

**7 Castle Close
Ventnor
Isle of Wight
PO38 1UD**

SLOPE STABILITY ASSESSMENT & DESK STUDY REPORT

**Client: Martin White
7 Castle Close
Ventnor
Isle of Wight
PO38 1UD**

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INTRODUCTION

Cowan Consultancy Limited were contacted by Mr D Gayler, Architect, on behalf of Mr White and asked to provide a slope stability assessment of the site of No. 7 Castle Close, Ventnor, Isle of Wight PO38 1UD. The assessment is to accompany a planning application for a roof top extension to the property.

This report addresses the requirements of the National Planning Policy Framework, Guidance on Land Stability. The report reviews the history of the site, the local geology and its relationship to the ancient landslide system, known as the Undercliff.

- i. This report has been prepared by Cowan Consultancy Ltd on behalf of Mr Martin White, and takes into account his particular instructions and requirements. It is not intended for and should not be relied on by any third party and no responsibility is undertaken to any third party.
- ii. No inspection has been made of woodwork or other deleterious materials that are covered, unexposed or inaccessible and hence, we are unable to report that any such item is free from defect.
- iii. Inspections for the presence of asbestos are specifically excluded, and it is recommended that you commission a specialist report if asbestos is suspected.
- iv. The condition and safety of the buildings services does not form part of this Structural Inspection Report.

THE SITE

The site is located approximately at National Grid Reference SZ553772 to the southern side of Castle Close. The site measures approximately 45m from north to south and 30m east to west.

The site is relatively level from Castle Close to the rear elevation of the property. Beyond the property there is a terraced garden followed by a steep slope leading to Undercliff Gardens. In total there is approximately 12m drop in level from the front (northern) to the rear (southern) boundaries of the site.

The existing property on the site is a single storey dwelling with slate roof, which is hipped to the front elevation and has a gable to the rear elevation. There is a single storey flat roof extension to the western side, constructed in 2009, with further alterations undertaken in 2017.

The building was originally constructed as a train workshop/shed but was converted to a residential property following closure of the railway lines.

Photos taken during the 2009/17 extension and alteration works to the property were made available to us, copies are contained in the appendices. It is understood that the extensions are founded on traditional shallow foundations. Anecdotal evidence, supported by the images, suggest the surface geology across the site is formed from sandstone blocks.

PROPOSALS

The proposals for the site are to construct a new first floor extension above the ground floor bedroom at the north-west corner of the property.

The extension will measure approximately 4.5m wide by 8m deep on plan and will be accessed via a new staircase from the ground floor. The extension will have a mansard style roof structure with a slate covered sloping roof to the front elevation and a flat roof over the new bedroom. The southern elevation will have a glazed façade with door to access the existing flat roof, which will be utilised as a balcony. Drawings indicating the proposals are contained in the appendices of this report.

It is assumed the existing foundation building foundations will be suitable to support the roof extension but the roof joists may need upgrading to act as a floor structure for the new bedroom and for the balcony area. The new wall panels and roof structure will result in additional load on the site, as will the potential imposed floor loading. Taking into account the size of the extension, maximum additional unfactored site loadings are estimated to be in the order of 100kN permanent dead load and 50kN imposed loading. This loading will be distributed through the existing masonry walls to the foundations and into the ground.

HISTORICAL ORDNANCE SURVEY MAPS

Historic maps of the area were obtained from the Isle of Wight County Records Office and also from online sources. Maps dating from 1862 through to 1970 have been studied along with recent aerial photographs. Extract from these maps contained within the appendices of the report.

1862 Map

On this map the site lies within an area that appears to be part of a cultivated, possibly walled, garden. The southern and western boundaries of the site are identifiable by natural slope features. Approximately 100m to the south-west lies Steephill Castle. Most of the land to the west is shown as woodland with a network of tracks. To the north, slope features are shown with open land beyond. To the east and south, the land is undeveloped with slope features indicated, leading to the coastline, which lies just under 250m from the site. Approximately 60m to the south of the site the line of Steephill Road is shown but is not named.

1896 Map

The site and surrounding area appear largely unchanged from the previous map. The site remains part of a garden and Steephill Castle is shown. The woodland and pathways are still present to the west and open land remains to the north, east and south of the site. Approximately 400m to the south-west is an area of ground marked "cricket ground" and immediately to the west of this are buildings are shown that form part of the Royal National Hospital for Chest Diseases.

1907 Map

The railway line is now present on this map, crossing east to west past the northern boundary of the site. There is a structure shown on the site which has a distinctive rhomboid shape. In front of the building a rail siding is shown on ground that is now the parking area for the property. Directly to the east of the subject site is a building noted as "Town Station". Steephill Castle remains to the south-west and Steephill Road is now named. The cricket ground and hospital also remain further to the south-west.

1939 Map

The building remains on the site and the train lines and station are also still present. Steephill Castle, the cricket ground and hospital all remain unchanged from the previous record. Some development has taken place in the area with a number of buildings appearing to the west and south-west of the site.

1970 Map

The building on the site has been extended to the west and the train line is no longer shown. A large amount of development has taken place in the area with numerous new residential properties shown on the surrounding areas, particularly to the west. Undercliff Gardens is now shown passing the southern boundary of the site and Castle Close is present to the northern boundary, taking the route of the disused rail line. Most properties are now named, the building on the site is labelled "Joinery Works" and the station building is named "West Haven".

Aerial Photograph (2019)

From the aerial photograph further extensions are evident to the west side of the property. Additional developments can be identified to the surrounding area, most notably along the northern side of Steephill Road and the southern side of Castle Close, the west of the site.

GEOLOGY AND GROUND CONDITIONS ANTICIPATED AT THE SITE

The site of No. 7 Castle Close lies within the ancient landslide system known as the Undercliff, which extends below most of Ventnor and St Lawrence. The stability and ground behaviour of the Undercliff at Ventnor has been subject of a considerable amount of research into ground movements.

A report reviewing ground behaviour of the Undercliff produced by High Point Rendel (HPR) and commissioned by South Wight Borough Council contains a suite of maps detailing Geomorphology, Ground Behaviour and Planning Guidance which covers the area of the Undercliff from Bonchurch, through Ventnor town towards Steephill (Ref 1). These maps have been reviewed in the context of the subject site.

Geomorphology

This map indicates the subject site lies within an area of “multiple rotational failures, comprising seaward tilted blocks on level benches of Upper Greensand and chalk, fronted by steep scarp slopes”.

Ground Behaviour

The site is noted as a “landslide bench”. Contemporary processes for this area note imperceptible ground movements of less than 10mm per year have reported in these areas, although largely these benches are inactive. The potential impact of this zone states that “most properties situated on these benches have been largely unaffected by ground movement”. The description continues to say that the cumulative effects of ground movements have resulted in moderate to light damage to properties.

Planning Guidance

The development plan for the site states the area is likely to be subject to constraints on development and continues to say that a desk study walkover survey should be undertaken along with a geotechnical appraisal of the site.

BGS Boreholes

Online boreholes for the local area have been accessed via the BGS website. There are a number of records shown to the south of the site.

Boreholes most relevant to the site are F6 & F7 lie directly to the south of the site and are located along Steephill Road and Undercliff Gardens, respectively.

An interpretation of the borehole logs is represented on the site section contained towards the end of this report.

Both boreholes indicate the upper layers of ground close to the surface are formed from Upper Greensand debris. Borehole F7, along Undercliff Gardens encountered Gault Clay relatively close to the ground surface, at a depth of 4m (BGL). This description of Gault Clay continues to around 46m below the ground surface, at which point Carstone, part of the Sandrock formation, was encountered.

