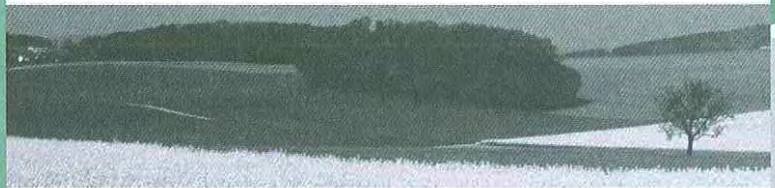


Slope Stability Desk Study Report
Proposed Residential Development
North Cliff Lodge, Penarth

Prepared for:
Celtic Developments Penarth Limited

December 2015

Job No: 13124



REPORT TITLE : **Slope Stability Desk Study Report – North Cliff Lodge, Penarth**

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Executive Summary

Terra Firma Wales Ltd were retained by Scimitar Developments Limited to perform a Desk Study Assessment of the stability of a site at North Cliff, Penarth

The site is situated at a National Grid Reference of 318900 172370. The site currently comprises a domestic property and a large garden set on three levels.

The site locates on the Penarth Escarpment. The escarpment has a history of slope instability including a recent landslide (2013) located immediately northeast of the study site.

The current study site exhibits evidence of ground movement.

The site is considered at High Risk of subsidence related to landslide although it should be noted that 'Highcliff' has experienced no significant movement since its construction. We would recommend that the site be investigated using rotary core boreholes. The boreholes will allow the installation of piezometers and inclinometers to monitor the long term stability of the site.

We anticipate that the final foundation solution will have to be piles to ensure the foundation load are transferred below the slope. Such a foundation solution together with a sympathetic development ethos should reduce the risk of ground movement to an acceptable level. The given foundation solution will be verified by the investigation.

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SECTION 1 Introduction and Proposed Development

Celtic Developments Penarth Limited have requested that a Slope Stability Desk Study be performed for North Lodge, Penarth

The main objectives of the desk study were to:

- Determine the geological setting of the site
- Investigate the history of the site by referring to old Ordnance Survey maps
- Collate information relating to historical subsidence in the vicinity if the site

Based on the desk study information, the following assessment is to be made:

- Identify geotechnical liabilities associated with the site
- Provide provisional recommendations in relation to likely foundation solutions
- Detail recommended further works necessary to assess the ground conditions beneath the site

1.1 Limitations and Exceptions of Desk Study

Celtic Developments Penarth Limited has requested that a Slope Stability Desk Study be carried out in order to determine the geological setting, past history and recommended further works for stability assessment for the study site.

The desk study has been conducted and this report has been prepared for the sole internal reliance of Celtic Developments Penarth Limited and their design and construction team. This report shall not be relied upon or transferred to any other parties without the express written authorisation of Terra Firma (Wales) Limited. If an unauthorised third party comes into possession of this report they rely on it at their peril and the authors owe them no duty of care and skill.

The report represents the findings and opinions of experienced geo-environmental and geo-technical consultants. Terra Firma (Wales) Limited does not provide legal advice and the advice of lawyers may also be required.

SECTION 2 Review of Existing Data

2.1 Physical Setting

The site is located at the top of the Penarth Escarpment, at the eastern end of North Cliff Drive, at an approximate National Grid Reference of 318900, 172370. The site is located on three terraces. The upper, middle and lower terraces have an approximate altitude of 37m AOD, 29m AOD and 20m AOD respectively.

A masonry retaining wall in a poor state of repair separates the middle and lower terraces. The southern and northern areas of the site are heavily wooded with dense vegetation. North Cliff Lodge locates on the upper terrace.

The site has an approximate plan area of 0.64 Ha.

The site location is presented in **Figure 2.1**.



Figure 2.1. Site Location (NTS)

2.2 Site History

Historical 1:1,250 and 1:2,500 Scale maps of the site have been provided by Landmark Information Group, presented in **Annex A**. The relevant editions are summarised below:

1880

The 1:2,500 Scale 1880 map shows the site to be part of the garden of Cliff Villa, located east of the site. The far northeast of the site extends onto the slope and beyond, onto the boulders of the shoreline to the northeast of the site. Custom House is shown to locate at the base of the slope to the north of the site. Pathways are shown to traverse the slope. A quarry is shown approximately 100m west of the site.

1900

The 1:2,500 Scale 1900 edition shows Cliff Villa to have been renamed Northcliff. A lifeboat station has been added to the base of the escarpment, with a number of its buildings extending onto the far northeast of the site. The quarry is no longer identified west of the site.

1920

The 1: 2,500 scale 1920 map shows the site as previously described.

1942

The 1: 2,500 scale 1942 edition shows a building to have been constructed within the west of the site. A distinct line runs across the site which may represent the retaining wall located on site today. The shape of the main building identified as Northcliff house has been shown to have changed since the previous edition and surrounding buildings appear to have been replaced by new buildings.

1955

The 1:1,250 and 1:2,500 scale 1955 edition shows the site as previously described apart from some minor alterations to the foot print of the building at the west of the site.

1990, 1992 and 1995

The 1:1,250 and 1:2,500 scale 1990, 1992 and 1995 editions show the site to contain North Cliff Lodge in the west of the site as previously described. The northwest of the site's boundary is formed by Northcliffe Drive, and a small square building to the south of the road extends onto the site. A small road providing access to a car park extends onto the southwest of the site. Dyfed flats are indicated at the site of the former Northcliff house.

2.3 Current Use and Site Conditions

The site was visited on 23rd October 2015. The site currently comprises a domestic property with a large garden. The garden is divided into terraces with the lower terrace accessed via steps from the mid-terrace. A stone retaining wall separates the lower and mid terrace. Significant cracking is apparent in the retaining wall.



Plate 2.1. Cracking in retaining wall.

Cracking was also noted in the ground above the retaining wall and evidence of ground movement was also apparent in the garden steps.

There is, however, discernible evidence of movement within 'Highcliff'.

A higher terrace locates behind the house, and this area has significant tree cover.

2.4 Environmental Setting

2.4.1 Geology

A 1:50,000 Scale Geology Report was purchased from landmark Information Group.

The Geology Report shows the site to be underlain by rocks of the Penarth Group and, possibly the St Marys Well Bay Member in the southwest of the site (i.e. the highest point of the site).

The site is not shown to have superficial cover. Roughly east-west trending faults are shown to locate approximately 150m south of the site.

2.4.2 Previous Subsidence Events

In 2006 Thomas *et al* published a paper titled 'Implications of urban development on escarpment instability'. The paper detailed that between 1859 and 1865 the Penarth Dock was developed and railway sidings and shunting yards, associated with the adjacent Penarth Dock, ran along the base of the escarpment.

Historically limestone was also quarried from the escarpment. The toe of the escarpment has therefore been subject to haphazard excavation historically.

Thomas *et al* (2006) record at least three previous slope failure events preceding their paper which, itself, details a fourth event in 2004. During an inspection of the slope, Thomas *et al* (2006) encountered morphological evidence of a large scale historical failure in the slope previously obstructed by vegetation.

In 2013 Terra Firma Wales Ltd were engaged to assess a landslide at Penarth Marina, located immediately east of the current study site. A failure had occurred on the slope and Terra Firma Wales Ltd performed an inspection of the slope and the surrounding area. Landslide morphology was apparent and features including tree 'piston gripping' (i.e., curvature in the base of trees as they correct themselves to vertical following historical ground movement events) was noted adjacent to the slide, indicating further historical land movement to the northwest of the 2013 landslide.



Plate 2.2. 2013 Landslide adjacent to study site.

During the walkover of the current study site significant damage to a retaining wall, gaps between the retaining wall and the stairs and cracking in the ground of the mid level terrace were noted.

2.4.2 Previous Subsidence Events (Continued)



Plate 2.3. Evidence of Ground Movement during October 2015 visit.

2.4.3 Hydrogeology

The groundwater elevation beneath the site is currently unknown to Terra Firma Wales Ltd. During the 2013 landslide areas of seepage were noted in the face following the failure. An inspection chamber and damaged pipe work were noted in the slope and it is conceivable that these may have directed water in to the landslide.

Thomas et al (2006) note that the 2004 landslide was preceded by a period of heavy rain and this may have contributed to the failure.

SECTION 3 Conclusions and Recommended Further Works

3.1 Conclusions

The current study site locates within an area with a known history of landslide events, including a slide adjacent to the site in 2013 and there is evidence of ground movement within the study site.

The site is therefore considered to be at High Risk of ground movement associated with landslide. The risk will therefore need to be assessed to quantify this risk.

The landslide complex is likely to extend beyond the site and the system will have to be considered as a whole if any engineering works are undertaken not only within the study site but also within the slopes above and below the site. For example, excavation below the study site could reduce the factor of safety of the study site.

3.2 Recommended Further Works

We would recommend that an intrusive investigation be performed to determine the ground conditions beneath the site and also to install monitoring instrumentation to assess seasonal groundwater variation beneath the site and to assess whether any deep seated movement is underway.

Given the geology of the site drilling will have to be performed using Rotary Core Drilling Techniques. Upon completion of drilling inclinometers and piezometers can be installed in the boreholes to assess groundwater levels and ground movement respectively.

Undisturbed samples of soil and rock should be taken to determine effective shear strength parameters.

A programme of monitoring, extending at least 12 months, should be implemented after the drilling. It is recommended that at least 6 months of monitoring should have taken place prior to construction.

The shear strength parameters and groundwater information can then be used in a computer slope stability analysis on the pre and post development ground profiles.

Morphological mapping of the site and beyond should be performed and linked into the existing morphological map prepared for the 2013 landslide.

3.3 Anticipated Foundation Solutions

We anticipate that given the evidence detailed above it will be necessary to employ a foundation solution that will transfer the foundation load to depth, below any potential slip surface.

We therefore anticipate that any new development will require pre-bored steel cased piled foundations. Such a foundation would not further load any landslip and also provide a degree of lateral support. Such a foundation solution together with a sympathetic development ethos should reduce the risk of ground movement to an acceptable level.

Thomas et al (2006) identified the potential for deep seated failures and pile lengths may, therefore, extend to considerable depth.

Retaining structures on site may also be required to be founded on piles. The final foundation solution will be verified by the investigation works.

Depending on the outcome of the further investigations, further slope stabilisation measures may be recommended for the site.

The stability of the site has to be viewed in terms of a broader system including the slope beyond the site. Consequently any development within the slope below the site should take consideration of its potential effect of the study site. Groundwater can be a major contributor to ground instability and we do not recommend the use of soakaways at the site. In addition, any drainage pipes running close to or through the slope should be inspected to confirm their integrity.

**ANNEX A
ENVIROCHECK HISTORY REPORT**

Historical Mapping Legends

Ordnance Survey County Series 1:10,560

	Gravel Pit		Sand Pit		Other Pits
	Quarry		Shingle		Orchard
	Osiers		Reeds		Marsh
	Mixed Wood		Deciduous		Brushwood
	Fir		Furze		Rough Pasture
	Arrow denotes flow of water		Trigonometrical Station		
	Site of Antiquities		Bench Mark		
	Pump, Guide Post, Signal Post		Well, Spring, Boundary Post		
	-285 Surface Level				
	Sketched Contour		Instrumental Contour		
	Main Roads		Minor Roads		
	Sunken Road		Raised Road		
	Road over Railway		Railway over River		
	Railway over Road		Level Crossing		
	Road over River or Canal		Road over Stream		
	Road over Stream				
	County Boundary (Geographical)				
	County & Civil Parish Boundary				
	Administrative County & Civil Parish Boundary				
	County Borough Boundary (England)				
	County Burgh Boundary (Scotland)				
	Rural District Boundary				
	Civil Parish Boundary				

Ordnance Survey Plan 1:10,000

	Chalk Pit, Clay Pit or Quarry		Gravel Pit
	Sand Pit		Disused Pit or Quarry
	Refuse or Slag Heap		Lake, Loch or Pond
	Dunes		Boulders
	Coniferous Trees		Non-Coniferous Trees
	Orchard		Scrub
	Coppice		Bracken
	Heath		Rough Grassland
	Marsh		Reeds
	Saltings		
	Building		Glasshouse
	Sloping Masonry		Pylon
	Electricity Transmission Line		Pole
	Cutting		Embankment
	Standard Gauge Multiple Track		Standard Gauge Single Track
	Siding, Tramway or Mineral Line		Narrow Gauge
	Geographical County		
	Administrative County, County Borough or County of City		
	Municipal Borough, Urban or Rural District, Burgh or District Council		
	Borough, Burgh or County Constituency Shown only when not coincident with other boundaries		
	Civil Parish Shown alternately when coincidence of boundaries occurs		
	BP, BS Boundary Post or Stone		Pol Sta Police Station
	Ch Church		PO Post Office
	CH Club House		PC Public Convenience
	F E Sta Fire Engine Station		PH Public House
	FB Foot Bridge		SB Signal Box
	Fn Fountain		Spr Spring
	GP Guide Post		TCB Telephone Call Box
	MP Mile Post		TCP Telephone Call Post
	MS Mile Stone		W Well

1:10,000 Raster Mapping

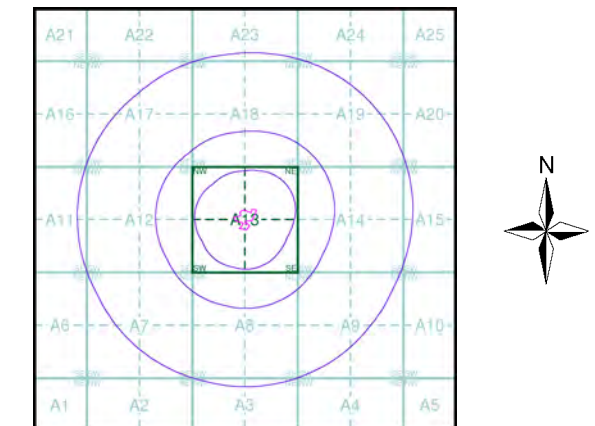
	Gravel Pit		Refuse tip or slag heap
	Rock		Rock (scattered)
	Boulders		Boulders (scattered)
	Shingle		Mud
	Sand		Sand Pit
	Slopes		Top of cliff
	General detail		Underground detail
	Overhead detail		Narrow gauge railway
	Multi-track railway		Single track railway
	County boundary (England only)		Civil, parish or community boundary
	District, Unitary, Metropolitan, London Borough boundary		Constituency boundary
	Area of wooded vegetation		Non-coniferous trees
	Non-coniferous trees (scattered)		Coniferous trees
	Coniferous trees (scattered)		Positioned tree
	Orchard		Coppice or Osiers
	Rough Grassland		Heath
	Scrub		Marsh, Salt Marsh or Reeds
	Water feature		Flow arrows
	MHW(S) Mean high water (springs)		MLW(S) Mean low water (springs)
	Telephone line (where shown)		Electricity transmission line (with poles)
	Bench mark (where shown)		Triangulation station
	Point feature (e.g. Guide Post or Mile Stone)		Pylon, flare stack or lighting tower
	Site of (antiquity)		Glasshouse
	General Building		Important Building



Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Glamorganshire	1:10,560	1885	3
Glamorganshire	1:10,560	1901	4
Glamorganshire	1:10,560	1922	5
Glamorganshire	1:10,560	1922	6
Glamorganshire	1:10,560	1938	7
Glamorganshire	1:10,560	1947	8
Historical Aerial Photography	1:10,560	1947	9
Historical Aerial Photography	1:10,560	1947	10
Ordnance Survey Plan	1:10,000	1964 - 1965	11
Ordnance Survey Plan	1:10,000	1970 - 1974	12
Cardiff	1:10,000	1982	13
Ordnance Survey Plan	1:10,000	1984	14
Ordnance Survey Plan	1:10,000	1993 - 1996	15
10K Raster Mapping	1:10,000	2006	16
VectorMap Local	1:10,000	2015	17

