



From: Info
Sent: Friday, 29 September 2023 11:04 AM
To: Council Northernbeaches Mailbox
Subject: DA2022/2246 206 Hudson Parade CLAREVILLE NSW 2107

To Whom it may concern,

Please find attached peer review report relating to the above-mentioned DA.

Kind Regards

Danielle Lee

Administration/ Accounts

(I am in the office Mon, Tues, Wed, Fri)



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Date: 20 September 2023

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Project No.: 2023-138

Development Officer
Northern Beaches Council.

Assessment of geotechnical report for proposed new dwelling
at 206 Hudson Parade, Clareville.

We have been requested by the owners of No. 208 Hudson Parade, Clareville to assess a geotechnical report and its suitability to inform the design and construction of a proposed new dwelling in the neighbouring property submitted with a Development Application (DA2022/2246) for No. 206 Hudson Parade, Clareville.

As a result we have reviewed the following documents which have been downloaded from the Northern Beaches Council eplanning portal:

1. Geotechnical Report titled "Geotechnical Investigation", Reference No.: ESWN-PR-2022-1546, Dated: 31 October 2022.
2. Development Application design drawings by RM Designers, Project no.: 22009, Drawing no.: DA1 to DA17, Issue: A, Dated: 15/11/2022 Another Architect, Project No.: S9601 – 03, Dated: 17/04/2015.
3. Survey drawing by M. Y. Xu & Co, Reference; 14 85-T1, Dated: 23/09/2022

The undersigned completed an inspection of No. 208 and adjacent land as part of this assessment. It was noted that No. 206 is located to the north of No. 208, and slightly upslope in relation to a west striking ridge line and point upon which both properties occupy the western extremity. The inspection indicated that No. 206 is gently sloping at the front and then moderately to then steeply sloping down to the Pittwater foreshore, matching adjacent properties. It contains a two storey residential dwelling on the front half of the block, with the lower ground floor level excavated into the slope up to an estimated 2.50m depth along its eastern side. The house extends to within approximately 1.0m of the common boundary with No. 208.

No. 208 contains a concrete floor garage, in its north-east corner, which is suspended above ground surface levels on concrete piers and extends to the common boundary with No. 206. The dwelling within No. 208 comprises a three storey masonry residential dwelling formed on the centre of the block that extends to within approximately 1.50m of the common boundary with No. 206. Garden slopes down the northern side boundary of No. 208 appear very similar to slightly below the elevation of the pathway and ground surface within No. 206 adjacent to the common boundary.

Architectural design review

A review of the design plans indicates that the proposed new dwelling will involve four levels which partially step down the block from the upper level, being named First Floor (FFL 21.91), then the underlying Ground Floor (FFL 18.76 to 18.31), Bedroom Level (FFL 15.16) and Private Open Space Level (FFL 12.01).

The Bedroom and Private Open Space levels are both indicated as excavated into the hill slope, with setbacks to external walls of 2.50m to the south boundary and within 1.0m of the north boundary.

A review of the architectural design drawing (Excavation and Fill Plan) shows that excavation to 1.965m depth is required at the eastern end of the Bedrooms Level whilst excavation to 4.770m depth is required at the eastern end of the Private Open Space Level.

Design to construction assessment

It is expected from experience with similar excavations that a Base Excavation Level (BEL) of approximately 0.40m depth below the FFL of the lowest level will be required, to allow for construction of perimeter footings and slab thickness. As such, a BEL of approximately RL 11.60 will be required for the Open Living Space Level.

The lift shaft located on the southern edge of the new dwelling is anticipated to require an excavation of approximately 1.0m depth below the BEL to achieve its foundation and over-run. As such, its Base Excavation Level is anticipated at RL 10.60.

Similarly, a lateral excavation extension of approximately 0.30m is expected to allow construction of the external walls of the dwelling within an open excavation. These walls would then be retaining walls and damp (unless an excavation cavity is formed). As such, anticipating the external walls of the Open Living Space Level will act as retention, the excavation is expected to extend to within 2.20m of the southern side boundary and 0.70m of the northern side boundary.

