

DTA

Consulting Engineers LLP

Multi Discipline Consultancy

Flood Risk Assessment Report

For

**The proposed Fabrication / Storage unit for the
Port of Tyne within the former McNulty site**

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Date: 14th September

on behalf of
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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 construction of a new building to replace the existing Fabrication Shed which formed part of the former McNulty site.
- 1.3 This FRA will accompany the Port of Tyne's Planning Application to allow the construction of this building.
- 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 former McNulty's site and its proximity to the River Tyne. The former site was split into two distinct sections; the North and South yards.
- 2.2 The proposed building will be positioned along the dividing line between the north and south yards and replace the former McNulty Fabrication Shed.
- 2.3 The plan of the South yard is presented in appendix B and indicates the existing features within the site. The buildings are remnants of the previous McNulty Works and are to be demolished over the next five years as part of the Port of Tyne's masterplan for the redevelopment of this site.
- 2.4 The outline of the proposed building is shown on the Port of Tyne drawing presented in appendix C and indicates both the plan location and the proposed elevation.
- 2.5 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. A public highway forms the boundary of the site to the east and is slightly elevated in level adjacent the South Yard. This road increases in elevation as we move north and the majority of the site north of the existing Fabrication Shed is bounded by substantial retaining walls ranging in height from 2 to 5 metres. Access to the North Yard is via two purpose built ramps off West Holborn road.
- 3.2 The site falls towards the river at about 1 in 100 and site levels vary between 4.3 and 4.6m AOD.

4.0 HISTORY OF THE SITE

- 4.1 The Envirocheck historical record maps for the site are presented in appendix D 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.



FS 533709

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- 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 staithe with a railway line, saw mill and other industrial uses such as an iron foundry as well as a glasswork.

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 (NWL) plan presented in appendix E indicates the adopted sewers in and around the site.
- 5.2 Three adopted sewers currently traverse the site and discharge into the River Tyne:
 - An 840 x 1100 Brick Egg Culvert to the South.
 - A 620 x 480 Brick Egg Culvert centrally.
 - A 2300mm concrete pipe to the North.

These sewers were previously part of the combined infrastructure owned and maintained by NWL. Since then NWL have constructed an interceptor sewer, incorporated several CSO's and adopted pumping stations has re-directed foul flows to suitable treatment facilities. All three of these sewers remain adopted and operational and form part of NWL's surface water system discharging into the river.

- 5.3 The current status and full extent of any wayleave on any of these sewers remains unknown at this time, but is assumed to be in accordance with Sewers for Adoption 7th edition.
- 5.4 Within the site the foul discharge is either connected directly to the Public sewer in Corstorphine Town road where levels will permit or is pumped back to this sewer via private pumping stations constructed further into the site.
- 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 As part of the Port of Tyne's redevelopment of this river frontage, significant strengthening and rebuilding works to the quay frontage have recently been completed providing a quayside link between the main Port of Tyne site and the former McNulty site.
- 6.2 As part of this redevelopment, most of the former McNulty buildings have been ear marked for demolition and this process has begun.
- 6.3 The proposed building which will replace the old Fabrication Shop will be constructed as part of the redevelopment strategy and is presented in appendix C.

7.0 FLOOD RISK CONSIDERATIONS

7.1 The three main flood risk considerations for this site are:

- Flooding from the River Tyne
- Overland flow
- Surcharged or blocked sewers

River Flooding

- 7.2 The site is situated along the banks of the River Tyne as it nears the North Sea. The River Tyne is tidal at this point and consideration must be made for the high and low tides.
- 7.3 The River Tyne is a major river with a large catchment area, but the main contributing factors to the water level adjacent to the proposed site are the tide levels and the direction of the incoming weather.
- 7.4 The highest recorded tide levels are presented in appendix F. These have been measured and compiled by the Port of Tyne since 1860. The highest ever recorded tide level occurred 5 December 2013 and measured 6.9 above chart datum (ACD). Using the conversion this can be related to ordinance datum (AOD) and related directly to the site's topographical survey levels. The 6.9m ACD is equivalent to 4.3 AOD.
- 7.5 The photograph presented in appendix G was taken on the 5th December 2013 and shows the level of this extreme event adjacent to the proposed site. The existing Fabrication Shop is clearly visible and it is evident that the hardstanding around it is still above the water level. On the day of this extreme event areas both upstream and downstream were flooded including the Newcastle quayside and the North Shields Fish quay.
- 7.6 Based on the topographical survey data for the site the Port of Tyne has produced the drawing presented in appendix H. This drawing indicates the theoretical flood contour for a 1 in 1000 year return extreme flood event and is based on the Ports flood modelling on the adjacent site. This indicates that an extreme event with a return period of 1000 years could flood to a level of 4.65m AOD. It can be seen that although a large proportion of the site is flooded, key buildings including the sub-station, gatehouse and some of the office space remains above the flood zone.
- 7.7 The proposed building will have a floor level of 5.15m AOD to elevate it above the predicted extreme flood level of 4.65m AOD and provide additional protection for both the operating personnel and the property.
- 7.8 This raised floor level would provide the property 850mm above the level of the highest ever recorded flood level and provide a safe exit for any workforce if the water level continued to rise.
- 7.9 The location of the site adjacent to a major tidal river makes it vulnerable to flooding. It is impossible to eliminate this risk of flooding completely and the Port of Tyne recognises that an evacuation procedure and early warning system is required to safeguard personnel and property on this site.
- 7.10 In the extreme event when flooding does occur on the site, the elevated floor level will afford the workforce operating the building safe passage to the south east of the site and higher ground.
- 7.11 The Port of Tyne and other quayside users operate a "early warning system" elsewhere on the River Tyne. This consists of a network of key personnel who keep a close eye on the tides and weather fronts affecting the north east coast and communicate potential surge flows like the one in 2013.
- 7.12 Once this warning has been given the Port halts certain vulnerable operations and all the workforce are warned.

- 7.13 If flooding does occur, the Port operates a controlled evacuation of the buildings affected in a similar manner to a fire evacuation and all personnel are taken to higher ground. Registers of all personnel and visitors within the site are kept and these are used to ensure everybody is accounted for.
- 7.14 The proposed site will be operated under the same Port procedures for controlled evacuation should the need arise.
- 7.15 The usual increase of 20 percent for climate change is accounted for by lifting the floor level of the proposed building to a reasonable height above the 1 in 1000year extreme event. It is also recognised that the risk of flooding on this site cannot be fully eliminated and evacuation procedures are in place should this occur.

Overland flow

- 7.16 The threat of overland flows is considered because of the topography of the site and the elevated surrounding urban areas. These areas consist of both urban and industrial development with hard surfacing and increased impermeability. Drainage systems collect the surface run-off and discharge it to the River Tyne.
- 7.17 In extreme events of high intensity rainfall, these drainage systems may be overwhelmed forcing the excess run-off to travel overland. Because the surrounding area is generally higher than the proposed site, these overland flows would pass through the site to the river.
- 7.18 There is no evidence or records that this has occurred on the site.
- 7.19 The presence of the retaining wall along the majority of the eastern boundary provides a barrier and the alignment of the road along this boundary casts the water both north and south around the site.
- 7.20 The site was most recently used for the construction of off-shore projects and as such the ground is made up in the most part of granular fill. This fill is generally unsealed and any rainfall or overland flows soak through this granular material and migrate to the river. Existing buildings and hardstanding discharge direct to the river or into this granular infill.

Surcharged Sewers

- 7.21 The Northumbrian Water apparatus record presented in appendix E indicates the three adopted public sewers that cross the site to the River Tyne.
- 7.22 The presence of three large diameter adoptable sewers running through the site must be considered as a possible flood risk. The high ground to the south east of the site is developed and much of this infrastructure drains to the river via these sewers. The relatively low level of the site compared to the higher ground surrounding it could lead to surcharging.
- 7.23 There is no evidence of surcharging in these sewers and following consultation with NWL, there is no historic records of flooding from these sewers.
- 7.24 None of these sewers are located near enough to the proposed building to have an effect.
- 7.25 Any further improvements or amendments to the site will be the subject of further consultation with Northumbrian Water Limited to ensure their existing public sewers crossing the site are accessible and if a diversion is required, that it is completed under a Section 102 Agreement.