Historical Map - Slice A



Order Details

Order Number: 76477814_1_1
 Customer Ref: 13124
 National Grid Reference: 318910, 172360
 Slice: A
 Site Area (Ha): 0.9
 Search Buffer (m): 1000

Site Details

Northcliffe Lodge, Northcliffe Drive, PENARTH, South Glamorgan, CF64 1DQ



Tel: 0844 844 9952
 Fax: 0844 844 9951
 Web: www.envirocheck.co.uk

Russian Military Mapping Legends

1:5,000 and 1:10,000 mapping

a. Not drawn to scale b. Drawn to scale

	Government and Administrative Buildings		Military and Industrial Buildings
	Military and Communication Areas		Subway Entrance
	Fireproof Building		Prominent Fireproof Building
	Non-fireproof Building		Non-fireproof Building (non-dwelling)
	Factory, mill, and flour mill, with chimneys		Factory, mill, and flour mill, without chimneys
	Power Station, drawn to scale		Hydroelectric Power Station
	Radio Station, drawn to scale		Telephone Station, drawn to scale
	Abandoned Open-pit Mine or Quarry		Open-pit Salt Mine
	Pit		Oil Deposit or Well
	Oil Seepage		Natural Gas Tank
	Tailings Pile		Fuel Storage Tanks
	Bench Mark		Drill Hole
	Burial Mound		Triangulation Point on Burial Mound
	Single-track Railroad		Double-track Railroad
	Railroad and Station Building		Small Bridge
	Pipe (Culvert)		Tunnel
	Coniferous Forest		Deciduous Forest
	Mixed Forest		Lawns
	Citrus Orchard		Wet Ground
	Scattered Vegetation		

243,8 Values for prominent elevations
186.0 Numbers for spot elevations, depth soundings, contour lines, etc.
0,2 Velocity of the current, width of river bed, depth of river
180/12 Fractional terms: length and capacity of bridges; depth of fords and condition of the river bottom; height of forest and the diameter of trees

Russian Alphabet (For reference and phonetic interpretation of map text)

А а (A)	З з (Z)	П п (P)	Ч ч (CH)
Б б (B)	И и (I)	Р р (R)	Ш ш (SH)
В в (V)	Й й (Y)	С с (S)	Щ щ (SHCH)
Г г (G)	К к (K)	Т т (T)	Ъ (-)
Д д (D)	Л л (L)	У у (U)	Ы (Y)
Е е (E)	М м (M)	Ф ф (F)	Ь (')
Ё ё (YO)	Н н (N)	Х х (KH)	Э э (E)
Ж ж (ZH)	О о (O)	Ц ц (TS)	Ю ю (YU or IU)
			Я я (YA or IA)

1:25,000 mapping

a. Not drawn to scale b. Drawn to scale

	Government and Administrative Buildings		Military and Industrial Buildings
	Military and Communication Areas		Subway Entrance
	Partly Demolished Buildings		Demolished Buildings
	Built-Up Area with Fireproof Buildings Predominant		Built-Up Area with Non-Fireproof Buildings Predominant
	Individual Fireproof Building		Prominent Industrial Building
	Individual Dwelling, Fireproof		Ruins of an Individual Dwelling
	Factory or Mill Chimney		Factory or Mill with Chimney
	Factory or Mill without Chimney		Salt Mine
	Tailings Pile		Mine or Open Pit Mine
	Operating Shaft or Mine		Non-Operating Shaft or Mine
	Pit		Gas Pump or Service Station
	Fuel Storage or Natural Gas Tank		Oil or Natural Gas Derrick
	Small Hydroelectric Power Station		Power Station
	Transformer Station		Cemetery
	Burial Mound (height in metres)		Triangulation Point on Burial Mound
	Triangulation Point		Bench Mark
	Bench Mark (monumented)		Telegraph Office
	Telephone Station		Radio Station
	Radio Tower		Airfield or Seaplane Base
	Landing Strip		Cut
	Fill		Km Post
	Plantings		Width of Road
	Steep Grade		Highway under Construction
	Improved Dirt Road (former truck road)		Small Bridge
	Pipe (Culvert)		Tunnel
	Dismantled Railroad		Double-track Railroad with First Class Station
	Railroad Under Construction		Shore Embankment
	River or Ditch with Embankment		Water Gauge
	Direction and velocity of current		Water Level Mark
	Well		Spring
	Water Reservoir or Rain Water Pit		Isobath with value
	Heavy (Index) Contour Line		Half Contour Line
	Contour Line and Value		Spot Elevation Value
	Coniferous		Deciduous
	Mixed		Scrub

Key to Numbers on Mapping

ST17SE_Cardiff

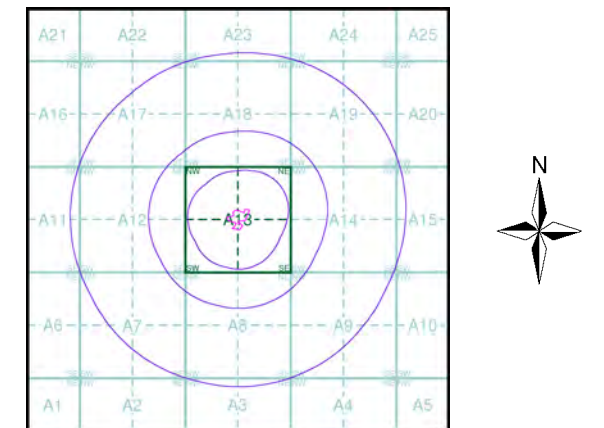
No.	Description
49	Factory (Oil Refining)
85	Post Office
107	Custom House
109	Tunnel (Pedestrian)



Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Glamorganshire	1:10,560	1885	3
Glamorganshire	1:10,560	1901	4
Glamorganshire	1:10,560	1922	5
Glamorganshire	1:10,560	1922	6
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Russian Map - Slice A



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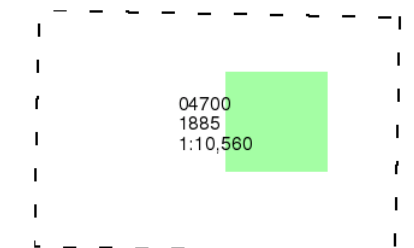
Glamorganshire

Published 1885

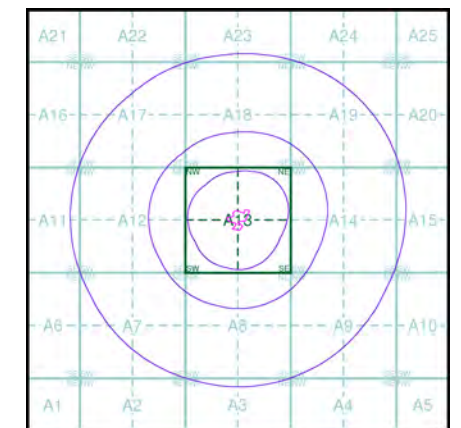
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The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

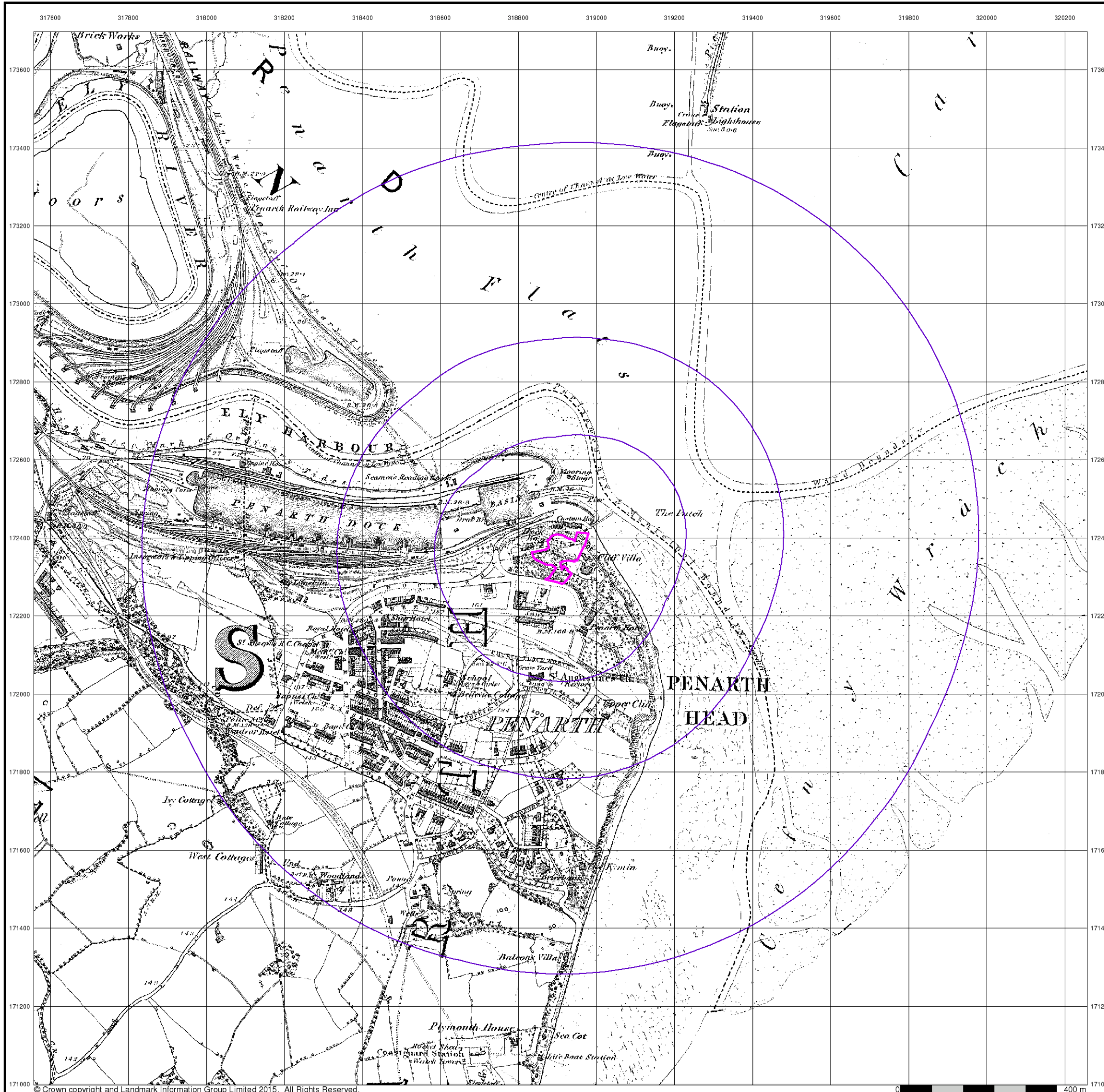
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Glamorganshire

Published 1901

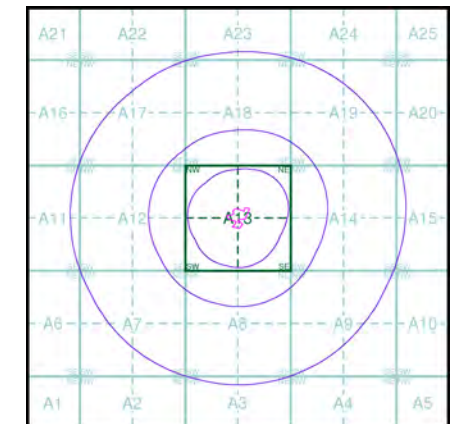
Source map scale - 1:10,560

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Map Name(s) and Date(s)

047NE
1901
1:10,560
047SE
1901
1:10,560

Historical Map - Slice A



Order Details

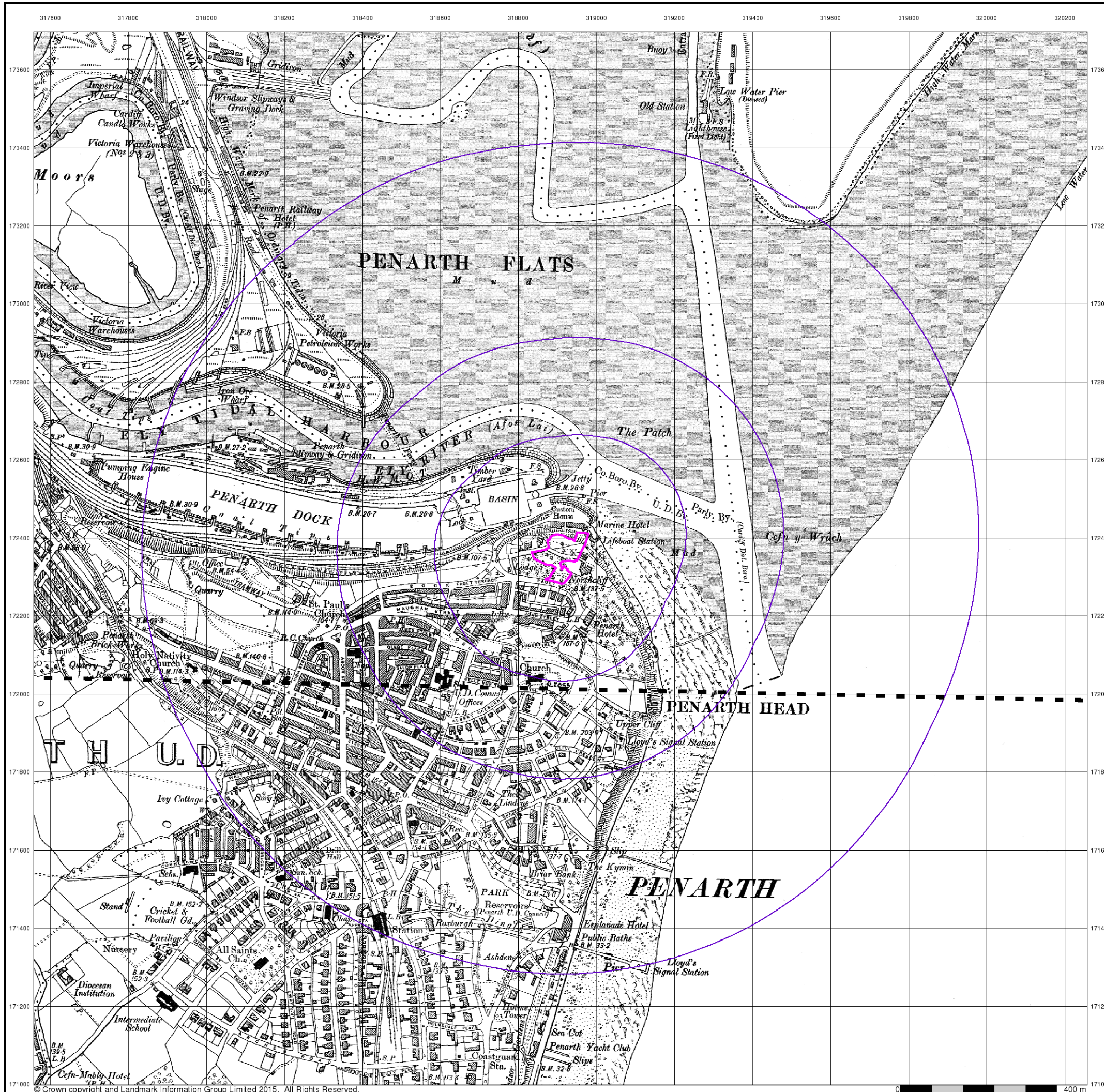
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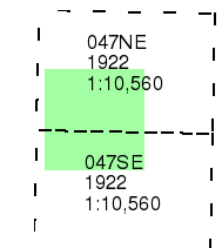
Glamorganshire

