

FINAL PLAN

Site Management Plan for the
Bunnerong Power Station Site,
Lots 11, 20, 21, 22 and 23
Bumborah Point Road, Port Botany

Prepared for

Sydney Ports Corporation

Level 4, 20 Windmill Street,
Walsh Bay, Sydney NSW 2000

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Executive Summary

ES1. Introduction

This Site Management Plan (SMP) was prepared to support future management and re-development of the former Bunnerong Power Station Site (the site). The SMP has been prepared for Sydney Ports Corporation (SPC) by URS Australia Pty Ltd (URS).

ES2. Background

The site which was part of the historic Bunnerong Power Station property at Bumborah Point Road, Port Botany, NSW comprises a 13.26 hectare plot of land. The site has undergone remediation works as preparation for re-development for industrial purposes. Remediation works included the removal of soil impacted by heavy metals and petroleum hydrocarbons. In addition, a capping layer was placed over residual soil impacted by asbestos.

The site which was previously designated Lot 103 in Deposited Plan (DP) 805244 has been subdivided into separate Lots as follows:

- Lot 2 in DP 1050505 comprising the southern 1.4 hectares of the site (note that this Lot is not addressed in this plan);
- Lot 11, in DP 1050506 comprising 2.7 hectares to the north of Lot 2;
- Lot 20 in DP 1068292 comprising 3.48 hectares to the north of Lot 11;
- Lot 21 in DP 1068292 comprising 3.15 hectares to the north of Lot 20;
- Lot 22 in DP 1068292 comprising 2.40 hectares to the north east and north of Lot 21; and
- Lot 23 in DP 1098292 comprising 0.1504 hectares to the north west of Lot 11 and south west of Lot 20, and which is occupied by Golden Grove Road.

This SMP provides information regarding the history of the site and the remediation works undertaken. The SMP provides guidance on the future management of the site (excluding Lot 2), including relevant documentation with regard to potential contamination issues and regulatory requirements associated with any future intrusive works.

Executive Summary

ES3. Remediation Works

The remediation objective was to provide a site that is suitable for industrial use.

Section 3 of this SMP summarises the remediation and subsequent validation works undertaken across the site (excluding Lot 2) including the different remediation areas. Remediation works included the following:

- excavation and off site disposal of hydrocarbon impacted soil;
- excavation and off site disposal of asbestos impacted soil; and
- capping of asbestos impacted soils.

Section 3 of this SMP also provides a summary of the site conditions following remediation works including residual contamination and the extent of the capped area.

No remediation works were undertaken in Lot 22 (the north east and northern most portion of the site).

ES4. Regulatory Guidance

Section 4 of the SMP provides guidance on the relevant regulatory legislation pertaining to future intrusive works on the site.

ES5. Management of Lots 20 and 21

Sections 5 and 6 of the SMP provides guidance on the future management of Lots 20 and 21 with respect to the management of the capped areas and intrusive works in both the capped and un-capped areas of the Lot.

This section summarises the known residual contamination remaining on the Lot which includes:

- hydrocarbon impacted material; and
- asbestos impacted materials located below the capping layer.

This section also provides guidance on the planning permit approval and excavation protocols and documentation required for undertaking intrusive works in Lots 20 and 21. The maintenance and reinstatement of the capping layer is also covered.

ES6. Management of Lot 11

Section 7 of the SMP provides guidance on the future management of Lot 11 with respect to the management of the capped areas and intrusive works both in the capped and un-capped areas of the Lot.

Executive Summary

This section summarises the known residual contamination remaining on the Lot which includes asbestos impacted materials located below the capping layer.

The remediation works undertaken on Lot 11 were undertaken separately from the rest of the site by the tenant, Australian Customs Service (ACS). The capping layer in this Lot comprises concrete slabs which form part of the pavement for the ACS development.

This section provides guidance on the planning permit approval and excavation protocols and documentation required for undertaking intrusive works in Lot 11. The maintenance and reinstatement of the capping layer are also covered.

ES7. Management of Lot 22

Lot 22 is currently heavily vegetated, and is understood to contain protected/endangered flora species. Lot 22 includes areas set aside to be preserved under Randwick City Council DCP No. 13 and is part of the Bunnerong Matraville Bushland Remnant. Consequently only limited investigations and no remediation works have been undertaken in this Lot. Management of works in Lot 22 is covered in this SMP, however, future development of this area is likely to require further investigation and assessment.

ES8. Management of Lot 23

Lot 23 has been developed for use as an access road (Golden Grove Road) and has been validated as suitable for industrial use. Protocols for management of Lot 23 are not covered in this SMP, however should unexpected conditions be encountered during future intrusive work, SPC and other appropriate authorities should be notified.

ES9. Contingency and Emergency Response Planning

Section 10 of the SMP provides guidance on potential unexpected conditions that might be encountered during site works associated with the past land use of the site. This section provides a list of potential issues, how they could be identified and corrective actions.

1.1 Preface

This Site Management Plan (SMP) was prepared for Sydney Ports Corporation (SPC) (current owner of the site) by URS Australia Pty Ltd (URS) to support future management and re-development of the former Bunnerong Power Station Site (the site) (see **Figure 1**).

The 13.26 hectare site, was the former Lot 103 in DP 805244 and was part of the historic Bunnerong Power Station property at Bumborah Point Road, Port Botany, NSW. The site has undergone remediation works in preparation for re-development for industrial purposes.

The remediation works included the removal of soil impacted by heavy metals and petroleum hydrocarbons and the placement of a clean soil capping layer over parts of the site impacted by asbestos. The scope of the planned remediation works with the exception of Lot 11 Australian Customs Service (ACS) facility (refer **Figure 2**) is described in detail in the Remedial Action Plan (RAP) (URS, December 2002). The scope of implemented remedial works is described in detail in the Validation Reports (URS, 25 November 2003a and 2003b).

This SMP provides information on the remediation works undertaken and guidance on the future management of the site, including intrusive site works that may be proposed in the future. Intrusive site works may be defined as any works which involve excavation into or through the capping material. The SMP also provides sufficient information to enable development of appropriate health and safety and environmental controls relevant to future intrusive works. The SMP provides guidance on the relevant documentation and current regulatory requirements associated with any future intrusive works with regard to potential contamination issues.

Whilst the primary intent of the SMP is to provide guidance on the management of future works associated with excavations through the capping material, guidance on management of other site works and contingencies for management of unexpected environmental conditions during future works on the site is provided.

1.2 Objectives

The objectives of this SMP are to:

- maintain through a series of protocols the integrity of the capping layer;
- provide appropriate guidelines for health and safety requirements related to potential exposure to materials below the capping layer during possible excavation through the capping (eg during excavation for foundations, installation of services etc.);
- provide appropriate environmental guidelines for handling potentially contaminated soils associated with the former power station site that may be encountered during excavations on parts of the site that are not covered by the capping layer;

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- outline contingency options should unexpected conditions be encountered during future site works; and
 - provide appropriate guidance on regulatory and reporting requirements for future works at the site.

1.3 Structure

The SMP has been prepared in a format that systematically documents the background and remediation works and then documents the operation and future management of the site on a Lot by Lot basis.

- Section One - Introduction: prefaces the purpose and the objectives of the SMP;
- Section Two - Background: presents a brief background of the site including description, history, environmental setting and contamination issues;
- Section Three - Site Remediation: presents a summary of the remediation works undertaken and the status of the site following remediation;
- Section Four - Regulatory Background: provides a context for the future management of the site.

The site has been sub-divided into Lots as detailed in Section 2.1. The subsequent sections of the SMP focus on the nature of the separate Lots and the management requirements associated with works in each area.

- Section Five – Lot 20
- Section Six – Lot 21
- Section Seven – Lot 11
- Section Eight – Lot 22
- Section Nine – Lot 23
- Section Ten – Contingency and Emergency Response Planning: provides guidance on contingency and emergency response procedures.

1.4 Implementation of the SMP

Only suitably qualified consultants and/or contractors shall be commissioned either by SPC, their representatives, or by site tenants with prior approval of SPC, to undertake works which include excavation below the capping layer.

The responsibilities of the various organisations concerned with the site are outlined in Section 1.4.1.

Amendments to the SMP or changes to the condition of the site may be required to be reviewed by an NSW EPA accredited Environmental Auditor.

1.4.1 Responsibilities

The following table provides a summary of the responsibilities of organisations involved in works at the site in relation to the implementation of the SMP. It should be noted that other responsibilities related to the site management are included elsewhere in this document and that the table does not include all responsibilities.

These responsibilities do not replace any other regulatory responsibilities of the parties in undertaking works at the site.

Organisation	Title	Responsibilities	Comments
Sydney Ports Corporation	SPC Project Manager, Property	• Approve consultants and contractors for undertaking works; • Approve work method; • Ensure that site tenants are aware of SMP and procedures; • Update Site management data as required from Tenant's survey plans of excavations and as-built drawings. • Ensure tenants are provided with current version of SMP • Brief appropriate personnel in tenant's organisation on the commencement of the SMP, when tenant's nominated SMP representative changes or when there is a change to the SMP.	
	SPC Project Manager, Property	• Co-ordinates implementation of the SMP on behalf of SPC • Co-ordinate maintenance of capping inspections, evaluate inspection reports, consider rectification works where required	
	SPC Project Manager, Property	• Approve consultants and contractors for undertaking works	Appointed by SPC

Introduction

SECTION 1

Organisation	Title	Responsibilities	Comments
Site Tenant	Tenant	• Nominate particular company representative for the implementation of the SMP • Prepare all relevant documentation and plans to undertake the works. • Notify SPC of the nominated person responsible for SMP implementation and notify SPC should the responsibility be transferred to another employee • Obtain approval from SPC for consultants and contractors for undertaking works; • Manage works including consultants and contractors such that their works are carried out in accordance with SMP protocols; • Confirm to SPC that works are being undertaken in accordance with procedures set out in SMP; • Notify SPC of any non-conformance with the SMP and corrective actions; • Provide to SPC and maintain survey plans of excavations and as-built drawings	Tenant to ensure all activities are undertaken in full compliance with the lease provisions for the site
Consultant	Approved Consultant	• Undertake works in accordance with the requirements of the SMP	Suitably qualified by relevant authority and commissioned by SPC, SPC representative or Site Tenant (with approval from SPC)
Earth Works Contractor	Approved / Licenced Contractor	• Undertake works in accordance with the requirements of the SMP	Suitably qualified by relevant authority and commissioned by SPC, SPC representative or Site Tenant (with approval from SPC)

Lease Agreements

Tenants of the property need to adhere to the protocols as outlined in this SMP and as further clarified in the lease for the site. The implementation of the SMP should be a lease condition of each lease agreement, and as noted in the lease documentation.

2.1 Site Description

The entire property extends over 13.26 hectares and is located in the Local Government area of Randwick along Bumborah Point Road, between Military Road and Botany Road (**Figure 1**). The entire site was formerly designated Lot 103 in Deposited Plan (DP) No: 805244 and zoned Industrial 4b (Port Botany Zone) under the Randwick Local Environment Plan (LEP) 1998.

As part of the development of the site, Lot 103 has been subdivided as presented in **Figure 2** as follows:

- Lot 2 in DP 1050505 comprising the southern 1.4 hectares of the site (note that this Lot is not addressed in this plan);
- Lot 11, in DP 1050506 comprising 2.7 hectares to the north of Lot 2, currently leased to the Australian Customs Service (ACS);
- Lot 20 in DP 1068292 comprising 3.48 hectares to the north of Lot 11;
- Lot 21 in DP 1068292 comprising 3.15 hectares to the north of Lot 20;
- Lot 22 in DP 1068292 comprising 2.40 hectares to the north east and north of Lot 21. This area is currently heavily vegetated, and is understood to contain protected/endangered species and includes areas set aside to be preserved under Randwick City Council DCP No. 13 as well as part of the Bunnerong Matraville Bushland Remnant (Randwick Council 09/97); and
- Lot 23 in DP 1098292 comprising 0.1504 hectares to the north west of Lot 11 and south west of Lot 20, and which is occupied by Golden Grove Road.

The site previously formed part of the Bunnerong Power Station site which included two power stations operating from 1929 until the demolition of the last power stations in 1987. The layout of the former Power station is presented in **Figure 3**. Following demolition of the power stations and associated workshops and equipment, the site was vacant until it was purchased by SPC in 2002 and remediation and development works commenced. A detailed site history is provided in Section 2.3 of the RAP.

2.2 Contaminants of Concern

Based on the site history and preliminary and detailed environmental investigations at the site, the following contaminants were identified as the key contaminants of concern (COC) at the site:

- total petroleum hydrocarbons (TPH); and
- asbestos.

The nature of the COCs identified during the environmental investigations as being present on-site in concentrations greater than the relevant criteria are described in **Appendix A**.

The preliminary investigations also identified other potential contaminants of concern (PCOCs) for the site based on the site history. However, analytical results for detailed environmental investigations undertaken by Woodward Clyde (now URS) in 1992 and URS in 2002 indicated that concentrations of these PCOC in the site soils were below their respective assessment criteria. These additional PCOCs included the following:

- polycyclic aromatic hydrocarbons (PAHs);
- volatile organic compounds (VOCs) including benzene, toluene ethylbenzene and xylene (BTEX);
- polychlorinated biphenyls (PCBs); and
- inorganics - arsenic (As), cadmium (Cd), nickel (Ni), mercury (Hg) and zinc (Zn).

2.3 Development Information

The remediation of the site was defined as a Category 2 remediation under the State Environmental Planning Policy No. 55 (SEPP 55) in accordance with the Environmental Planning and Assessment Act 1979 (EP&A Act).

SPC presented a Development Application (Development Application No 02/00995/GL) to Randwick City Council for the subdivision of the site. The conditions of consent for the Development Application (Notice of Determination) have been issued by Council. All works at the site should be undertaken in accordance with the requirements of the final subdivision Development Application Notice of Determination and any future Development Consents.

The portion of the site comprising Lot 11, currently leased to ACS, has already been developed by ACS.

2.4 Geology and Hydrogeology

The following provides a brief summary of the geology and hydrogeology of the site. Further details are provided in the RAP and Environmental Investigation report (URS, July 2002). The site is underlain by fill materials associated with the former use of the site as a power station including ash and coal waste. The fill material is underlain by quaternary dune sand, Botany Sands in the north and east of the site and sandstone of the Hawkesbury Sandstone Formation. The eastern boundary of the site is marked by sandstone outcrops. The land to the west of the Bumborah Point Road was formed by reclamation during the development of Port Botany.

Groundwater flow below the site is towards the west and south west towards Botany Bay, but is locally influenced by the former cooling canal which flowed from the inlet at the south-east of the site to the discharge at the north-west (refer **Figure 3**). Groundwater levels measured during previous investigations on the site were between 0.5 m Australian height datum (AHD) along the western boundary and 2.55 m AHD in the east of the site close to the cooling canal.

3.1 Remediation Objective

The remediation objective was to provide a site that is suitable for industrial use in accordance with the land use exposure settings¹.

3.2 Extent of Contamination Prior to Remediation

The results of Environmental Investigations undertaken at the site are summarised in the Phase 2 investigation report (URS, July 2002) and the RAP. A NSW EPA accredited Site Auditor, (Mr Graeme Nyland, Environ Pty Ltd) reviewed the investigation works and issued a Site Audit Statement (SAS)² and Summary Site Audit Report (SSAR)³ for the site. The conditions of the SAS required that the site be remediated such that it was suitable for ongoing industrial land use.

During investigation works the site was divided into Investigation Areas which corresponded to previous work areas or features of the site (eg coal stockpile area, cooling canal area) as presented in **Figure 4**.

Based on the results of the Environmental Investigations and development requirements, the site was divided into Remediation Areas as presented in **Figure 5**. The six remediation areas were as follows:

- A – comprising the northern portion of the Demolition Area;
- B – comprising the north section of the Coal Stockpile Area;
- C – comprising the southern portion of the Coal Stockpile Area (not addressed in this Plan);
- D – comprising the Ash Handling Area;
- E – comprising the Cooling Canal Area; and
- ACS Area (Lot 11) comprising the southern part of the Demolition Area and the middle part of the former coal stockpile area. Remediation of this area was undertaken by ACS and was separate to the works conducted by SPC in Areas A to E.

The area to the north and north east of Areas D & E (Lot 21) which comprises Lot 22 was not included in the remediation works.

¹ National Environmental Protection Council (1999). *National Environmental Protection Measure (NEPM) – Schedule B (1) – Guidelines on the Investigation Levels for Soil and Groundwater*.

² Site Audit Statement (SAS) No. GN 53 24, 24 July 2002 Mr Graeme Nyland (Environ Pty Ltd)

³ Summary Site Audit Report (SSAR) Former Bunnerong Power Station, Mr Graeme Nyland (Environ Pty Ltd) July 2002

3.2.1 Hydrocarbon Impacted Soil

Field observations and analytical results indicated an area impacted by the heavier fraction of TPH (C₁₀-C₃₆ fraction) along the eastern property boundary in Remediation Area D, to the north of the former power stations. The impact observed in a test pit was characterised by the inflow of water with an oily film, black staining of the soil and hydrocarbon-like odours. Due to access constraints created by heavy vegetation the extent of hydrocarbon impacted soils was not clearly defined prior to the remediation works. However, during remediation works the impacted soil was identified as being associated with a network of pipework and pits as indicated in **Figure 8**. This infrastructure was considered to form part of the fuel house for the former boiler house of the power station. **Appendix B** provides excerpts from the available historical plans showing the pipework and pits. The network of pipes also extended into remediation Area A.

3.2.2 Asbestos Impacted Soil

Based on the findings of investigations prior to and during the remediation works, the extent of potentially asbestos impacted soil was identified as being in Remediation Areas A, D and E and in the eastern part of the ACS Area (Lot 11). Asbestos impacted soil was generally identified as being associated with demolition rubble, predominantly in the vicinity of the demolished former power stations (Remediation Area A and eastern portion of ACS Area) and the former cooling canal (Remediation Area E). The asbestos fibres were not visually identified, but detected by analytical methods.

3.2.3 Presence of Asbestos Cement Debris

During investigations and remediation works, localised observations of asbestos cement fragments and sheets of potentially asbestos containing material (ACM) were also identified in the ACS area.

3.3 Remediation Methodology

The remediation works undertaken at the site are detailed in the Validation Reports (URS, 25 November 2003a and 2003b) and are summarised in the following sections.

3.3.1 Hydrocarbon Impacted Soil

Remediation of hydrocarbon impacted soil was predominantly by excavation and off-site disposal at an appropriately licensed landfill facility. Excavated material was stockpiled and assessed by analytical means. Materials which met the required remediation guidelines were re-used on-site. Materials not meeting the remediation guidelines were predominantly disposed off-site. Small volumes of materials were bio-remediated on site and re-used on-site following confirmation that the contaminant levels were below the remediation guidelines.

3.3.2 Asbestos Impacted Areas

The property which forms Lot 11 was leased to Australian Customs Services (ACS) prior to remediation of the balance of the site (ie. Areas A to E). Remediation of potentially asbestos impacted soils across the former Lot 103 was, therefore, undertaken in several stages by either SPC or ACS as summarised in the following sections.

ACS Area Lot 11

For the Demolition Area part of Lot 11, remediation works included:

- excavation and removal off-site of potentially asbestos impacted soils in areas where excavations were required for the development of the site (eg for foundations and underground services);
- where soils potentially impacted with asbestos remained in the walls and base of the excavations, a clearly visible geofabric marker layer was placed above the soils;
- imported sandstone material verified as Virgin Excavated Natural Material (VENM) was placed over the excavation surface as capping; and
- a reinforced concrete slab was constructed overlying the VENM.
- For the Coal Stockpile Area part of Lot 11 no remediation was undertaken.
- construction over the 'Coal Stockpile' part of the ACS site included the placement of a reinforced concrete slab and landscaped garden beds and grass as illustrated in the 'as-built' construction drawing included in **Appendix C (Figures D1 & D2)**. The 'as-built' construction drawings have been prepared by contractors engaged by ACS. References for these drawings are included in Section 11.

A stormwater culvert was constructed through Lot 11 as shown on **Figure 2**. The construction of the culvert included excavation and removal off-site of potentially asbestos impacted soil. Where excavations were within potentially impacted soils, the base and sides of the excavation were marked by the placement of a geofabric marker layer prior to the construction of the concrete culvert above. The construction drawings of the culvert and the placement of the marker layer are available for review from Sydney Ports Corporation.

Remediation Areas A, D and E

Remediation of potentially asbestos impacted soils in Areas A, D and E comprised the placement of a clean soil capping layer above the impacted soil, thus preventing exposure to the impacted material. The capping layer comprised the following:

- a clearly visible geofabric marker layer; and
- placement followed by compaction to a minimum thickness of 450 mm of clean imported material. The swale drain, located along the northern boundary of Area E (refer **Figure 7**), is capped by a minimum 300mm of clean imported material.

The purpose of the remedial works was to provide management of the risk of exposure to asbestos fibres. Following completion of remedial works, the surface of the capping layer was sprayed with a bituminous spray to seal the surface and prevent infiltration and erosion by water and minimise the establishment of vegetation prior to later development.

The construction of the stormwater culvert, which extends through Areas A, D and E (refer **Figure 2** and **Figure 5**), included excavation and removal off-site of potentially asbestos impacted soil. Where excavations were within potentially impacted soils, the base and sides of the excavation were marked by the placement of a geofabric marker layer prior to the construction of the concrete culvert above. The capping layer was placed above the culvert.

The existing sewer that runs through Areas A, D and E (refer **Figure 5**) is located within the potentially asbestos impacted material below the marker layer. However, in the vicinity of the sewer pits, excavation and offsite disposal of potentially asbestos impacted soil was undertaken prior to placement of the marker layer and capping layer.

3.4 Validation Process

The validation of the site following remediation is detailed in the validation reports prepared by URS (URS, 25 November 2003a and 2003b) for Remediation of Areas A to E (by SPC) and the ACS (Lot 11) site. The validation works are summarised in the following sections.

3.4.1 Hydrocarbon Impacted Soil

Validation of hydrocarbon impacted soil in Areas A and D was undertaken in two stages, with validation of excavations and validation of excavated and stockpiled materials.

Excavations

Following excavation of hydrocarbon impacted soils the excavations were validated by:

- visual assessment of the exposed excavation;
- field screening of soil samples using a portable photoionisation detector (PID) to identify the presence of volatile organic compounds;
- collection and analysis (for TPH) of samples from the walls and base of the excavations and assessment against the remediation guidelines; and
- based on the findings of the visual assessment, field screening and/or, where analytical results indicated that concentrations of TPH were in excess of the remediation guidelines, further excavation was undertaken and the validation process repeated.

Stockpiled Material

Material excavated from hydrocarbon impacted areas was stockpiled on-site and characterised by sampling and analysis (for TPH). Stockpiled material which was confirmed as meeting the remediation guidelines was re-used on site. Stockpiled material that did not meet the remediation guidelines was disposed off-site. A small volume of hydrocarbon impacted material was bio-remediated on site, validated and reused on site.