8.0 CONCLUSIONS

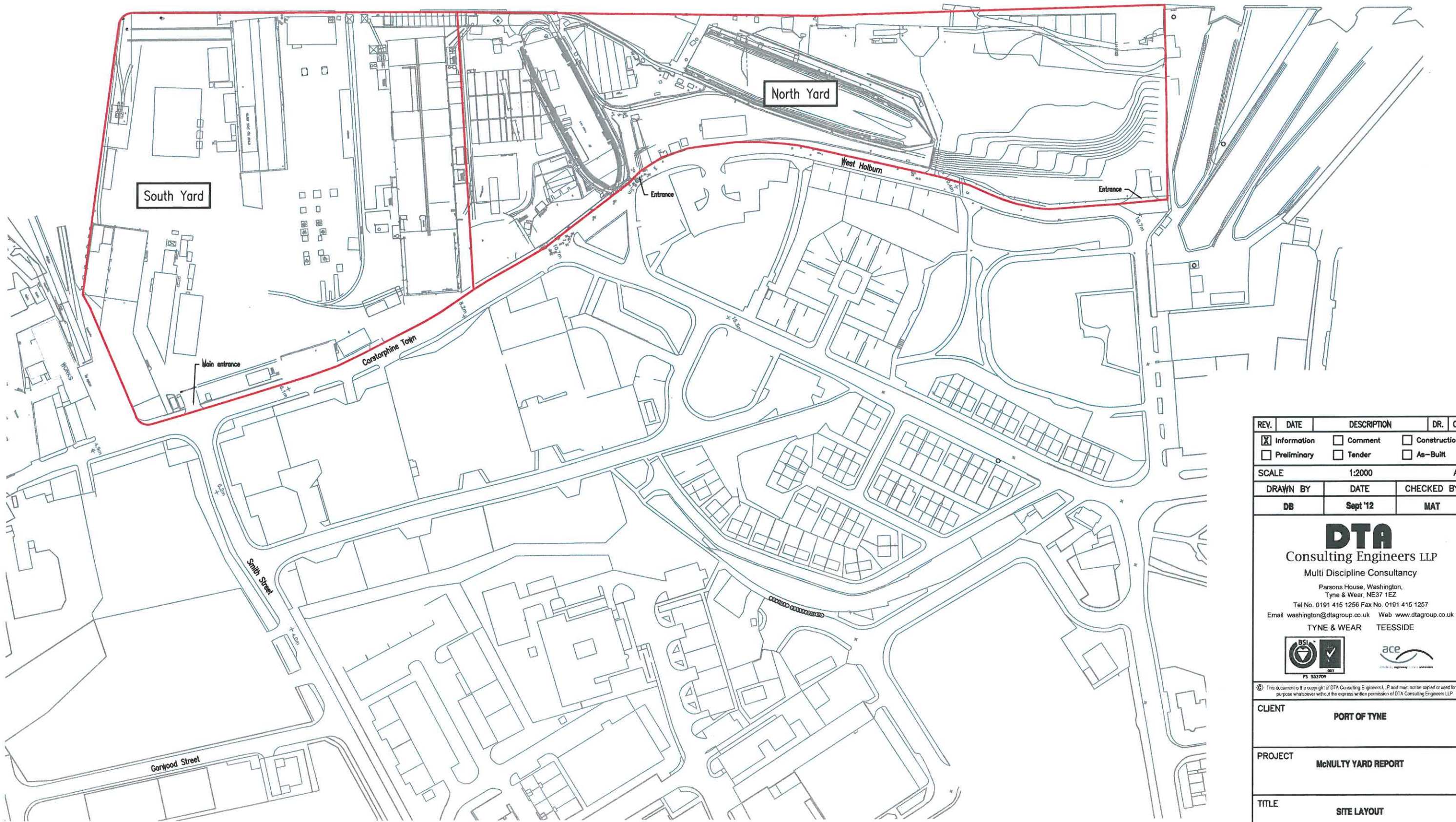
- 8.1 According to the Environment Agency Flood Risk Plans this site is categorised as flood risk zone 1. This is mainly because of the close proximity to the River Tyne.
- 8.2 In our assessment of the flood risks associated with both the overland flow and the surcharged sewers, we are content that these risks are relatively low because of the granular nature of the site and its ability to drain naturally to the ground.
- 8.3 The main threat to flooding the site comes from the River Tyne. In order to minimise this risk, we have inspected the records from the last 140 years for this area, identified the most extreme event and set the floor level of the proposed building 850mm higher.
- 8.4 We have also recognised that however unlikely the risk of flooding from the River Tyne, it cannot be ignored or neglected and an “early warning system” and evacuation procedure similar to that found on other Port of Tyne sites will be put in place for this site.



9.0 APPENDIX A – OVERALL 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
SCALE		1:2000	A3	
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



10.0 APPENDIX B – EXISTING SITE LAYOUT



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

REV.	DATE	DESCRIPTION	DR.	CH.
<input checked="" type="checkbox"/>		Information	<input type="checkbox"/>	Construction
<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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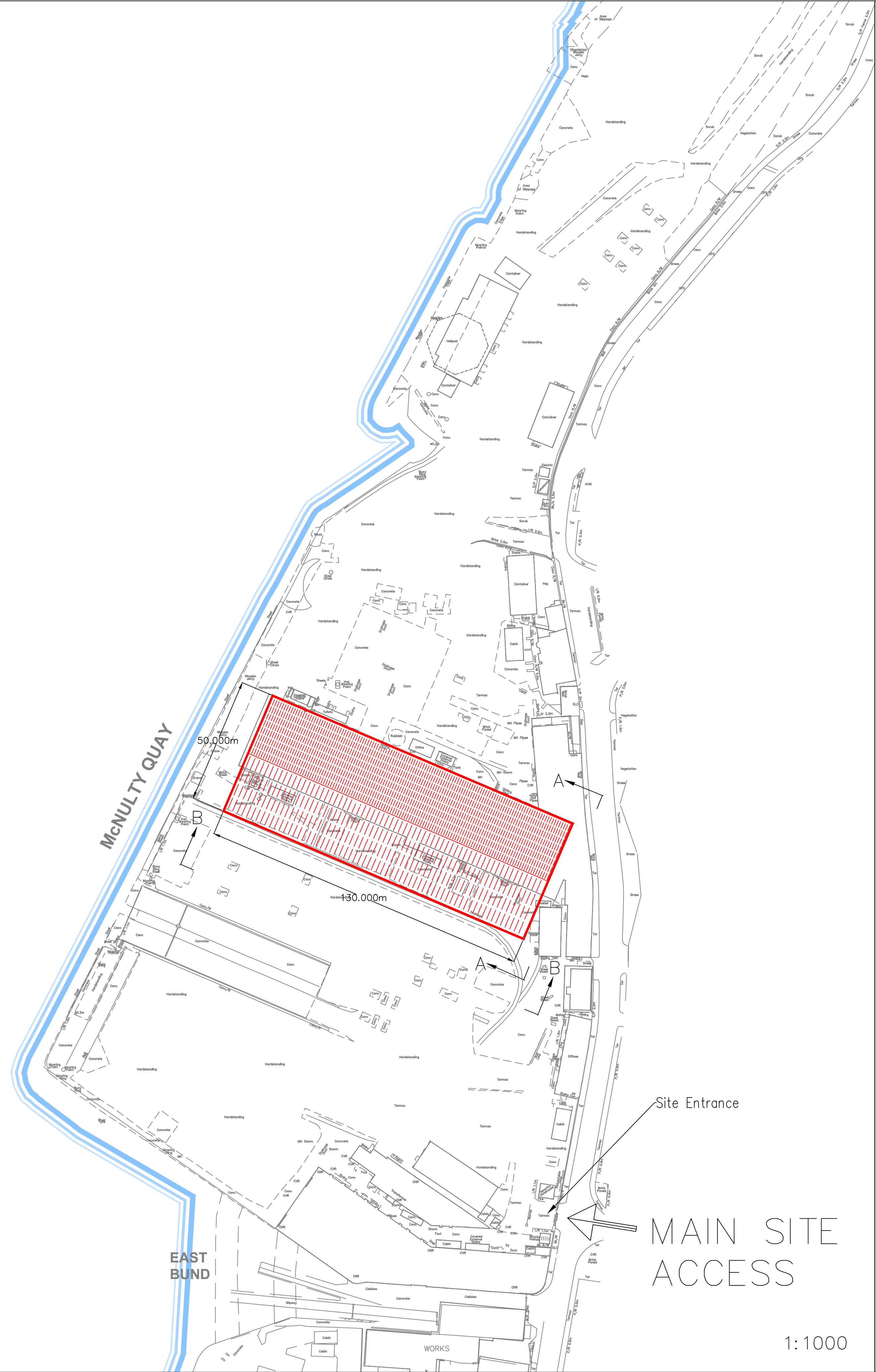
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CLIENT	PORT OF TYNE
PROJECT	McNULTY YARD REPORT
TITLE	SOUTH & PART NORTH YARD BUILDING & QUAY REFERENCES

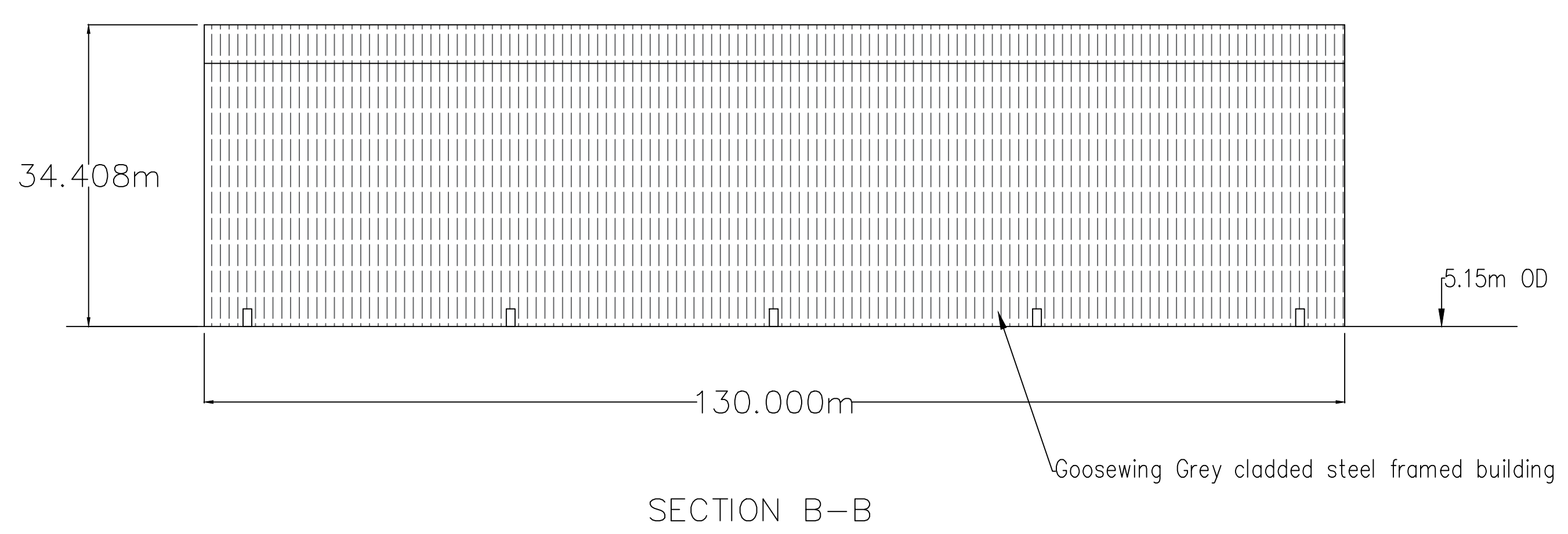
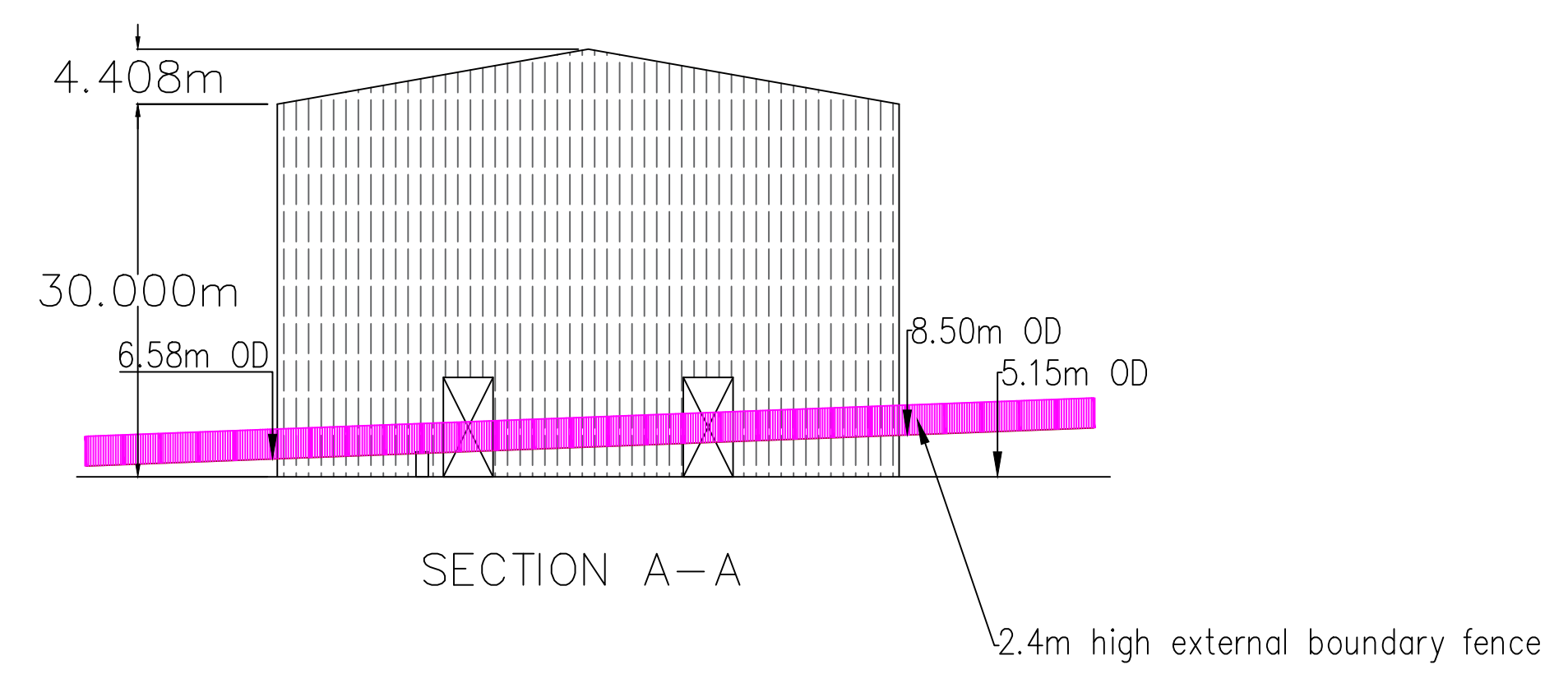
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11.0 APPENDIX C – PROPOSED BUILDING AND ELEVATIONS