Published 1922

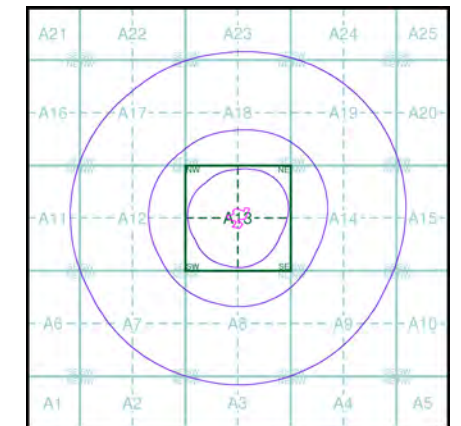
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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 76477814_1_1
Customer Ref: 13124
National Grid Reference: 318910, 172360
Slice: A
Site Area (Ha): 0.9
Search Buffer (m): 1000

Site Details

Northcliffe Lodge, Northcliffe Drive, PENARTH, South Glamorgan, CF64 1DQ



Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk





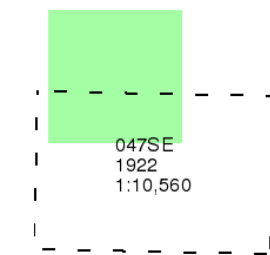
Glamorganshire

Published 1922

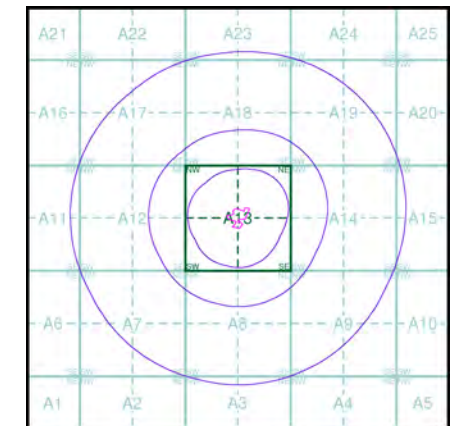
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

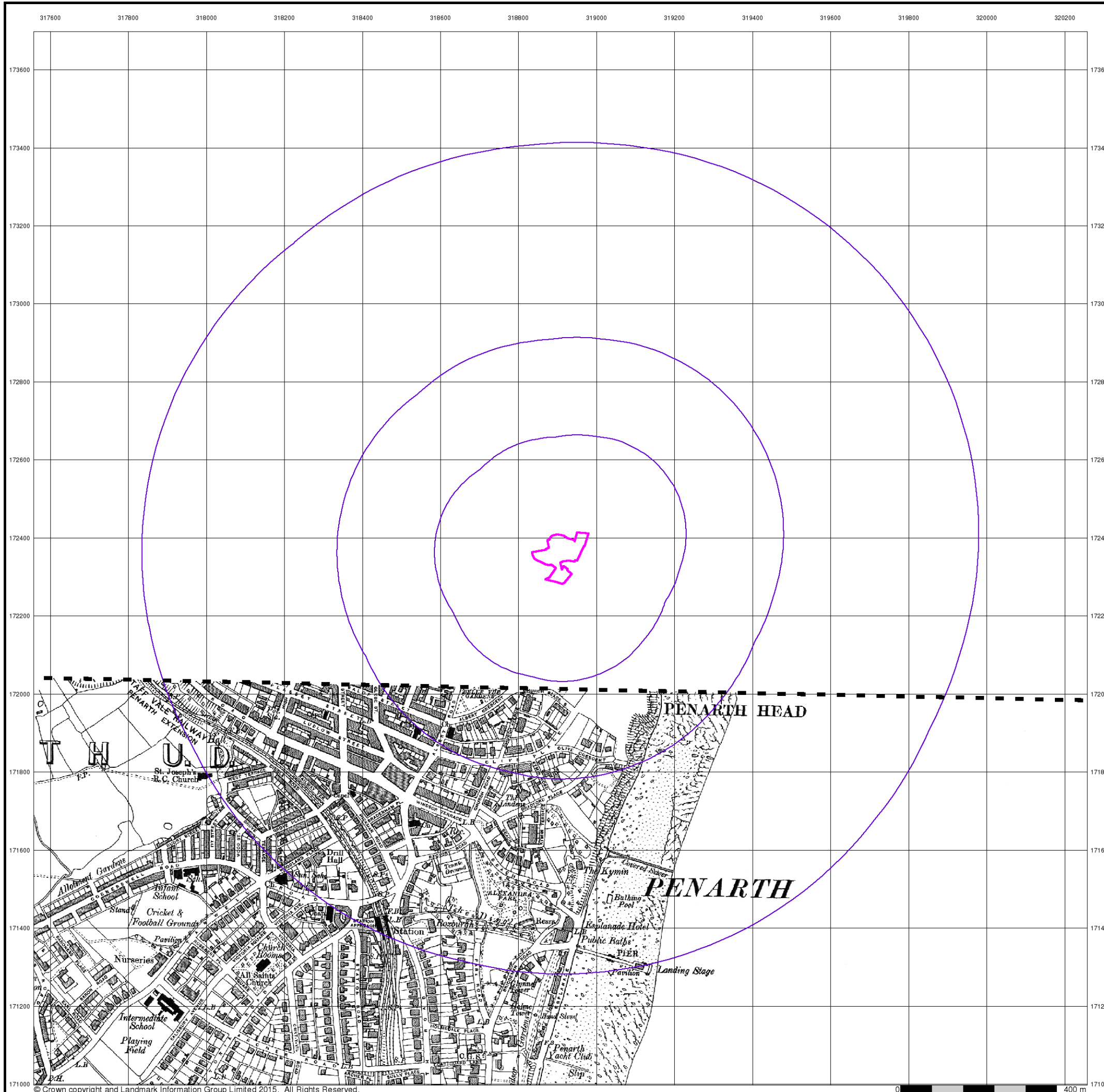
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Customer Ref: 13124
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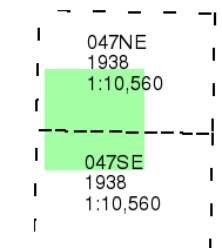
Glamorganshire

Published 1938

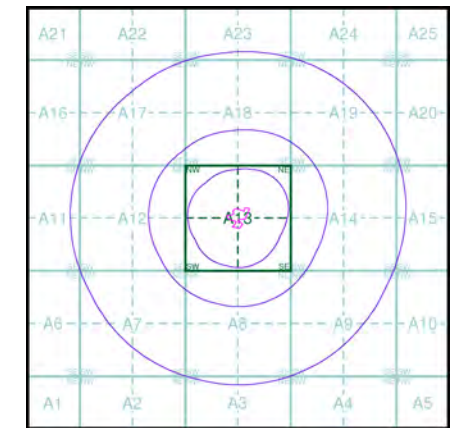
Source map scale - 1:10,560

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Glamorganshire

Published 1947

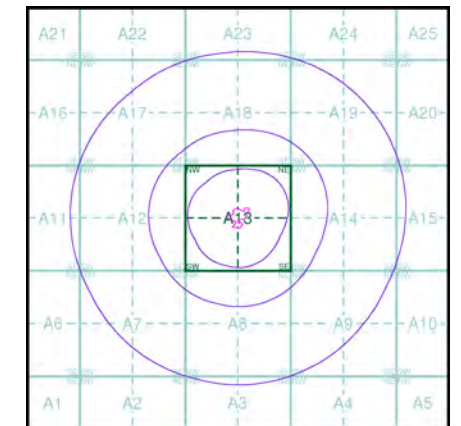
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

047NE
1947
1:10,560
047SE
1947
1:10,560

Historical Map - Slice A



Order Details

Order Number:	76477814_1_1
Customer Ref:	13124
National Grid Reference:	318910, 172360
Slice:	A
Site Area (Ha):	0.9
Search Buffer (m):	1000

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Historical Aerial Photography

Published 1947

Source map scale - 1:10,560

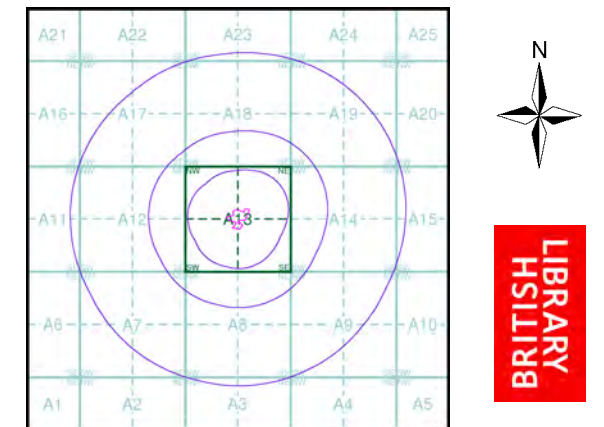
The Historical Aerial Photos were produced by the Ordnance Survey at a scale of 1:1,250 and 1:10,560 from Air Force photography. They were produced between 1944 and 1951 as an interim measure, pending preparation of conventional mapping, due to post war resource shortages. New security measures in the 1950's meant that every photograph was re-checked for potentially unsafe information with security sites replaced by fake fields or clouds. The original editions were withdrawn and only later made available after a period of fifty years although due to the accuracy of the editing, without viewing both revisions it is not easy to spot the edits. Where available Landmark have included both revisions.

© Landmark Information Group and/or Data Suppliers 2010.

Map Name(s) and Date(s)

ST17SE 1947 1:10,560	ST27SW 1947 1:10,560
----------------------------	----------------------------

Historical Aerial Photography - Slice A



Order Details

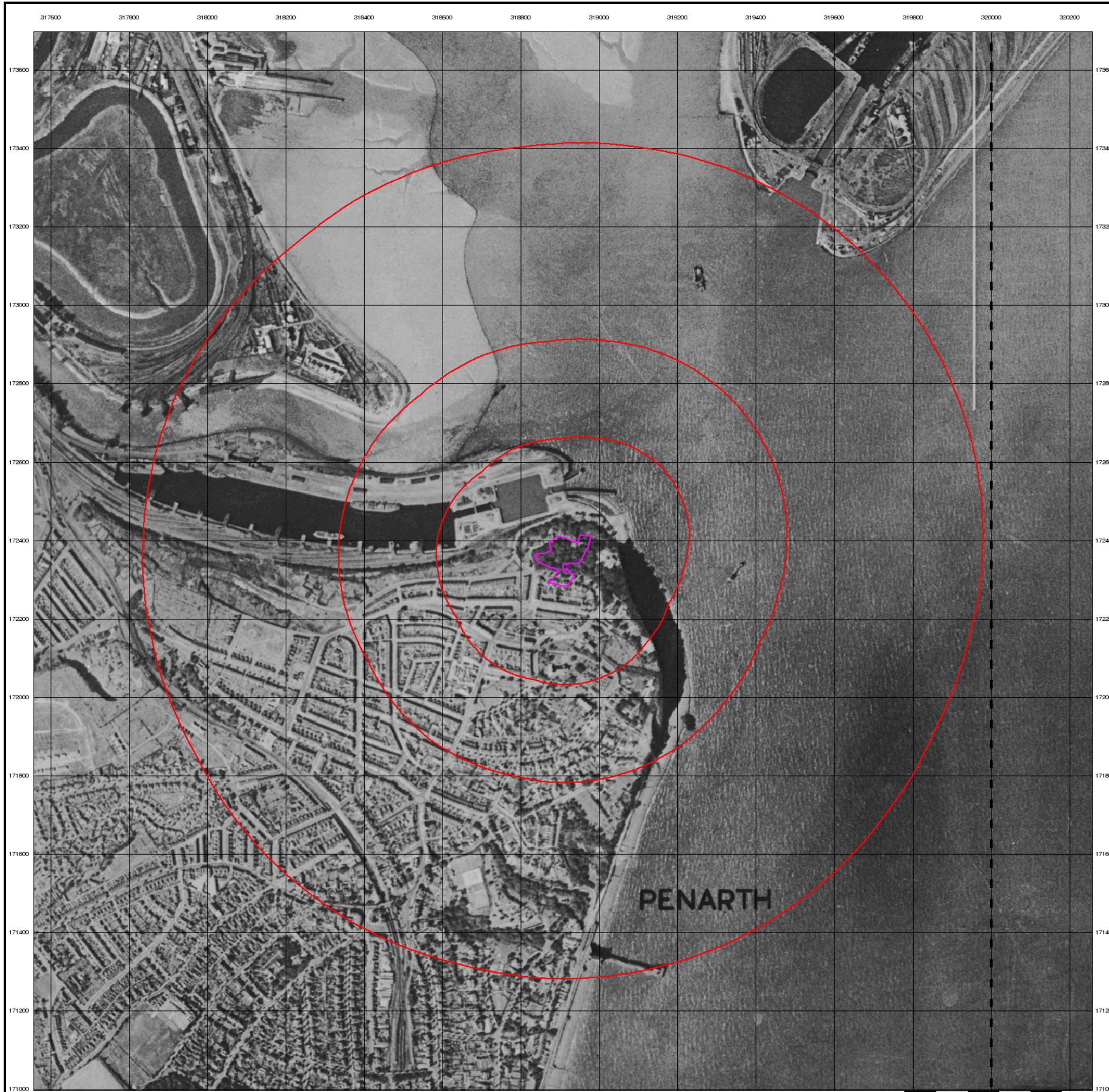
Order Number: 76477814_1_1
 Customer Ref: 13124
 National Grid Reference: 318910, 172360
 Slice: A
 Site Area (Ha): 0.9
 Search Buffer (m): 1000

Site Details

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Historical Aerial Photography

Published 1947

Source map scale - 1:10,560

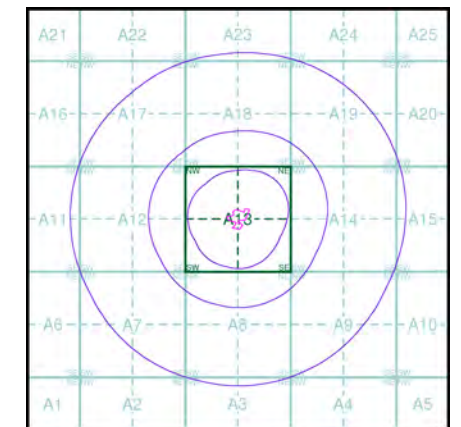
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© Landmark Information Group and/or Data Suppliers 2010.

