GEOTECHNICAL INVESTIGATION REPORT

ALTERATIONS AND ADDITIONS TO A DWELLING
21A GREYCLIFFE STREET, SEAFORTH NSW

PREPARED FOR GREG RITCHIE
REPORT ID: G25023QUE-R01F

Date: 7th April 2025
Revision No.: 0

Client:
Old For New Pty Ltd
615 Great Western Highway
Greystanes NSW 2145

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Field Engineer / Scientist: M. Kilham

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1 PROJECT INFORMATION

1.1 INTRODUCTION AND OBJECTIVES

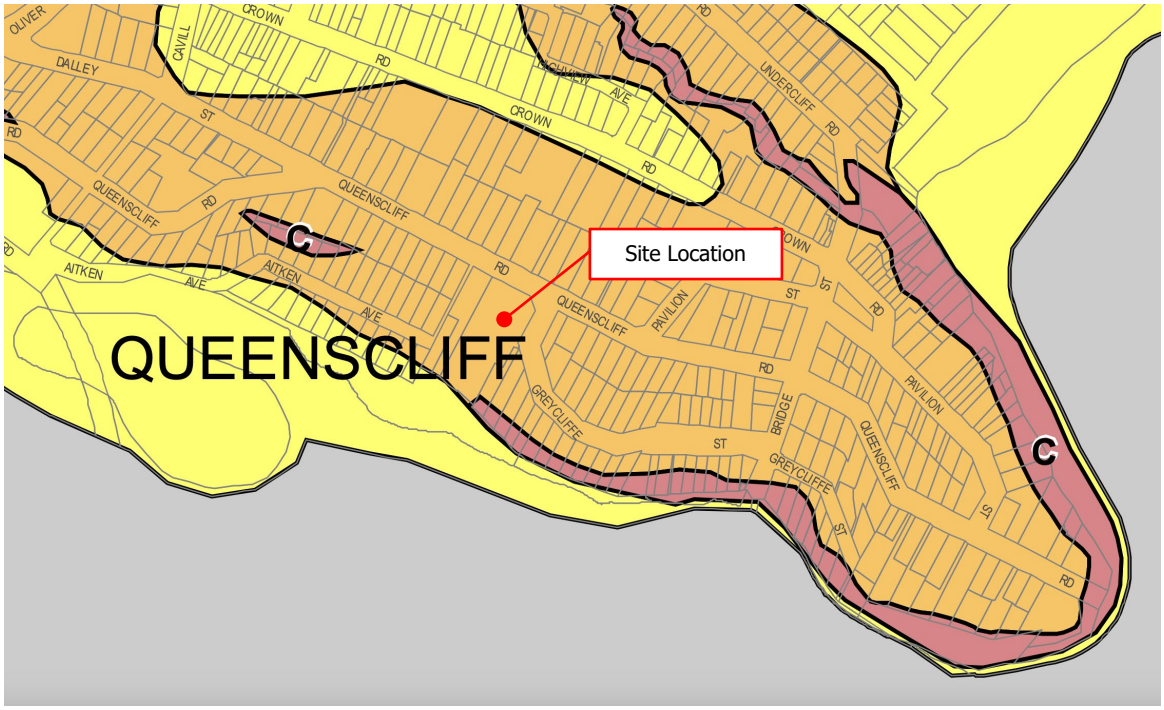
Geo-Environmental Engineering (GEE) was commissioned by Greg Ritchie from Old For New Pty Ltd to undertake a geotechnical assessment at 21a Greycliffe Street, Queenscliff NSW (herein referred to as the 'site'). A copy of the DA Basix plans are provided in **Appendix A**.

The investigation relates to proposed alterations and additions to an existing dwelling and was required to support a development application with Northern Beaches Council and to address potential landslide risk, because site lies in Landslip Risk Area 'B' as defined under the Northern Beaches Council Landslip Risk Maps (specifically, Part 6.4 of the Warringah LEP 2011).

This report presents the factual and interpreted results of the field investigations and provides interpretation and recommendations regarding the ground conditions at the site, in accordance with client requirements and the agreed scope of work.

1.2 NORTHERN BEACHES COUNCIL DCP

The Northern Beaches Council, Waringah LEP 2011-Landslide Risk Map (see below) shows that the site is within 'Area B (Flanking Slopes from 5 to 25 Degrees)'.



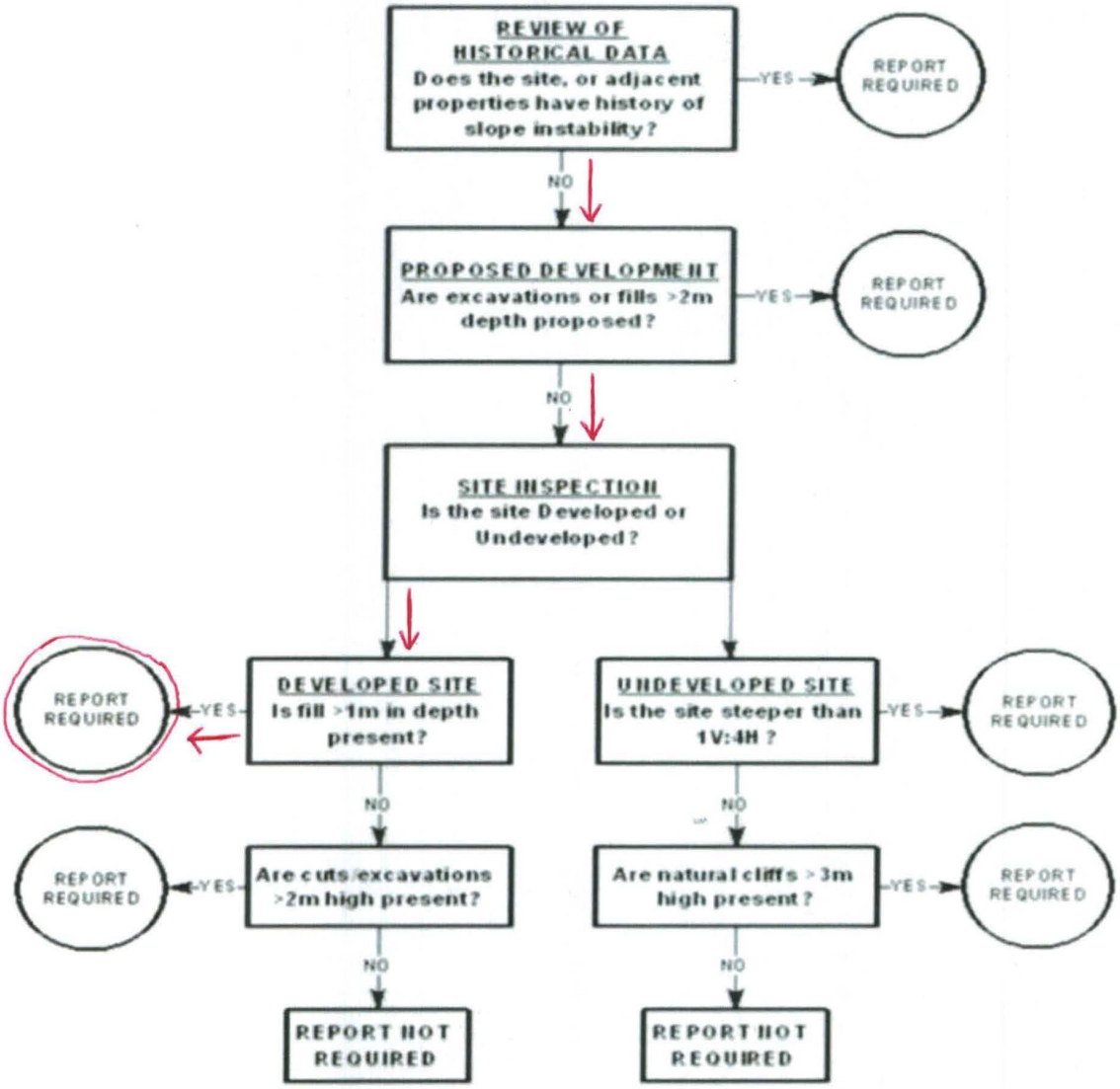
Landslip Risk Map Covering the site.

Landslip Risk Map Key.

For land in Area B, a Checklist (refer to Section 3.2) is used to determine whether a geotechnical report is required. This checklist is provided below, and GEE considers that a geotechnical report is required.

DATE OF ASSESSMENT : 1/4/2025 **ASSESSMENT BY :** Matthew Kitham

CHECKLIST FOR COUNCIL'S ASSESSMENT OF SITE CONDITIONS AND NEED FOR GEOTECHNICAL REPORT



1.3 PROPOSED DEVELOPMENT

According to the architectural plans, a copy of which is provided in **Appendix A**, the proposed alterations and additions include:

- ◊ Demolition of existing structures in the rear yard,
- ◊ The extension of the rear northwest corner of the existing dwelling and the construction of a new studio in the rear southwest corner of the site, and
- ◊ A new timber deck extending from the front verandah of the dwelling.

1.4 SCOPE OF WORK

To satisfy the above objectives, GEE completed a geotechnical site investigation which included the following scope of work:

- ◊ Performance of a Before You Dig Australia (BYDA) desktop search for buried services,
- ◊ Review of published geological, soils and acid sulfate maps for the area,
- ◊ Visual appraisal of the site conditions and locality,
- ◊ Drilling and logging of two (2) boreholes (BH1 and BH2) in accessible areas across the site to assess the nature and consistency of subsurface soils and the depth of the underlying bedrock,
- ◊ Mapping of site features and review of the site slope stability using AGS 2007 Guidelines (reference 1), and
- ◊ Preparation of this report.

2 SITE INFORMATION

2.1 SITE DESCRIPTION

The site is located to the west of Greycliffe Street and is surrounded by low-density apartment buildings to the south, west and north. The site covers an area of 283.1m^2 (by survey) and is legally described as Lot B in Deposited Plan DP 961049.

At the time of our investigation the site was occupied by a one and two storey brick dwelling. The dwelling has been constructed with minor cut and fill techniques into the natural southerly dipping hillslope with an average interpreted slope of 8 to 9 degrees.