1: 1000



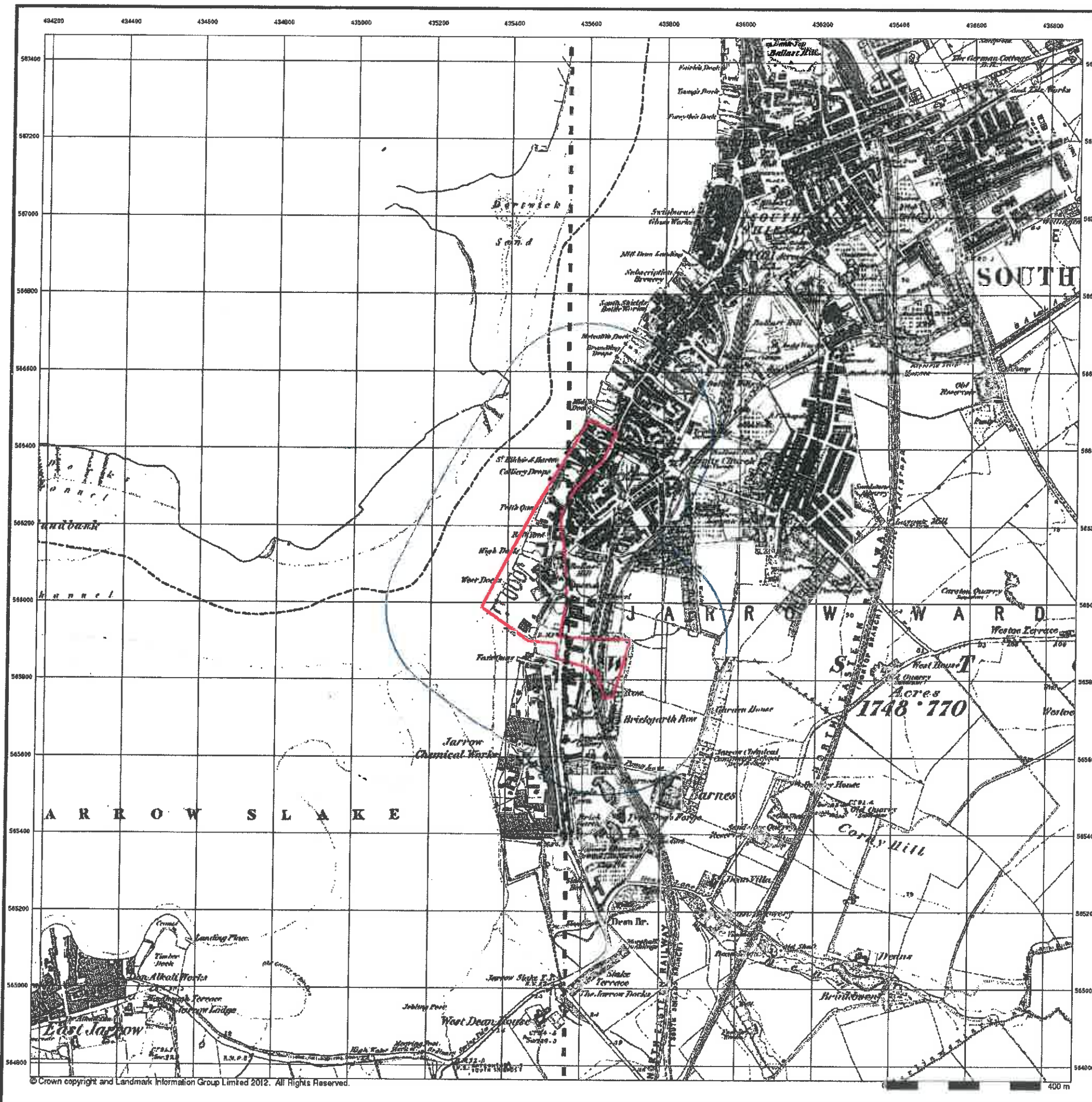
1: 500

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2	12.07	MAIN SITE ACCESS ADDED	KPE
REV	DATE	DESCRIPTION	BY
REVISION / STATUS			
		MARITIME HOUSE TYNE DOCK SOUTH SHIELDS NE34 9PT 0191 4552671	
TITLE			
FORMER McNULTY SITE PROPOSED SHED			
K. EMMETT BEng, CEng, M.I.C.E. HEAD OF INFRASTRUCTURE DEVT.			
PREPARED BY	KPE	CHECKED BY	ARK
DATE	06/07/2016	DATE	06/07/2016
SCALE	AS SHOWN	CLIENT REF	
DWG No.	2298-KPE-0004	REVISION	2
COPYRIGHT © PORT OF TYNE			A1



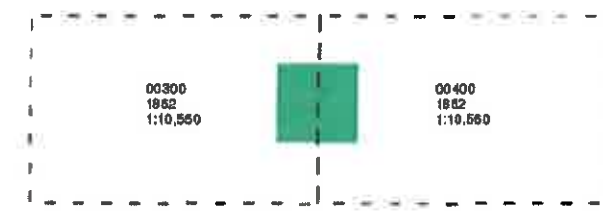
12.0 APPENDIX D – ENVIROCHECK HISTORICAL MAPS



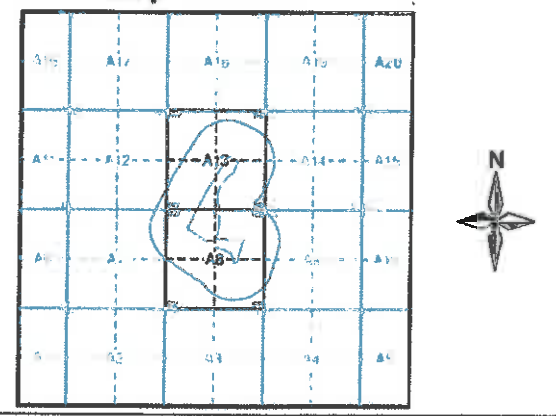
Durham
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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

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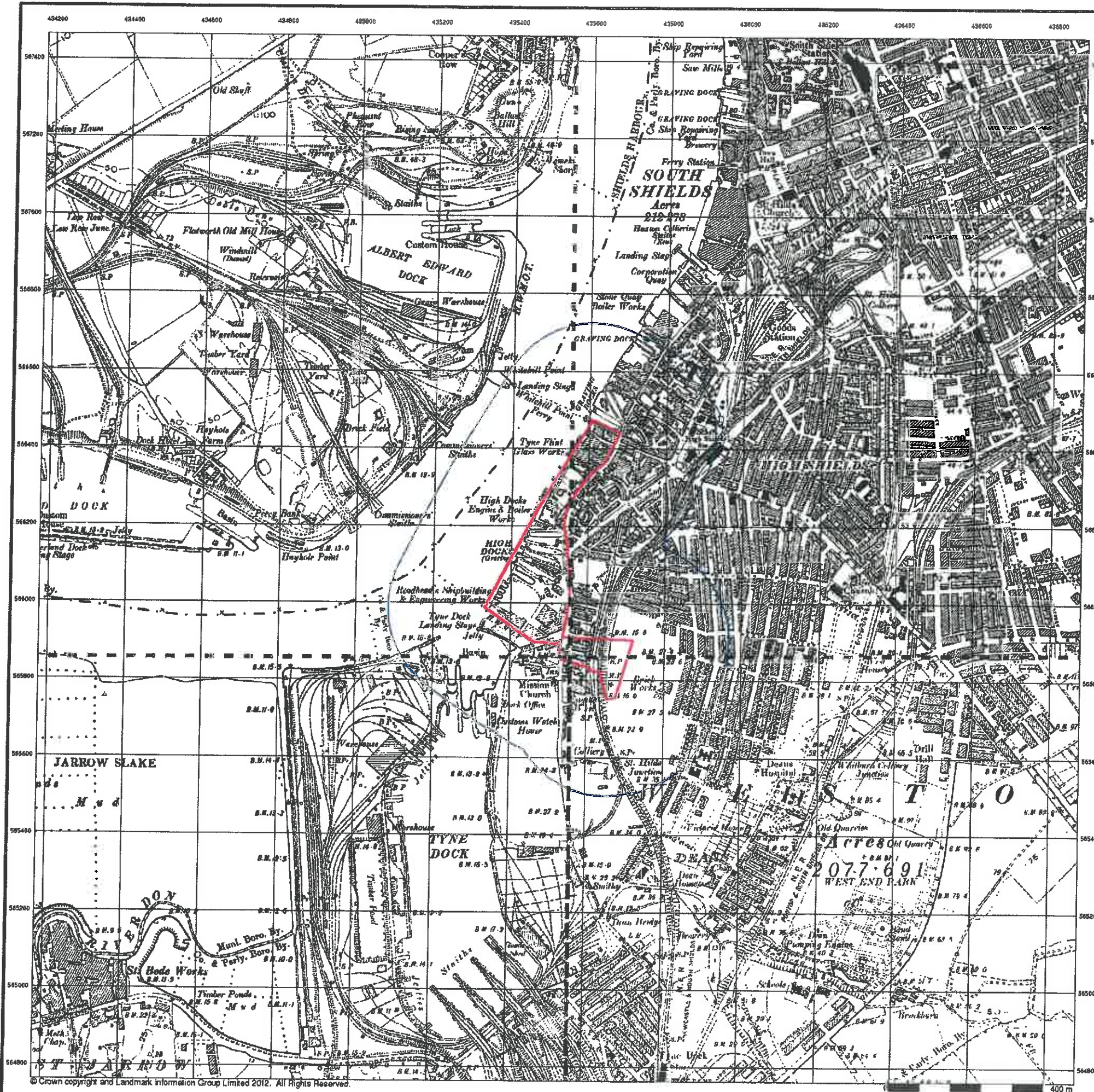
Site Details

