

DTA

Consulting Engineers LLP

Multi Discipline Consultancy

Flood Risk Assessment Report

For

**The proposed “Change of Use” of the former
McNulty site into the Port’s Operation Area**

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Date: 23RD July 2015

on behalf of
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Project No: 3386
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1.0 INTRODUCTION

- 1.1 This Flood Risk Assessment (FRA) has been produced in accordance with the Environment Agency Guidance Notes which support the National Planning Policy Framework (NPPF).
- 1.2 The purpose of this FRA is to assess the risk of flooding from all sources now and in the future, taking into account climate change, for the former McNulty site that is to become part of the Port of Tyne's Operation Area.
- 1.3 This FRA will accompany the Port of Tyne's Planning Application for a "Change of Use" for this site.
- 1.4 DTA Consulting Engineers have been commissioned by the Port of Tyne to produce this FRA.

2.0 THE SITE

- 2.1 The site layout plan presented in Appendix A indicates the extent of the site and its proximity to the River Tyne. The two more detailed plans of the North and South yards of the site are presented in appendix B and indicate some of the site features.
- 2.2 The original McNulty yard consisted of three areas, the two main areas of the yard, North and South are located between the River Tyne and Corstorphine Town/West Holborn which are to the East. The car park and stockyard is located between Corstorphine Town and Garwood Street and South of Smith Street, but will not form part of the site considered for the "change of use".
- 2.3 The centre of the site is located at map reference NZ 355 661 with a post code of NE33 1RZ.

3.0 SITE TOPOGRAPHY

- 3.1 The site is generally flat with a slight fall towards the river. The adjacent land outside rises the farther to the North, such that a retaining wall of increasing height is required to the East side of the site with ramps required for the two access points off West Holborn.
- 3.2 The site falls towards the river at about 1 in 100 and site levels vary between 4.0 and 4.6m AOD.

4.0 HISTORY OF THE SITE

- 4.1 The Envirocheck historical record maps for the site are presented in appendix C and provide a profile of the site's development over the last 150 years.
- 4.2 The 1820 map shows the river line generally as it is today, with a number of small graving docks on the South yard and some on the North yard. A number of these graving docks are located at the end of the fabrication shop. At this time the area seemed to be in use for the construction of wooden ships.
- 4.3 In circa 1880, the South yard was purchased by John Redhead. From this point in time it was progressively developed and became known as Redheads Yard. It was eventually taken over by British Shipbuilders in the 1970's with the last ship being constructed in 1977, after which the yard was closed.
- 4.4 The South yard developed from the 1880's eventually consisting of three slipways at one time, but the central one was replaced by an elevated crane in the early 1960's.
- 4.5 The South yard was bought by the McNulty Brothers in the mid 1980's from the then British Shipbuilders and the slipways either side of the elevated crane track were in-filled.
- 4.6 The current North yard consisted of two areas, the Southern area had two large dry docks constructed in 1897 and the 1910's and known as West Docks.

- 4.7 The Northern area has had a variety of uses such as a coal depot and staites with a railway line, saw mill and other industrial uses such as an iron foundry as well as a glassworks.

A power station was also constructed in circa 1910 and substantially demolished in the mid 1960's, with the remaining buildings being demolished in the 1980's.

5.0 EXISTING DRAINAGE

- 5.1 The Northumbrian Water Limited plan presented in Appendix D indicates the adopted sewers in and around the site.

- 5.2 Three adopted sewers currently traverse the site and discharge into the River Tyne:

- A 840 x 1100 Brick Egg Culvert to the South.
- A 620 x 480 Brick Egg Culvert centrally.
- A 2300mm concrete pipe to the North.

As would be expected, these sewers were previously part of the combined discharge from the surrounding areas into the river. Since then the construction of an interceptor sewer, several CSO's and adopted pumping stations has re-directed foul flows to a suitable treatment facility. However, all three of these adopted sewers are still in operation and discharge the surface water and diluted effluent to the river.

- 5.3 The current status and full extent of any wayleave on any of these sewers remains unknown at this time.

- 5.4 Within the site the foul drainage from the buildings is either connected directly to the public sewer within Corstorphine Town road or, where levels do not allow, a small private pumping station has been constructed adjacent the Fabrication Shed which re-directs gravity flows back to the same public sewer.

- 5.5 All on-site surface water discharge is directed towards the River Tyne via private drains and channels, or simply soaks into the predominantly granular hardstandings.

6.0 PROPOSED SITE

- 6.1 The proposed "Change of Use" for the site will see the site incorporated into the Port of Tyne's "operation area".

- 6.2 This will not constitute any physical changes to the site except for the improvements to the quay frontage that are currently underway as part of essential and critical repair work.

7.0 ENVIRONMENT AGENCY CONSIDERATIONS

- 7.1 The main two considerations with regard to flood risk for this site are:

- From the River Tyne
- Overland flow

After consulting the Environment Agency website and examining the various flood zone maps, clearly the biggest threat of flooding to the site is from the River Tyne, which is not only influenced by the surface water entering the river, but also the influence of the tides and the sea.

- 7.2 The Port of Tyne drawing presented in Appendix E indicates a detailed contour map of the flooding the site would suffer during a 1 in 1000 year storm with high tides. The contour has been set at 4.63 AOD and, as can be seen, covers most of the site with the exception of the South East boundary. This high spot is where the two inhabitable buildings on the site reside.

- 7.3 The proximity of the River Tyne to the site and the general topography of the site provides a low lying flood plain that is susceptible to flooding in extreme circumstances and is classified as a zone 1 or low risk area according to the Environment Agency flood maps.
- 7.4 The proposed “change of use” for the site will initially improve the quay frontage making it serviceable for loading and unloading cargo.
- 7.5 The remainder of the site will remain semi-permeable hardstanding for storing cargo as part of the Port of Tyne’s ongoing operations.
- 7.6 Loading or unloading will not be permitted during a 1 in 1000 year event and all material stored in the flood zone will be vetted such that it is not affected by rising flood waters.
- 7.7 The risk of flooding from surface water run-off is almost non-existent. The general fall across the site to the river and the granular makeup of the hardstandings reduce the effects of surface water run-off to a couple of isolated puddles. The Environment Agency map confirms this and also indicates that, although the rear of the site rises, the residential developments adjacent do not contribute to any external surface water run-off entering the site.

8.0 NORTHUMBRIAN WATER LIMITED

- 8.1 The Northumbrian Water apparatus presented in Appendix D indicates three separate adopted public sewers that cross the site to the River Tyne.

The existing surface water run-off drains either into the ground or directly to the river, and the foul water discharges to the public sewers within Corstorphine Town road.

It is understood that this “Change of Use” proposed by the Port of Tyne will not change any of these existing drainage parameters.

Any further improvements or amendments to the site will be the subject of further consultation within Northumbrian Water Limited to ensure their existing public sewers crossing the site are accessible or diverted under a Section 102 Agreement.

Although no wayleaves are indicated for these sewers on Northumbrian Water Limited records, the Port of Tyne understands that access for maintenance is required and will consult with Northumbrian Water Limited should site developments impair or impede this access in the future.

9.0 CONCLUSIONS

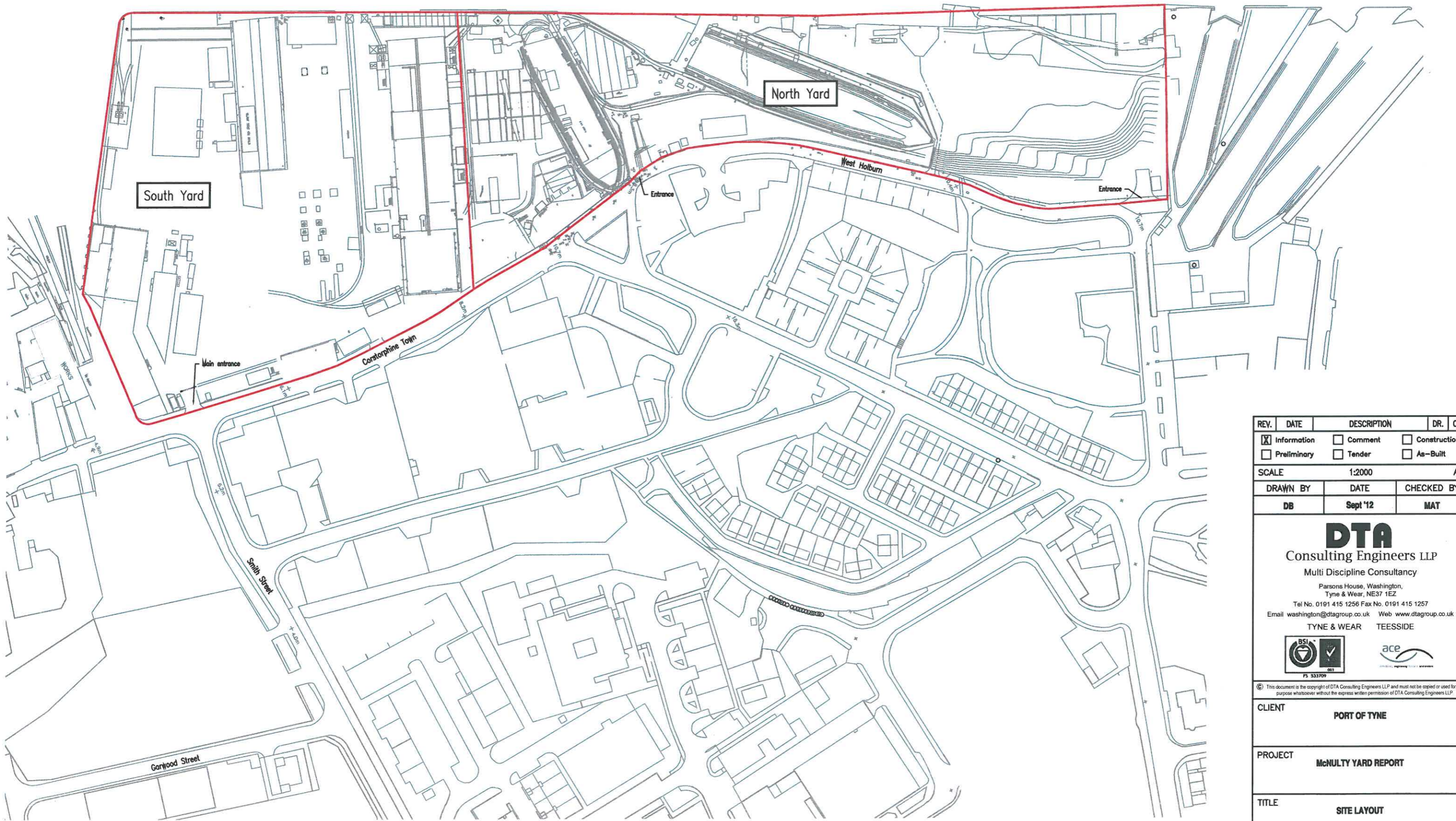
- 9.1 According to the Environment Agency Flood Risk Plans this site is categorised as a “low risk” for both surface water run-off and flooding from the River Tyne.
- 9.2 The area of the site that will be flooded in a 1 in 1000 year storm event is indicated in Appendix E and covers a large proportion of the site, although both the occupied buildings remain above the limit of the flood. All flooded areas of the site are hardstanding or disused/derelict workshops due for demolition.
- 9.3 The proposed “Change of Use” for the site will bring the site into the Port’s Operation Area allowing the Port of Tyne to utilise the site’s river frontage as part of their commercial operations.
- 9.4 This change of use will have no effect on the existing drainage or surface water discharges from the site which drain either to the ground or flow overland to the tidal river.
- 9.5 Existing Northumbrian Water Limited apparatus through the site will remain intact and Northumbrian Water Limited will be consulted should future developments of the site influence or impact on these public sewers.



