

Our Ref 59916119
Contact Martin Griffin



5th February 2016

The Manager
Angus Developments Pty Ltd
4 Spicer Street
WOOLLAHRA NSW 2025

Attention: Mr Adam Flohm c/o – Lachlan Pierce

Dear Adam,

**OVERLAND FLOW FLOOD ADVICE – 466-488 NEW CANTERBURY ROAD,
DULWICH HILL**

Cardno has been engaged by BKA Architecture on behalf of Angus Developments to provide flood advice for the proposed development at 460 – 488 New Canterbury Road, Dulwich Hill. This report has been prepared to inform a planning proposal submission for the proposed development.

Marrickville Council has provided the following advice regarding the development at 466-480 New Canterbury Road, Dulwich Hill:

The site is adjacent to Council/State Rail stormwater pipes that drain the two low points in the area. One of the low points is located adjacent to 480 New Canterbury Road and the other at the rear adjacent to 38 Hercules Street. An assessment of the capacity of stormwater system at these low points needs to be undertaken. The assessment must investigate if there is any significant ponding and overland flows (during 1 in 100 year storm event) at these locations which may result in flooding and impact the development.

The location of the two low points are shown as star points in **Figure 1**.

The aim of this assessment is provide comment on the likely extent of 100 yr ARI overland flow flooding at these two locations and if these flows impact on the proposed development and if the development is likely to have an impact on flood behaviour.

1. AVAILABLE DATA

LiDAR survey data for the site and upstream catchment was acquired from the NSW Land & Property Information (L&PI) (2013). A Digital Elevation Model (DEM) has been established for the area based on the LiDAR data as shown in **Figure 2**.

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Figure 1 – Subject Site and the Two Low Points Referenced by Council (Source: Google Maps, 2016)

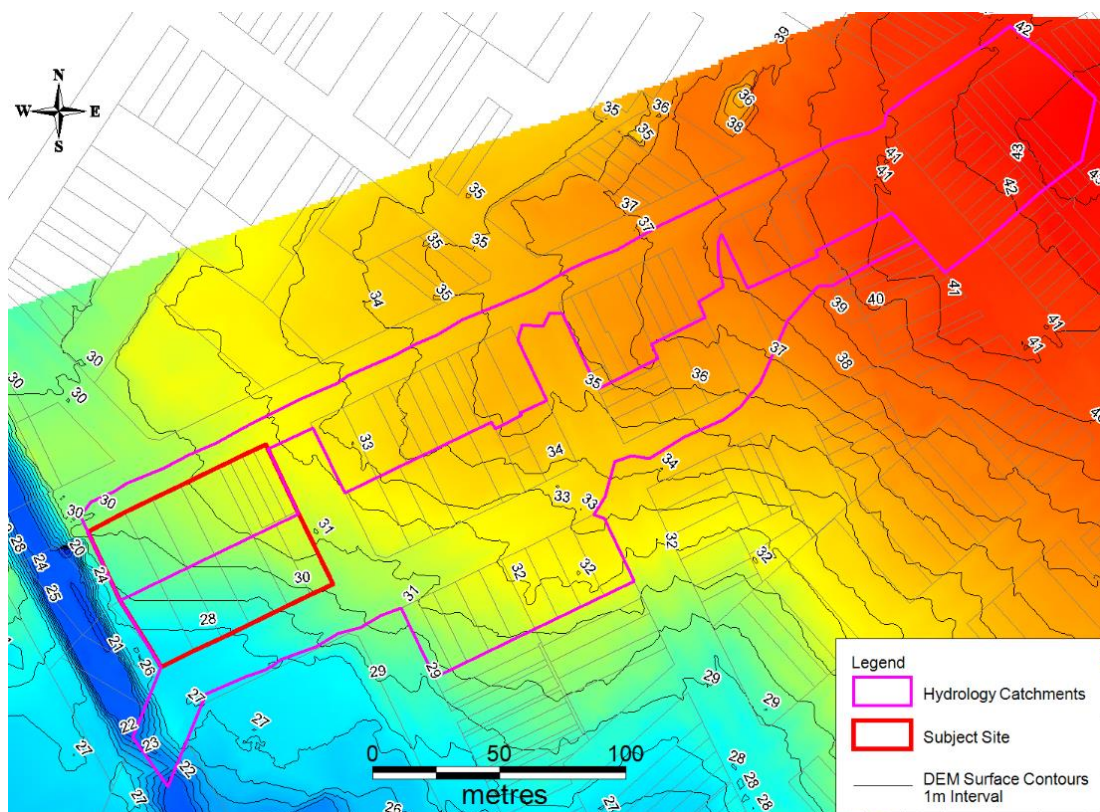


Figure 2 – DEM Surface and Hydrology Catchments to Two Low Points

Unfortunately stormwater pit and pipe data for the Council and State Rail assets mentioned in Council's comment could not be acquired to inform this study.