3.4.2 Asbestos Impacted Areas

ACS Area (Lot 11)

Validation was achieved through the following process:

- a reinforced concrete slab covers the majority of the ACS facility, with the exception of some grassed landscaped areas on the western and southern boundaries;
- excavated materials considered to be impacted with asbestos were removed from site. This was typically undertaken in the Demolition Area of the ACS site;
- where potentially asbestos impacted soils remained in the walls and base of the excavations, a clearly visible geofabric marker layer was placed above and adjacent to the residual soils, prior to backfill with material verified as VENM. Typically the marker layer was placed in the trench excavations;

-
- trench excavations were completed in areas where building footings and foundations were required. Excavated materials considered to be impacted with asbestos were removed from site. Soil samples were collected from the base of the trenches for either validation or characterisation purposes and submitted to the laboratory for analysis of asbestos fibres. Marker layer fabric was placed over the base of trench excavations; and
 - validation surface soil samples were collected on a 20m sampling grid to the west of the Demolition Area. Laboratory analysis for all samples indicated no-detection of asbestos fibres. These samples (identifications PB1 to PB26) are noted on the attached 'as-built' construction drawing as included in Appendix C (Figure D1).

Areas A, D and E

Soils identified as being potentially asbestos impacted were remediated by the placement of the marker layer and a minimum of 300 - 450 mm capping material. No analytical validation of the underlying potentially impacted soils was undertaken.

Area B

Remediation works were not required in Area B, however, validation of the surface of the area was undertaken as follows:

- collection of surface samples on a 20 m by 20 m grid based pattern; and
- analysis for asbestos fibres and confirmation that asbestos fibres were not detected in any soil samples.

3.4.3 Imported Fill Material

All materials which were imported onto the site for use as fill or capping were validated as suitable for use on site. Validation included the following:

- review of the source site history and visual inspection of the source site;
- visual inspection of imported materials; and
- sampling of materials at a rate of at least 1 sample per 1000 m³ and analysis for the contaminants of concern identified for the source site.

3.5 Summary of Site Conditions Following Remediation

Following remediation activities, the site comprised four main areas as presented in **Figure 7** and summarised as follows:

- Capped Area - comprising Areas A, D and E;
- ACS area – the area leased to ACS;
- Uncapped Areas - to the north of the ACS area comprising Area B; and
- Lot 22 - the area to the north of Area E which comprises the new Lot 22 in which remediation activities have not been undertaken

The condition of these areas following remediation is summarised in the following sections. Further details are available in Validation Reports (URS, 25 November 2003a and 2003b). As part of the re-development and subdivision of the site, the site will be divided into lease areas as detailed in Section 2.1 and presented in **Figure 2**. Lots 20 and 21 will include part of the capped and uncapped areas of the site.

3.5.1 Residual Contamination

Residual contamination known to remain on site includes:

- approximately 20m³ of hydrocarbon impacted materials, in excess of the remediation acceptance criteria, backfilled during the remediation program. This material was placed at a depth of approximately 1 m below ground level. The location of this material is noted on **Figure 6a**, within Lot 21. This material is located under the capping and marker layers. Further details on the retention of this material can be reviewed in the Validation Report (URS, 25 November 2003a);
- some residual hydrocarbon impacted material, considered impractical to remove, was retained in place in the 'fuel-house' excavation in Lot 20. The location of this material is noted on **Figure 6b**. This material is located under the marker layer and capping. Further details on the retention of this material can be reviewed in the Validation Report (URS, 25 November 2003a);
- materials potentially impacted with asbestos are located under the capping and marker layers.

Underground structures such as power station infrastructure, foundations, pipes and cable conduits may be present in areas across the site. If uncovered, these structures should be considered potentially contaminated. Underground structures which were encountered during the remediation works are indicated on **Figure 8**.

3.5.2 Capped Area

The extent of the capped area of the site is presented in **Figure 7**. The capped area of the site (Area A, D and E) extends over approximately 5.2 hectares and comprises the following:

- a nominal 450 mm thick clean soil layer which has a bituminous covering, underlain by;
- geofabric marker layer (typically of a high visibility colour), underlain by;
- potentially asbestos impacted fill material, soil, demolition waste and underground structures.

The surface levels of the base and top of the capping layer across the capped area are presented in **Figures 9 and 10**. The surveyed thickness of the capping layer is presented in **Figure 11**.

3.5.3 ACS Area

The extent of the ACS area is presented in **Figure 2** and in the as-built construction drawings presented in **Appendix C**. The area extends over approximately 2.7 hectares and is generally covered by concrete pavement, roadways or building. Some landscaped areas exist on the property. The layout of the area is presented in the survey drawings presented in **Appendix C (Figure D1)**. Details of the site condition of the ACS Lot 11 is presented in the Lot 11 Validation Report (URS, 25 November 2003b).

3.5.4 Uncapped Areas

The extent of the uncapped areas is presented in **Figure 7**. The uncapped areas of the site (Area B) are located to west of the capped area. Based on the results of investigations and the validation of the remediation works, these areas meet the requirements for industrial land use.

3.5.5 North-East Area

The remaining portion of the site is located to the north and north east of the former cooling canal as presented in **Figure 7**. The limited investigations undertaken to date have indicated that this area is suitable for industrial land use.

This area is, however, currently heavily vegetated and subject to flora protection as discussed in Section 2.1. This part of the site has not been altered as part of the remediation or development works. Any future development of this area is likely to require further investigation and assessment.

This SMP has been produced to provide guidance on management of future intrusive works on the site, particularly in relation to excavation through and below the capping material. However, all works at the site should be undertaken in accordance with the requirements of the relevant regulatory legislation, which includes but is not limited to the following:

- NSW Contaminated Land Management Act (1997);
- Randwick City Council Contaminated Land Policy (1999);
- NSW Occupational Health and Safety Act (2000);
- NSW Occupational Health and Safety Regulations (2001);
- DPWS Construction Policy Steering Committee Environmental Management systems Guidelines (CPSC EMS guidelines);
- State Environmental Planning Policy No 55 Remediation of Land (SEPP 55);
- Protection of the Environment Operations Act 1997;
- Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and resource management Council of Australian and New Zealand (ARMCANZ), Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000;
- National Environmental Protection Measure 1999 Assessment of Site Contamination;
- NSW EPA Contaminated Sites: Guidelines for Assessing Service Station Sites 1994;
- NSW EPA Contaminated Sites: Sampling Design Guidelines (1995);
- NSW EPA Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites (1997); and
- NSW EPA Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (1998).

The extent of Lot 20 is presented in **Figure 2**. This Lot includes the southern portion of the capped area of the site and a portion of uncapped area. The following section discusses the ongoing management of Lot 20 with respect to management of capped areas and management of intrusive works in both capped and un-capped areas.

5.1 Residual Contamination

Residual contamination known to remain in Lot 20 includes:

- some residual hydrocarbon impacted material, considered impractical to remove, was retained in place in the 'fuel-house' excavation in Lot 20. The location of this material is noted on **Figure 6b**. This material is located under the marker layer and capping. Further details on the retention of this material can be reviewed in the Validation Report (URS, 25 November 2003a);
- materials potentially impacted with asbestos are located under the marker layer and capping.

Underground structures such as power station infrastructure, foundations, pipes and cable conduits may be present in areas across the site. If uncovered, these structures should be considered potentially contaminated. Underground structures encountered during the remediation works are indicated on **Figure 8**.

5.2 Maintenance of Existing Capping

The capping has been placed to prevent exposure to the underlying potentially asbestos impacted soils. The integrity of the capping will be required to be maintained to minimise the future risk of exposure to the underlying impacted materials.

The capping layer placed as part of the remediation works comprised the following:

- a clearly visible geofabric marker layer; and
- placement and compaction of a minimum thickness of 450 mm of clean imported material.

Following development works, the capping layer is likely to be covered by buildings, pavements and roadways. However, prior to and during the development works, maintenance of the capping will be required and will include but not be limited to the following:

- establishment and maintenance of appropriate drainage across the surface of the capped area to minimise the action of erosion of the covering material. In the short term, further drainage features should be designed to allow stormwater collection and disposal without pooling or high velocity water flow. A 6 monthly inspection program should be implemented by SPC (responsible party is Project Manager, Property) to monitor the surface and, if required a suitably qualified contractor will undertake works to modify drainage conditions;

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- in the short term, maintenance of the bituminous covering to prevent infiltration and erosion by water. A 6 monthly inspections shall be made of the condition of the bituminous surface of the capped area by SPC (responsible party is Project Manager, Property);
 - if significant subsidence of the capping layer is observed appropriate geotechnical investigation will be undertaken and, if required, remedial works undertaken to reinstate the integrity of the cap. A 6 monthly inspections for subsidence shall be made of the surface of the capped area by SPC (responsible party is Project Manager, Property).

During inspections, records of observations of the following to be compiled:

- evidence of pooling during and after rainfall events;
- evidence of high velocity storm flows during and after rainfall events;
- condition of bituminous covering, noting any cracks or disturbances to the covering; or
- evidence of significant subsidence.

Following inspections, rectification works to be considered and implemented by the SPC Project Manager, Property as required.

Following further site redevelopment and the establishment of pavements, foundations etc, the integrity of these structures will be required to be maintained such that there is no risk of exposure to the underlying impacted soils. Maintenance of any sections of the capping, which are not covered by pavement/foundation etc, following re-development will be required as discussed above.

5.3 Intrusive Site Works In Capped Area

5.3.1 Planning Intrusive Site Works

With the exception of sewer or stormwater, all services shall be installed above the marker layer. Stormwater and sewer pipes shall be kept above the marker layer where possible.

Building foundations should be installed above the marker layer where practical. Deep foundations will be approved only if shallow foundations are not technically feasible.

Where excavation into the capping layer or below the marker layer into the underlying potentially impacted materials is unavoidable, such excavation shall only be undertaken after receipt of approval from SPC and under the supervision of a suitably qualified consultant and in accordance with the protocols outlined in the following sections.

Prior to conducting intrusive site works on Lot 20 a permit must be sought by the applicant and approved by SPC for the specific activities planned. Reference should be made to the survey information presented in **Figures 9 and 10** to determine whether works will involve excavation into the capping or below the marker layer.

Notwithstanding approval from SPC, all works undertaken on site shall be in accordance with appropriate planning legislation requirements including any conditions on current or future Development Consent for the property.

All services for future developments should be designed to be installed within the capping layer, with the exception of stormwater and sewer works .

Permit Approval Process

The permit approval process will include (but not be limited to) the following:

- the Applicant must submit an Application Form and associated documentation (see **Appendix D**) to SPC providing all details of the proposed activities prior to their commencement
- upon receipt of the application, SPC will review the proposed works. Based on information provided by the Applicant and as-built information prepared during the site validation, SPC will assess whether the works require excavation into the capping layer or below the marker layer into the underlying potentially impacted material.
- SPC will provide approval and conditions for undertaking the works.

5.3.2 Excavation Protocols for Intrusive Site Works - Above The Marker Layer

This section provides guidance on the protocols to be followed during intrusive site works within the capping layer, but above the marker layer. Should works be required below the marker layer reference should be made to Section 5.3.3.

Documentation Requirements

The documentation required prior to commencement of the intrusive site works includes, but is not limited to the following:

- a completed Application form (**Appendix D**);
- an illustrated plan of the proposed works;

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- a safe work method statement (SWMS) and where appropriate, an occupational health & safety management plan (OHSMP) as required by the NSW Occupational Health and Safety Act (2000) and Regulation (2001) for the proposed activities (see Section 5.3.4);
 - a work method statement approved by SPC which provides a description of the activities to be undertaken and the protocols for each hazardous activity, including for handling of materials, storage and disposal and the methods of reinstatement. The work method statement should also include the contingencies and emergency response should the marker layer be breached; and
 - a Permit from SPC for undertaking the work.

Equipment

Details regarding the types of excavating equipment planned for use are required on the Application Form (**Appendix D**). Use of equipment that limits the potential for generating excess spoil and disturbance to the capping layer is recommended.

Earthworks

During excavation works within the capping layer care should be taken to monitor the depth of the earthworks such that the geofabric marker layer is not exposed and/or penetrated. Reference should be made to the survey information for the capping layer and marker layer presented in **Figures 9 and 10**.

Where possible, once excavation works are complete, excavated capping material should either be returned to the excavation and original soil surface restored. Excess capping materials should be either reused on site or disposed off-site at a controlled NSW EPA licensed facility/landfill. The responsibility for obtaining approval for disposal, waste classification and disposal of materials remains with the Applicant.

The work method statements submitted as part of the Application process should include details for excavation protocols and management of materials.

Underground Structures

Intrusive site works above the marker layer may include works associated with the stormwater culvert which runs through Lot 20 (refer **Figure 2**). Access to the stormwater culvert should be undertaken in accordance with appropriate regulatory requirements.

Should excavations be required below the stormwater culvert or to the sides of the culvert these will require excavation through the marker layer and the protocols for excavation below the marker layer as discussed in Section 5.3.3 should be followed.

Stockpiling of Materials

All spoil materials not hauled off site during excavation works should be stockpiled such that potentially impacted materials do not come into contact with 'clean' materials. Stockpiles should also be bunded and sediment retention and dust management measures put in place immediately after the stockpile is formed.

Disposal of Soil

Disposal of excess soil which cannot be returned to the excavation should be in accordance with the requirement of NSW EPA's Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes (NSW EPA, 1999), and may require analytical testing.

Reinstatement of Capping Layer

Following excavation works, the capping layer should be reinstated either by use of the stockpiled clean capping material or suitable covering eg concrete, asphalt roadway. Where reinstatement requires importation of material, the Applicant shall first demonstrate to the satisfaction of SPC that the material is suitable for use as capping material. This may require analytical testing.

Capping materials shall be placed and compacted such that the geotechnical properties of the reinstated material match those of the surrounding capping material. Evidence of the compaction may be required by SPC. The surface of the capping should be designed to provide a smooth free draining surface. A bituminous spray may be required on the surface of the capping. All requirements for reinstatement will be assessed as part of the approval process

Survey

Following completion of intrusive site works, survey plans produced by registered surveyors, of the excavations and reinstatement of the capping layer shall be provided by the Applicant to SPC.

Licences and Other Requirements

All works are to be carried out by operators holding appropriate licences and permits for the activities to be undertaken.

5.3.3 Excavation Protocols for Intrusive Site Works - Below The Marker Layer

This section provides guidance on the protocols to be followed during intrusive site works which include works within the capping layer and below the marker layer.

Documentation Requirements

The documentation required prior to commencement of the intrusive site works includes, but is not limited to the following:

- a completed Application form (**Appendix D**);
- an illustrated plan of the proposed works;
- a safe work method statement (SWMS) and where appropriate, an occupational health & safety management plan (OHSMP) as required by the NSW Occupational Health and Safety Act (2000) and Regulation (2001) for the proposed activities (see Section 5.3.4);
- a work method statement approved by SPC which provides a description of the activities to be undertaken and the protocols for each hazardous activity, including for handling of materials, storage and disposal and the methods of reinstatement; and
- a Permit from SPC for undertaking the work.

Equipment

Details regarding the types of excavating equipment planned for use are required on the Application form (**Appendix D**). Use of equipment that limits the potential for generating excess spoil and disturbance to the capping layer is recommended.

Earthworks

During excavation works within the capping layer and below the marker layer, care should be taken to separate capping materials from the underlying potentially impacted material.

The work method statements submitted as part of the Application process should include details for excavation protocols and management of clean and impacted materials. Excavations should be undertaken such that underlying materials do not come into contact with the clean capping layer.

Underground Structures

Excavation works below the marker layer within Lot 20 may encounter underground structures including the former cooling canal, the stormwater culvert and the sewer main (refer **Figures 2, 3 and 5**). In addition a network of pipes and pits exists as presented in **Figure 8** and the historical site plans presented in **Appendix B**. Reference to these figures should be made prior to excavation to assess whether excavations are likely to encounter these structures.

Excavation works below or into the sides of the stormwater culvert (refer **Figure 2**) will include excavation through potentially asbestos impacted materials.

Other underground structures such as power station foundations, pipes and cable conduits, other than those discussed above may be present. Where underground structures are encountered, the Applicant should immediately inform SPC.

Stockpiling of Materials

All spoil materials not hauled off site during excavation works should be stockpiled such that potentially impacted materials do not come into contact with 'clean' materials. Where materials excavated from below the capping are required to be stockpiled, these should be covered or kept wet to prevent generation of dust. Stockpiles should also be bunded and sediment retention measures put in place immediately after the stockpile is formed.

Reinstatement

Where possible, once excavation works are complete, potentially impacted soil/fill should either be returned to the excavation and compacted and a highly visible marker layer (Bidim A14 or equivalent) placed prior to replacing the clean capping layer above.

The capping layer should be reinstated either by use of the stockpiled clean capping material or suitable covering eg concrete, asphalt roadway. Where reinstatement requires importation of material, the Applicant shall first demonstrate to the satisfaction of SPC that the material is suitable for use as capping material. This may require analytical testing.

Capping materials shall be placed and compacted such that the geotechnical properties of the reinstated material match those of the surrounding capping material and is suitable for further civil development. Evidence of the compaction and geotechnical performance of the capping may be required by SPC. The surface of the capping should be designed to provide a smooth free draining surface. A bituminous spray may be required on the surface of the capping. All requirements for reinstatement will be assessed as part of the approval process.

Disposal of Soil

Any excess material excavated from below the marker layer that cannot be reinstated should be disposed off-site at a controlled NSW EPA licensed facility/landfill. Any excess capping materials generated that cannot be reinstated should be either reused on site or disposed off-site at a controlled NSW EPA licensed facility/landfill. Disposal of excess soil should be in accordance with the requirements of NSW EPA's Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes (NSW EPA, 1999), and may require analytical testing.

The responsibility for obtaining approvals, waste classification of materials and disposal of materials remains with the Applicant.

Survey

Following completion of intrusive site works, survey plans produced by registered surveyors, of the excavations and reinstatement of the capping layer shall be provided by the Applicant to SPC.

Licences and Other Requirements

All works are to be carried out by operators holding appropriate licences or permits which would include but not be limited to:

- contractors carrying out excavation works below the capping material are required to hold a current friable asbestos license from WorkCover NSW; and
- all NSW EPA WorkCover codes of practice and regulations relating to asbestos, including the Occupational Health and Safety Regulation (2001) and the Occupational Health and Safety Act NSW (2000).

5.3.4 Health and Safety

All works need to be undertaken in accordance with the NSW Occupational Health & Safety Act (2000) and Regulation (2001).

A requirement of this Regulation is that a safe work method statement (SWMS) and where appropriate, an occupational health and safety management plan (OHSMP) will be required as part of the approval process to undertake intrusive works on the site.

The SWMS/OHSMP should be prepared by the party conducting the works. It should be the sole responsibility of the Applicant to assess the risks and prepare the SWMS/OHSMP prior to commencing works. The Applicant will be responsible for implementing the SWMS/OHSMP .

SWMS/OHSMP should include, but not be limited to the following information:

- required personal protective equipment for works above the marker layer (eg safety footwear, hard hats, ear and eye protection, gloves);
- required personal protective equipment for works below the marker layer (eg respiratory protection, disposable overalls, safety footwear, hard hats, ear and eye protection, gloves);
- relevant approvals and guidelines;
- environmental monitoring (eg air/dust);
- work methods;
- site induction process;

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- contingency plans and procedures;
 - provision of exclusion zones where appropriate; and
 - decontamination process.

SWMS/ OHSP Documentation and Reporting Requirements

- Results of environmental and personnel monitoring (e.g air/dust/noise/vibration) to be documented and subsequently reported to SPC;
- Health and safety incidents and injuries to be documented. Any health and safety issues considered to be related to potential site contamination to be reported to SPC;
- Record which personnel has completed induction and training in relation to the SWMS/OHSMP for the proposed works.

5.3.5 Reporting Intrusive Site Work Activities

Following completion of the works, the Applicant will be required to submit the following to SPC:

- daily logs documenting the location and quantities of material excavated, reinstated and disposed of off-site. This information should be recorded on a log sheet and completed with an as-built site plan;
- source and verification of imported fill as outlined for the reinstatement protocol described in Section 5.3.2 and Section 5.3.3.
- waste tracking receipts and approvals documentation from the licensed facilities to which materials had been disposed;
- results of environmental and personnel monitoring (e.g air/dust/noise/vibration); and
- Health and safety incidents and injuries to be documented. Any health and safety issues considered to be related to potential site contamination to be reported to SPC.

5.3.6 Notification to Relevant Authorities

The Applicant shall immediately notify SPC if conditions encountered during works indicate the presence of unexpected conditions or if there is a breach in control of materials on site. Refer to Section 10 for details of contingency and emergency response planning protocols. Notwithstanding notification to SPC, the Applicants shall also notify other relevant authorities as required.

5.4 Intrusive Site Works in Uncapped Areas

The uncapped areas of Lot 20 have been validated as suitable for industrial land use.

Intrusive site works undertaken in these areas will not require approval, under this SMP, from SPC prior to commencement. However, all works should take into consideration the risks associated with the former use of the site as a power station and should be undertaken in accordance with appropriate regulatory requirements and legislation and with the corporate requirements of the organisation undertaking the works.

Should unexpected conditions be encountered, SPC and other appropriate authorities should be notified immediately.

5.5 Landscaping and Vegetation

Where landscaping is required as part of the development only shallow rooting plants and trees which will not breach the marker layer should be selected.

Advice on the maximum depth of plant rooting systems should be sought from a qualified horticulturalist.

The extent of Lot 21 is presented in **Figure 2**. This Lot includes the northern portion of the capped area of the site (Area D and E) and a small portion of the uncapped area. The following section discusses the ongoing management of Lot 21 with respect to management of capped areas and management of intrusive works in both capped and un-capped areas.

6.1 Residual Contamination

Residual contamination known to remain on site includes:

- approximately 20m³ of TPH impacted materials, in excess of the remediation acceptance criteria, backfilled during the remediation program. This material was placed at a depth of approximately 1 metre below ground level. The location of this material is noted on **Figure 6a**, within Lot 21. This material is located under the marker layer and capping. Further details on the retention of this material can be reviewed in the Validation Report (URS, 25 November 2003a);
- materials potentially impacted with asbestos are located under the marker layer and capping.

Underground structures such as power station infrastructure, foundations, pipes and cable conduits may be present in areas across the site. If uncovered, these structures should be considered potentially contaminated. Underground structures encountered during the remediation works are indicated on **Figure 8**.

6.2 Maintenance of Existing Capping

The capping has been placed to prevent exposure to the underlying potentially asbestos impacted soils. The integrity of the capping will be required to be maintained to minimise the future risk of exposure to the underlying impacted materials.

The capping layer placed as part of the remediation works comprised the following:

- a clearly visible geofabric marker layer; and
- placement and compaction of a minimum thickness of 450 mm of clean imported material. The swale drain, located along the northern boundary of Area E, is capped by a minimum 300mm of clean imported material.

Following development works, the capping layer is likely to be covered by buildings, pavements and roadways. However, prior to and during the development works, maintenance of the capping will be required and will include but not be limited to the following:

- establishment and maintenance of appropriate drainage across the surface of the capped area to minimise the action of erosion of the covering material. In the short term, further drainage features should be designed to allow stormwater collection and disposal without pooling or high velocity water flow. A 6 monthly inspection program should be implemented by SPC (responsible party is Project Manager, Property) to monitor the surface and, if required a suitably qualified contractor will undertake works to modify drainage conditions;
- in the short term, maintenance of the bituminous covering to prevent infiltration and erosion by water. A 6 monthly inspection shall be made by SPC (responsible party is Project Manager, Property) of the condition of the bituminous surface of the capped area; and
- if significant subsidence of the capping layer is observed appropriate geotechnical investigation will be undertaken and, if required, remedial works undertaken to reinstate the integrity of the cap. A 6 monthly inspection for subsidence shall be made by SPC (responsible party is Project Manager, Property) of the surface of the capped area.