By contrast, the log F6 encountered a far greater depth of Greensand debris interspersed with bands of chalk and Gault Clay, down to around 40m below surface level. At this point the borehole description notes Sandrock formation was encountered.

SITE RECONNAISSANCE

Walkover survey of the site and surrounding area was undertaken on 7th February 2024.

The site is accessed directly from Castle Close via a level gravel driveway and parking area. The gravel drive continues along the eastern side of the property where there is an open car port structure along the side wall of the property.

The property is a single storey dwelling with a pitched slated roof which has a hip end to the northern side facing Castle Close and a gable end facing south. The building has a distinctive angled shape which is understood to result from the available space alongside the rail line. To the west side of the site is a single storey projection constructed from stonework with a flat roof over.

There is a section of stone wall to the front of the site at the western side of the property. Beyond the stone wall is an enclosed area of garden which forms part of the site. To the south of this area is a lightweight shed/outbuilding which abuts the side extension.

To the east side the lean-to car port leads to a timber gate which gives access to a terraced garden. The garden leads down to a gate separating the garden from the steep slope which runs alongside Undercliff Gardens.

Inspection of the property did not record any signs of structural movement or distortion. The roof and ridge line were found to be true and no cracks were identified to the external walls.

Inspection of the slope from Undercliff Gardens noted a low stone wall at the base of the slope and vegetation across the whole slope. Towards the western side of the slope an outcrop of rock was noted.

Inspection of the rock outcrop showed it is formed from large blocks of sandstone interspersed with smaller rock fragments and loose sand debris.

CONCLUSIONS & RECOMMENDATIONS

The site of No. 7 castle Close is located in an area of known ground movements on the ancient landslip known as the Undercliff.

The research undertaken for this report confirms the existing building is the first structure to have been built on the site. Historic maps date construction of the original building to be between 1896 and 1907. Since that date the building has been converted from a workshop to living accommodation and has been extended to the west.

The HPR maps for the area indicates the site is located on a landslide bench where imperceptible ground movements have been reported, although most properties situated on these benches have been largely unaffected by ground movement.

Inspection of the property did not note any evidence of recent or historic structural movements. Similarly, inspection of the external areas of the site, including the historic stone wall to the north-west corner of the site did not find evidence of ground movements.

Interpretation of borehole logs in the area suggest the site will be underlain by Greensand debris close to the surface. This is likely to consist of large blocks of sandstone with smaller sandstone fragments and loose sand between. The blocks of greensand will increase in size with depth. The outcrop of rock noted to the scarp slope that forms the southern boundary of the site supports this interpretation of the ground make-up. In addition, anecdotal evidence and site photos from recent extension works at the property also suggest the Greensand is present below the surface of the site.

The proposals for the site are to construct a roof top extension over the north-west corner of the property. The proposed extension is modest in size and the estimated maximum increase in site loading is small at around 150kN. The Greensand formation will easily support loading of this magnitude and disperse the load into the ground surrounding ground, as such the additional site loading not likely to cause instability of the site or the wider surrounding area.

In conclusion, having studied the available documentation for the site and carried out the site reconnaissance, the site appears to be stable and is not likely to be threatened or affected by foreseeable slope instability originating outside the site boundaries. Considering the geology beneath the site and the small increase in load on the site as a result of the development, it is unlikely that the development will affect the overall stability of the site or the surrounding area. Therefore, there appears to be no overriding factors which would preclude development of the site on the grounds of general stability.

I trust the above information is clear but please contact us should you require any further assistance.



Signature Date: 21st February 2024

STEPHEN BURGESS M Eng (Hons)
For and on Behalf of Cowan Consultancy Ltd

Ref 1: High Point Rendel (1995). *The Undercliff of the Isle of Wight: A Review of Ground Be.* Cross Publishing

APPENDICES

- A Historical Maps
 - 1862
 - 1896
 - 1907
 - 1939
 - 1970

2019 Aerial Photograph
- B Photographs
- C Site Section
- D Proposed Architects Drawings

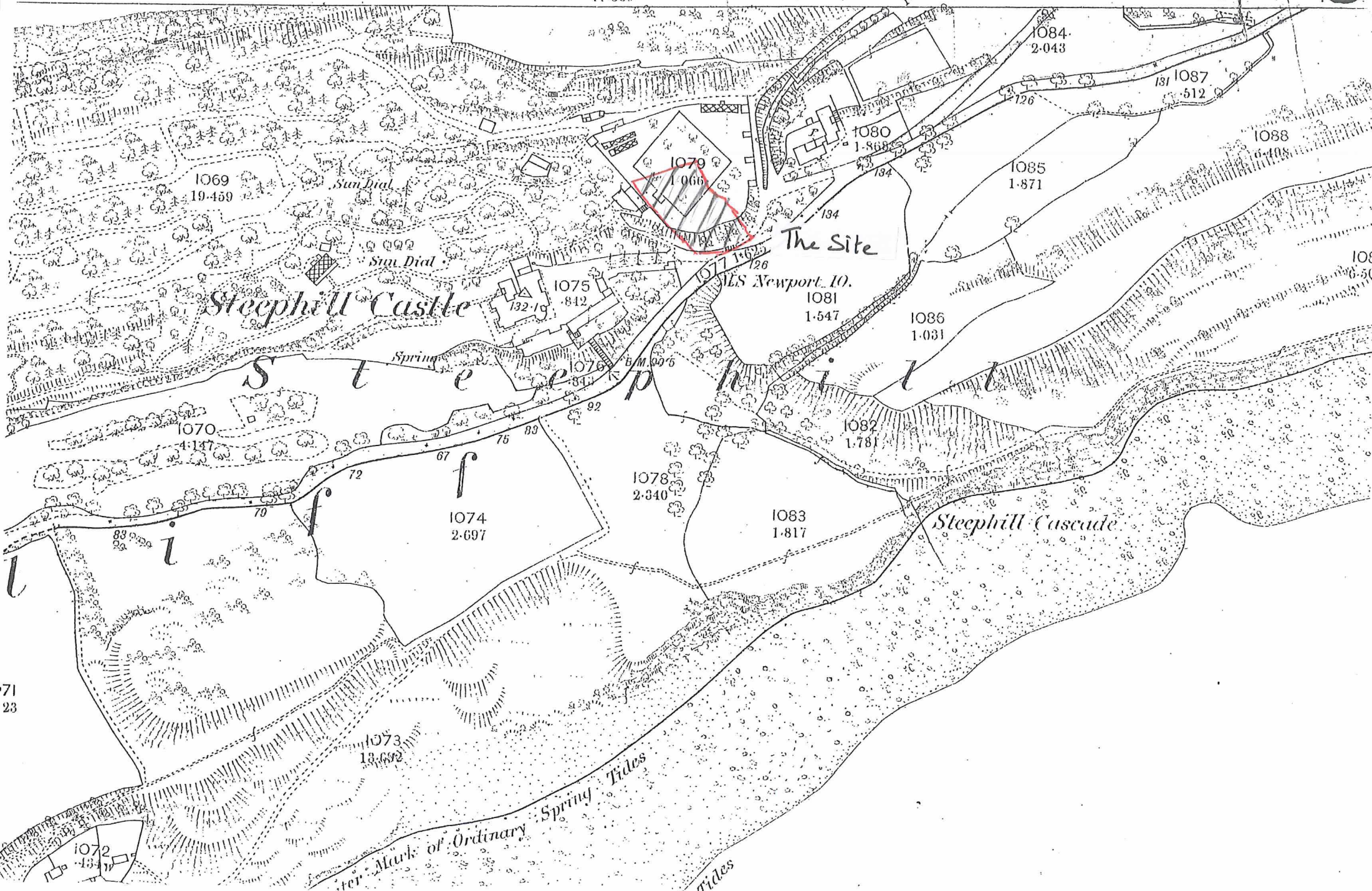
APPENDIX A

1038

1038
17-389

1041
1-300

1046
1-91



71
23

To Ventnor

80

3.170

1896

82

CA
R

795

84

233

Fish Pond

U.D. Bay

200

28.296

S.D.