The southern boundary is retained by a concrete block retaining wall up to 1.70m in height, **Plates 2, 3 and 4** with the northern boundary being retained by a brick wall and a separate concreted wall, **Plates 5 and 6**. A garage has been constructed into the southern side of the ground floor level which is accessed by a concrete driveway from Greycliffe Street, **Plate 1**.

The rear yard has a small garden area along the rear northern boundary, a fibro shed in the southwest corner and an enclosed outdoor area in the northwest corner. The remaining paths and open areas were covered in tiles, **Plates 8 and 9**. The front yard comprised an open garden area, with a concrete driveway and concreted pathways down both sides of the dwelling, **Plate 1**.

From the 1943 'Sixmaps' imagery, some broken sandstone outcrop does appear to be evident immediately downslope and to the west of the southwest corner of the site, noting it has likely been removed or buried. It is also noted that the Sydney Water Sewer line crossing the southwest corner of the site has an invert depth of approximately 2.0m bgs suggesting that a natural step / low cliff line is likely to be present in proximity to the southwest corner of the site, as the sewers are generally founded into the underlying bedrock where possible. A natural stepped sandstone cliff line up to 10 metres in height striking approximately east-west is evident approximately 30 to 40 metres downslope from the site, running parallel with Greycliffe Street.

The brick dwelling noted it appeared to be in sound condition. Given the likely interpreted stepped or sloped nature of the sandstone bedrock it is likely that the dwelling has been founded into the underlying sandstone bedrock. The boundary retaining walls, concrete paths and driveways had various degrees of minor cracking noting these are likely present due to variable foundation and construction conditions rather than evidence of active slope instability.

GEE notes that observations of the natural sandstone outcrop suggest the presence of detached or weathered in-situ sandstone boulders and outcrop within or adjacent to the site is possible. Given the depth of the sewer line across the southwest corner of the site, the retaining wall along the southern boundary is expected to be retaining fill with a depth of up to 1.70m in height. The nature of this fill was not determined during the investigation.

Finally, it is noted that a Sydney Water Sewer Line comprising a 225 VC pipeline crosses the southwest corner of the site. An adjacent man cover shows the invert depth of the pipe is approximately 2 metres below ground surface. A copy of the Sydney Water BYDA plan is provided for reference in **Appendix B**.

Existing site features are detailed on **Figure 1**, while **Figure 2** includes cross sections A-A' and B-B' which detail the interpreted surface and sub-surface profile across the site. Photographs of the site which were taken at the time of the site investigation are provided for reference in **Plates 1 to 9** below.

Plate 1: Front of the dwelling viewed to the west.

Plate 2: Southern boundary of the site viewed to the west.

Plate 3: Southern site boundary viewed to the west.

Plate 4: Southern site boundary viewed to the north.

Plate 5: Low concrete retaining wall along northern site boundary viewed to west.

Plate 6: Low concrete retaining wall along northern site boundary viewed to east.

Plate 7: Boundary with 68a Queenscliff Road viewed to west.

Plate 8: Rear yard viewed to the north.

Plate 9: Rear yard viewed to the south.

2.2 TOPOGRAPHY

The site has been developed by constructing into a natural southerly dipping hillslope. A review of the site survey plan (**Appendix A**) indicates that the site surface elevation falls from approximately 25.6m above Australian Height Datum (AHD) along the front northeast corner of the site to approximately 23.8m AHD along the front southeast corner of the site.

2.3 GEOLOGY AND SOIL

A review of the regional geological map (reference 2) indicates that the site is underlain by the Triassic aged Hawkesbury Sandstone Formation. The Hawkesbury Sandstone Formation typically comprises "*…Medium to coarse-grained quartz sandstone, very minor shale and laminite lenses*".

A review of the regional soils map indicates that the site is located within the (Colluvial) Hawkesbury Soil Landscape. (reference 3). The Hawkesbury Soil Landscape comprises rugged rolling to steep hills on Hawkesbury Sandstone, narrow crests and ridges, incised valleys, steep sided slopes and rocky benches, broken scarps and boulders. Limitations of the Hawkesbury Group Soils include extreme soil erosion hazard, mass movement

(rockfall hazard), steep slopes, rock outcrops, highly permeable and of low fertility. Soils of the Hawkesbury group are characterised by shallow to moderately deep (30-100cm) yellow earth and earthy sands. These soils typically are very permeable, have low fertility and form a high soil erosion hazard.

Rock outcrop and sub-surface soils identified during the fieldwork were consistent with the published mapping.

2.4 HYDROGEOLOGY

Based on the regional geological and soils information, the groundwater beneath the site is likely to be confined or partly confined, discrete, water-bearing zones within the bedrock formation. However, intermittent water seepage may also occur along the fill/colluvium, colluvium/residual and residual soil/bedrock contacts and from defects within the bedrock formation. This perched water is considered to be recharged by rainfall and is intermittent and variable in quantity.

2.5 ACID SULFATE SOIL POTENTIAL

Acid Sulfate Soil is naturally occurring sediments and soils containing iron sulfides (principally iron sulfide, iron disulfide or their precursors). Oxidation of these soils through exposure to the atmosphere or through lowering of groundwater levels results in the generation of sulfuric acid.

Land that may contain potential acid sulfate soils was mapped by the NSW Department of Land and Water Conservation (DLWC) and based on these maps local Councils produced their own acid sulfate soil maps to be used for planning purposes.

The regional DLWC Acid Sulfate Soil Risk Map for Sydney Heads (reference 4), indicates that the site lies within an area with no known occurrences of acid sulphate soil and land activities within this area are "...*not likely to be affected by acid sulphate soil materials*".

The ASS Planning Map produced by the NSW Department of Planning and Environment for Northern Beaches Council, and available via interactive online mapping, indicates that the site is situated within an area classified as 'Class 5'. According to Part 6.1 of the Manly Local Environment Plan (LEP) 2013 a preliminary assessment of acid sulfate soil, and potentially a management plan, is required for "…*works within 500m of adjacent Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum and by which the watertable is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 and 4 land*".

The surface elevation is greater than 5m AHD and the maximum depth of excavation is not extending below 1m AHD. In this regard, dewatering below 1m AHD is not required and therefore there is no need for an acid sulphate soil assessment or management plan.

3 FIELD INVESTIGATIONS

Fieldwork was undertaken on the 1st of April 2025 by Mathew Kilham from GEE and the work comprised:

- ◊ A site inspection,
- ◊ The drilling and logging of boreholes (BH1 to BH2) in accessible areas across the site to assess the soil conditions and depth to bedrock, and
- ◊ Mapping of site features and review of the site slope stability using AGS 2007 Guidelines.

3.1 BOREHOLE DRILLING

Prior to commencement of the fieldwork, an inspection for potential underground services and utilities was completed and cross-checked with the results of a BYDA search.

The boreholes were drilled using an 85mm diameter stainless steel hand auger. During the drilling of each borehole the encountered fill, natural soils and bedrock were geologically logged taking care to describe the presence and depth of fill material / previously disturbed ground, the natural stratum, moisture, seepages or water bearing zones. GEE notes that boreholes could not be undertaken along the lower half of the site which was covered in concrete pavement.

The boreholes were advanced through minor topsoil and fill materials (i.e. either disturbed or imported material), into thin underlying residual sandy soils before refusing on the weathered sandstone bedrock at 0.6 metres below ground surface (bgs) at BH1 and 0.30 metres bgs at BH2.

The location of the boreholes was estimated using measurements from existing features and are detailed on **Figures 1 and 2**.

3.2 LANDSLIP RISK ASSESSMENT

The landslip risk assessment comprised:

- ◊ Mapping of site features including slopes, structures, geology and geomorphology to identify potential geotechnical hazards,
- ◊ Recording of data on site cross sections,
- ◊ Review of identified geotechnical hazards and general site slope stability using AGS 2007 Guidelines (reference 1).

The site assessment is presented in Section 4.2 and includes a review of our assessment and opinions on slope instability risk for the site and proposed development.

4 INVESTIGATION RESULTS

4.1 SUBSURFACE CONDITIONS

The subsurface conditions, as observed in the boreholes, typically comprised shallow sandy topsoil / fill overlying sporadic residual sandy soils then the weathered sandstone bedrock profile. A summary of the subsurface conditions encountered across the site are provided in **Table 1**.

Table 1: Summary of Subsurface Conditions

Layer / Unit	Description	Depth to the Base of the Layer (m)[1]	Soil Consistency or Relative Density
FILL/ TOPSOIL	SAND trace Silt: dark grey black, fine to coarse grained, trace fine to coarse gravel roots, with occasional anthropogenic inclusions (concrete, brick, terracotta, ceramics), moist to wet.	0.15 – 0.25	Very loose
COLLUVIUM	SAND: dark grey, fine to coarse grained, roots, moist to wet	0.30 -- 0.50	Very loose
RESIDUAL SOIL	Clayey SAND: orange-brown, fine to coarse grained, trace roots, wet.	0.60	Loose to medium dense
BEDROCK	SANDSTONE: extremely to highly weathered, fine to coarse grained	>0.30 – 0.60	Estimated very low strength

Note 1: Determined from borehole observations.

Estimated sections that summarise the ground conditions across the site are provided for reference as **Figure 2**.

4.1.1 GROUNDWATER

Permanent groundwater (i.e. the water table) was not encountered during the drilling of the boreholes. However, seepage water was observed in BH1 on the fill / colluvium contact and is expected to develop at the interfaces of the colluvium / residual soil, residual soil / bedrock interfaces. This water is perched water that is typically recharged directly by rainfall and therefore its occurrence is generally intermittent, and rates of seepage are expected to vary significantly.

4.2 LANDSLIP RISK ASSESSMENT

4.2.1 HAZARD ASSESSMENT

The dwelling, retaining walls and associated structures appeared to be in sound condition, with observed cracking where present likely related to differential settlements due to variable foundation materials, poor founding techniques or design / construction related issues. The minor distress in structures is not considered to be evidence of larger slope instability issues on the site.