10.0 APPENDIX A – SITE LAYOUT



River Tyne



LOCATION PLAN
SCALE 1:2000

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<input type="checkbox"/>		Preliminary	<input type="checkbox"/>	Tender
			<input type="checkbox"/>	As-Built
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DRAWN BY		DATE	CHECKED BY	
DB		Sept '12	MAT	

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CLIENT	PORT OF TYNE		
PROJECT	McNULTY YARD REPORT		
TITLE	SITE LAYOUT		
DRAWING No.	3386-C-200	REV.	0



11.0 APPENDIX B – SITE LAYOUT WITH FEATURES



SOUTH AND PART NORTH YARD: GENERAL ARRANGEMENT
SCALE 1:1000

LEGEND

- 1 - Pipe Shop
- 2 - Gate House
- 3 - Stores
- 4 - Workshop and Stores
- 5 - Rubb Tent
- 6 - Temporary Building
- 7 - Office Space
- 8 - Main Office Building
- 9 - Safety Office
- 10 - Canteen
- 11 - Substation
- 12 - Electrical Store
- 13 - Fab Shop and Offices
- 14 - Rigging Store
- 15 - Rubb Tent
- 16 - Dock Office
- 17 - Office Space
- 18 - Office Space
- 19 - Sub-station
- 20 - Electrical Store
- 21 - Rubb Tent

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<input type="checkbox"/>		Preliminary	<input type="checkbox"/>	As-Built
<input type="checkbox"/>		Comment	<input type="checkbox"/>	Tender

SCALE 1:1000 A3

DRAWN BY	DATE	CHECKED BY
DB	Sept '12	MAT

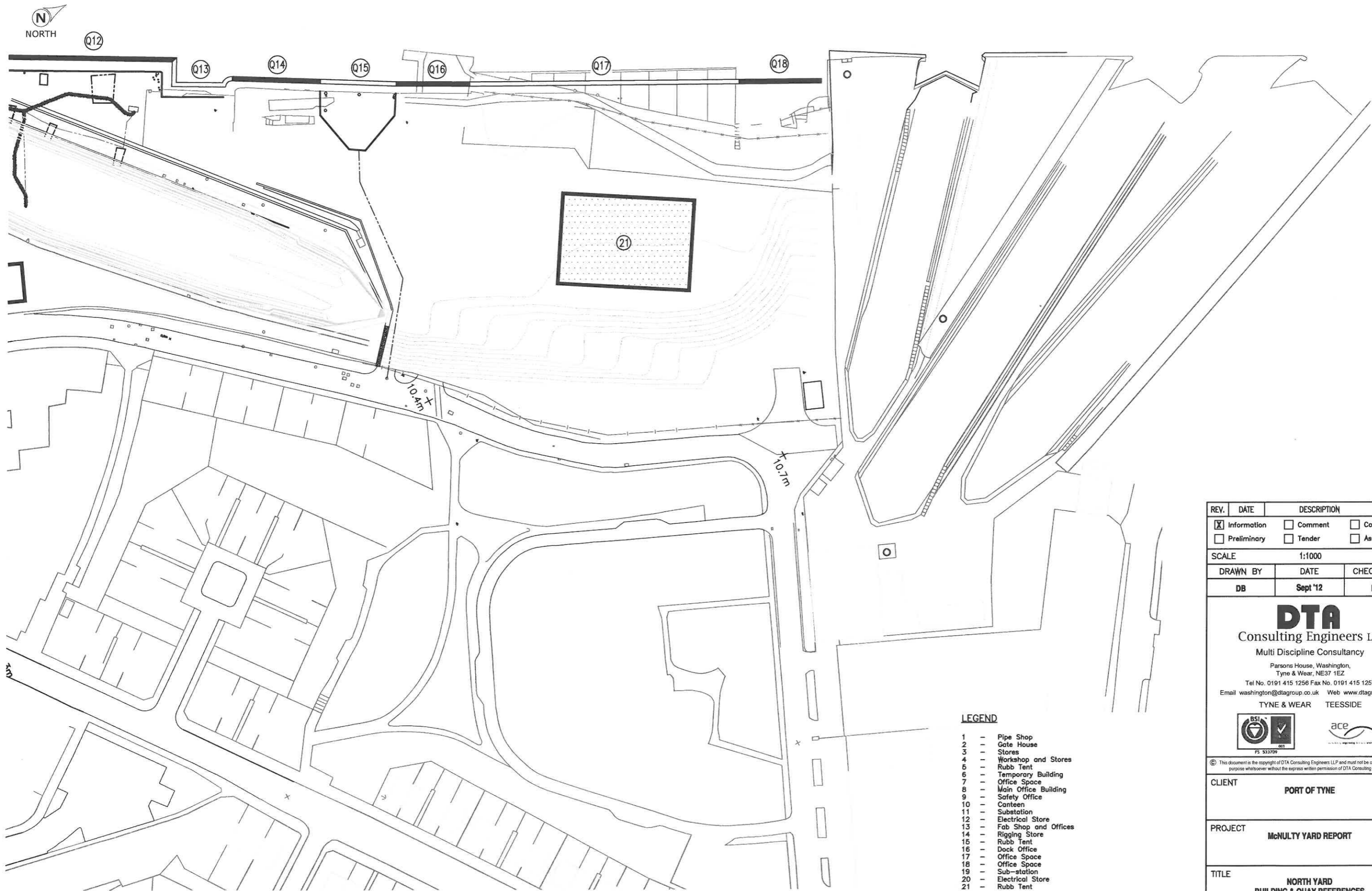
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CLIENT	PORT OF TYNE
PROJECT	McNULTY YARD REPORT
TITLE	SOUTH & PART NORTH YARD BUILDING & QUAY REFERENCES

DRAWING No.	3386-C-201	REV.	0
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NORTH YARD: GENERAL ARRANGEMENT
SCALE 1:1000

LEGEND

- 1 - Pipe Shop
- 2 - Gate House
- 3 - Stores
- 4 - Workshop and Stores
- 5 - Rubb Tent
- 6 - Temporary Building
- 7 - Office Space
- 8 - Main Office Building
- 9 - Safety Office
- 10 - Canteen
- 11 - Substation
- 12 - Electrical Store
- 13 - Fab Shop and Offices
- 14 - Rigging Store
- 15 - Rubb Tent
- 16 - Dock Office
- 17 - Office Space
- 18 - Office Space
- 19 - Sub-station
- 20 - Electrical Store
- 21 - Rubb Tent

REV.	DATE	DESCRIPTION	DR.	CH.
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DRAWN BY		DATE	CHECKED BY	
DB		Sept '12	MAT	

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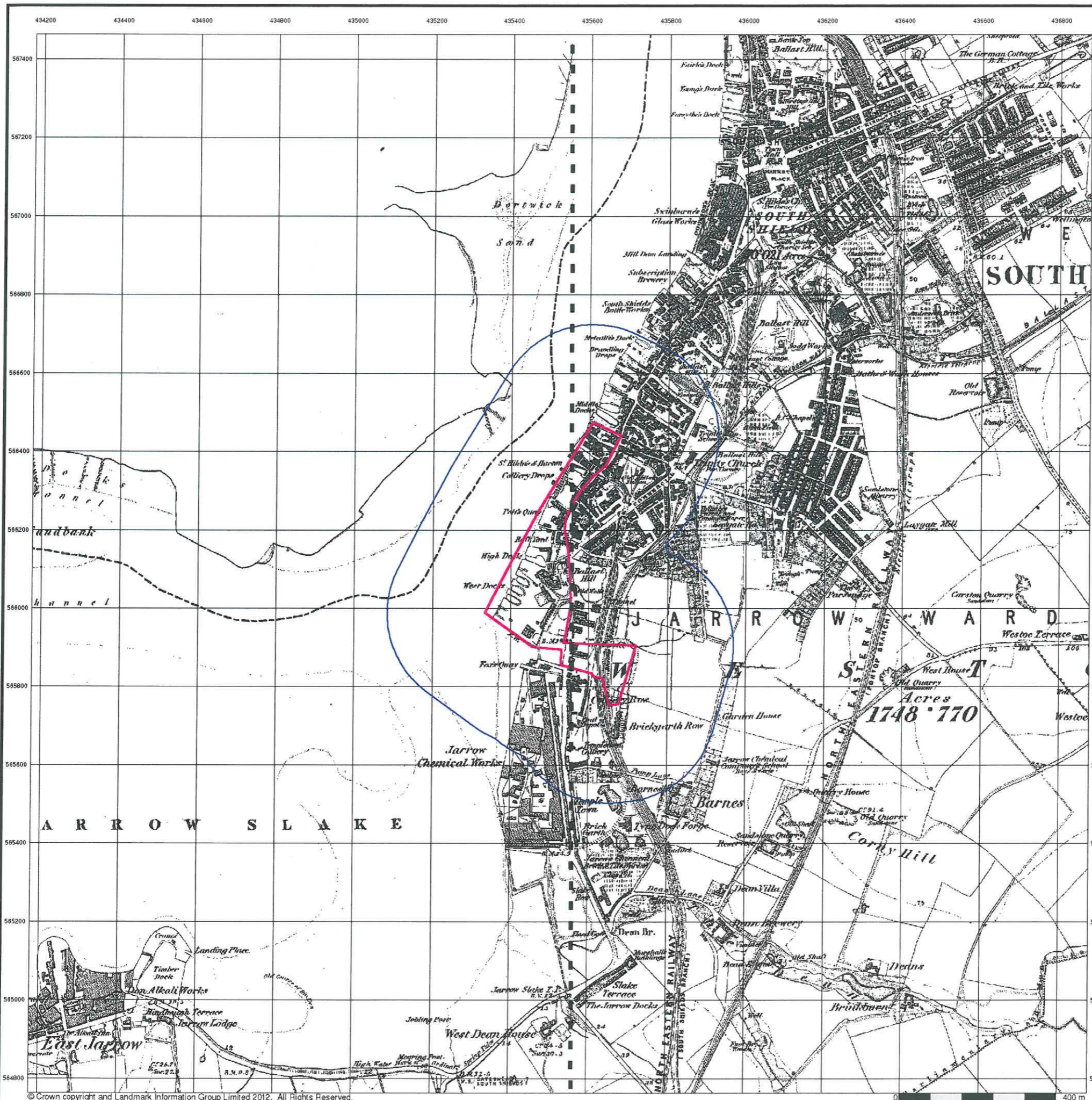


