS.
- EXISTING VERGE FOOTPATHS SHALL BE MAINTAINED. ALL EXISTING VERGE FOOTPATHS AND DRIVEWAYS SHALL REMAIN UNOBSTRUCTED THROUGHOUT THE CONSTRUCTION PERIOD TO PROVIDE SAFE PEDESTRIAN MOVEMENT AT ALL TIMES UNLESS AN ALTERNATIVE IS APPROVED BY TCCS.
- WHERE A CONSTRUCTED FOOTPATH OR CYCLEWAY EXISTS WITHIN THE VERGE, PROTECTIVE FENCING INCLUDING THE CONCRETE PEDESTALS SHALL BE ERECTED TO PROVIDE A CLEAR AND UNOBSTRUCTED SET BACK OF 600mm FROM EACH SIDE OF THE FOOTPATH/CYCLEWAY IN ALL CASES TO ENSURE SAFE PASSAGE FOR CYCLISTS AND PEDESTRIANS.
- IF THERE IS NO CONSTRUCTED PUBLIC FOOTPATH ON THE VERGE A FENCED CLEARWAY OF 1.8m IN WIDTH SHALL BE MAINTAINED FOR THE ENTIRE FRONTAGE OF THE LEASE TO ALLOW FOR CYCLISTS AND PEDESTRIANS.
- ANY DEVIATIONS FROM THE DISTANCES SPECIFIED IN THIS CLAUSE DEEMED NECESSARY BECAUSE OF LOCAL RESTRAINTS REQUIRE PRIOR APPROVAL FROM TCCS.
- ACCESS GATES INTO THE SITE SHALL SWING INTO THE SITE AND NOT BE CAPABLE OF BLOCKING PEDESTRIAN ACCESS ALONG THE VERGE OR VEHICULAR TRAFFIC ON THE ROAD.
- FENCING SHALL NOT BE REMOVED FOR SERVICE INSTALLATION ACROSS THE VERGE WITHOUT PRIOR APPROVAL FROM TCCS FOR THE SERVICE INSTALLATION.
- WHERE APPROVAL HAS BEEN GRANTED, THE FENCE SHALL BE REALIGNED TO PROVIDE A LANE FOR SERVICE TRENCHING BUT FENCES SHALL BE RE-ERECT TO ENCLOSE TREES BEFORE TRENCHING COMMENCES. UPON COMPLETION OF TRENCHING, THE FENCE SHALL BE RETURNED TO ITS ORIGINAL ALIGNMENT.