4.2.2 SLOPE RISK ASSESSMENT RESULTS

There was no evidence of past or present slope instability within the site. It is noted that some potential for instability in retaining structures along the southern and northern site boundaries may exist where the retaining structures and natural slope are not adequately maintained.

GEE notes that in the absence of any direct or presumed evidence of recent slope instability (last several hundred years and more), the likelihood of landslide activity initiating on or adjacent to (but influencing) the site over a notional design life for the continuing existence of the present developments on these properties of 50 years, is considered 'RARE'.

Our slope risk assessment has been carried out based on the current slope conditions and how they would be expected to interact with the proposed development.

4.2.3 ASSESSMENT AND MAINTENANCE OF EXISTING STRUCTURES

GEE noted that the sub-surface profile across the lower half of the site could not be accessed due to the concrete pavements at the time of the investigation.

GEE makes the following recommendations to ensure the following structures and slopes are adequately assessed and maintained:

- ◊ Retaining walls along the lower southern boundary and upper northern site boundaries to be assessed by a qualified structural engineer to ensure their current condition is adequate and meet the requirements of AS4678-2002: Australian Standard, 2002: Earth Retaining Structures (reference 5).
- ◊ Site drainage should be assessed to make sure surface water flows are not directly impacting retaining structures and natural slopes below.

4.2.4 PROPOSED DEVELOPMENT

It is our opinion that the proposed development can be completed so that the slope conditions and structural elements will have a low risk or lower in regard to slope instability, when assessed in accordance with the guidelines in AGS 2007 (reference 1). This is contingent on the following:

- ◊ All recommendations of this report being faithfully implemented, and
- ◊ The engineering design, construction controls and monitoring, and final engineering verifications as appropriate, being properly undertaken in accordance with the normally accepted practice and regulation for this type of development.

Furthermore, reference is made to AGS Geoguide LR8 'Hillside Construction Practice', **Appendix C** which provides relevant advice on good construction practices for dwellings and structures constructed on hill slopes.

5 CONCLUSION

GEE considers that sufficient information has been gained to be confident of the subsurface conditions across the site and to provide Council with assurances regarding the geotechnical feasibility of the proposed development and the risk of instability.

Based on the results of the investigation, it is concluded that the development can be undertaken with appropriate engineering design and construction controls, such that the risks of slope instability associated with the works and the completed development will be acceptable, i.e. low risk, in accordance with AGS Guidelines.

GEE will be pleased to assist with any further advice or geotechnical services required in regard to the proposed development.

6 GENERAL LIMITATIONS

Soil and rock formations are variable. The logs or other information presented as part of this report indicate the approximate subsurface conditions only at the specific test locations. Boundaries between zones on the logs or stratigraphic sections are often not distinct, but rather are transitional and have been interpreted.

The precision with which subsurface conditions are indicated depends largely on the frequency and method of sampling, and on the uniformity of subsurface conditions. The spacing of test sites also usually reflects budget and schedule constraints. Groundwater conditions described in this report refer only to those observed at the place and under circumstances noted in the report. The conditions may vary seasonally or as a consequence of construction activities on the site or adjacent sites.

Where ground conditions encountered at the site differ significantly from those anticipated in the report, either due to natural variability of subsurface conditions or construction activities or changes to the design of the development, it is a condition of this report that GEE be notified of any variations and be provided with an opportunity to review the recommendations of this report. Recognition of changed soil and rock conditions requires experience and it is recommended that a suitably experienced geotechnical engineer be engaged to visit the site with sufficient frequency to detect if conditions have changed significantly.

The comments given in this report are intended only for the guidance of the design engineer, or for other purposes specifically noted in the report. The number of boreholes or test excavations necessary to determine all relevant underground conditions which may affect construction costs, techniques and equipment choice, scheduling, and sequence of operations would normally be greater than has been carried out for design purposes. Contractors should therefore rely on their own additional investigations, as well as their own interpretations of the borehole data in this report, as to how subsurface conditions may affect their work.

7 REFERENCES

1. Practice Note Guidelines for Landslide Risk Management 2007 [and Commentary], Australian Geomechanics, Vol.42, No.1, March 2007.
2. Department of Mineral Resources, 1983: Sydney 1:100,000 *Geological Series Map Sheet 9130 (Edition 1).*
3. Department of Land and Water Conservation (DLWC), 2004: Sydney 1:100 000 Soil Landscape Series Sheet 9130 (second edition).
4. DLWC, 1997: Department of Land and Water Conservation of NSW, 1997: Sydney Heads Acid Sulfate Soil Risk Map – Edition Two.
5. Australian Standard AS4678-2002: Australian Standard, 2002: Earth Retaining Structures.

FIGURES

1 – Site Plan
2 – Site Sections A - A' and B - B'

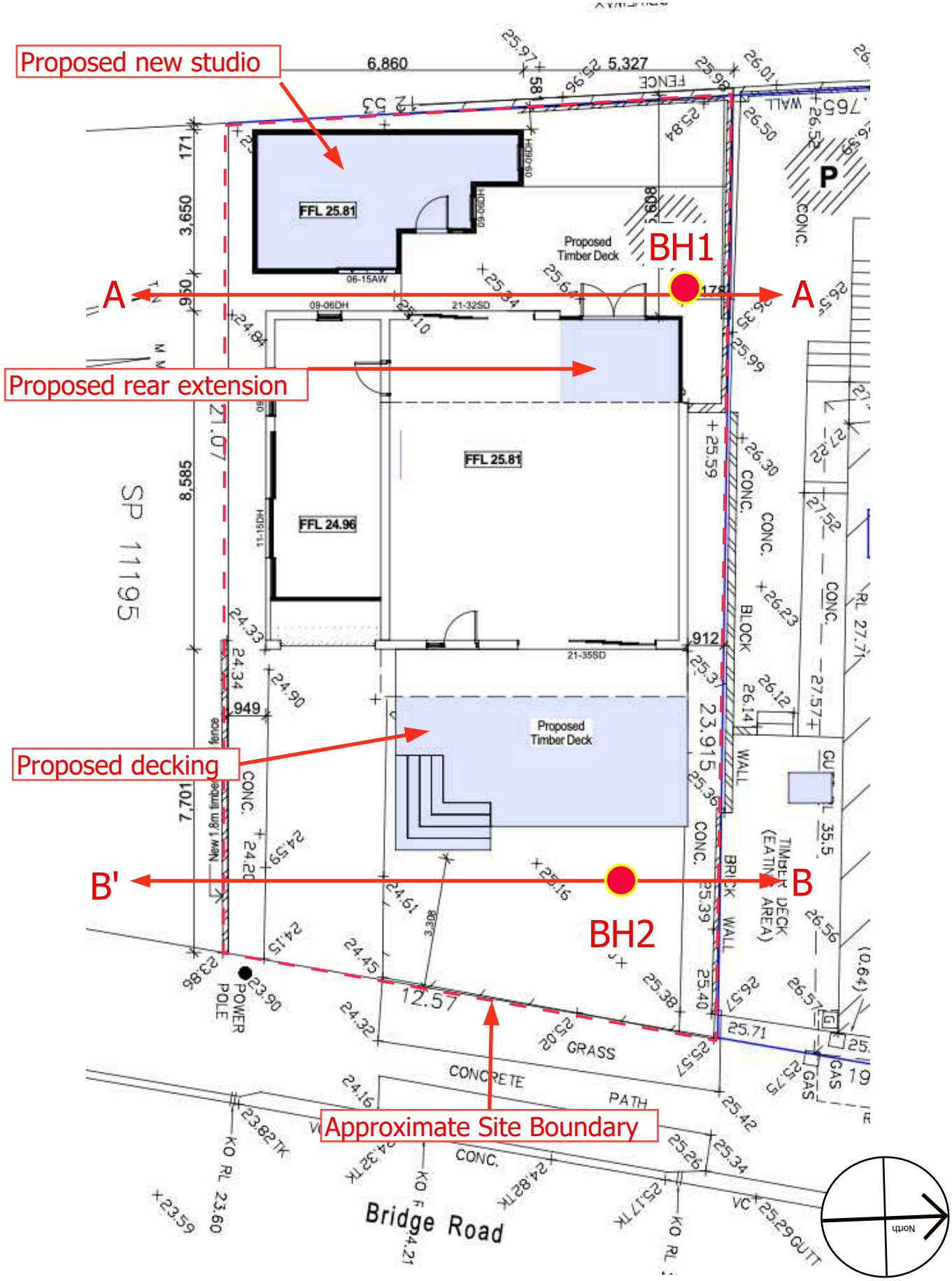


Image from 'Projects Quay', Basix Certificate Drawings ' Site Shadows and Waste Plans' ' Job No. 24Gre21aE

