APPENDIX 3

Copy Archival Record and Statement of Heritage Impact, No 1 Blast Furnace

STATEMENT OF HERITAGE IMPACT

PROPOSED DEMOLITION OF THE No. 1 BLAST FURNACE

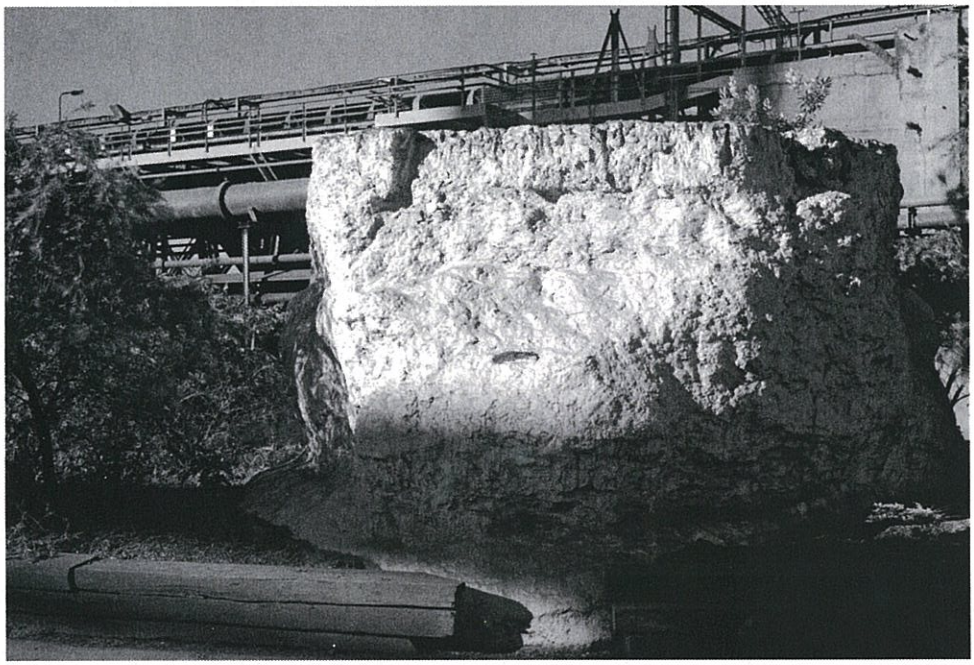

Figure 0.1 All that Remains of No. 1 Blast Furnace, resulting from Molten Ore that has spilled from the furnace.
Source:Erzetich. Ref B06/04.

Prepared By:

EJE
ARCHITECTURE

NEWCASTLE

412 King Street
Newcastle West NSW 2302

Telephone: (02) 4929 2353
Facsimile: (02) 4926 3069
e-mail: mail@eje.com.au
Web Site: www.eje.com.au

Project No. 3882.04 **April 2000**

CONTENTS

1.0 THE PROPOSAL

Major changes have occurred in Newcastle and the Hunter Region over the past 20 years. The downsizing and eventual decision to close BHP steel making operations and the rationalisation of the coal industry are a reflection of these changes. The BHP steel making site is strategically placed, not only on a local and regional level, but on a State and National level. It has been proposed that the existing site be redeveloped as a major Multi Purpose Terminal servicing the east coast of Australia. The area to be developed as the Multi Purpose Terminal, would require the demolition of all above ground structures located within this area (see Appendices for location plan) to enable remediation of the land and redevelopment of the site. Development of the remainder of the site at a later stage for industrial / commercial purposes is also proposed. The buildings proposed for demolition are:

1. No. 1 Blast Furnace
2. No. 1 Blower House
3. Open Hearth Building
5. No. 1 Bloom & Rail Mill
6. Steel Foundry
10. DC Sub Station
11. Wharves
14. No. 3 Blast Furnace
15. AC Pump House
16. Power House
19. Open Hearth Change House
20. Mould Conditioning Building
21. BOS Plant
23. No. 4 Blast Furnace

2.0 THE CONTEXT OF THE PROPOSAL

2.1 Physical Context

The remnant of the No. 1 Blast Furnace is located at the north eastern sector of BHP's Port Waratah works, near the north central area of the Proposed Wharf Precinct. It is associated with Ore Storage Bins to its immediate north, with No. 3 Blast furnace to its east and No. 1 Blower house to its south. No. 4 Blast furnace and Stoves are to the west. The Container Terminal proposal is located adjacent to the "swing basin" which forms the widest point in the Hunter River for marine manoeuvring.

2.2 Statutory Context

The No. 1 Blast Furnace is identified within the group identification forming Part B of Schedule 4 (Port Waratah – BHP Steelworks and Office) of "The Hunters Heritage" – Hunter Regional Environmental Plan 1989. It is identified individually within Schedule 4 of The Newcastle Local Environmental Plan 1987 as having an item of State – level heritage significance. (This ascribed level of significance is consistent with the level of significance determined in the Port Waratah Steelworks Conservation Plan prepared by EJE Architecture in 1991). The item does not fall within a Conservation Area and is not included on the State Heritage Register. Under the EP and A Act, if an item is of State level heritage significance, the local council is required to obtain the consent and concurrence of the Department of Urban Affairs and Planning to any major intervention into the item. Under the Integrated Approvals Amendment Act 1998, "Integrated development" is development (not being complying development) that, in order for it to be carried out, requires development consent and approval under other, listed environmental legislation (s 91 (1)). The "other listed environmental legislation" includes the Heritage Act 1977. Under the new legislation, (in Section 91a):

(2) Before granting development consent to an application for consent to carry out the development, the consent authority must, in accordance with the regulations, obtain from each relevant approval body the general terms of any approval proposed to be granted by the approval body in relation to the development. Nothing in this section requires the consent authority to obtain the general terms of any such approval if the consent authority determines to refuse to grant development consent. A Consent granted by the consent authority must be consistent with the general terms of any approval proposed to be granted by the approval body in relation to the development and of which the consent authority is informed. For the purposes of this Part, the consent authority is taken to have power under this Act to impose any condition that the approval body could impose as a condition of its approval.