Map Name(s) and Date(s)

ST17SE 1947 1:10,560	ST27SW 1947 1:10,560
----------------------------	----------------------------

Historical Aerial Photography - Slice A



Order Details

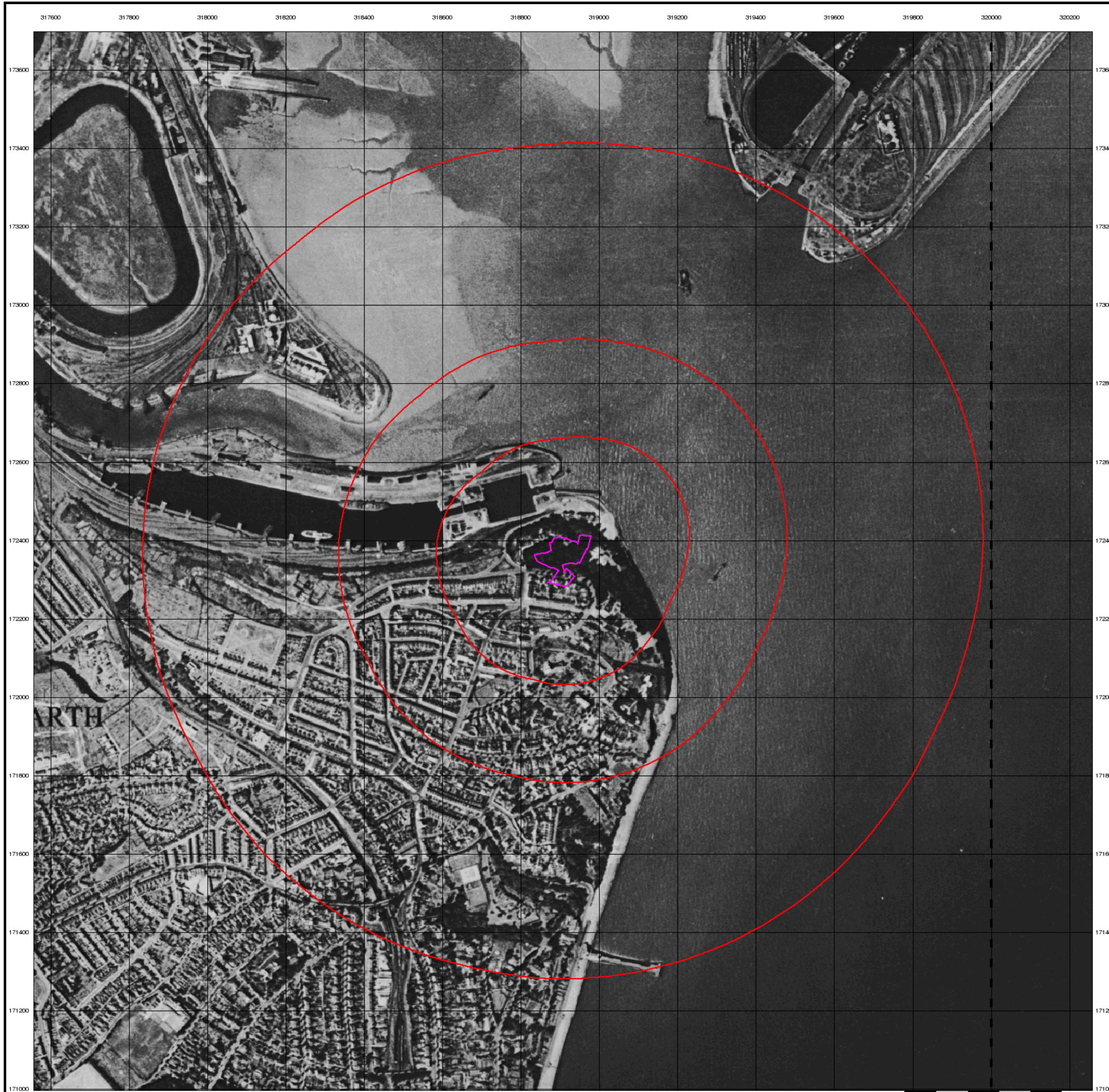
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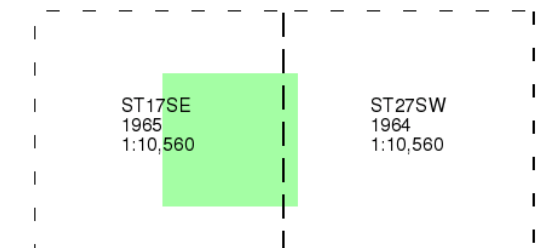
Ordnance Survey Plan

Published 1964 - 1965

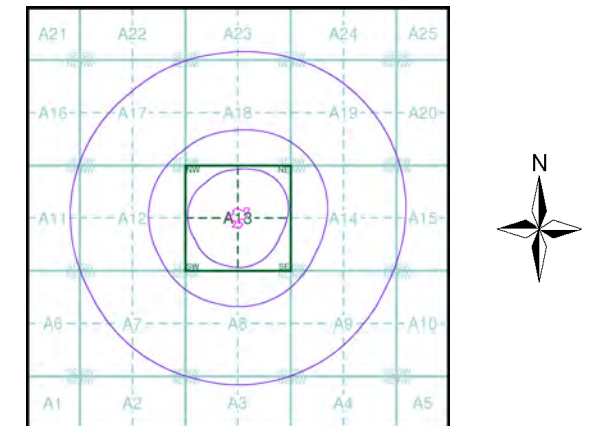
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

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Historical Map - Slice A



Order Details

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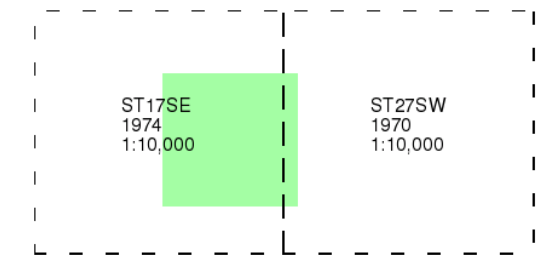
Ordnance Survey Plan

Published 1970 - 1974

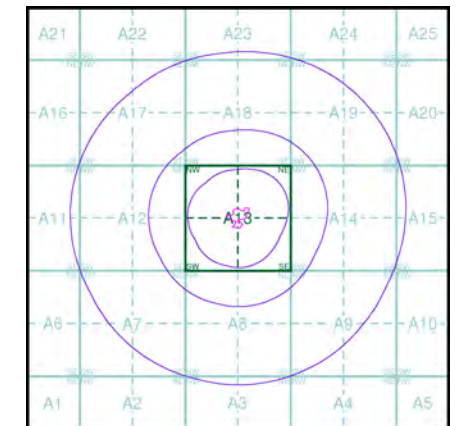
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

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Cardiff

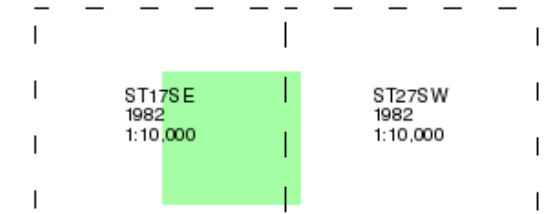
Published 1982

Source map scale - 1:10,000

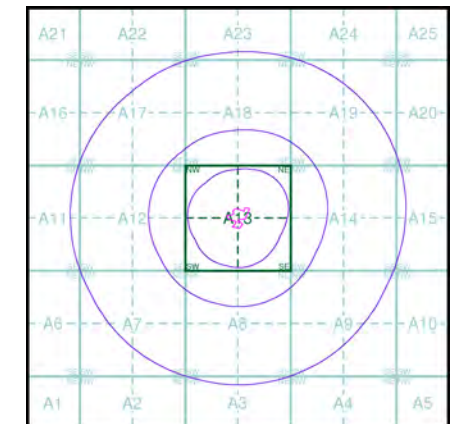
These maps were produced by the Russian military during the Cold War between 1950 and 1997, and cover 103 towns and cities throughout the U.K. The maps are produced at 1:25,000, 1:10,000 and 1:5,000 scale, and show detailed land use, with colour-coded areas for development, green areas, and non-developed areas. Buildings are coloured black and important building uses (such as hospitals, post offices, factories etc.) are numbered, with a numbered key describing their use.

They were produced by the Russians for the benefit of navigation, as well as strategic military sites and transport hubs, for use if they were to have invaded the U.K. The detailed information provided indicates that the areas were surveyed using land-based personnel, on the ground, in the cities that are mapped.

Map Name(s) and Date(s)



Russian Map - Slice A



Order Details

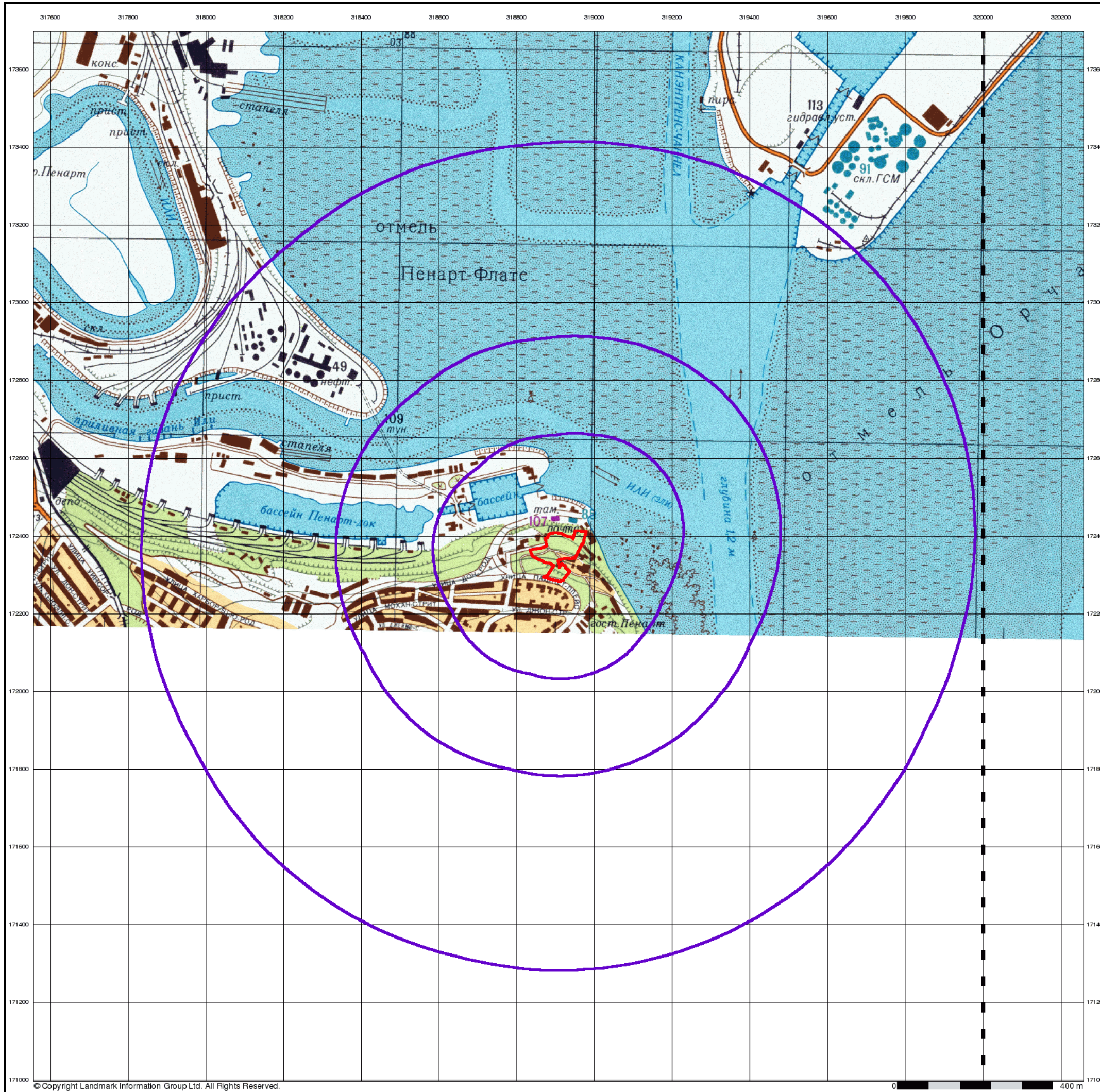
Order Number: 76477814_1_1
Customer Ref: 13124
National Grid Reference: 318910, 172360
Slice: A
Site Area (Ha): 0.9
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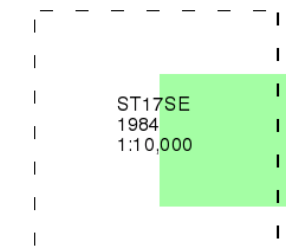
Ordnance Survey Plan

Published 1984

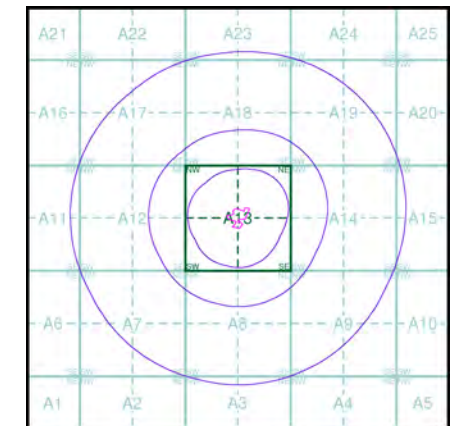
Source map scale - 1:10,000

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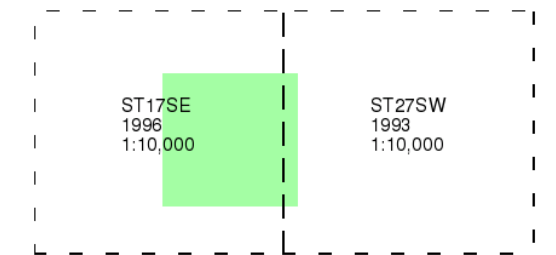
Ordnance Survey Plan

Published 1993 - 1996

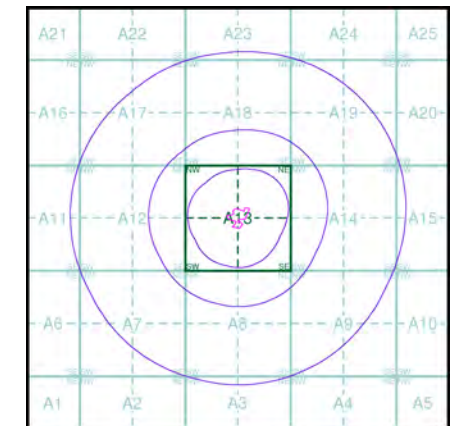
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

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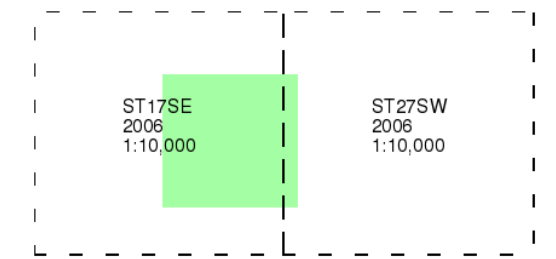
10k Raster Mapping

Published 2006

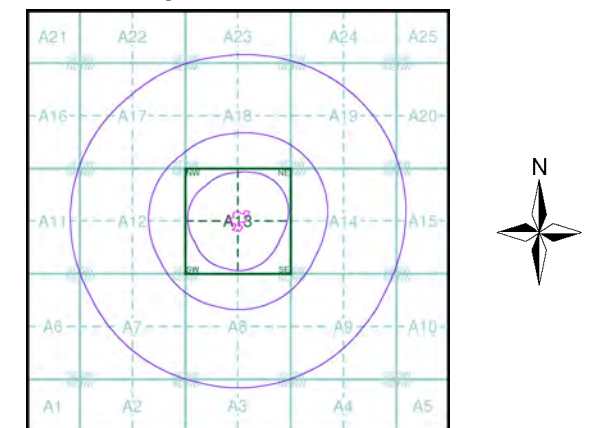
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