DRAWN:	SCALE:	JOB No.:	DATE:	REVISION:	FIGURE No.:
M.Kilham	N.T.S	G25023QUE	3 APRIL 2025	A	1

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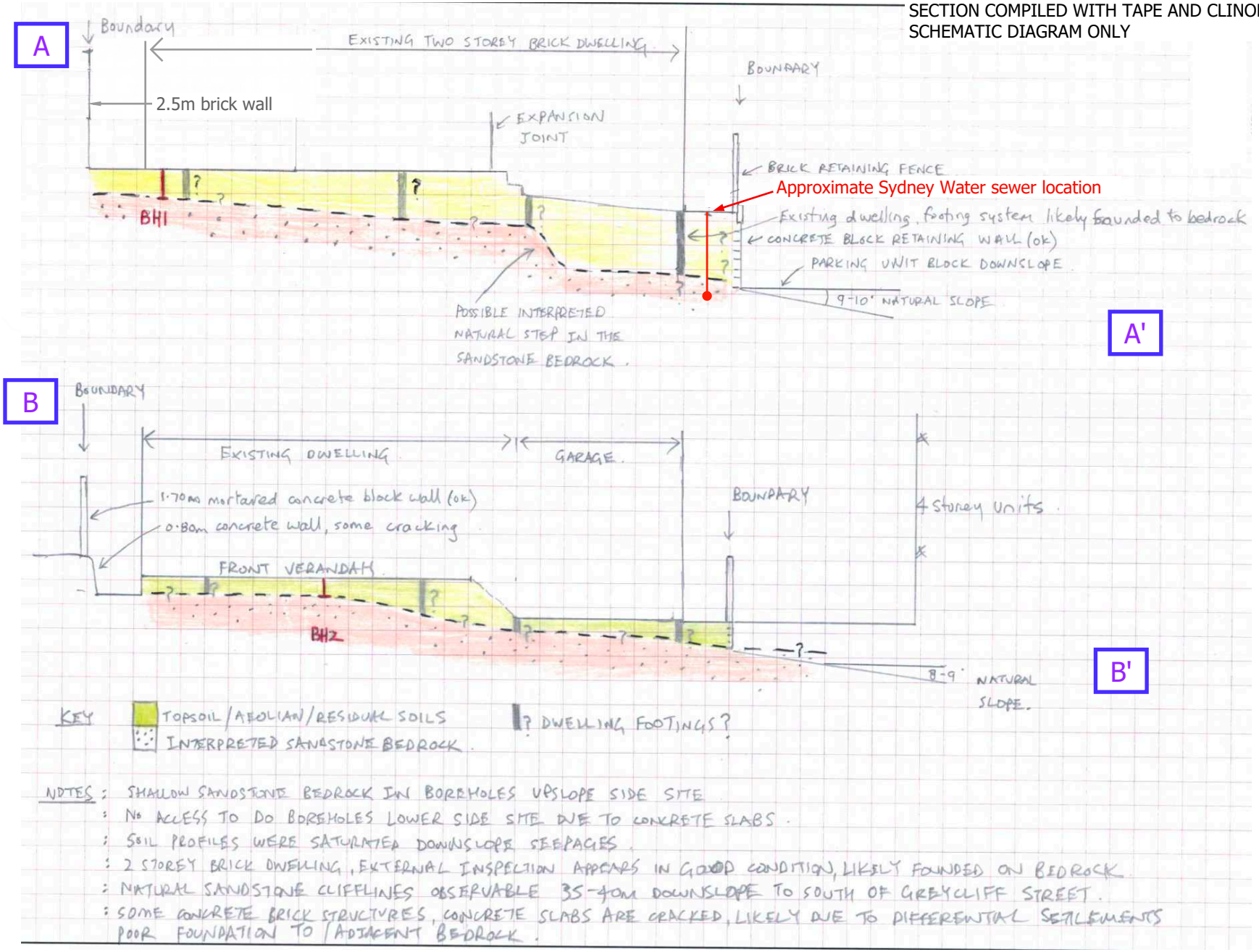
TITLE:

SITE PLAN

21a Greycliffes Street, QUEENSCLIFF NSW

SECTION COMPILED WITH TAPE AND CLINOMTER
SCHEMATIC DIAGRAM ONLY



NOTES:
- SHALLOW SANDSTONE BEDROCK IN BOREHOLES UPSLOPE SIDE SITE
- NO ACCESS TO DO BOREHOLES LOWER SIDE SITE DUE TO CONCRETE SLABS.
- SOIL PROFILES WERE SATURATED DOWNSLOPE SEEPAGES.
- 2 STOREY BRICK DWELLING, EXTERNAL INSPECTION APPEARS IN GOOD CONDITION, LIKELY FOUNDED ON BEDROCK
- NATURAL SANDSTONE CLIFFLINES OBSERVABLE 35-40m DOWNSLOPE TO SOUTH OF GREYCLIFF STREET.
- SOME CONCRETE BRICK STRUCTURES, CONCRETE SLABS ARE CRACKED, LIKELY DUE TO DIFFERENTIAL SETTLEMENTS POOR FOUNDATION TO / ADJACENT BEDROCK.

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TITLE: SITE SECTIONS A-A' , B-B' 21a Greycliffes Street, QUEENSCLIFF NSW	SCALE: **N.T.S**	DATE: **3 April 2025**	FIGURE No.: **2**
	DRAWN: **M.Kilham**	JOB No.: **G25023QUE**	REVISION: **A**

APPENDIX A

Survey and Architectural Plans (3 Sheets)

THESE PLANS ARE TO BE READ IN CONJUNCTION WITH THE CURRENT BASIX CERTIFICATE
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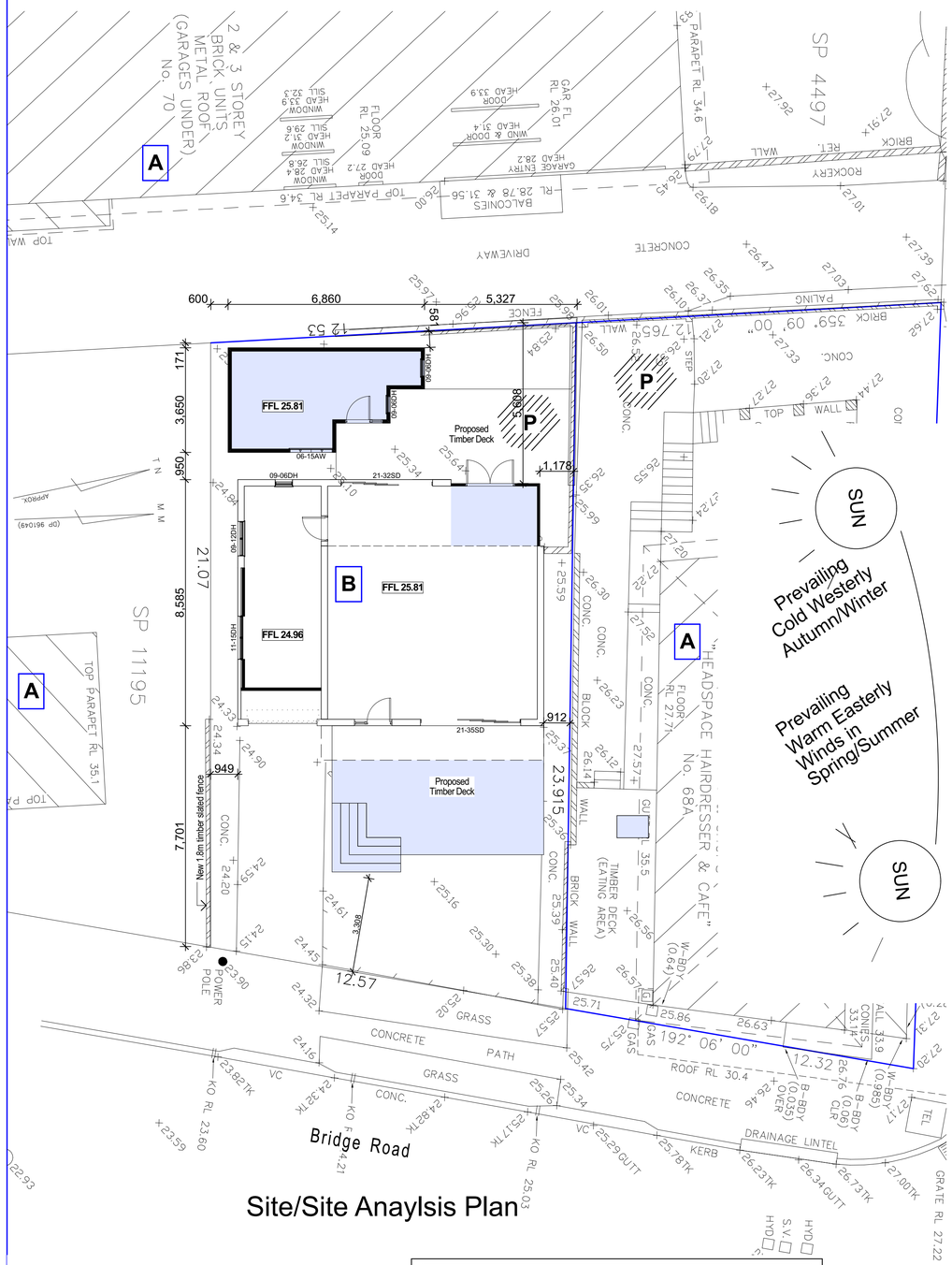
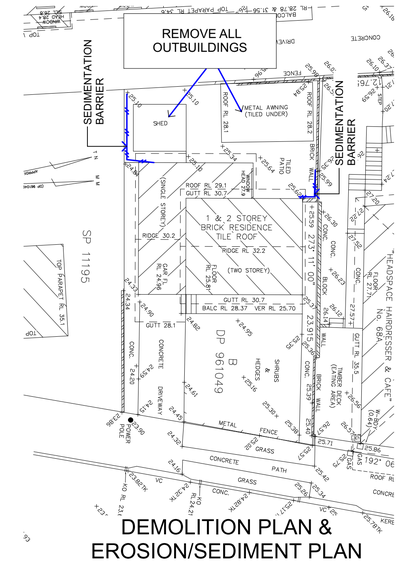