(3) A consent granted by the consent authority must be consistent with the general terms of any approval proposed to be granted by the approval body in relation to the development and of which the consent authority is informed. For the purposes of this Part, the consent authority is taken to have power under this Act to impose any condition that the approval body could impose as a condition that the approval body could impose as a condition of its approval.

3.0 HISTORICAL REVIEW

On the 24th January, 1913 piling operations began near to the site occupied by the old copper smelter which had been operated by the previous owner of the site, the Port Waratah Copper Works. The design of the No. 1 Blast Furnace was done in the United States of America by the engineering office of James Ladd, ME, a colleague and one time partner of David Baker, General Manager of the BHP Port Waratah Steelworks.

Because the proposed site was swampy, Mr Baker organised that the piles for the foundations should be driven from a punt on which a pile driver and steam engine were located. In water, which was approximately 2' 6" deep, 255 piles of 31' 5" long were driven. After forming a concrete slab 44 feet square and 17 feet deep for the base of the blast furnace and piled foundations with a concrete cap for the stove foundations 132 feet long 29 feet wide and 15 feet thick, the prefabricated furnace was built. This first fully mechanised steel plated furnace was prefabricated in the USA by The William B. Pollock Company of Youngstown Ohio, and was the first in Australia. The Furnace platform stood thirty metres above ground level and the furnace charge was raised to the charging bell by a skip haulage system similar to later furnaces.

The furnace was blown in on 8th March 1914 using iron ore from Whyalla and went into production in 1915, rated at 350 tons per day.

This Blast Furnace represented a landmark in Australian blast furnace technology, introducing innovations which had been implemented in United States in 1883. Earlier Australian blast furnaces were manually charged and required no structure above the stack. In contrast, BHP's Blast Furnace was mechanically charged using skips which were loaded with raw materials and raised up an inclined hoist to the top of the furnace, where the contents were dumped into a hopper. A double bell and cone-top sealing system allowed the charge to be distributed uniformly into the furnace, while avoiding unnecessary gas loss. The mechanical superstructure and ductwork associated with mechanical charging brought considerable changes to the furnace profile, which can clearly be seen in photographs of BHP's furnace and earlier blast furnaces constructed at Eskbank in 1875-76 and Lithgow in 1907 and 1913.

In 1938 the Blast Furnace gas cleaning plant was commissioned. In 1943 the furnace was relined and remodelled. The lower portion of the cast iron and cast steel riveted sections of the furnace shell were replaced with welded mild steel and cooling plate provisions were made. The furnace was re-lined with English bricks to a point 25' above the mantle, and the cast house floor was enlarged to improve operations.

Further modifications and re-lining operations took place in 1964, 1971, 1975, and 1979. The various modifications and enlargements over the years had increased the average daily production from 268 ton's in 1915 to 900 ton's in 1982. The Blast Furnace was decommissioned in 1982, and demolished in 1988.

As part of the process of closure of iron and steelmaking operations in 1999, several departmental histories were compiled and these included anecdotal accounts of various incidents. Among those published in The Blast is Past: A Collection of Stories about the Ironmakers of Newcastle, was the story of the attempt to remove the remnants of No. 1 Blast Furnace.

When the No. 1 Blast Furnace was demolished, all that was left was the "Button". It was decided to remove it and one of the men was given the task. Now this bloke had only just completed his Shop Firers Course and was keen and ready. He spent days drilling and preparing. Finally came the day to set the charges. The charges were set, explosion mats installed and the area cleared. Off went the siren and then came the explosion. When the dust settled, an explosion mat was in the river, most of the windows in the top storey of the Office Block were smashed and the button was still there. He wanted a second attempt, but was quickly stopped.

A plaque was subsequently mounted on the remnant but the plaque has since disappeared, probably when the front end of the plant ceased operations in September 1999.

4.0 SUMMARY CONDITION ASSESSMENT

The only remains of No. 1 Blast Furnace is the "button", a remaining chunk of iron and slag from the base of the furnace. Attempts to remove this large solid lump have to date been unsuccessful.

The original concrete & brickwork ore storage bins and skip hoist pit for the No. 1 Blast Furnace still exist to the adjacent northern side of the "button" in a much degraded state. A steel framed and sheet clad elevated structure above the skip hoist has been demolished. Some surface level brick paving surrounding the original stoves is still present.

The condition of each of the subject buildings is fully described in written and photographic form in the Archival Record document produced to accompany this Statement of Heritage Impact.

5.0 ASSESSMENT OF SIGNIFICANCE

The remains of the No. 1 Blast Furnace have been assessed (1991 Port Waratah Steelworks Conservation Plan) as having State Significance within the context of the development of the Steelworks.

The following detailed Assessment of Significance has been undertaken to reflect current NSW Heritage Act, Heritage Amendment Act and Burra Charter requirements.