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

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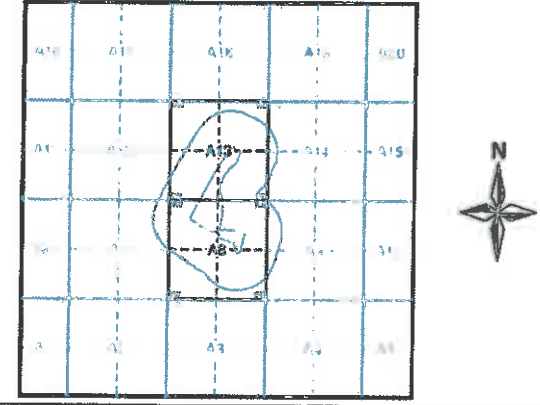
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Published 1898
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Map Name(s) and Date(s)

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

Historical Map - Slice A



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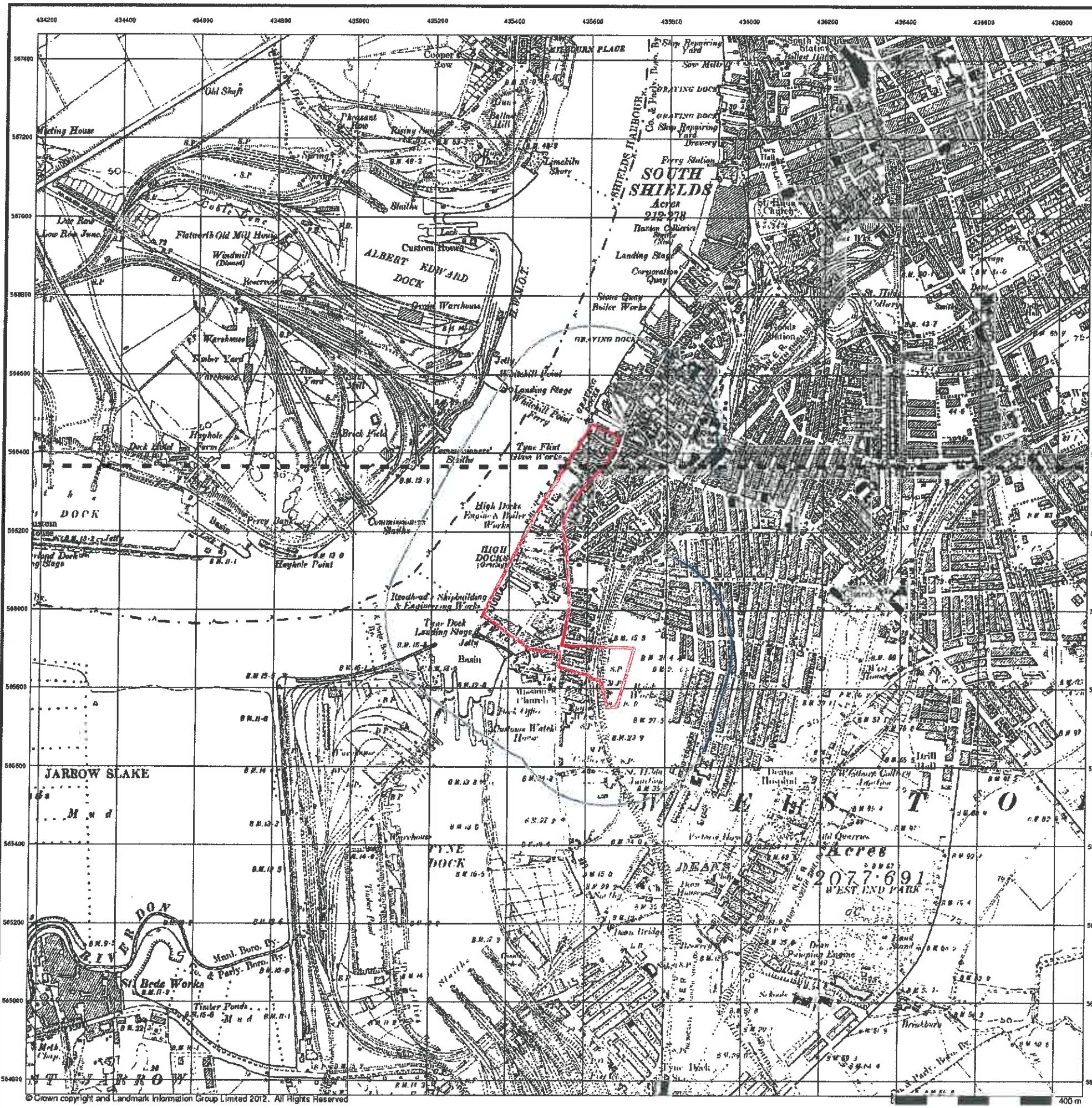
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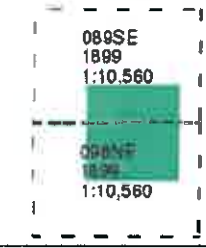
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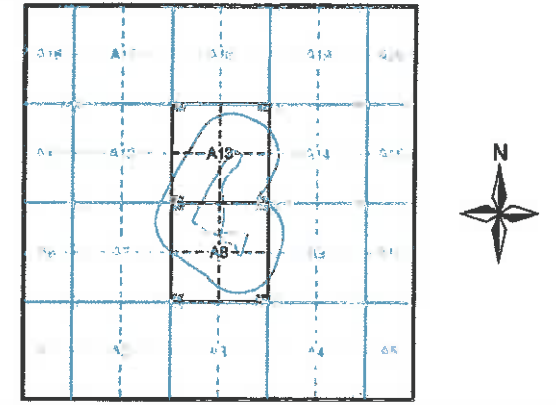
Northumberland
Published 1899
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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

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 Customer Ref: 060
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 Slice: A
 Site Area (Ha): 8.59
 Search Buffer (m): 250

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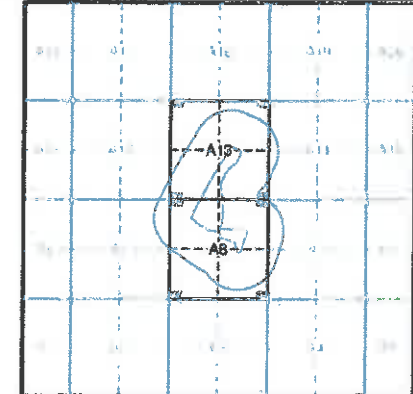
Durham
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Map Name(s) and Date(s)

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Historical Map - Slice A



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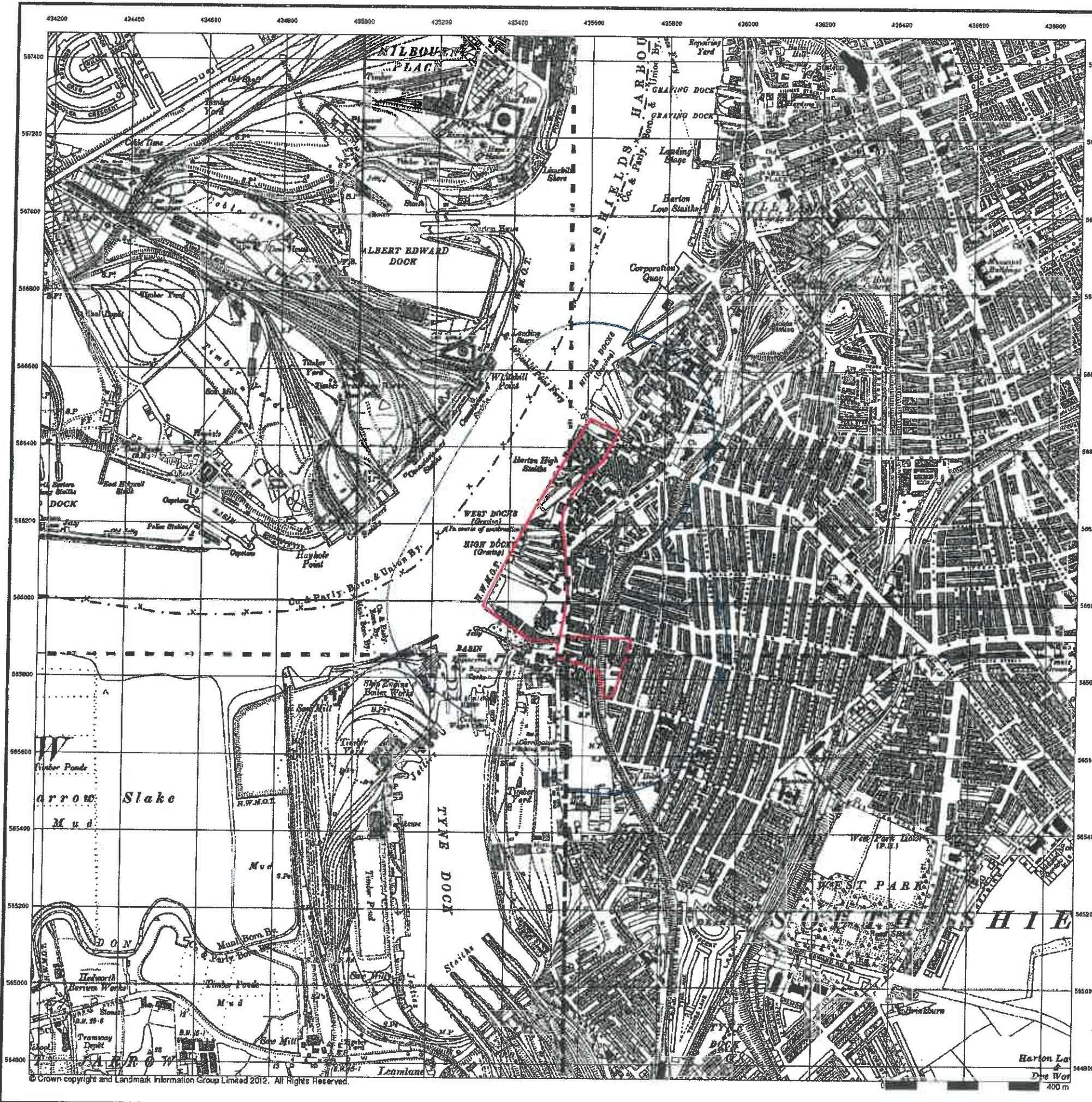
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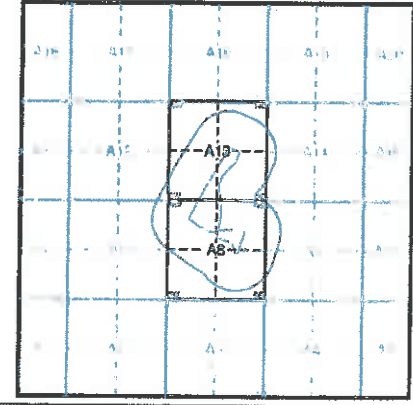
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Map Name(s) and Date(s)