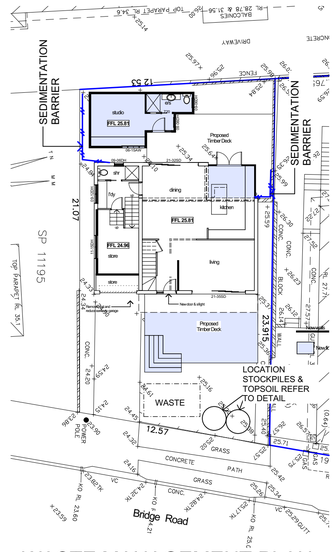
Site/Site Anaylsis Plan

CARPORT
SITE
CONTOURS
A THREE STOREY
B TWO STOREY
P PRIVATE OPEN SPACE
OVERLOOKING
EXISTING TREES

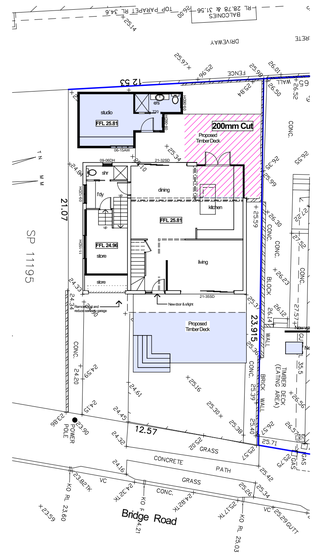
BAR SCALE 1 0 1 2 3 4 5 6 7 8



DEMOLITION PLAN & EROSION/SEDIMENT PLAN

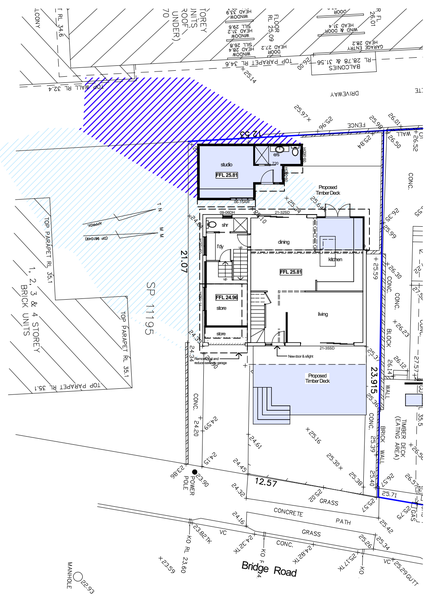


WASTE MANAGEMENT PLAN r

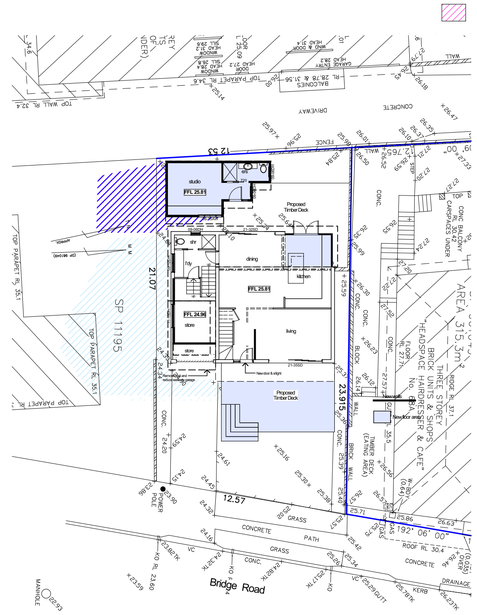


CUT & FILL PLAN nts.

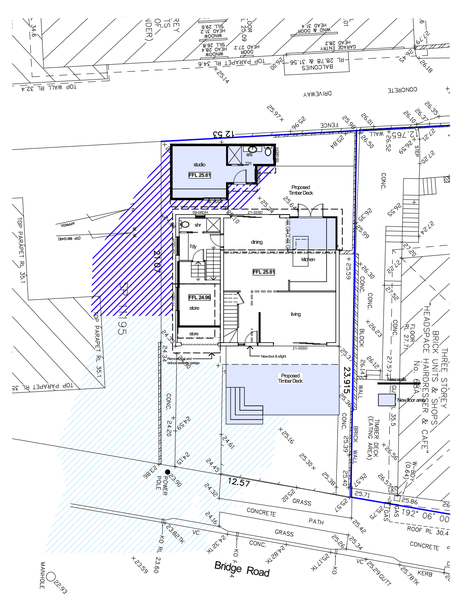
Cut & fill



SUN SHADING PLAN 9.0am nts



SUN SHADING PLAN 12 PM nts



SUN SHADING PLAN 3 PM nts

New shadows
Existing shadows

Colour Schedule

ALL EXTERNAL WALLS TO RE-CLADD OR PAINTED

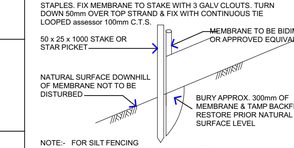
ROOFING	MAIN WALLS	GARAGE/DOORS/WINDOWS
MANUF.: Colorbond	MANUF.: Dulux	MANUF.: Dulux
COLOUR: Windspray	COLOUR: Grey	COLOUR: Vivid White
WINDSPRAY® SA = 0.58. BCA = M	Tranquil Retreat	Vivid White™ SW1G1

LOT B DP 961049
AREA: 283.1m2

SITE DATA

SITE AREA:	= 283.1m²
MAX F.S.R:	= No controls
EXISTING DWELLING:	= 140m²
EXTENSION:	= 26m²
TOTAL:	= 166m²

STRING 16 GAUGE WIRE TAUTLY BETWEEN STAKES & FIX BY STAPLES. FIX MEMBRANE TO STAKE WITH 3 GALV CLOUTS. TURN DOWN 50mm OVER TOP STRAND & FIX WITH CONTINUOUS TIE LOOPED assessor 100mm C.T.S.



NOTE:- FOR SILT FENCING
CLEAN BEHIND FENCE AFTER EACH MAJOR STORM OR OTHERWISE AS DIRECTED AND REMOVE SILT FROM SITE. SITE DISPOSAL WILL ONLY BE APPROVED WHERE IT CAN BE ESTABLISHED THAT NO FURTHER EROSION OF THE MATERIAL CAN OCCUR.

SILT FENCE DETAIL N.T.S.

Smoke Alarm
Mechanical Exhaust Fan
Floor Waste
+10.00 existing levels
+10.00 proposed levels
Smoke Alarm

PROJECTS QUAY
P.O. Box 30, Crows Nest, NSW,1585
p: 9439 7455, f: 9906 3453
e: abkavangh@bigpond.com

www.dialbeforeyoudig.com.au
DIAL1100 BEFORE YOU DIG

Builder to confirm all floor levels match Storm Water plans before proceeding with site works.

ISSUE	DESCRIPTION	DATE
B	DA Plans	13/03/25
A	Draft Plans	17/12/24

project: PROPOSED ALTERATIONS & ADDITIONS TO EXISTING DWELLING

project: No.21a Greycliffe Street, QUEENSCLIFF.

drawing title: Site, Shadows & Waste Plans

designer: Gregg Ritchie | drawn: Gregg Ritchie | date: Dec 2024 | scale: 1:100, 1:200 & 1:500 | 1/3 | issue: B. | job No: 24Gre21aE

THESE PLANS ARE TO BE READ IN CONJUNCTION WITH THE CURRENT BASIX CERTIFICATE
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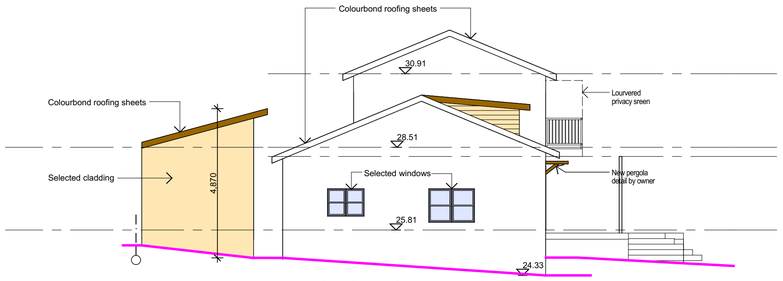
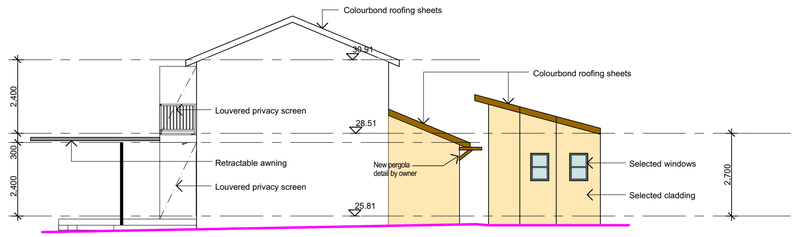
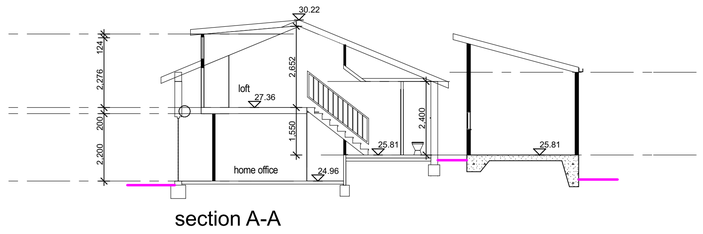