During inspections, records of observations of the following to be compiled:

- evidence of pooling during and after rainfall events;
- evidence of high velocity storm flows during and after rainfall events;
- condition of bituminous covering, noting any cracks or disturbances to the covering; or
- evidence of significant subsidence.

Following inspections, rectification to be considered and implemented by the SPC Project Manager, Property as required.

Following further site redevelopment and the establishment of pavements, foundations etc, the integrity of these structures will be required to be maintained such that there is no risk of exposure to the underlying impacted soils. Maintenance of any sections of the capping which are not covered by pavement/foundation etc, following re-development will be required as discussed above.

6.3 Intrusive Site Works In Capped Area

6.3.1 Planning Intrusive Site Works

With the exception of sewer or stormwater, all services shall be installed above the marker layer. Stormwater and sewer pipes shall be kept above the marker layer where possible.

Building foundations should be installed above the marker layer where practical. Deep foundations will be approved only if shallow foundations are not technically feasible.

Where excavation into the capping layer or below the marker layer into the underlying potentially impacted materials is unavoidable, such excavation shall only be undertaken after receipt of approval from SPC and under the supervision of a suitably qualified consultant and in accordance with the protocols outlined in the following sections.

Prior to conducting intrusive site works on Lot 21 a permit must be sought by the applicant and approved by SPC for the specific activities planned. Reference should be made to the survey information presented in **Figures 9 and 10** to determine whether works will involve excavation into the capping or below the marker layer.

Notwithstanding approval from SPC, all works undertaken on site shall be in accordance with appropriate planning legislation requirements including any conditions on current or future Development Consent for the property.

All services for future developments should be designed to be installed within the capping layer, with the exception of stormwater and sewer works.

Permit Approval Process

The permit approval process will include (but not be limited to) the following:

- the Applicant must submit an Application Form and associated documentation (see **Appendix D**) to SPC providing all details of the proposed activities prior to the commencement;
- upon receipt of the application, SPC will review the proposed works. Based on information provided by the Applicant and as-built information prepared during the site validation, SPC will assess whether the works require excavation into the capping layer or below the marker layer into the underlying potentially impacted material; and
- SPC will provide approval and conditions for undertaking the works.

6.3.2 Excavation Protocols for Intrusive Site Works - Above The Marker Layer

This section provides guidance on the protocols to be followed during intrusive site works within the capping layer, but above the marker layer. Should works be required below the marker layer reference should be made to Section 6.3.3.

Documentation Requirements

The documentation required prior to commencement of the intrusive site works includes, but is not limited to the following:

- a completed Application form (**Appendix D**);
- an illustrated plan of the proposed works;
- a safe work method statement (SWMS) and occupational health & safety management plan (OHSMP) as required by the NSW Occupational Health and Safety Act (2000) and Regulation (2001) for the proposed activities (see Section 6.3.4);
- a work method statement approved by SPC which provides a description of the activities to be undertaken and the protocols for each hazardous activity, including handling of materials, storage and disposal and the methods of reinstatement. The work method statement should also include the contingencies and emergency response should the marker layer be breached; and
- a Permit from SPC for undertaking the work.

Equipment

Details regarding the types of excavating equipment planned for use are required on the Application Form (**Appendix D**). Use of equipment that limits the potential for generating excess spoil and disturbance to the capping layer is recommended.

Earthworks

During excavation works within the capping layer care should be taken to monitor the depth of the earthworks such that the geofabric marker layer is not exposed and/or penetrated. Reference should be made to the survey information presented in **Figures 9, 10 and 11** for the capping layer.

Where possible, once excavation works are complete, excavated capping material should either be returned to the excavation and original soil surface restored. Excess capping materials should be either reused on site or disposed off-site at a controlled NSW EPA licensed facility/landfill. The responsibility for obtaining approval for disposal, waste classification and disposal of materials remains with the Applicant.

The work method statements submitted as part of the Application process should include details for excavation protocols and management of materials.

Underground Structures

Intrusive site works above the marker layer may include works associated with the stormwater culvert which runs through Lot 21 (refer **Figure 2**). Access to the stormwater culvert should be undertaken in accordance with appropriate regulatory requirements.

Should excavations be required below the stormwater culvert or to the sides of the culvert these will require excavation through the marker layer and the protocols for excavation below the marker layer as discussed in Section 6.3.3 should be followed.

Stockpiling of Materials

All spoil materials not hauled off site during excavation works should be stockpiled such that potentially impacted materials do not come into contact with 'clean' materials. Stockpiles should also be bunded and sediment retention and dust management measures put in place immediately after the stockpile is formed.

Disposal of Soil

Disposal of excess soil which cannot be returned to the excavation should be in accordance with the requirement of NSW EPA's Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes (NSW EPA, 1999), and may require analytical testing.

Reinstatement of Capping Layer

Following excavation works, the capping layer should be reinstated either by use of the stockpiled clean capping material or suitable covering eg concrete, asphalt roadway. Where reinstatement requires importation of material, the Applicant shall first demonstrate to the satisfaction of SPC that the material is suitable for use as capping material. This may require analytical testing.

Capping materials shall be placed and compacted such that the geotechnical properties of the reinstated material match those of the surrounding capping material. Evidence of the compaction and geotechnical performance of the capping may be required by SPC. The surface of the capping should be designed to provide a smooth free draining surface. A bituminous spray may be required on the surface of the capping. All requirements for reinstatement will be assessed as part of the approval process.

Survey

Following completion of intrusive site works, survey plans produced by registered surveyors, of the excavations and reinstatement of the capping layer shall be provided by the Applicant to SPC.

Licences and Other Requirements

All works are to be carried out by operators holding appropriate licences and permits for the activities to be undertaken.

6.3.3 Excavation Protocols for Intrusive Site Works - Below The Marker Layer

This section provides guidance on the protocols to be followed during intrusive site works which include works within the capping layer and below the marker layer.

Documentation Requirements

The documentation required prior to commencement of the intrusive site works includes, but is not limited to the following:

- a completed Application form (**Appendix D**);
- an illustrated plan of the proposed works;
- a safe work method statement (SWMS) and occupational health & safety management plan (OHSMP) as required by the NSW Occupational Health and Safety Act (2000) and Regulation (2001) for the proposed activities (see Section 6.3.4);
- a work method statement approved by SPC which provides a description of the activities to be undertaken and the protocols for each hazardous activity, including handling of materials, storage and disposal and the methods of reinstatement; and
- a Permit from SPC for undertaking the work.

Equipment

Details regarding the types of excavating equipment planned for use are required on the Application form (**Appendix D**). Use of equipment that limits the potential for generating excess spoil and disturbance to the capping layer is recommended.

Earthworks

During excavation works within the capping layer and below the marker layer, care should be taken to separate capping materials from the underlying potentially impacted material.

The work method statements submitted as part of the Application process should include details for excavation protocols and management of clean and impacted materials. Excavations should be undertaken such that underlying materials do not come into contact with the clean capping layer.

Underground Structures

Excavation works below the marker layer within Lot 21 may encounter underground structures including the former cooling canal, the stormwater culvert and the sewer main (refer **Figures 2, 3 and 5**). In addition a network of pipes exists as presented in **Figure 8** and the historical site plans presented in **Appendix B**. Reference to these figures should be made prior to excavation to assess whether excavations are likely to encounter these structures.

Excavation works below or into the sides of the stormwater culvert (refer **Figure 2**) will include excavation through potentially asbestos impacted materials.

Other underground structures such as power station foundations, pipes and cable conduits, other than those discussed above may be present. Where underground structures are encountered, the Applicant should immediately inform SPC.

Stockpiling of Materials

All spoil materials not hauled off site during excavation works should be stockpiled such that potentially impacted materials do not come into contact with 'clean' materials. Where materials excavated from below the capping are required to be stockpiled, these should be covered or kept wet to prevent generation of dust. Stockpiles should also be bunded and sediment retention measures put in place immediately after the stockpile is formed.

Reinstatement

Where possible, once excavation works are complete, potentially impacted soil/fill should either be returned to the excavation and compacted and the marker layer replaced prior to replacing the clean capping layer above.

The capping layer should be reinstated either by use of the stockpiled clean capping material or suitable covering eg concrete, asphalt roadway. Where reinstatement requires importation of material, the Applicant shall first demonstrate to the satisfaction of SPC that the material is suitable for use as capping material. This may require analytical testing.

Management of Lot 21

SECTION 6

Capping materials shall be placed and compacted such that the geotechnical properties of the reinstated material match those of the surrounding capping material. Evidence of the compaction may be required by SPC.

Disposal of Soil

Any excess material excavated from below the marker layer that cannot be reinstated should be disposed off-site at a controlled NSW EPA licensed facility/landfill. Any excess capping materials generated that cannot be reinstated should be either reused on site or disposed off-site at a controlled NSW EPA licensed facility/landfill. Disposal of excess soil should be in accordance with the requirement of NSW EPA's Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes (NSW EPA, 1999), and may require analytical testing.

The responsibility for obtaining approvals, waste classification of materials and disposal of materials remains with the Applicant.

Survey

Following completion of intrusive site works, survey plans produced by registered surveyors, of the excavations and reinstatement of the capping layer shall be provided by the Applicant to SPC.

Licences and Other Requirements

All works are to be carried out by operators holding appropriate licences or permits which would include but not be limited to:

- contractors carrying out excavation works below the capping material are required to hold a current friable asbestos license from WorkCover NSW; and
- all NSW EPA WorkCover codes of practice and regulations relating to asbestos, including the Occupational Health and Safety Regulation (2001) and the Occupational Health and Safety Act NSW (2000).

6.3.4 Health and Safety

All works need to be undertaken in accordance with the NSW Occupational Health & Safety Act (2000) and Regulation (2001).

A requirement of the Regulation is that a safe work method statement (SWMS) and where appropriate, an occupational health & safety management plan (OHSMP) will be required as part of the approval process to undertake intrusive works on the site.

The SWMS/ OHSMP should be prepared by the party conducting the works. It should be the sole responsibility of the Applicant to assess the risks and prepare the SWMS/ OHSMP prior to commencing works. The Applicant will be responsible to implementing the SWMS/ OHSMP.

SWMS/ OHSMP should include, but not be limited to the following information:

- required personal protective equipment for works above the marker layer (eg safety footwear, hard hats, ear and eye protection, gloves);
- required personal protective equipment for works below the marker layer (eg respiratory protection, disposable overalls, safety footwear, hard hats, ear and eye protection, gloves);
- relevant approvals and guidelines;
- environmental monitoring (eg air/dust);
- work methods;
- site induction process;
- contingency plans and procedures;
- provision of exclusion zones where appropriate; and
- decontamination process.

SWMS/ OHSMP Documentation and Reporting Requirements

- Results of environmental and personnel monitoring (e.g air/dust/noise/vibration) to be documented and subsequently reported to SPC;
- Health and safety incidents and injuries to be documented. Any health and safety issues considered to be related to potential site contamination to be reported to SPC;
- Record which personnel has completed induction and training in relation to the SWMS/ OHSMP for the proposed works.

6.3.5 Reporting Intrusive Site Work Activities

Following completion of the works, the Applicant will be required to submit the following to SPC:

- daily logs documenting the location and quantities of material excavated, reinstated and disposed of off-site. This information should be recorded on a log sheet and completed with an as-built site plan;
- source and verification of imported fill as outlined for the reinstatement protocol described in Section 6.3.2 and Section 6.3.3.
- any health and safety issues considered to be related to potential site contamination to be reported to SPC;

-
- waste tracking receipts and approvals documentation from the licensed facilities to which materials had been disposed;
 - results of environmental and personnel monitoring (e.g air/dust/noise/vibration); and
 - Health and safety incidents and injuries to be documented. Any health and safety issues considered to be related to potential site contamination to be reported to SPC.

6.3.6 Notification to Relevant Authorities

The Applicant shall immediately notify SPC if conditions encountered during works indicate the presence of unexpected conditions or if there is a breach in control of materials on site. Refer to Section 10 for details of contingency and emergency response planning protocols. Notwithstanding notification to SPC, the Applicants shall also notify other relevant authorities as required.

6.4 Intrusive Site Works in Uncapped Areas

The uncapped areas of Lot 21 have been validated as suitable for industrial land use. Should works in uncapped areas be considered, consult with SPC to establish if characterisation by sampling and analysis of the surface is necessary. The proposed land use of the uncapped area may guide the density of sampling to be undertaken.

All works should take into consideration the risks associated with the former use of the site as a power station and should be undertaken in accordance with appropriate regulatory requirements and legislation and with any corporate requirements of the organisation undertaking the works.

Should unexpected conditions be encountered, SPC and other appropriate authorities should be notified immediately.

6.5 Landscaping and Vegetation

Where landscaping is required as part of the development only shallow rooting plants and trees which will not breach the marker layer should be selected.

Advice on the maximum depth of plant rooting systems should be sought from a qualified horticulturalist

The extent of Lot 11 is presented in **Figures 2 and 12** and in the as-built construction drawings presented in **Appendix C (Figure D1)**. This Lot includes the area leased to ACS. The following section discusses the ongoing management of Lot 11 with respect to management of intrusive works.

7.1 Residual Contamination

Residual contamination considered to remain on site includes materials potentially impacted with asbestos. These materials may be located under the capping layer. The extent of the capping is illustrated in the as-built construction drawings provided by Australian Customs Service in **Appendix C (Figure D1)**. The capping layer extended over the eastern portion or Demolition Area [as defined for the URS Investigation (URS, July 2002)] of Lot 11.

Underground structures such as power station infrastructure, foundations, pipes and cable conduits may be present in areas across the site. If uncovered, these structures should be considered potentially contaminated. Underground trenches containing waste ash were uncovered during the redevelopment and capping works. These trenches are marked on the as-built drawings as included in **Appendix C (Figure D1)** and **Figure 12**.

Further details on the site conditions of Lot 11 can be reviewed in the Validation Report (URS, 25 November 2003b);

7.2 Maintenance of Existing Capping

7.2.1 Concrete Capping

The capping has been placed to prevent exposure to the underlying potentially asbestos impacted soils. The integrity of the capping will be required to be maintained to minimise the future risk of exposure to the underlying impacted materials. The capping layer extended over the eastern portion or Demolition Area [as defined for the URS Investigation (URS, July 2002)] and extends towards the south-east in the Coal Stockpile Area [as defined for the URS Investigation (URS, July 2002)] of Lot 11. The extent of this concrete capping is illustrated as Portion B on **Figure 12**.

The capping layer placed as part of the remediation works comprised the following:

- placement of a clearly visible geofabric marker on the walls and base of excavations where potentially impacted asbestos soils remained;
- placement of clean sandstone material over an area considered to have been previously impacted with asbestos (i.e 'Demolition Area' of ACS); and
- construction of a reinforced concrete slab overlying the placed sandstone material.

A second area of concrete capping where underlying materials could include potential asbestos impact exists in the north-west part of Lot 11, as noted on Figure D1 (refer Appendix C) in what was the former investigation area described as the Coal Stockpile Area. This area of concrete capping is illustrated in **Figure 12** as Portion C. No geofabric marker layer underlies the concrete capping in Portion C.

The ACS site development has enabled the establishment of pavements, foundations etc in the concrete capping area. These structures will be required to be maintained such that there is no risk of exposure to the underlying impacted soils.

7.2.2 Clean Soil Barrier Capping

Capping provided as a 500 mm clean soil barrier exists in the grassed and landscaped areas of the ACS site, illustrated as Portion A. The underlying subsurface in these landscaped areas prior to the ACS development has not been characterised. No geofabric marker layer underlies the clean soil barrier capping in Portion A.

Maintenance of any sections of the capping which are not covered by concrete/pavement/foundation etc, will be required as per the following:

- establishment and maintenance of appropriate drainage across the surface of the clean soil barrier to minimise the action of erosion of the covering material. Drainage features should be considered to allow stormwater collection and disposal without pooling or high velocity water flow. A 6 monthly inspection program should be implemented by SPC (responsible party is Project Manager, Property) to monitor the surface and, if required a suitably qualified contractor will undertake works to modify drainage conditions;
- if significant subsidence of the clean soil barrier is observed, appropriate geotechnical investigation will be undertaken and, if required, remedial works undertaken to reinstate the integrity of the barrier. A 6 monthly inspection for subsidence shall be made by SPC (responsible party is Project Manager, Property) of the surface of the clean soil barrier.

During inspections, records of observations of the following to be compiled:

- evidence of pooling during and after rainfall events;
- evidence of high velocity storm flows during and after rainfall events; or
- evidence of significant subsidence.

Following inspections, rectification to be considered and implemented by the SPC Project Manager, Property as required.

7.3 Intrusive Site Works in Capped Areas

7.3.1 Planning Intrusive Site Works

The capped areas in which these protocols apply include the grassed/landscaped parts of ACS (Portion A), the concrete capped areas on the east of the site (Portion B) and the concrete capped parts on the west of the site (Portion C) (refer **Figure 12**).

Where excavation into the underlying potentially impacted materials is unavoidable, such excavation shall only be undertaken after receipt of approval from SPC and under the supervision of a suitably qualified consultant and in accordance with the protocols outlined in the following sections.

Prior to conducting intrusive site works on Lot 11 a permit must be sought by the applicant and approved by SPC for the specific activities planned.

Notwithstanding approval from SPC, all works undertaken on site shall be in accordance with appropriate planning legislation requirements including any conditions on current or future Development Consent for the property.

Permit Approval Process

The permit approval process will include (but not be limited to) the following:

- the Applicant must submit an Application Form and associated documentation (see **Appendix D**) to SPC providing all details of the proposed activities prior to the commencement.
- upon receipt of the application, SPC will review the proposed works. Based on information provided by the Applicant and as-built information compiled during the site validation, SPC will assess whether the works require excavation into the capping layer into the underlying potentially impacted material.
- SPC will provide approval and conditions for undertaking the works.

7.3.2 Excavation Protocols for Intrusive Site Works

This section provides guidance on the protocols to be followed during intrusive site works across the capping layer portion of the site.

Documentation Requirements

The documentation required prior to commencement of the intrusive site works includes, but is not limited to the following:

- an completed Application form (**Appendix D**)

-
- an illustrated plan of the proposed works;
 - a safe work method statement (SWMS) and where appropriate, an occupational health & safety management plan (OHSMP) as required by the NSW Occupational Health and Safety Act (2000) and Regulation (2001) for the proposed activities (see Section 7.3.3);
 - a work method statement which provides a description of the activities to be undertaken and the protocols for handling of materials including storage and disposal of impacted and non-impacted materials and the methods of reinstatement; and
 - Permit from SPC for undertaking the work.

Equipment

Details regarding the types of excavating equipment planned for use are required on the Application Form (**Appendix D**). Use of equipment that limits the potential for generating excess spoil and disturbance to the capping layer is recommended.

Earthworks

During excavation works care should be taken to separate capping materials from the underlying potentially impacted material.

The work method statements submitted as part of the Application process should include details for excavation protocols and management of clean and impacted materials. Excavations should be undertaken such that underlying materials do not come into contact with the clean capping layer.

Underground Structures

Excavation works may encounter underground structures including the stormwater culvert and the sewer main (refer **Figures 2, 3 and 5** and **Appendix C**). In addition a network of pipes and pits may exist as presented in the historical site plans attached as **Appendix B**. Reference to these figures should be made prior to excavation to assess whether excavations are likely to encounter these structures.

Excavation works below or into the sides of the stormwater culvert (refer **Figure 2**) will include excavation through potentially asbestos impacted materials.

Other underground structures such as power station foundations, pipes and cable conduits, other than those discussed above may be present. Where underground structures are encountered, the Applicant should immediately inform SPC.

Stockpiling of Materials

All spoil materials not hauled off site during excavation works should be stockpiled such that potentially impacted materials do not come into contact with 'clean' materials. Where materials excavated are required to be stockpiled, these should be covered or kept wet to prevent generation of dust. Stockpiles should also be bunded and sediment retention measures put in place immediately after the stockpile is formed.

Reinstatement

Where possible, once excavation works are complete, potentially impacted soil/fill should either be returned to the excavation and compacted and a highly visible marker layer (Bidim A14 or equivalent) placed prior to replacing the clean capping layer above.

The capping layer should be reinstated either by use of the stockpiled clean capping material or suitable covering eg concrete, asphalt roadway. Where reinstatement requires importation of material, the Applicant shall first demonstrate to the satisfaction of SPC that the material is suitable for use as capping material. This may require analytical testing.

Capping materials shall be placed and compacted such that the geotechnical properties of the reinstated material match those of the surrounding capping material and is suitable for further civil development. Evidence of the compaction and geotechnical performance of the capping may be required by SPC. The surface of the capping should be designed to provide a smooth free draining surface. A bituminous spray may be required on the surface of the capping. All requirements for reinstatement will be assessed as part of the approval process.

Disposal of Soil

Any excess material excavated that cannot be reinstated should be disposed off-site at a controlled NSW EPA licensed facility/landfill. Any excess capping materials generated that cannot be reinstated should be either reused on site or disposed off-site at a controlled NSW EPA licensed facility/landfill. Disposal of excess soil should be in accordance with the requirements of NSW EPA's Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes (NSW EPA, 1999), and may require analytical testing.

The responsibility for obtaining approvals, waste classification of materials and disposal of materials remains with the Applicant.

Survey

Following completion of intrusive site works, survey plans produced by registered surveyors, of the excavations and reinstatement of the capping layer shall be provided by the Applicant to SPC.

Licences and Other Requirements

All works are to be carried out by operators holding appropriate licences or permits which would include but not be limited to:

- contractors carrying out excavation works below the capping material are required to hold a current friable asbestos license from WorkCover NSW; and
- all NSW EPA WorkCover codes of practice and regulations relating to asbestos, including the and the Occupational Health and Safety Act NSW (2000) and Occupational Health and Safety Regulation (2001).

7.3.3 Health and Safety

All works are to be undertaken in accordance with the NSW Occupational Health & Safety Act (2000) and Regulation (2001).

A requirement of the Regulation is that a safe work method statement (SWMS) and where appropriate, an occupational health & safety management (OHSMP) will be required as part of the approval process to undertake intrusive works on the site.

The SWMS/ OHSMP should be prepared by the party conducting the works. It should be the sole responsibility of the Applicant to assess the risks and prepare the SWMS/ OHSMP prior to commencing works. The Applicant will be responsible to implementing the SWMS/ OHSMP .

SWMS/ OHSMP should include, but not be limited to the following information:

- required personal protective equipment for works within the capping layer (eg safety footwear, hard hats, ear and eye protection, gloves);
- required personal protective equipment for works below the capping layer/clean soil barrier (eg respiratory protection, disposable overalls, safety footwear, hard hats, ear and eye protection, gloves);
- relevant approvals and guidelines;
- environmental monitoring (eg air/dust);
- work methods;
- site induction process;
- contingency plans and procedures;
- provision of exclusion zones where appropriate; and
- decontamination process.

SWMS/ OHSMP Documentation and Reporting Requirements

- Results of environmental and personnel monitoring (e.g air/dust/noise/vibration) to be documented and subsequently reported to SPC;
- Health and safety incidents and injuries to be documented. Any health and safety issues considered to be related to potential site contamination to be reported to SPC; and
- Record which personnel has completed induction and training in relation to the SWMS/ OHSMP for the proposed works.

