

Date: 26<sup>th</sup> April, 2019

**Geotechnical Assessment of Existing Public Stairway**

**To:** David Allen

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**Email:** da@dapropties.com.au

**No. of Pages:** 6

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**Re:** 52 Lauderdale Avenue, Fairlight

**Project No:** 2016-013.2

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**CC:** Frida Blomqvist

**Email:** frida@platformarchitects.com.au

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**Comments:** Site inspection on 24<sup>th</sup> April, 2019

David,

We attended the above mentioned site on the 24<sup>th</sup> April 2019 to undertake a geotechnical inspection and assessment of the existing public stairway adjacent to a vertical cut face at the street level. This stairway provides access from street level to the upper foot path directly in front of the site.

The main objectives of this site inspection were:

- To inspect and assess stability of the existing stairway with regards to safety of the pedestrians using this stairway to access the upper level foot path.
- To inspect and assess an alternative proposed location for relocation of the existing stairway which is being proposed because of an insufficient height under the existing stairway to accommodate the proposed new driveway as part of the construction of two, 3 storey high, semi-detached dwellings with a basement and undercroft areas. The basement car park will be accessed from the street level via a driveway.

Please note that Crozier Geotechnical Consultants (CGC) have previously carried out geotechnical investigations at the site for the proposed new dwellings (Project No. 2016-013.1, March 2016).

The site is located within Area G2 of Manly Councils 2013 DCP – Potential Geotechnical Landslip Hazard Map. Therefore as part of the Development Application, Northern (Manly) Beaches Council requires a Site Stability Report.

The site inspection and reporting were undertaken as per your email request, Dated: 16<sup>th</sup> April 2019.

The following plans were supplied by the architect for the work:

- Architectural drawings (Pre DA Issue) by Platform Architects, Project: LAF, Drawing No.: A1.00, A1.01 A2.05, Revision: PR9, Dated: 29<sup>th</sup> March January 2019.

Based on our site inspection and assessment, following observations are made with regards to in-situ conditions and stability of the existing public stairway:

- The existing concrete stairway is located adjacent to a 3.00m – 4.00m high cliff within the road reserve and provides access from the street level to the upper foot path, as shown in Photo 1 below:



*Photo 1: Existing concrete stairway leading from street level to upper foot path*

- Thin concrete cover over the bottom 5 steps of the stairway is almost completely damaged exposing the uneven rock surface. The perennial water seepage through the sub-horizontal bedding defects within the adjacent cliff face accumulates over the uneven rock surface and creates slippery conditions which is a major “Slip, Trip and Fall” hazard, shown in photo 2 below:



*Photo 2: Uneven and slippery rock surface over the bottom steps*

- Also the channel between the stairway and the cliff face is clogged up with washed out material and overgrowth which makes seepage water flow over concrete steps, creating slippery surface over the entire stairway.
- A significant crack was also observed between the concrete steps at the bottom which has caused rotation of the concrete steps along with losing contact with the founding bedrock, shown in Photo 3 below:



*Photo 3: Crack between concrete steps*

- The lower half of the stairway is resting over a bed of sandstone which is undercut as shown in Photo 4 below:



*Photo 4: Stairway founded on undercut bed of sandstone*

- The depth of the undercut is approximately 0.30m deep with an up 150mm thick clay seam located immediately below the undercut bed, as shown in Photo 5 below. This clay seam is highly susceptible to erosion due to water seepage that will lead to further destabilization of stairway founded above.



*Photo 5: Clay seam below the undercut rock*



- The lower section at founding level of the top landing block of the stairway is completely detached from the main concrete structure where further cracks have developed and a severely decayed timber post has lost its footing completely, see Photo 6 below:



*Photo 6: Clay seam below the undercut rock*

**Conclusion:**

In view of the above mentioned site observations, it is concluded that:

- Under the existing conditions of the existing stairway, there is a significant hazard of “Slip, Trip and Fall” due to the uneven rock surface and slippery surface over concrete steps of the stairway which is a major risk for public safety.
- The long term stability of the existing stairway is at high risk due to cracks within the concrete structure and undercutting of the founding bedrock which is also prone to further destabilization due to erosion of clay seams along bedding defects.

**Alternative Location:**

In view of the above mentioned risks regarding public safety and stability of the existing stairway, it is recommended that the stairway be relocated to a proposed location to the east of the existing stairway, as shown in Photo 7 below:



*Photo 7: Alternative location for relocation of stairway*

There is sufficient space available at the proposed location of the stairway where it will be constructed as per Councils requirements. It is proposed that the new stairway will be constructed similar to an existing stairway located in front of the property No. 58 Lauderdale Avenue, as shown below in Photo 8 below:



*Photo 8: Existing stairway in front of property No. 58 Lauderdale Avenue*

It is evident from Photo 8 that:

- The steps of this stairway are constructed over two monoliths of concrete founded over stepped rock cut faces which are in a very stable condition.
- The timber posts are very stable and well connected to the concrete blocks over a longer section of the concrete block.
- Water seepage through defects within the rock mass is collected in a channel and diverted away to avoid slippery conditions over the concrete steps.

Therefore the new stairway constructed at the proposed location in front of the project site (No. 52 Lauderdale Avenue) will be safe for the public and have long term stability.

Hope the above comments meet your present needs, should you require clarification on any of the above detail or any further advice please do not hesitate to contact the undersigned.

Regards,



Shahzada Rizvi  
Senior Engineering Geologist