

## **STORMWATER DRAINAGE REPORT**

Job No. 16450

**Report Date:** 8<sup>th</sup> December, 2017

**Client:** Redan Constructions

**Site Address:** 30 DAY STREET, COLYTON

### **Purpose Of Investigation:**

We have been instructed by the client to inspect the existing development on this site, to carry out stormwater drainage designs to satisfy Council for the proposed additions and alterations and to prepare a report and associated drawings.

### **Pre-development - General Description:**

The site is located in a residential development that was generally constructed in the 1950 to 1960's. The site appears to have been zoned to suit the development of a small local shopping centre. The land is identified as DP 26030, Lots 139, 151, 151A, 152, 152A, 153 and 153A.

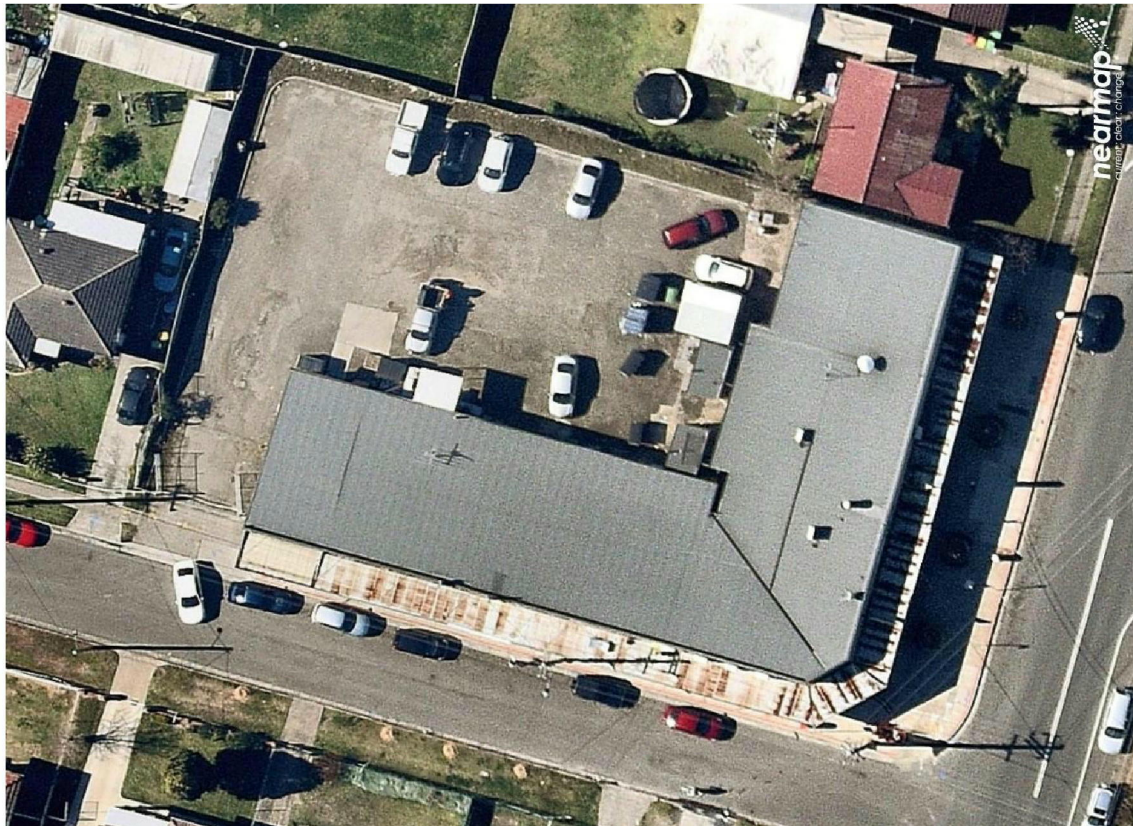


Photo 1: Aerial view of development. C/- Nearmap

These lots were then developed to provide nine separate shops fronting both Day Street and Carpenter Street with a roof area, including the awnings of . The development included a large bitumen paved carparking area at the rear that is accessed by a double width driveway from Day Street. This resulted in the

entire site being covered with roof and impervious pavement with the exception of a narrow strip of landscaping between the edge of the carpark and the side and rear boundaries. It appears that the current development is basically unchanged from the original development.

We have investigated the existing stormwater drainage for the current development. At the time of our site visit it had just finished raining and so we were able to observe the manner in which the pavements are currently drained. Looking at the aerial view above, we found that the awnings that project over the footpath are drained to the kerb through seven separate kerb outlets. Some of these were in poor condition and needing maintenance. The main roof of the shops all falls to the rear. There are a number of downpipes serving the rear guttering, some of which pass into the ground with uncertain further direction, but most simply discharge onto the rear pavement. Refer to the following photos.



Photo 2: Rear view, looking south



Photo 3: Downpipe detail



Photo 4: Carpark discharges over footpath to kerb

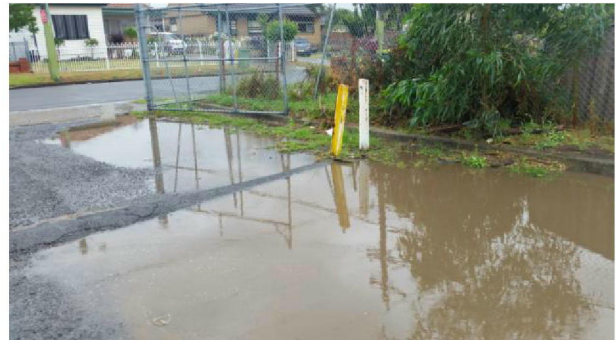


Photo 5: Carpark ponding at northwest corner.