7.3.4 Reporting Intrusive Site Work Activities

Following completion of the works, the Applicant will be required to submit the following to SPC:

- daily logs documenting the location and quantities of material excavated, reinstated and disposed of off-site. This information should be recorded on a log sheet and completed with an as-built site plan;
- source and verification of imported fill as outlined for the reinstatement protocol described in Section 7.3.2 and Section 7.3.3.
- any health and safety issues considered to be related to potential site contamination to be reported to SPC;
- waste tracking receipts and approvals documentation from the licensed facilities to which materials had been disposed;
- results of environmental and personnel monitoring (e.g air/dust/noise/vibration); and
- Health and safety incidents and injuries to be documented. Any health and safety issues considered to be related to potential site contamination to be reported to SPC.

7.3.5 Notification to Relevant Authorities

The Applicant shall immediately notify SPC if conditions encountered during works indicate the presence of unexpected conditions or if there is a breach in control of materials on site. Refer to Section 10 for details of contingency and emergency response planning protocols. Notwithstanding notification to SPC, the Applicants shall also notify other relevant authorities as required.

7.4 Intrusive Works in Uncapped Areas

The uncapped areas of Lot 11 (Portions D and E) have been validated as suitable for industrial land use through the completion of sampling and analysis of surface samples for asbestos fibres on a 20m sampling grid. Should works in uncapped areas be considered, consult with SPC to establish if characterisation by sampling and analysis of the surface is necessary. The proposed land use of the uncapped area may guide the density of sampling to undertaken.

All works should take into consideration the risks associated with the former use of the site as a power station and should be undertaken in accordance with appropriate regulatory requirements and legislation and with any corporate requirements of the organisation undertaking the works.

Should unexpected conditions be encountered, SPC and other appropriate authorities should be notified immediately.

The area considered 'uncapped' where intrusive works do not require SPC approval is illustrated on **Figure 12** as Portions D and E.

Management of Lot 22

SECTION 8

The extent of Lot 22 is illustrated in **Figure 2**. Lot 22 was not included within the remediation works. The limited investigations undertaken to date have indicated that this area may be suitable for use for industrial land use. Any future development of this area is likely to require further investigation and assessment. There may be the requirement for remediation of this area should development be required in the future, however, the area is currently heavily vegetated and subject to a preservation order under Randwick City Council DCP No13 and is part of the Bunnerong Matraville Bushland Remnant.

Lot 23 which has been developed for use as an access road (Golden Grove Road) has been validated as suitable for industrial land use. As such, intrusive site works undertaken in these areas will not require approval, under this SMP, from SPC prior to commencement. However, all works should take into consideration the risks associated with the former use of the site as a power station and should be undertaken in accordance with appropriate regulatory requirements and legislation and with the corporate requirements of the organisation undertaking the works.

Should unexpected conditions be encountered, SPC and other appropriate authorities should be notified immediately.

Contingency and Emergency Response Planning SECTION 10

This section provides guidance of potential unexpected conditions that may be encountered during site works associated with the past land use of the site. The SWMS/ OSHMP prepared by contractors for all work activities should include contingency and emergency response planning.

Potential Issue	Evidence/Signs	Corrective Action
Unplanned Breach of Marker Layer	- evidence of high visibility geofabric marker layer - puncture of high visibility geofabric - demolition material encountered - subsidence of capping	- stop works; - notify SPC and other relevant authorities; - cordon off and control area excluding all but authorised personnel; - reference to contingency measures in H&SP; - works to be progressed by suitably qualified contractors; - keep exposed surfaces wet; - replace any excavated material below marker layer, replace/reinstate marker layer.
Asbestos fragments identified	- asbestos sheeting, lagging material observed - Asbestos Containing Materials (ACM) observed	- notify SPC; - removal of materials by suitably qualified and WorkCover licensed contractors; - validation of surfaces may be required following removal of material.
Hydrocarbon impacted soil	- hydrocarbon odour - oil staining of soil - evidence of steel pipework or concrete sumps possibly with oil products - elevated readings on photo ionisation detector (PID)	- notify SPC; - excavation and removal in accordance with NSW EPA requirements; - validation of excavation in accordance with NSW EPA service station guidelines in consultation with accredited Site Auditor with reference to existing SAS.
Underground structures	- pipework - concrete pits - void spaces - concrete slabs	- reference to pipework layout in Appendix B; - notify SPC and other relevant authorities.
Release of hydrocarbon from underground structures	- black odorous liquid - broken pipework and /or concrete pits - black staining of soil in vicinity - elevated readings on PID	- notify SPC; - use absorbent booms/pads to remove oil, make repair as required; - remove source and dispose off- site in accordance with NSW EPA requirements; - excavation and validation of soil as required (see hydrocarbon impacted soil above).
Inflow of groundwater	water ingress into excavations	- notify SPC; - assess groundwater which accumulates in excavation - Should disposal be required, the relevant regulatory requirements of for e.g NSW EPA and Sydney Water to be followed.
Hydrocarbon impacted water	- black odorous water - rainbow sheen on water	- notify SPC; - collection and off site disposal in accordance with NSW EPA requirements; - bund to prevent water being transported over the site.

Contingency and Emergency Response Planning

SECTION 10

Potential Issue	Evidence/Signs	Corrective Action
Subsidence of capping	- significant cracking of capping surface – crack open greater than 50 mm or stepped vertically greater than 50 mm and/or; - local settlement greater than 150 mm relative to the surrounding area, over a horizontal distance of less than 3 m.	- notify SPC; - cordon off and control area excluding all but authorised personnel\review of as-built survey drawings; - survey by registered surveyor; - build up capping layer with approved clean material to restore general site levels and prevent excessive ponding of run-off, or placement of concrete/roadway capping as part of development works; - survey by registered surveyor to produce revise as-built capping thickness.
Unplanned breach of bituminous surface covering	- cracking in bituminous cover greater than 25 mm width for individual crack, or cumulative width greater than 100 mm per metre for multiple cracks; - clean soil layer exposed; - water ingress; - establishment of vegetation	- notify SPC; - re-spray surface of capping layer with bituminous spray; - removal of vegetation may be required.
Detection of asbestos in air monitoring	asbestos fibres detected during environmental monitoring	- stop excavation works; - notify relevant authorities and SPC; - review excavation protocols. Keep excavation surfaces wet; - review materials handling protocols; - minimise requirement for stockpiling of potentially impacted materials. Off-site disposal may be required; - keep stockpiles wet and covered; - review weather forecasts to avoid excavation works during high winds and dry conditions; - review decontamination procedures; and - increase scope of monitoring
Encounter drums or other previously unknown impacted Objects and Materials		- set aside in sealed and bunded areas - cordon off and control area excluding all but authorised personnel - if object is drum, contact disposal specialists. Do not open drum if swollen or bulging. Material should be assessed appropriately by a suitable qualified expert

References

SECTION 11

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- AGC Woodward-Clyde, *Stage 2 Environmental Audit, Bunnerong Power Station Site, Proposed Sampling and Analysis Strategy Volume 1 – Main Report and Volume 2 – Appendices, January 1993 & December 1993*.
- AGC Woodward-Clyde, *Stage 1 Environmental Audit, Bunnerong Power Station Site*, August 1992
- AGC Woodward-Clyde, *Stage 1 Remediation Report, Bunnerong Power Station Site Environmental Audit*, March 1993
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- ANZECC/ARMCANZ (2000) *Australian Water Quality Guidelines for the Protection of Aquatic Ecosystem*.
- DJ Douglas and Partners, *Report on Geotechnical Investigation Bunnerong Power Station Site, Lot 103 Bumborah Point Road, Botany*, December 1990
- National Environmental Protection Council (1999). *National Environmental Protection Measure – Schedule B (1) – Guidelines on the Investigation Levels for Soil and Groundwater*.
- NSW EPA (1994) *Guidelines for Assessing Service Station Sites*
- Pollution Research Pty Ltd, *PCB Contamination Investigation, Bunnerong Power Station*, November 1988
- URS (2002a) *Final Report Environmental Site Assessment Bunnerong Power Station Site*, July 2002
- URS (2002b) *Remediation Action Plan*, 19 December 2002
- URS (25 November 2003a) *Remediation Validation, Former Bunnerong Power Station, Lots 20, 21, 22 & 23, Bumborah Point Road, Port Botany*
- URS (25 November 2003b) *Addendum No. 1, Remediation Validation, Lot 11, Former Bunnerong Power Station, Bumborah Point Road, Port Botany*.
- Woodward-Clyde, *Letter Report, Former Bunnerong Power Station Site, Review of Site Conditions*, July 1996
- Worksafe Australia (1988) *The National Code of Practice for the Safe removal of Asbestos*

References

SECTION 11

As Built Construction Drawings – Appendix C

Jack Taylor Architects (North Sydney) Proposed Container Examination Facility, Site Remediation Works 23/April/2003, Revision C, Drawing CD1002.

Jack Taylor Architects (North Sydney) Proposed Container Examination Facility, Site Remediation Works 23/April/2003, Revision C, Drawing CD1003.

Woolacotts Consulting Engineers/ Jones & Jones (Artarmon) Proposed Container Examination Facility, Civil Works Plan – Part A – As Built Drawing (Drawing C.04, Job Number 191-01, Revision C 8/August/2002)

Woolacotts Consulting Engineers/ Jones & Jones (Artarmon) Proposed Container Examination Facility, Civil Works Plan – Part B – As Built Drawing (Drawing C.05, Job Number 191-01, Revision D 26/August/2002)

Limitations

SECTION 12

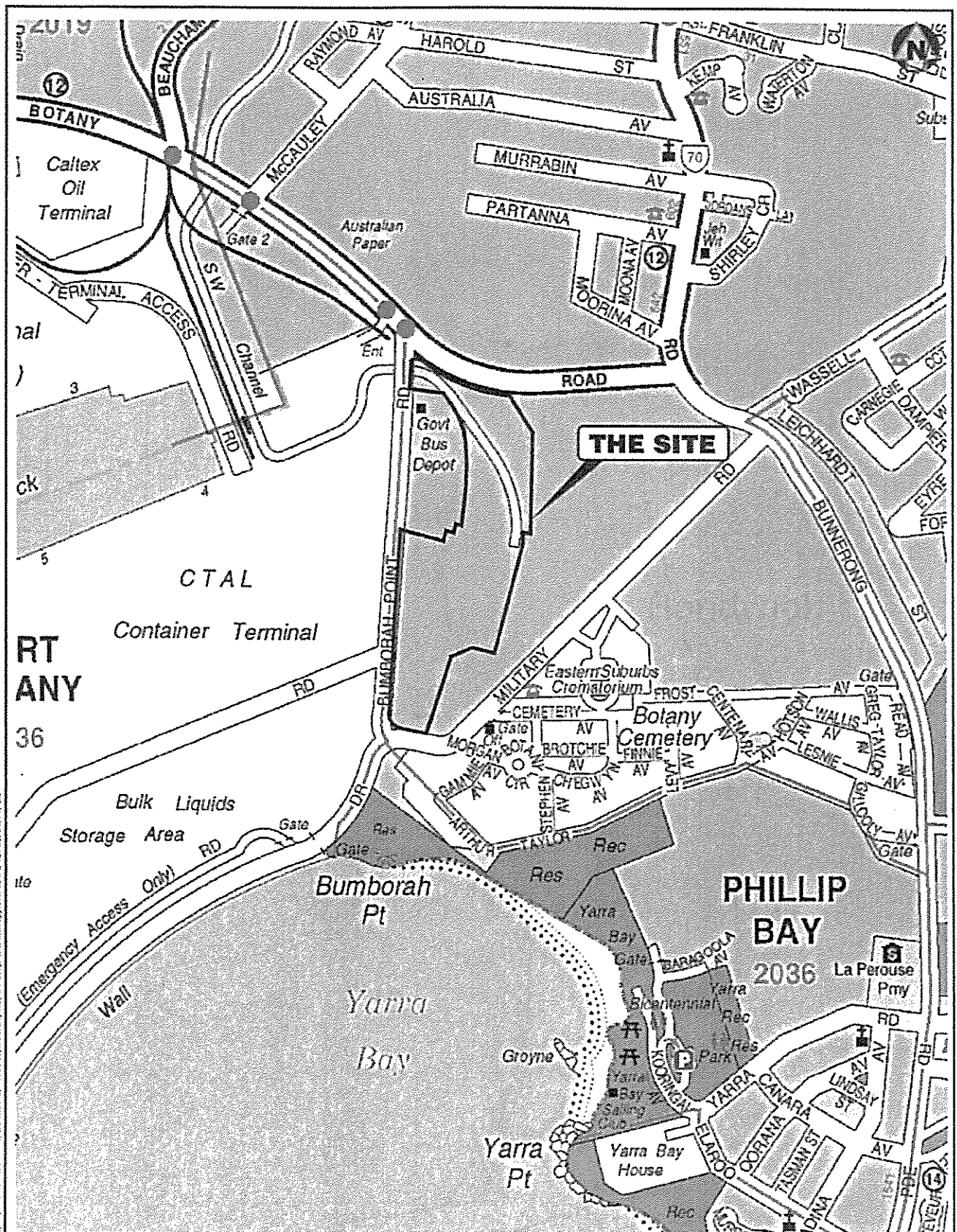
URS Australia Pty Ltd (URS) has prepared this plan for the use of Sydney Ports Corporation and any other parties that may rely on the plan in accordance with the usual care and thoroughness of the consulting profession. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. It is prepared in accordance with the scope of work and for the purpose outlined in the URS Proposal dated 11 February 2003.

The methodology adopted and sources of information used by URS are outlined in this report. URS has made no independent verification of this information beyond the agreed scope of works and URS assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to URS was false.

This report was prepared between 21 February and 25 November 2003 and is based on the conditions encountered and information reviewed at the time of preparation. URS disclaims responsibility for any changes that may have occurred after this time.

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.

Figures



CLIENT:
SYDNEY PORTS CORPORATION

PROJECT:
**FORMER BUNNERONG POWER STATION
SITE MANAGEMENT PLAN**

TITLE:
SITE LOCATION PLAN

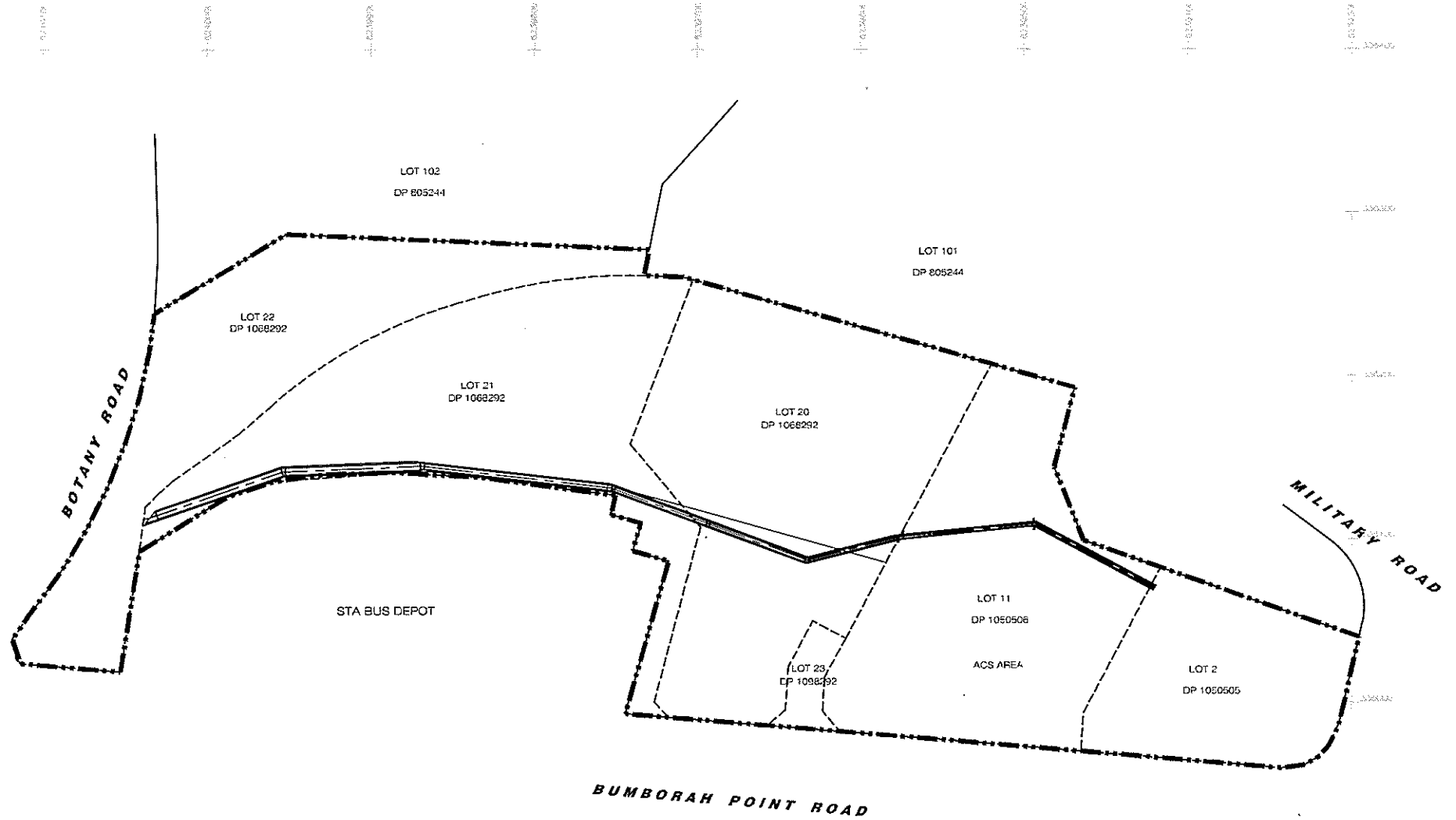
DESIGNED: **DFM**
DRAWN: **JT**
DATE: **23/09/02**

APPROVED
DATE:
STATUS: **DRAFT**

PROJECT: **43027-015**
CAD FILE: **013.CDR**
REVISION: **A**

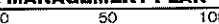
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FIGURE:
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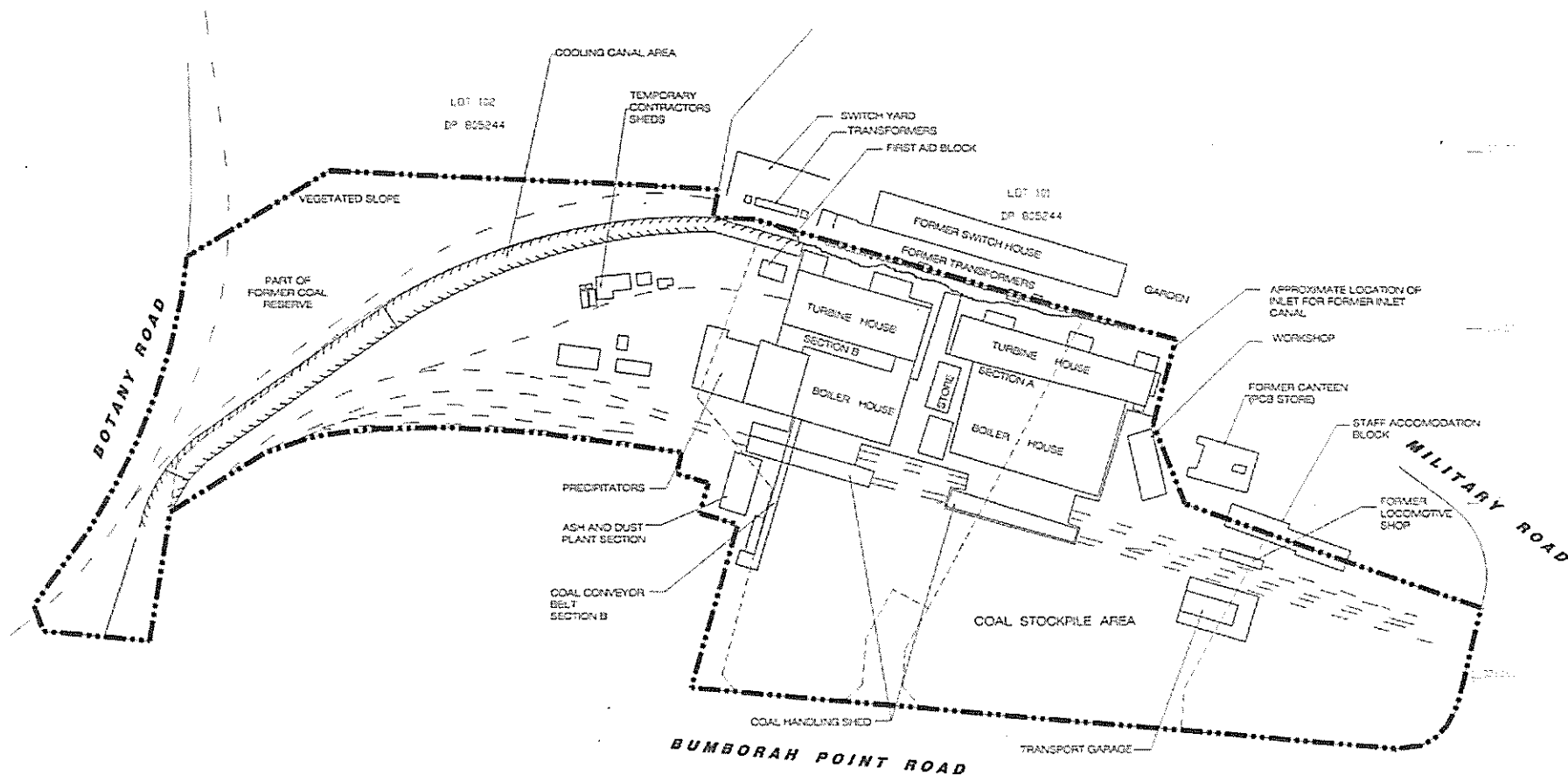


LEGEND

- LOT BOUNDARIES
- PROPERTY BOUNDARY
- == STORMWATER CULVERT

CLIENT: SYDNEY PORTS CORPORATION				TITLE: LAYOUT SHOWING SUBDIVISION OF SITE	
PROJECT: FORMER BUNNERONG POWER STATION SITE MANAGEMENT PLAN					
		DESIGNED: DM	APPROVED:	PROJECT: 43346010	
		DRAWN: AJW	DATE:	CAD FILE: 001.DWG	
		DATE: 21/10/09	STATUS: FINAL	REVISION: C	
				FIGURE 2	

This drawing is subject to CPDRS26. It remains the property of URS Australia Pty Ltd

