Date: 20 October 2020
Ref: 33589BNM Site Report 1

Site Report

Jamie Durie
C/- Jamie Duire Media
Suite 213, 117 Old Pittwater Road
Brookvale NSW 2100

Attention: Katrina O'Callaghan
Email: katrina@jamiedurie.com

GEOTECHNICAL INSPECTION
PROPOSED STABILISATION OF ROCK OVERHANG
189 RIVERVIEW ROAD, AVALON BEACH, NSW

As requested, our Associate Geotechnical Engineer, Mr Matthew Pearce, visited the above site on 15 October 2020 to complete a detailed inspection of a previously identified potentially unstable block of overhanging rock on the boundary between the subject site and No 191 Riverview Road. This site report confirms and expands upon our discussions on site with Mr Jamie Durie.

We assessed the geometry of the rock using taped measurements and hand held clinometer and the strength by sounding of the rock using a geological pick. Therefore, measurements and strengths are approximate. In summary the block is characterised as follows:

- The block is formed by open joints, at the rear (east) and side (north).
- The plan dimensions of the block are about 3.5m to 4.5m wide (north-south) by 2.5m to 2.7m deep (east-west)
- The block is a maximum of approximately 5m high, but at its western edge it is about 4m high over an undercut at the base.
- At the base of the block is an undercut, or 'cave', which measures about 2.5m to 3m wide (north-south) by 1.3m to 1.8m deep (east-west), and is 0.7m to 1.2m high.
- A fig tree is growing at the top of the block, with its roots extending into the joints at the rear and side of the block.
- The external face of the block was assessed to be of medium to high strength, and the material at the rear of the cave was of low to medium strength.
- At the base of the cave sandstone bedrock is exposed within the rear and central portions, however, the surface of the bedrock slopes or steps down to the west and is covered with sandy fill.
- From our measurements, the centre of gravity of the block is approximately just at the rear face of the cave.

- We estimate the mass of overhanging rock to be about 40 tonnes.

A plan of the block and selected photos are attached.

It appears that the block is only marginally stable, and as such, we recommend that additional support be provided without delay.

We recommend the block be stabilised by underpinning with blade walls founded on sandstone bedrock of at least medium strength below the base of the cave. We strongly recommend an investigation be completed to confirm the depth to such bedrock within the extent of the base of the cave at an early stage, as alternate solutions may be required if such bedrock is not present. At least two blade walls are recommended at one third points from each end.

It must be noted there is a moderate risk to life for persons undertaking the works. To reduce the risk we recommend the following:

- Prior to any works commencing, including investigation, the western edge of the block must be propped by metal props, or similar, with a combined capacity of at least 50 tonnes, with the props wound up 'tight' against the base of the block. These props should be able to be extended to be nipped tight. The props should ideally be supported on bedrock.
- Non-vibratory techniques must be used for trimming the bedrock and boulder (where required).
- Pairs of survey points must be established on the southern face of the block and on the intact bedrock behind, with measurements taken daily to check for any movement of the block. If any movement occurs, the area below the block must be evacuated and further geotechnical advice sought before proceeding.
- Any noises, e.g. creaking or cracking must be treated seriously as early warnings of instability of the block. If any such noises are heard, the area below the block must be evacuated and further geotechnical advice sought before proceeding.

Blade walls may comprise masonry or mass concrete (with a UCS of at least 25MPa), however, if concrete is adopted, we recommend the blade walls include a layer of SL81 mesh to each vertical face, with at least 50mm cover, to provide some protection against shrinkage cracking. Whatever material is selected, the blades should be constructed to 50mm shy of the cave roof and then the gap packed with non-shrink grout following curing of the concrete. Two blade walls of 0.6m width by minimum 1m length are considered geotechnically suitable to support the estimated 40 tonne block.

The rock foundation for the blade walls must be trimmed so as to be level, or stepped level sections, prior to the blade walls being constructed. Further, each blade wall is to incorporate at least 8 No, minimum 30mm diameter, stainless steel shear dowels epoxied into 50mm diameter holes and to a depth of 0.4m into the bedrock below the base of the blade walls.

Prior to the blade wall footings being constructed, the bedrock must be exposed for at least 1m downslope (to the west) and be inspected by a geotechnical engineer. The purpose of this inspection is to check for the presence of possible adverse defects which could compromise the capacity of the proposed blade walls.

To protect against potential root jacking, the fig tree growing at the top of the block should be killed and provisions made for future maintenance to prevent growth of additional trees.

Should you require any further information please contact the undersigned.