S.D.

The Site

85

2.571

Steephill Castle

Spring

S T E E P H I L L

87

4.129

B.M. 93.6

102

86

371

79+

93

4.046

95

1.817

F.R.

Steephill Cas

Pavilion

L.B. Lodge

HOSPITAL

90

4.185

Cricket Ground

92

4.260

94

9.701

F.P.

High Water Mark of Ordinary Tides

Water Mark of Ordinary Tides

Groyne

91

560

F.W.

16

324

50

2

0

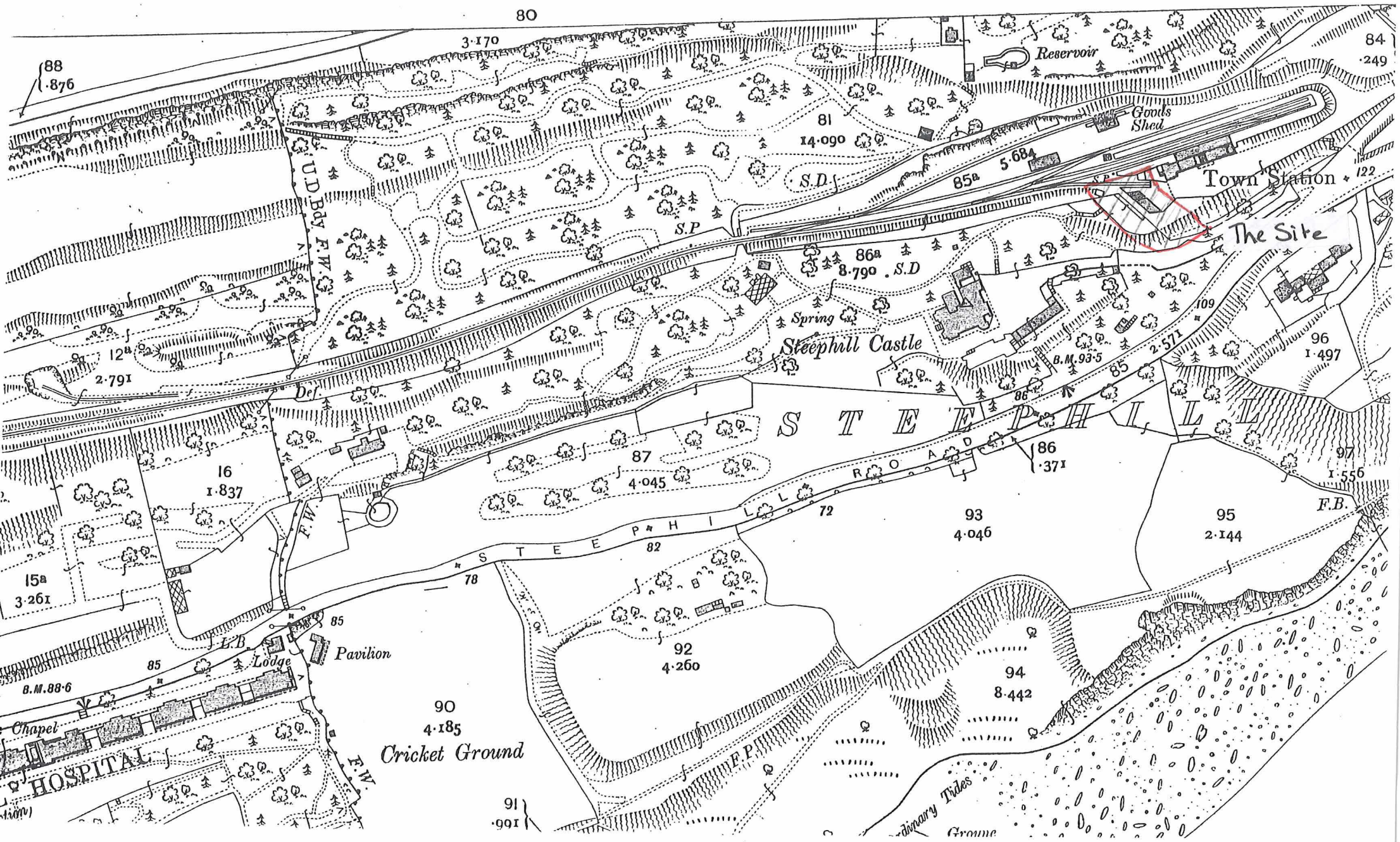
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0

0

0

0



88
1.876

80

3.170

84
249

81
14.090

85a
5.684

Town Station

The Site

Steephill Castle

S T E E P H I L L

R O A D

16
1.837

87
4.045

96
1.497

97
1.556

F.B.

93
4.046

95
2.144

15a
3.261

78

S T E E P H I L L

92
4.260

94
8.442

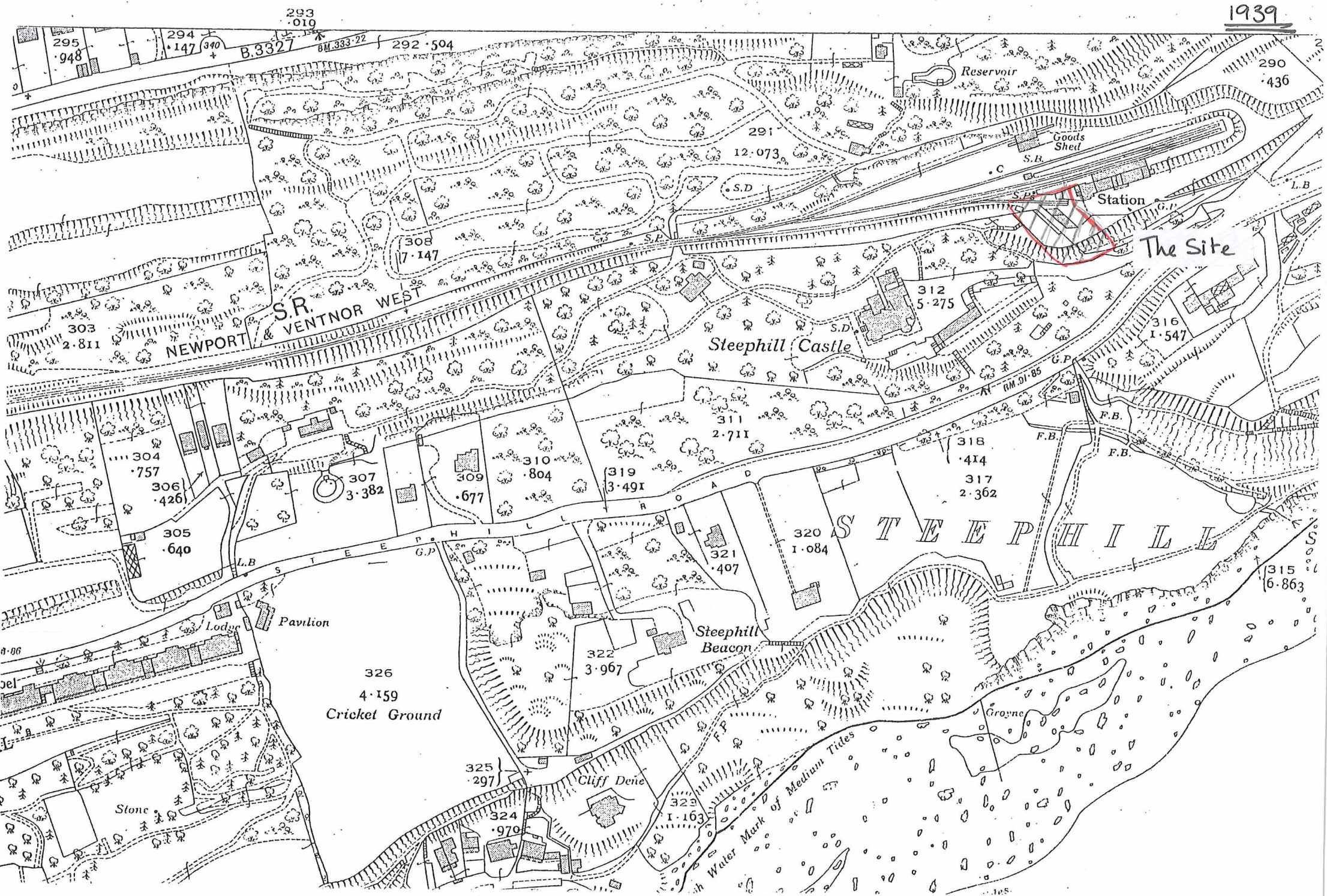
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4.185