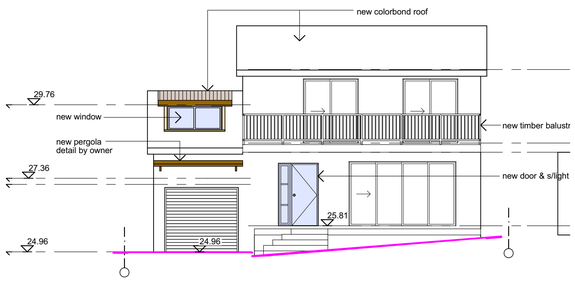
south elevation



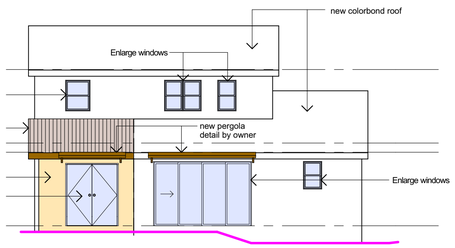
north elevation



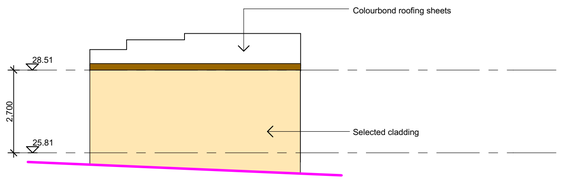
section A-A



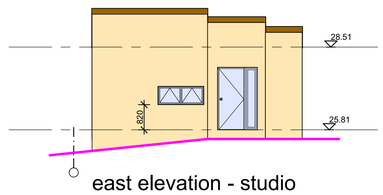
east elevation



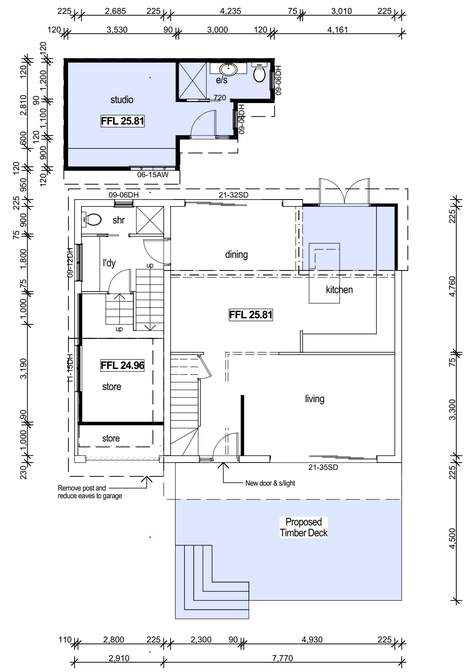
west elevation



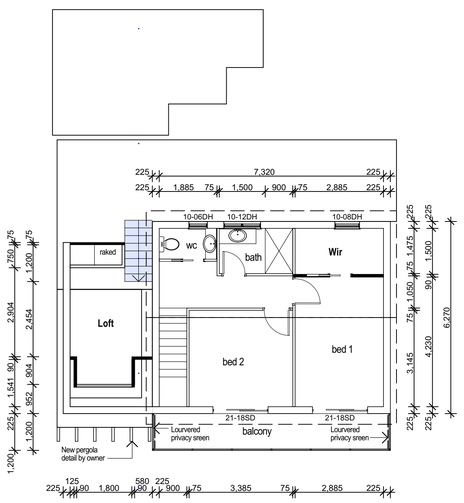
west elevation - studio



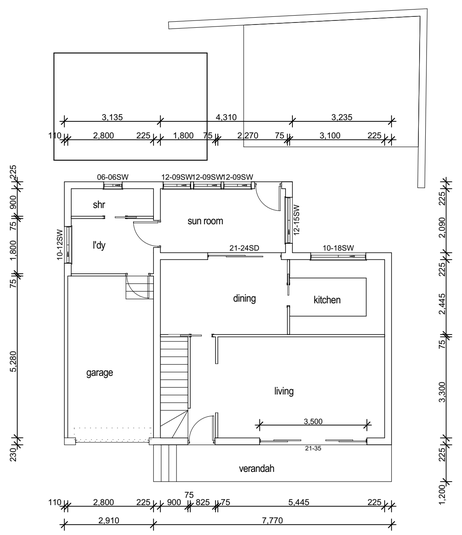
east elevation - studio



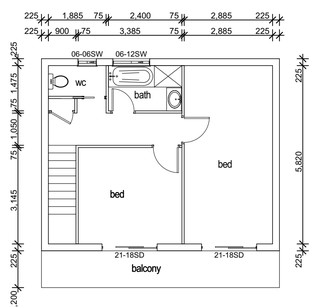
proposed ground floor plan



proposed first floor plan



existing ground floor plan



existing first floor plan

1 0 1 2 3 4 5 6 7 8
BAR SCALE

Smoke Alarm
Mechanical Exhaust Fan
f/w Floor Waste
+10.00 existing levels
+10.00 proposed levels
Smoke Alarm

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Builder to confirm all floor levels match Storm Water plans before proceeding with site works.

ISSUE	DESCRIPTION	DATE
B	DA Plans	13/03/25
A	Draft Plans	17/12/24

project: PROPOSED ALTERATIONS & ADDITIONS TO EXISTING DWELLING

project: No.21a Greycliffe Street, QUEENSCLIFF.

drawing title: Floor Plans, Elevations & Section

designer:	drawn:	date:	scale:			issue:	job No:
Gregg Ritchie	Gregg Ritchie	Dec 2024	1:100, 1:200 & 1:500		2/3	B.	24Gre21aE

THESE PLANS ARE TO BE READ IN CONJUNCTION WITH THE CURRENT BASIX CERTIFICATE
THESE PLANS ARE TO BE READ IN CONJUNCTION WITH THE CURRENT BASIX CERTIFICATE

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BASIX® Certificate

Building Sustainability Index www.basix.nsw.gov.au

Alterations and Additions

Certificate number: A1786549

This certificate confirms that the proposed development will meet the NSW government's requirements for sustainability, if it is built in accordance with the commitments set out below. Terms used in this certificate, or in the commitments, have the meaning given by the document entitled "BASIX Definitions" dated 10/09/2020 published by the Department. This document is available at www.basix.nsw.gov.au

Secretary
Date of issue: Saturday, 08 March 2025
To be valid, this certificate must be lodged within 3 months of the date of issue.

NSW GOVERNMENT

Project address	
Project name	Greycliffe Street 21A
Street address	21A GREYCLIFFE Street QUEENSCLIFF 2096
Local Government Area	Northern Beaches Council
Plan type and number	Deposited Plan DP961049
Lot number	B
Section number	-

Project type	
Dwelling type	Dwelling house (detached)
Type of alteration and addition	I want a BASIX Certificate for optional compliance. This means I won't have to comply with any existing Council energy and water efficiency provisions.
N/A	N/A

Certificate Prepared by (please complete before submitting to Council or PCA)

Name / Company Name: OLD FOR NEW PTY LTD

ABN (if applicable): 67097021424

Construction	Show on DA Plans	Show on CC/CDC Plans & specs	Certifier Check
Insulation requirements			
The applicant must construct the new or altered construction (floor(s), walls, and ceilings/roofs) in accordance with the specifications listed in the table below, except that a) additional insulation is not required where the area of new construction is less than 2m2, b) insulation specified is not required for parts of altered construction where insulation already exists.	✔	✔	✔

Construction	Additional insulation required (R-value)	Other specifications
concrete slab on ground floor.	nil	N/A
external wall: framed (weatherboard, fibro, metal clad)	R1.30 (or R1.70 including construction)	
flat ceiling, pitched roof	ceiling: R1.45 (up), roof: foil backed blanket (55 mm)	medium (solar absorptance 0.475 - 0.70)

Glazing requirements	Show on DA Plans	Show on CC/CDC Plans & specs	Certifier Check

Windows and glazed doors glazing requirements

Window/door number	Orientation	Area of glass including frame (m2)	Overshadowing height (m)	Overshadowing distance (m)	Shading device	Frame and glass type
W1	E	7.3	0	0	awning (fixed) >=900 mm	improved aluminium, single clear, (U-value: 6.44, SHGC: 0.75)
W2	S	1.6	0	0	none	improved aluminium, single clear, (U-value: 6.44, SHGC: 0.75)
W3	S	1	0	0	none	improved aluminium, single clear, (U-value: 6.44, SHGC: 0.75)
W4	W	0.5	0	0	eave/ verandah/ pergola/balcony >=450 mm	improved aluminium, single clear, (U-value: 6.44, SHGC: 0.75)
W5	W	6.7	0	0	eave/ verandah/ pergola/balcony >=750 mm	improved aluminium, single pyrolytic low-e, (U-value: 4.48, SHGC: 0.46)
W6	W	3	0	0	eave/ verandah/ pergola/balcony >=750 mm	improved aluminium, single pyrolytic low-e, (U-value: 4.48, SHGC: 0.46)
W7	W	0.6	0	0	eave/ verandah/ pergola/balcony >=600 mm	improved aluminium, single pyrolytic low-e, (U-value: 4.48, SHGC: 0.46)
W8	W	1.2	0	0	eave/ verandah/ pergola/balcony >=600 mm	improved aluminium, single pyrolytic low-e, (U-value: 4.48, SHGC: 0.46)
W9	W	0.8	0	0	eave/ verandah/ pergola/balcony >=600 mm	improved aluminium, single pyrolytic low-e, (U-value: 4.48, SHGC: 0.46)
W10	E	1.3	0	0	eave/ verandah/ pergola/balcony >=450 mm	improved aluminium, single pyrolytic low-e, (U-value: 4.48, SHGC: 0.46)
W11	S	0.5	0	0	none	improved aluminium, single clear, (U-value: 6.44, SHGC: 0.75)

BCA NOTES: All building works must be carried out in accordance with National Building Code

The building works included in the subject application will comply with the relevant deemed-tosatisfy provisions of the NCC 2022 National Construction Code (Volume 2 & ABCB Housing Provisions) satisfy provisions of the NCC 2022 National Construction Code (Volume 2 & ABCB Housing Provisions) and relevant standards of construction. Particular reference is made to the following NCC 2022 provisions and Australian Standards, which form part of the application and will be complied with:

Demolition: -
- AS 2601(1991) - The demolition of structures

Site Preparation: -
- Earthworks - To be carried out in accordance with the requirements of the Environmental Planning & Assessment Act 1979, conditions of development consent and the relevant requirements of Part H1D9 of the NCC 2022 (Volume 2).
- Stormwater drainage - Part 3.3 of NCC 2022 (Volume 2 ABCB Housing Provisions); and ASINZS 3500 (2003)
- Part 3 - Stormwater drainage AS/NZS 3500 (2000) Part 5 - Domestic installations -
- Section 5 - stormwater drainage
- Termite protection Part 3.4 of NCC 2022 (Volume 2 ABCB Housing Provisions): and AS 3660.1(2000) - Protection of buildings from subterranean termites

Footings and Slabs: -
- Footings and slabs - Part H1D4 of NCC 2022 (Volume 2); and AS 2870 (1996) - Residential slabs and footings
- AS 3600 (2001) - Concrete structures
- AS 2159 (1995) - Piling - Design and installation
- Site classification Part 4.2 of NCC 2022 (Volume 2 ABCB Housing Provisions)

Masonry: -
- Masonry construction - Part H2D4 of NCC 2022 (Volume 2)
- AS 3700 (2001) - Masonry Code

Framing: -
- Sub-floor ventilation Part 6 .2 of NCC 2022 (Volume 2 ABCB Housing Provisions)
- Steel framing - Part 6.3.2 of NCC 2022 (Volume 2 ABCB Housing Provisions)
- AS 4100 (1998) - Steel structures
- Timber wall, floor and roof framing - Part 3.4.3 of NCC 2019 (Volume 2); and
- AS 1684 (2006) - Residential timber - frame construction
- Structural steel members - Part 6.3.2 of NCC 2022 (Volume 2 ABCB Housing Provisions)

