CAPITAL PLANNERS ACT PTY LTD

PROPOSED COMMERCIAL DEVELOPMENT
BLOCK 13 SECTION 9 BARTON

PRELIMINARY GEOTECHNICAL ASSESSMENT

SEPTEMBER 2005

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PRELIMINARY GEOTECHNICAL ASSESSMENT

1 INTRODUCTION

At the request of Capital Planners ACT Pty Ltd, ACT Geotechnical Engineers Pty Ltd carried out a desk-top geotechnical assessment of Block 13, Section 9, Barton, ACT. The proposed commercial development is expected to comprise a four or five-storey building plus a one or two-storey basement for carparking. The information is required as part of a conceptual planning study for the development.

This report summarises expected site geotechnical/geological conditions based on research of available geological and topographical maps, aerial photographs, previous geotechnical investigations in the area, and a surface reconnaissance.

2 SITE DESCRIPTION

Block 13, Section 9, Barton is bounded by Macquarie Street to the west, Broughton Street to the north, Blackall Street to the east, and Blocks 8 and 11 to the south. Adjoining Block 12 on the SW corner of the Broughton/Blackall Streets intersection is occupied by a café. Blocks 8 and 11 at the southern boundary are occupied by the AMA Building and Tourism House office buildings. Figure 1 shows the location of the site.

The site is approximately 120m wide along the southern boundary, and ~160m north to south. The ground surface dips NW towards the Broughton/Macquarie Streets intersection, sloping at about 4° at the upslope SE corner, flattening to about 1° at the NW corner. The present surface appears to be close to natural levels.

The site is presently an on-grade open-air bitumen-sealed carpark. There are no structures on the site, but some trees and shrubs are present between car parking bays. Figure 3 is an aerial photo of the site, showing its present condition.

It is understood the site was previously occupied by army barracks or migrant hostel style accommodation consisting of single-storey timber structures supported above ground by brick pier footings. Those buildings have been demolished, and the present carpark was constructed about five years ago. A plan of the block layout from 1978 is shown in Figure 2 Site Plan.

3 SITE GEOLOGY & EXPECTED SUBSURFACE CONDITIONS

3.1 Site Geology

The 1:10,000 Central Canberra Geology Map (Reference 1) indicates the site to be covered by Tertiary age alluvial deposits, underlain by Silurian age Canberra Formation sedimentary bedrock that may include siltstone, sandstone, mudstone and shale. As parts of the bedrock formation were deposited in shallow marine environments, the rock can be calcareous in places, and include limestone. The alluvium is remnant fluvial deposits associated with ancestral courses of the Molonglo River, and can include quartz pebble gravels and is often cemented.

The geology map also documents a north-south aligned fault traversing the middle of Block 13. Such faults are typically associated with locally deeper weathering of the bedrock, and sometimes groundwater aquifers.

The above geologic features are shown in Figure 4 which is an extract of the 1:10,000 geology map referred to above.

3.2 Expected Subsurface Conditions

ACT Geotechnical Engineers had carried out a shallow test pit investigation for the construction of the present carpark in May 1999 (Reference 2), which found the following subsurface profile:

Depth Interval	Geological Profile
0m - 0.5m/1m	FILL
0.0m/1m - 0.5m/1.5m	ALLUVIAL Sandy Clay and Gravelly Sandy Clay
0.5m/1.5m - 1.5m/2m	RESIDUAL Clay and Silty Clay
below 1.5m/2m	EW/HW & HW SILTSTONE & SANDSTONE BEDROCK (very weak & weak)

Because of the geologic fault, it is expected that the depth to and weathering of the bedrock may vary.

Permanent groundwater is expected at about 7m/8m below existing surface levels. Temporary, perched seepages could be encountered at shallower depth, especially after rain. Fractured rock associated with the geological fault could also provide pathways for seasonal seepages.

4 PAST LANDUSE

Environment ACT was approached for any records of contamination on the block. Our request and their response, is included as Appendix A.

Environment ACT records indicate that underground fuel storage tank(s) for a boiler fuel system were present on the site at some stage. It is not known whether these tank(s) are still present. It is also indicated that a vehicle wash down or refueling facility may have existed.