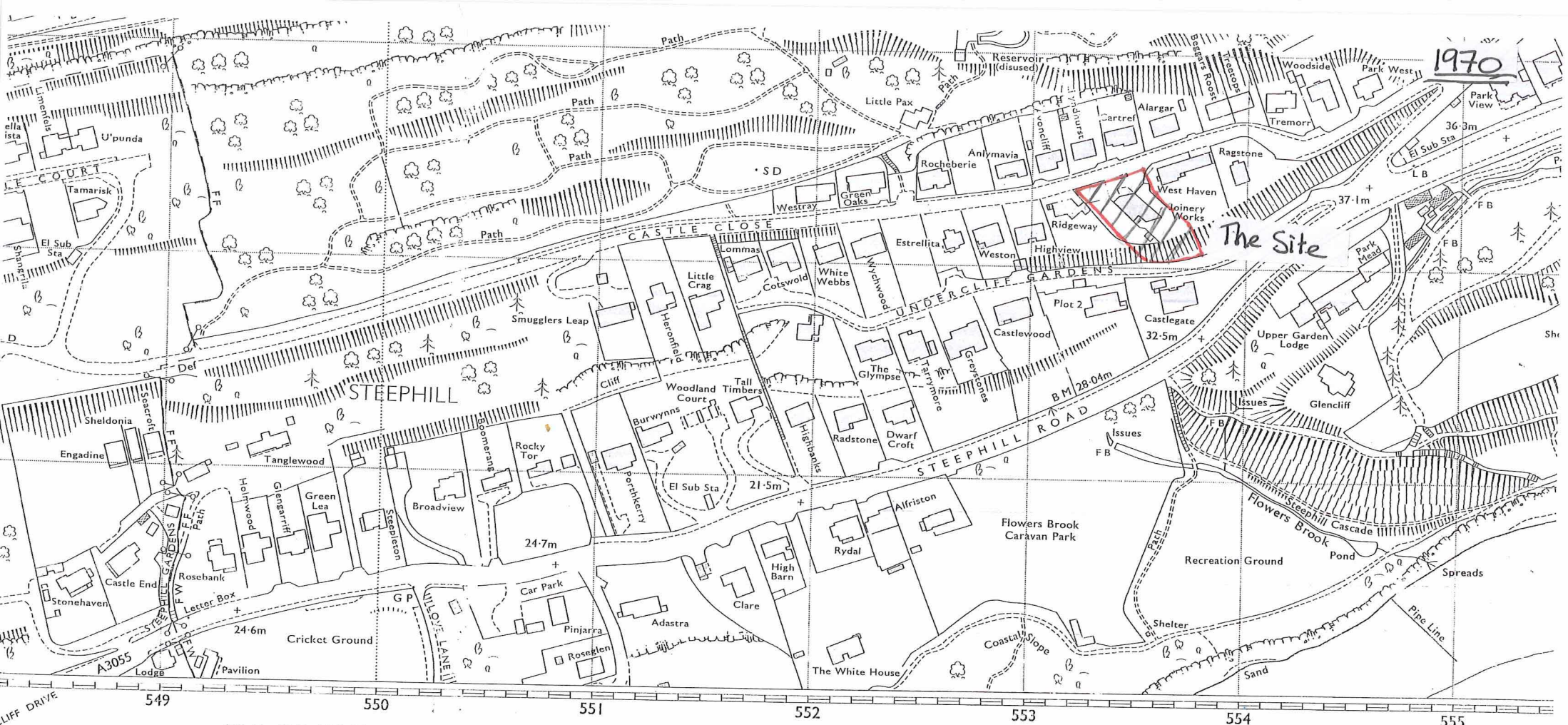
Cricket Ground

91
9.091

HOSPITAL

Primary Tides
Groume

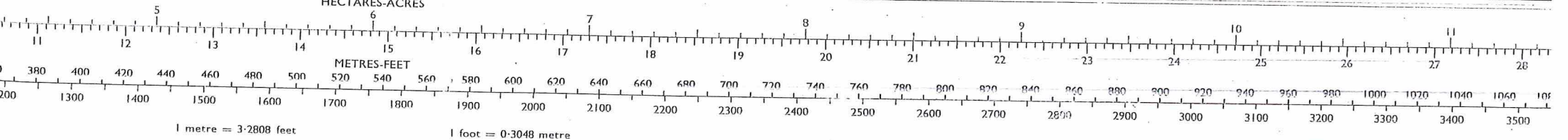




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SZ 5476-5576

CONVERSION SCALES
HECTARES-ACRES



SYMBOLS

- Non-coniferous Trees
- Coniferous Trees
- Surveyed Trees
- Orchard Trees
- Coppice
- Slopes
- Cliff
- Cave Entrance
- Track
- Antiquity (site of)
- Culvert
- Direction of water flow
- Electricity Pylon

England & Wales

- County Boundary (geographical)
- County & Civil Parish Boundary coterminous
- Admin County or County Borough Boundary
- London Borough Boundary
- County District Boundaries based on civil parish

England, Wales & Scotland

- Civil Parish Boundary

BOUNDARIES

- Co Cnl Bdy
- Co Cnl Bdy
- Co of City Bdy
- Co of City Bdy
- Burgh Bdy
- Burgh Bdy

1970

1970

Whitwell Rd
7 Castle Close, Ventnor



APPENDIX B

7 Castle Close, Ventnor – Site Walkover 7th February 2024



7 Castle Close viewed from the road



View of western side extension and historic stonewall



View looking east across terraced garden



View of rear elevation from lower garden terrace



View of slope and low stone wall along southern boundary of the site with Undercliff Gardens - Note: rock outcrop