Roof and wall cladding: -
- Roof tiling - Parts 7.3 of NCC 2022 (Volume 2 ABCB Housing Provisions) and AS 2049 (2002) - Roof tiles
- Metal roof sheeting - Parts 7.2 of NCC 2022 (Volume 2 ABCB Housing Provisions)
- Gutters and downpipes - Part 7.4 NCC 2022 (Volume 2 ABCB Housing Provisions); and
- AS/NZS 3500 (2003) Part 3 - Stormwater drainage
- AS/NZS 3500 (2000) Part 5 - Domestic installation
- Wall cladding - Part 7.5 NCC 2022 (Volume 2 ABCB Housing Provisions)

Glazing: -
- Glazing - Part 8 of NCC 2022 (Volume 2 ABCB Housing Provisions)
- Protection of Operable Windows - Clause 11.3.7
- AS 1288 (2006) Glass in buildings
- AS 2047 (1999) Windows in buildings

Fire safety:
- Fire separation - Separating wall construction - Part 9.2 & 9.3.1 of NCC 2022 (Volume 2 ABCB Housing Provisions)
- Fire separation - Roof lights - Part 9.5 of NCC 2022 (Volume 2 ABCB Housing Provisions)
- Smoke alarms - Part 9.5.4 of NCC 2022 (Volume 2 ABCB Housing Provisions) and AS 3786 (1993) - Smoke alarms
- Heating appliances - AS 2918 (2001) & Part 12.4 of NCC 2022 (Volume 2 ABCB Housing Provisions) - Domestic
- solid - fuel burning appliances - installation

Health and amenity: -
- Wet areas - Part H4P1 of the NCC 2022 (Volume 2) and AS 3740 (2004) - Waterproofing of wet areas in residential buildings.
- Room heights - Part H4P2 of NCC 2022 (Volume 2)
- Facilities - Parts H4P3 of NCC 2022 (Volume 2)
- Light - Parts H4P4 of NCC 2022 (Volume 2)
- Ventilation - Part H4P5 of NCC 2022 (Volume 2) - Clause 10.6.2.
- Sound insulation - Part H4P6 of NCC 2022 (Volume 2) - Clause 10.7.1
- Condensation and water vapour management - Part H4O7 of NCC 2022 (Volume 2)

Safe movement and access: -
- Stair construction - Part 11.2 of NCC 2022 (Volume 2 ABCB Housing Provisions) - Acceptable construction practice
- Barriers and handrails - Part 11.3 of NCC 2022 (Volume 2 ABCB Housing Provisions) - Acceptable construction
- practice
- Balustrades Installation - Clause 11.3.4 of NCC 2022

Energy efficiency: -
- Energy Efficiency - Part NSW Part H6 of NCC 2022 (Volume 2)
- Building Fabric - Part 13.2 of NCC 2022 (Volume 2)
- External Glazing - Part 13.3 of NCC 2022 (Volume 2)
- Building Sealing - Part 13.4 of NCC 2022 (Volume 2)
- Services - Part 13.7 of NCC 2022 (Volume 2)

Structural design manuals: -
- AS 1170.1 (1989) - Dead and live loads and load combinations
- AS 1170.2 (1989) or AS 4055 (1992) -Wind loads
- AS 1170.4 (1993) - Earthquake loads
- AS 1720.1 (1997) - Timber structures
- AS 2159 (1995) - Piling - design and installation
- AS 3600 (2001) - Concrete structures
- AS 4100 (1998) Steel structures

AS 1170.2 (1989) or AS 4055 (1992) -Wind loads
AS 1170.4 (1993) - Earthquake loads
AS 1720.1 (1997) - Timber structures
AS 2159 (1995) - Piling - design and installation
AS 3600 (2001) - Concrete structures
AS 4100 (1998) Steel structures

1 0 1 2 3 4 5 6 7 8
BAR SCALE

Smoke Alarm (SA) — +10.00 existing levels
Mechanical Exhaust Fan (mf) — +10.00 proposed levels
Floor Waste (fw) — Smoke Alarm (SA)

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Builder to confirm all floor levels match Storm Water plans before proceeding with site works.

ISSUE	DESCRIPTION	DATE
B	DA Plans	13/03/25
A	Draft Plans	17/12/24

project: PROPOSED ALTERATIONS & ADDITIONS TO EXISTING DWELLING

project: No.21a Greycliffe Street, QUEENSCLIFF.

drawing title: Basix Reports

designer: Gregg Ritchie | drawn: Gregg Ritchie | date: Dec 2024 | scale: 1:100, 1:200 & 1:500 | 3/3 | issue: B. | job No: 24Gre21aE

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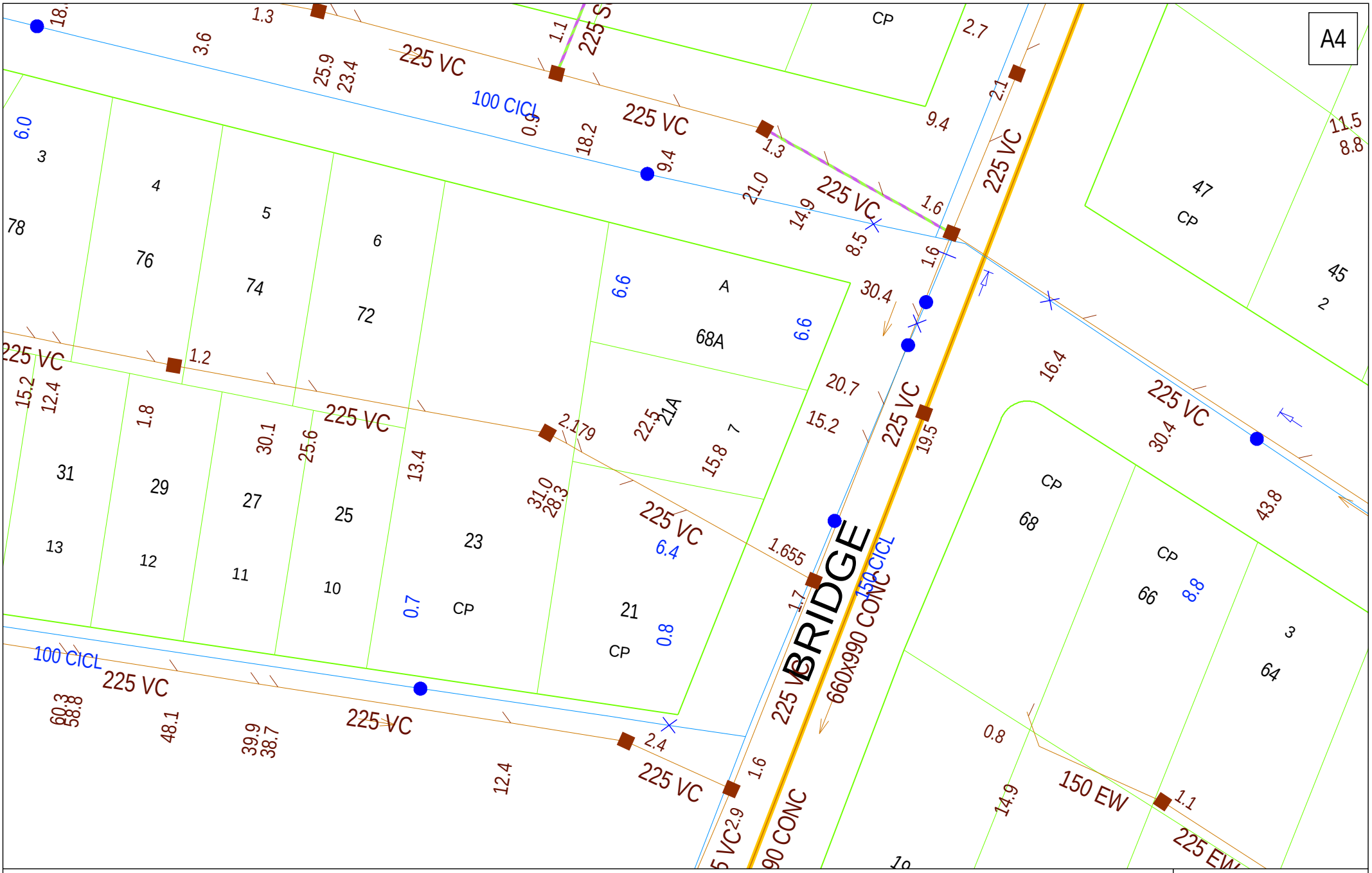
THESE PLANS ARE TO BE READ IN CONJUNCTION WITH THE CURRENT BASIX CERTIFICATE

APPENDIX B

Sydney Water Sewer Plan (1 Sheet)



DBYD Address:
21a Greycliffe St
Queenscliff NSW
2096

DBYD Job No: 39039225

DBYD Sequence No: 253324809

No warranty is given that the information shown is complete or accurate.