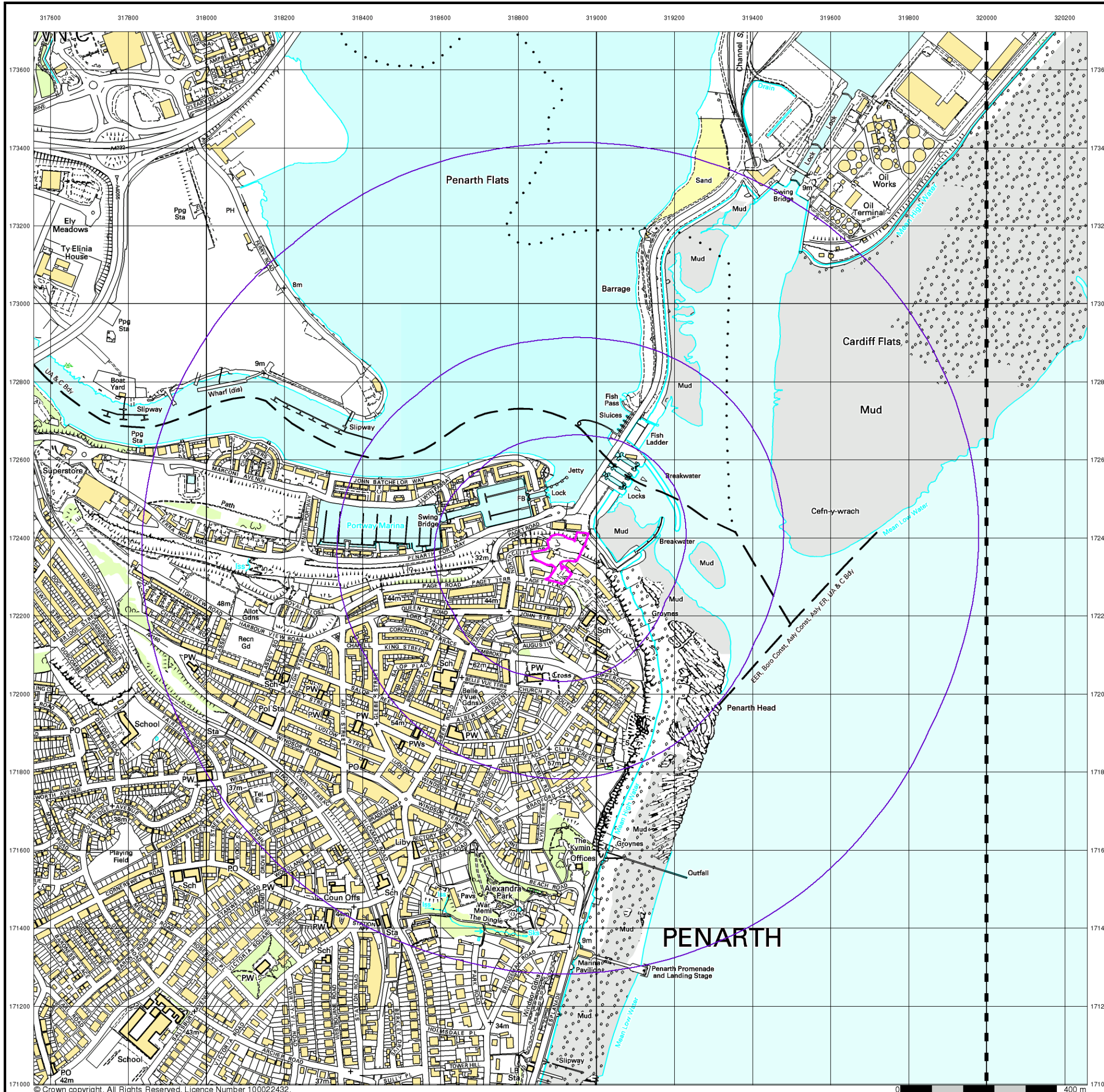
Order Number: 76477814_1_1
Customer Ref: 13124
National Grid Reference: 318910, 172360
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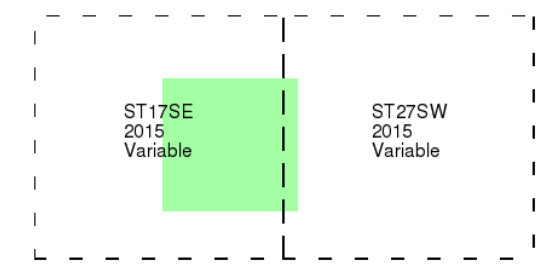
VectorMap Local

Published 2015

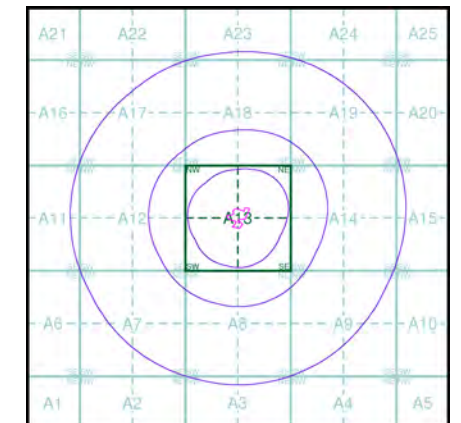
Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities), 1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)



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Historical Mapping Legends

Ordnance Survey County Series and Ordnance Survey Plan 1:2,500

Quarry **Gravel Pit** **Sand Pit**
Clay Pit **Shingle** **Refuse Heap**
Sloping Masonry **Flat Rock**
Marsh **Reeds** **Osiers**
Rough Pasture **Furze** **Wood**
Mixed Wood **Brushwood** **Orchard**
Fir **Ford** **Stepping Stones**
Ferry **Waterfall** **Lock**
Trig. Station **Altitude at Trig. Station**
B.M. 325.9 **Bench Mark** **Surface Level**
Arrow denotes flow of water **Antiquities (site of)**
Cutting **Embankment**
Railway crossing Road **Level Crossing** **Road crossing Railway**
Railway crossing River or Canal **Road over single stream** **Road over River or Canal**
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
County Borough Boundary (England)
Co. Boro. Bdy.
County Burgh Boundary (Scotland)
Boundary Post or Stone **Police Call Box**
B.R. **Bridle Road** **P** **Pump**
E.P **Electricity Pylon** **S.P** **Signal Post**
F.B. **Foot Bridge** **Sl** **Sluice**
F.P. **Foot Path** **Sp.** **Spring**
G.P **Guide Post or Board** **T.C.B** **Telephone Call Box**
M.S **Mile Stone** **Tr.** **Trough**
M.P M.R **Mooring Post or Ring** **W** **Well**

Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250

Inactive Quarry, Chalk Pit or Clay Pit **Active Quarry, Chalk Pit or Clay Pit**
Rock **Boulders**
Cliff **Slopes** **Top**
Roofed Building **Glazed Roof Building**
Sloping Masonry **Archway**
Non-Coniferous Tree (surveyed) **Coniferous Tree (surveyed)**
Non-Coniferous Trees (not surveyed) **Coniferous Trees (not surveyed)**
Orchard Tree **Scrub** **Bracken**
Coppice, Osier **Reeds** **Marsh, Saltings**
Rough Grassland **Heath** **Culvert**
Direction of water flow **Bench Mark** **Antiquity (site of)**
Cave Entrance **Triangulation Station** **Electricity Pylon**
Electricity Transmission Line
County Boundary (Geographical)
County & Civil Parish Boundary
Civil Parish Boundary
Admin. County or County Bor. Boundary
London Borough Boundary
Symbol marking point where boundary mereing changes
BH **Beer House** **P** **Pillar, Pole or Post**
BP, BS **Boundary Post or Stone** **PO** **Post Office**
Cn, C **Capstan, Crane** **PC** **Public Convenience**
Chy **Chimney** **PH** **Public House**
D Fn **Drinking Fountain** **Pp** **Pump**
EI P **Electricity Pillar or Post** **SB, S Br** **Signal Box or Bridge**
FAP **Fire Alarm Pillar** **SP, SL** **Signal Post or Light**
FB **Foot Bridge** **Spr** **Spring**
GP **Guide Post** **Tk** **Tank or Track**
H **Hydrant or Hydraulic** **TCB** **Telephone Call Box**
LC **Level Crossing** **TCP** **Telephone Call Post**
MH **Manhole** **Tr** **Trough**
MP **Mile Post or Mooring Post** **Wr Pt, Wr T** **Water Point, Water Tap**
MS **Mile Stone** **W** **Well**
NTL **Normal Tidal Limit** **Wd Pp** **Wind Pump**

Large-Scale National Grid Data 1:2,500 and 1:1,250

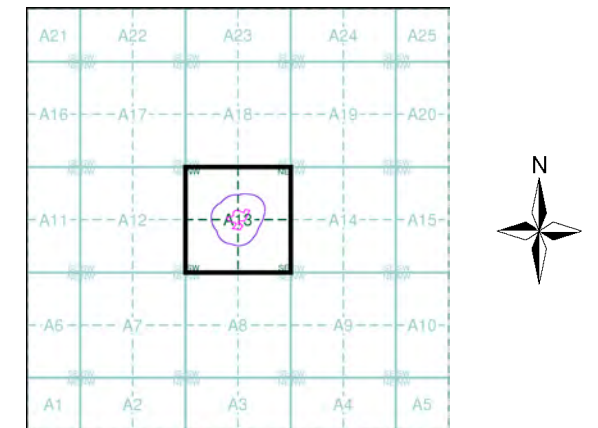
Cliff **Slopes** **Top**
Rock **Rock (scattered)**
Boulders **Boulders (scattered)**
Positioned Boulder **Scree**
Non-Coniferous Tree (surveyed) **Coniferous Tree (surveyed)**
Non-Coniferous Trees (not surveyed) **Coniferous Trees (not surveyed)**
Orchard Tree **Scrub** **Bracken**
Coppice, Osier **Reeds** **Marsh, Saltings**
Rough Grassland **Heath** **Culvert**
Direction of water flow **Triangulation Station** **Antiquity (site of)**
Electricity Transmission Line **Electricity Pylon**
B.M. 231.60m **Bench Mark** **Buildings with Building Seed**
Roofed Building **Glazed Roof Building**
Civil parish/community boundary
District boundary
County boundary
Boundary post/stone
Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)
Bks **Barracks** **P** **Pillar, Pole or Post**
Bty **Battery** **PO** **Post Office**
Cemy **Cemetery** **PC** **Public Convenience**
Chy **Chimney** **Pp** **Pump**
Cis **Cistern** **Ppg Sta** **Pumping Station**
Dismtd Rly **Dismantled Railway** **PW** **Place of Worship**
EI Gen Sta **Electricity Generating Station** **Sewage Ppg Sta** **Sewage Pumping Station**
EI P **Electricity Pole, Pillar** **SB, S Br** **Signal Box or Bridge**
EI Sub Sta **Electricity Sub Station** **SP, SL** **Signal Post or Light**
FB **Filter Bed** **Spr** **Spring**
Fn / D Fn **Fountain / Drinking Ftn.** **Tk** **Tank or Track**
Gas Gov **Gas Valve Compound** **Tr** **Trough**
GVC **Gas Governor** **Wd Pp** **Wind Pump**
GP **Guide Post** **Wr Pt, Wr T** **Water Point, Water Tap**
MH **Manhole** **Wks** **Works (building or area)**
MP, MS **Mile Post or Mile Stone** **W** **Well**



Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Glamorganshire	1:2,500	1879 - 1880	2
Glamorganshire	1:2,500	1900	3
Glamorganshire	1:2,500	1920	4
Glamorganshire	1:2,500	1940 - 1942	5
Ordnance Survey Plan	1:1,250	1954 - 1955	6
Ordnance Survey Plan	1:2,500	1955	7
Additional SIMs	1:1,250	1955 - 1989	8
Ordnance Survey Plan	1:1,250	1973 - 1976	9
Ordnance Survey Plan	1:1,250	1990	10
Additional SIMs	1:1,250	1990	11
Additional SIMs	1:1,250	1990	12
Large-Scale National Grid Data	1:1,250	1992	13
Large-Scale National Grid Data	1:1,250	1993 - 1995	14

Historical Map - Segment A13



Order Details

Order Number: 76477814_1_1
 Customer Ref: 13124
 National Grid Reference: 318910, 172360
 Slice: A
 Site Area (Ha): 0.9
 Search Buffer (m): 100

Site Details

Northcliffe Lodge, Northcliffe Drive, PENARTH, South Glamorgan, CF64 1DQ



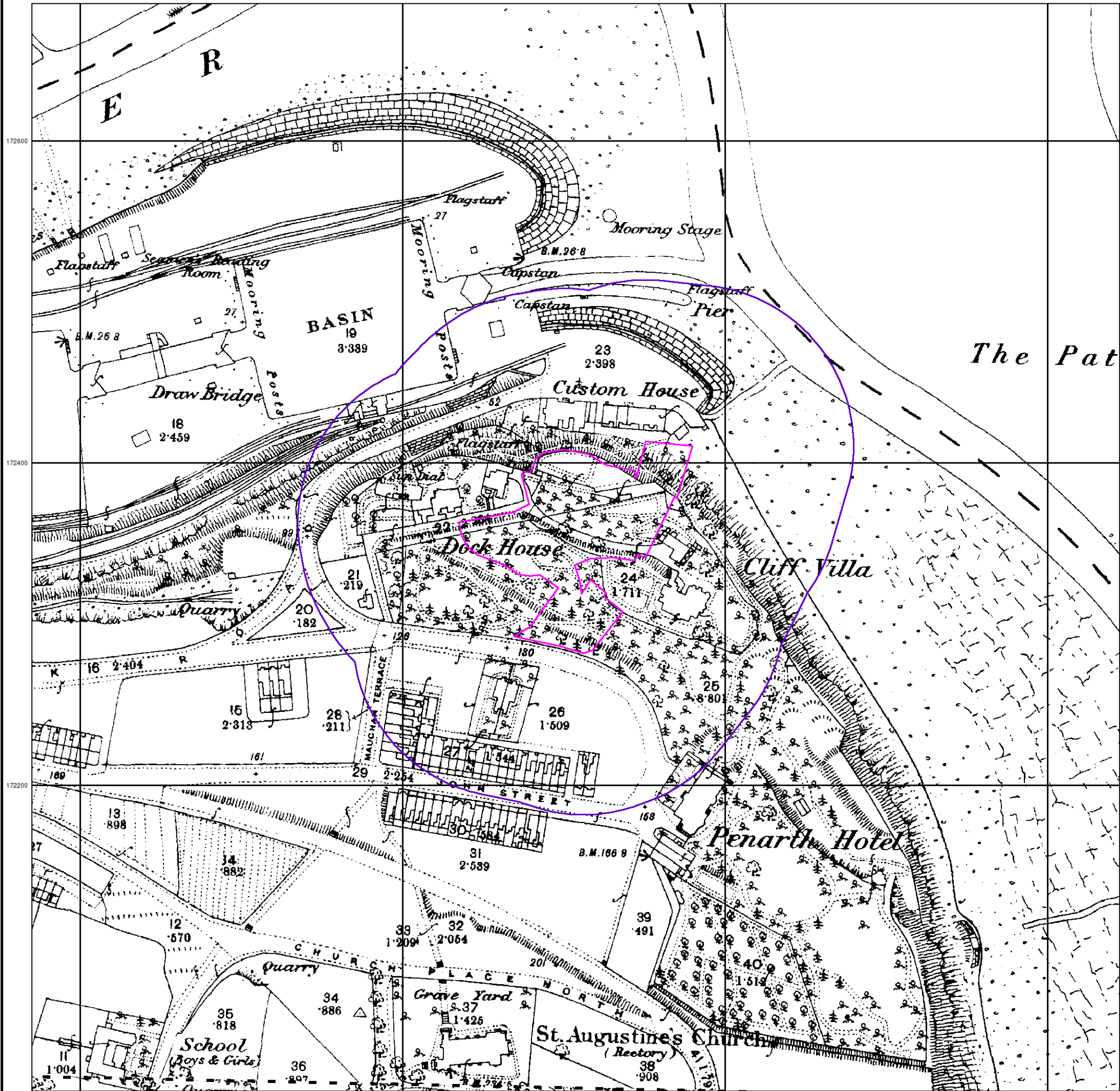
Tel: 0844 844 9952
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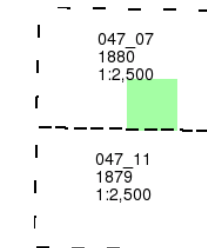
Glamorganshire