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CLIENT	PORT OF TYNE		
PROJECT	McNULTY YARD REPORT		
TITLE	NORTH YARD BUILDING & QUAY REFERENCES		
DRAWING No.	3386-C-202	REV.	0



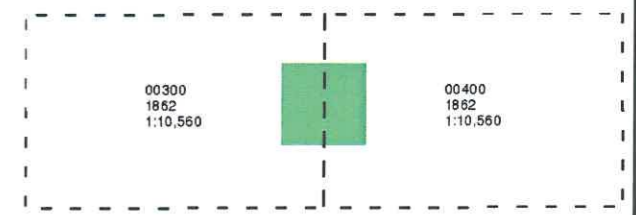
12.0 APPENDIX C – ENVIROCHECK HISTORICAL MAPS



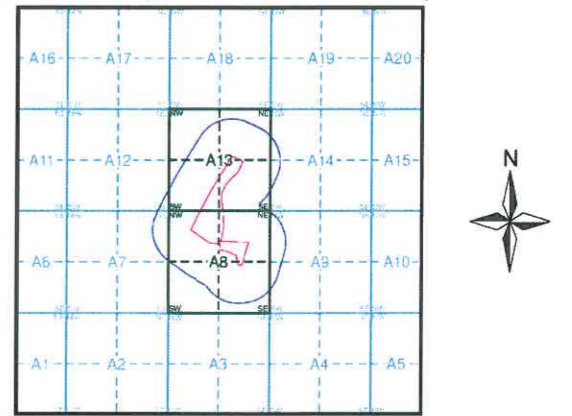
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Published 1862
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The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for 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

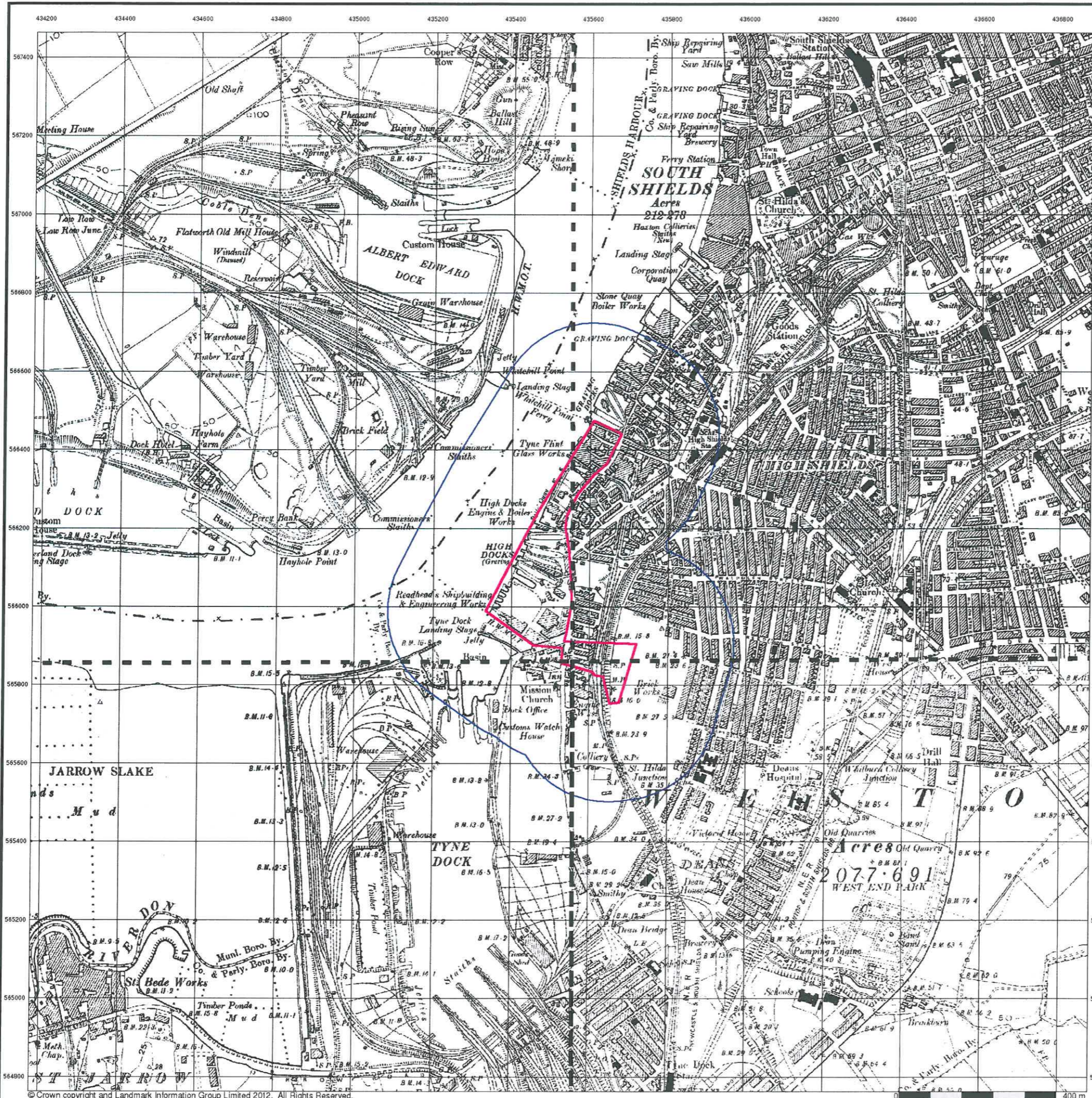
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 National Grid Reference: 435560, 566100
 Slice: A
 Site Area (Ha): 8.59
 Search Buffer (m): 250

Site Details

McNulty Offshore Construction Ltd, 16-17 Corstorphine Town, SOUTH SHIELDS, Tyne and Wear, NE33 1RZ



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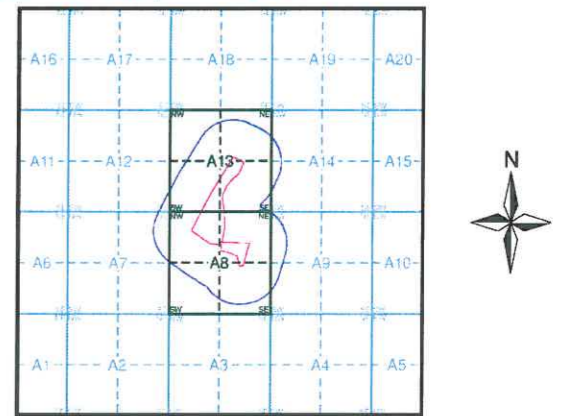
Durham
Published 1898
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Map Name(s) and Date(s)

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003SE 1898 1:10,560	004SW 1898 1:10,560

Historical Map - Slice A



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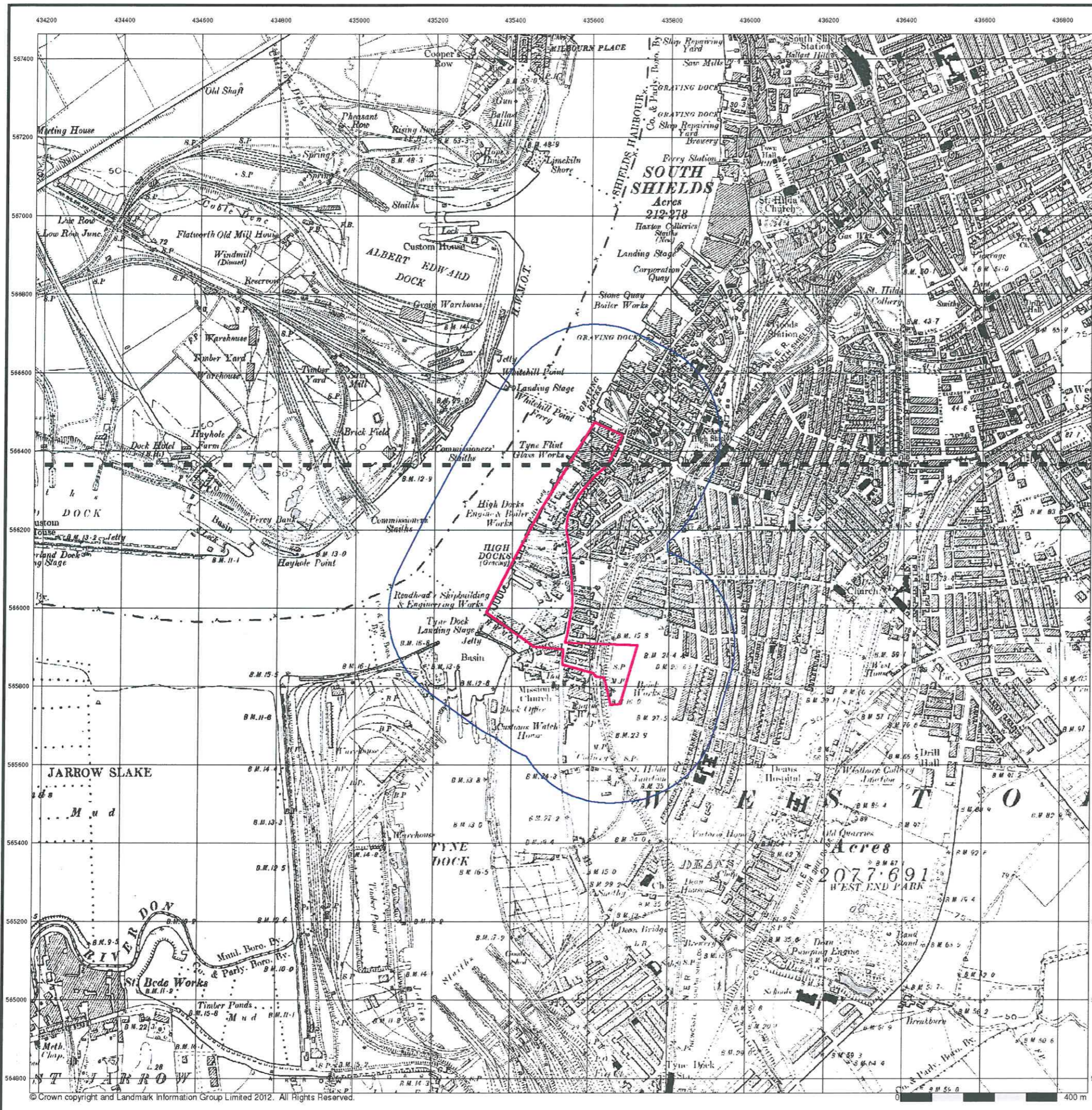
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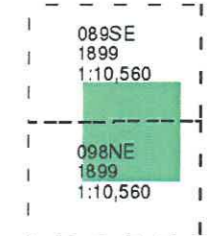
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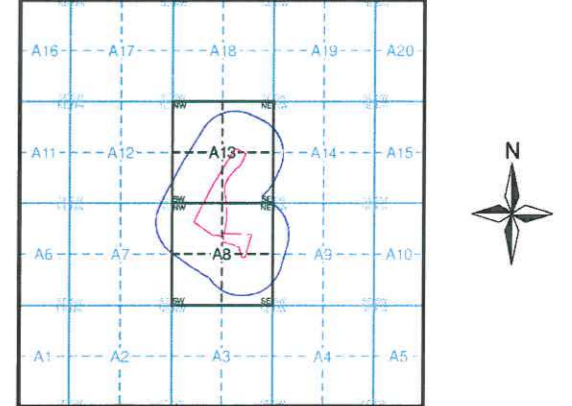
Northumberland
Published 1899
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Map Name(s) and Date(s)