Mainstream flooding in this area has been analysed in a number of studies commissioned by Marrickville Council, Sydney Water, and NSW Roads and Maritime Services (RMS). It is assumed that mainstream flooding is contained within the adjacent rail corridor due to the 4-6 m difference in surface levels between the rail corridor and the road levels of New Canterbury Road and Hercules Street.

2. HYDROLOGY

Using the LiDAR data for the area it was possible to delineate the local catchments draining to the two low points of interest. The following assumptions have been made regarding runoff from the local catchments:

- In the absence of stormwater pit and pipe data it has been assumed that overland flows generally align with the surface topography of the catchment and that local drainage systems do not divert runoff from external areas to the low points;
- It has been assumed that runoff from properties fronting New Canterbury Road drains to New Canterbury Road and not towards Hercules Street at the rear; and
- The crest along the centerline of New Canterbury Road acts as a ridgeline with flows from either side of the road not able to cross the road based on available LiDAR data.

The two local catchments draining to the two low points are shown in **Figure 2** and have contributing areas of 1.75 ha and 1.8 ha respectively.

The peak runoff from these local catchments were assessed using a simple DRAINS model. Design rainfall intensities were generated using the Intensity Frequency Duration methodology outlined within Australian Rainfall & Runoff (1987, 1998).

The 100 yr ARI peak flows from the New Canterbury Road and Hercules Street catchments were estimated to be around 1.2 m³/s in the 90 minute critical storm burst for both catchments.

3. HYDRAULICS

The hydraulic behaviour of overland flows at the two low points has been assessed as follows. As stormwater pit and pipe data was not available a conservative assumption of complete blockage has been adopted for the stormwater network so that all flows are conveyed as overland flow.

3.1 New Canterbury Road

This low point is located within the New Canterbury Road reserve which has a longitudinal grade of approximately 1% in a west-south-west direction. As can be seen in **Figure 3** the surface levels at the top of the kerb at the boundary of the subject site are approximately 0.2 metres higher than the low point on the road. Assuming flow can be conveyed down two lanes of the road (half of the Canterbury Road width) the total flowpath width is approximately 7 metres wide. Using Mannings equation it was estimated that the peak 100 year ARI flows (1.2 m³/s) can be wholly contained within the road reserve in the event that the drainage system is fully blocked.

It is therefore estimated that the site is not affected by overland flow flooding from New Canterbury Road.