Published 1879 - 1880

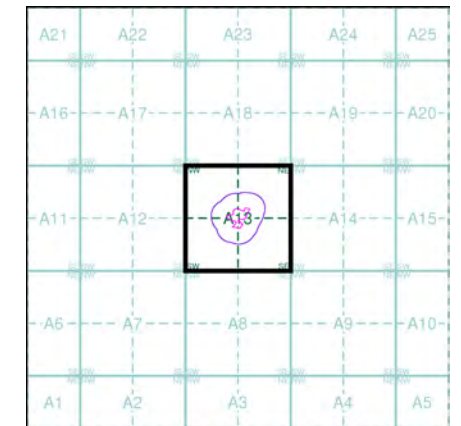
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The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

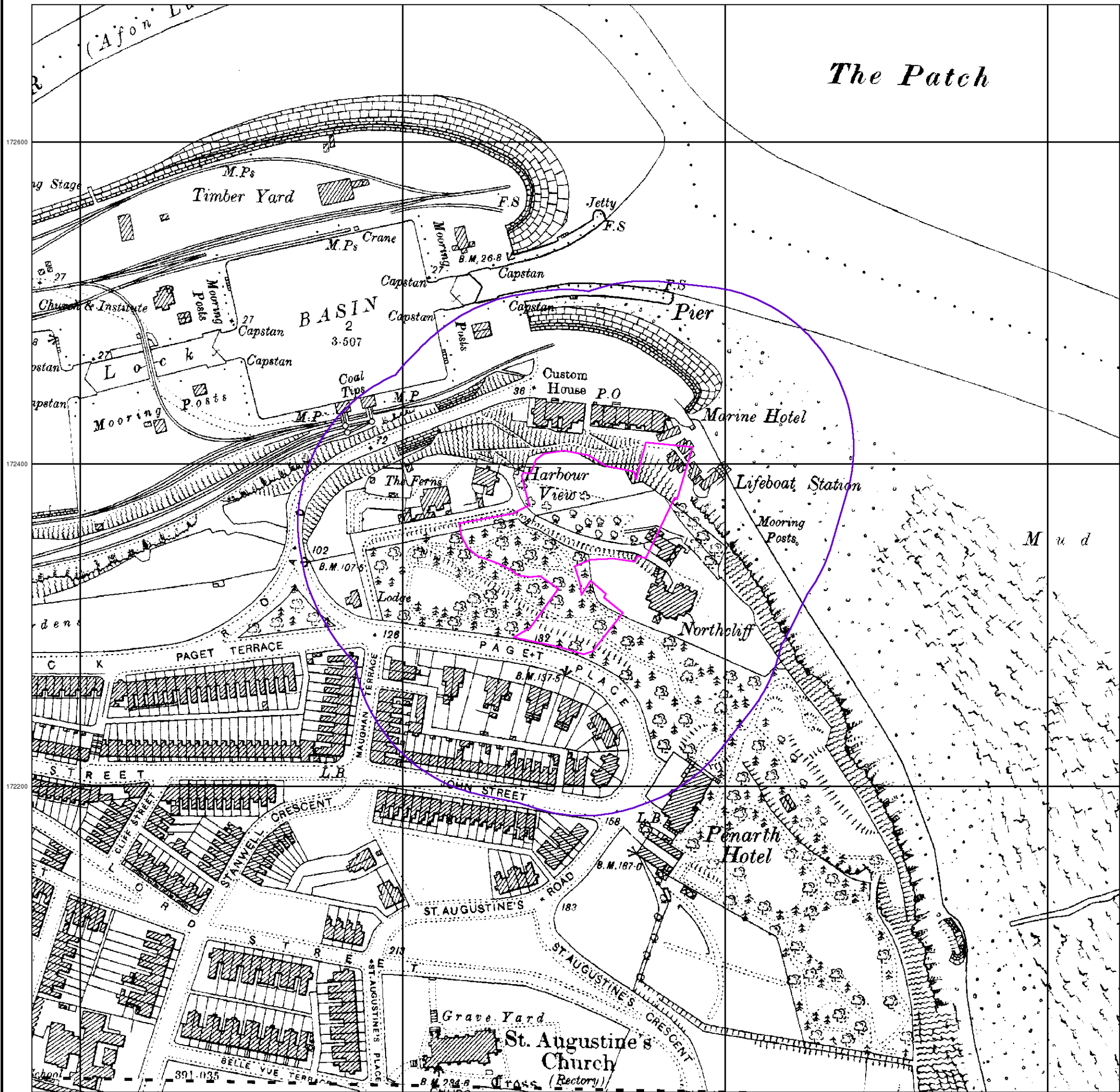
Order Number: 76477814_1_1
 Customer Ref: 13124
 National Grid Reference: 318910, 172360
 Slice: A
 Site Area (Ha): 0.9
 Search Buffer (m): 100

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The Patch

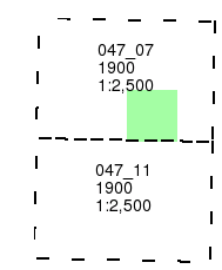


Glamorganshire
Published 1900

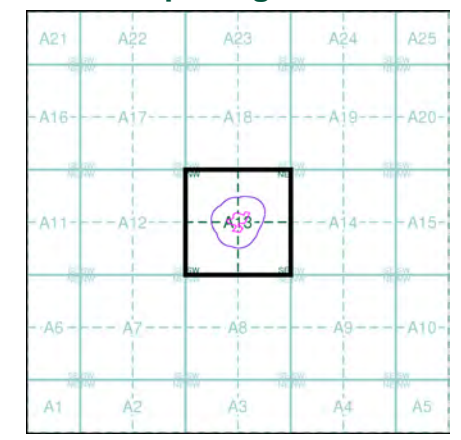
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 76477814_1_1
 Customer Ref: 13124
 National Grid Reference: 318910, 172360
 Slice: A
 Site Area (Ha): 0.9
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Site Details

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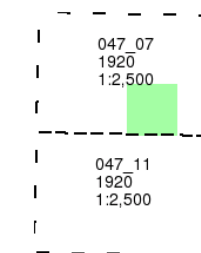
Glamorganshire

Published 1920

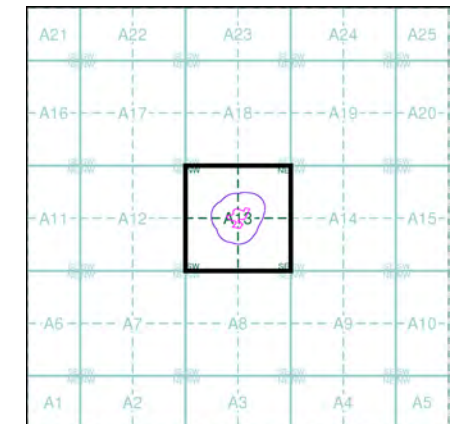
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

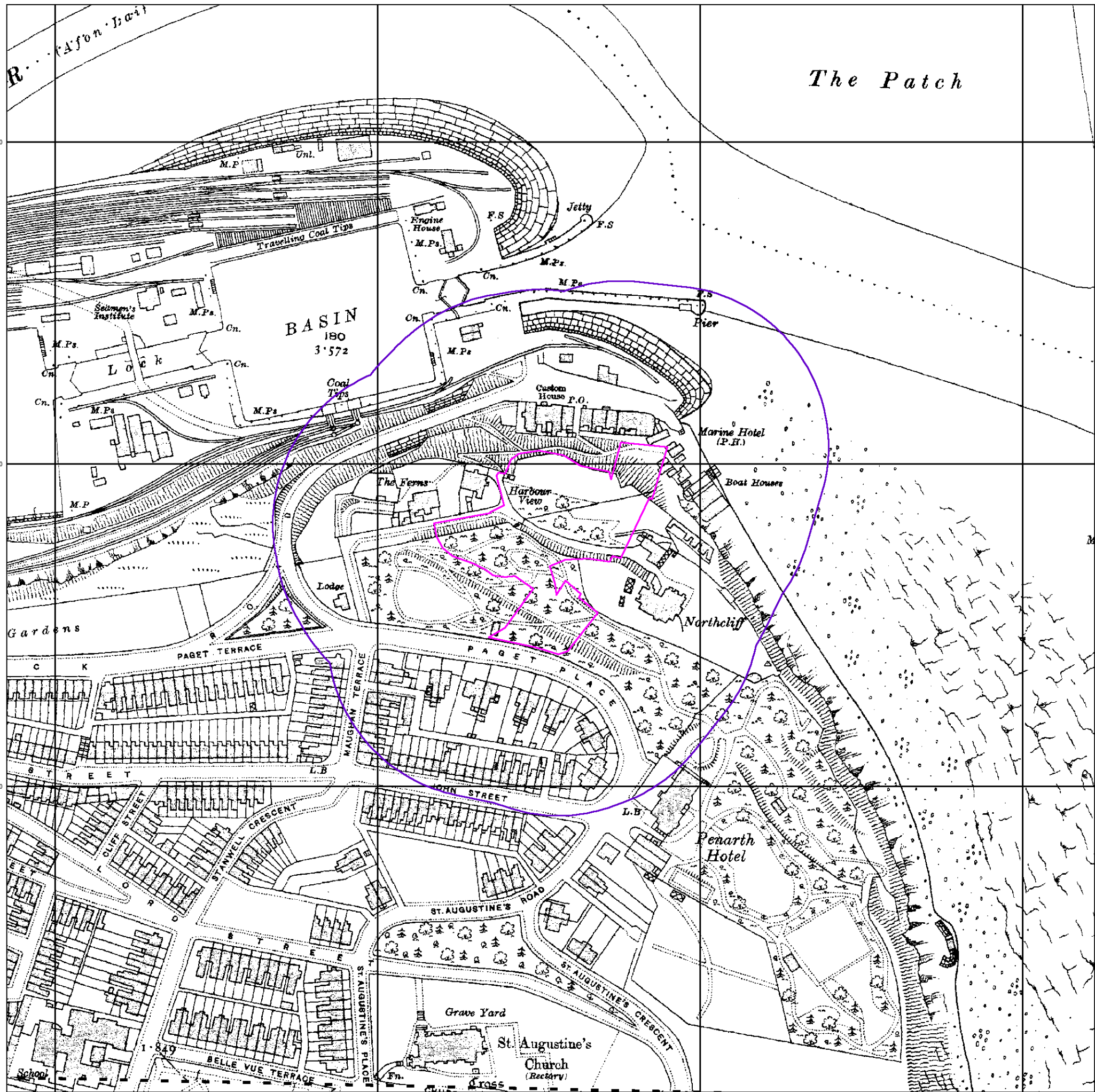
Order Number: 76477814_1_1
Customer Ref: 13124
National Grid Reference: 318910, 172360
Slice: A
Site Area (Ha): 0.9
Search Buffer (m): 100

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Glamorganshire

Published 1940 - 1942

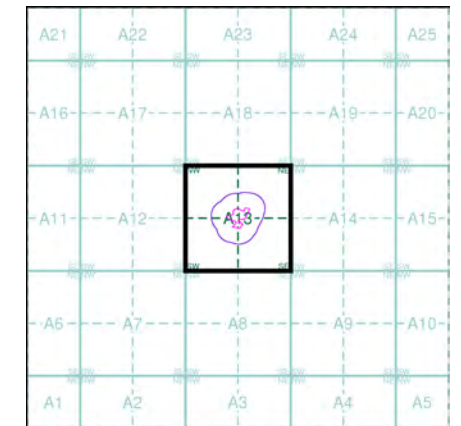
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

047 07	1942	1:2,500
047 11	1940	1:2,500

Historical Map - Segment A13



Order Details

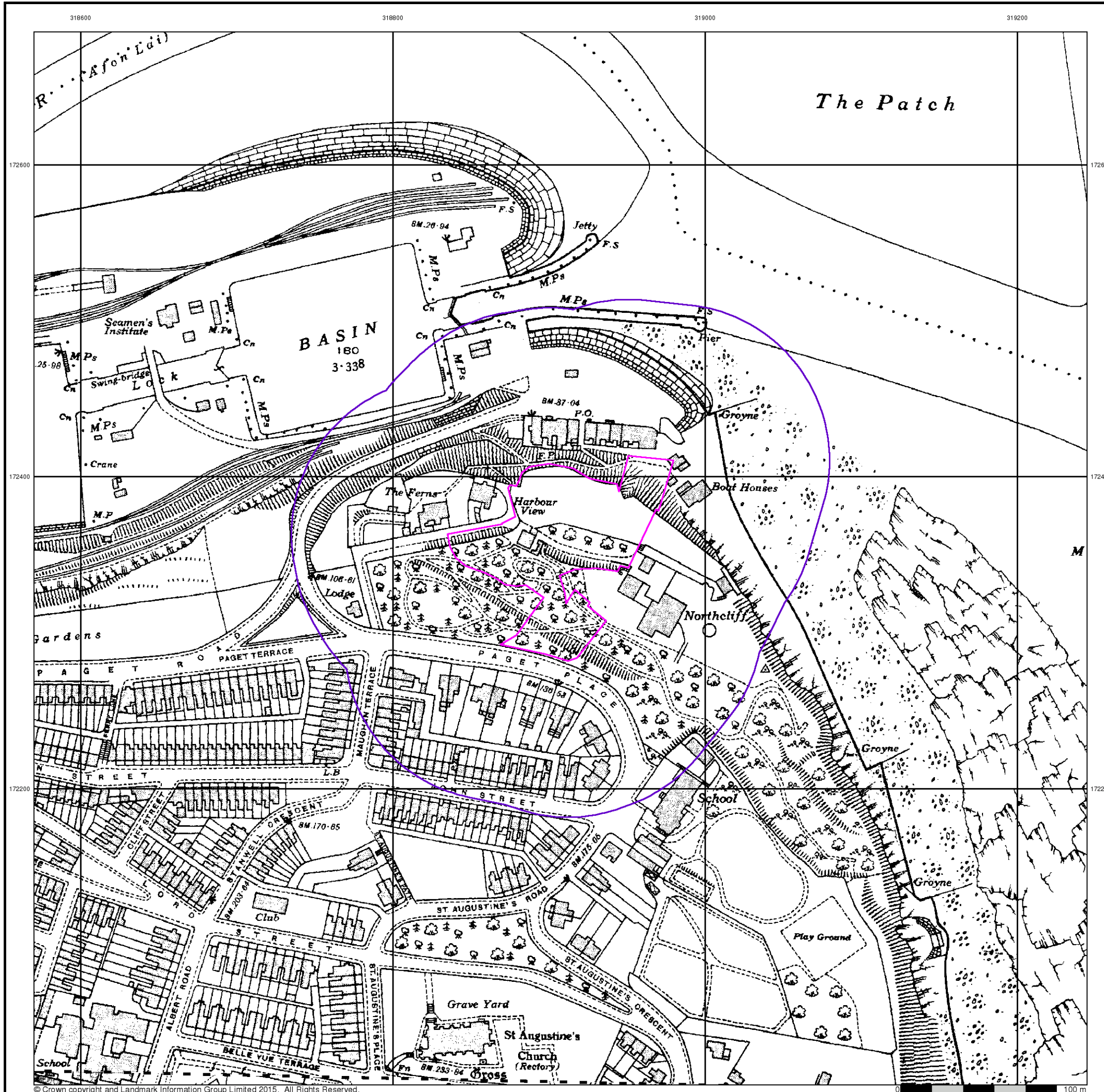
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 Customer Ref: 13124
 National Grid Reference: 318910, 172360
 Slice: A
 Site Area (Ha): 0.9
 Search Buffer (m): 100