Historical Map - Slice A



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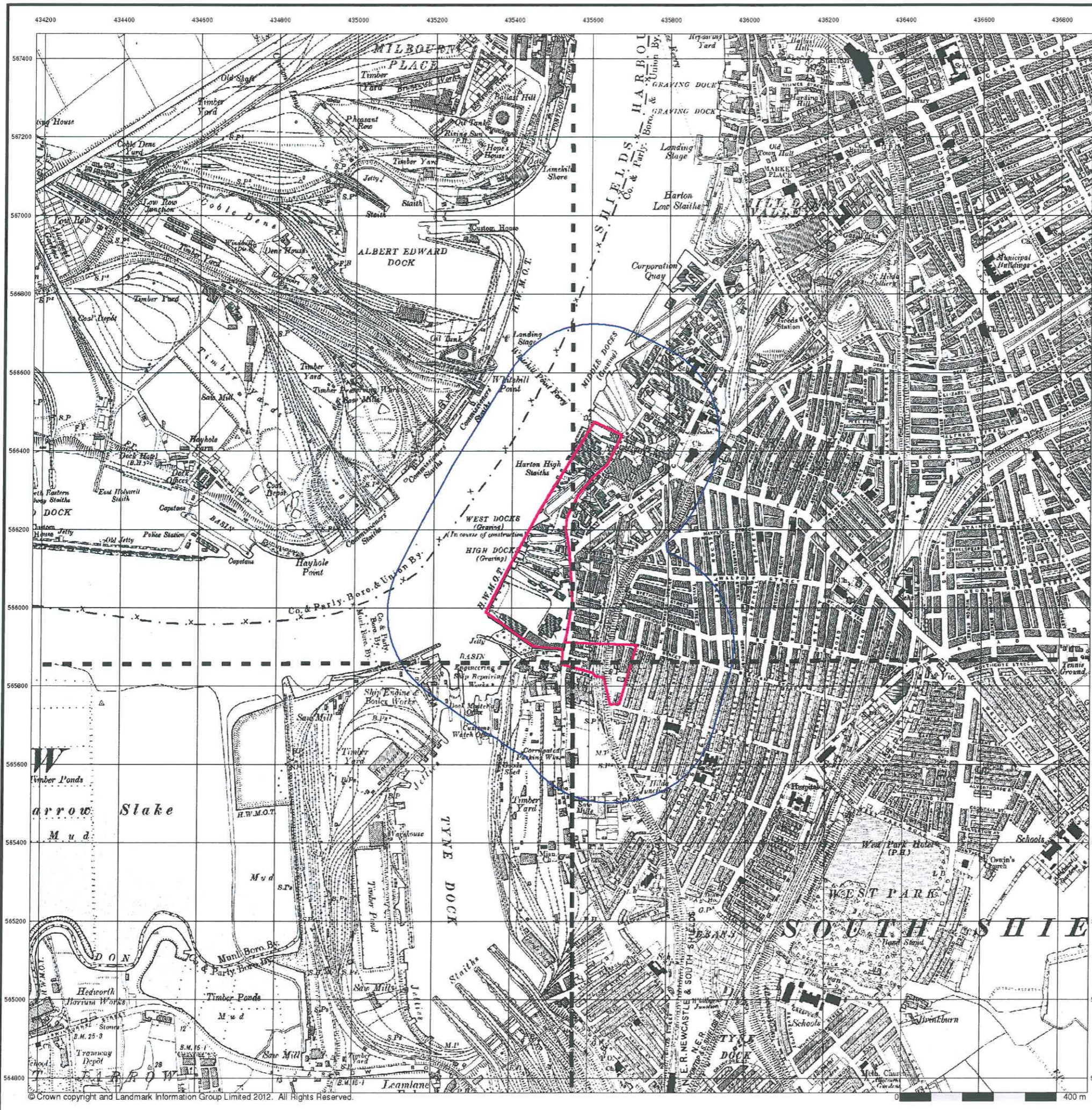
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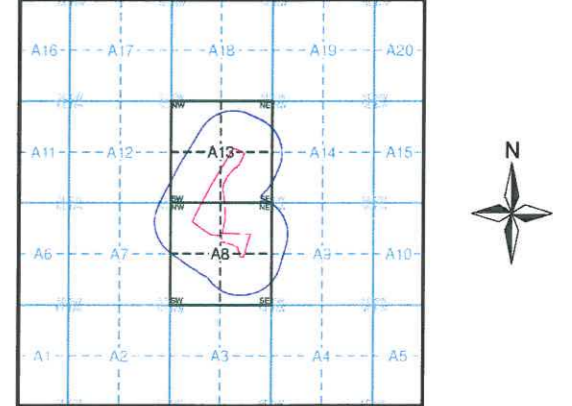
Durham
Published 1921
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Map Name(s) and Date(s)

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003SE 1921 1:10,560	004SW 1921 1:10,560

Historical Map - Slice A



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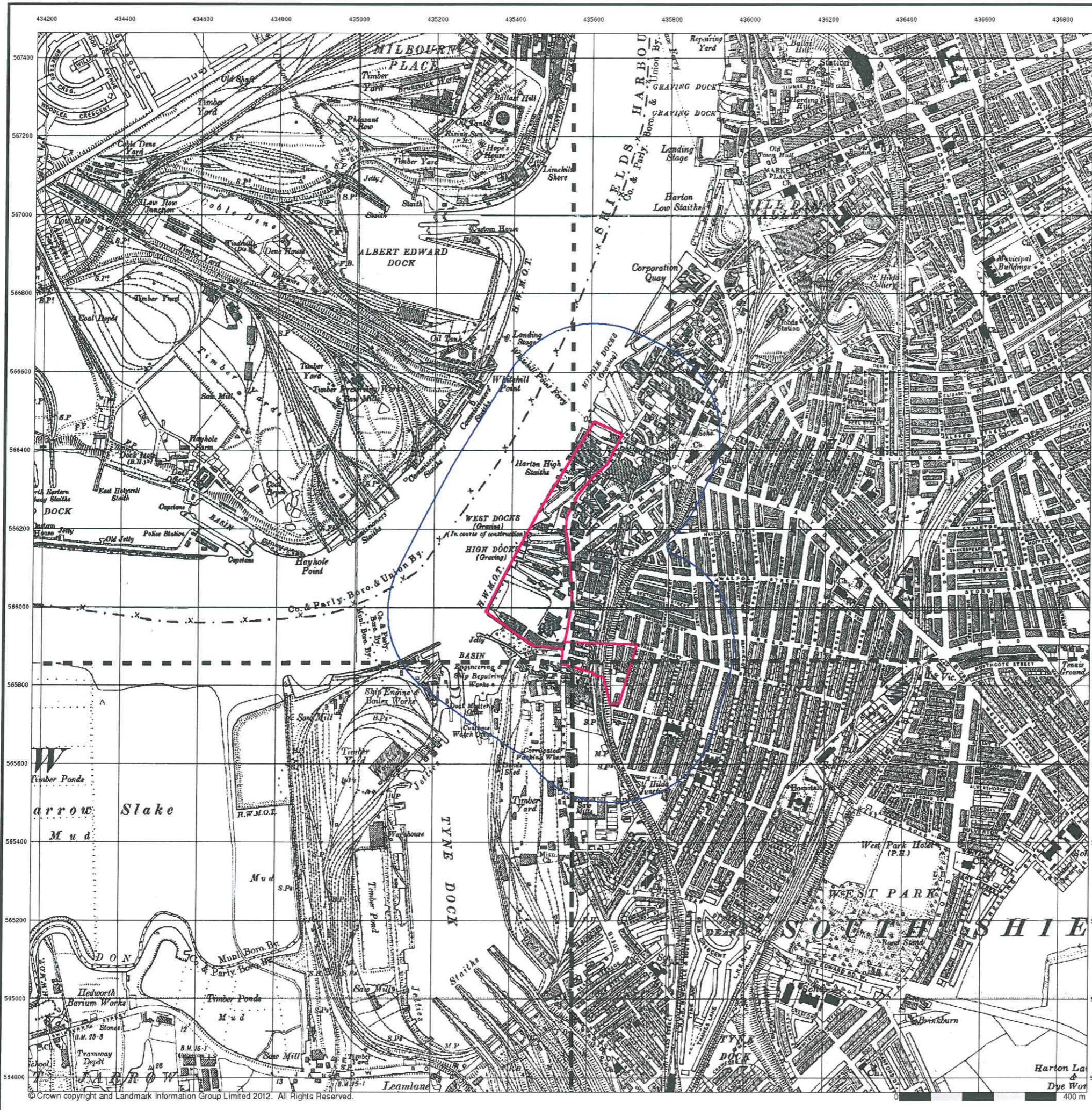
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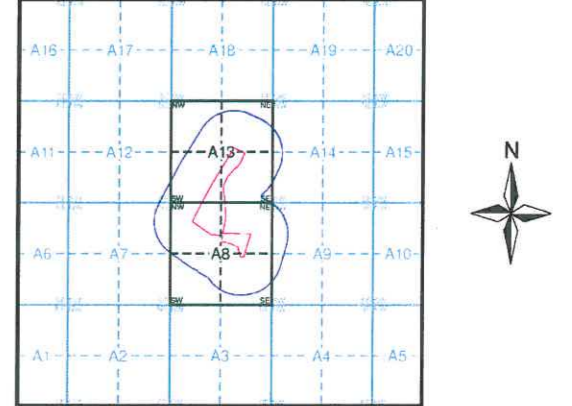
Durham
Published 1938
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Map Name(s) and Date(s)