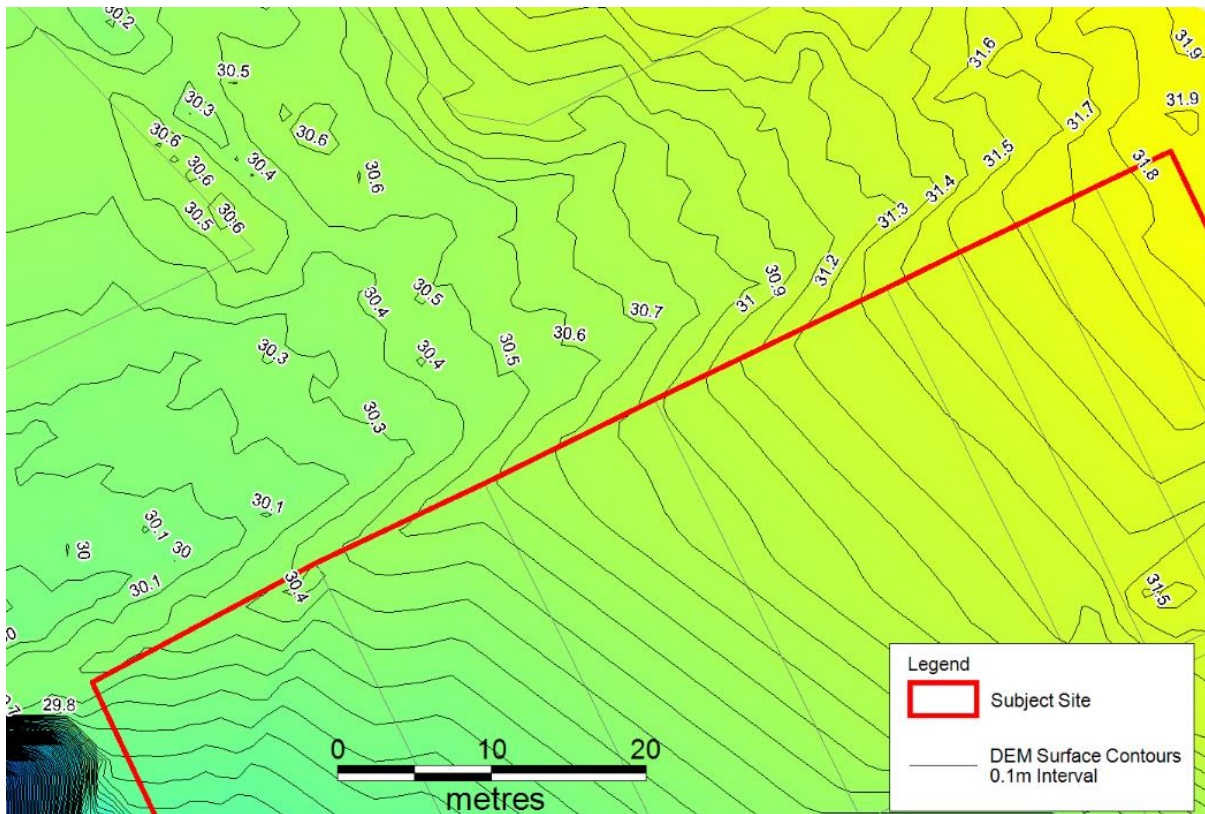


Figure 3 – New Canterbury Road Low Point Road Levels

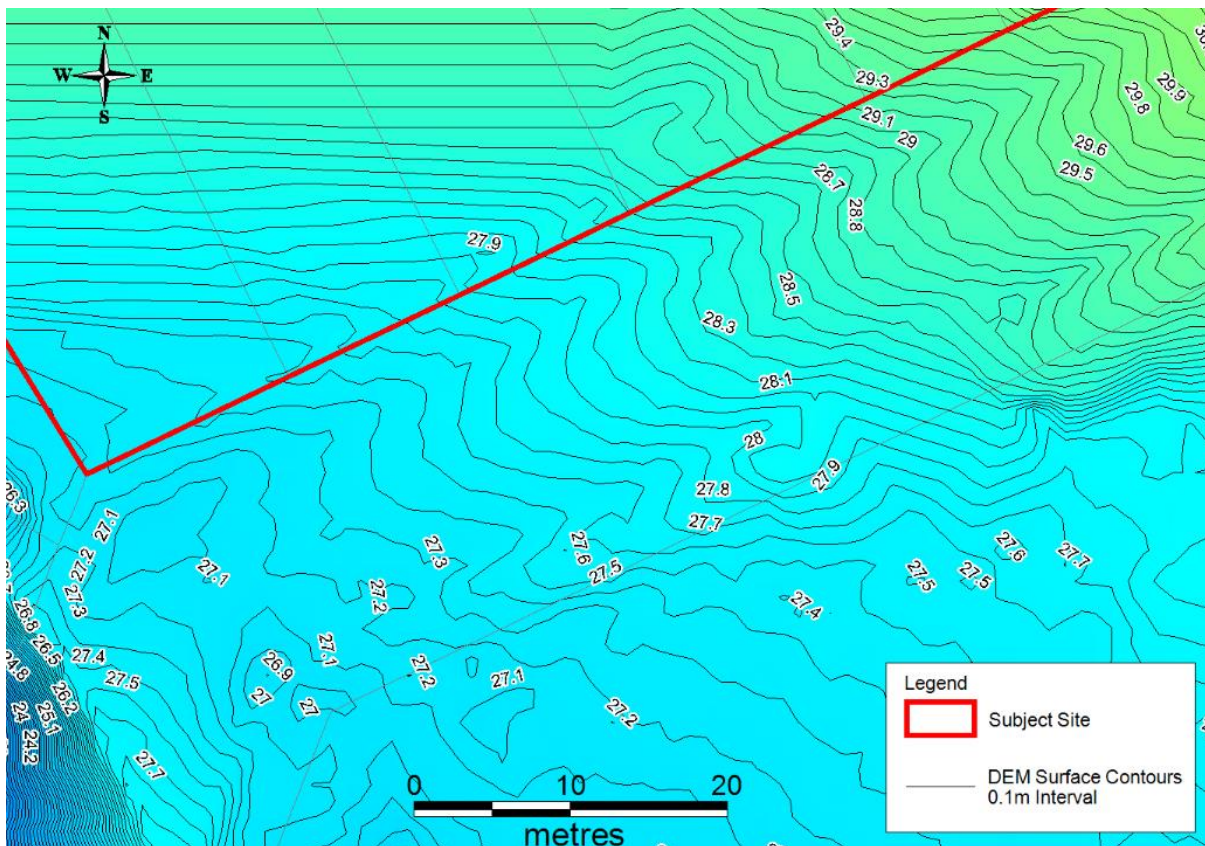


Figure 4 – Hercules Street Low Point Road Levels

3.2 Hercules Street

The low point in Hercules Street is located at the south-west corner of the subject site as shown in **Figure 4**.

Flows that pond within the road reserve at this location are assumed to preferentially discharge south into the Dulwich Hill Public School which has a minimum ground level of 27.0 m AHD compared to the minimum site levels at the south-west corner of 27.2m AHD.

It is therefore estimated that the site is not affected due to ponding on Hercules Street.

4. CONCLUSION

In response to Council's comments relating to the development at 466-488 New Canterbury Road Dulwich Hill, Cardno has assessed the overland flow flooding / ponding occurring within the road reserves of New Canterbury Road and Hercules Street. Even if the drainage system is fully blocked it estimated that the site is not affected by 100 yr ARI overland flow flooding from New Canterbury Road or Hercules Street.

If you have any questions please contact me on 9496 7859.

Yours faithfully



Martin Griffin
Engineer
for **Cardno (NSW/ACT) Pty Ltd**