The section lines within the architectural design, along which sections for the DA submission were determined, do not intersect the rear or south-east corners of the proposed lower levels, in the areas where deeper excavation are expected based on site slopes/local topography and the design.

The survey plan indicates that the ground surface level at the boundary adjacent to the south-east corner of the Private Open Space Level is at approximate RL 18.30, with the ground surface reducing towards the west to approximately RL 17.0 adjacent to the lift shaft location and RL 14.0 at the pool.

This indicates that the bulk excavation will be up to 6.70m depth (RL 18.30 – 11.60) at the south-east corner of the Private Open Space Level and up to 6.40m depth (RL 17.0 – 10.60) adjacent to the lift shaft. These excavation depths are greater than those listed in the architectural design plans.

A portion of this excavation is previously completed as part of the existing structure. However, it is expected that the existing retention system will be removed during demolition as it is not in line with the proposed works, therefore the excavation will be of full height as detailed above.

Geotechnical Report review

Section 1.2 Proposed Development details “*The design plans indicate variable excavation up to 2.50m deep at the eastern or front of Lower Level 01 (or Cinema Room) and excavation of 2.0m-3.5m deep for the Lower Level 02 (or entertainment Area) and swimming pool, due to sloping effect. An approximate setback of 1.0m from the northern side boundary and 2.5m from the southern side boundary was proposed...*”.

Section 3 Local Geology references the Sydney 1:100 000 geological series sheet 9130, however it details that the site “*the site is located in an area underlain by Hawkesbury Sandstone*”. The report also states that visual examination of sandstone outcrops exposed within the site as provided in Section 5.2 confirmed the published geology.

The geotechnical report details the results of investigation completed by hand tools, anticipated to be a hand auger and Dynamic Penetrometer tests. These tests encountered refusal at $\leq 1.50\text{m}$ depth below ground surface levels, on what has been interpreted in the report as weathered bedrock of Class IV to Class III of the Pells et al system, with medium to high strength bedrock indicated ‘*based on examination of sandstone outcrops exposed within the site*’. The investigation comprised one test location (BH4/DCP4) at the front of the site with three completed along the rear alignment of the proposed new dwelling.

The safe batter slopes detailed in Table 2 of the report are considered reasonable for the geological units listed in that table. The report then details that “Based on proposed setbacks and depth of excavation as mentioned in Section 1.2m, we assessed that temporary batters recommended in Table 2 are applicable for proposed majority excavation of Proposed Lower levels and swimming pool”.

It subsequently details that “if excavation using safe excavation batter above is not feasible for excavation along site side boundaries due to inadequate setback” that alternative options should be implemented including reinforced shotcrete, raking or inclined shores, or a line of closely spaced/contiguous piles.

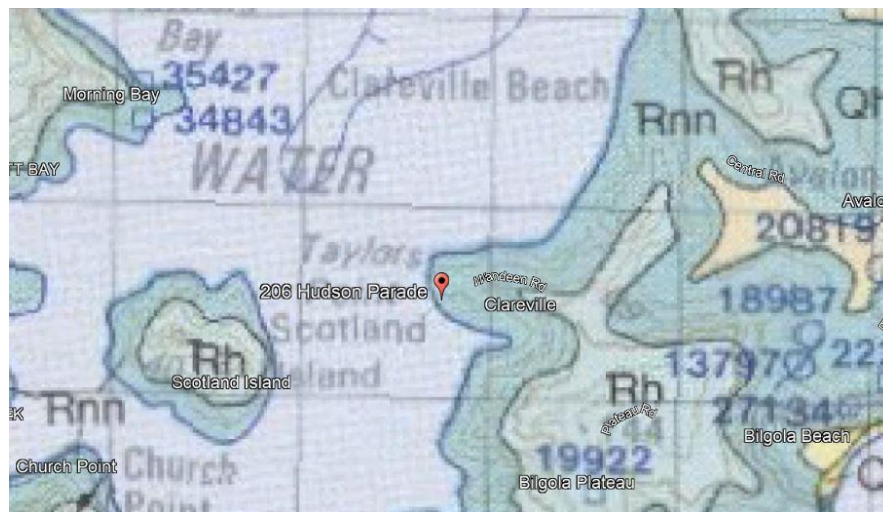
The report provides a landslide risk analysis which appears to roughly comply with the recommendations of the Councils - Geotechnical Risk Management Policy for Pittwater 2009 and the Australian Geomechanics Society (AGS 2007 guidelines) for property, however it does not provide sufficient detail to determine how the risk levels were determined and does not provide a confirmation that the site can achieve the geotechnical policies ‘Acceptable’ risk management criteria.