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003SE 1938 1:10,560	004SW 1938 1:10,560

Historical Map - Slice A



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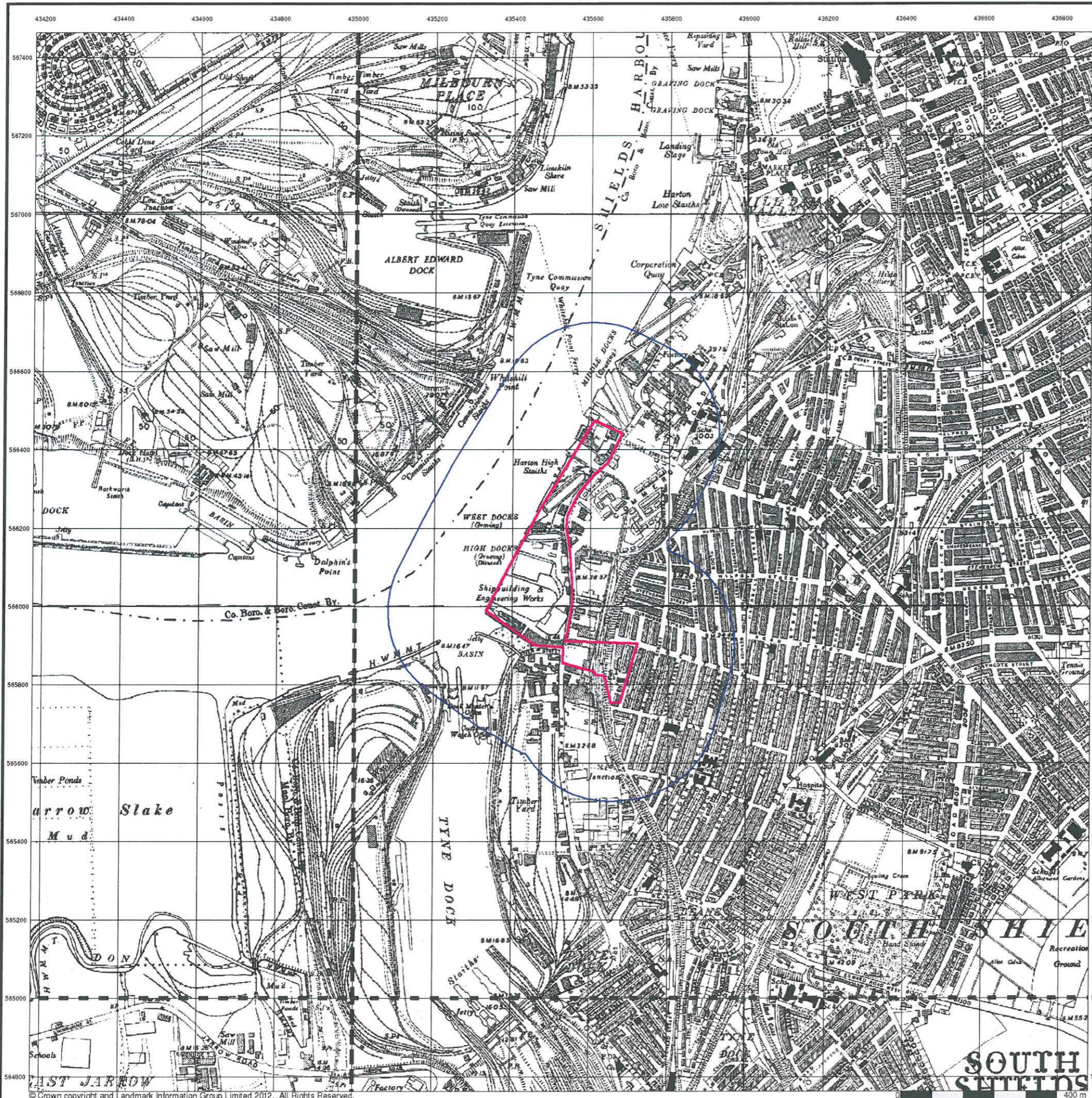
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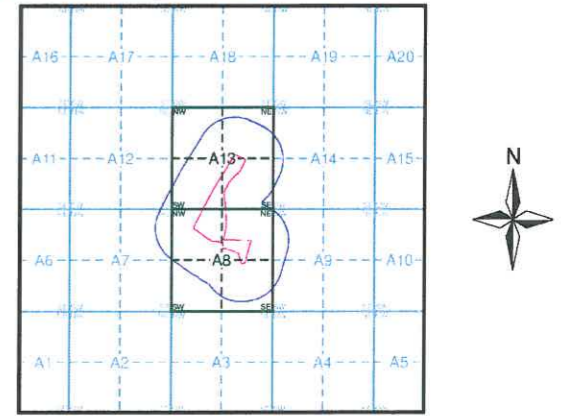
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Published 1951 - 1952
Source map scale - 1:10,000

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.

Map Name(s) and Date(s)

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NZ36SW 1952 1:10,560	NZ36SE 1951 1:10,560

Historical Map - Slice A



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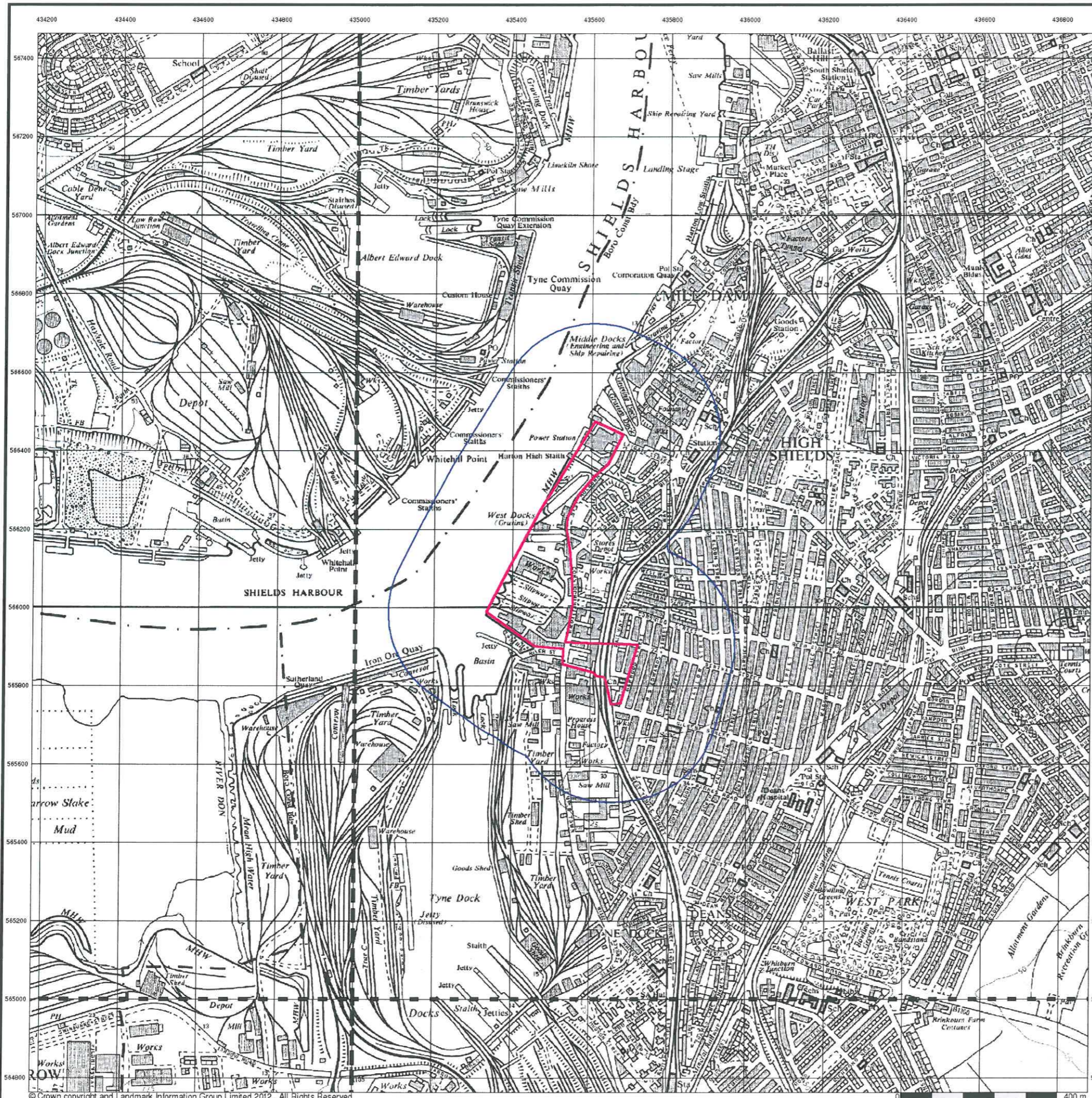
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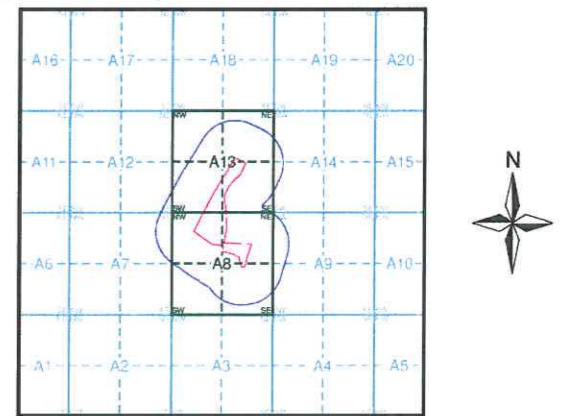
Ordnance Survey Plan
Published 1967 - 1968
Source map scale - 1:10,000

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.

