Lucas Consulting Engineers
Pty Limited

PROPOSED RESIDENTIAL DEVELOPMENT
STAGES 2 & 3
SITE 3 AUSTRALIA AVENUE
SYDNEY OLYMPIC PARK

SERVICES and FLOODING REPORT

Prepared for **Site 3 Development Company Pty Ltd**

Prepared by

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Review and Approval Record

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1 INTRODUCTION

Lucas Consulting Engineers Pty Limited has been engaged by Site 3 Development Company Pty Limited to investigate the requirement for civil works associated with the proposed residential development at No 1-11 Australia Avenue, (Site 3) Sydney Olympic Park. The civil works comprise the provision of utility services to the site, stormwater issues, access roads for future residents and environmental safeguards during the construction phase. Lucas Consulting Engineers was also requested to review the overland flow and flooding situation on the property.

Stages 2 and 3 are the final stages of the implementation of a Masterplan for the development of Site 3 in Australia Avenue at Sydney Olympic Park. The last of 4 high rise towers to be constructed, Stages 2 and 3 incorporates 588 one, two and three bedroom units accommodated in two high rise towers, T1 and T2, ranging in height from 25 to 30 storeys. Parking is to be provided in four basement levels under the building.

The site is currently vacant but has a large fig tree which is to be relocated to the southern end of the site and contains a storm water quality improvement device (GPT) and associated drainage infrastructure, together with access roads and temporary offices currently being used for the construction of Stage 1. These will be retained but slightly modified to allow the construction of the new development. Permanent access to the site will be from Australia Avenue.

Issues relating to internal access, public utility services, stormwater and overland flow are the subject of this investigation. It should be noted that the following information is based on verbal discussions with relevant authorities and will be confirmed at the post DA stage when applications for servicing can be made to the authorities.

2 ACCESS DRIVEWAYS

Permanent access to the site is from Australia Avenue via a driveway at the northern end of the site into the Stage 1 development and from a new access road opposite the intersection with Figtree Drive.

The northern driveway will provide access to the upper parking level and loading dock areas and will be via a right of carriageway over the Stage 1 property.

The driveway opposite Figtree Drive will provide access to the basement car park levels and the existing Gross Pollutant Trap. The GPT is to remain in its current location and is currently cleaned out on a 3 monthly cycle by Veolia Environmental Services on behalf of the Sydney Olympic Park Authority. Access for a large twin steer (8m) truck is to be provided to the main GPT with a height clearance of 4m. Access is to be provided along the railway corridor to the other storm water pits and the Sydney Water sewer manhole.

The access roads should provide an all weather surface suitable for the intended service vehicles.

3 SERVICES

Utility services are generally available to the site from Australia Avenue.

3.1 Water

There is an existing 250mm and 150mm main in Australia Avenue. Sydney Water has issued a Notice of Requirements for Stage 1 wherein it advised that the connection point for water will be off the 250mm main in Australia Ave. It is expected that this will be the same for Stages 2 and 3 given that the site was originally planned for a high density residential complex.

The 250mm main is located towards the northern end of the site and then reduces down to the 150mm main for most of the site frontage. Future water services will have to enter the new building adjacent to the Stage 1 building where direct access to the 250mm main can be obtained.

3.2 Recycled Water

A WRAMS system has been established in the Sydney Olympic Park area that collects waste water from the area for reuse as recycled water. SOPA has advised that all new developments will require recycled water to be used in the building.

As for Stage 1, Sydney Water and SOPA will require connection to the recycled water main in Australia Avenue. The main in Australia Avenue is a 375mm ductile iron main.

3.3 Sewer

A 375mm diameter sewer main exists in the north eastern corner of the property. The main has been recently relocated and concrete encased as part of the Stage 1 works to allow construction of the building. The existing manhole at this location has a 225mm inlet point suitable for connection of the sewer from the Stage 2 and 3 buildings.

The invert of the sewer is at RL 6.10.

3.4 Gas

There is a 75mm high pressure gas main in Australia Avenue which is expected to be available for connection.