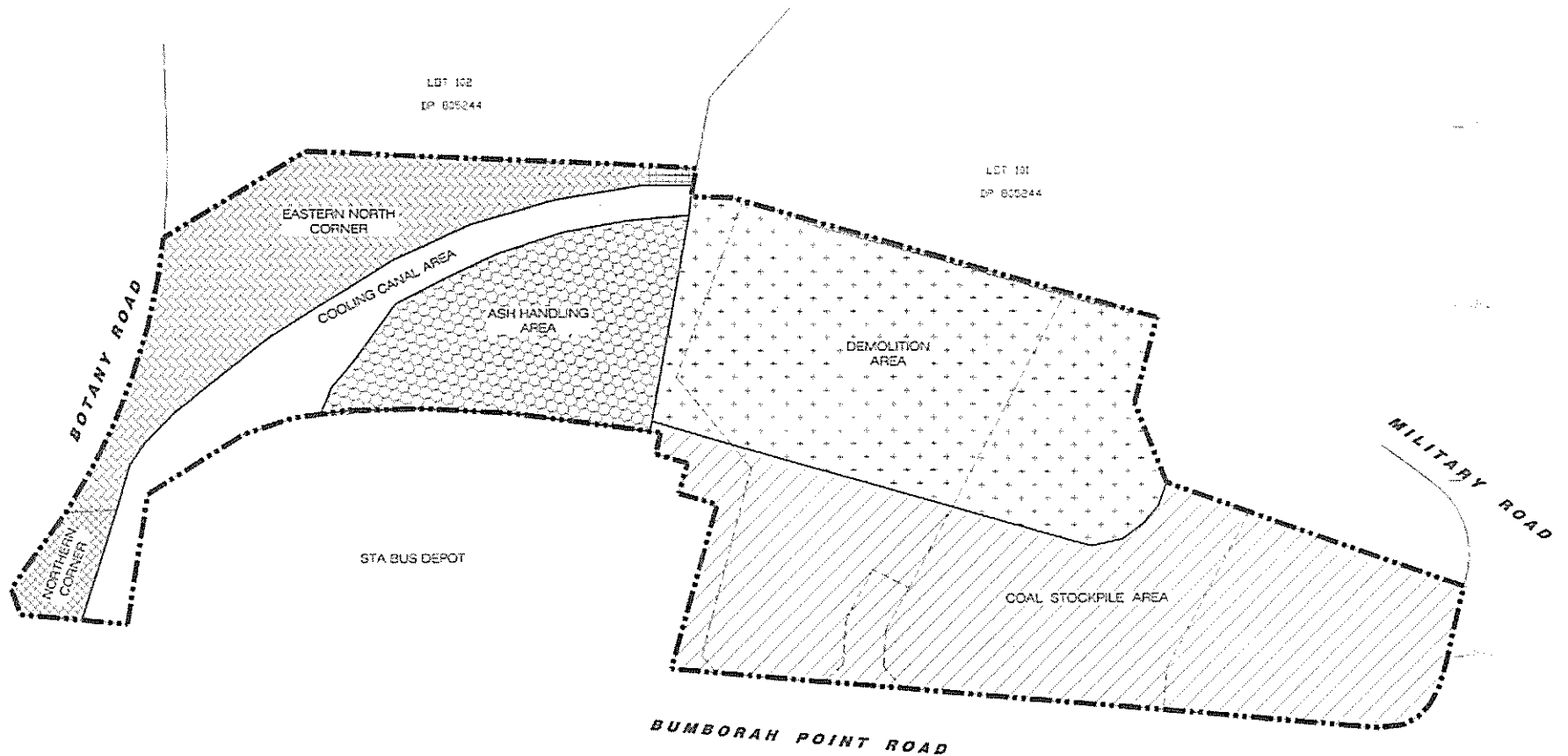


LEGEND

- LOT BOUNDARIES
- PROPERTY BOUNDARY
- STORMWATER CULVERT
- LOCATION OF FORMER RAILWAY LINES
- LOCATION OF FORMER BUILDINGS
- FORMER OUTLET CANAL

CLIENT: SYDNEY PORTS CORPORATION				TITLE: PROPERTY LAYOUT SHOWING FORMER POWER STATION LAYOUT	
PROJECT: FORMER BUNNERONG POWER STATION SITE MANAGEMENT PLAN				PROJECT 43027-015	
DESIGNED: DM				PROJECT 016.DWG	
DRAWN: JT/TT				REVISION A	
DATE: 25/03/03				STATUS DRAFT	
0 50 100 1:2500 (metres)				URS	
				FIGURE 3	

This drawing is subject to 2D/3D/4D/5D/6D/7D/8D/9D/10D/11D/12D/13D/14D/15D/16D/17D/18D/19D/20D/21D/22D/23D/24D/25D/26D/27D/28D/29D/30D/31D/32D/33D/34D/35D/36D/37D/38D/39D/40D/41D/42D/43D/44D/45D/46D/47D/48D/49D/50D/51D/52D/53D/54D/55D/56D/57D/58D/59D/60D/61D/62D/63D/64D/65D/66D/67D/68D/69D/70D/71D/72D/73D/74D/75D/76D/77D/78D/79D/80D/81D/82D/83D/84D/85D/86D/87D/88D/89D/90D/91D/92D/93D/94D/95D/96D/97D/98D/99D/100D/101D/102D/103D/104D/105D/106D/107D/108D/109D/110D/111D/112D/113D/114D/115D/116D/117D/118D/119D/120D/121D/122D/123D/124D/125D/126D/127D/128D/129D/130D/131D/132D/133D/134D/135D/136D/137D/138D/139D/140D/141D/142D/143D/144D/145D/146D/147D/148D/149D/150D/151D/152D/153D/154D/155D/156D/157D/158D/159D/160D/161D/162D/163D/164D/165D/166D/167D/168D/169D/170D/171D/172D/173D/174D/175D/176D/177D/178D/179D/180D/181D/182D/183D/184D/185D/186D/187D/188D/189D/190D/191D/192D/193D/194D/195D/196D/197D/198D/199D/200D/201D/202D/203D/204D/205D/206D/207D/208D/209D/210D/211D/212D/213D/214D/215D/216D/217D/218D/219D/220D/221D/222D/223D/224D/225D/226D/227D/228D/229D/230D/231D/232D/233D/234D/235D/236D/237D/238D/239D/240D/241D/242D/243D/244D/245D/246D/247D/248D/249D/250D/251D/252D/253D/254D/255D/256D/257D/258D/259D/260D/261D/262D/263D/264D/265D/266D/267D/268D/269D/270D/271D/272D/273D/274D/275D/276D/277D/278D/279D/280D/281D/282D/283D/284D/285D/286D/287D/288D/289D/290D/291D/292D/293D/294D/295D/296D/297D/298D/299D/300D/301D/302D/303D/304D/305D/306D/307D/308D/309D/310D/311D/312D/313D/314D/315D/316D/317D/318D/319D/320D/321D/322D/323D/324D/325D/326D/327D/328D/329D/330D/331D/332D/333D/334D/335D/336D/337D/338D/339D/340D/341D/342D/343D/344D/345D/346D/347D/348D/349D/350D/351D/352D/353D/354D/355D/356D/357D/358D/359D/360D/361D/362D/363D/364D/365D/366D/367D/368D/369D/370D/371D/372D/373D/374D/375D/376D/377D/378D/379D/380D/381D/382D/383D/384D/385D/386D/387D/388D/389D/390D/391D/392D/393D/394D/395D/396D/397D/398D/399D/400D/401D/402D/403D/404D/405D/406D/407D/408D/409D/410D/411D/412D/413D/414D/415D/416D/417D/418D/419D/420D/421D/422D/423D/424D/425D/426D/427D/428D/429D/430D/431D/432D/433D/434D/435D/436D/437D/438D/439D/440D/441D/442D/443D/444D/445D/446D/447D/448D/449D/450D/451D/452D/453D/454D/455D/456D/457D/458D/459D/460D/461D/462D/463D/464D/465D/466D/467D/468D/469D/470D/471D/472D/473D/474D/475D/476D/477D/478D/479D/480D/481D/482D/483D/484D/485D/486D/487D/488D/489D/490D/491D/492D/493D/494D/495D/496D/497D/498D/499D/500D/501D/502D/503D/504D/505D/506D/507D/508D/509D/510D/511D/512D/513D/514D/515D/516D/517D/518D/519D/520D/521D/522D/523D/524D/525D/526D/527D/528D/529D/530D/531D/532D/533D/534D/535D/536D/537D/538D/539D/540D/541D/542D/543D/544D/545D/546D/547D/548D/549D/550D/551D/552D/553D/554D/555D/556D/557D/558D/559D/560D/561D/562D/563D/564D/565D/566D/567D/568D/569D/570D/571D/572D/573D/574D/575D/576D/577D/578D/579D/580D/581D/582D/583D/584D/585D/586D/587D/588D/589D/590D/591D/592D/593D/594D/595D/596D/597D/598D/599D/600D/601D/602D/603D/604D/605D/606D/607D/608D/609D/610D/611D/612D/613D/614D/615D/616D/617D/618D/619D/620D/621D/622D/623D/624D/625D/626D/627D/628D/629D/630D/631D/632D/633D/634D/635D/636D/637D/638D/639D/640D/641D/642D/643D/644D/645D/646D/647D/648D/649D/650D/651D/652D/653D/654D/655D/656D/657D/658D/659D/660D/661D/662D/663D/664D/665D/666D/667D/668D/669D/670D/671D/672D/673D/674D/675D/676D/677D/678D/679D/680D/681D/682D/683D/684D/685D/686D/687D/688D/689D/690D/691D/692D/693D/694D/695D/696D/697D/698D/699D/700D/701D/702D/703D/704D/705D/706D/707D/708D/709D/710D/711D/712D/713D/714D/715D/716D/717D/718D/719D/720D/721D/722D/723D/724D/725D/726D/727D/728D/729D/730D/731D/732D/733D/734D/735D/736D/737D/738D/739D/740D/741D/742D/743D/744D/745D/746D/747D/748D/749D/750D/751D/752D/753D/754D/755D/756D/757D/758D/759D/760D/761D/762D/763D/764D/765D/766D/767D/768D/769D/770D/771D/772D/773D/774D/775D/776D/777D/778D/779D/780D/781D/782D/783D/784D/785D/786D/787D/788D/789D/790D/791D/792D/793D/794D/795D/796D/797D/798D/799D/800D/801D/802D/803D/804D/805D/806D/807D/808D/809D/810D/811D/812D/813D/814D/815D/816D/817D/818D/819D/820D/821D/822D/823D/824D/825D/826D/827D/828D/829D/830D/831D/832D/833D/834D/835D/836D/837D/838D/839D/840D/841D/842D/843D/844D/845D/846D/847D/848D/849D/850D/851D/852D/853D/854D/855D/856D/857D/858D/859D/860D/861D/862D/863D/864D/865D/866D/867D/868D/869D/870D/871D/872D/873D/874D/875D/876D/877D/878D/879D/880D/881D/882D/883D/884D/885D/886D/887D/888D/889D/890D/891D/892D/893D/894D/895D/896D/897D/898D/899D/900D/901D/902D/903D/904D/905D/906D/907D/908D/909D/910D/911D/912D/913D/914D/915D/916D/917D/918D/919D/920D/921D/922D/923D/924D/925D/926D/927D/928D/929D/930D/931D/932D/933D/934D/935D/936D/937D/938D/939D/940D/941D/942D/943D/944D/945D/946D/947D/948D/949D/950D/951D/952D/953D/954D/955D/956D/957D/958D/959D/960D/961D/962D/963D/964D/965D/966D/967D/968D/969D/970D/971D/972D/973D/974D/975D/976D/977D/978D/979D/980D/981D/982D/983D/984D/985D/986D/987D/988D/989D/990D/991D/992D/993D/994D/995D/996D/997D/998D/999D/1000D/1001D/1002D/1003D/1004D/1005D/1006D/1007D/1008D/1009D/1010D/1011D/1012D/1013D/1014D/1015D/1016D/1017D/1018D/10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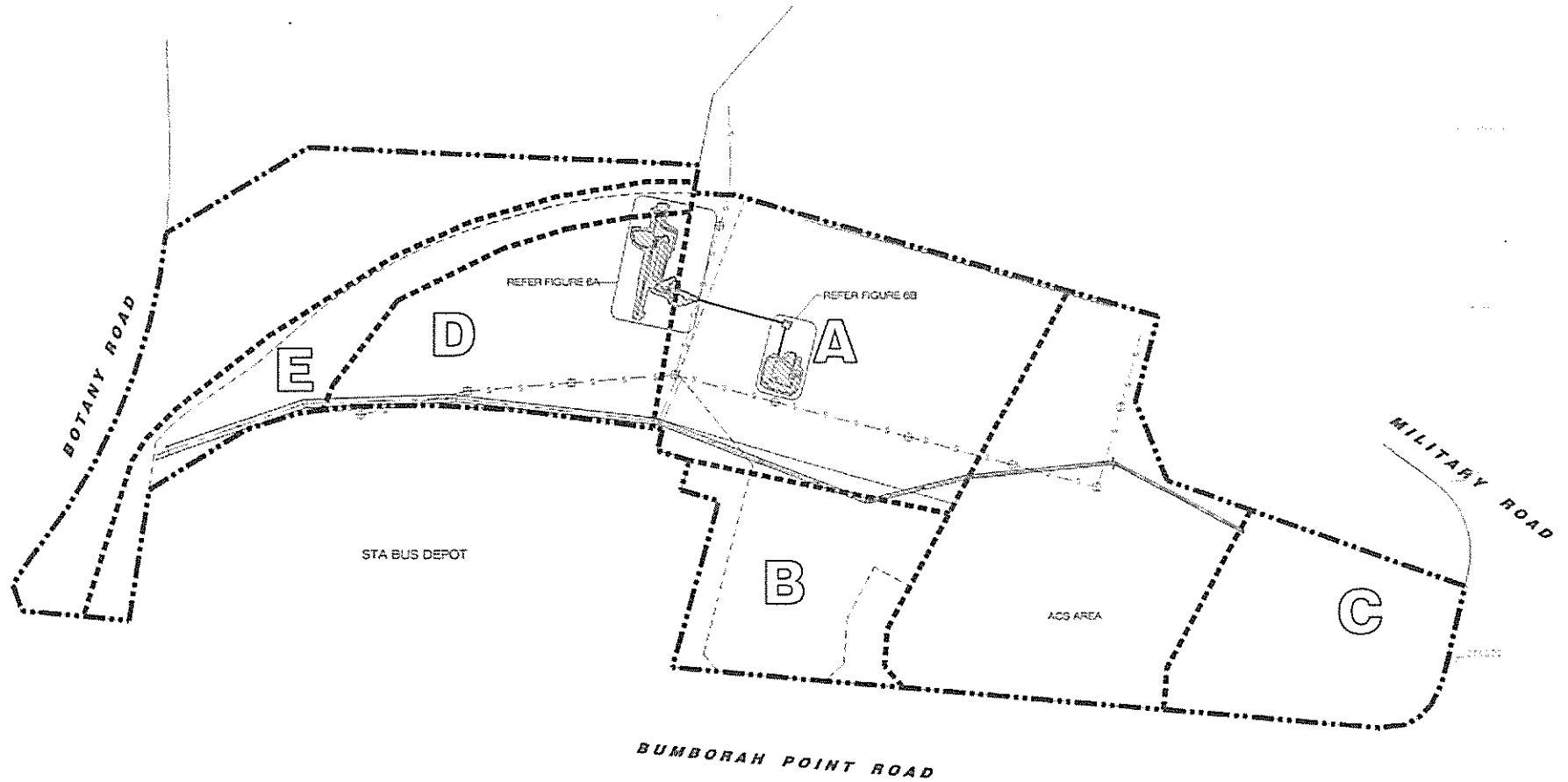


LEGEND

- LOT BOUNDARIES
- PROPERTY BOUNDARY
- INVESTIGATION WORK AREA BOUNDARY
- COAL STOCKPILE AREA
- DEMOLITION AREA
- ASH HANDLING AREA
- COOLING CANAL AREA
- NORTHERN CORNER
- NORTH EASTERN CORNER

CLIENT SYDNEY PORTS CORPORATION				TITLE INVESTIGATION AREAS	
PROJECT FORMER BUNNERONG POWER STATION SITE MANAGEMENT PLAN				PROJECT 43027-015	
DRAWN JT/TT				CAD FILE 017.DWG	
DATE 30/07/03				REVISION B	
DESIGNED DM				APPROVED DATE	
STATUS DRAFT				FIGURE 4	

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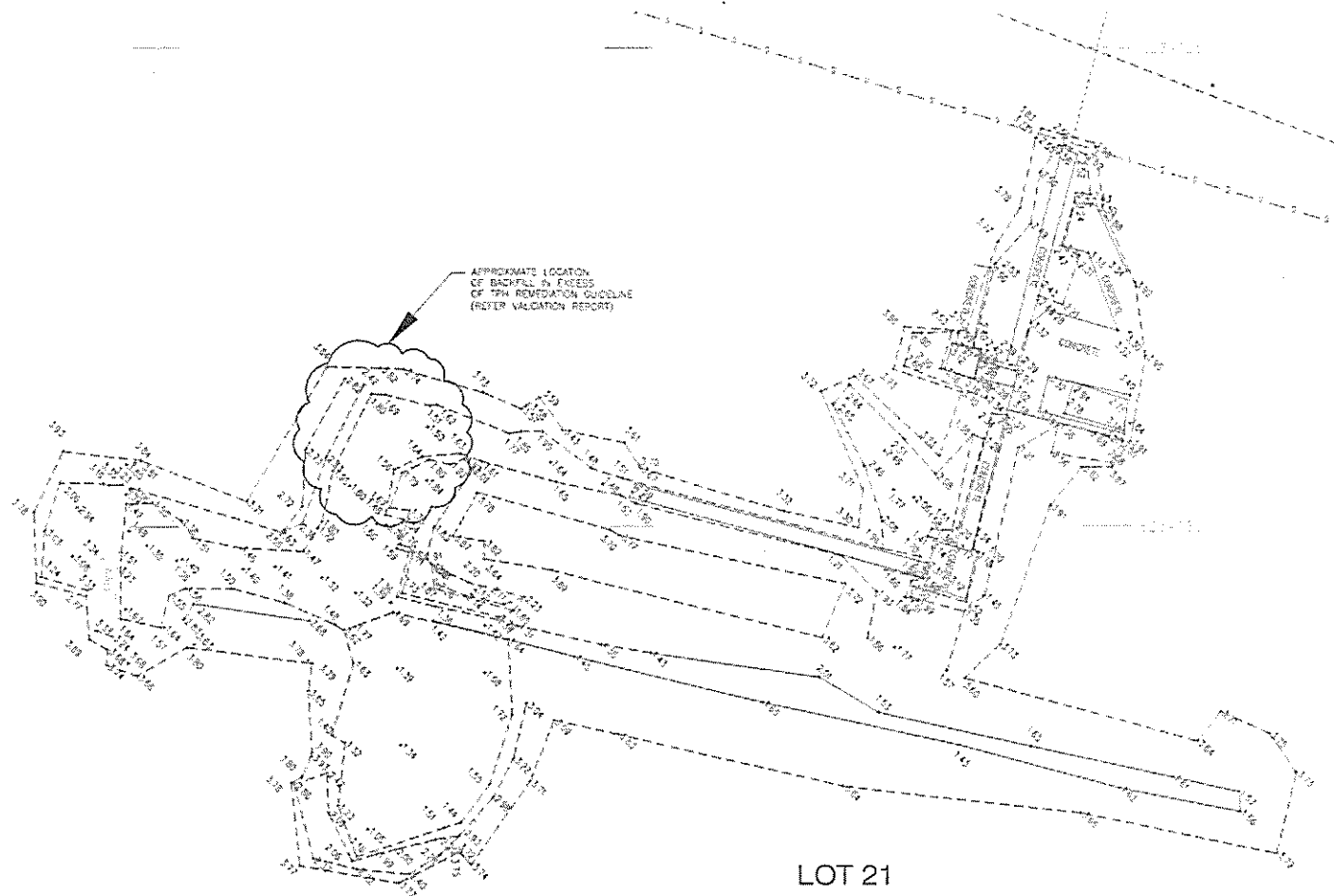


LEGEND

- LOT BOUNDARIES
- PROPERTY BOUNDARY
- CULVERT
- D REMEDIATION AREA
- REMEDIATION AREA BOUNDARY
- S SEWER
- EXTENT OF HYDROCARBON REMEDIATION

APPROXIMATE SITE AREAS	
A	28,000m ²
B	13,500m ²
C	15,500m ²
D	16,000m ²
E	5,000m ²

CLIENT: SYDNEY PORTS CORPORATION				TITLE: SITE PLAN SHOWING REMEDIATION AREAS	
PROJECT: FORMER BUNNERONG POWER STATION SITE MANAGEMENT PLAN				PROJECT: 45027-015	
DESIGNED: DM				PROJECT: 015.DWG	
DRAWN: JT/TT				REVISION: B	
DATE: 30/07/02				STATUS: DRAFT	
0 50 100				URS	
1:2500 (metres)				FIGURE 5	



LEGEND

- LOT BOUNDARIES
- PROPERTY BOUNDARY
- SEWER
- METRES AND EXCAVATION LEVEL

INFORMATION TAKEN FROM
BEE AND LETHERIDGE PTY. LTD.
DRAWING 1357949F - 02/07/03

CLIENT SYDNEY PORTS CORPORATION				TITLE LAYOUT AND LEVELS OF TPH REMEDIATION (NORTHERN)	
PROJECT FORMER BUNNERONG POWER STATION SITE MANAGEMENT PLAN				PROJECT CAD FILE 0306.DWG	
DESIGNED DM		APPROVED		REVISION	
DRAWN JM		DATE		A	
DATE 30/07/03		STATUS		DRAFT	

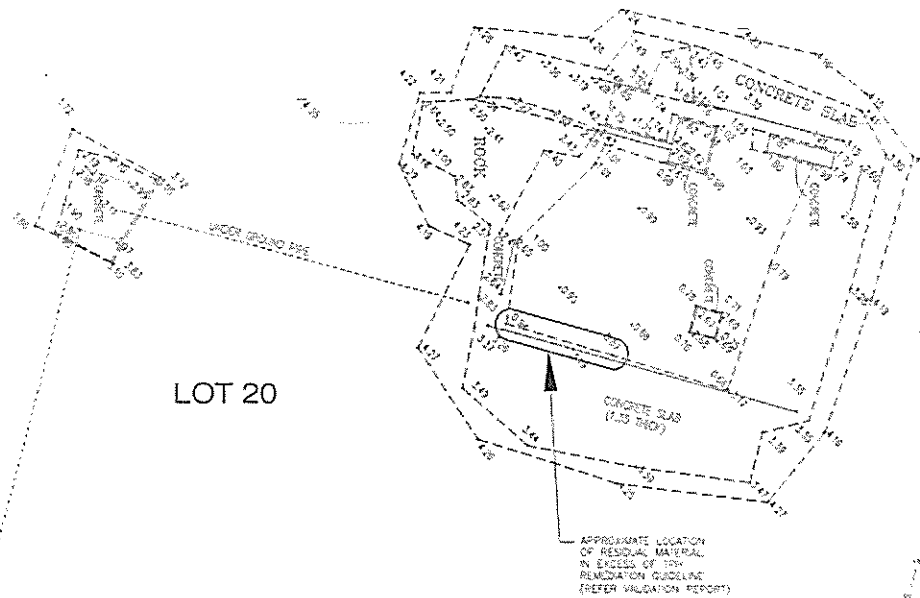
0 50 100

1:2500 (metres)