Pre-development and present contour maps were examined for signs of ground disturbance or filled-in excavations etc. From this, it appears that the present surface levels are similar to natural levels. Some minor fill was found during the 1999 test pit investigation carried out by ACT Geotechnical Engineers Pty Ltd, but appears to be associated with the locations of old footings/underground services. There is no evidence of past presence of stockpiles, sheep pens/dips, etc, or any past industrial use.

It appears then, that the land has been used for residential and carparking purposes, and possibly for grazing early in the last century.

5 PRELIMINARY GEOTECHNICAL APPRAISAL

5.1 Expected Excavation Conditions

Excavations for a two-level basement could extend to about 6m/7m depth, and will be in minor fill and alluvial/residual soils and weathered sedimentary bedrock. The soils and upper expected EW/HW, HW and HW/MW bedrock should be readily diggable by backhoe or excavator. If MW and less weathered bedrock were encountered, this would require ripping and/or rock hammering. A large piering rig such as a "Soilmec" or similar can auger and socket pier holes into the MW or less weathered, strong bedrock.

The site soils are expected to mostly comprise low and medium plasticity sandy, silty or gravelly clays, which are generally suitable for use in controlled fill. The EW/HW and HW bedrock would break down during excavation and compaction to a clayey sandy gravel/clayey gravelly sand, which could also be used.

Preliminary design CBR values of 5% could be assumed for compacted site soils, and 8% for compacted EW/HW and HW bedrock materials.

5.2 Anticipated Building Footing Systems

Suitable footing systems for buildings would can include shallow pads and strips, founded in soil or weathered bedrock, and bored piers socketed into bedrock. A one or two-level basement will almost certainly reach the weathered bedrock. The following allowable end-bearing pressures could be used in preliminary design of footings:

Natural Soil & EW Bedrock	Strips - 100kPa	Pads - 150kPa	
HW Bedrock	Strips - 400kPa	Pads - 600kPa	Piers - 800kPa
MW Bedrock	Strips - 800kPa	Pads - 1200kPa	Piers - 1600kPa

The natural subsurface profile of Block 13, Section 9 is expected to be a "M" Class (moderately reactive) site in accordance with AS2870 "Residential Slabs & Footings" (Reference 3), although if greater than 0.45m depth of existing fill is present, the block would be a Class "P" (problem) site.

5.3 Expected Excavation Stability

The basement excavation could be temporarily battered back to a slope not steeper than 1(H):1(V) in soil and EW/HW and HW bedrock, and no steeper than 0.5(H):1(V) in HW/MW and less weathered bedrock. Temporary batters would need to be protected against erosion and fretting.

Any permanent unsupported cuts should be formed at no steeper than 2(H):1(V) in soil and EW/HW and HW bedrock, and 1(H):1(V) in HW/MW and less weathered bedrock. Steeper excavations would need to be supported by structural retaining walls.

Methods of excavation support used successfully in similar strata in Canberra have included cantilevered and tied-back soldier pier walls. The soldier piers can be spaced apart with horizontal lagging applied to the exposed excavation face between the piers, or can be made semi-contiguous without lagging.

5.4 Site Drainage

As the permanent water table is expected to be at about 7m/8m depth, excavations for a one or two-level basement should remain above permanent groundwater. Temporary seepages could be encountered at shallower depth following rain, particularly in fractured bedrock. Groundwater levels would need to be established during a geotechnical investigation of the site.

6 FURTHER INVESTIGATION

The information in this report is of a preliminary nature, based on limited available site information, on our knowledge of the various geological formations, and our brief site inspection.

To properly assess the site conditions, including the weathered profile of the bedrock (particularly at fault locations), and the groundwater conditions, a comprehensive, detailed geotechnical investigation by cored boreholes and possibly test pits will be required.

In addition to a geotechnical investigation, a further investigation may be required to establish the locations of any existing former underground fuel storage tanks, and to test such areas for contamination.