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

Historical Map - Slice A



Order Details

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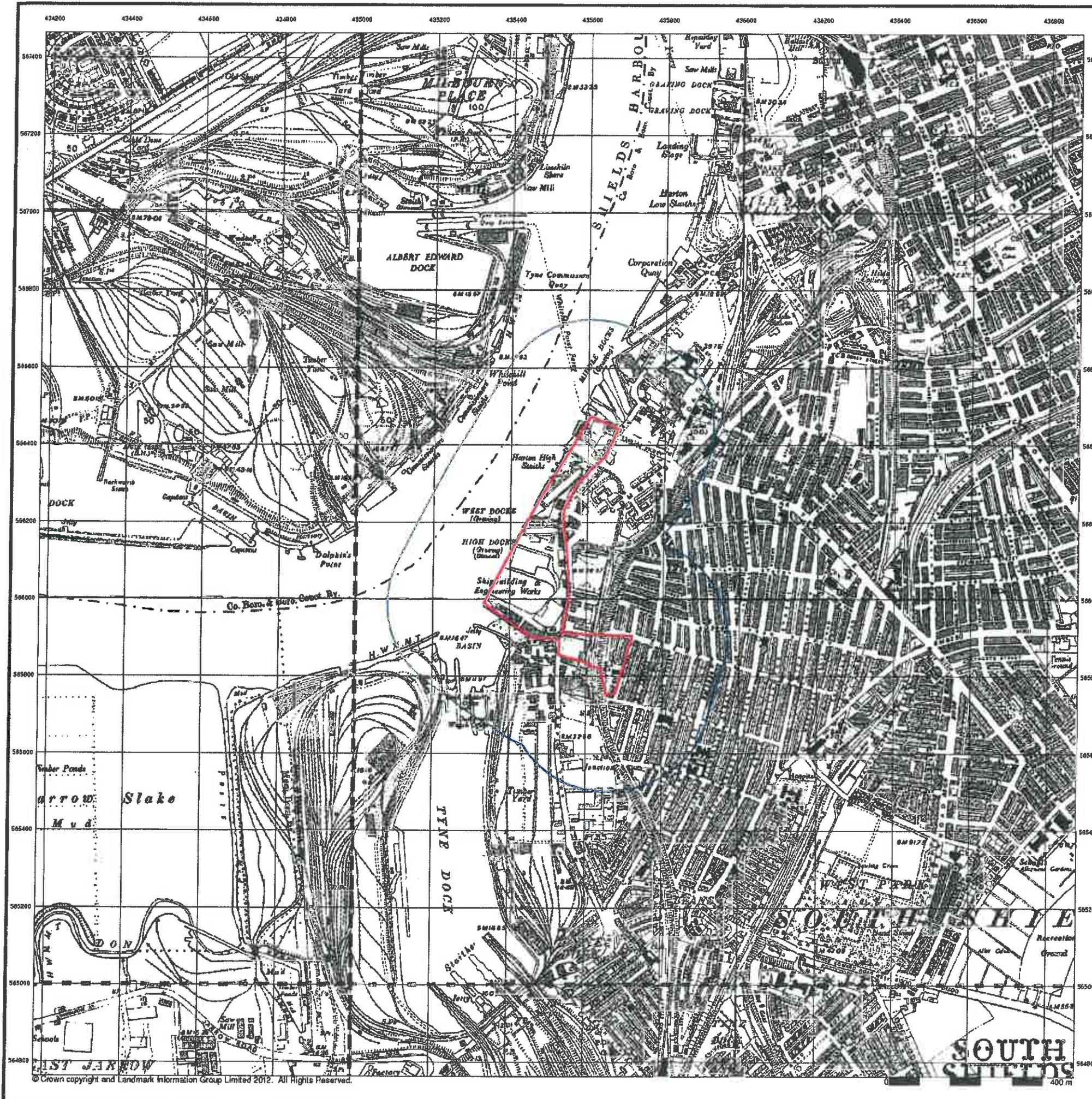
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McNulty Offshore Construction Ltd, 16-17 Corstorphine Town, SOUTH SHIELDS, Tyne and Wear, NE33 1RZ



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

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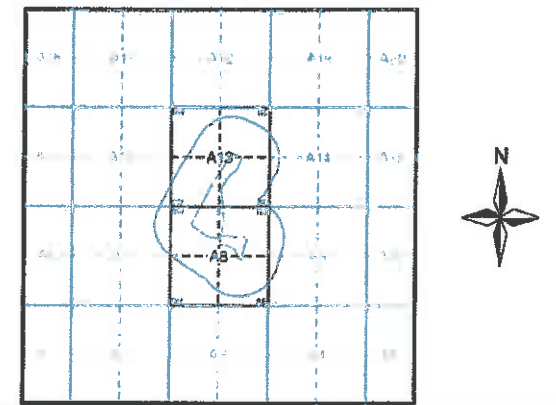
**Ordnance Survey Plan
Published 1951 - 1952
Source map scale - 1:10,000**

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)

NZ36NW 1951 1:10,560	NZ36NE 1952 1:10,560
NZ36SW 1952 1:10,560	NZ36SE 1951 1:10,560

Historical Map - Slice A



Order Details

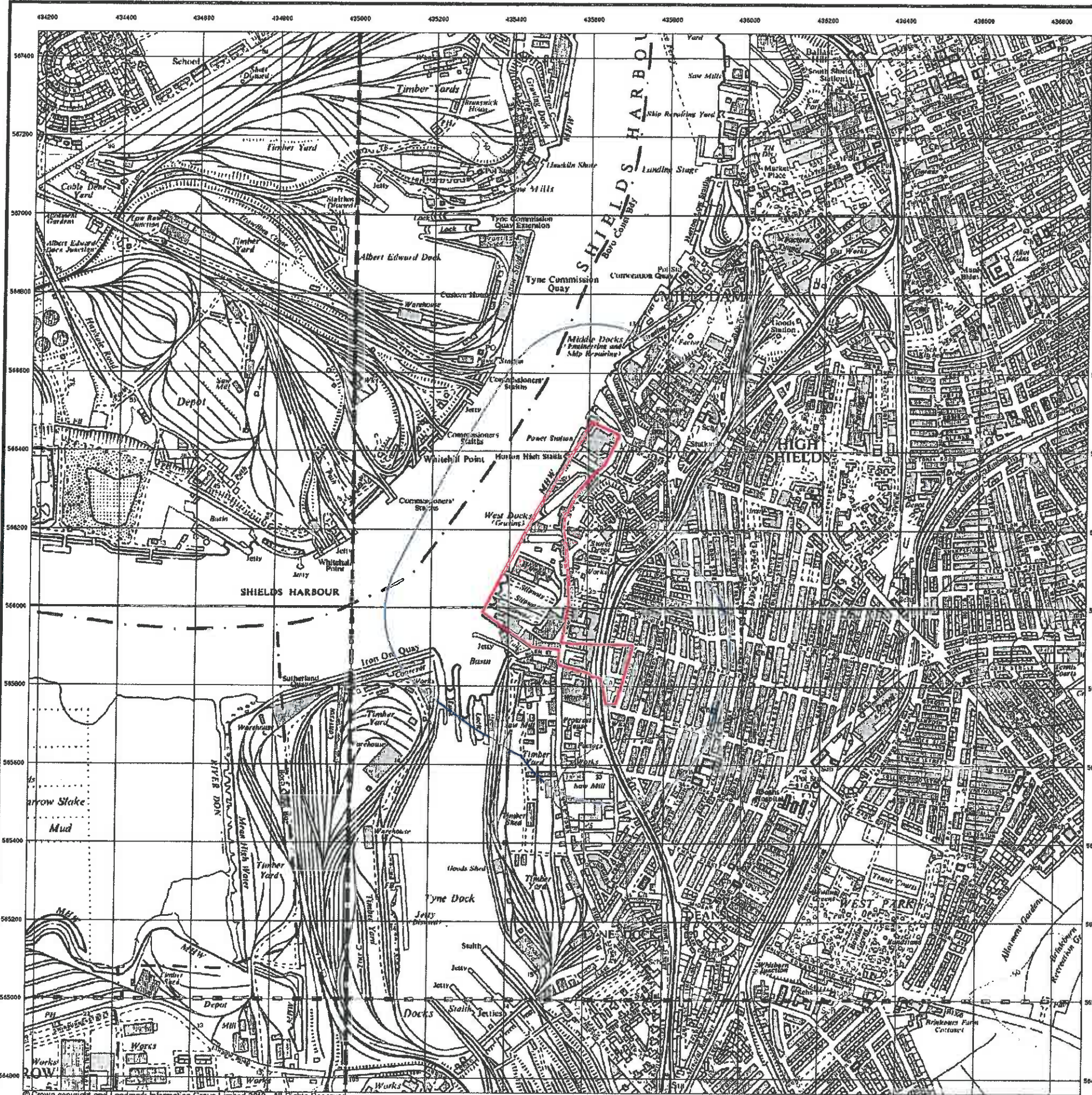
Order Number: 41689911_1_1
Customer Ref: 060
National Grid Reference: 435560, 566100
Slice: A
Site Area (Ha): 8.59
Search Buffer (m): 250