Historic Significance

The remains of the No. 1 Blast Furnace identify an item that was once the first fully mechanised Blast Furnace in Australia and first to be located on the BHP Steelworks site in Newcastle. Although no longer interpretable as such, the remains of No. 1 Blast Furnace are inextricably associated with the initially – significant establishment phase of the steelworks, and also with landmark technology in Australia. As such it has HIGHEST – level STATE HERITAGE significance.

Aesthetic Significance

Because of its resultant form, the remnant "button" is not interpretable aesthetically. It has no Aesthetic significance.

Social Significance

The remnant of No. 1 Blast Furnace forms a key component of the emergence of iron and steel making in NSW and has important linkages with the creation of work and with the social fabric of Newcastle resulting from that work.

The remnant is a most significant indicator of a major event in the history of the steelworks. This event has been identified by a plaque at the site and is one which has special social and educational associations for the thousands of regional families for which its story has a special place. The event and the remnant are one of the central identifiers of the site and the remnant is held in great esteem by that easily – identified group within the regional community. For this reason, the remnant No. 1 Blast Furnace "button" has REGIONAL SOCIAL significance.

Technical Significance

Archival records and photographs of No. 1Blast Furnace illustrate that, in the context of the BHP steelworks in Newcastle, it formed a key role in the technical production of iron and steel in Australia and as such forms a benchmark reference site providing evidence of an evolution of technology unavailable elsewhere other than at very few sites in the state and nation.

However its potential, of itself, to yield worthwhile information is now limited. It has REGIONAL TECHNICAL heritage significance.

Overall, the item has STATE heritage significance.

6.0 OPTIONS FOR PHYSICAL INTERVENTION

The Conservation Plan BHP Port Waratah Site Addendum 1999 described the following options:

"After closure of steelmaking, the 27 items of heritage significance identified in the Newcastle LEP 1987 (as well as all other heritage items identified in this Conservation Plan), will remain in situ until:

a) the item becomes unsafe and/or uneconomic to maintain; or
b) the item is to be removed to facilitate remediation of the site; or
c) the item is sold; or
d) the item is to be removed to facilitate the proposed redevelopment

Where "Front End" items are to be demolished they should, where easily transportable and relocatable, be relocated, to a low impact, operating environment within the overall Steelworks site. Components/elements of existing structures/buildings should be similarly relocated or preferably, be relocated to either the proposed Interpretation Centre or, (if that is not appropriate), to the proposed State Industrial Archaeological Repository, both being within the existing Steelworks site. Items capable of continuing to provide service within a steel-making operation, should be relocated to Port Kembla Steelworks or other iron and steel making operation elsewhere in Australia or the world. Where buildings/structures of higher level significance are demolished and removed, interpretation of the building form at ground level is required (Burra Charter and NSW Heritage Act – As Amended).

This item is to be removed to facilitate this proposal. Therefore in accordance with Burra Charter and NSW Heritage Office requirements, recording and interpretation must be undertaken.

It would be preferable for the button to remain. However, this proposition is considered untenable given:

a) If the No. 1 Blast Furnace remains, it cannot be adaptively re-used.

b) Remediation of this area of the site is required. The remediation proposal involves capping the proposed Multi Purpose Terminal site with a monolithic concrete slab.

c) The item is unsaleable in its present form.

d) This is an item which, if it is possible to remove it from its current site, can be relocated elsewhere on site and given interpretation at that location.

Off-site (i.e. not in-situ) interpretation, will only be undertaken where on-site interpretation is not possible and will involve samples of highest-level fabric/fittings/equipment.

Possible re-use or interpretation items include: the remnant "button".

It is proposed as part of the overall interpretation of the Heritage of iron and steel making at Newcastle to remove the "button" to ground level, interpret the original site in the paving and relocate some components to a site opposite the BHP Administration building on Crebert Street. This will ensure accessibility for the public and enable interpretation of this significant item.

7.0 THE HERITAGE IMPACTOF THE PROPOSAL

This item is substantiated as having STATE level significance, therefore demolition of the item to enable development of the Multi Purpose Terminal will impact the significance of the item. The closure of operations at the Newcastle Steelworks impacted the interpretation of the processes of iron and steel making, demolition of the item changes the interpretation of the processes and the significance of the item.

This impact will be ameliorated by fully recording the item in accordance with the NSW Heritage Council Guidelines and interpretation and protection of the in-situ remains below the pavement of the proposed Multi-Purpose Terminal. The individual site will be interpreted using pavement treatment that can identify the extent of the item and accommodate the operation of the Terminal. The processes associated with the item will be further interpreted on the main site at Port Waratah via the Delprat Interpretive Centre and supplemented by selected items being deposited in the proposed State Archaeological Repository. However, the physical site will remain and its location will be identified through interpretive design within the pavement of the Multi Purpose Terminal.

8.0 APPENDICES:

Appendix 8.1 Site Development Masterplan – showing area of proposed Multi Purpose Terminal in yellow

Appendix 8.2: Three Precincts Concept Plan – Showing Identified Heritage Items to be demolished

Appendix 8.3: Conceptual Design for Heritage Interpretation of No. 1 Blast Furnace