View of rock outcrop

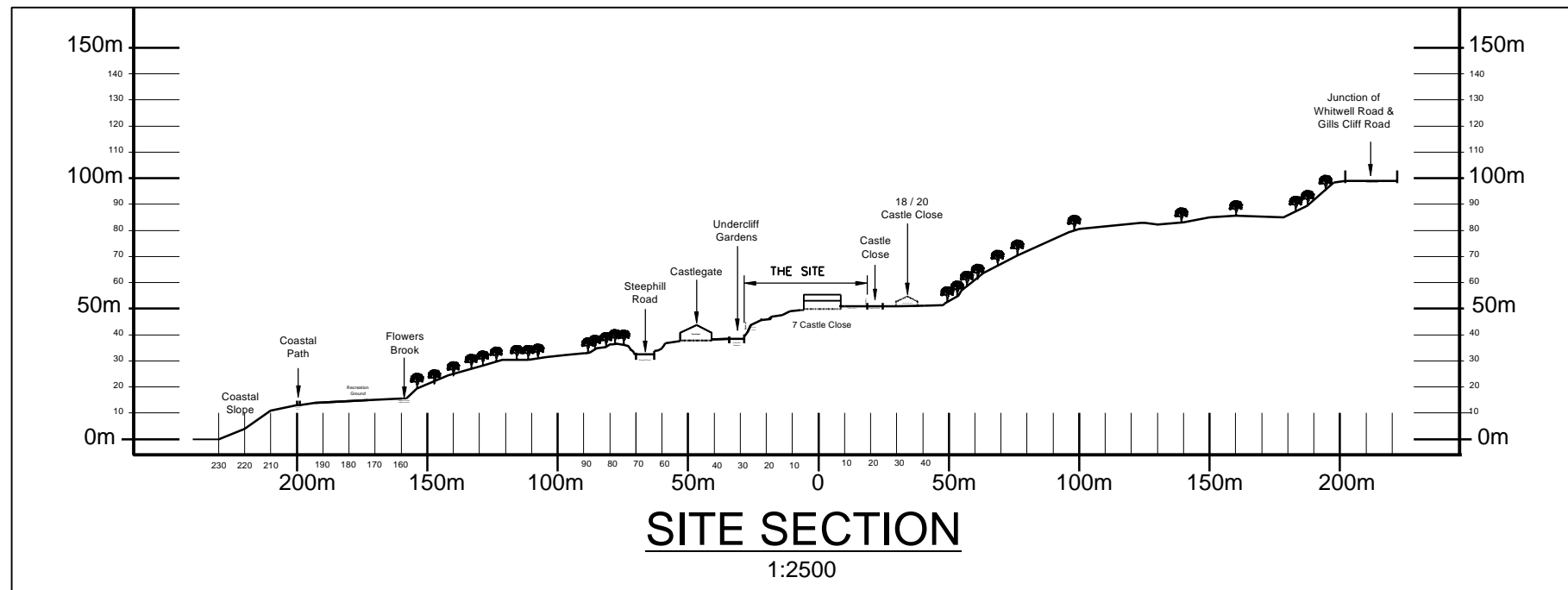


View of western extension under construction



View of alterations to the rear of property in progress

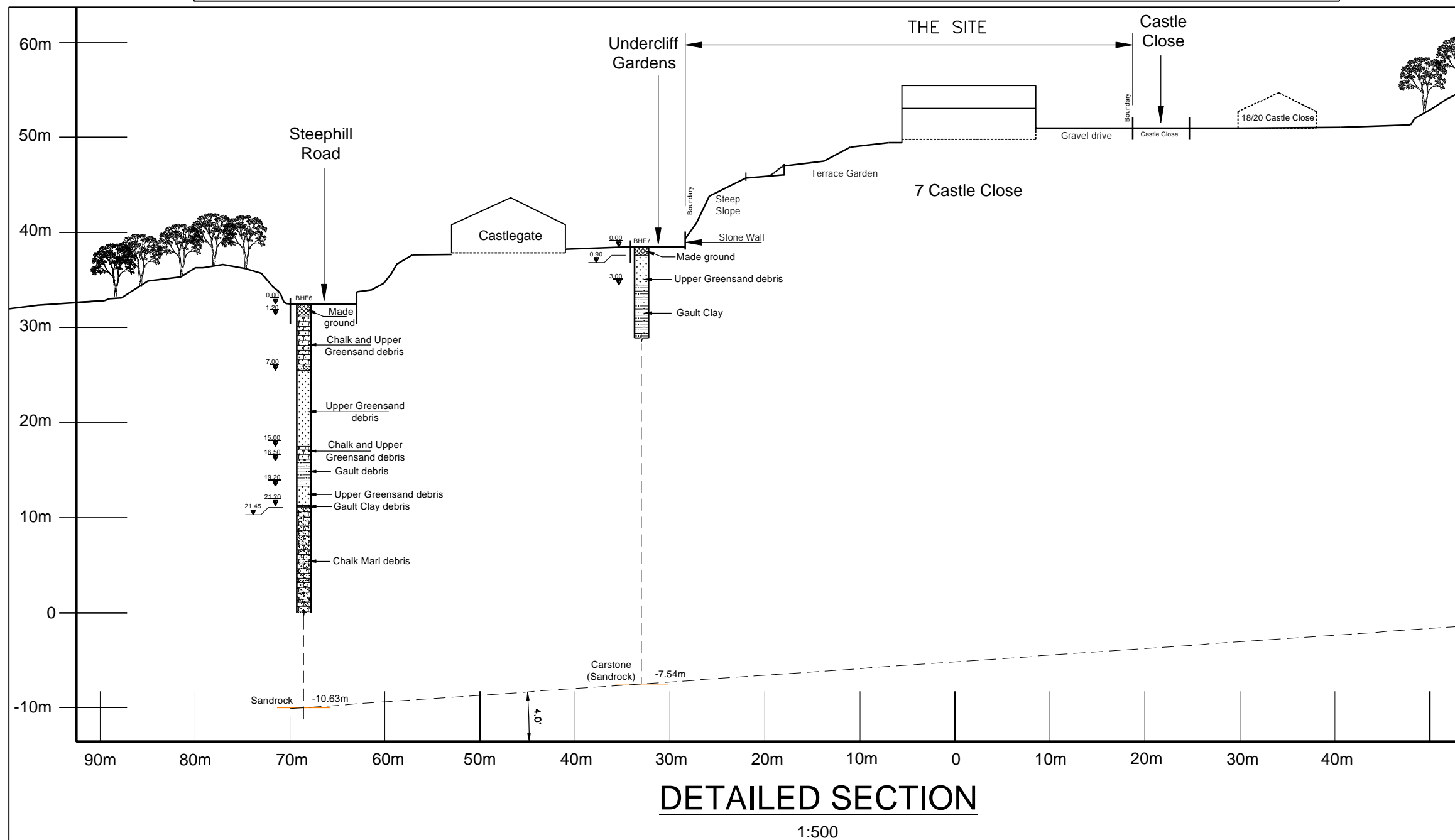
APPENDIX C



NOTES

This drawing has been compiled using the site survey, Ordnance Survey maps and aerial photographs.