Map Name(s) and Date(s)

NZ36NW 1967 1:10,560	NZ36NE 1967 1:10,560
NZ36SW 1967 1:10,560	NZ36SE 1968 1:10,560

Historical Map - Slice A



Order Details

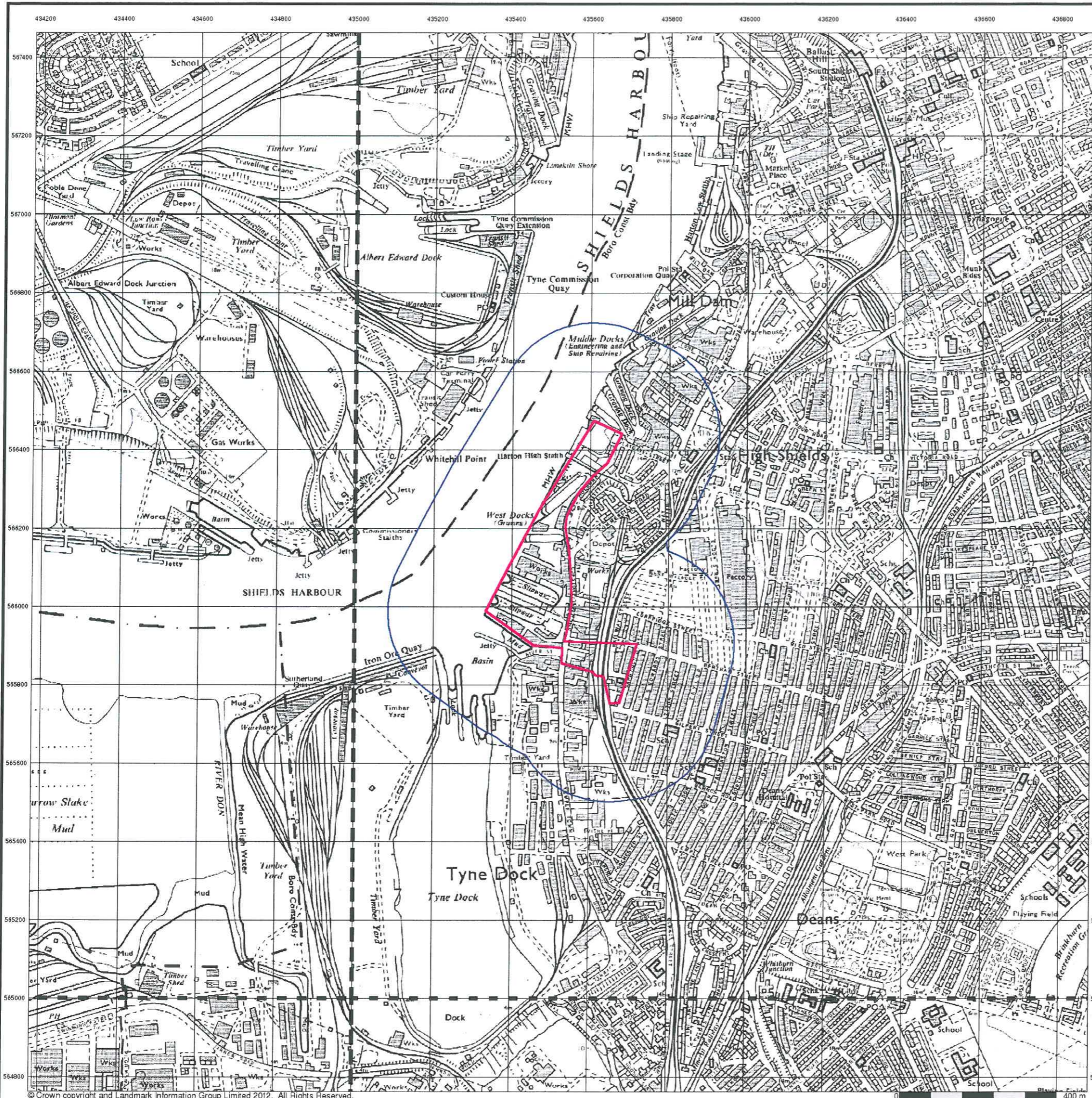
Order Number: 41689911_1_1
 Customer Ref: 060
 National Grid Reference: 435560, 566100
 Slice: A
 Site Area (Ha): 8.59
 Search Buffer (m): 250

Site Details

McNulty Offshore Construction Ltd, 16-17 Corstorphine Town, SOUTH SHIELDS, Tyne and Wear, NE33 1RZ



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



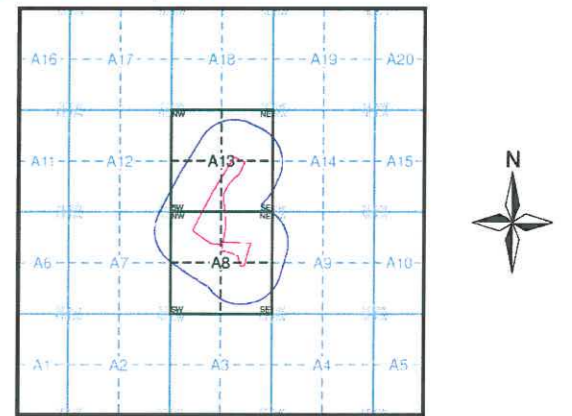
Ordnance Survey Plan
Published 1973 - 1977
Source map scale - 1:10,000

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.

Map Name(s) and Date(s)

NZ36NW 1973 1:10,000	NZ36NE 1976 1:10,000
NZ36SW 1975 1:10,000	NZ36SE 1977 1:10,000

Historical Map - Slice A



Order Details

Order Number: 41689911_1_1
 Customer Ref: 060
 National Grid Reference: 435560, 566100
 Slice: A
 Site Area (Ha): 8.59
 Search Buffer (m): 250

Site Details

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Newcastle-upon-Tyne

Published 1977

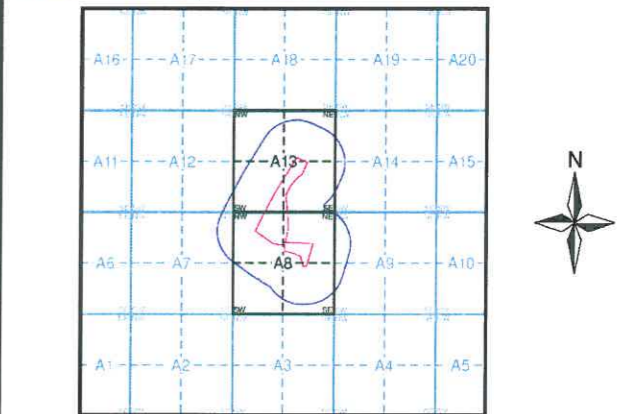
Source map scale - 1:25,000

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

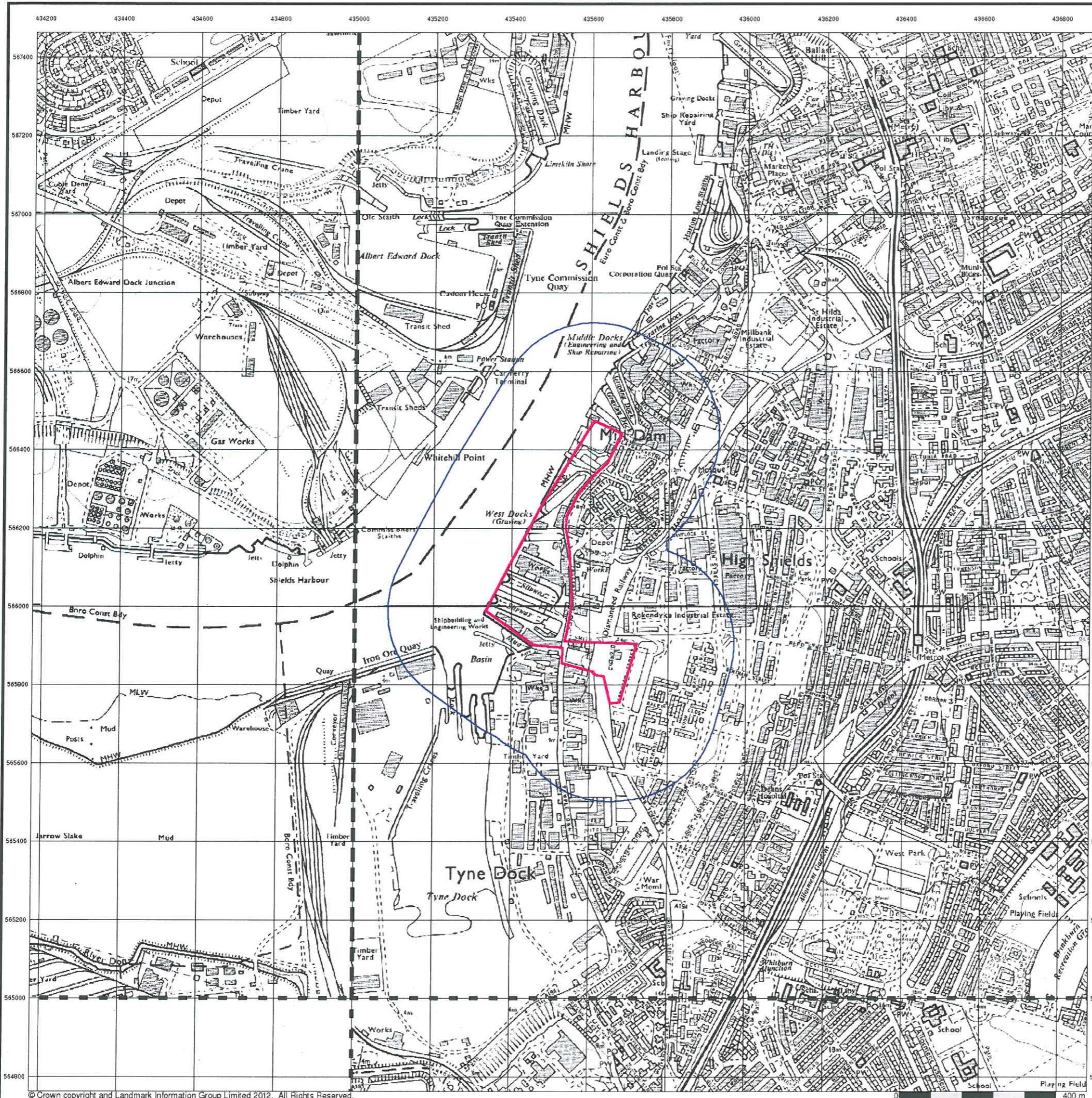
Order Number: 41689911_1_1
 Customer Ref: 060
 National Grid Reference: 435560, 566100
 Slice: A
 Site Area (Ha): 8.59
 Search Buffer (m): 250

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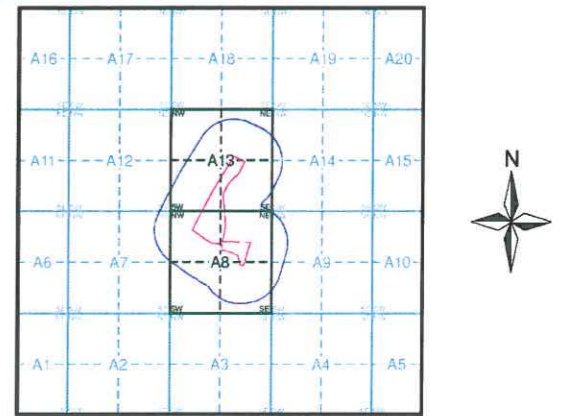
Ordnance Survey Plan
Published 1982 - 1987
Source map scale - 1:10,000