EXISTING TREES

- ALL TREES LOCATED IN THE ROAD RESERVE, VERGE, PUBLIC OPEN SPACE AND ON UNLEASED TERRITORY LAND, SHALL BE RETAINED AND MUST REMAIN UNDAMAGED. THE LMPP PROCESS REQUIRES THE COORDINATOR TO IDENTIFY ANY TREES THAT MAY BE AFFECTED BY THE WORKS AND TO SUBMIT A REQUEST FOR APPROVAL TO PROCEED WITH THE WORK CLEARLY IDENTIFYING THE NATURE OF THE WORK AFFECTING THE TREE AND PROTECTIVE MEASURES PROPOSED TO MINIMISE DAMAGE TO THE TREE. WRITTEN AUTHORISATION FROM TCCS IS REQUIRED PRIOR TO ANY WORK AFFECTING THE TREE TAKING PLACE. AUTHORISATION WILL BE SUBJECT TO:
 - EXISTING CANOPY CLEARANCE NOT BEING ALTERED;
 - CROWNS AND APEX OF CANOPIES NOT BEING ALTERED OR REDUCED;
 - LIFTING EQUIPMENT AND LOAD CAPABLE OF OPERATING IN A MANNER THAT IT CLEARS THE HEIGHT AND WIDTH OF THE TREE CANOPY WITHOUT DAMAGING THE CROWN, AND;
 - CONSTRUCTION EQUIPMENT CAN PASS BENEATH THE TREES' LOWEST LIMB THROUGH THE DESIGNATED DRIVEWAY ACCESS ROUTE.
- THE MAJORITY OF TREE ROOTS GROW IN THE TOP 300mm OF SOIL. THESE ARE THE FEEDER ROOTS, OFTEN VERY FINE ROOTS THAT PROVIDE THE TREE WITH WATER, OXYGEN AND NUTRIENTS. THESE ROOTS TYPICALLY GROW FROM THE TRUNK OF THE TREE TO WELL BEYOND ITS 'DRIP-LINE' (THE CANOPY EDGE).
- EXCAVATION WITHIN THE DRIP ZONE OF A TREE DOES CONSIDERABLE DAMAGE TO ITS ROOT SYSTEM. IT CAN AFFECT TREE STABILITY AND TREE HEALTH TO SUCH AN EXTENT THAT IT WILL LEAD TO THE DECLINE AND POSSIBLE DEATH OF THE TREE OVER A PERIOD OF YEARS.
- EXCAVATION THAT OCCURS WITHIN THE DRIP ZONE OF A TREE SHALL BE RESTRICTED TO ONE SIDE OF THE TREE ONLY AND SHALL HAVE PRIOR APPROVAL FROM TCCS.
- WHERE EXCAVATION IS APPROVED, THE FOLLOWING MEASURES SHALL BE ADOPTED FOR TREE PROTECTION:
 - DO NOT SEVER LARGE ROOTS (>30mm DIAMETER) CLOSER THAN HALFWAY FROM THE DRIP-LINE TO THE TRUNK;
 - LOCATE THESE ROOTS BY HAND TRENCHING TO A DEPTH OF 300mm BEFORE ANY MECHANICAL TRENCHING IS UNDERTAKEN;
 - CUT ALL ROOTS CLEANLY WITH EQUIPMENT SPECIFICALLY DESIGNED FOR THIS PURPOSE OR BY SUITABLE PRUNING EQUIPMENT;
 - PROTECT ROOTS EXPOSED FROM DESICCATION BY LIGHTLY WATERED OR COVERING WITH HESSIAN, WHICH MUST BE KEPT MOIST; AND
 - MAINTAIN THE GOOD HEALTH OF THE TREES THAT HAVE HAD DISTURBANCE IN THEIR ROOT ZONE BY CONTINUAL WATERING. AT NO TIME SHALL THE DISTURBED AREA BE ALLOWED TO DRY OUT TO THE DETRIMENT OF THE TREES HEALTH.

SITE ACCESS

- SITE ACCESS SHALL BE BY THE EXISTING DRIVEWAY ACCESS POINTS FOR THE WORKS.
- IN SOME CASES CONSIDERATION MAY BE GIVEN TO ALLOWING NEW ACCESS POINTS ACROSS PUBLIC LAND, HOWEVER, ALTERNATIVE OR ADDITIONAL ACCESS POINTS REQUIRE APPROVAL FROM TCCS. WHERE APPROVAL HAS BEEN GRANTED, THE SITE ACCESS SHALL BE POSITIONED MIDWAY BETWEEN TWO EXISTING TREE TRUNKS DEPENDENT ON THE DISTANCE BETWEEN TREES. ACCESS SHALL NOT OCCUR ON TWO SIDES OF A TREE WITHIN THE APPROVED CLEARANCE DIMENSION.
- CONSTRUCTION TECHNIQUE SHALL MINIMISE THE NEED FOR EXCAVATION ACROSS THE VERGE.
- ACCESS ACROSS ADJOINING PUBLIC OPEN SPACES, PARKS, RECREATIONAL RESERVES, ADJOINING PROPERTIES E.G. SCHOOL PLAYGROUNDS, COMMUNITY HALLS ETC. IS PROHIBITED WITHOUT PRIOR WRITTEN AUTHORISATION FROM TCCS, AND ANY OTHER ASSET OWNER WHERE APPLICABLE.