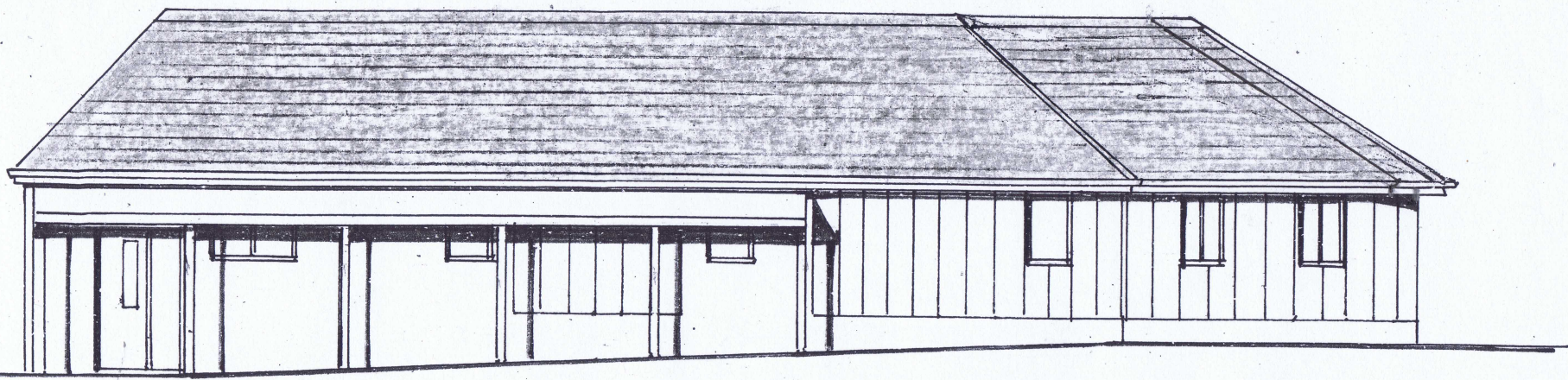
Borehole logs have been obtained from the BGS website.



DO NOT SCALE THIS DRAWING

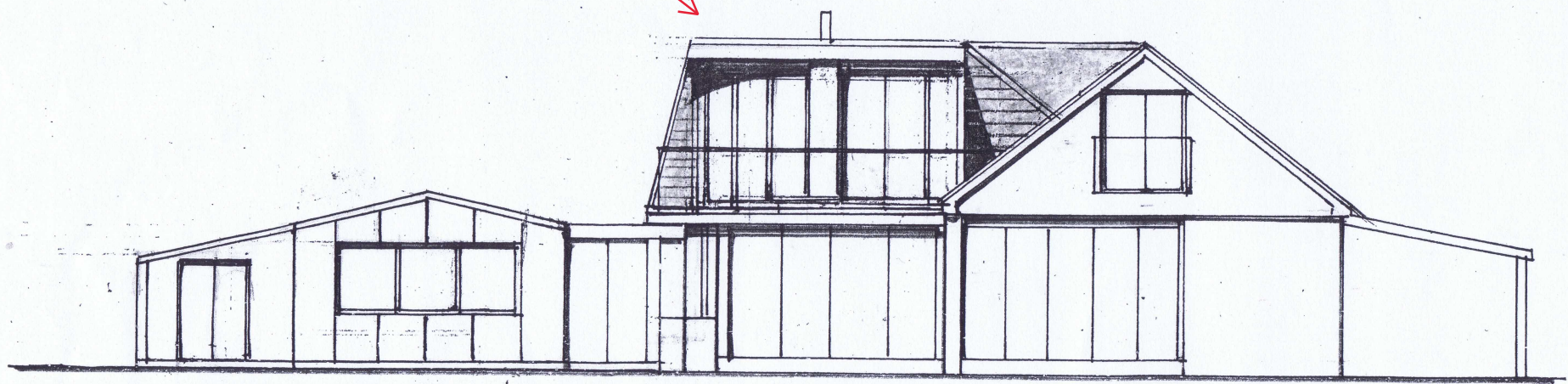
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Landguard Manor Landguard Manor Road Shanklin Isle of Wight PO37 7JB			Tel: 01983 868497 Fax: 01983 865781 iow@cowanconsult.co.uk www.cowanconsult.co.uk		
Client: Mr M White					
Project: 7 Castle Close					
Title: Veninor, IoW					
Title: Site Section					
Date	Feb 2024	Scale	As Shown @A3	Drw. No.	
Drawn	BR	Chk'd	STB	QA'D	STB
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APPENDIX D

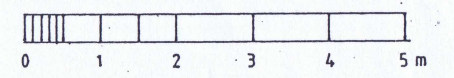


EAST ELEVATION

First Floor Extension



SOUTH ELEVATION



Revisions

Client
M. WHITE

Project Title
7 CASTLE CLOSE
VENTNOR

Revision Title
NEW ELEV'S.1

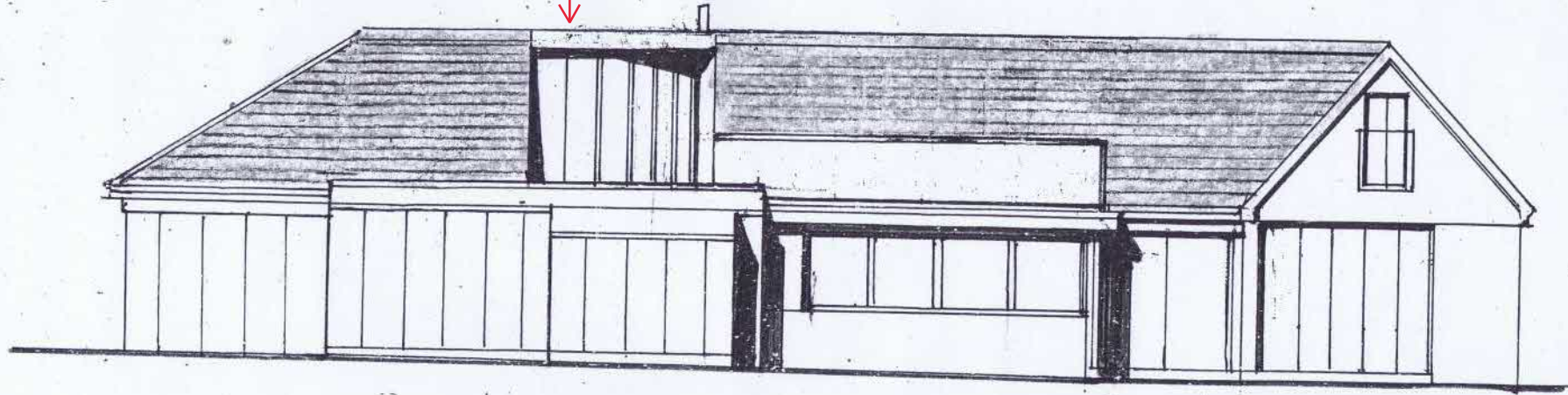
Duncan Gayler RIBA Architect
107 Grand Avenue, Worthing BN11 5BE
Email: dg@mdg.uk.net
Mob: 07783066427 Office: 01903 340817