URS

FIGURE
6A

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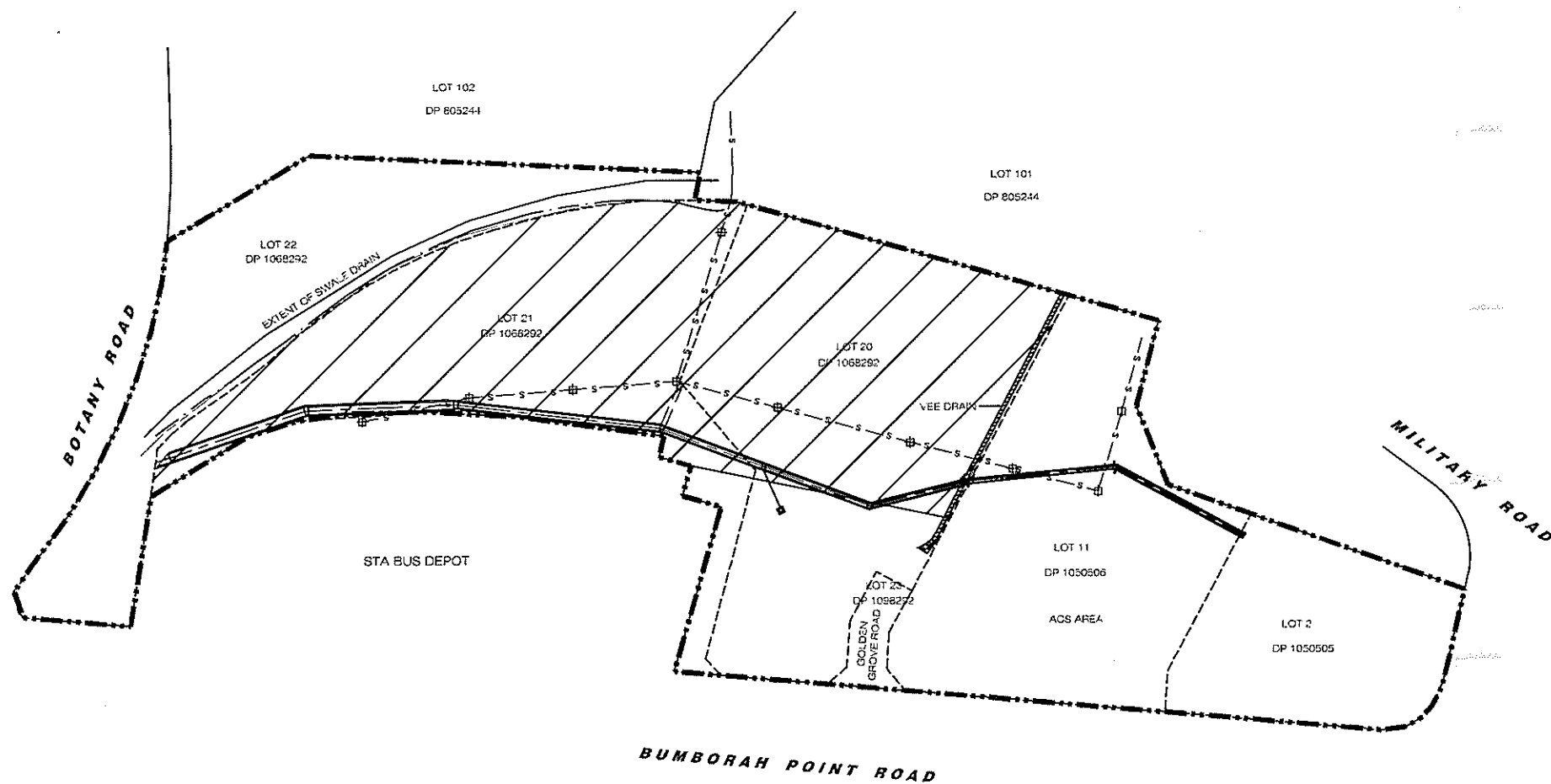
LEGEND

- LOT BOUNDARIES
- PROPERTY BOUNDARY
- SEWER
- METRES AND EXCAVATION LEVEL

INFORMATION TAKEN FROM
BEE AND LETHBRIDGE PTY. LTD
DRAWING 1357949F - 02/07/03

CLIENT SYDNEY PORTS CORPORATION				TITLE LAYOUT AND LEVELS OF TPH REMEDIATION (SOUTHERN)	
PROJECT FORMER BUNNERONG POWER STATION SITE MANAGEMENT PLAN				PROJECT CAD FILE 037.DWG	
DESIGNED DM		APPROVED		PROJECT REVISION A	
DRAWN JM		DATE		FIGURE	
DATE 30/07/03		STATUS DRAFT		URS	
0 50 100 1:2500 (metres)				6B	

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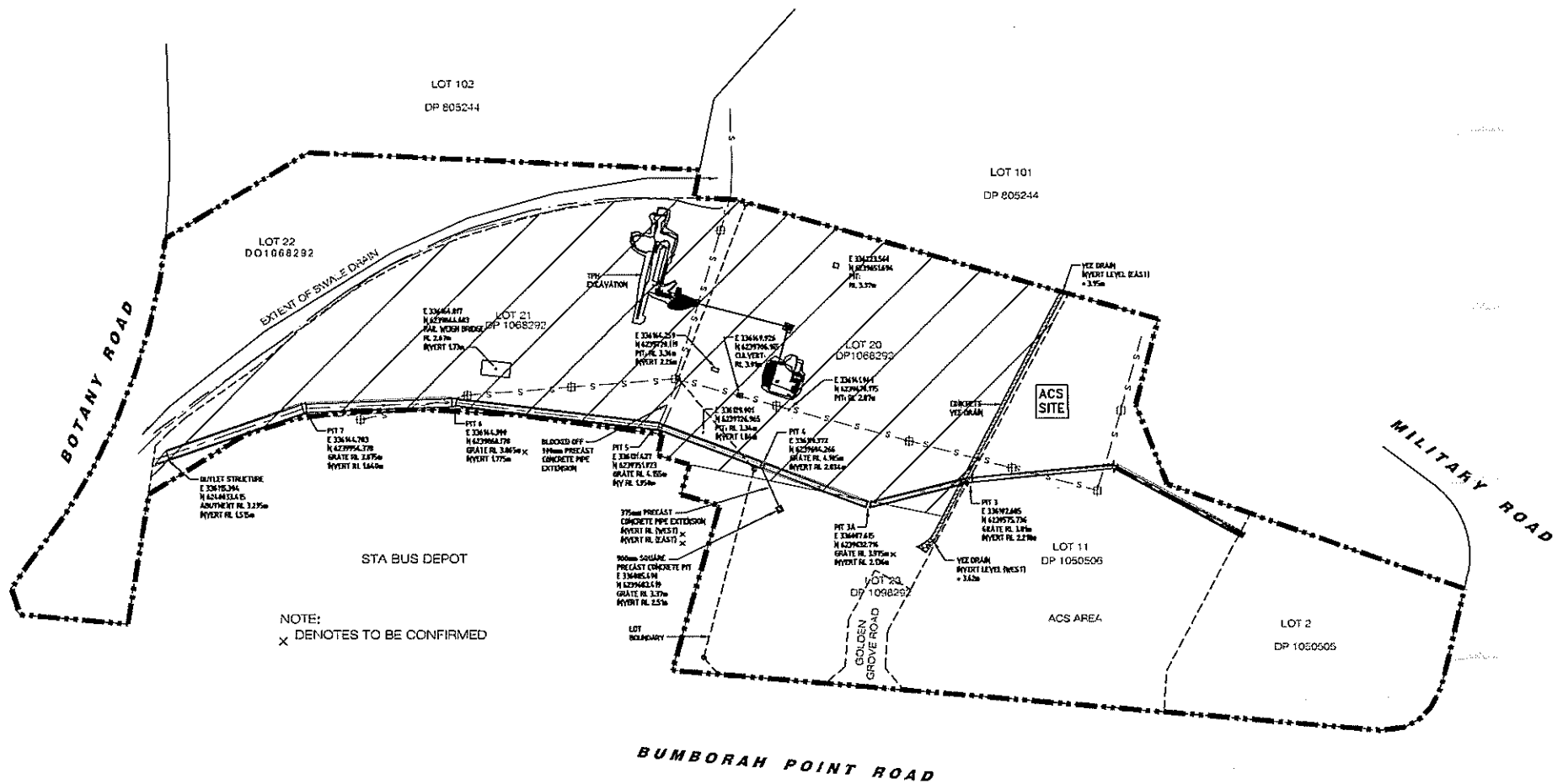


LEGEND

- LOT BOUNDARIES
- PROPERTY BOUNDARY
- STORMWATER CULVERT
- CAPPING AREA
- SEWER

CLIENT: SYDNEY PORTS CORPORATION			TITLE: LAYOUT OF SITE FOLLOWING REMEDATION	
PROJECT: FORMER BUNNERONG POWER STATION SITE MANAGEMENT PLAN				
0 50 100 1:2500 (metres)			DESIGNED: DM DRAWN: AJW DATE: 21/10/09	APPROVED: DATE: STATUS: FINAL
			PROJECT: 43346010 CAD FILE: 002.DWG REVISION: B	URS FIGURE 7

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LEGEND

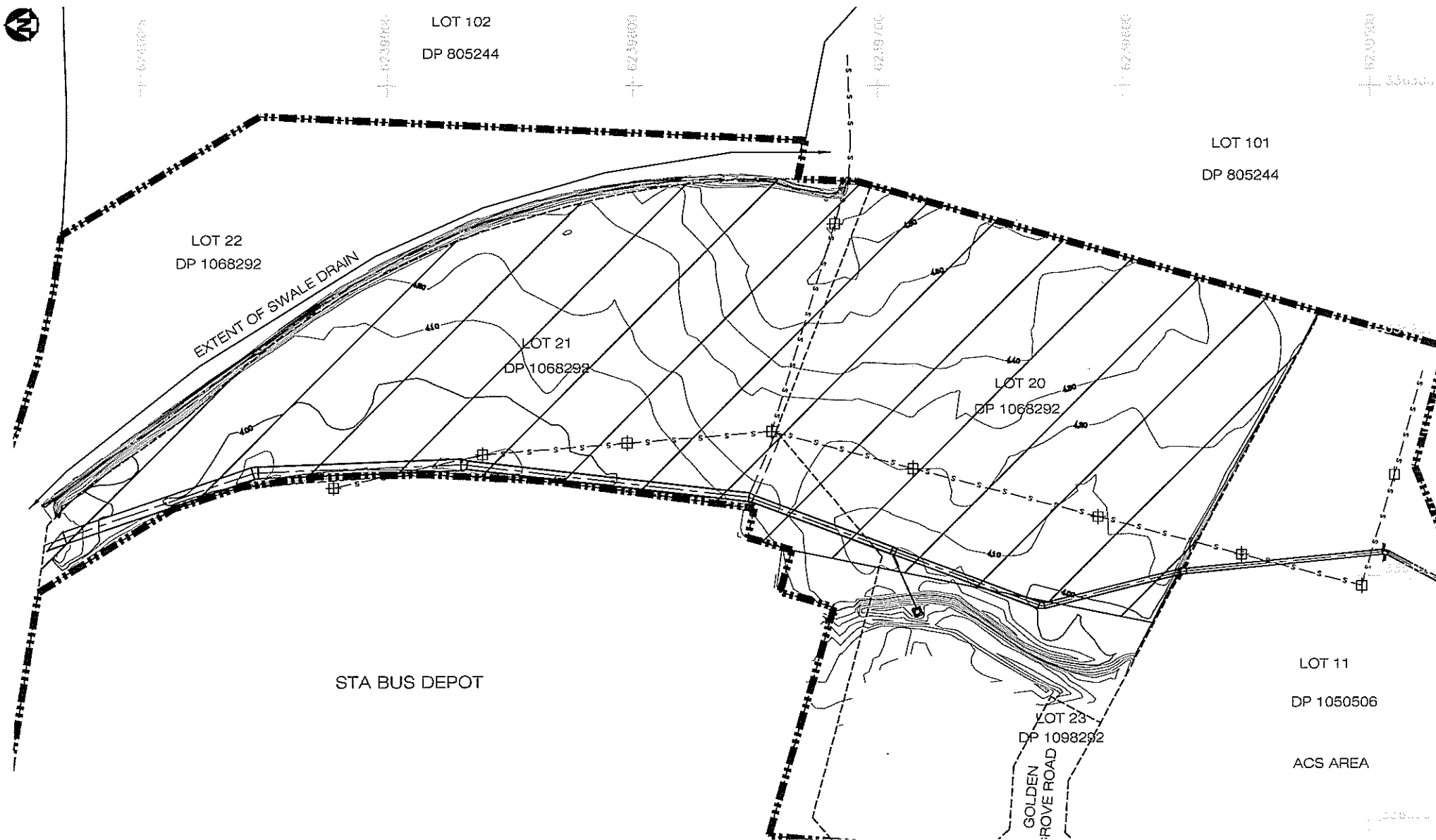
- LOT BOUNDARIES
- PROPERTY BOUNDARY
- STORMWATER CULVERT
- GAPPING AREA
- SEWER

NOTE:
X DENOTES TO BE CONFIRMED

- DENOTES SEWER MANHOLE
- DENOTES CULVERT PIT
- DENOTES TOE OF BATTER
- DENOTES LOT BOUNDARY
- DENOTES PITS
- DENOTES CONCRETE STRUCTURES

CLIENT: SYDNEY PORTS CORPORATION		TITLE: PLAN OF KNOWN PIT LOCATIONS AND CONCRETE STRUCTURES	
PROJECT: FORMER BUNNERONG POWER STATION SITE MANAGEMENT PLAN		PROJECT: 43346010 CAO FILE: 006.DWG REVISION: B	
DESIGNED: DM DRAWN: AJW DATE: 28/10/09	APPROVED: DATE: STATUS: FINAL	URS	
0 50 100 1:2600 (metres)		FIGURE 9	

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LEGEND

- LOT BOUNDARIES
- PROPERTY BOUNDARY
- STORM/WATER CULVERT
- CAPPING AREA
- SEWER

NOTES:

1. FINAL LEVELS ON VEE DRAIN YET TO BE CONFIRMED BY WARD CIVIL AS AT 13/03/04.
2. LEVELS ARE ON 20 BTG DATUM AND ORIGIN OF LEVELS IS TAKEN FROM BSM 44057 (RL 3.177m AHD AND RL 4.102 2P BTG).

INFORMATION TAKEN FROM
BEE AND LETHBRIDGE PTY. LTD.
DRAWING 13579602_3D - 02/07/03

CLIENT:
SYDNEY PORTS CORPORATION
PROJECT:
FORMER BUNNERONG POWER STATION
SITE MANAGEMENT PLAN

TITLE:
**FINAL LEVELS OF
CAPPING LAYER**

0 50 100
1:2500 (metres)

DESIGNED: **DM**
DRAWN: **AJW**
DATE: **21/10/09**

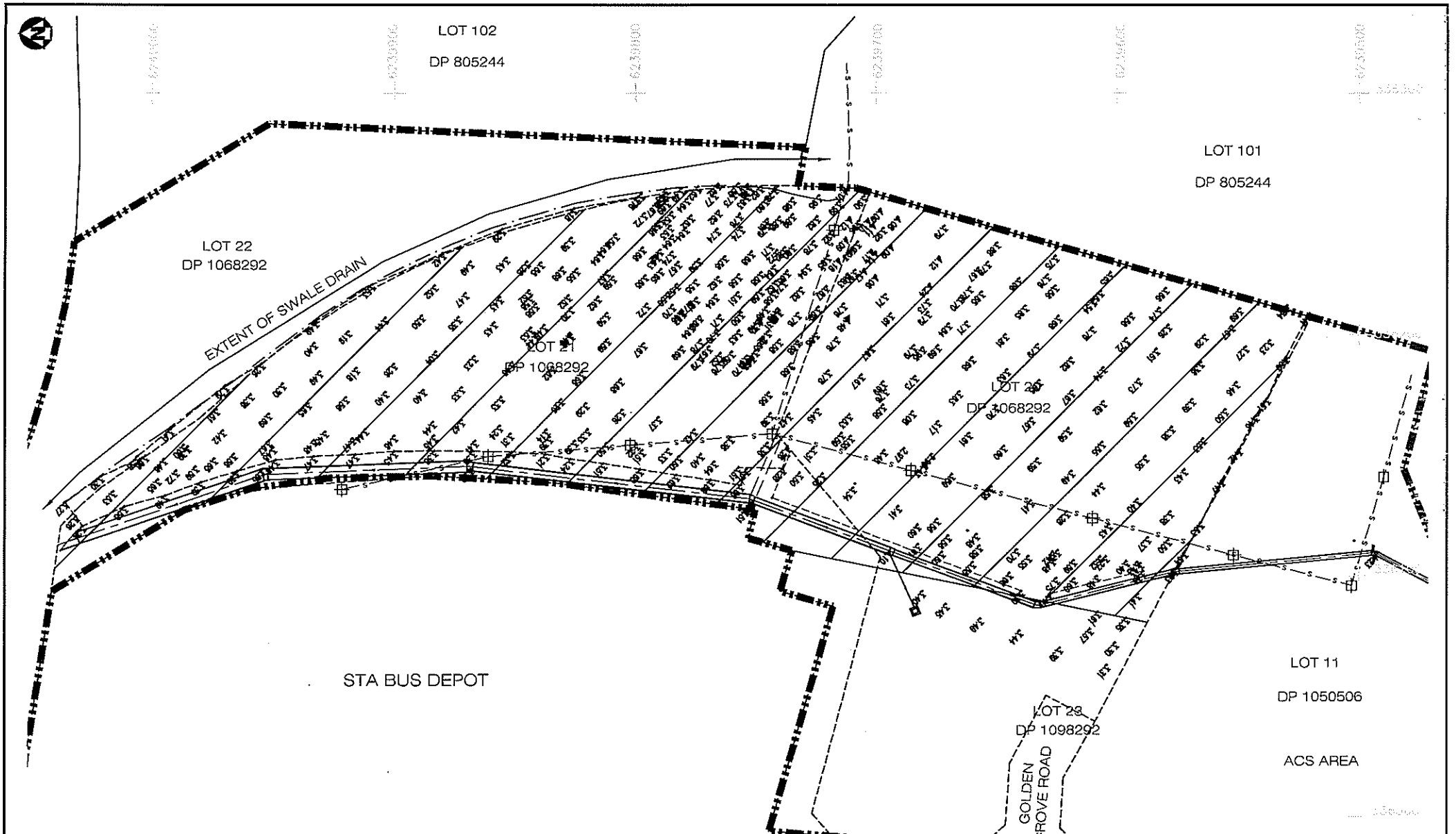
APPROVED:
DATE:
STATUS: **FINAL**

PROJECT: **43346010**
CAD FILE: **003.DWG**
REVISION: **B**

URS

FIGURE
9

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LEGEND

- LOT BOUNDARIES
- PROPERTY BOUNDARY
- STORMWATER CULVERT
- CAPPING AREA
- SEWER

NOTES:

1. FINAL LEVELS ON VEE DRAIN YET TO BE CONFIRMED BY WARD CIVIL AS AT 13/08/03
2. LEVELS ARE ON ZP BTG DATUM AND ORIGIN OF LEVELS IS TAKEN FROM SSM 44857 (RL 3.177m AHD AND RL 4.102 ZP BTG)

INFORMATION TAKEN FROM
BEE AND LETHBRIDGE PTY. LTD.
DRAWING 1357917_3DA - 02/07/03

CLIENT: SYDNEY PORTS CORPORATION			TITLE: AS BUILT LEVELS OF MARKER LAYER		
PROJECT: FORMER BUNNERONG POWER STATION SITE MANAGEMENT PLAN			PROJECT: 43346010 CAD FILE: 005.DWG REVISION: B		
DESIGNED: DM DRAWN: AJW DATE: 21/10/09			APPROVED: DATE: STATUS: FINAL		
			FIGURE 10		

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LOT 102
DP 805244

LOT 101
DP 805244

LOT 22
DP 1068292

EXTENT OF SWALE DRAIN

LOT 21
DP 1068292

LOT 20
DP 1068292

STA BUS DEPOT

LOT 11
DP 1050506

ACS AREA

LOT 23
DP 1098292
GOLDEN
ROVE ROAD

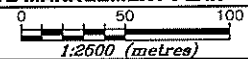
LEGEND

- LOT BOUNDARIES
- PROPERTY BOUNDARY
- STORMWATER CULVERT
- /// CAPPING AREA
- S --- SEWER

INFORMATION TAKEN FROM
BEE AND LETHBRIDGE PTY. LTD.
DRAWING 1357961_3D - 02/07/03

CLIENT:
SYDNEY PORTS CORPORATION
PROJECT:
**FORMER BUNNORONG POWER STATION
SITE MANAGEMENT PLAN**

TITLE:
**AS BUILT THICKNESS OF
CAPPING LAYER**



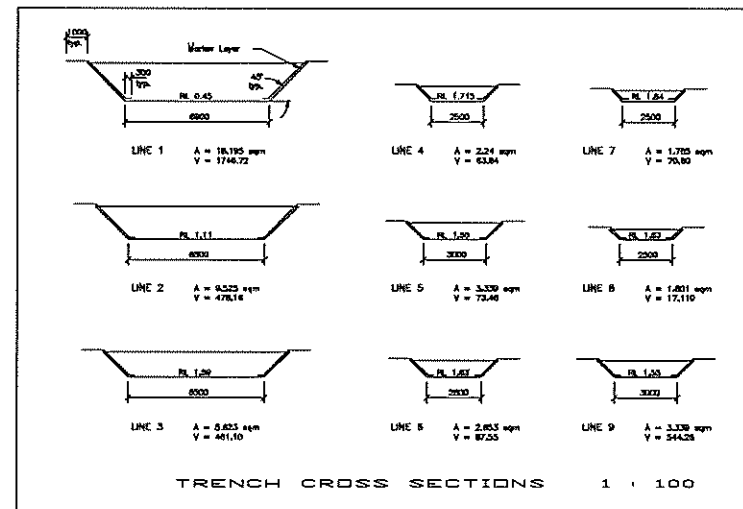
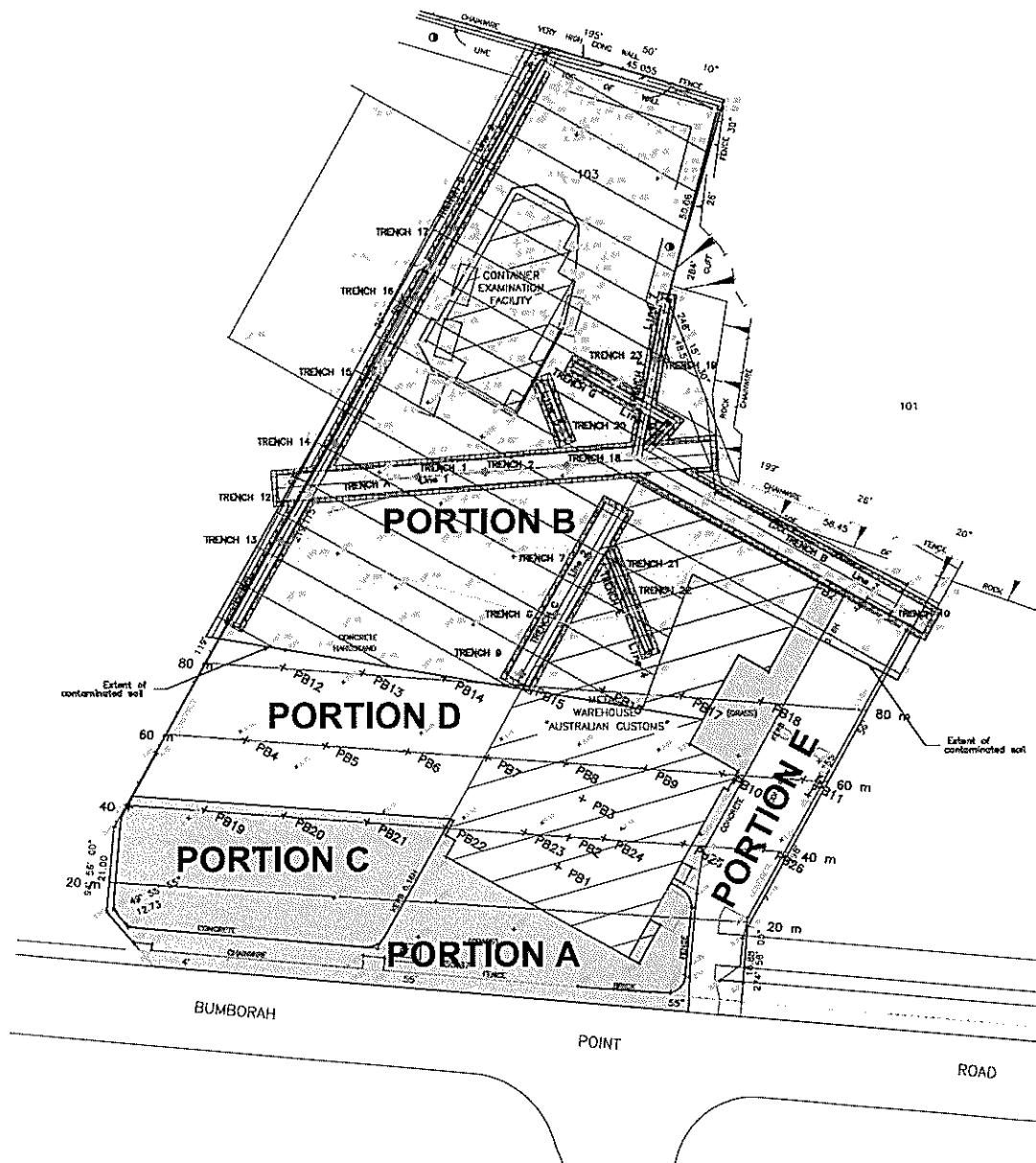
DESIGNED: **DM**
DRAWN: **AJW**
DATE: **28/10/09**
APPROVED: **DATE:**
STATUS: **FINAL**

PROJECT: **43346010**
CAD FILE: **007.DWG**
REVISION: **B**

URS

FIGURE
11

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- LEGEND**
- EXTENT OF LANDSCAPING
 - LEVEL AT TOP OF R.C. SLAB
 - LEVEL AT U/S OF CLEAN SANDSTONE FILL
 - LEVEL AT BASE OF ASH PIT
 - ASBESTOS TEST SAMPLE POINT
 - TRENCH D
 - TRENCH VALIDATION SAMPLE POINT
 - EXTENT OF MARKER LAYER
 - EXTENT OF ASBESTOS AFFECTED AREA
 - DEMOLITION/COAL STOCKPILE AREA BOUNDARY

SOURCE: JACK TAYLOR ARCHITECTS DRG. 16. CD1002
DRAWING RECEIVED FROM SYDNEY PORTS CORPORATION EN: MAY 2003.