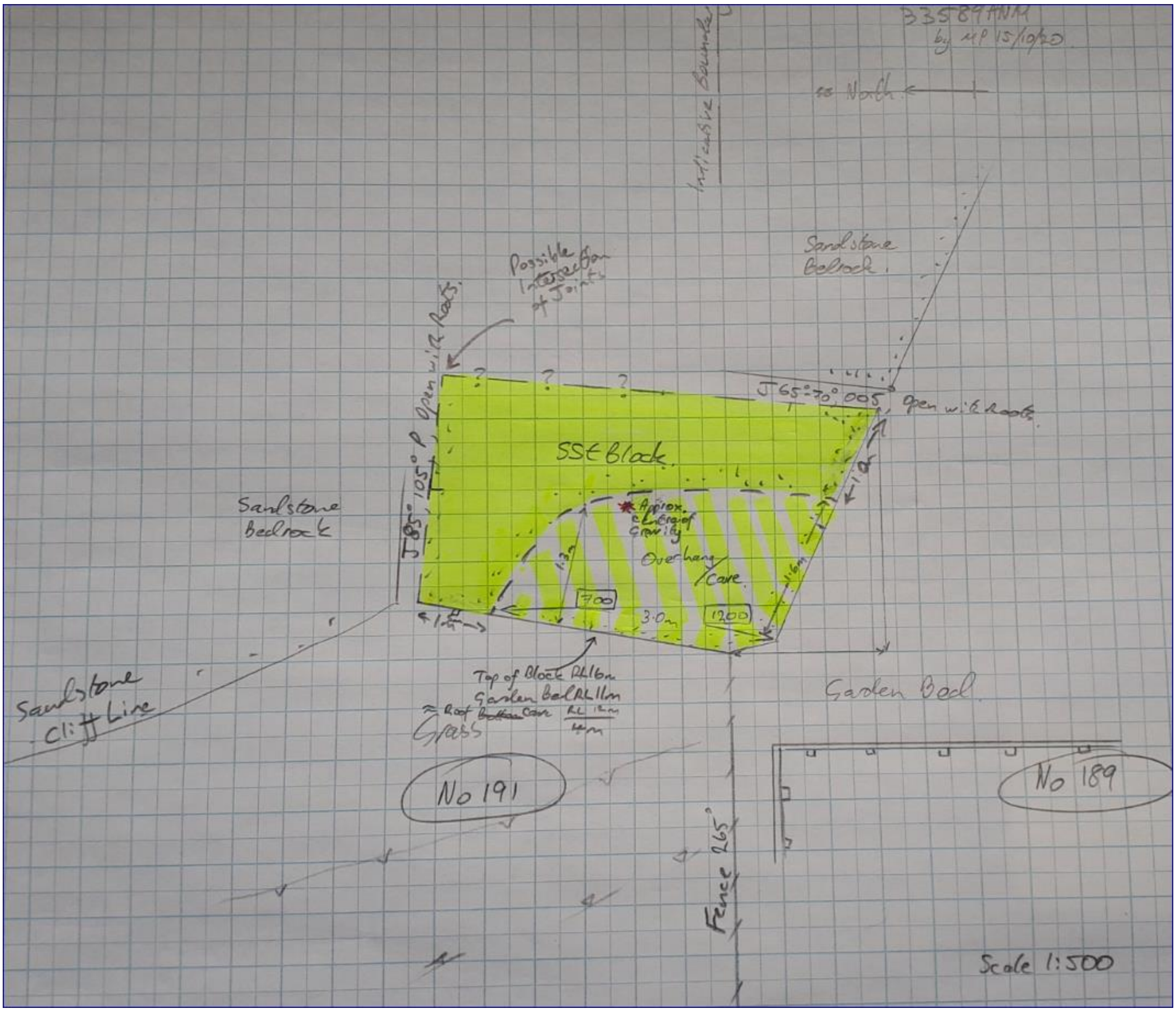
Regards
For and on behalf of
JK GEOTECHNICS

Matthew Pearce
Associate |Geotechnical Engineer

Reviewed by:

Nicholas Smith
Senior Associate | Geotechnical Engineer

Encl: Sketch Plan
Selected Photos

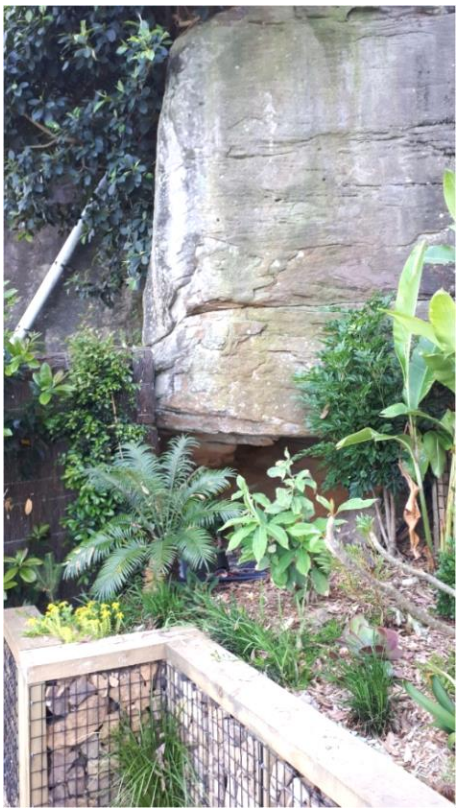

33589BNM
by MP 15/10/20
North
Indicative Boundary
Sandstone Bedrock
Possible Intersection of Joints
J 85°, 105° P, Open with Roots
SSt Block
J 65°-70° 005 Open with Roots
Approx. centre of Gravity
Overhang/Cave
700
1200
3.0m
Sandstone Bedrock
Top of Block RL16m
Garden Bed RL11m
Grass
Sandstone Cliff Line
Garden Bed
No 191
No 189
Fence 265°
Scale 1:500