Site Details

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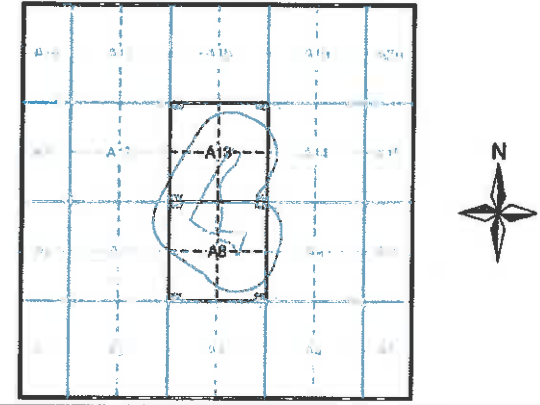
**Ordnance Survey Plan
Published 1967 - 1968
Source map scale - 1:10,000**

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

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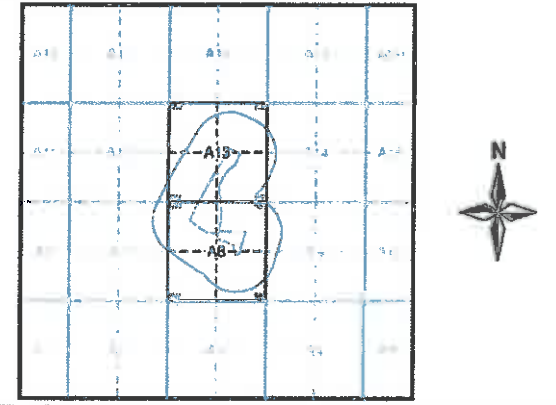
**Ordnance Survey Plan
Published 1973 - 1977
Source map scale - 1:10,000**

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

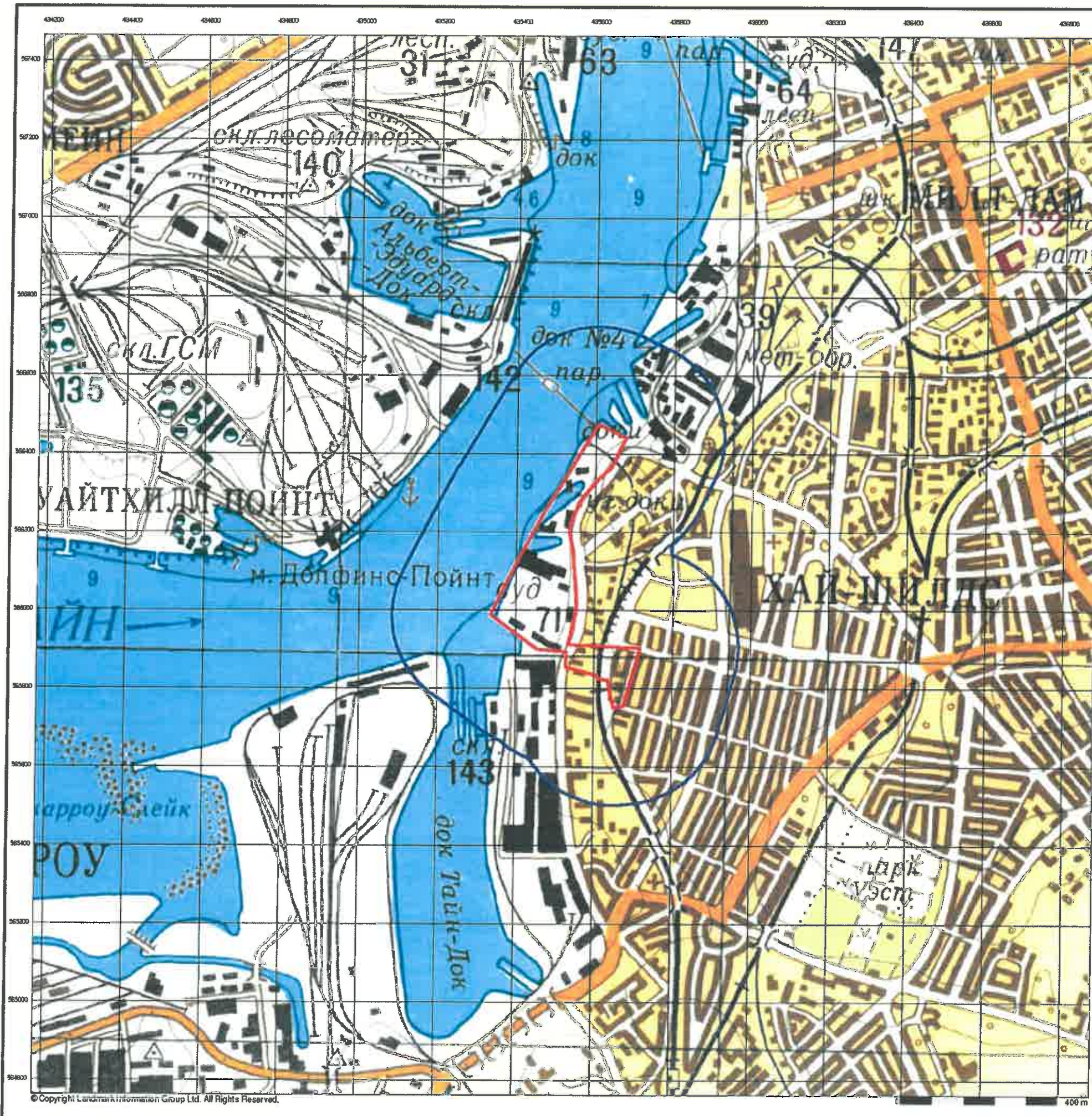
Order Number: 41689911_1_1
 Customer Ref: 060
 National Grid Reference: 435560, 566100
 Slice: A
 Site Area (Ha): 8.59
 Search Buffer (m): 250

Site Details

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



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Newcastle-upon-Tyne
Published 1977

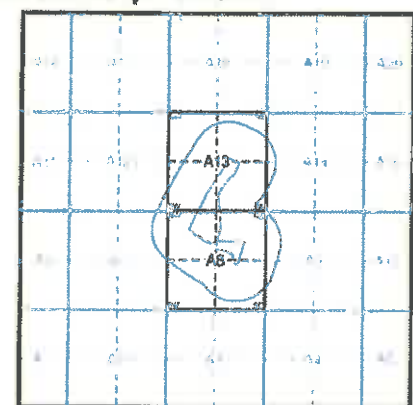
Source map scale - 1:25,000

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

Site Details

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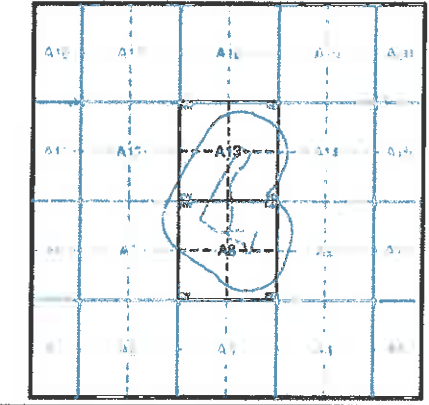
**Ordnance Survey Plan
Published 1982 - 1987
Source map scale - 1:10,000**

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 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 1982 1:10,000	NZ36NE 1986 1:10,000
	
NZ36SE 1987 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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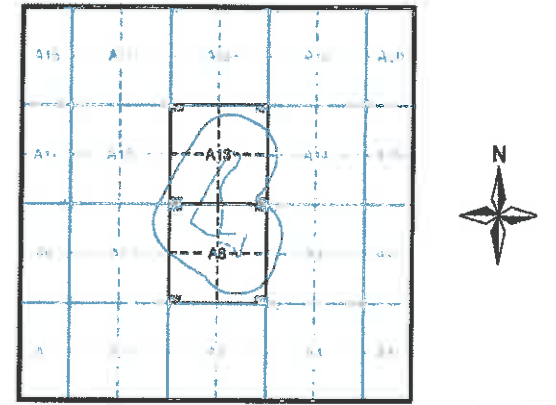
**Ordnance Survey Plan
Published 1992 - 1995
Source map scale - 1:10,000**