CLIENT: SYDNEY PORTS CORPORATION			TITLE: LOT 11 VALIDATION AREAS		
PROJECT: SITE MANAGEMENT PLAN FORMER BUNNORONG POWER STATION, PORT BOTANY, NSW					
NOT TO SCALE			DESIGNED: FM DRAWN: AJW DATE: 28/10/09	APPROVED: DATE: STATUS: FINAL	PROJECT: 43346010 CAD FILE: 008.DWG REVISION: B
			FIGURE 12		

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Appendix A

Contaminants of Concern

Appendix A

Contaminants of Concern

Total Petroleum Hydrocarbons

Total petroleum hydrocarbons (TPH) is a term used to describe a large family of several hundred chemical compounds that originally come from crude oil. Some chemicals that may be found in TPH are hexane, jet fuels, mineral oils, benzene, toluene, xylenes, naphthalene, and fluorene, as well as other petroleum products and gasoline components, however, it is likely that samples of TPH will contain only some, or a mixture, of these chemicals.

Potential exposure routes to these compounds include inhalation of vapours, contaminated soil or liquid aerosols, skin absorption following contact with contaminated soil or liquids, and ingestion of contaminated soil or liquids.

If a person is exposed to high levels of TPH in the air, they can cause headaches and dizziness at high levels in the air and others can cause effects on the blood, immune system, nervous system, lungs, skin, and eyes. The International Agency for Research on Cancer (IARC) has determined that one TPH compound (benzene) is carcinogenic to humans. IARC has determined that other TPH compounds (benzo[a]pyrene and gasoline) are probably and possibly carcinogenic to humans. Most of the other TPH compounds are considered not to be classifiable by IARC.

Asbestos

Asbestos is the name applied to a group of six different fibrous minerals (amosite, chrysotile, crocidolite, and the fibrous varieties of tremolite, actinolite, and anthophyllite) that occur naturally in the environment. Asbestos fibres do not have any detectable odour or taste. Asbestos can be found naturally in soil and rocks in some areas. Asbestos fibres are resistant to heat and most chemicals. Because of this property, asbestos fibres have been mined for use in a wide range of man-made products, mostly in building materials, friction products, and heat-resistant fabrics.

The asbestos encountered on site was generally in the form of fibres of amosite and/ or chrysotile.

Asbestos fibres do not evaporate into air or dissolve in water. However, pieces of fibres can enter the air and water from the weathering of natural deposits and the wearing down of man-made asbestos products. Small fibres and fibres-containing particles may remain suspended in the air for a long time and be carried long distances by wind or water currents before settling. Larger fibres and particles tend to settle more quickly. Asbestos fibres are not able to move through soil and they are not broken down to other compounds in the environment. Therefore, they can remain in the environment for decades or more.

The most important pathway for exposure to asbestos is the inhalation of asbestos fibres suspended in air. These fibres can come from natural outcroppings of asbestos or from the suspension of asbestos within contaminated soils. Other sources include wearing down of man-made products including insulation, ceiling and floor tiles, roof shingles, cement, and automotive brakes and clutches.

Low levels of asbestos that are not likely to be harmful to your health can be detected in almost any air sample. For example, in rural areas, an average of around 0.03–3 fibres are usually present in a cubic

Appendix A

Contaminants of Concern

meter (f/m³) of outdoor air. Higher levels are usually found in cities, where there may be 2–300 f/m³. The fibre count depends on how the fibres are measured.

Dermal absorption of asbestos fibres is considered to be insignificant.

Inhalation of asbestos fibres has been associated with asbestosis which causes shortness of breath, often accompanied by a cough, disability and death. Asbestosis is not usually of concern to people exposed to low levels of asbestos. Exposures to high levels of asbestos fibres in air (typically associated with asbestos workers) have been associated with increased occurrence of two types of cancer: cancer of the lung tissue itself and mesothelioma, a cancer of the thin membrane that surrounds the lung and other internal organs.

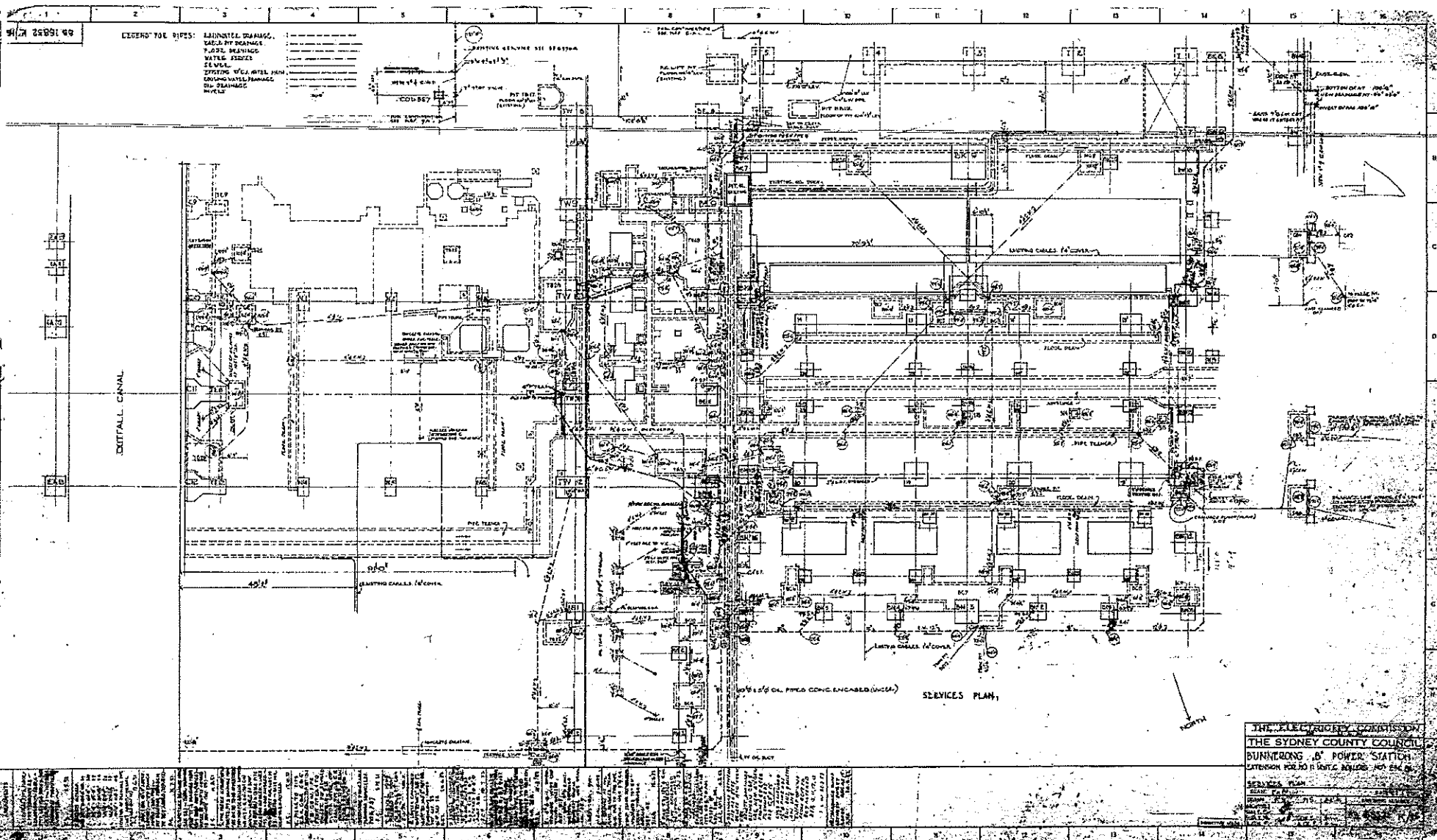
The levels of asbestos in air that lead to lung disease depend on a large number of factors. The most important of these are (1) length of exposure, (2) when exposure started, and (3) smoking cigarettes. Interactions between cigarette smoke and asbestos increase the chances of getting lung cancer. Also, there is a scientific debate concerning the differences in the extent of disease caused by different fibre types and sizes. Generally, smaller fibre diameters or widths are associated with mesothelioma, while larger widths are associated with lung cancer. The International Agency for Research on Cancer (IARC) has determined that asbestos (via inhalation) is carcinogenic to humans.

The health effects from swallowing asbestos are unclear and hence such exposures are generally considered to be of less concern than inhalation exposures.

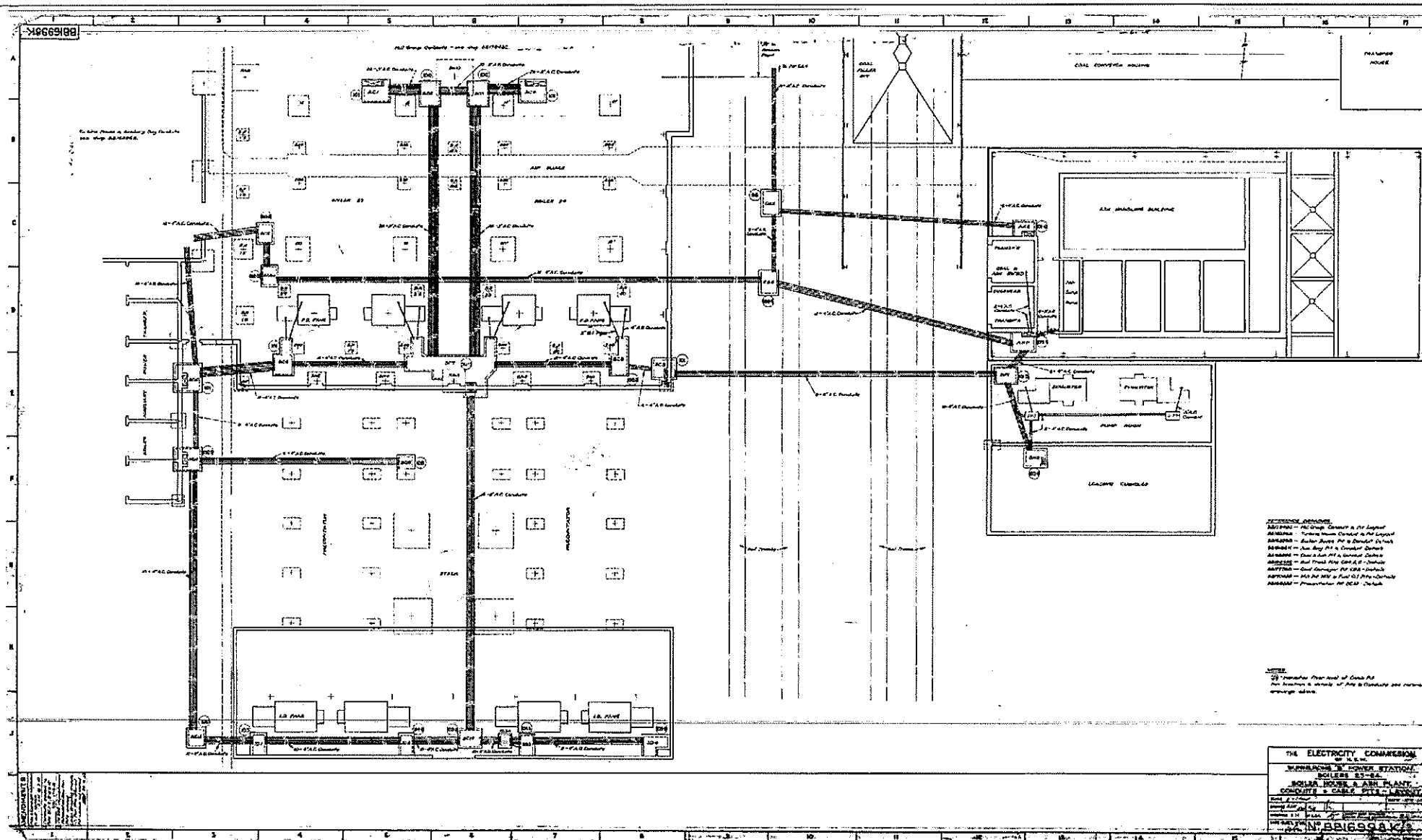
Appendix B

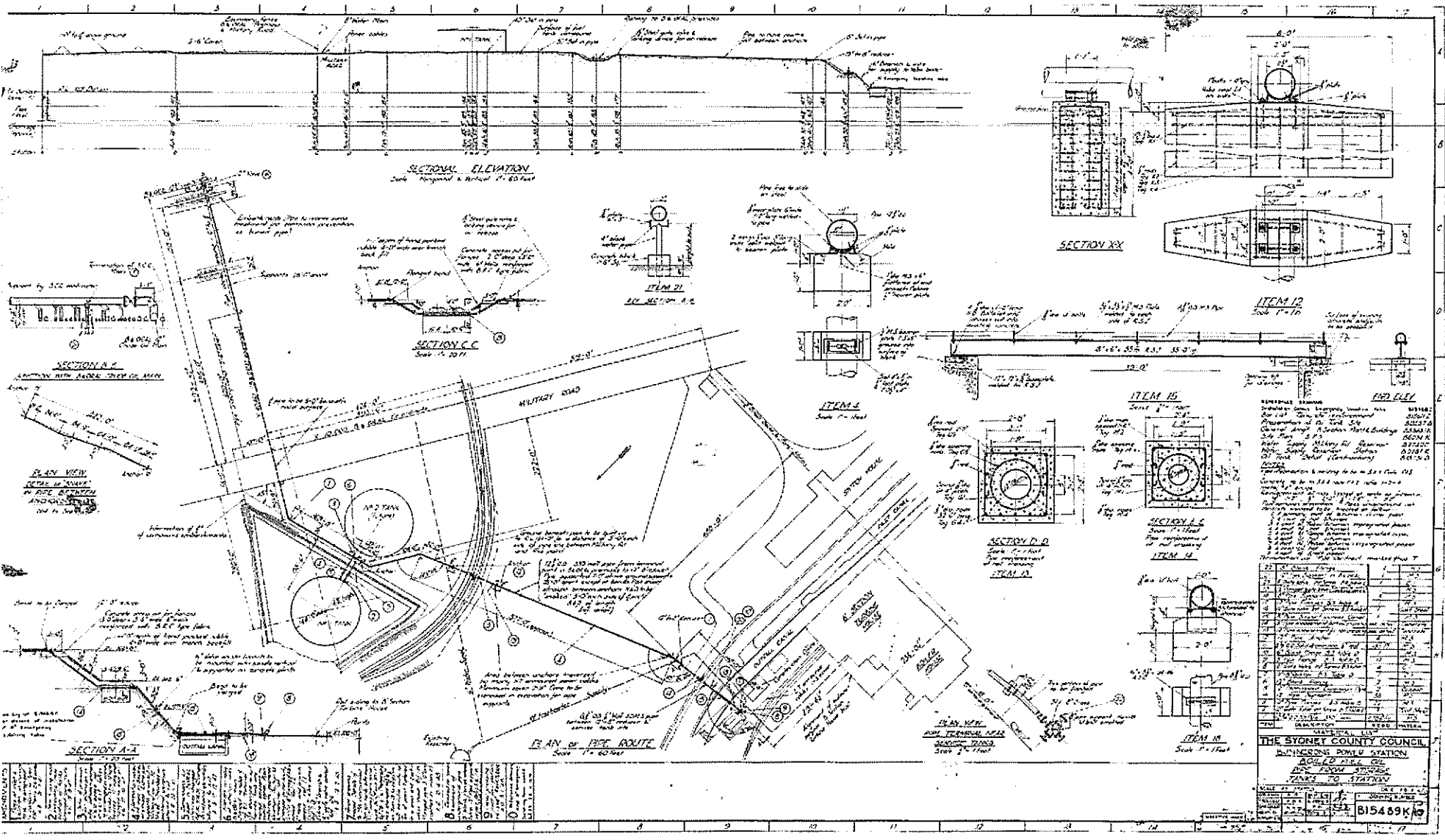
Historical Pipework

Layout Plan

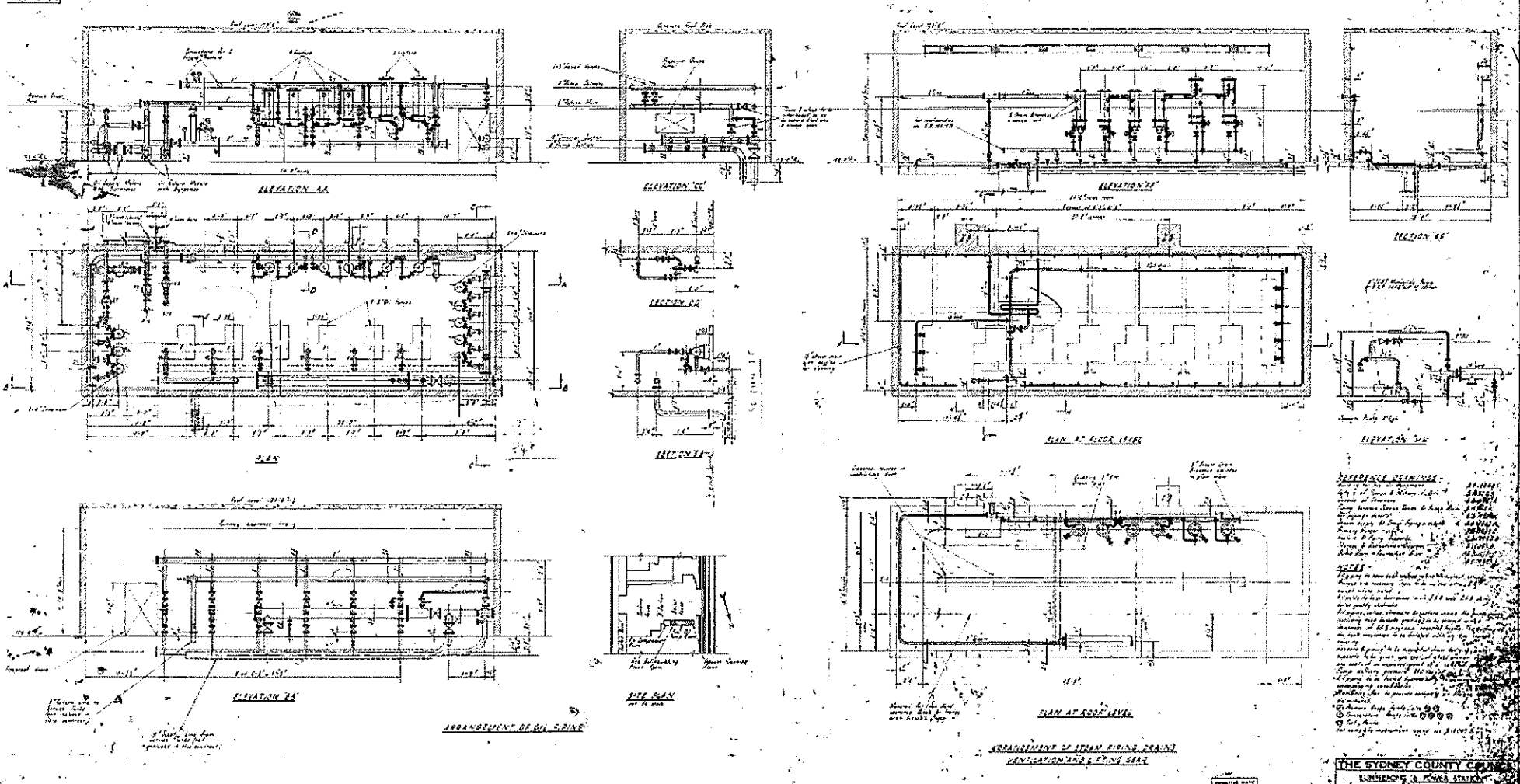


THE ELECTRICITY COMMISSION
THE SYDNEY COUNTY COUNCIL
BUNNIBONG, B. POWER STATION
EXTENSION FOR 10 FIVE BOLLERS AND ONE
SERVICES PLAN
SCALE 1/4\"/>