3.5 Electricity

Electricity is available in the area and will be extended to the site. Details of the proposed electrical services and sub-station requirements have been addressed by Haron Robson.

3.6 Telecommunications

Telecommunication services are available to the site in Australia Avenue. Details of the proposed services have been addressed by Haron Robson.

3.7 Stormwater

Stormwater infrastructure associated with the buildings and internal open space areas will be collected by a piped system and connected through to the nearest available pit in Australia Avenue. SOPA has advised that on-site detention will not be required for the site.

The existing storm water line traversing the south eastern corner of the site will possibly require diversion around the building if the footings conflict with the line. This detail will have to be determined during the design development for CC issue.

4 SOIL AND WATER MANAGEMENT

Soil and Water management practices will be undertaken in accordance with the NSW Department of Housing publication "Managing Urban Stormwater – Soils and Construction" 1998, which is the industry standard. The basic principles to be adopted are to divert clean water from undisturbed area around the construction works, minimise the extent of disturbed areas to areas affected by the construction works, direct all runoff from disturbed areas to storage basins for treatment prior to discharge and staging of the project to limit the extent of disturbed areas exposed at any given time. A regular inspection, maintenance and testing program will also be implemented.

Given the nature of the construction, it is expected that runoff from disturbed areas will generally be captured on the downhill slope from the fill areas by sediment barriers. Most of the work area will be within the main building excavation which is approximately 8 to 10m below existing ground levels. A detailed SWMP has been prepared by Lucas Consulting Engineers Pty Ltd.

4.1 Site Environmental Management Plan

An EMP is a document developed to help ensure that commitments made in the Environmental Assessment (SEE) are implemented, reported on and validated, and that the environmental impacts of the project are managed. EMPs are dynamic documents, which are prepared before or during the detailed design phase and updated over the life of the project.

The EMP for this proposal will include the following main documents:

- **Waste/Sediment disposal Management plan**
- **Soil and Water Management Plan during the construction phase**

The Council (or SOPA), prior to construction, will approve these documents. Additionally, the EMP will include, but not be limited to:

- statutory requirements relevant to each impact,
- proposed actions to manage those impacts,
- allocation of responsibility for those actions, and
- a method of reporting actions.

4.2 Implementation of Environmental Safeguards

The EMP will be a key mechanism in the implementation of safeguards. Written into the special conditions of contract there will be a requirement for the successful contractor to submit a detailed EMP as outlined above. The EMP will cover the construction phases and will be vetted by the project manager.

5 OVERLAND FLOWS AND FLOODING

The upstream catchment is predominantly confined to the surface runoff from Australia Avenue which has an area of approximately 0.38 Ha and extends upstream to the intersection with Parkview Drive.

The catchment is serviced by an underground stormwater pipe system that starts at the corner of Australia Avenue and Parkview Drive adjacent to the site. The catchment is fully paved and extends from property boundary to property boundary on either side of Australia Avenue. The only exception is the central median strip along Australia Avenue and the grass verges in the footpath that are landscaped. The properties on either side of Australia Avenue fall away from the road therefore any stormwater falling within private the properties is generally diverted away from the street catchment.

Generally the overland flow affecting the site is generated from rainfall falling on the road and footpath surfaces within Australia Avenue and travelling along the kerb and gutter into the street gully pits. Any excess flow will travel along the kerb and gutter past the site. The central median is 200mm high and unless the overland flow is large enough the catchment draining past the site is limited to the eastern side of Australia Avenue only.

Any excess overland flow that is not captured by the street stormwater pits will travel along the kerb and gutter in Australia Avenue until it reaches the intersection with Bennelong Parkway.

We confirm that the design overland flow generated along Australia Avenue for the **100 year ARI** storm is in the order of **0.25 cumecs** for existing site conditions and the design flow for the **20 year ARI** storm is in the order of **0.2 cumecs**. There are 7 street gully pits along this section of Australia Avenue that collect the surface runoff each having an inlet capacity of 70 L/s (0.07 cumecs) giving a total capacity of 0.49cumecs which exceeds the design flows. The design overland flow along Australia Avenue is therefore contained within the street kerb and gutter system.