The report provides reasonable recommendations for dilapidation surveys, vibration control/monitoring and what appear to be conservative parameters for design of retention systems.

Geotechnical Report Assessment

The geotechnical report lists significantly different excavation depths to those determined by the author from the survey and the architectural plans submitted with the DA. The maximum excavation depth appears to be up to 3.0m greater than that indicated in the geotechnical report. This would be expected to alter the risk levels assessed in the report and the recommendations for support systems.

The geological series sheet 9130 shows the site is actually underlain by a different geological unit, Rnn Narrabeen Group Rocks, with the Hawkesbury Sandstone located upslope to the east.



This has been confirmed by the author during inspection of numerous excavations within the local area. As such, the geological sequence expected below the site is different to that indicated in the report and the existence of outcrops of Hawkesbury Sandstone rock may only indicate the presence of boulders in the profile that have travelled from upslope. As such, a high potential exists for variation to the interpreted geological sequence and as such the suitability of the recommendations and design parameters supplied in the report.

The Pells et al system was not developed in the geological sequence underlying the site, however it has been used in numerous conditions and is at least a reasonable classification system in these conditions for looking at rock mass quality.

Class IV-III rock of the Pells et al system, as indicated in the subsurface conditions of the report, would equate to a rock with Unconfined Compressive Strength of >2 to >7 MPa, which itself equates to Low to Medium strength rock as per AS1726-2017 Geotechnical Site Investigations. It is possible that this strength rock exists on site, though it is impossible to confirm from hand auger and DCP tests. The outcrops shown within the photos and indicated as being used to define the Class IV-III of the bedrock do not provide sufficient detail to confirm the geological sequence or the bedrock conditions.

The Narrabeen Group rocks are known to weather far more deeply than the Hawkesbury Sandstone along with a higher tendency for defects and as such the bedrock is likely to contain various weathered units of siltstone/shale/claystone that will have lower stability when compared to the sandstone.

The Safe Excavation Batters listed are reasonable for the geological units listed in the report, however for excavations of >3.0 m depth continuous batter slopes in soils or weak rock are generally unsafe. Also, when considering the high potential that the geological sequence varies from that indicated in the report, along with the significantly increased excavation depths indicated, it is considered that these safe batter slopes are not possible in many locations with respect to boundary stability, and therefore pre-excavation support is needed.

As such, a more detailed investigation into sub-surface conditions is required to confirm geological sequences and determine and provide recommendations for support systems.

Conclusion:

The geotechnical report provides geotechnical design recommendations that are for a geological sequence that does not exist below the property, with very little investigation completed to determine the sequence.

The report also appears to be assessing a significant shallower excavation than is proposed in the architectural design, potentially making the recommendations and design parameters of the report invalid/unsuitable.

Based on the apparent potential for excavation of up to 6.70m depth within proximity of property boundaries, it is considered that the geotechnical report does not provide suitable assessment to meet the Council Geotechnical Risk Management Policy requirements.

We trust the above comments meet your current needs, if we can be of further assistance in regard to this matter please don't hesitate to contact the undersigned.

Yours faithfully,



Troy Crozier

Principal

MIE Aust. – Geotechnical Engineer

MAIG, RPGeo – Geotechnical and Engineering