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

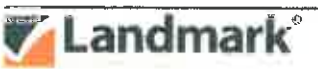


Order Details

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

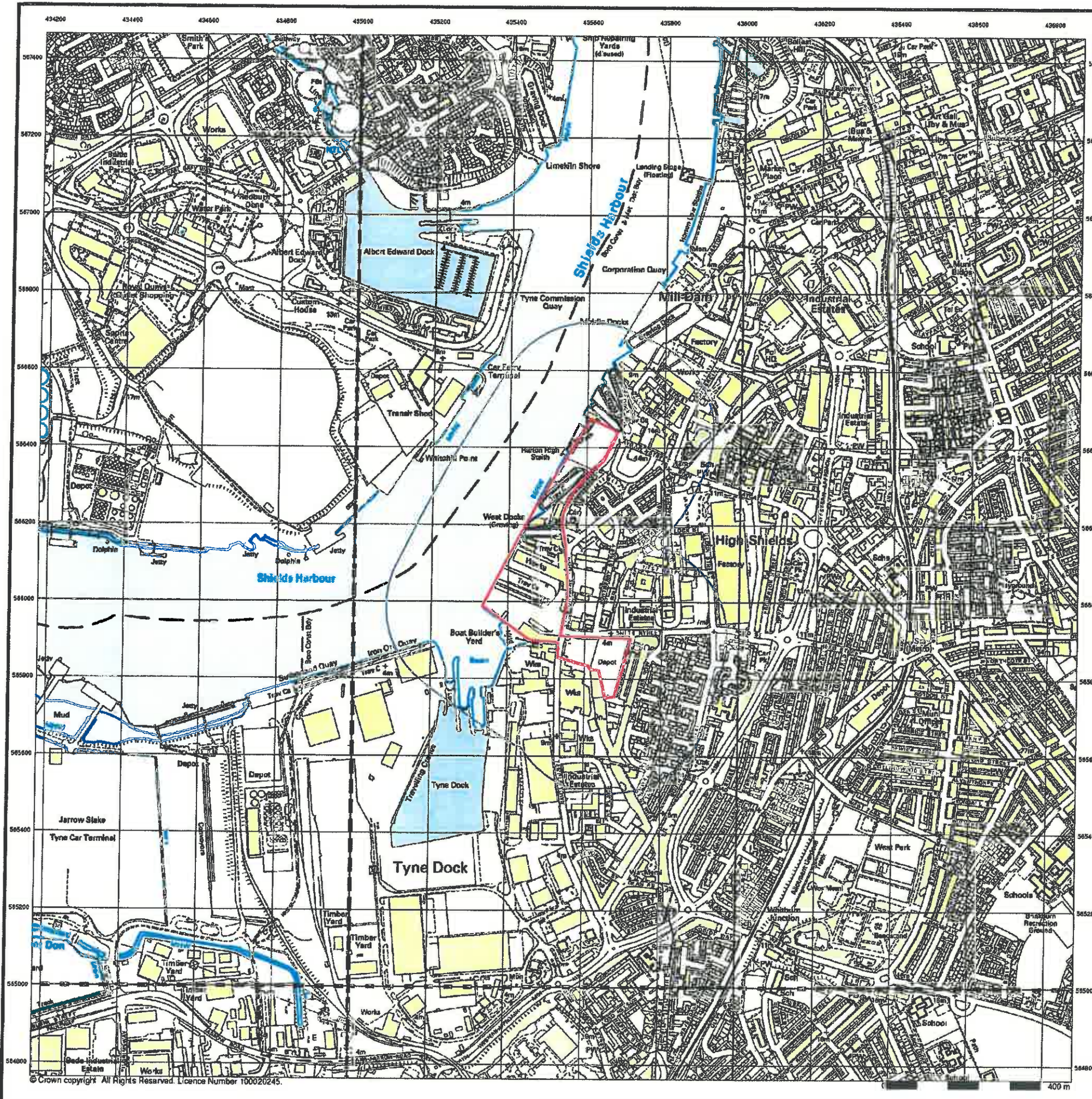
Site Details

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



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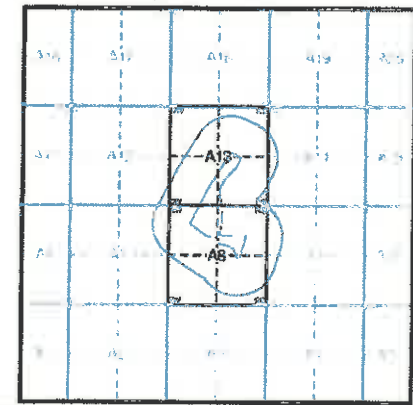
10k Raster Mapping
Published 2006
Source map scale - 1:10,000

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

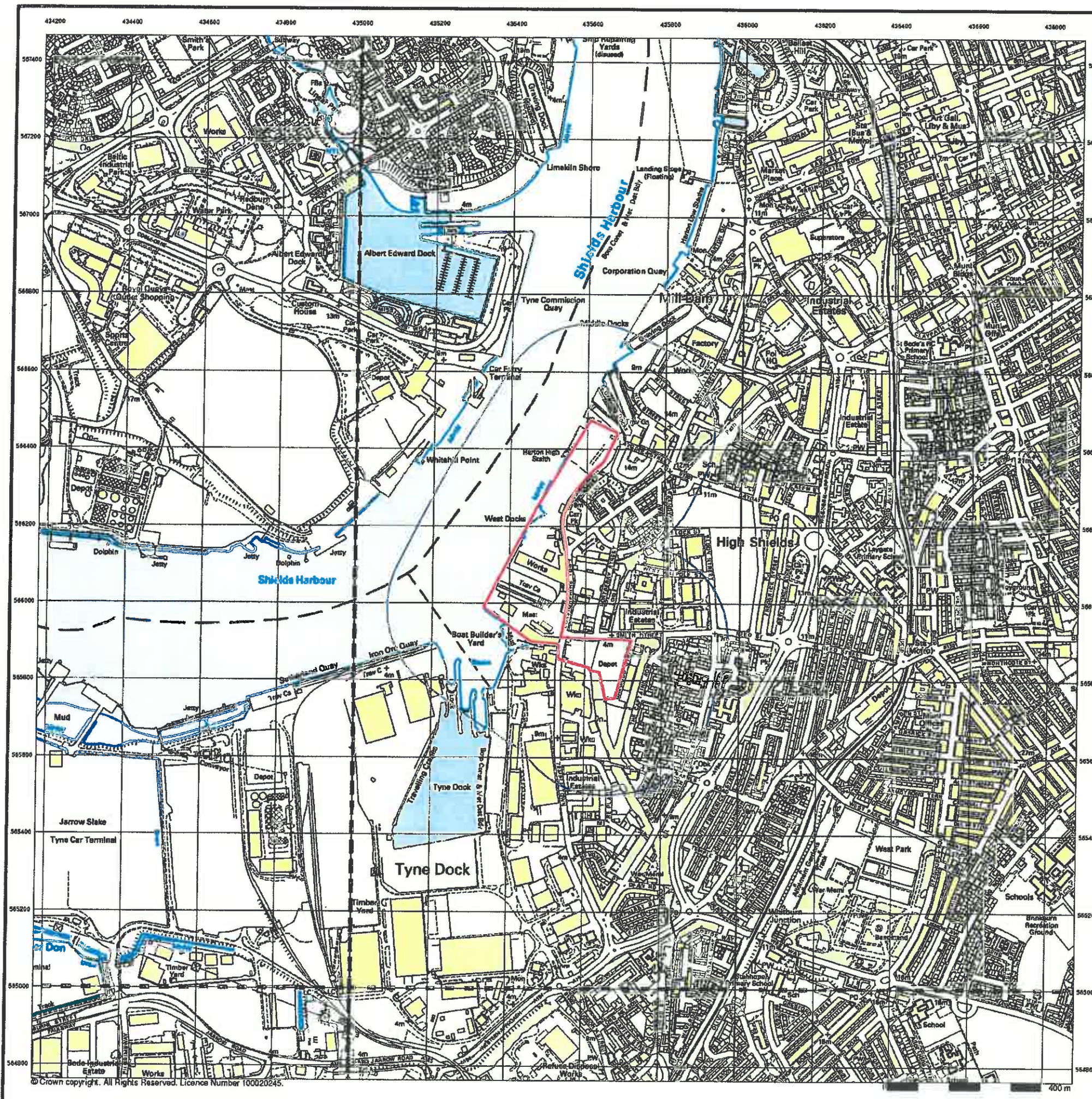
Order Number: 41689911_1_1
 Customer Ref: 060
 National Grid Reference: 435560, 566100
 Slice: A
 Site Area (Ha): 8.59
 Search Buffer (m): 250

Site Details

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



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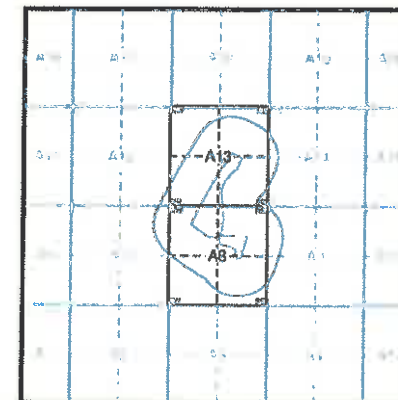
10k Raster Mapping
Published 2012
Source map scale - 1:10,000

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

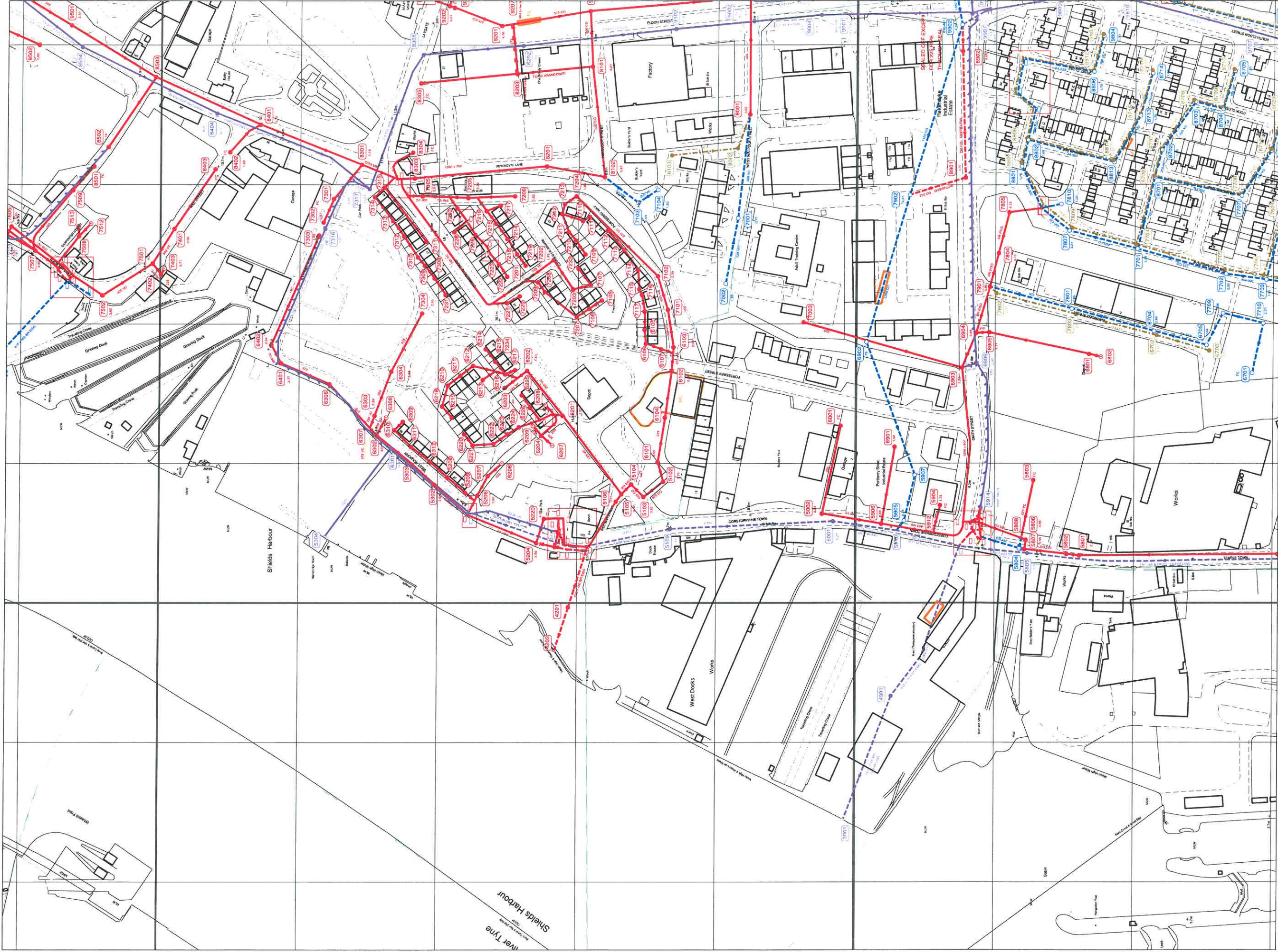
McNulty Offshore Construction Ltd, 16-17 Corstorphine Town, SOUTH SHIELDS, Tyne and Wear, NE33 1RZ