ARCHIVAL RECORD

WATERFRONT PRECINCT HERITAGE BUILDINGS, MAIN SITE BHP PORT WARATAH STEELWORKS, NEWCASTLE

NO.1 BLAST FURNACE

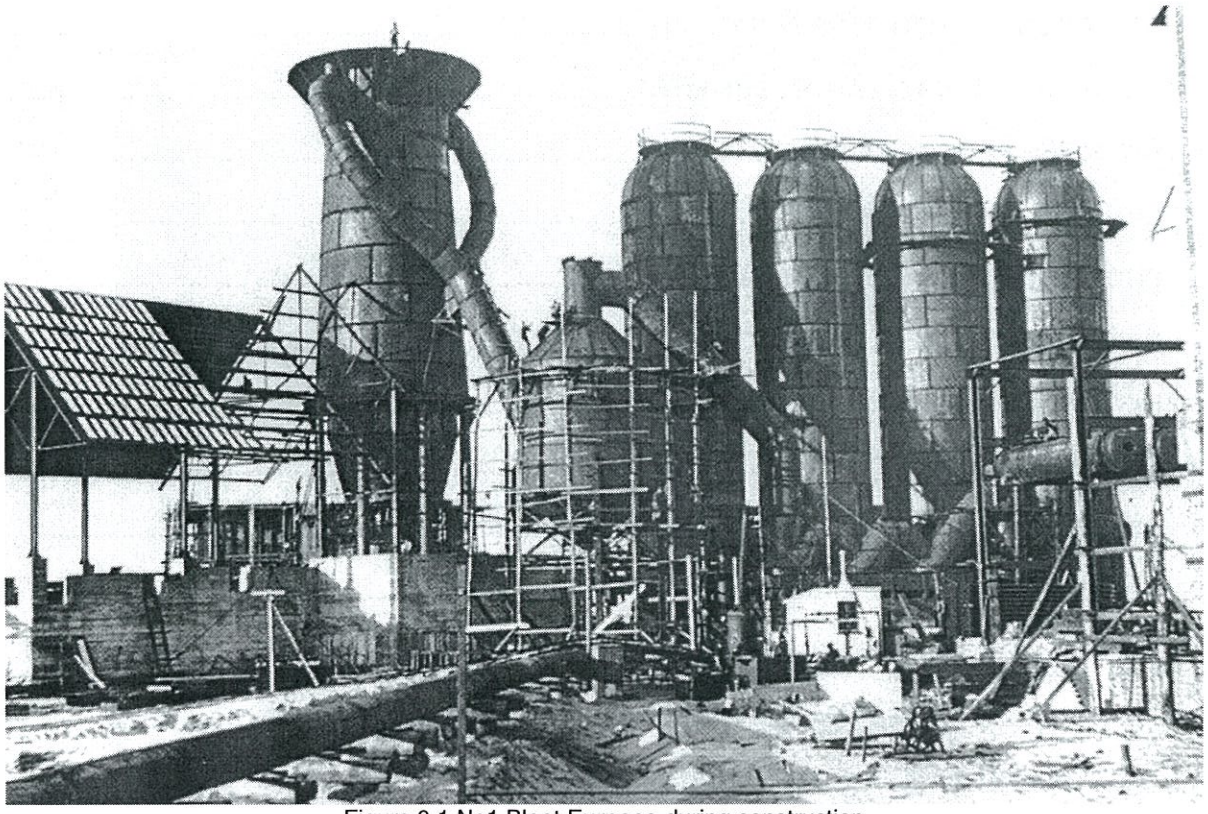

Figure 0.1 No1 Blast Furnace during construction
Source: Sansom (1999: 22)

Prepared by:

EJE ARCHITECTURE

In Association with:

Rosemary Melville – Historian
Bill Jordan – Heritage Engineer
Austral Archaeology Pty Ltd

NEWCASTLE

412 King Street
Newcastle NSW 2300

Telephone: (02) 4929 2353
Facsimile: (02) 4926 3069
E-mail: mail@eje.com.au
Web Site: www.eje.com.au

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TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 Background to the project

Major changes have occurred in Newcastle and the Hunter region over the past 20 years. The downsizing and eventual decision to close BHP steel making operations and the rationalisation of the coal industry are a reflection of these changes. The BHP steel making site is strategically placed, not only on a local and regional level, but also on a State and National level. It has been proposed that the existing site be redeveloped as a major Container Handling Terminal servicing the east coast of Australia. The area to be developed as the Container Handling Terminal would require the demolition of all above ground structures located within this area to enable remediation of the land and redevelopment of the site. Development of the remainder of the site at a later stage for industrial /commercial purposes is also proposed.

In light of the above, EJE Architecture has been commissioned to prepare detailed archival records of the buildings proposed to be demolished that are considered to have heritage value. These records involve documenting the relevant buildings and items they contain as well as the industrial processes that took place within them. Designed to help ascertain the heritage significance of the buildings and associated processes, these archival records also form a statement for the future interpretation of this now redundant part of Newcastle's industrial culture.

The following document constitutes the Archival Record of the No.1 Blast Furnace - an item classified as having a 'State level of heritage significance'[1].

1.2 Archival Recording Methodology

The approach taken in recording these heritage items and the document format is based on heritage consultant input and current NSW Heritage Office's guidelines including those relating to the preparation of archival records and their photographic recording.

A number of important aspects have been identified in the statement of heritage significance included in the report whose recording was necessary to reflect the item's character and value described. Hence it is this statement that drives the rationale for the report and determines the relevance of information collected. Derived from three main elements - buildings (structure and fabric), the individual items they housed and the processes that took place within them - these aspects are elaborated on in a number of different ways, which reflect their respective social, technical and aesthetic qualities.

As a way of dealing with the items various facets of heritage value, the report is broken into 3 main components:

-Written descriptions (history, process and heritage statement),
-Pictorial descriptions (photographs and working drawings)
-Inventories and other supporting information

Together these components create a comprehensive account of the chronological development of both the buildings and the industrial technologies held within them that have invariably changed throughout their lives. At times the components are incorporated into each other to provide a more coherent and illuminating description. All material is cross-referenced to each other and referenced to archival registers and source publications.