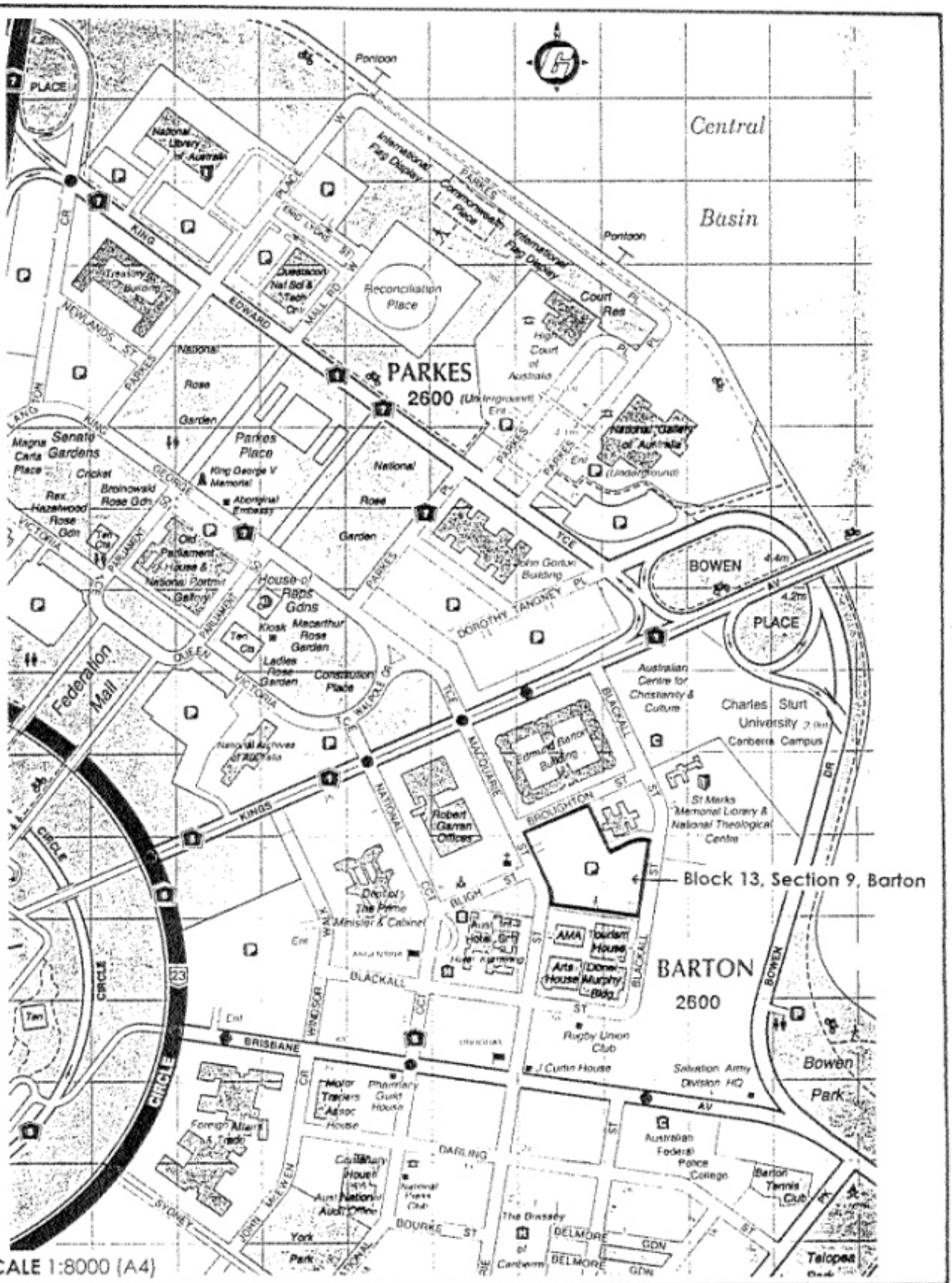
ACT Geotechnical Engineers Pty Ltd

REFERENCES

1 Bureau of Mineral Resources, Commonwealth of Australia, "Central Canberra 1:10,000 Engineering Geology Series", 1985.