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 Web: www.envirocheck.co.uk



13.0 APPENDIX E – 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 F – HIGHEST TIDES RECORDED

Highest Recorded Tide each year since 1860 at the Quayside and Swing Bridge



RIVER TYNE - Highest Tides Recorded at Quayside & Swingbridge Newcastle since 1860



Date	Height above 0 D (Newlyn) m	Height above Chart Datum (LAT) m	Remarks
Feb 1860	3.26	5.86	Quayside
Nov 1861	2.96	5.56	""
Dec 1862	3.34	5.94	""
Jan 1863	3.36	5.96	""
Sep 1864	3.21	5.81	""
Feb 1865	3.19	5.79	""
Mar 1866	3.31	5.81	""
Dec 1876	3.44	6.04	""
Jan 1877	3.41	6.01	""
Jan 1878	3.41	6.01	""
Mar 1879	3.24	5.84	""
Sep 1880	3.19	5.79	""
Aug 1881	3.29	5.89	""
Feb 1882	3.52	6.12	""
Oct 1883	3.64	6.24	""
Nov 1884	3.39	5.99	""
Jan 1885	3.41	6.01	""
Mar 1886	3.16	5.76	""
Oct 1887	3.36	5.96	""
Mar 1888	3.34	5.94	""
Nov 1889	3.34	5.94	""
Sep 1890	3.79	6.39	""
Sep 1891	3.39	5.99	""
Nov 1892	3.19	5.79	""
Oct 1893	3.16	5.76	""
Nov 1894	2.98	5.58	""
April 1895	3.16	5.76	""
Aug 1896	3.06	5.66	""
Aug 1897	2.93	5.53	""
Sep 1901	3.21	5.81	""
Dec 1902	3.26	5.86	""
Oct 1903	3.26	5.86	""
April 1904	3.31	5.91	""
Sep 1905	3.31	5.91	""
Mar 1906	3.52	6.12	""
Dec 1907	3.11	5.71	""
Oct 1908	3.26	5.86	""
Mar 1909	3.34	5.94	""
April 1910	3.19	5.79	""
Nov 1911	3.36	5.96	""
Mar 1912	3.36	5.96	""
Oct 1913	3.26	5.86	""
Feb 1914	3.34	5.94	""
April 1915	3.16	5.76	Swing Bridge
Oct 1916	3.47	6.07	""
Sep 1917	3.49	6.09	""
Sep 1918	3.54	6.14	""
Sep 1919	3.19	5.79	""
Dec 1920	3.34	5.94	""
Dec 1921	3.77	6.37	""

20 Year Ave=
3.28

20 Year Ave=
3.29

20 Year Ave=
3.31

Highest Recorded Tide each year since 1860 at the Quayside and Swing Bridge

Jan 1922	3.39	5.99	""
Oct 1923	3.54	6.14	""
Feb 1924	3.62	5.22	""
Sep 1925	3.34	5.94	""
Aug 1926	3.39	5.99	""
Mar 1927	3.47	6.07	""
Mar 1928	3.29	5.89	""
Oct 1929	3.26	5.86	""
Sep 1930	3.29	5.89	""
Oct 1931	3.47	6.07	""
Sep 1932	3.36	5.96	""
April 1933	3.26	5.86	""
Jan 1934	3.47	6.07	""
Sep 1935	3.49	6.09	""
Dec 1936	3.24	5.84	""
Nov 1937	3.21	5.81	""
Jan 1938	3.34	5.94	""
Oct 1939	3.34	5.94	""
Nov 1940	3.36	5.96	""
Oct 1941	3.59	6.19	""
Dec 1942	3.34	5.94	""
Feb 1943	3.77	6.37	""
Sep 1944	3.54	6.14	""
Oct 1945	3.44	6.04	""
April 1946	3.16	5.76	""
Oct 1947	3.34	5.94	""
Oct 1948	3.31	5.91	""
Sep 1949	3.41	6.01	""
Sep 1950	3.44	6.04	""
Aug 1951	3.19	5.79	""
Sep 1952	3.31	5.91	""
Jan 1953	3.52	6.12	""
Nov 1954	3.64	6.24	""
Jan 1955	3.49	6.09	""
Dec 1955	3.41	6.01	""
Sep 1969	3.48	6.08	""
Nov 1971	3.60	6.20	""
Jan 1975	3.59	6.19	""
Average	3.35	5.94	

20 Year Ave=
3.39

20 Year Ave=
3.43



RIVER TYNE - Highest Tides Recorded at North Shields Since 1974



Date	Height above 0 D (Newlyn) m	Height above Chart Datum (LAT) m	Remarks
Feb 1974	3.13	5.73	North Shields
Oct 1975	3.15	5.75	""
Jan 1976	3.40	6.00	""
Nov 1977	3.45	6.05	""
Jan 1978	3.45	6.05	""
Dec 1979	3.35	5.95	""
Oct 1980	3.32	5.92	""
Mar 1981	3.23	5.83	""

Highest Recorded Tide each year since 1860 at the Quayside and Swing Bridge

Jan 1982	3.05	5.65	'''
Feb 1983	3.45	6.05	'''
Nov 1984	3.28	5.88	'''
Apr 1985	3.12	5.72	'''
Jan 1986	3.02	5.62	'''
Sep 1987	3.09	5.69	'''
Sep 1988	3.29	5.89	'''
Sep 1989	3.30	5.90	'''
Feb 1990	3.44	6.04	'''
Dec 1991	3.27	5.87	'''
Aug 1992	3.19	5.79	'''
Jan 1993	3.30	5.90	'''
Dec 1994	3.17	5.77	'''
Feb 1995	3.35	5.95	'''
Sep 1996	3.15	5.75	'''
Jan 2005	3.57	6.17	Λ
Oct-06	3.19	5.79	μ
DEC 2013		6.90	Λ
Average	3.27	5.87	

20 Year Ave=
3.26

1867 to 1875 No Records
 1898 to 1900 No Records
 1955 to 1968 No Records
 1972 to 1973 No Records
 1996 to 2004 No Records



PORT OF TYNE AUTHORITY

BEWICK STREET
NEWCASTLE UPON TYNE
NE1 5HS

Telephone 091 232 5541
Facsimile 091 261 9739
Telex 53595

Director of Port Services
J. BRINKHURST, B.Sc., C.Eng., M.I.Mech.E.

TIDAL NOTATION

Tidal levels for Standard Ports (of which the River Tyne, North Shields, is one) are subject to re-examination from time to time. Due to changes in mean sea level they do not necessarily remain constant. Recent analyses have caused a number of levels to be raised by an average of about 0.1 metre (0.3 ft.) which is the estimated amount by which sea level has risen around the British Isles during the last 40 years or so.

The levels are referred to Admiralty Chart Datum, which is the same as the zero of the tidal predictions in all cases. At the present time, Admiralty Chart Datum for the River Tyne is a fixed level of 2.60 metres (8.5 ft.) below Ordnance Datum (Newlyn), which is equivalent to Lowest Astronomical Tide (LAT) and corresponds with zero on the Authority's Tide Gauges.

The levels of MHWS and MLWS which vary in level both by time and location, are re-calculated from time to time and are published in the Admiralty Tide Tables. At the present time MHWS at the River Tyne, North Shields, is 5.0 metres (16.4 ft.) above Zero or Chart Datum, and MLWS is 0.7 metre (2.3 ft.) above Zero or Chart Datum. At Newcastle MHWS is 5.3 metres (17.4 ft.) above Zero or Chart Datum and MLWS is 0.8 metre (2.6 ft.).

Soundings and dredged depths in the River Tyne are related to Chart Datum or Zero on the Authority's Tide Gauges.

J. BRINKHURST, B.Sc., C.Eng., M.I.Mech.E.,
DIRECTOR OF PORT SERVICES

PORT OF TYNE AUTHORITY.
TIDAL DATA OF RIVER TYNE 1991

TIDAL LEVELS AT
NORTH SHIELDS

H.A.T. 5.7 (18.7 ft.)

M.H.W.S. 5.0 (16.4 ft.)

M.H.W.N. 3.9 (12.8 ft.)

3.54 (11.6 ft.)

M.L.W.N. 1.8 (5.9 ft.)

M.L.W.S. 0.70 (2.3 ft.)

CHART DATUM (L.A.T.)
(- 2.60 BELOW ORDNANCE DATUM NEWLYN)

TIDAL LEVELS AT
NEWCASTLE

M.H.W.S. 5.3 (17.4 ft.)

M.H.W.N. 4.1 (13.5 ft.)

NORMAL DOCK LEVEL

M.L.W.N. 1.9 (6.2 ft.)

M.L.W.S. 0.80 (2.6 ft.)

LEVELS ARE IN METRES RELATIVE TO
CHART DATUM AND ARE SUBJECT TO
RE-EXAMINATION FROM TIME TO TIME

J. BRINKHURST, M.I. Mech. E.
DIRECTOR OF PORT SERVICES



15.0 APPENDIX G – Mc NULTY SITE 5TH DEC 2013



FS 533709

DTA

Consulting Engineers LLP
Multi Discipline Consultancy

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Telephone: 0191 4151256
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Email: washington@dtagroup.co.uk
www.dtagroup.co.uk



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A list of members' names is available for inspection at the registered office, Parsons House, Washington, Tyne & Wear, NE37 1EZ



16.0 APPENDIX H – 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
DATE:	12/06/13	NO. OF SHEETS:	1
SCALE:	1:1000	DATE:	12/06/13

ORGNO: X
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