The carpark area is virtually flat but does have the slightest overall fall to the vehicle entry crossing in Day Street. From the photos we confirm that the only discharge point for almost all the stormwater from the main roof and the carpark is via overland flow over the footpath to the kerb. Refer to the above photos for evidence of the current drainage.

Landscaping of the current development consists of two narrow strips of land between the carpark kerb and the east (rear) and north side boundary. Most of the land in these narrow strips falls steeply towards the boundary as shown in the following photos as we suspect the original carpark was filled to provide a fall to the street. Therefore all rainfall on these strips will become part of the overland flow of the neighbouring properties and not become part of the current site discharge. These landscape areas currently occupy 111m<sup>2</sup> or 0.6% of the site.



Photo 6: North strip of landscaping

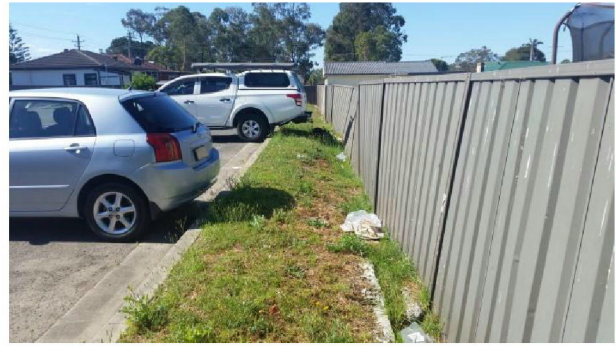


Photo 7: East (rear) strip of landscaping

**Post Development – General Description:**

The proposed development essentially consists of constructing a basement level as carparking virtually exactly below the whole area of the current surface carpark. There will be a ramp leading up to the surface and the remainder of the existing surface carpark area will still be used essentially for parking. A new first floor will be constructed above the existing shops and extending over a large part of the current surface level carpark.

The footprint of the new work is essentially the same as the pre-development improvements. The main difference will be the proportion of roof area to hard standing area will alter with the roof area increasing for the post development case. The small areas that are currently, in principle, used as landscaping will remain the same areas. However, with the external walls of the basement virtually under the existing kerb line, it will be very problematic to capture these small areas into the post development catchment areas and we recommend that Council permit these areas, as shaded on our plan, to be allowed to bypass the drainage system and continue as overland flow into the adjoining properties as they have been for many years with no detrimental effects.

The Council's pre-lodgement advice dated 4<sup>th</sup> September 2017, required a number of engineering works to be designed for this site. The writer has considered all of these requirements and after viewing the site requested to meet with Council's Senior Development Engineer, Fred Shokair. At our meeting on 8<sup>th</sup> November 2017, it was acknowledged that many of the requirements of the pre-lodgement advice are physically unable to be satisfied for this development. Council's officer recommended that we prepare additional information in our drainage report to identify the issues and provide the best options. This report will address each of these requirements separately.

**Stormwater Drainage:**

Council required the drainage design include on site detention at the rate of 280 m<sup>3</sup>/Ha and limit a discharge to 120 L/s/Ha as per Council's standard drainage requirements in the absence of a rigorous pre/post development analysis. Please refer to the stormwater drainage plan and tabulated calculations on the attached drawings. The difference between the pre and post development discharge from the site has been calculated to be 3.65 L/s. We propose to include on site detention in the form of two 5,000L above ground water tanks as shown on drawing C3. The whole of the roof area that does not fall towards the street, will be collected in downpipes and directed to the tanks via pipes suspended from the underside of the first floor slabs and then drop into the tanks. The whole of the roof area that falls towards the street frontages will be collected in downpipes and gutters to then connect into the existing seven downpipes that are discharging to

the kerb. The overflow from the detention tanks is proposed to be joined by pumpout from the basement and surface drainage of the carpark to a junction pit at the north west corner of the property where it will flow to the existing kerb.

We have investigated the presence of any existing Council drainage infrastructure around this site. We found two pits on the other side of Carpenter Street that do not collect any drainage from this site. They would also be impossible to get any fall or access for them to be used for this development. We then traced the current flow of stormwater in the kerb. We found that the water flowed north along Day Street then around the corner into Muscio Street and then flowed some 140 m to the first available kerb inlet pit.

#### WSUD Design

The pre and post site coverage is exactly the same and the available space for landscaping and the installation of a WSUD facility is similarly very limited. The water quality leaving the site can be seen from the photos above to be carrying a lot of silt but otherwise quite clean. The source of the silt is mainly from the exposed subbase material in the carpark where the wearing course has failed. The new development will be a durable concrete wearing surface throughout the carpark area. The water quality will be significantly improved by this change to the existing situation. The issue of the need for WSUD on this site was raised at our meeting on 8<sup>th</sup> November and Council's engineer acknowledged that it was a redundant and impractical requirement for this site. He recommended that we ask Council to waive this requirement from this D.A. application.

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#### **Concluding Comments:**

1. In our opinion, we have addressed the drainage engineering constraints and difficulties of the proposed development. We have applied common sense with logical engineering principles, utilized the existing drainage where possible and improved the current drainage and water quality.
  2. The difference between the pre and post development discharges is very small and can be catered for in two small above ground water storage tanks that are dedicated to on site stormwater control.
  3. There is no area of the current development or the current proposal where a WSUD facility can be installed and still be able to drain to the existing Council infrastructure. We ask that Council waive this requirement on this development.
  4. The small strips of landscaping that form part of this development proposal should be at the same level as the adjoining properties and all stormwater discharge from these small areas be allowed to bypass the stormwater drainage system and become overland flow through the neighbouring properties as it has been occurring for the life of the current development.
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**For: INHOUSE CONSULTING ENGINEERS PTY LTD**

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