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Date Drawn By

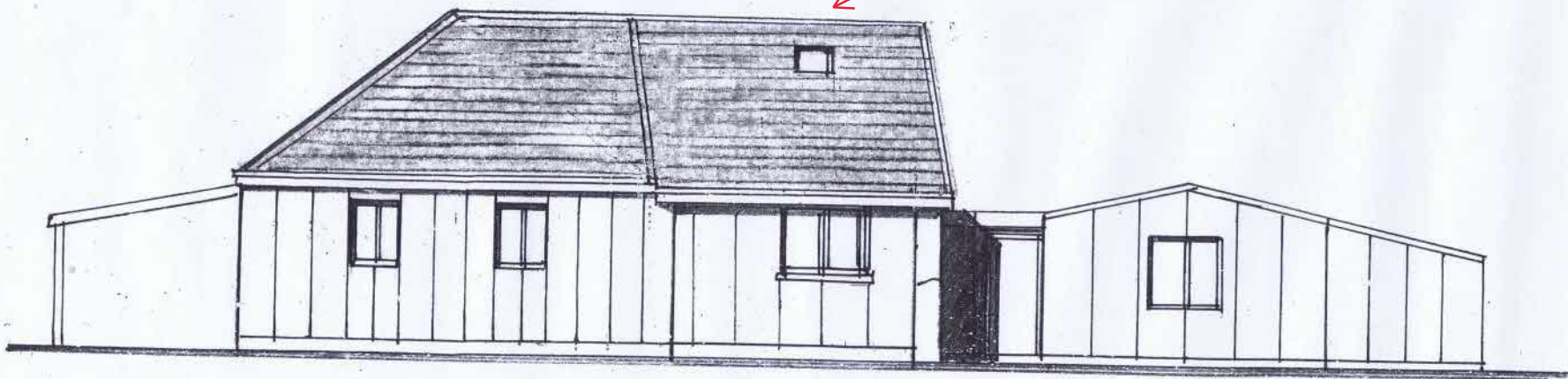
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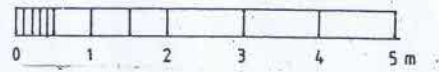


WEST ELEVATION

First Floor Extension



NORTH ELEVATION



Revisions

Client
M. WHITE

Project Title
7 CASTLE CLOSE
VENTNOR

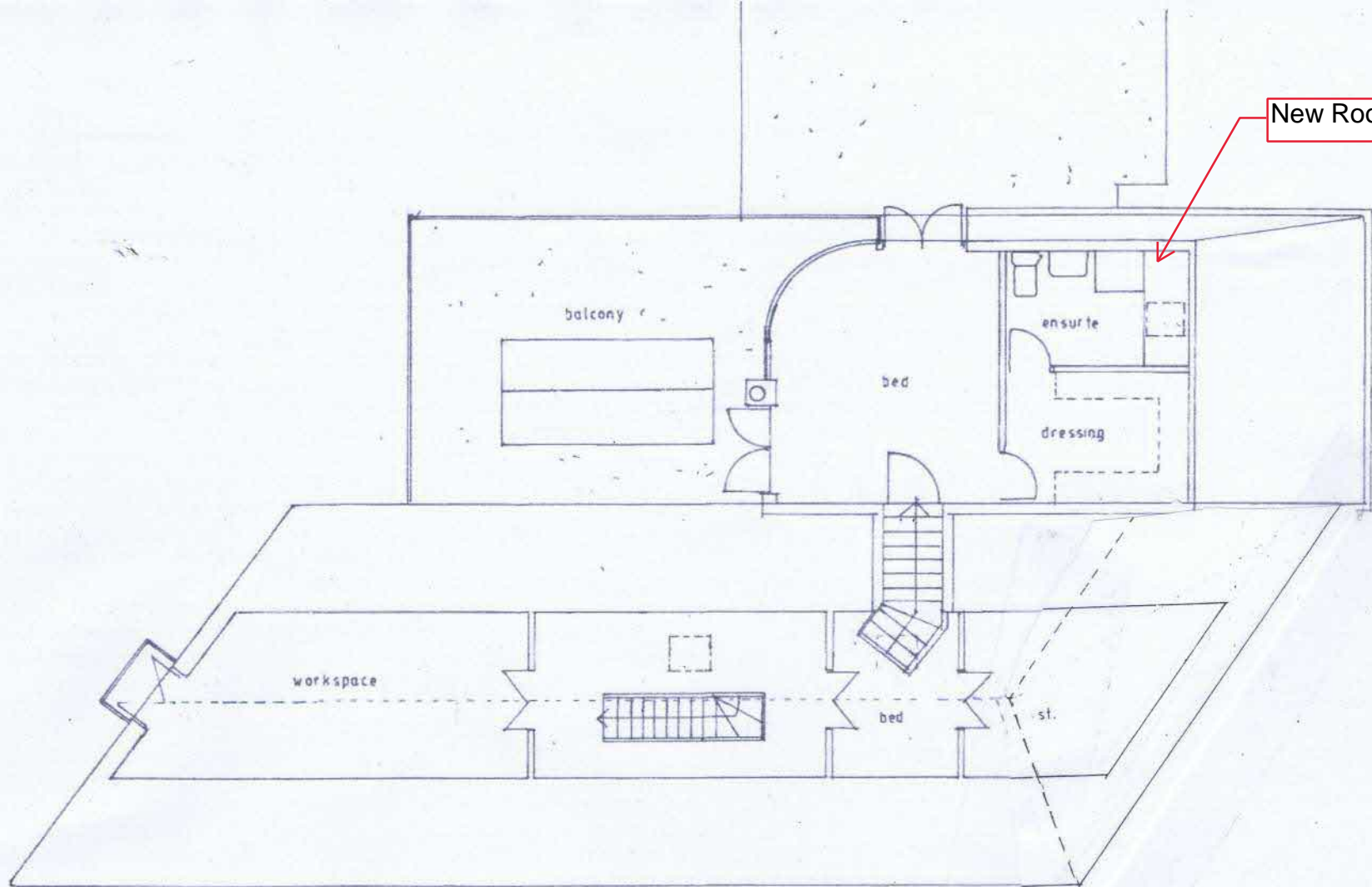
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NEW ELEV'S-2

Duncan Gayler RIBA Architect
107 Grand Avenue, Worthing BN11 5BE
Email: dg@mdg.uk.net
Mob: 07783066427 Office: 01903 340817