Based on these flows we confirm that the proposed development area is not subject to flooding in the 100 year ARI storm event.

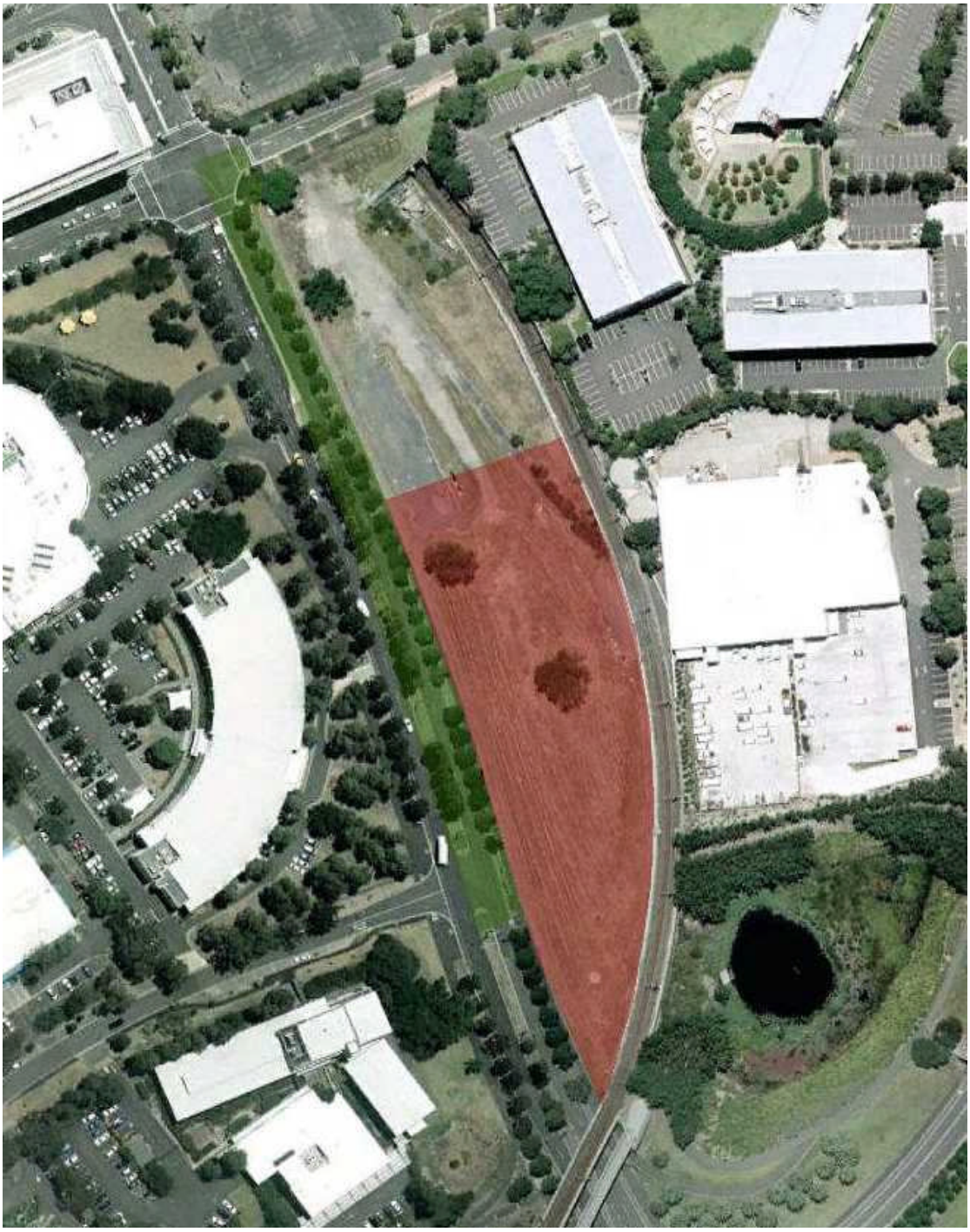

Plate 1 – Aerial Photo showing extent of catchment draining from Australia Avenue in green with the site in red