SERVICES AND UTILITIES TO SITE

- THE COORDINATOR SHALL COORDINATE AND COLLATE ALL APPROVALS FOR PROPOSED SERVICES WITHIN THE AREA.
- APPROVAL FOR TRENCH LOCATIONS AND EXCAVATIONS WITHIN THE VERGE SHALL BE OBTAINED THROUGH THE RELEVANT TCCS AGENCIES AT THE PLANNING AND DESIGN STAGES. APPROVAL IS SUBJECT TO THE FOLLOWING REQUIREMENTS:
 - IF THE PROPOSED EXCAVATION IS WITHIN THE CANOPY SPREAD OF ANY TREE, BORING OR TUNNELING BELOW THE ROOT ZONE MUST BE UNDERTAKEN;
 - SHARED TRENCHING FOR SERVICES IS MANDATORY;
 - THE NUMBER OF VERGE CROSSINGS SHALL BE MINIMISED;
 - EXCAVATION FOR SERVICES ACROSS VERGE (I.E. AT RIGHT ANGLES TO KERB OR PROPERTY LINE) SHALL BE MIDWAY BETWEEN THE TREE TRUNKS
 - ANY SERVICE INSTALLATION WITHIN 5.0m OF AN EXISTING TREE TRUNK, OR WITHIN THE TREE CANOPY, REQUIRES PRIOR APPROVAL.

SERVICES AND UTILITIES ALONG ROAD RESERVES

- THE COORDINATOR SHALL COORDINATE ALL SERVICE APPROVALS. APPROVAL BY TCCS FOR TRENCH LOCATIONS SHALL BE OBTAINED AS PART OF THE LMPP PROCESS.
- TO MINIMISE DAMAGE AND/OR DISTURBANCES TO THE ROOTS OR ROOT ZONE AND SUBJECT TO APPROVAL BY TCCS, ANY NEW OR UPGRADED SERVICES PARALLEL TO THE KERB OR PROPERTY LINE SHALL BE INSTALLED ON THE FOLLOWING ALIGNMENTS:
 - WITHIN ROAD PAVED AREA;
 - BELOW THE ROOT ZONE IF THE EXCAVATION REQUIRED IS WITHIN THE CANOPY SPREAD OF ANY TREE;
 - BELOW THE EXISTING FOOTPATH ON THE PROPERTY LINE, AND
 - IMMEDIATELY BEHIND THE KERB.

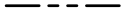

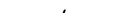






IRRIGATION

- ACT PARKS & CONSERVATION (P&C) ACTIVELY DISCOURAGES THE USE OF IN-GROUND IRRIGATION SYSTEMS AND GENERALLY DOES NOT ENDORSE THEIR INSTALLATION IN THE VERGE. HOWEVER, A SYSTEM OF QUICK-COUPERS AT THE LEASE EDGE OF THE VERGE MAY BE INSTALLED SUBJECT TO APPROVAL OF THE IRRIGATION PLAN BY P&C. A PREFERRED ALTERNATIVE IS THE PLANTING OF DROUGHT TOLERANT GRASSES AND SHRUBS THAT ARE NOT RELIANT ON WATERING TO SURVIVE.

VERGE INFRASTRUCTURE CONDITION AND RESTORATION

- THE COORDINATOR SHALL NOTIFY TCCS AT THE COMPLETION OF WORK AND OBTAIN APPROVAL PRIOR TO COMMENCEMENT OF ANY VERGE RESTORATION. DURING VERGE RESTORATION, TOPSOIL SHALL NOT BE REMOVED AND THE SOIL LEVEL SHALL NOT BE CHANGED WITHIN THE DRIP ZONE OF TREES OR AS OTHERWISE APPROVED AND, UPON COMPLETION OF THE WORKS, VERGES SHALL HAVE ESTABLISHED APPROPRIATE GRASS COVER AS APPROVED BY P&C, E.G. DRYLAND GRASS, NATIVE GRASS OR COUCH.
 - IF THE STANDARD OF GRASS COVER ON THE VERGE NEEDS TO BE IMPROVED, THE FOLLOWING REQUIREMENTS SHALL APPLY:
 - WITHIN THE ROOT ZONE OF TREES, LIGHTLY CULTIVATE THE SOIL IN ONE DIRECTION ONLY TO BETWEEN 25mm TO 50mm DEPTH (50mm MAXIMUM TO MINIMISE DAMAGE TO TREE ROOTS), AVOID MAJOR ROOTS AND KEEP A MINIMUM OF 1.0m AWAY FROM TREE TRUNKS;
 - OUTSIDE THE ROOT ZONE OF TREES NORMAL CULTIVATION PRACTICE APPLIES;
 - ADD 'B TYPE' TOPSOIL AT 25mm TO 50mm DEPTH. LEVEL THE TOPSOIL AND ADD NPK FERTILISER (EQUIVALENT TO MULTIGRO) AT 40 GSM (grams per meter²) AND;
 - LAY TURF OR SOW SEED OF SUITABLE DROUGHT TOLERANT SPECIES AS SPECIFIED IN THE STANDARD SPECIFICATION FOR URBAN INFRASTRUCTURE WORKS. KEEP MOIST DURING ESTABLISHMENT.
- ALL RESTORATION WORK SHALL BE APPROVED BY TRANSPORT CANBERRA CITY SERVICES (TCCS) AND CARRIED OUT BY APPROVED OPERATORS.