The written descriptions provide a background to the building and the functions that it housed and incorporate relevant photographs. As an essential part of the written component, a statement on the item's heritage significance details why the item is valued.

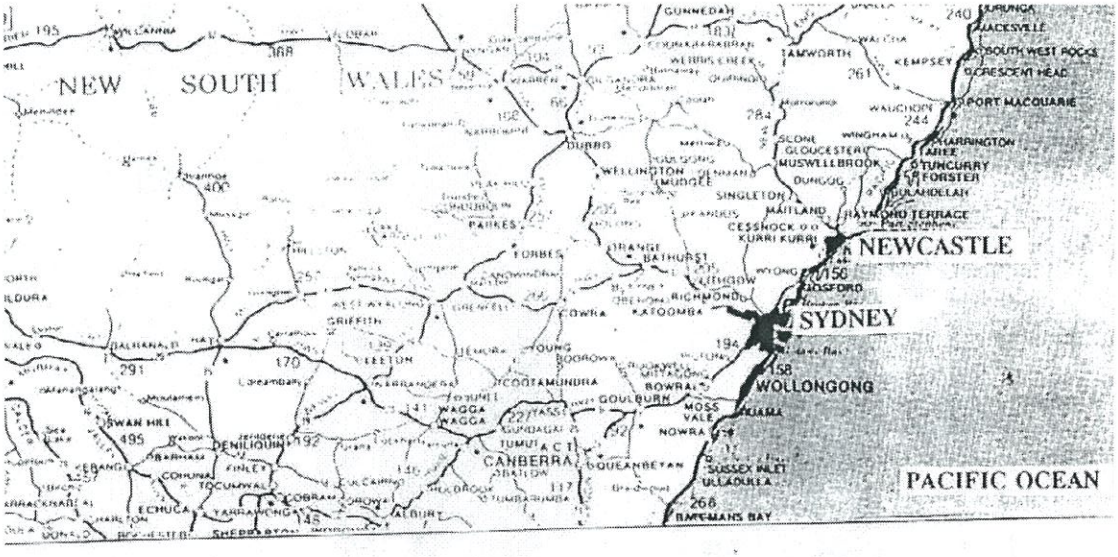
[1] Identified individually within Schedule 4 of The Newcastle Local Environmental Plan 1987 and the Port Waratah Steelworks Conservation Plan 1991.

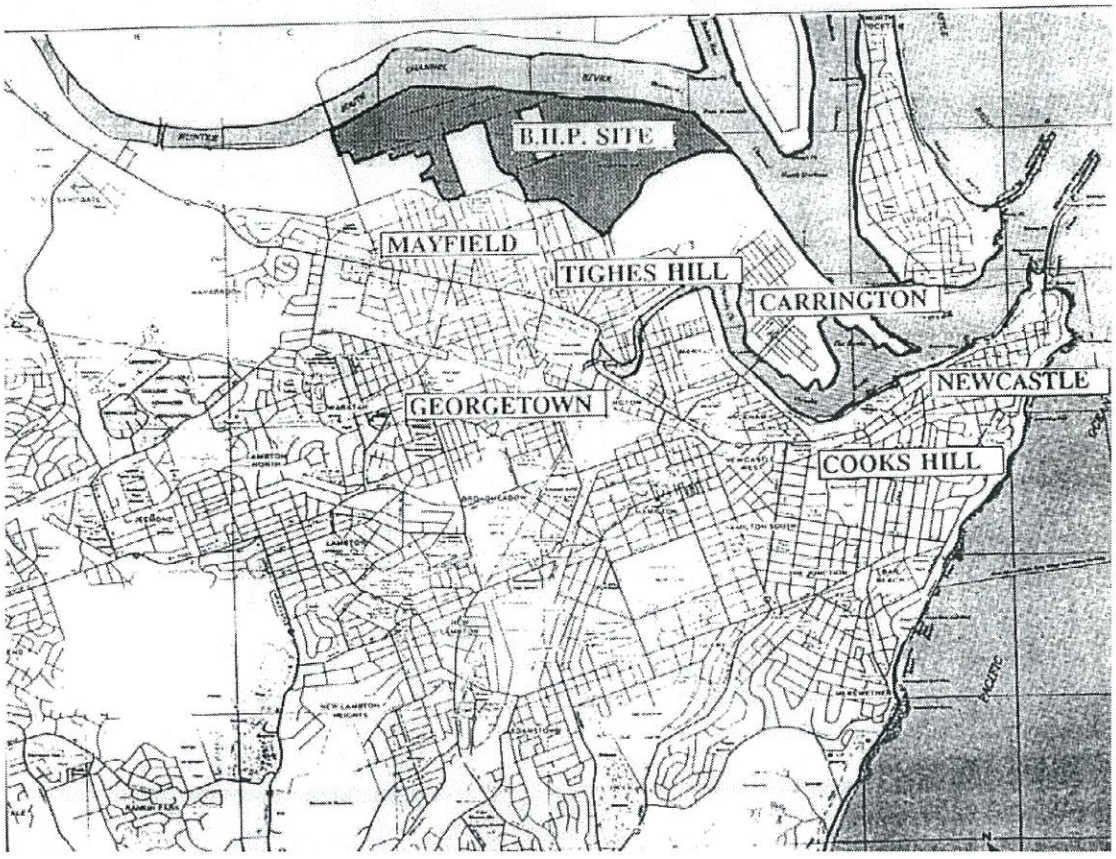
The bulk of the information in this report comes from the pictorial descriptions. Comprising of both historic and contemporary photographs, an account of the building fabric, the various industrial processes contained and the changes that have taken place through time is made. In addition, a selection of original working drawings provide a detailed picture of the construction techniques, structure and fabric details and offer substantial dimensions and measurements, making largely redundant any requirement for contemporary measured drawings or scaled photographs.