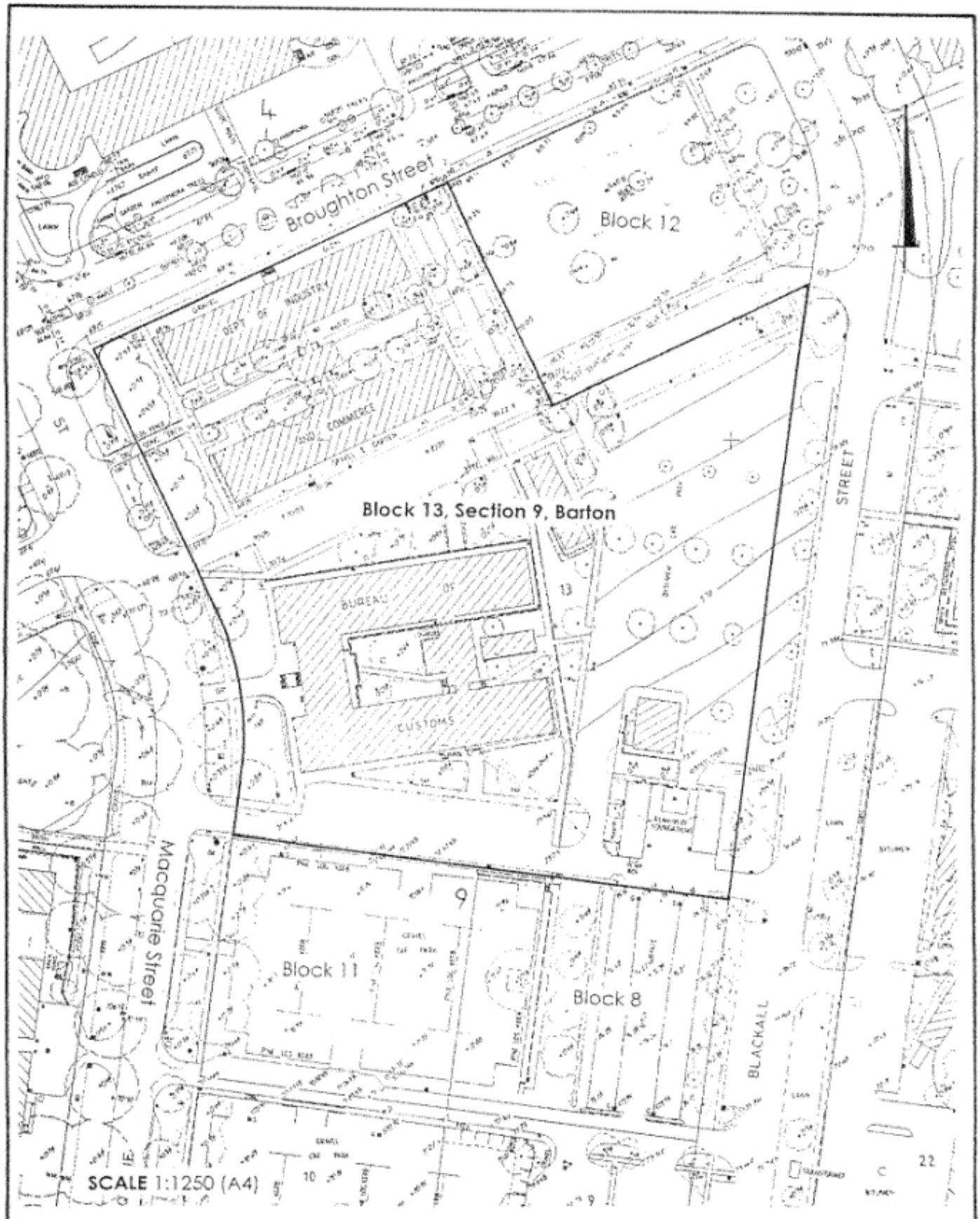
2 ACT Geotechnical Engineers Pty Ltd, "Proposed Carpark - Block 13, Section 9, Barton, ACT - Geotechnical Investigation Report", Report Number C4105 for George Moss Consulting Engineer, May 1999.