LEGEND

-  SITE BOUNDARY
-  SITE / SECURITY FENCE
-  VERGE FENCE
-  SITE GATES (INDICATIVE)
-GATES TO OPEN INTO SITE
-  STABILISED CONSTRUCTION ENTRANCE LOCATION
-  SITE SHEDS (INDICATIVE)
-  EXISTING CONTOUR
-  EXISTING TREE TO BE RETAINED
-(INDICATIVE SYMBOL SHOWN)
-  EXISTING TREE TO BE REMOVED

File Name: P:\2020\200771_Rowing-Act-BoatShed-Action\04_CAD\1.2_Drawings\CIV\200771-drg-civ-ev-0900.dwg

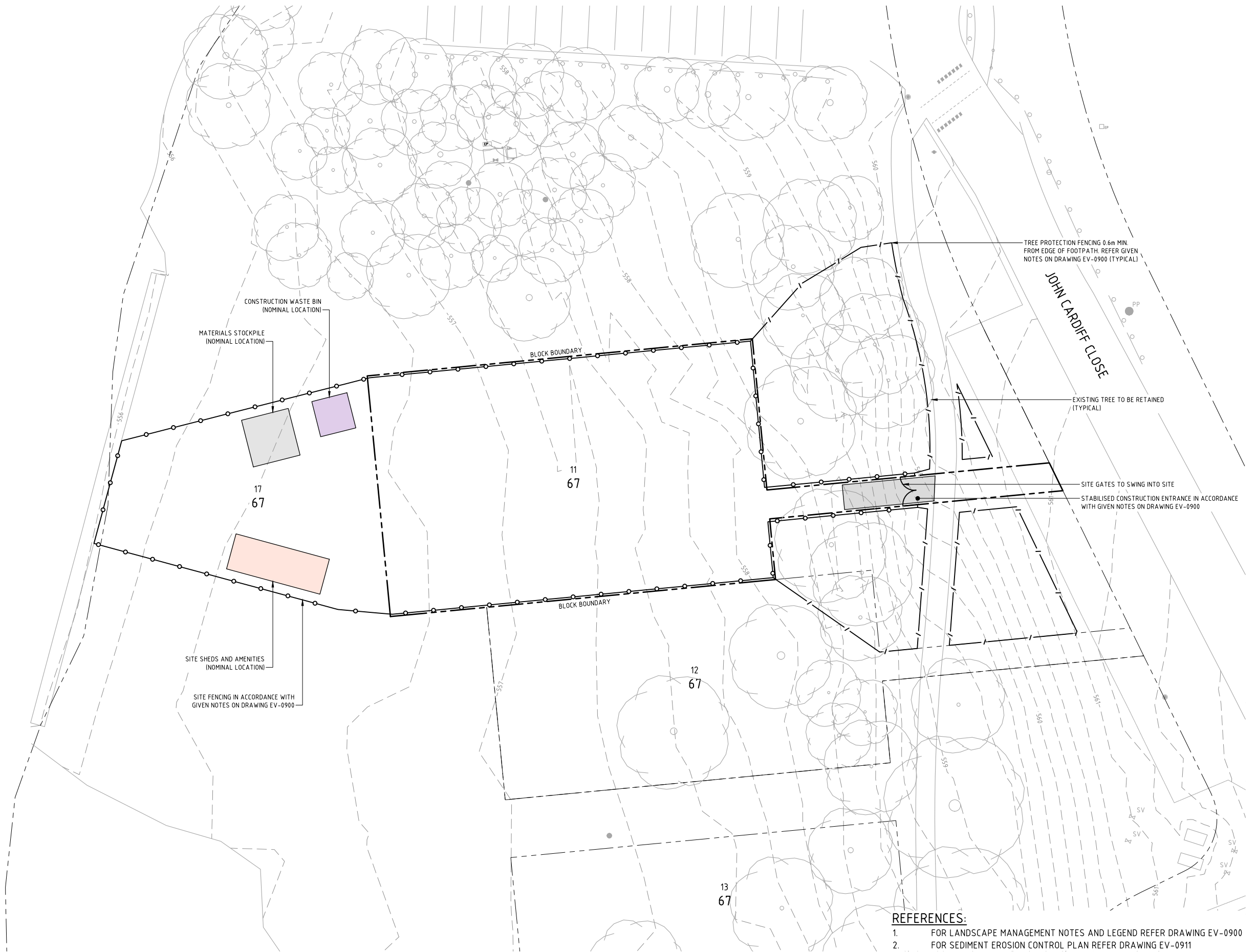
		Scales		North						Status <h3>NOT FOR CONSTRUCTION</h3>				Project Name and Location ROWING BOAT SHED BLOCK 11 SECTION 67 ACTON, ACT													
										Original Size A1		Drawn By DA		Drafting Check RT		Drawing Title LANDSCAPE MANAGEMENT											
										Date Plotted 24-Mar-21		Designed By AM		Design Check BC		NOTES AND LEGEND											
										Coordinate System STROMLO GRID		Approved AM		Approved Date 24/03/2021		Project Number 200771		Type DRG		Discipline CIV		Sub-Discipline EV		Drg No. 0900		Rev A	
A		FOR APPROVAL		24.03.2021		DA																					
Rev		Description		Date		Drawn By																					