Supporting both the written and pictorial information is a series of inventories and tables which provide details of equipment contained within the building, cross-referenced descriptions of photographs and shot locations, and bibliographical information.

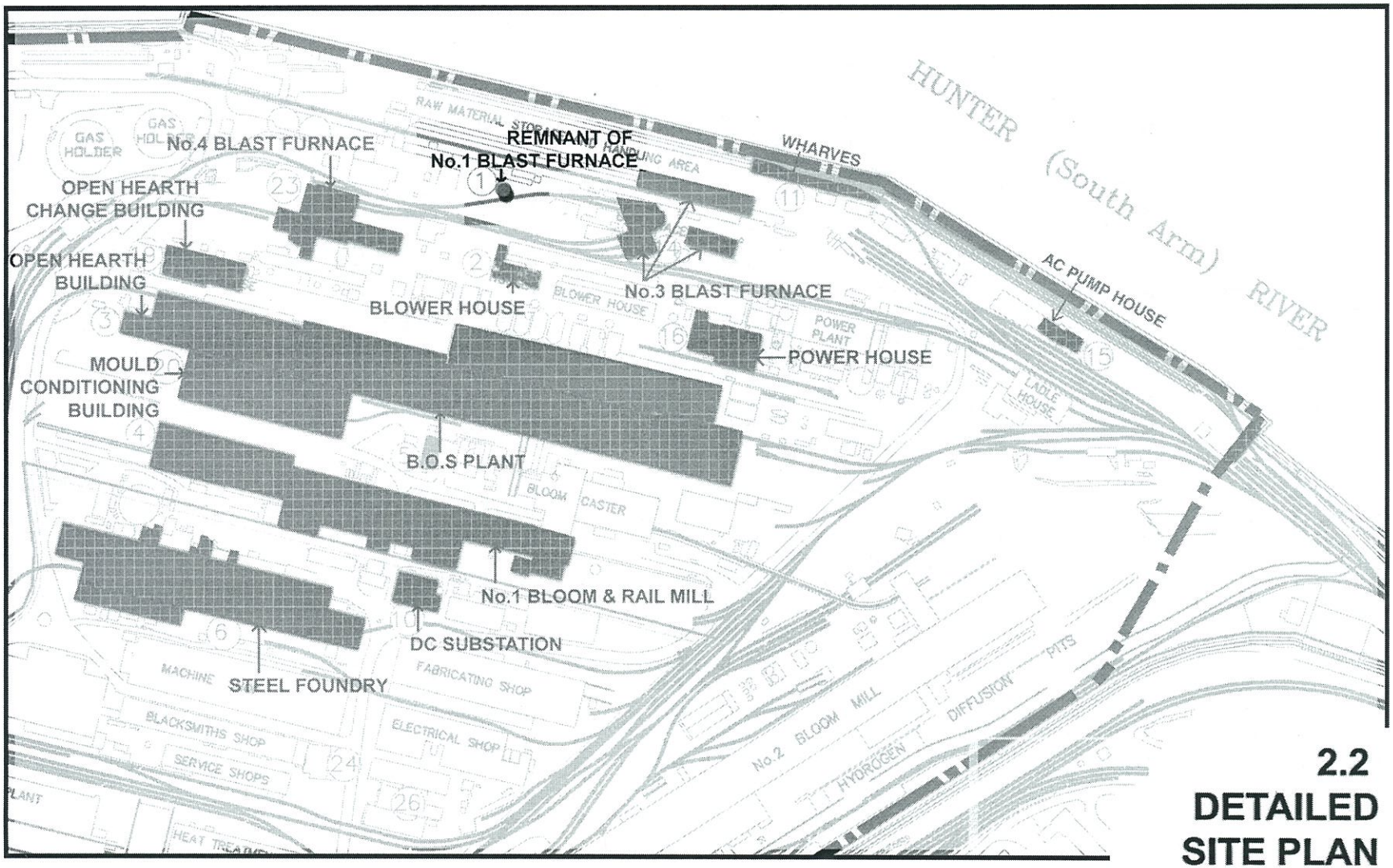
The process of documenting the heritage items involved a number of input teams, of which EJE was the coordinator.

2.0 LOCATION PLANS






2.1
MAIN SITE
Buildings as identified in the archival record reports.
Refer to Detail Site Plan
HUNTER (South Arm) RIVER
BOUNDRY
REMNANT OF No.1 BLAST FURNACE
No.3 BLAST FURNACE
No.4 BLAST FURNACE
POWER HOUSE
BLOWER HOUSE
B.O.S PLANT
No.1 BLOOM & RAIL MILL
DC SUBSTATION
STEEL FOUNDRY
OPEN HEARTH CHARGE BUILDING
OPEN HEARTH BUILDING
MOULD CONDITIONING BUILDING
BHP NEWCASTLE
ARCHIVE OF RECORDS



2.2
DETAILED SITE PLAN
REMNANTS OF No.1 BLAST FURNACE

BHP NEWCASTLE
ARCHIVE OF RECORDS

EJE ARCHITECTURE

3.0 OUTLINE OF HISTORY, INDUSTRIAL PROCESS & DESCRIPTION

We will put up one blast furnace to begin with;
but we will make room for eight blast furnaces.