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Ordnance Survey Plan

Published 1954 - 1955

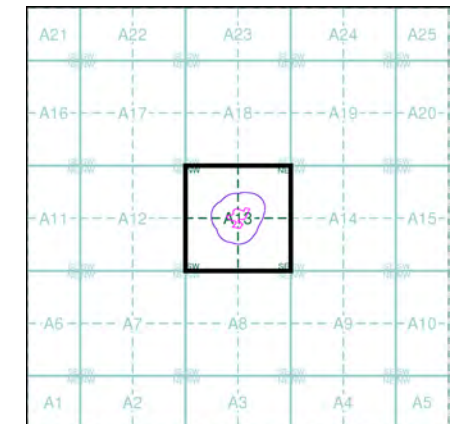
Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

ST1872NE	1955	1:1,250
ST1872SE	1955	1:1,250
ST1972SW	1954	1:1,250

Historical Map - Segment A13



Order Details

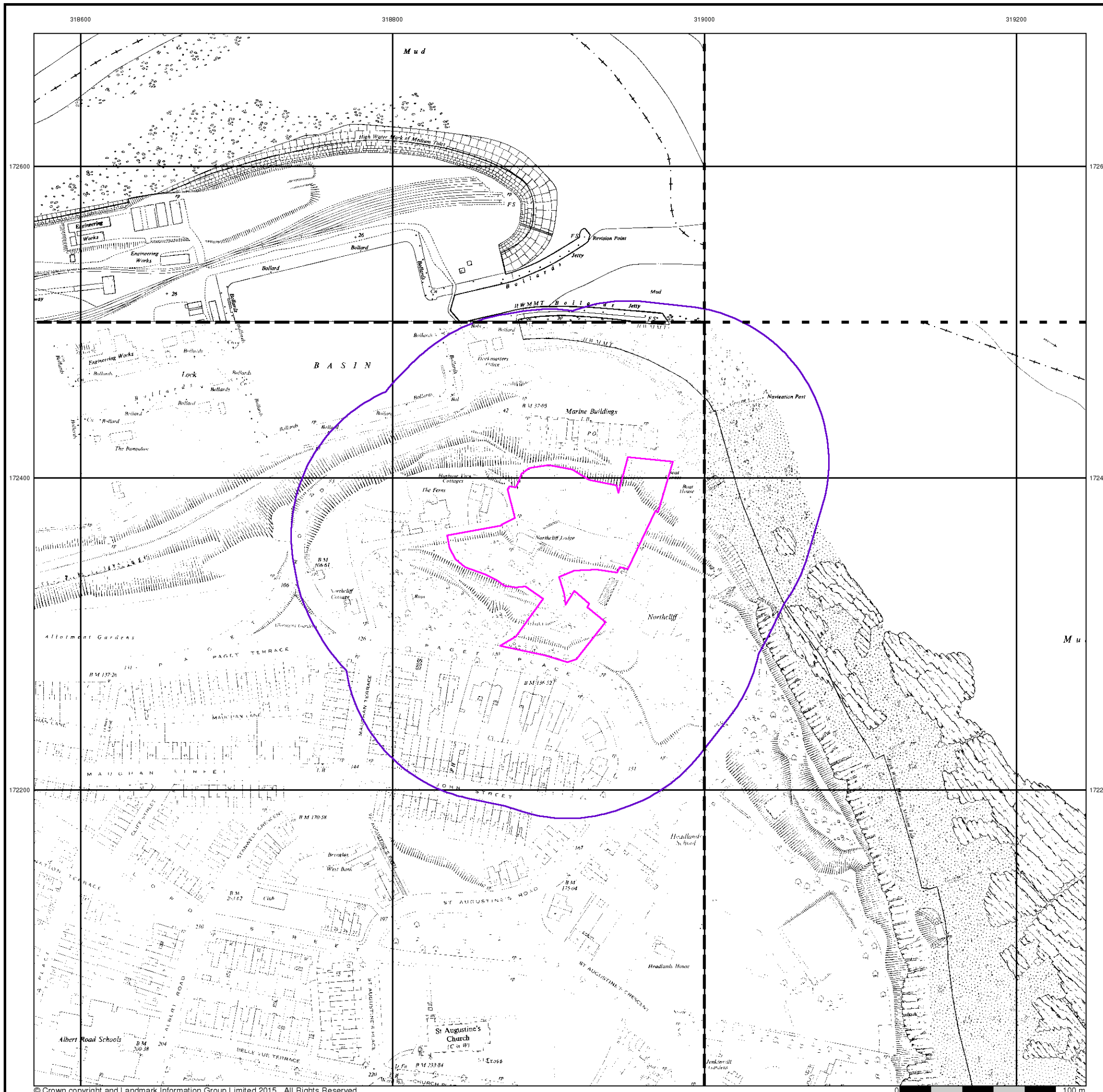
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 Customer Ref: 13124
 National Grid Reference: 318910, 172360
 Slice: A
 Site Area (Ha): 0.9
 Search Buffer (m): 100

Site Details

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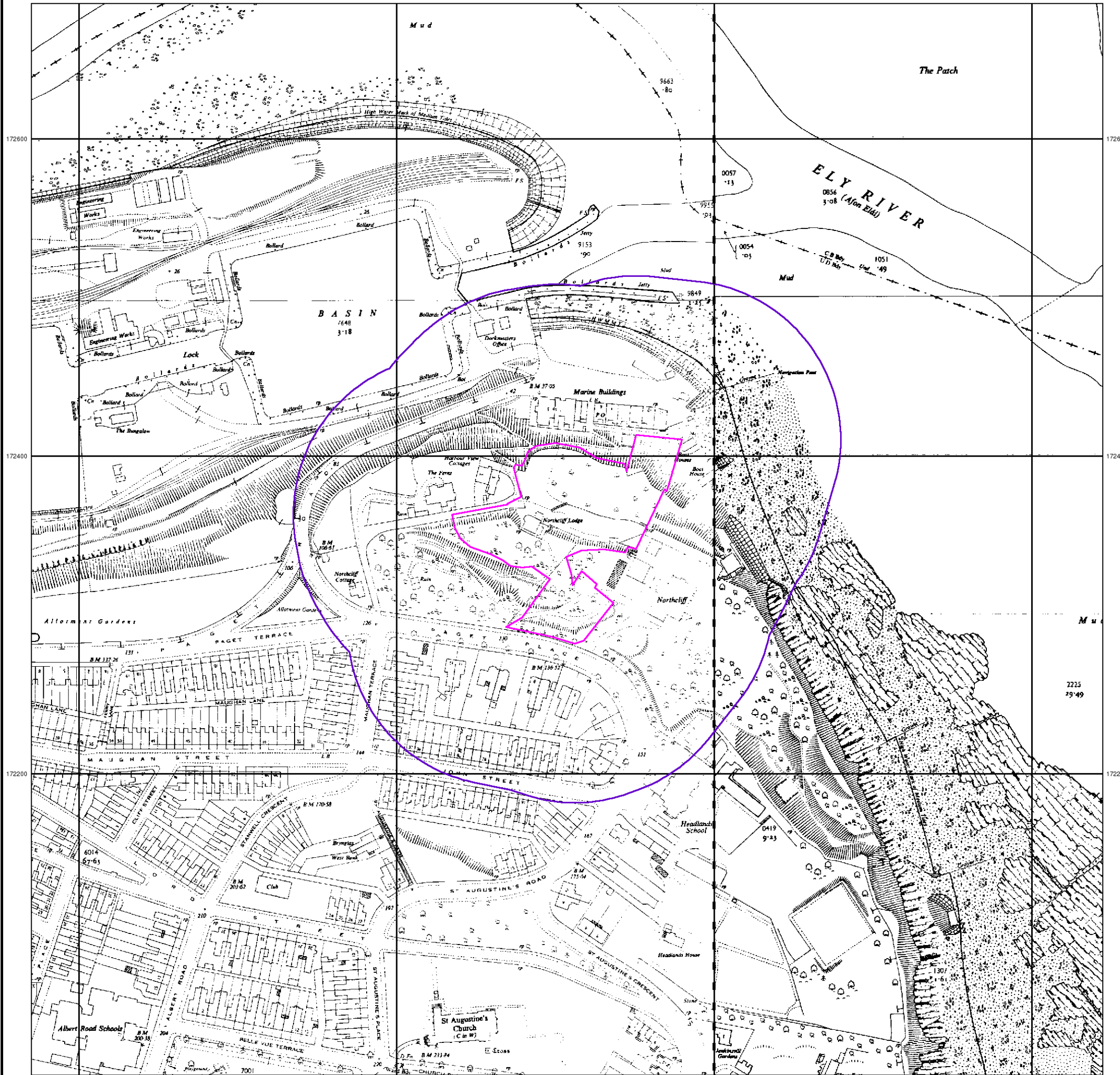


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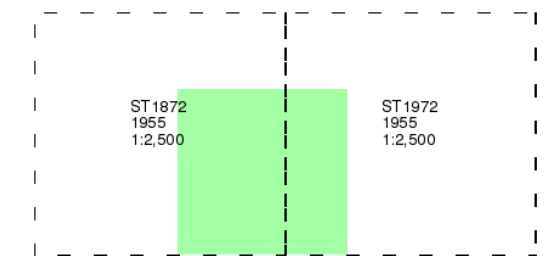
Ordnance Survey Plan

Published 1955

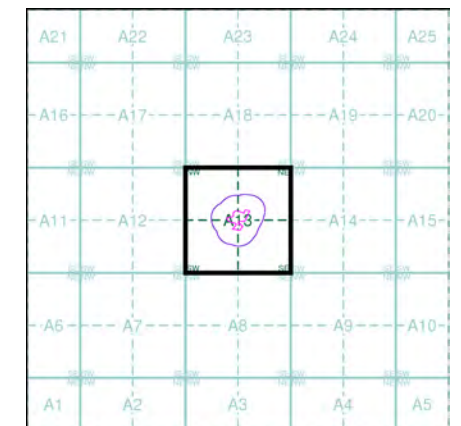
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 76477814_1_1
 Customer Ref: 13124
 National Grid Reference: 318910, 172360
 Slice: A
 Site Area (Ha): 0.9
 Search Buffer (m): 100

Site Details

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Additional SIMs

Published 1955 - 1989

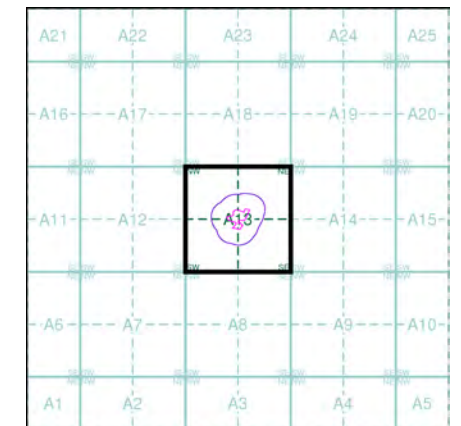
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

ST1872NE	1988	1:1,250
ST1872SE	1955	1:1,250
ST1972SW	1989	1:1,250

Historical Map - Segment A13



Order Details

Order Number: 76477814_1_1
 Customer Ref: 13124
 National Grid Reference: 318910, 172360
 Slice: A
 Site Area (Ha): 0.9
 Search Buffer (m): 100

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Ordnance Survey Plan

Published 1973 - 1976

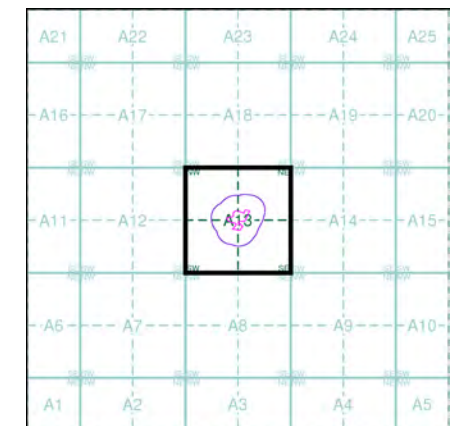
Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

ST1872NE	1973	1:1,250
ST1972SW	1976	1:1,250

Historical Map - Segment A13



Order Details

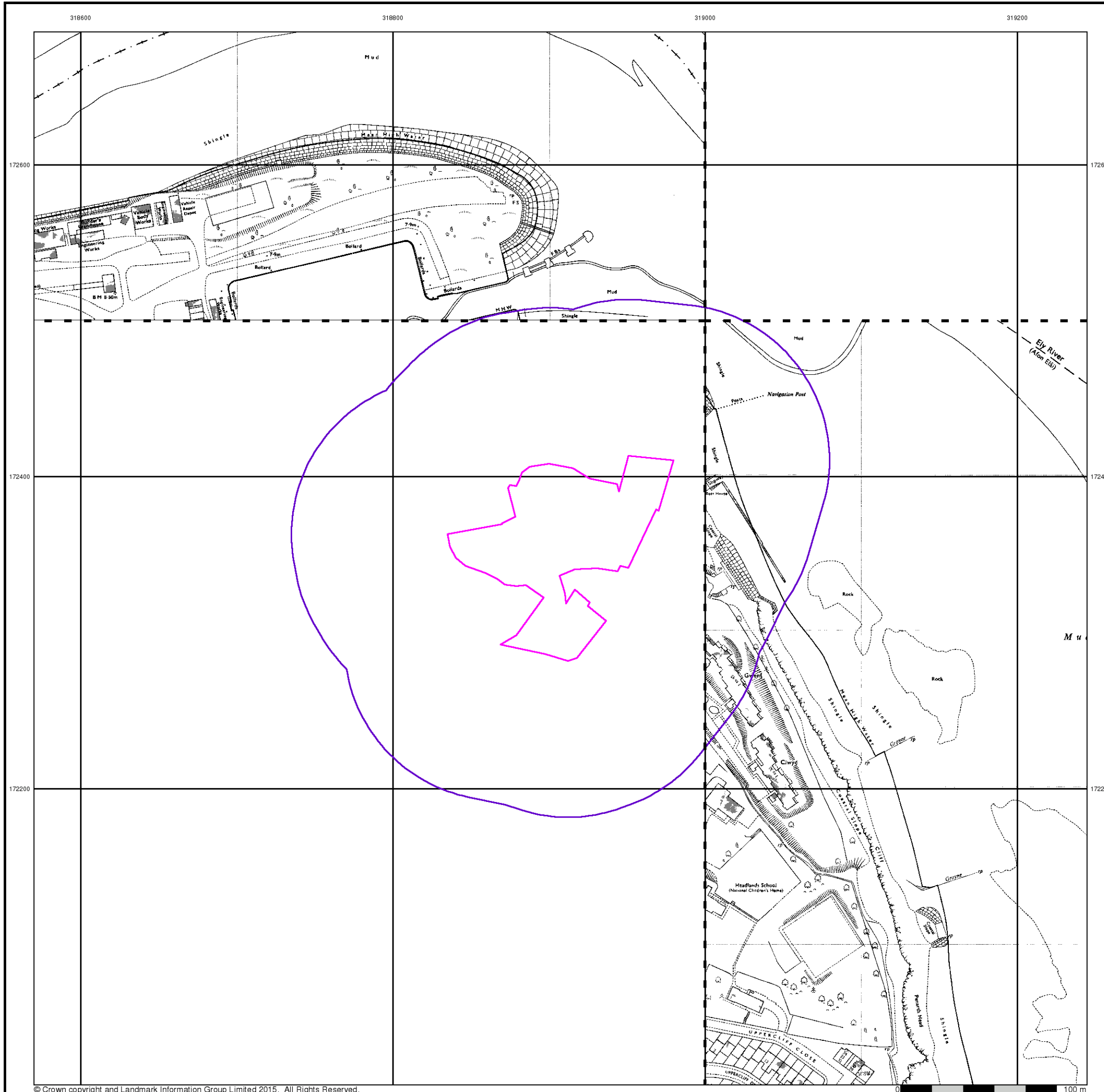
Order Number: 76477814_1_1
 Customer Ref: 13124
 National Grid Reference: 318910, 172360
 Slice: A
 Site Area (Ha): 0.9
 Search Buffer (m): 100