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 data 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)

NZ36NW 1982 1:10,000	NZ36NE 1986 1:10,000
	
NZ36SE 1987 1:10,000	

Historical Map - Slice A



Order Details

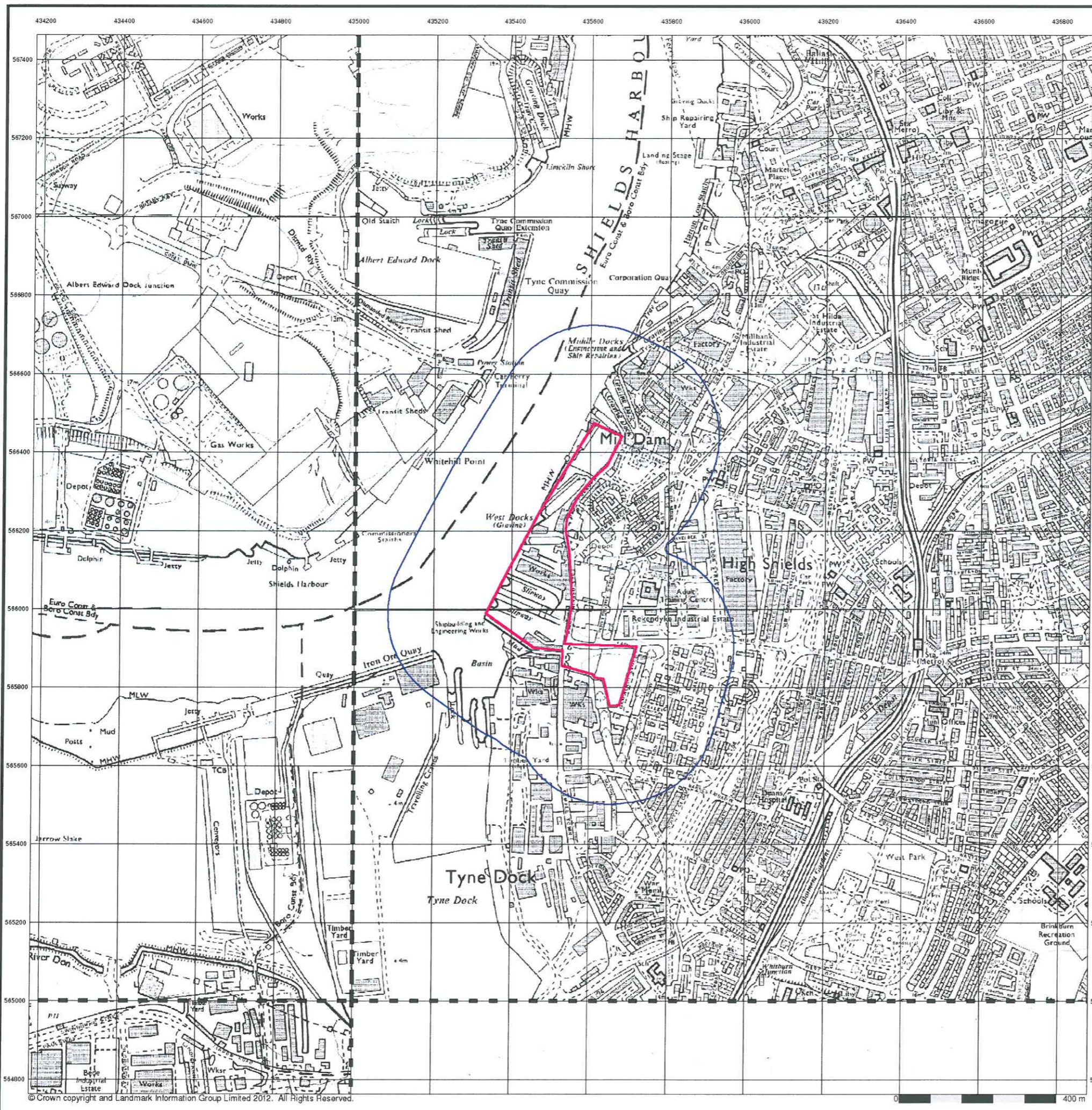
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 Customer Ref: 060
 National Grid Reference: 435560, 566100
 Slice: A
 Site Area (Ha): 8.59
 Search Buffer (m): 250

Site Details

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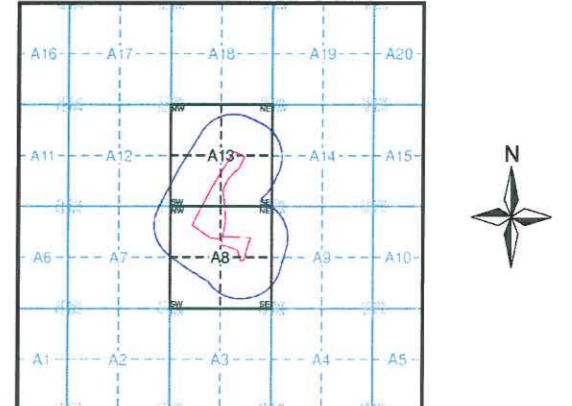
Ordnance Survey Plan
Published 1992 - 1995
Source map scale - 1:10,000

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.

Map Name(s) and Date(s)

NZ36NW 1995 1:10,000	NZ36NE 1993 1:10,000
NZ36SW 1992 1:10,000	

Historical Map - Slice A



Order Details

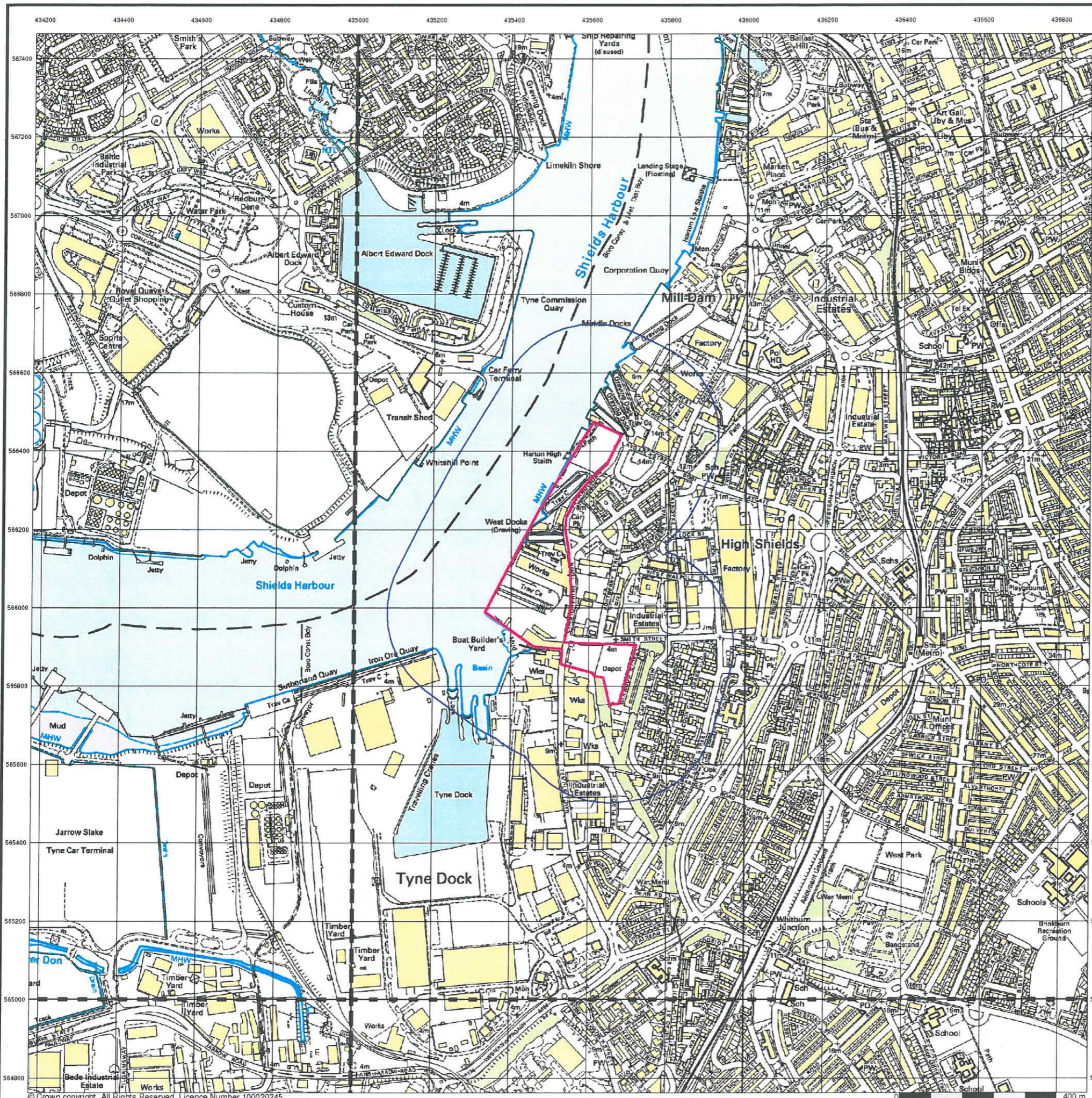
Order Number: 41689911_1_1
 Customer Ref: 060
 National Grid Reference: 435560, 566100
 Slice: A
 Site Area (Ha): 8.59
 Search Buffer (m): 250

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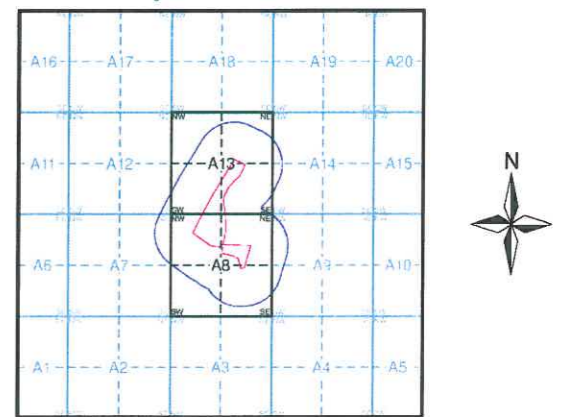
10k Raster Mapping
Published 2006
Source map scale - 1:10,000

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)