Sketch Plan

Photos from within No 189

Looking North-eastwards

Looking northwards



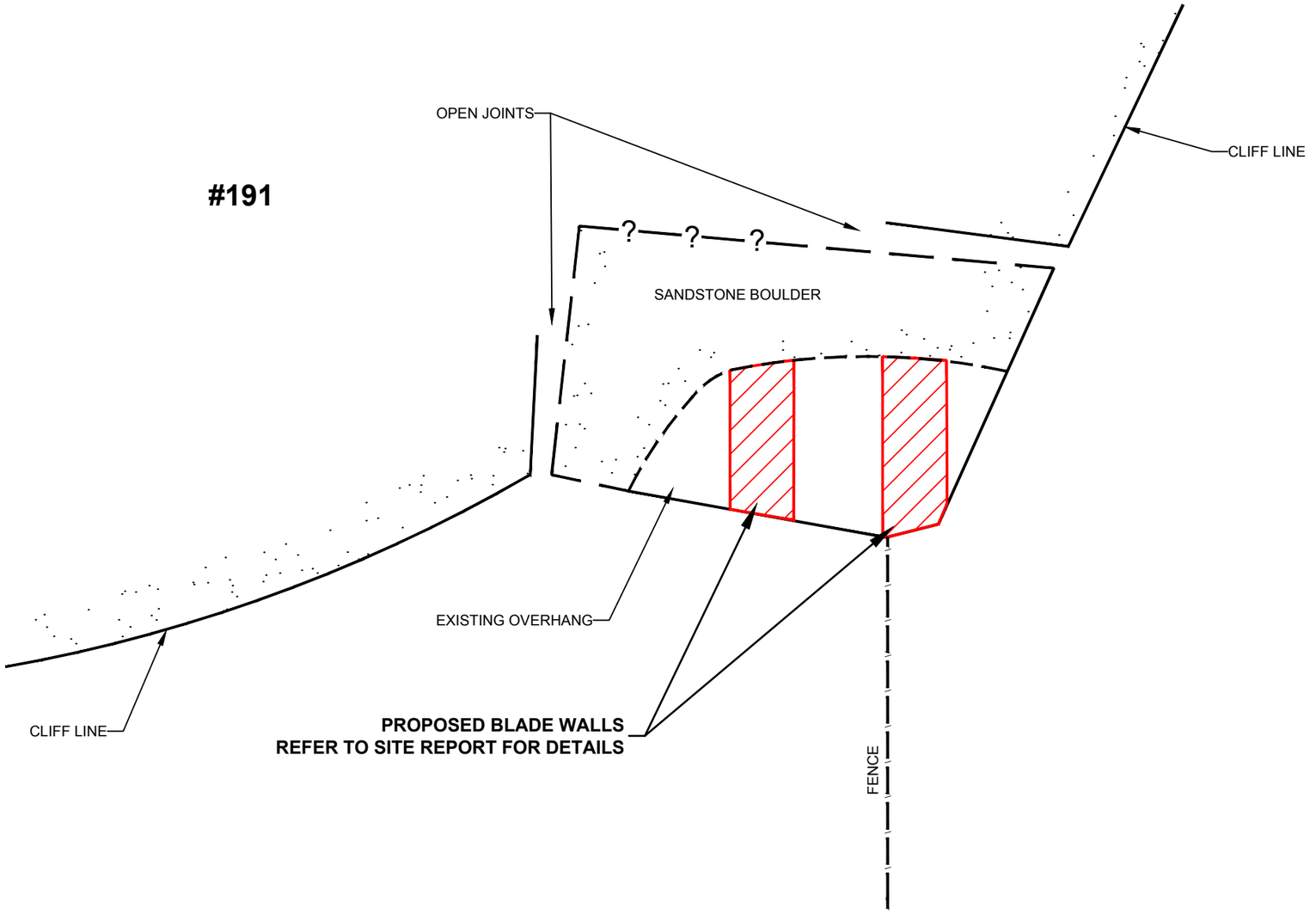
Photos from within No 191

Northern end, Looking NE

Southern end, looking SE

#191

#189



0 0.5 1 1.5 2 2.5

SCALE 1:50 @A3 METRES

This plan should be read in conjunction with the JK Geotechnics report.

Title: **BLADE WALL PLAN**

Location: 189 RIVERVIEW ROAD, AVALON BEACH, NSW

Report No: 33589PNM

Figure No: 1

JKGeotechnics

PLOT DATE: 17/11/2020 1:25:02 PM DWG FILE: Y:\33000'S\33589PNM AVALON BEACH\CAD\33589PNM.DWG

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