3 Standards Australia, "AS2870 - 1996 - Residential Slabs & Footings - Construction".



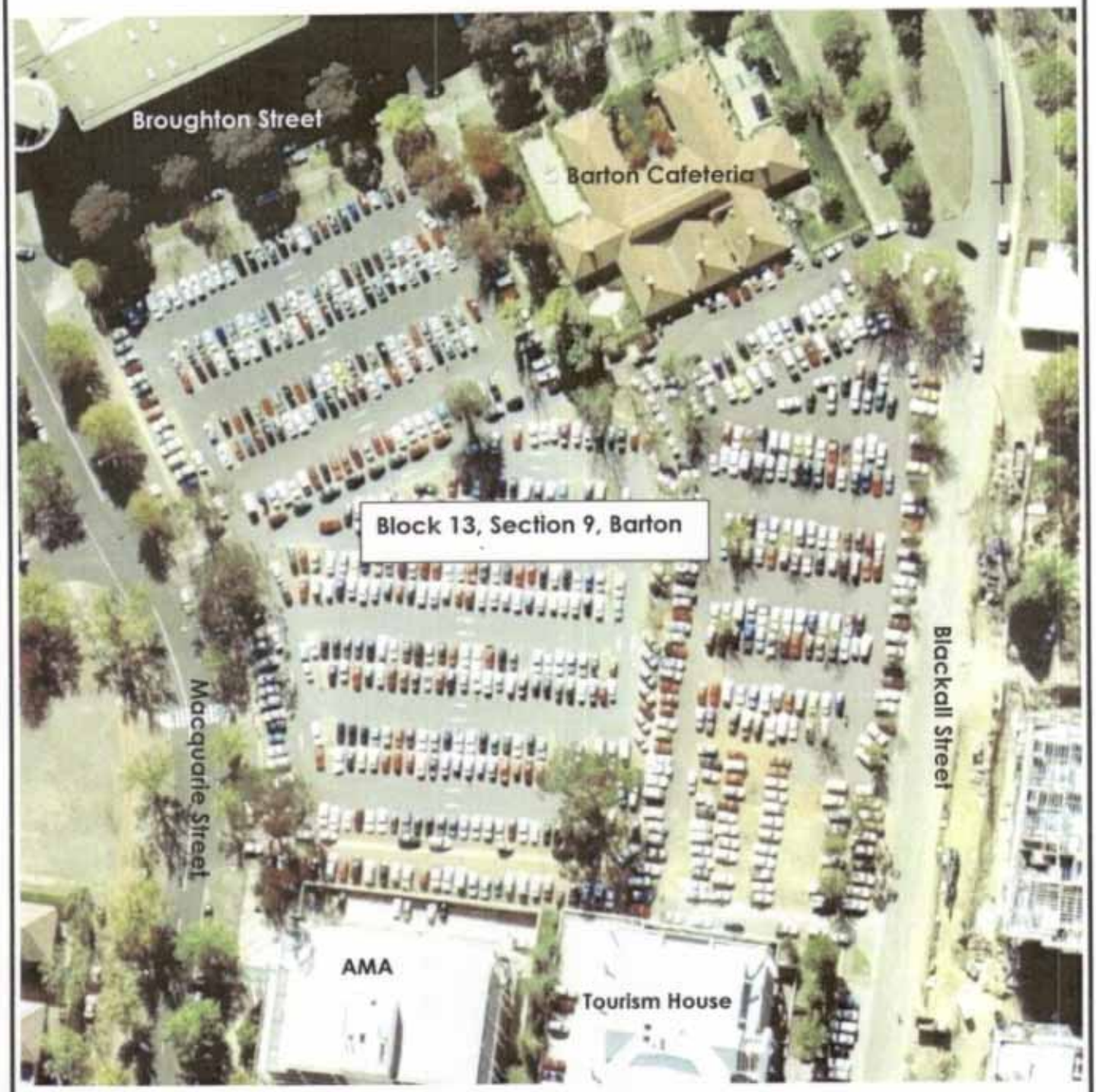
CAPITAL PLANNERS PTY LTD
BLOCK 13, SECTION 9, BARTON
LOCALITY PLAN

ACT Geotechnical Engineers Pty Ltd	C4931	FIGURE 1



CAPITAL PLANNERS PTY LTD
BLOCK 13, SECTION 9, BARTON
1978 SITE PLAN

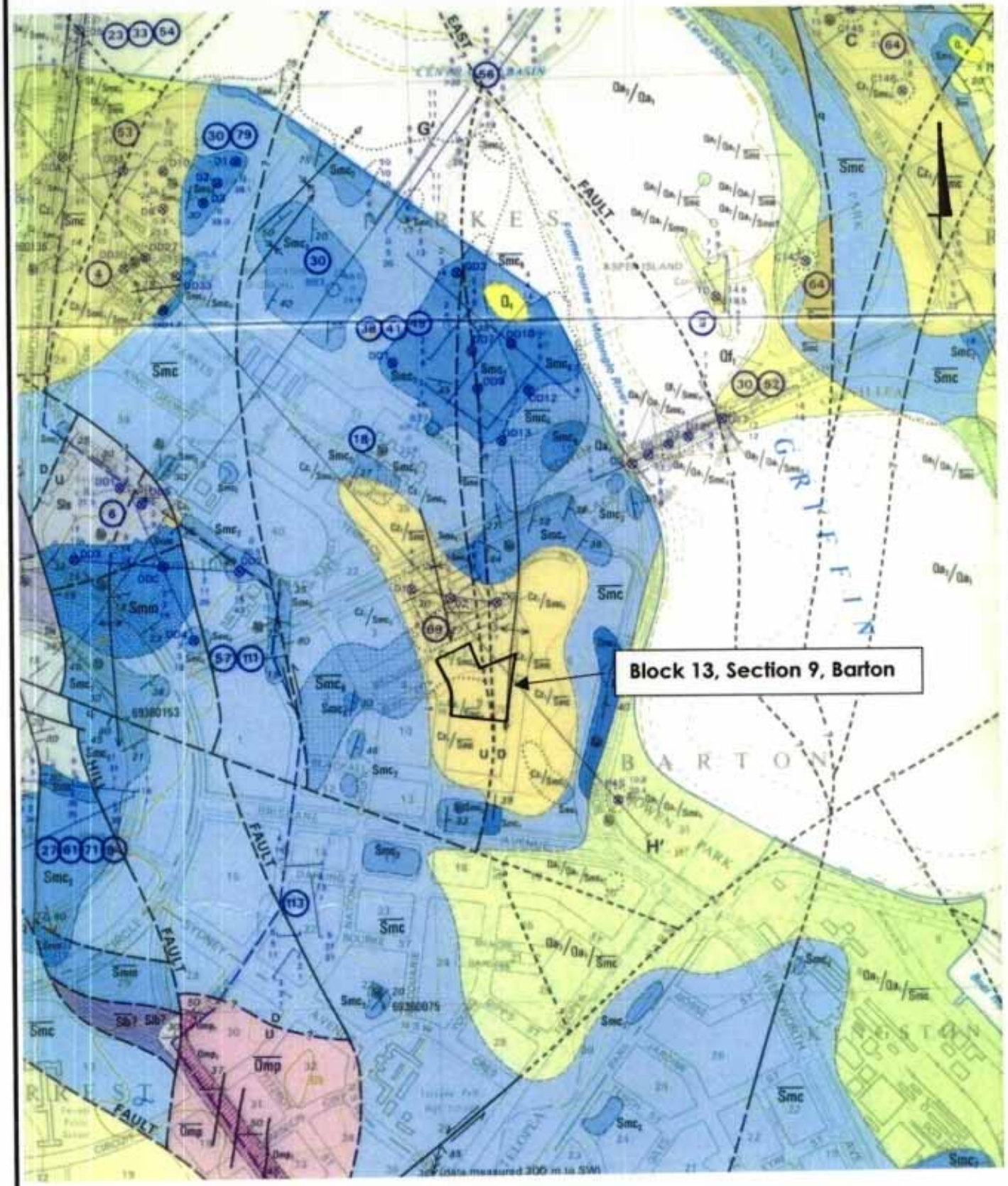
ACT Geotechnical Engineers Pty Ltd	C4931	FIGURE 2



NTS

CAPITAL PLANNERS PTY LTD
BLOCK 13, SECTION 9, BARTON
AERIAL PHOTOGRAPH

ACT Geotechnical Engineers Pty Ltd	C4931	FIGURE 3



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CAPITAL PLANNERS PTY LTD
BLOCK 13, SECTION 9, BARTON
GEOLOGY MAP

ACT Geotechnical Engineers Pty Ltd	C4931	FIGURE 4

APPENDIX A

Information Request & Environment ACT Response

ACT Government

building our city
building our community

environment ACT

File Ref: 02/11809

Mr Jeremy Murray
ACT Geotechnical Engineers Pty Ltd
31-37 Townshend Street, Suite 3
Phillip ACT 2606

RE: CONTAMINATED LAND SEARCH

Dear Mr Murray

Thank you for your search form request of 15/09/2005 enquiring about:

Block 13 Section 9 Barton Canberra Central

Records held by the Environment Protection Unit (EPU) for the above block(s) indicate the following:

The EPU is aware that hazardous materials are located, or were located, on the property (i.e. underground fuel storage tanks). The tanks are likely to have been associated with the operation, or former operation, of a boiler fuel system. These systems were generally fueled by diesel or heating oil which was mainly stored in underground fuel storage tanks. Underground fuel storage tanks have been identified on site in an area currently used as a carpark. There is also evidence of an abandoned triple interceptor and possibly other fuel fill/dip points which could indicate vehicle wash down or refueling facilities may have existed at the site.