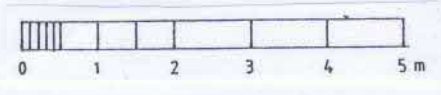
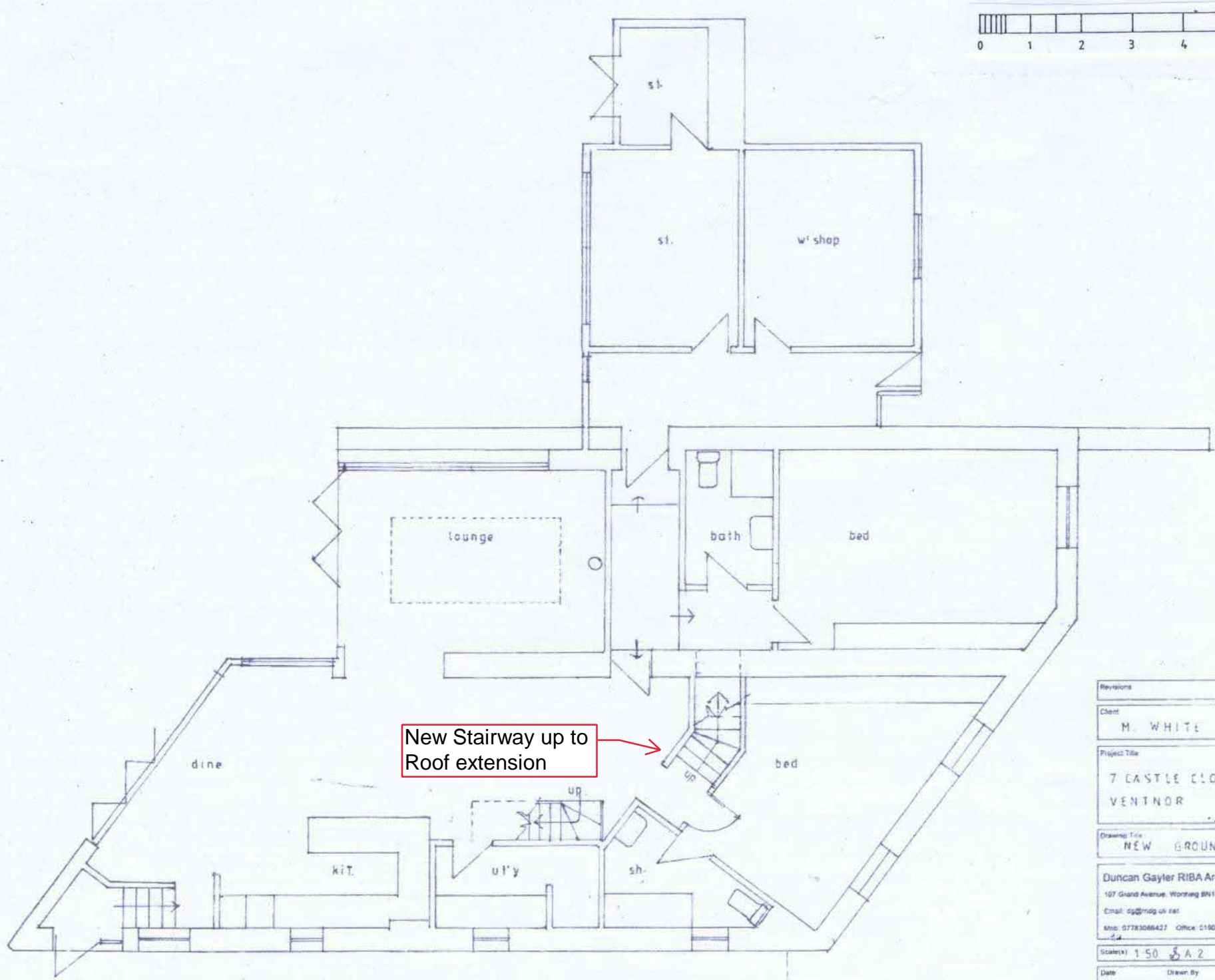
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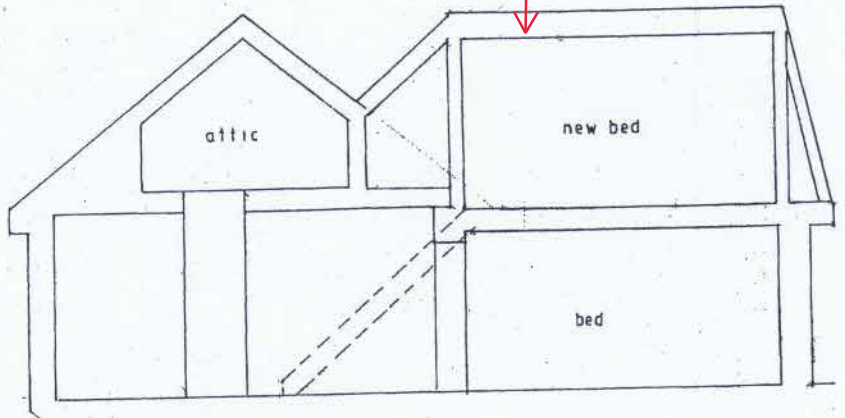


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Client M. WHITE
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Duncan Gayler RIBA Architect 107 Grand Avenue, Worthing BN11 5BE Email: dg@mgd-uk.net Mob: 07783086427 Office: 01903 345817
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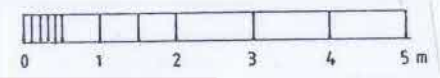


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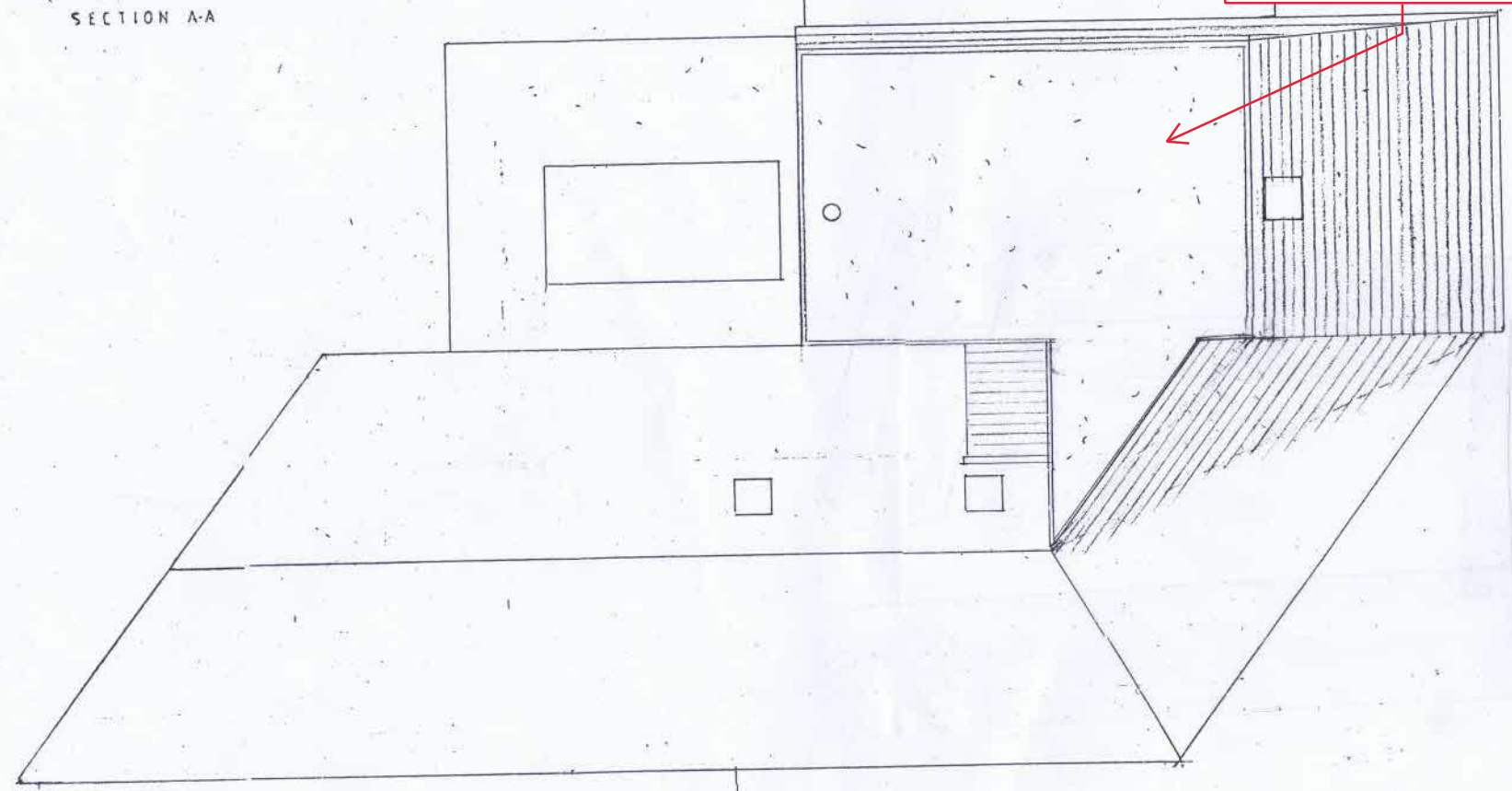
First Floor Extension



SECTION A-A



First Floor Extension



ROOF PLAN

Revisions
Client M. WHITE
Project Title 7 CASTLE CLOSE VENTNOR
Drawing Title ROOF PLAN/SECTION NEW
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