NZ36NW 2006 1:10,000	NZ36NE 2006 1:10,000
NZ36SW 2006 1:10,000	NZ36SE 2006 1:10,000

Historical Map - Slice A



Order Details

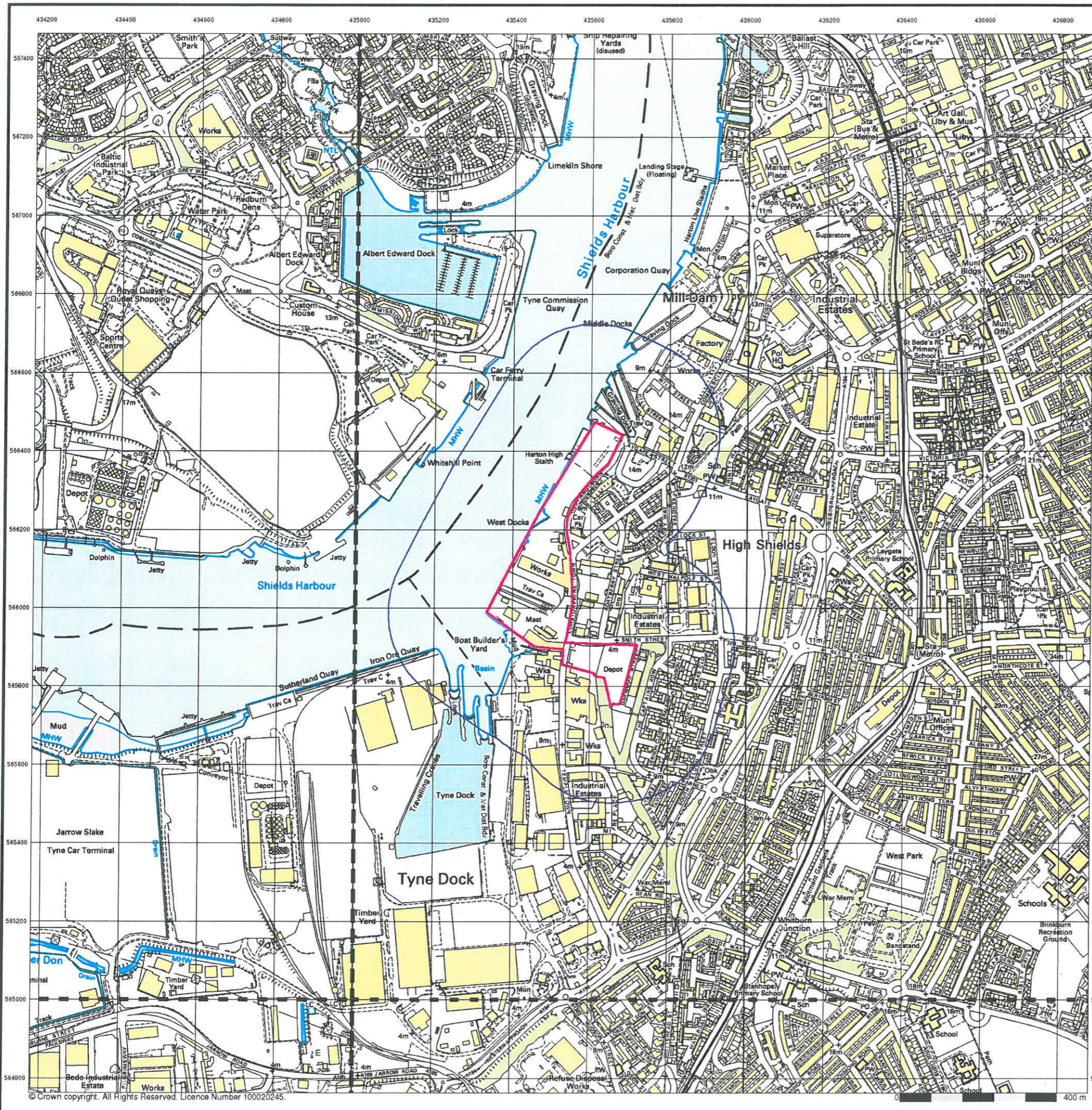
Order Number: 41689911_1_1
 Customer Ref: 060
 National Grid Reference: 435560, 566100
 Slice: A
 Site Area (Ha): 8.59
 Search Buffer (m): 250

Site Details

McNulty Offshore Construction Ltd, 16-17 Corstorphine Town, SOUTH SHIELDS, Tyne and Wear, NE33 1RZ



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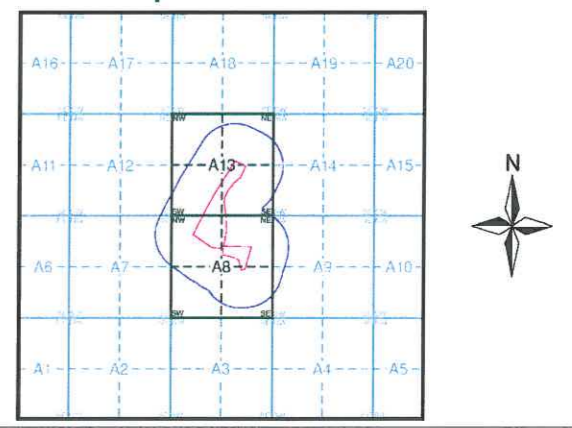
10k Raster Mapping
Published 2012
Source map scale - 1:10,000

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)

NZ36NW 2012 1:10,000	NZ36NE 2012 1:10,000
NZ36SW 2012 1:10,000	NZ36SE 2012 1:10,000

Historical Map - Slice A



Order Details

Order Number: 41689911_1_1
 Customer Ref: 060
 National Grid Reference: 435560, 566100
 Slice: A
 Site Area (Ha): 8.59
 Search Buffer (m): 250

Site Details

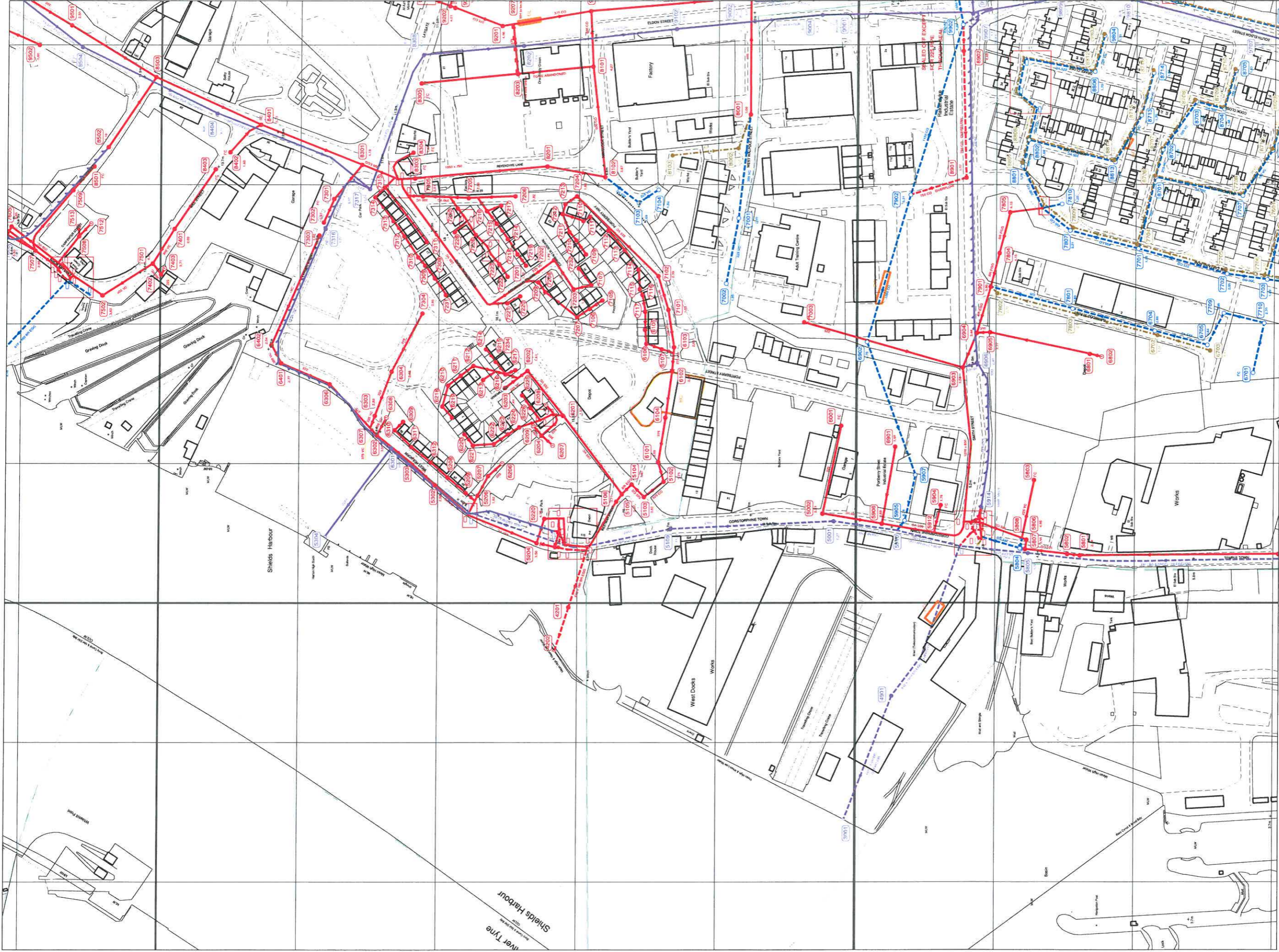
McNulty Offshore Construction Ltd, 16-17 Corstorphine Town, SOUTH SHIELDS, Tyne and Wear, NE33 1RZ



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



13.0 APPENDIX D – NORTHUMBRIAN WATER LTD PUBLIC SEWERS



Author :
 Title :
 Centre Point : 435591,566153

Date : 06-12-2013
 Sheet: NZ3566SE
 Scale : 1:2500



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14.0 APPENDIX E – FLOOD LIMIT FOR A 1 IN 1000 STORM EVENT

NOTES
4.63m Flood Level



DATE: 12/06/13
DRAWN BY: J. G. GIBSON

PORT TYNE MARITIME HOUSE
TYNE DOCK
SOUTH SHIELDS
NEIGH 211
0191 4952671

TITLE
Activity Yard
4.63m A.O.D. Flood Level

KEMMETT
REG. CIVIL ENGINEER
HEAD OF THE PRACTICE DEPT

DATE:	12/06/13	NO. OF SHEETS:	1
SCALE:	1:1000	DATE:	12/06/13

DATE:	12/06/13	NO. OF SHEETS:	1
SCALE:	1:1000	DATE:	12/06/13
DATE:	12/06/13	NO. OF SHEETS:	1
SCALE:	1:1000	DATE:	12/06/13

ORGNO: X
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A1

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