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Ordnance Survey Plan

Published 1990

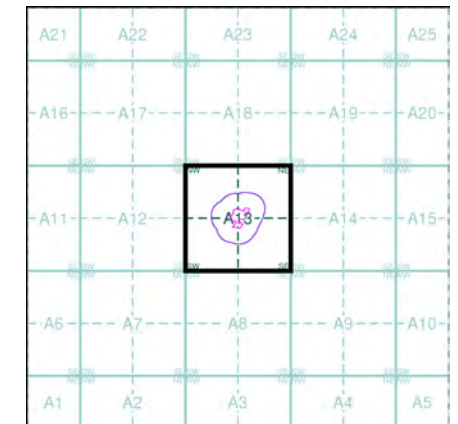
Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

ST1872NE
1990
1:1,250

Historical Map - Segment A13



Order Details

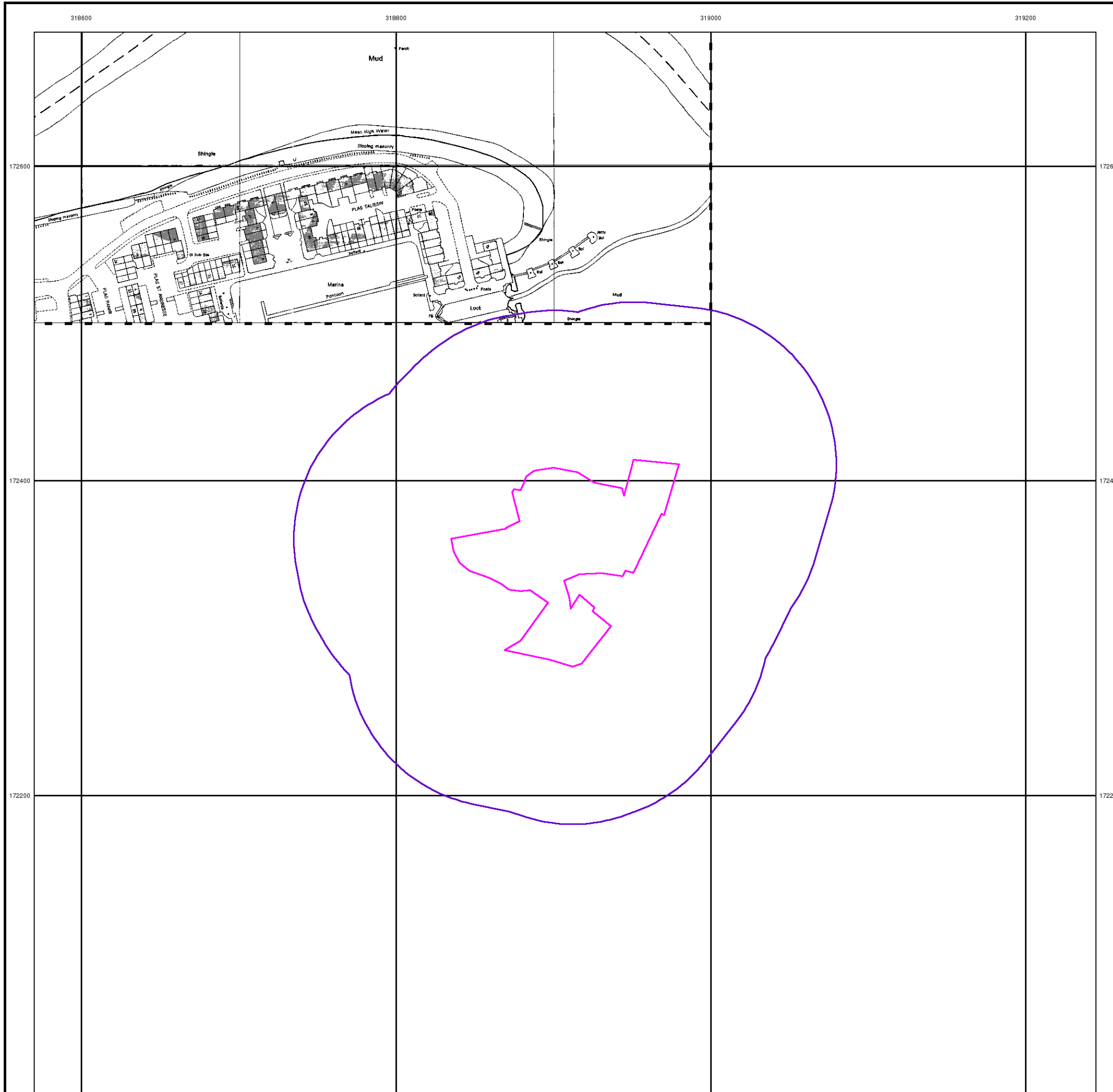
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Customer Ref: 13124
National Grid Reference: 318910, 172360
Slice: A
Site Area (Ha): 0.9
Search Buffer (m): 100

Site Details

Northcliffe Lodge, Northcliffe Drive, PENARTH, South Glamorgan, CF64 1DQ



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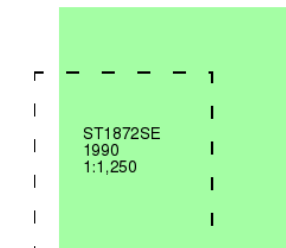
Additional SIMs

Published 1990

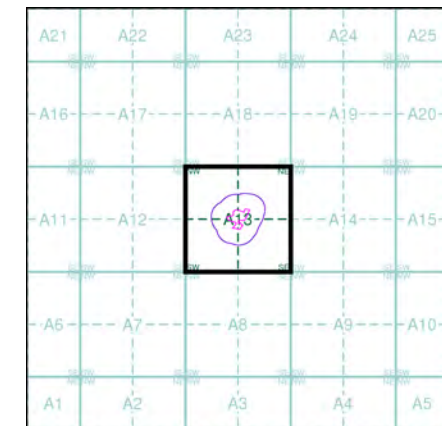
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 76477814_1_1
Customer Ref: 13124
National Grid Reference: 318910, 172360
Slice: A
Site Area (Ha): 0.9
Search Buffer (m): 100

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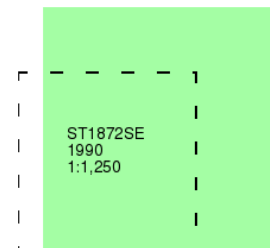
Additional SIMs

Published 1990

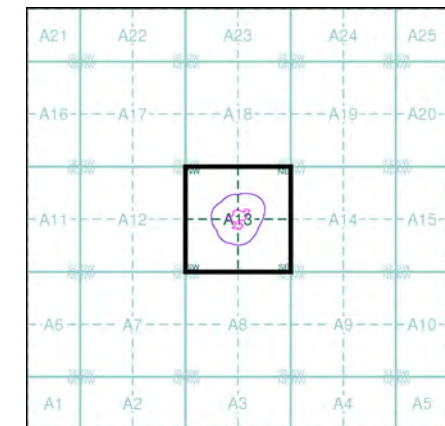
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 76477814_1_1
Customer Ref: 13124
National Grid Reference: 318910, 172360
Slice: A
Site Area (Ha): 0.9
Search Buffer (m): 100

Site Details

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Large-Scale National Grid Data

Published 1992

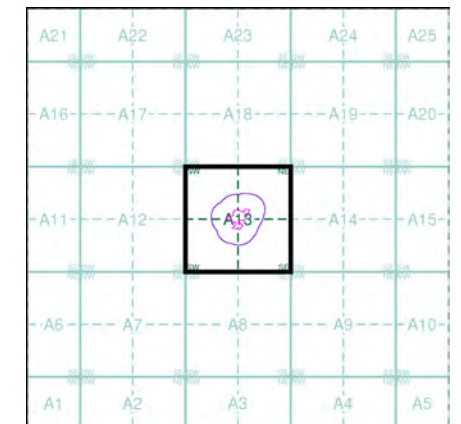
Source map scale - 1:1,250

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

ST1872NE	1992	1:1,250	ST1972NW	1992	1:1,250
ST1872SE	1992	1:1,250	ST1972SW	1992	1:1,250

Historical Map - Segment A13



Order Details

Order Number: 76477814_1_1
 Customer Ref: 13124
 National Grid Reference: 318910, 172360
 Slice: A
 Site Area (Ha): 0.9
 Search Buffer (m): 100

Site Details

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Large-Scale National Grid Data

Published 1993 - 1995

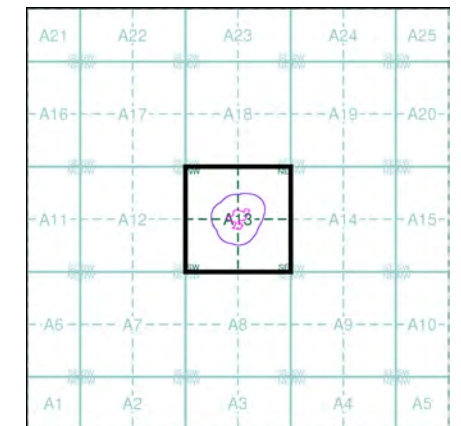
Source map scale - 1:1,250

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

ST1872NE
1993
1:1,250
ST1872SE
1995
1:1,250

Historical Map - Segment A13



Order Details

Order Number: 76477814_1_1
 Customer Ref: 13124
 National Grid Reference: 318910, 172360
 Slice: A
 Site Area (Ha): 0.9
 Search Buffer (m): 100

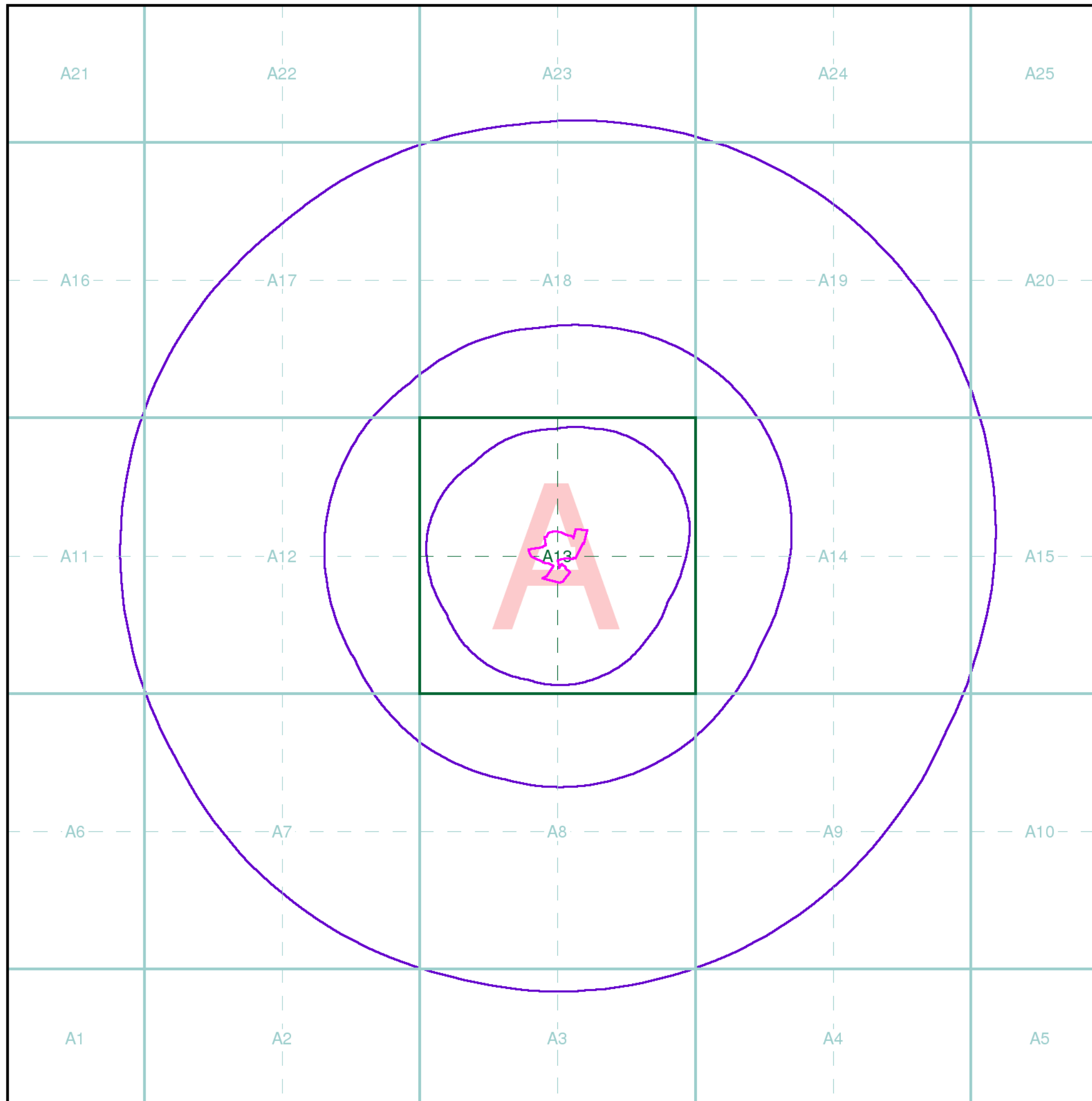
Site Details

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Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

Slice

Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

Segment

A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

Quadrant

A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:



Envirocheck reports are compiled from 136 different sources of data.

Client Details

Ms H Brooke-Smith, Terra Firma (Wales) Ltd, 5 Deryn Court, Wharfdale Road, Pentwyn, Cardiff, CF23 7HB

Order Details

Order Number: 76477814_1_1
 Customer Ref: 13124
 National Grid Reference: 318910, 172360
 Site Area (Ha): 0.9
 Search Buffer (m): 1000

Site Details

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<http://www.landmarkinfo.co.uk/Terms/Show/515>



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