

REPORT No5 - Stormwater Assessment

1 External Stormwater Drainage

There is no formal Council stormwater system readily available to this site as the site drains to the rear boundary and 4.5m below Carew St. The closest available street drainage is in "The Crescent", some 14m below and 70m north, through private property.

1.1 Run-on Overland Flow

The site is located some 70m north of and 2m below the ridge line, which is defined by the intersection of Quirk and Carew Streets. Hence it is almost at the top of the catchment and well placed to avoid the likelihood of even the most-severe storms damage originating from outside the site. Bushey Place shares a common boundary with the site and re-directs off-site overland flows into the Council piped drainage system some 60m to the east of the site. Surface water originating from the Carew St. pavement is captured in the kerb and gutter and directed north down Carew St. away from the site. Should the gutter surcharge onto the nature strip due to debris in front of the site is prevented by the driveway apron and nature strip levels being locally raised to contain the flow within the street.

1.2 Upslope Subsurface Flow

Both Bushey Pl. and Carew St. are sealed and therefore contribute very little seepage water to the site.

2 Site Soils

Rock depth varies across the site from 0 to up to 1.5m, with the 4 boreholes (Ref: Site Plan for location) showing depth to be 0.25 to 1.02m. Overlying this is weathered grey sandy clay with topsoil depth up to 200mm. Surface gradients vary from 8% to 19%.

3 Site Drainage Behaviour

As there is no formal drainage to which to connect, there is no piped drainage system on the site, with the exception of a dedicated absorption / surcharge trench installed with the construction of the existing house. Hence all roof water is captured and directed into that trench from downpipes. An overflow trench grate installed across the gravel driveway, outside the carport, drains directly onto the lower grassed access way beside the house. There appears to be no formal subsurface drainage, as carport and laundry wall foundations appear to be founded on strip footings, which bear on porous grey sandy clay loam. At times of heavy prolonged rainfall, the bottom of the site becomes waterlogged and boggy, but surface water depth remains absent. The ground dries quickly once rainfall ceases.

4 Proposed Stormwater Works

It is proposed to retain the existing stormwater management system and extend it as follows.

4.1 Existing Grated Drain

Divert the drain outlet into a new 100 PVC pipe to drain into the existing surcharge trench. This will stop surface water from discharging under the new works.

4.2 New Grated Drain

Construct a grated drain down the southern wall to maintain this area as dry as possible. This will drain into the diversion piped drain.

4.3 Retaining Wall Drainage

The retaining wall will be of pervious construction in order to have minimal effect on subsurface drainage. However in order to ensure there is detention within the absorption area behind the wall, the mandatory subsoil drain will be raised by 200mm. A 65mm filter-wrapped subsoil drain will be laid the full length of the wall, but will be turned up at both ends to distribute drainage evenly through the wall to avoid concentration at the boundary.

4.4 Construct Absorption Area

Construct an absorption area behind the retaining wall. This will provide 30m³ earth fill to detain additional storm flows from the 32m² of additional non-pervious roof under the rear deck. Based on a percolation rate of 1.5m/day*, the area of fill with average depth of 200mm will provide, conservatively, an equivalent detention volume of some 3.75kL.

4.5 Install Rainwater Tank

A 2kL water tank with 1.5kL volume reserved for rainwater capture will provide some additional detention. With the absorption area, this will provide an equivalent 5,250L of detention storage.

** References:*

1. *Soil Landscape of Sydney – Soil Conservation Service NSW, for soil types*
2. *AS/NZS 1547:2000 – On-site Domestic Wastewater Management, for Soil Permeability - Constant Head Test using Talsma-Hallam method)*