The ANZECC 1992, Guidelines for the Assessment and Management of Contaminated Sites and the Contaminated Sites Environment Protection Policy 2000 list fuel storage as past activities associated with land contamination which may pose a risk to human health and the environment. The EPU does not have any records that indicate the status of these facilities or any incidents associated with them.

There are specific requirements in the ACT for the abandonment and assessment of sites containing fuel storage tanks where the facilities are no longer in use or impacts on human health or the environment are identified. For further information on these requirements please contact the ACT Dangerous Goods Unit on (02) 6207 6355 for the abandonment of fuel storage facilities and this office on (02) 6207 2151 for the requirements for assessment of sites containing fuel storage facilities.

Block 9 Section 13 Barton is in a Designated land use area with land planning administered by the National Capital Authority (NCA) a Commonwealth Government

ENVIRONMENT ACT • ENVIRONMENT PROTECTION

Level 2 Annexe, Macarthur House 12 Wattle Street, Lyneham ACT PO Box 144, Lyneham ACT 2602
Telephone 132281 **Fax** 02 6207 6084 **email** environmentACT@act.gov.au **website** www.environment.act.gov.au

agency, you or your client should contact the NCA to determine whether there are any records of contamination of this block.

The block is not recorded on the Register of contaminated sites under section 21(A) of the Environment Protection Act 1997.

At present the EPU has no information on contamination of the above block(s) other than as detailed above. However, this does not absolutely rule out the possibility of contamination and should not be interpreted as a warranty that there is no contamination.

I appreciate that this does not absolutely rule out the existence of contamination of the soils. If you or your clients wish to be completely sure you, or they, should arrange to conduct independent tests.

Yours sincerely

Mark Heckenberg

Mark Heckenberg
Project Officer,
Environment Protection Unit

22/09/2005

environment ACT
ACT URBAN SERVICES

ABN 37 307 569 373

Search Form – CONTAMINATED LAND SEARCH

Location – Environment ACT Information Centre, Macarthur House, 12 Wattle St, Lyneham ACT 2602
Postal Address – Environment Protection Unit, Environment ACT, PO Box 144 Lyneham ACT 2602
Email - environmentACT@act.gov.au **Facsimile** - (02) 6207 6084
Enquiries – (02) 6207 9777 **Collection** - (02) 6207 6770

IMPORTANT: Please supply all information requested below to ensure your search is completed without undue delay. Search forms sent without the correct payment will be returned unprocessed unless prior arrangements have been made.

Contaminated Land Search Fee $29.40 per block (Fee effective from 1 July 2004. For searches submitted prior to 1 July 2004 the fee is $28.85. Payment and collection options overleaf)

The Contaminated Land Search has also been incorporated into the Lease Conveyancing Enquiry through ACT Planning and Land Authority (ACTPLA).

For those customers undertaking a Lease Conveyancing Enquiry for conveyancing purposes through ACTPLA there will be no need to separately undertake a Contaminated Land Search through Environment ACT unless the Lease Conveyancing Enquiry indicates further information is available from Environment ACT in relation to the land.

If you require further information on the Lease Conveyancing Enquiry, provided by ACTPLA, please contact their Customer Service Centre on (02) 6207 1923 or (02) 6207 1926 or visit the ACTLA home page at **www.actpla.act.gov.au** where you will find a full listing of fees and charges.

Details of Company/Individual

Name: ACT Geotechnical Engineers Telephone: 6285 1547 Fax: 6285 1861

Postal Address: 31-37 Townshend Street, Phillip, ACT

Posteode: 2606

Email:

Contact Name: Jeremy Murray Telephone 62851547

Details of Search Request

Block: 13 Section: 9 Division (Suburb): Barton District:

Site Address: Site bounded by Macquarie St, Broughton St & Blackall St in Barton

Posteode: 2600

ACT Government

Building our city for the future, our community