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MOLONGLO RIVER



TREE PROTECTION FENCING 0.6m MIN. FROM EDGE OF FOOTPATH. REFER GIVEN NOTES ON DRAWING EV-0900 (TYPICAL)

JOHN CARDIFF CLOSE

EXISTING TREE TO BE RETAINED (TYPICAL)

SITE GATES TO SWING INTO SITE
STABILISED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH GIVEN NOTES ON DRAWING EV-0900

CONSTRUCTION WASTE BIN (NOMINAL LOCATION)

MATERIALS STOCKPILE (NOMINAL LOCATION)

BLOCK BOUNDARY

17
67

11
67

SITE SHEDS AND AMENITIES (NOMINAL LOCATION)

SITE FENCING IN ACCORDANCE WITH GIVEN NOTES ON DRAWING EV-0900

BLOCK BOUNDARY

12
67

13
67

REFERENCES:

- FOR LANDSCAPE MANAGEMENT NOTES AND LEGEND REFER DRAWING EV-0900
- FOR SEDIMENT EROSION CONTROL PLAN REFER DRAWING EV-0911

A	FOR APPROVAL	24.03.2021	DA
Rev	Description	Date	Drawn By

Scales

1:200 @ A1

North

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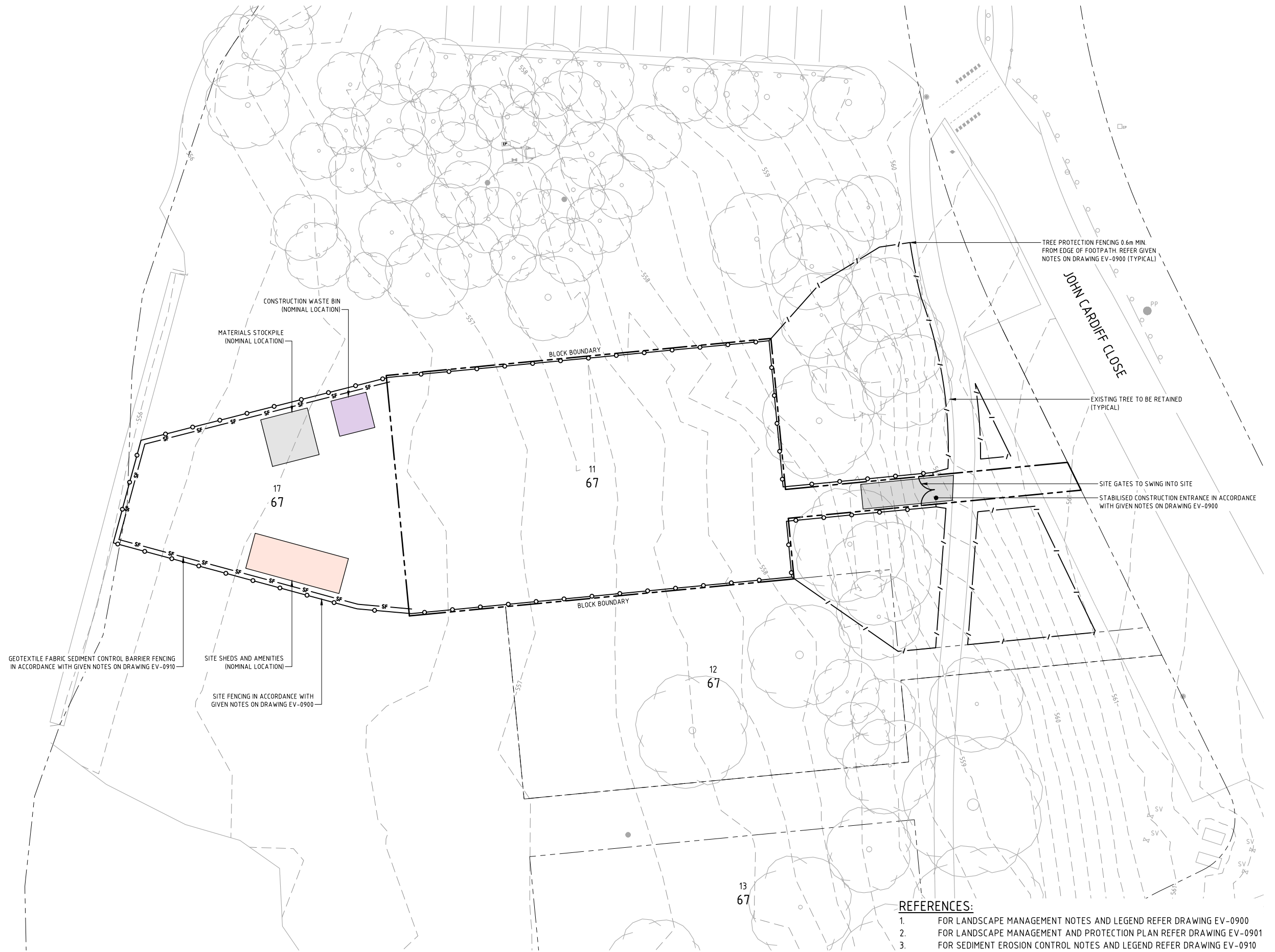
Client Logo

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Original Size	A1	Drawn By	DA
Date Plotted	24-Mar-21	Designed By	AM
Coordinate System	STROMLO GRID	Approved	AM
