

Our ref NA80813231L007
Contact: Peter Waugh

RPA MULTISTOREY STAFF CARPARK Civil & Structural Design Report

01/06/16
V3

1 STORMWATER

1.1 Flooding

The site is located in the Johnstons Creek catchment. A flood study for this catchment was prepared by WMAWater in August 2014. Inspection of this report shows that the site is clear of both the 1% AEP and PMP storm events. A copy of the relevant flood maps from the WMAWater study are attached for reference.

1.2 On Site Detention

To meet the requirements of Council's DCP2012, on-site detention (OSD) is required to control stormwater discharge from the site.

Requirements for the design of the on-site detention system are detailed in Council's '*Stormwater Drainage Connection Information*', Rev 02, July 2006. This requires the 1% AEP peak storm event from the developed site be restricted to no greater than the peak flow from the 20% AEP storm event from the existing site.

A preliminary DRAINS computer model has been prepared. Results show that approximately 80m³ of OSD storage is required to meet Council's OSD requirements.

An OSD tank is proposed to be constructed under car park Level 0b. Discharge from the OSD tank will be routed through the proposed water quality treatment devices (see Section 1.3) before discharging into the existing Council stormwater pit at the intersection of Church Street and Lucas Street.

A sediment sump pit, with 300mm deep sump, will be constructed within the site boundary immediately prior to the discharge of site stormwater to the existing Council pit.

1.3 Water Quality Treatment

Stormwater water quality treatment targets are specified in Council's DCP2012, Section 3.7.3. In accordance with the DCP, the following water quality targets are applicable for the site:

- 90% reduction in gross pollutants >5mm
- 85% reduction in total suspended solids (TSS)
- 65% reduction in total phosphorus (TP)
- 45% reduction in total nitrogen (TN)

Pit insert baskets along the Brodie Street extension (refer Section 1.4) will collect gross pollutants prior to discharge to the on-site detention tank. Runoff off the multi-storey car park will be collected in grated inlets that limit the ingress of any large pollutants. A sediment sump is proposed in the OSD tank to collect any transported sediments.

A proprietary water quality treatment devices will be installed on car park Level 0a. The water quality treatment devices are likely to consist of a secondary treatment device, such as a Humes Jellyfish, or similar. Final details will be prepared as part of the detailed design.

1.4 Brodie Street Stormwater

It is proposed to partially reconstruct and extend Brodie Street from New East Hospital Road to Church Street. The existing kerb adjacent to the Queen Mary Building will be retained with one-way crossfall proposed to a new kerb and gutter parallel to the proposed multi-storey car park.

Two extended kerb inlet (EKI) pits with water quality pit insert baskets are proposed to collect stormwater runoff before discharging into the OSD tank. A small section of Brodie Street adjacent to Church Street will bypass the OSD tank and discharge direct to the Church Street kerb via a galvanised RHS section.

2 ROAD WORKS

2.1 Brodie Street

As noted in Section 1.4, Brodie Street will be extended from New East Hospital Road to Church Street.

As part of the reconstruction works a pedestrian footpath, graded at 2.5%, will be constructed behind the proposed kerb and gutter that will run adjacent to the multi-storey car park.

2.2 New East Hospital Road

The western kerb along New East Hospital Road will generally be retained. A new footpath will be constructed behind the existing kerb to service the proposed multi-storey car park. The new footpath will remove the existing 'split-level' footpath that currently exists to Building No 19 at the intersection of New East Hospital Road and Lucas Street, noting that Building No 19 will be demolished as part of the proposed works.

2.3 Lucas Street and Church Street

The southern kerb of Lucas Street and the eastern kerb of Church Street that adjoin the proposed multi-storey car park will be retained. Footpaths long these kerbs will also be generally retained. Local adjustment of site ingress and egress will be undertaken on the kerb and gutter and footpath per the proposed drawings.

3 EROSION AND SEDIMENT CONTROL

Erosion and sediment control measures will be installed and maintained in accordance with the requirements of Council and the 'Blue book'. An indicative Erosion and Sediment Control Plan is included with the DA drawings.

The Contractor will ultimately be responsible for the installation and maintenance of the measures in accordance with Council and Blue Book requirements.

4 STRUCTURAL DESIGN REPORT

The proposed multistorey carpark is a “split” construction with floor levels coordinated to ensure a minimum 6.0m clearance above the Sydney Water Easement and 2.2m minimum internal circulation clearance headroom and 2.5m disabled space headroom. It has been designed to comply with a Class 1 carpark (reference AS 2890.1) and AS 1170.1 for gross vehicle mass of 2500kg.

The column grid of the carpark has been developed on the basis of minimum columns and providing car park compliant spaces between columns for either a 3 or 4 car bay parking and appropriate aisle separation.

4.1 Structural System

The concrete structure will be post tensioned and reinforced band beam arrangement bearing on reinforced concrete columns with a permanent building joint located approximately 60m from the east elevation. General slab thickness zoning is approximately 170mm minimum with 420mm deep x 1800mm wide band beams. Horizontal sway earthquake and wind resistance will be provided by the lift core, stair core and shear walls. A 1200mm deep x2400mm wide transfer beam above Brodie Street at Level 3 is envisaged to cantilever the car park superstructure above the Sydney Water Easement. The lowest level slabs are envisaged to be 120mm reinforced slabs on grade.

4.2 Fire Ratings

The fire ratings of the structure will comply with the BCA report (Reference Blackett McGuire Memo 130330) to comply with an open deck carpark and 60/60/60 FRL.