SYDNEY COUNTY COUNCIL	
BUSINESS BAZAAR STATION	
BUILT 1914	
BY THE SYDNEY COUNTY COUNCIL	
B15489K	

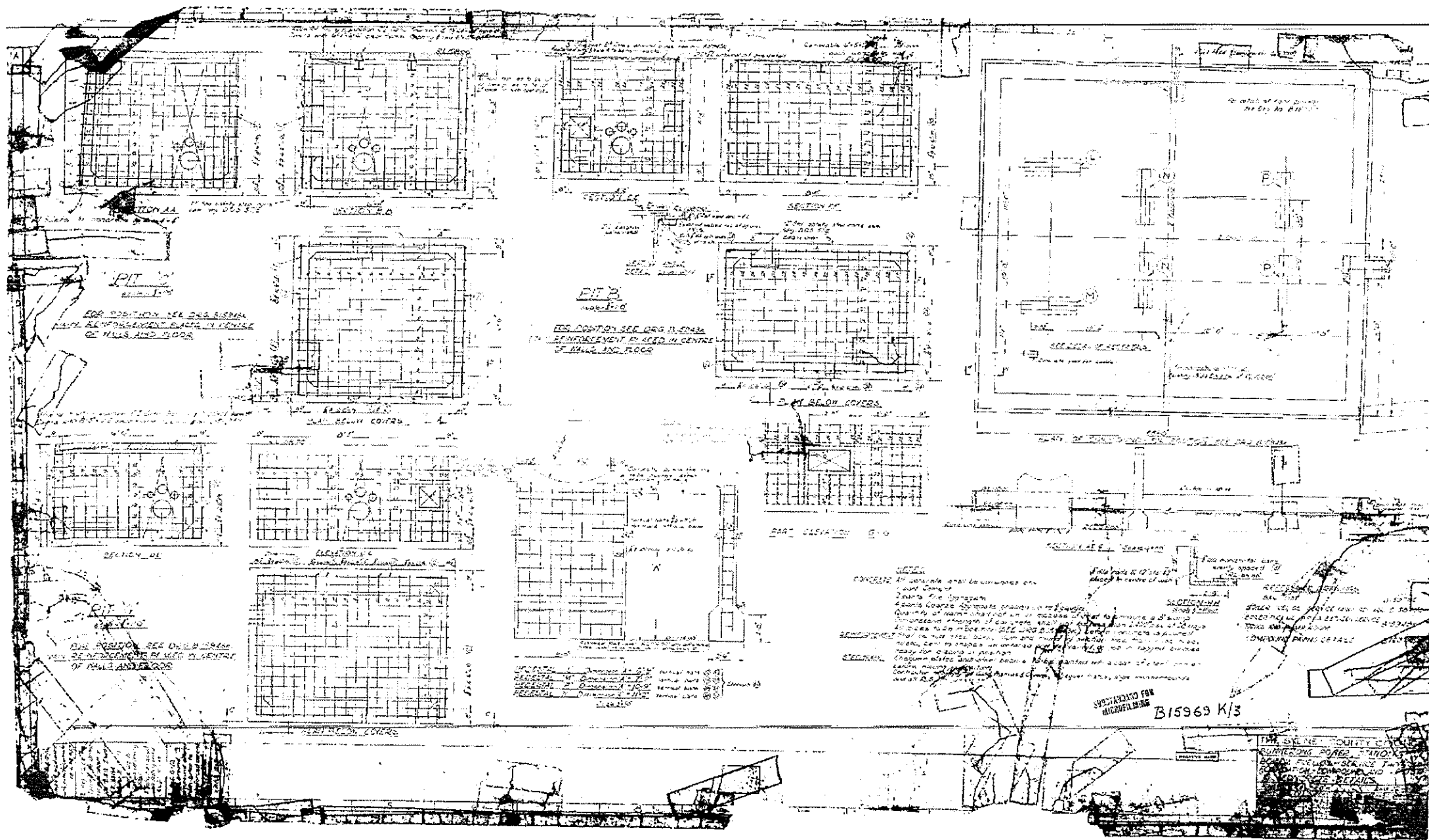


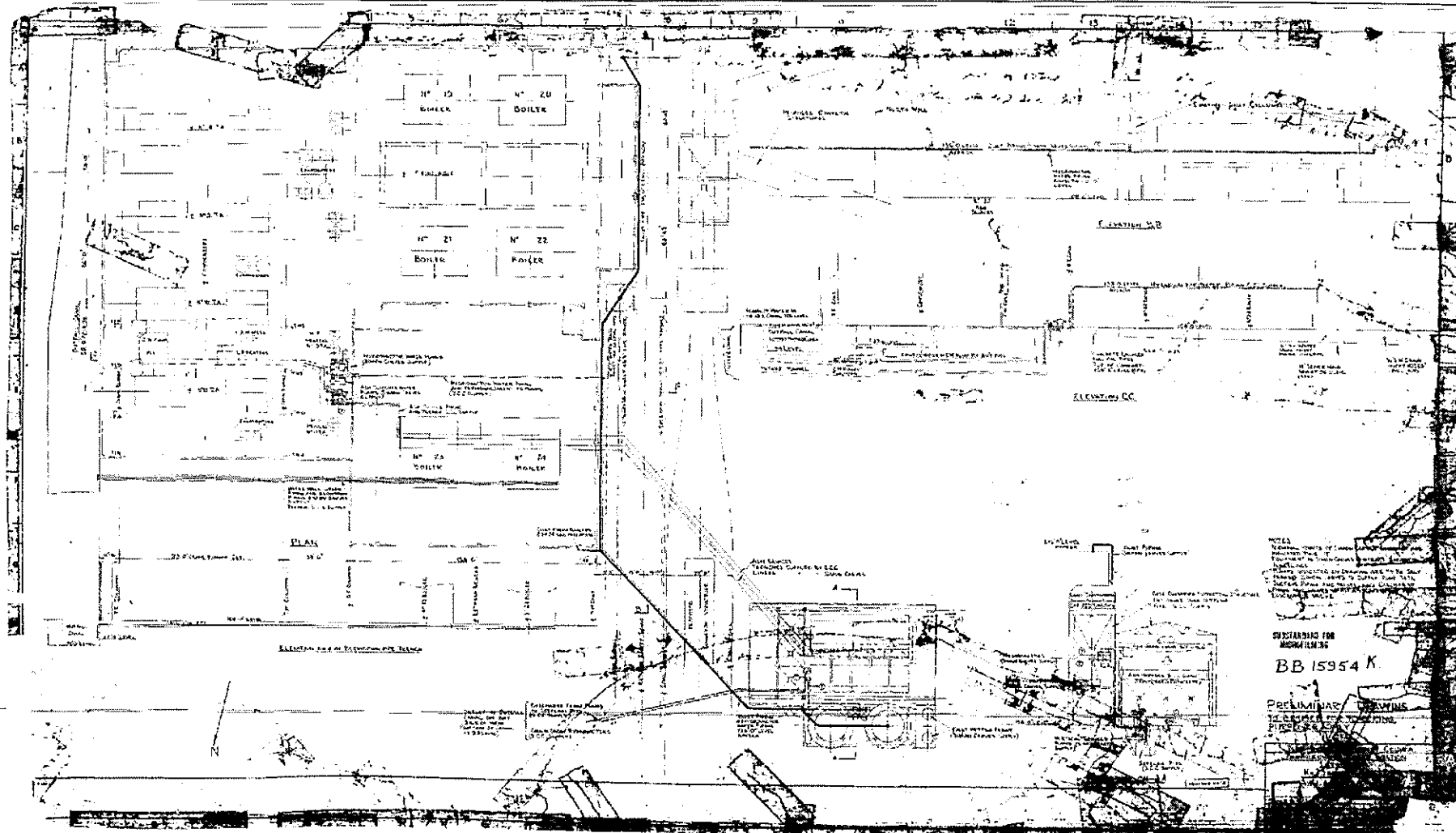
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THE SYDNEY COUNTY CROWN
SHERIFF'S & JAIL STATION
BRIAN WILLIAM
JAIL ROOM LAYOUT

SCOUTS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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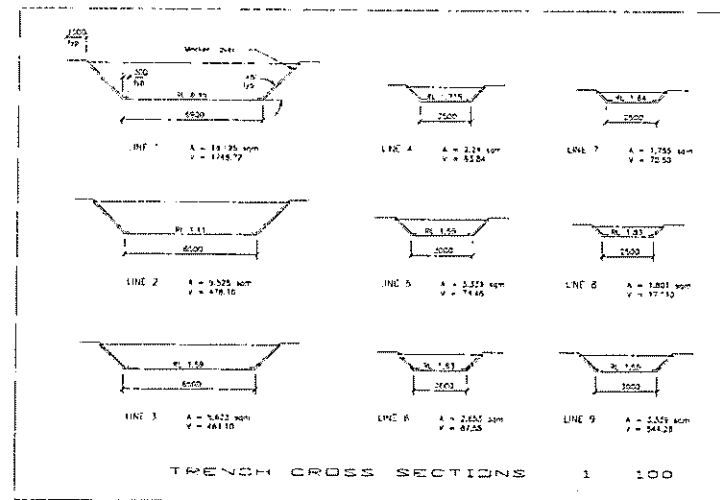
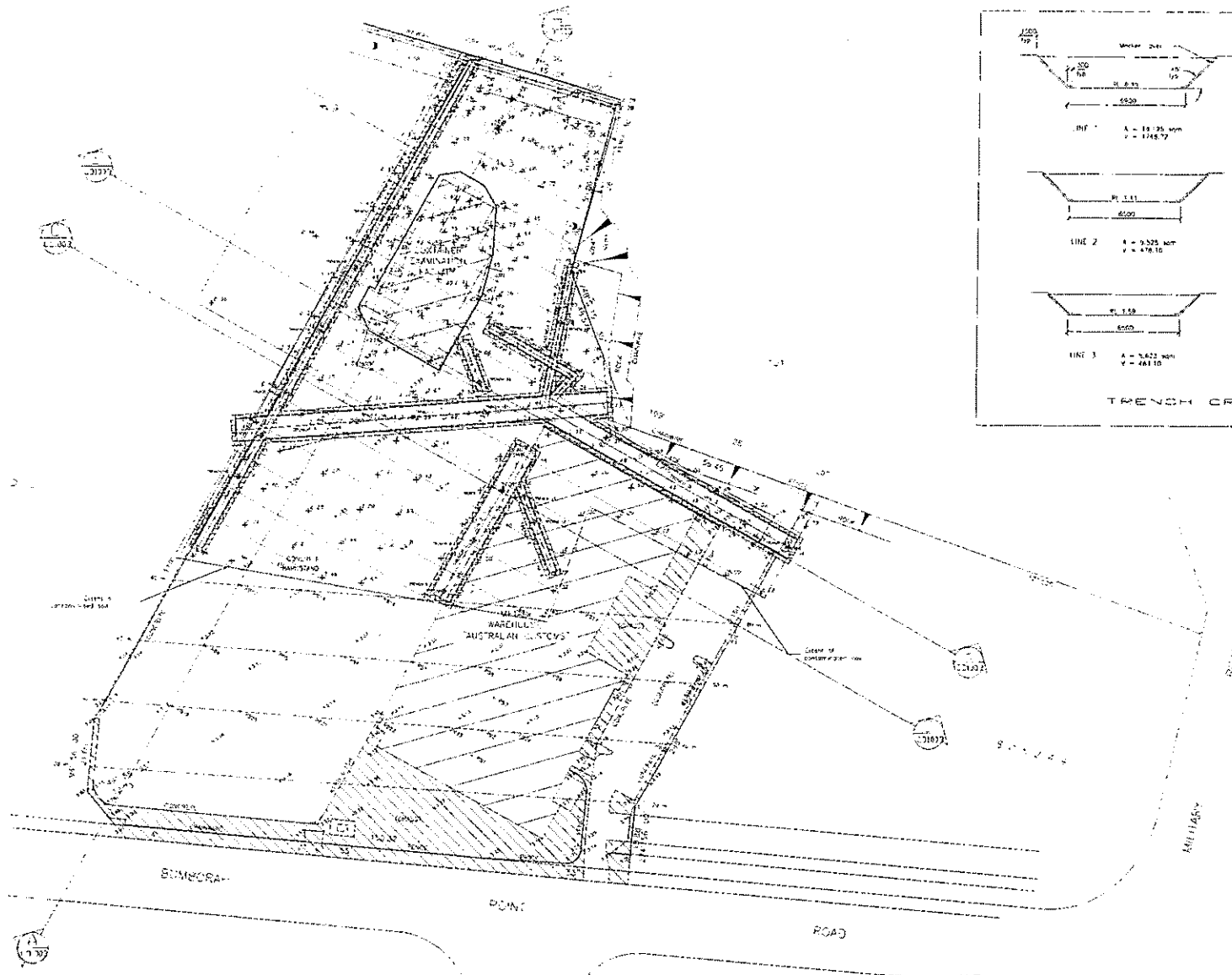
NOTES
 1. The building is to be constructed of concrete and steel.
 2. The building is to be constructed of concrete and steel.
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 10. The building is to be constructed of concrete and steel.

SUBSTANTIUM FOR
 MODIFICATION NO.
 BB 15954 K

PRELIMINARY DRAWINGS
 TO BE USED FOR CONSTRUCTION
 OF THE BUILDING

Appendix C

ACS Area Survey Drawings

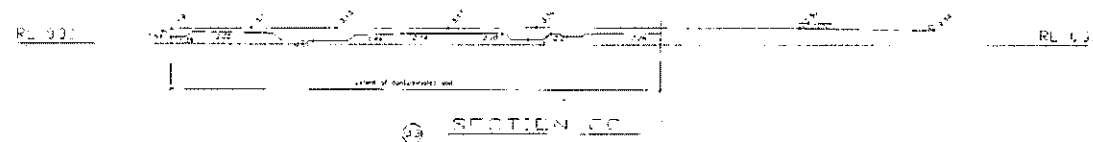


- LEGEND
- EXISTING & PROPOSED
 - ELEV. AT TOP OF 1:2 DUMP
 - ELEV. AT BASE OF 1:2 DUMP
 - ELEV. AT BASE OF 1:2 DUMP
 - ADDITIONAL 1:2 DUMP
 - EXISTING WATER
 - PROPOSED WATER
 - EXISTING ROAD
 - PROPOSED ROAD
 - EXISTING AREA

SOURCE: JACK TAYLOR ARCHITECTS DRG No. CD1002
DRAWING RECEIVED FROM SYDNEY PORTS CORPORATION 30 MAY 2003

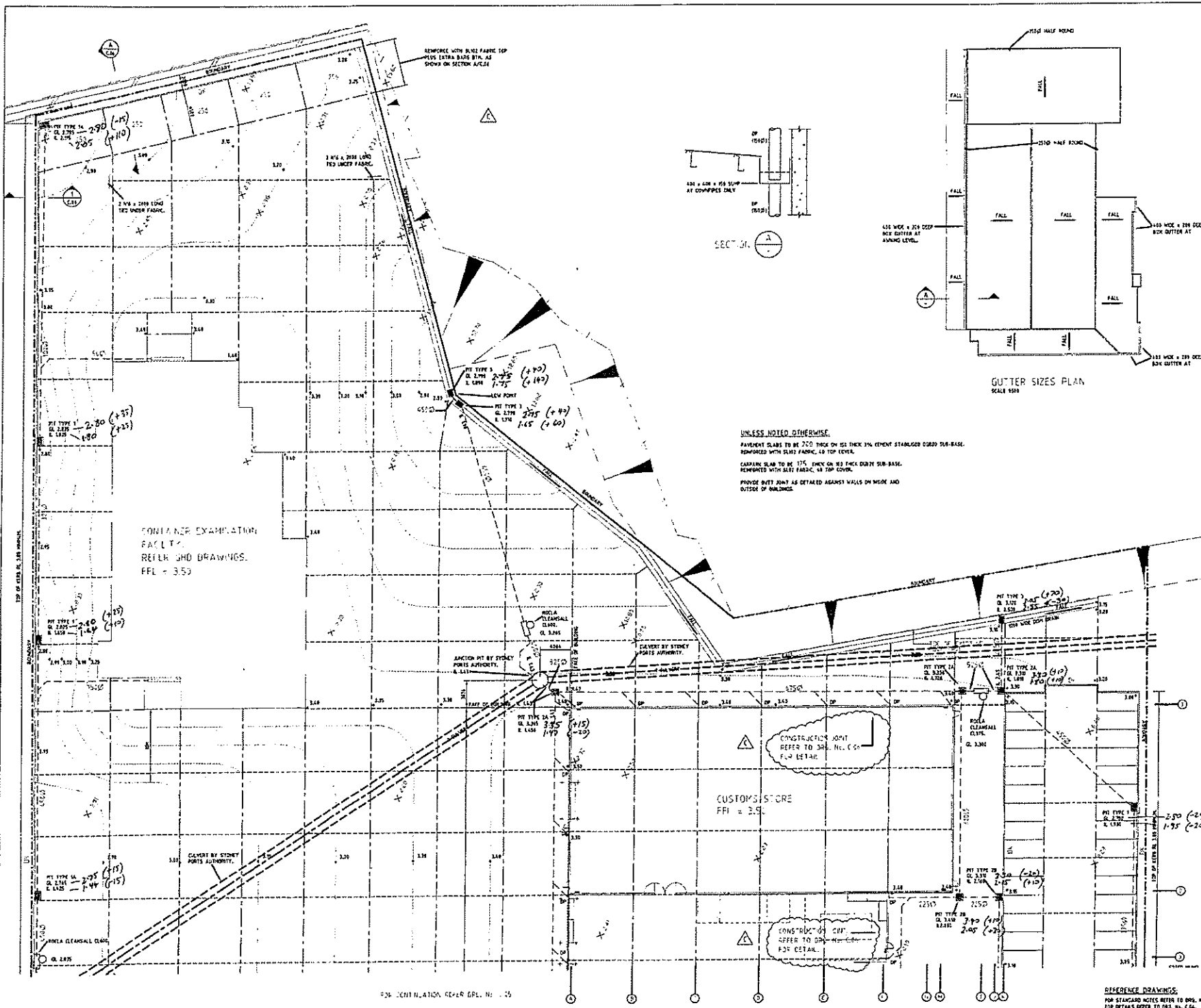
CLIENT SYDNEY PORTS CORPORATION				TITLE AS BUILT CONSTRUCTION PLAN OF LOT 11			
PROJECT BUNNORONG POWER STATION SITE - SITE MANAGEMENT PLAN APPENDIX D				A3			
NOT TO SCALE				PROJECT 43027-015	URS	FIGURE D1	
DESIGNED FM DRAWN RR DATE 13/08/03				APPROVED DATE STATUS DRAFT			
				PROJECT 43027-015	URS	FIGURE D1	
				CAD FILE 045.DWG			
				REVISION A			

This drawing is issued as a construction document and is not to be used for any other purpose.



SOURCE: JACK TAYLOR ARCHITECTS DRG No CD1003
DRAWING RECEIVED FROM SYDNEY PORTS CORPORATION 5th MAY 2003

CLIENT SYDNEY PORTS CORPORATION PROJECT BUNNERONG POWER STATION SITE - SITE MANAGEMENT PLAN APPENDIX D				TITLE AS BUILT CONSTRUCTION SECTION OF LOT 11		A3
NOT TO SCALE		DESIGNED: FM DRAWN: RR DATE: 13/08/03	APPROVED DATE S'ATLS DRAFT	PROJECT: 43027-015 CAD FILE: 046.DWG REVISION: A		FIGURE D2



ELEMENT	Strength Grade	Slump mm	Max. Agg. mm	Cement Type
PAVEMENT	40/50	80	40	CP
CARPARK	40/50	80	20	CP

- LEGEND**
- EXISTING GROUND LEVEL
 - PROPOSED GROUND LEVEL
 - PROPOSED STORM WATER PIT
 - STORMWATER DRAINAGE PIPE
 - KERBSIDE ROAD BOUNDARY
 - KERBSIDE BOUNDARY JOINT
 - KERBSIDE KEY JOINT
 - KERBSIDE CARPARK SLAB

JONES JONES

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email: jonesjones@jonesjones.com.au

191-01
WOOLACOTTS
CONSULTING ENGINEERS
19 DEC 2002
RECEIVED

Woolacotts Consulting Engineers

1931 CLEVED STREET, ARTAROUN.
PH: 02 9408 7200
FAX: 02 9408 7202
email: woolacotts@woolacotts.com.au

PROPOSED CONTAINER EXAMINATION FACILITY BUMBORAH POINT RD. BOTANY FOR AUSTRALIAN CUSTOMS SERVICE.

Architect: JACK TAYLOR ARCHITECTS Pty Ltd
1/281 PACIFIC HIGHWAY, NORTH SYDNEY

Working title: **EL-11 WORKS PLAN - PART 2**

AS BUILT DRAWING

Revised	By	Date	Reason
1	AS	JUNE 2002	1200

191-01

REFERENCE DRAWINGS:
FOR STANDARD NOTES REFER TO DWG. NO. 521
FOR DETAILS REFER TO DWG. NO. 521

FOR CONTINUATION REFER TO PL. 1/14.

CONCRETE QUALITY					
ELEMENT	SLAB THK	SLAB WID	SLAB HGT	SLAB AREA	CONCRETE TYPE
PAVEMENT	100	40	10	10	OP
CARPARK	100	40	20	20	OP

LEGEND

- EXISTING GROUND LEVEL
- PROPOSED GROUND LEVEL
- PROPOSED STORM WATER PIT
- STORMWATER DRAINAGE PIPE
- CONCRETE GABION DRAINAGE
- CONCRETE DRAINAGE JOINT
- CONCRETE KEY JOINT
- CONCRETE CARPARK SLAB

EXAMINATION WAREHOUSE
F.L. + 0.50

CONSTRUCTION JOINT
REFER TO DETAIL NO. (23)
FOR DETAIL

FOR STRUCTURAL DETAILS
REFER DRAWING NO. E.13

CONCRETE
100 HIGH RISE
REFER TO DETAIL NO. E.14

100 HIGH REINFORCED
BLOCK WALL WITH
REFER TO DETAIL NO. E.15

100 HIGH REINFORCED
BLOCK WALL WITH
REFER TO DETAIL NO. E.15

UNLESS NOTED OTHERWISE

PAYMENT SLABS TO BE 200 THICK ON 50 THICK 100 ELEMENT STABILISED GRADE SUB-BASE.
REINFORCED WITH 100mm DIA. 100mm DIA. TOP COVER.
EXISTING SLAB TO BE 100 THICK ON 50 THICK 100 SUB-BASE.
REINFORCED WITH 100mm DIA. 100mm DIA. TOP COVER.
PROVIDE 100mm DIA. 100mm DIA. TOP COVER.

Woolacotts
CONSULTING ENGINEERS
19 DEC 2002
RECEIVED

CONSTRUCTION BY
JONES JONES
19-21 GLEBE STREET, SYDNEY
PH: 02 9439 6002
FAX: 02 9439 6007
EMAIL: jonesjones@jonesjones.com.au

No.	Date	Description	Rev.	Appr.
1	19 DEC 2002	LEVELS AT ENTRANCE REVISED	CHW	SE18
2	19 DEC 2002	CONSTRUCTION JOINT ADDED	CHW	SE18
3	19 DEC 2002	STORMWATER PITS ADDED	CHW	SE18
4	19 DEC 2002	STORMWATER PITS ADDED	CHW	SE18
5	19 DEC 2002	LEVELS ADJUSTED, CARPARK UPDATED	CHW	SE18

Woolacotts
Consulting Engineers
19 DEC 2002
RECEIVED

PROPOSED CONTAINER EXAMINATION
FACILITY BUMBORAH POINT RD BOTANY
FOR AUSTRALIAN CUSTOMS SERVICE

Prepared by
JACK TAYLOR ARCHITECTS Pty Ltd
1/281 PACIFIC HIGHWAY,
NORTH SYDNEY

Civil Works Plan - Part B
AS BUILT DRAWING

Author	Checked	Approved	Date	Scale
S.E.T.A. 10/01/02	C.H.W. 10/01/02	A.S. 10/01/02	JUNE 2002	1:200
Job Number	Drawing Number	Revision		
191-01	C.05			

DIFFERENT DRAWINGS
FOR STANDARD WHEELS REFER TO DET. NO. E.14
FOR DETAILS REFER TO DET. NO. E.14