SYDNEY WATER CORPORATION

Scale: 1:500

Date of Production: 05/04/2025

Plan 1 of 1

N

0m 2m 4m 6m 8m 10m

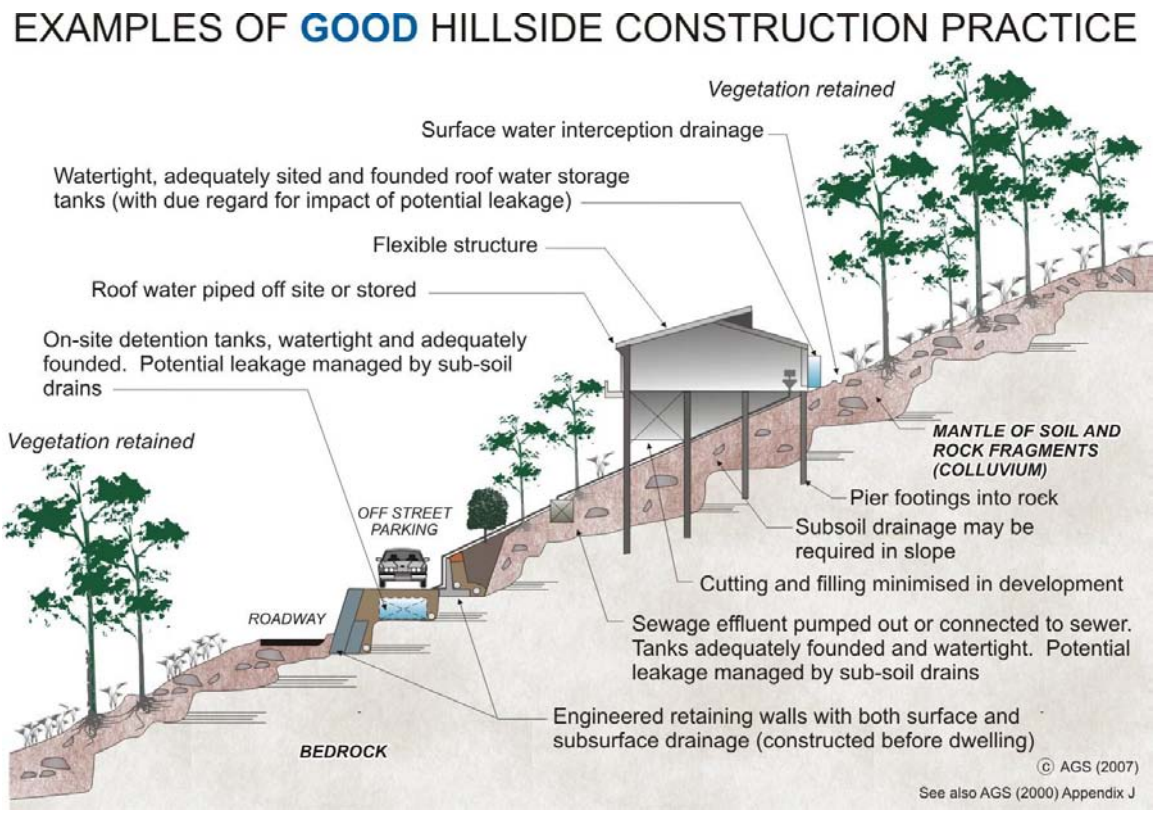
APPENDIX C

Australian Geoguide LR8 (Hillside Construction Practice - 2 Sheets)

AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

HILLSIDE CONSTRUCTION PRACTICE

Sensible development practices are required when building on hillsides, particularly if the hillside has more than a low risk of instability (GeoGuide LR7). Only building techniques intended to maintain, or reduce, the overall level of landslide risk should be considered. Examples of good hillside construction practice are illustrated below.



WHY ARE THESE PRACTICES GOOD?

Roadways and parking areas - are paved and incorporate kerbs which prevent water discharging straight into the hillside (GeoGuide LR5).

Cuttings - are supported by retaining walls (GeoGuide LR6).

Retaining walls - are engineer designed to withstand the lateral earth pressures and surcharges expected, and include drains to prevent water pressures developing in the backfill. Where the ground slopes steeply down towards the high side of a retaining wall, the disturbing force (see GeoGuide LR6) can be two or more times that in level ground. Retaining walls must be designed taking these forces into account.

Sewage - whether treated or not is either taken away in pipes or contained in properly founded tanks so it cannot soak into the ground.

Surface water - from roofs and other hard surfaces is piped away to a suitable discharge point rather than being allowed to infiltrate into the ground. Preferably, the discharge point will be in a natural creek where ground water exits, rather than enters, the ground. Shallow, lined, drains on the surface can fulfil the same purpose (GeoGuide LR5).

Surface loads - are minimised. No fill embankments have been built. The house is a lightweight structure. Foundation loads have been taken down below the level at which a landslide is likely to occur and, preferably, to rock. This sort of construction is probably not applicable to soil slopes (GeoGuide LR3). If you are uncertain whether your site has rock near the surface, or is essentially a soil slope, you should engage a geotechnical practitioner to find out.

Flexible structures - have been used because they can tolerate a certain amount of movement with minimal signs of distress and maintain their functionality.

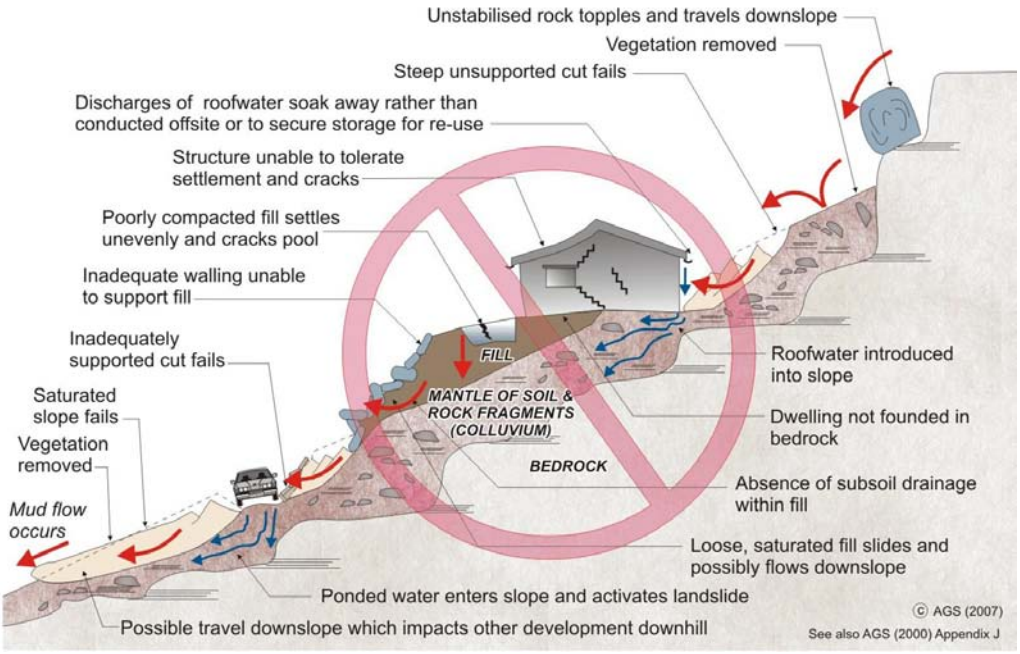
Vegetation clearance - on soil slopes has been kept to a reasonable minimum. Trees, and to a lesser extent smaller vegetation, take large quantities of water out of the ground every day. This lowers the ground water table, which in turn helps to maintain the stability of the slope. Large scale clearing can result in a rise in water table with a consequent increase in the likelihood of a landslide (GeoGuide LR5). An exception may have to be made to this rule on steep rock slopes where trees have little effect on the water table, but their roots pose a landslide hazard by dislodging boulders.

Possible effects of ignoring good construction practices are illustrated on page 2. Unfortunately, these poor construction practices are not as unusual as you might think and are often chosen because, on the face of it, they will save the developer, or owner, money. You should not lose sight of the fact that the cost and anguish associated with any one of the disasters illustrated, is likely to more than wipe out any apparent savings at the outset.

ADOPT GOOD PRACTICE ON HILLSIDE SITES

AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

EXAMPLES OF **POOR** HILLSIDE CONSTRUCTION PRACTICE



WHY ARE THESE PRACTICES POOR?

Roadways and parking areas - are unsurfaced and lack proper table drains (gutters) causing surface water to pond and soak into the ground.

Cut and fill - has been used to balance earthworks quantities and level the site leaving unstable cut faces and added large surface loads to the ground. Failure to compact the fill properly has led to settlement, which will probably continue for several years after completion. The house and pool have been built on the fill and have settled with it and cracked. Leakage from the cracked pool and the applied surface loads from the fill have combined to cause landslides.

Retaining walls - have been avoided, to minimise cost, and hand placed rock walls used instead. Without applying engineering design principles, the walls have failed to provide the required support to the ground and have failed, creating a very dangerous situation.

A heavy, rigid, house - has been built on shallow, conventional, footings. Not only has the brickwork cracked because of the resulting ground movements, but it has also become involved in a man-made landslide.

Soak-away drainage - has been used for sewage and surface water run-off from roofs and pavements. This water soaks into the ground and raises the water table (GeoGuide LR5). Subsoil drains that run along the contours should be avoided for the same reason. If felt necessary, subsoil drains should run steeply downhill in a chevron, or herring bone, pattern. This may conflict with the requirements for effluent and surface water disposal (GeoGuide LR9) and if so, you will need to seek professional advice.

Rock debris - from landslides higher up on the slope seems likely to pass through the site. Such locations are often referred to by geotechnical practitioners as "debris flow paths". Rock is normally even denser than ordinary fill, so even quite modest boulders are likely to weigh many tonnes and do a lot of damage once they start to roll. Boulders have been known to travel hundreds of metres downhill leaving behind a trail of destruction.

Vegetation - has been completely cleared, leading to a possible rise in the water table and increased landslide risk (GeoGuide LR5).

DON'T CUT CORNERS ON HILLSIDE SITES - OBTAIN ADVICE FROM A GEOTECHNICAL PRACTITIONER

More information relevant to your particular situation may be found in other Australian GeoGuides:

- GeoGuide LR1 - Introduction
- GeoGuide LR2 - Landslides
- GeoGuide LR3 - Landslides in Soil
- GeoGuide LR4 - Landslides in Rock
- GeoGuide LR5 - Water & Drainage
- GeoGuide LR6 - Retaining Walls
- GeoGuide LR7 - Landslide Risk
- GeoGuide LR9 - Effluent & Surface Water Disposal
- GeoGuide LR10 - Coastal Landslides
- GeoGuide LR11 - Record Keeping

The Australian GeoGuides (LR series) are a set of publications intended for property owners; local councils; planning authorities; developers; insurers; lawyers and, in fact, anyone who lives with, or has an interest in, a natural or engineered slope, a cutting, or an excavation. They are intended to help you understand why slopes and retaining structures can be a hazard and what can be done with appropriate professional advice and local council approval (if required) to remove, reduce, or minimise the risk they represent. The GeoGuides have been prepared by the Australian Geomechanics Society, a specialist technical society within Engineers Australia, the national peak body for all engineering disciplines in Australia, whose members are professional geotechnical engineers and engineering geologists with a particular interest in ground engineering. The GeoGuides have been funded under the Australian governments' National Disaster Mitigation Program.