Height Datum	AHD	Approved Date	24/03/2021
		Approved Signature	

Project Name and Location					
ROWING BOAT SHED					
BLOCK 11 SECTION 67 ACTON, ACT					
Drawing Title					
LANDSCAPE MANAGEMENT AND PROTECTION PLAN					
Project Number	Type	Discipline	Sub-Discipline	Drg No.	Rev
200771	DRG	CIV	EV	0901	A

File Name: P:\2020\200771_Rowing-Act-BoatShed-Acton\04_CAD\2_Drawings\CIV\200771-drg-civ-ev-0911.dwg

MOLONGLO RIVER



REFERENCES:

1. FOR LANDSCAPE MANAGEMENT NOTES AND LEGEND REFER DRAWING EV-0900
2. FOR LANDSCAPE MANAGEMENT AND PROTECTION PLAN REFER DRAWING EV-0901
3. FOR SEDIMENT EROSION CONTROL NOTES AND LEGEND REFER DRAWING EV-0910

A	FOR APPROVAL	24.03.2021	DA
Rev	Description	Date	Drawn By

Scales

1:200 @ A1

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		Approved Signature	

Project Name and Location						
ROWING BOAT SHED						
BLOCK 11 SECTION 67 ACTON, ACT						
Drawing Title						
SEDIMENT EROSION CONTROL						
PLAN						
Project Number	Type	Discipline	Sub-Discipline	Drw No.	Rev	
200771	DRG	CIV	EV	0911	A	

Appendix E

Material Tracking Form