(Delprat, Evidence to Select Committee on Newcastle Iron and Steel Works Bill, 31 October 1912, p.78.)

The land on which the steelworks was built was swampy, but this did not deter David Baker from considering it for the location of BHP's new steelworks. After sinking test bores, he concluded that the site would be less expensive to develop than that in Buffalo on which the Lackawanna steelworks had been constructed. No.1 Blast Furnace was subsequently built near the site of an old copper smelter that had been operated by the previous owner, Port Waratah Copper Works.

Pile driving for the furnace foundations commenced on 24 January 1913, an exercise which was detailed in the *Souvenir of Opening, Newcastle Steelworks*:

In order to drive the first pile for the foundations of the blast furnace, a punt with a pile driver and engine was floated right on to the site of the blast furnace, and from off that punt the piles were driven, the first one going down to a depth of 31ft. 5in. The water here was about 2 ft. 6 in. deep. Piling proceeded steadily, the ultimate location of the blast furnace being underpinned with 225 piles in 15 rows of 15 each.

Where the heating stoves are erected 9 rows of 38 piles were put down. Everywhere at which it was intended to build heavy structures the foundation was raised on piles, and the actual base fortified with concrete strong enough to carry the recoil of a German howitzer.

For instance, the foundation of the blast furnace, begun in the early part of May 1913, is a concrete block 44 ft. square and 17 ft. thick; the stove foundations are 132 ft. long, 29 ft. wide and 15 ft. thick.[1]

A detailed description of the furnace and its operation followed:

The blast furnace itself consists of a tall, cylindrical stack, lined with refractory brick, and standing 98 ft. above the ground. In the lower 8ft. is the hearth or crucible, which holds the metal and slag in a molten state; above that extends the widening portion called the "bosh" or melting zone of the furnace, with an outside diameter of 26 ft. 6 in. The stack, which slightly tapers in form, holds the cargo, which the intense heat driven through the stack is gradually transforming into cast iron and slag. From 900 to 1,000 tons of material are dumped into the stack during the 24 hours, and not only is the filling done without manual assistance, but the charge is directed in such a way that there is never any communication between the interior of the blast furnace and the outer air...

Through the lining of the furnace, just at the top of the hearth, into which molten metal descends, are the "tuyeres," a number of pipes through which a hot blast is driven to burn the coke and thus smelt the ore..."

Every four hours the furnace is tapped by breaking through a clay hole at the bottom of the hearth. This operation furnishes a pyrotechnic display, and distributes steam, heat and sparks with a noise and violence that strike terror to the beholder at his first initiation to the ceremony.... Bursting through the tapping hole with a paralyzing roar, the liquid iron, bubbling at a white heat, careers along a channel made in the platform, and flows over the side into a big steel cup, lined with fire brick and mounted on a trolley. The progress of the boiling metal, seething, hissing, tumultuous, and looking as if it wanted to lick up something to a fiery death, is most fascinating, giving the spectator a thrill that roots him to the spot. It is a terrifying example of man's power over nature, but it illustrates also those forces in nature embowelled in the earth that, beyond man's control, spread death and disaster in volcanoes and earthquakes."[2]

[1] *Souvenir of Opening: Newcastle Steel Works,* 2 June 1915, p.20.
[2] *ibid.,* p.24.

The furnace was blown in on 8 March 1915, using iron ore from Whyalla, which had been delivered by "Emerald Wings" to the ore wharf on 19 January. As the coke ovens were not yet operating, coke was purchased from beehive ovens in the district and also from retort ovens on the South Coast.[3]

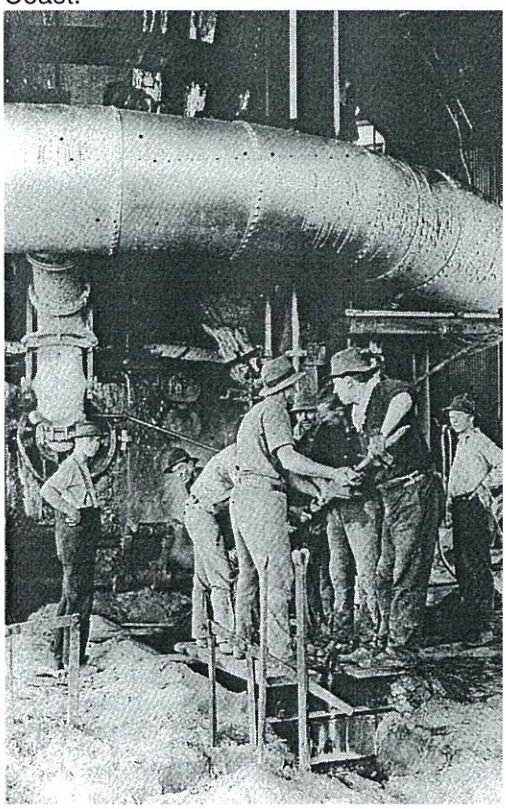


Figure 3.1: Just prior to first tapping of No1 Blast Furnace
Source: Jay (1999: 77)

This blast furnace represented a landmark in Australian blast furnace technology, introducing innovations that had been implemented in the United States in 1883. It also marked a break away from the traditional dependence on British technology. Earlier Australian blast furnaces were manually charged and required no structure above the stack. In contrast, BHP's blast furnace was mechanically charged using skips, which were loaded with raw materials and raised up an inclined hoist to the top of the furnace, where the contents were dumped into a hopper. A double bell and cone-top sealing system allowed the charge to be distributed uniformly into the furnace, while avoiding unnecessary gas loss.[4] The mechanical superstructure and ductwork associated with this charging system brought considerable changes to the furnace profile which made it different from earlier blast furnaces constructed at Eskbank in 1875-76[5] and Ligthgow in 1907 and 1913,[6]