4.3 Façade

The façade of the building consist of a lightweight aluminium perforated panel to detail and base masonry designed to be non climbable and impact protected by a galvanised steel barrier. (Rhino stop or equivalent).

4.4 Foundations

Foundations for the building will be bored piers drilled to Class III shale located between 8.1 and 13.8m below existing ground levels (RL 20.1 to RL 16.3). The foundations will start underneath the lowest slab level Oa and Ob with a pier cap and perimeter retaining walls will consist of 190mm reinforced blockwork bearing on strip foundations.

4.5 Bulk Levels and Groundwater

Ground water seepage was located at depths of 11.0m, 8.5m and 9.0m, respectively and stand pipe groundwater at a depth of 4.3m (RL 24.8m). The lowest bulk excavation level is envisaged to be RL 27.3 and lift stair overrun excavation to estimate IL 26.9.

4.6 General Specification

The concrete specification and reinforcement/post tensioning will be AS 3600 code compliant with a minimum durability design life of 50 years.

Yours faithfully



Peter Waugh
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NSW Structures Discipline Leader.
for **Cardno (NSW/ACT) Pty Ltd**

**JOHNSTONS CREEK CATCHMENT
FLOOD STUDY**

DRAFT REPORT



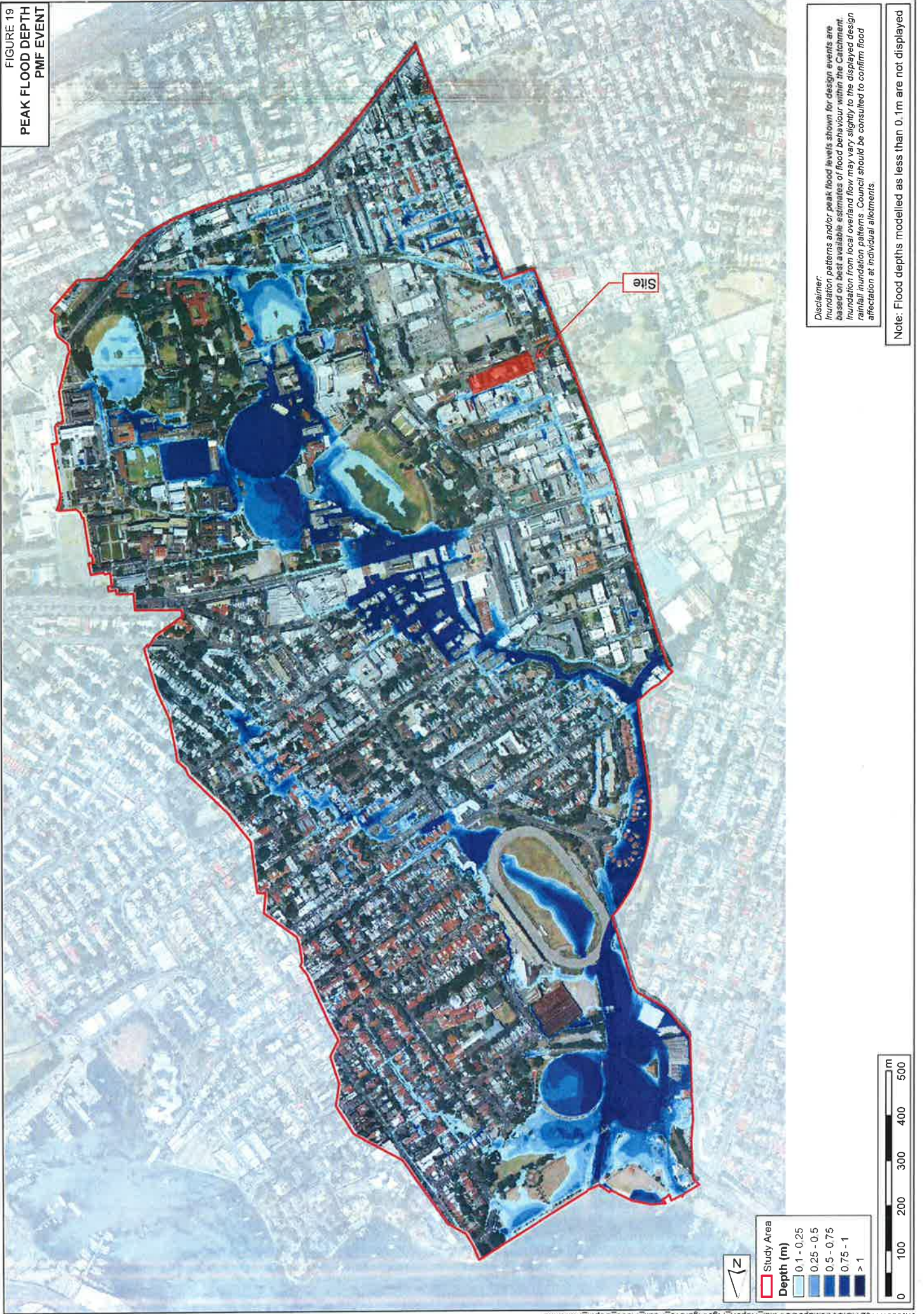
FIGURE 18
 PEAK FLOOD DEPTH
 1% AEP DESIGN FLOOD EVENT



Disclaimer:
 Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of flood behaviour within the Catchment. Inundation from local overland flow may vary slightly to the displayed design rainfall inundation patterns. Council should be consulted to confirm flood affectation at individual allotments.

Note: Flood depths modelled as less than 0.1m are not displayed

FIGURE 19
PEAK FLOOD DEPTH
PMF EVENT



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