By 1926, it was felt that the Company's blast furnaces were not performing at optimum efficiency and Mr L.P. Ross, a blast furnace expert, was brought from America in December 1926 to advise on general operating practice and the design of the Newcastle furnaces.[7] Among his recommendations was an improvement to the Baker-Newman top to allow the large and small bells to be moved out of centre when required, thereby facilitating a more even distribution of feed to the furnace.[8] Designs were prepared and the recommended modifications made, but by 1932 it had been decided to install a McKee top[9], which was installed when the furnace was relined in 1934.[10]

The furnace had previously been relined in 1916, 1919, 1924, 1926 and 1929. During the reline of 1934, as well as being fitted with the McKee top, the furnace was remodeled and its cubic capacity increased by 14.35%, which was anticipated to increase production by approximately 40%.[11]

During 1938 a gas cleaning plant was installed to improve and widen the use of blast furnace gas, previously used only on steam boilers and blast furnace stoves.[12]

At the next reline, in 1943, the opportunity was taken to enlarge and remodel the furnace, changing the lines to produce a furnace similar in size and lines to the other two furnaces. The lower part of the furnace shell, which had consisted of cast iron and cast steel sections, was replaced with welded mild steel plates with provision for the installation of cooling plates if required.

[3] D. Baker, "Reminiscences of the Broken Hill Proprietary Company's Adventure in Steel", *The BHP Review,* December 1935, p.4.
[4] E.M. Johnston-Liik, G. Liik and R.G. Ward, *A Measure of Greatness: The Origins of the Australian Iron and Steel Industry,* Melbourne, 1998, p.189.
[5] R. I.Jack and A. Cremin, *Australia's Age of Iron: History and Archaeology*, Sydney, 1994, p.100.
[6] Hoskins, C., *The Hoskins Saga,* Sydney, 1968, facing p.74.
[7] Report for half year ended May 1927, p.2.
[8] Report for half-year ended 30th November 1928, p.57.
[9] Report for half year ended 31st May 1932, p.41.
[10] Report for half year ended 30th November 1934 p.59
[11] *ibid.*
[12] C.L. Francis "Cleaning Blast Furnace Gas", *The BHP Review,* April, 1938, p.6.

The furnace was relined with A.J. & J. Pearson English bricks to a point 25' above the mantle. Above this point Newbolds high alumina fire bricks were used for the remainder of the lining, including the stock line.

The cast house floor was remodeled to give a longer main trough and this resulted in better casting operations and much more room for the operators to work around the front of the furnace.[13]

Subsequent relines were carried out in 1955, 1964, 1972 and 1979. Additional gas cleaning facilities were installed and fuel oil injection commenced in 1964, and an effluent control system was completed in 1975.

When it was constructed in 1915, No.1 Blast Furnace incorporated the most up to date technology of the time. Subsequent modifications, often carried out in conjunction with a reline, increased the efficiency and capacity of the furnace from an average daily production from 268 tones in 1915 to 900 tones in 1982.[14] However, its highest average daily production never matched that of subsequent furnaces, Nos.2, 3 and 4.

The furnace was decommissioned on 27 May 1982.[15]

As part of the process of closure of iron and steelmaking operations in 1999, several departmental histories were compiled and these included anecdotal accounts of various incidents. Among those published in *The Blast is Past: A Collection of Stories about the Ironmakers of Newcastle,* was the story of the attempt to remove the remnants of No.1 Blast Furnace

When No.1 Furnace was demolished, all that was left was the "Button" (salamander). It was decided to remove it and one of the men was given the task. Now this bloke had only just completed his Shot Firers Course and was keen and ready. He spent days drilling and preparing. Finally came the day to set the charges. The charges were set, explosion mats installed and the area cleared. Off went the siren and then came the explosion. When the dust settled, an explosion mat was in the river, most of the windows in the top storey of the Office Block were smashed and the button was still there. He wanted a second attempt, but was quickly stopped.[16]

A plaque was subsequently mounted on the remnant but it has since disappeared, probably when the front end of the plant ceased operations in September 1999.

[13] Report for half year ended 30th November 1943.
[14] J. Samson (ed.) *The Blast is Past: A Collection of Stories about the Iron Makers of Newcastle,* Newcastle, 1999, p.40.
[15] *ibid.*
[16] *ibid.*, p.90.

3.1 Steel condition & protection at BHP Steelworks site (relating to ore bins)

The BHP site in Newcastle is in a "Marine" to "Severe Marine" zone in accordance with AS/NZ 2312:1994 — "Guide to protection of iron and steel against exterior atmospheric corrosion". Now that the localized micro-climate from the operation of the plant has been removed, protection of the steelwork needs to be considered in terms of this Standard.

Observation at the site indicates that none of the steelwork on site has a coating system complying with this Standard for a design life of greater than 5 years. Some of the steelwork, such as the blast furnaces, is not protected at all and has been designed to operate in a hot environment where corrosion is inhibited by high temperatures driving off moisture; other steelwork was designed with extra thickness to form a sacrificial layer. In almost all buildings and in areas nearby the high temperature operations have been successful in keeping the corrosion under control except where steel has been insulated by brickwork which has trapped moisture and corrosion has been severe. There does not appear to be any general galvanic protection (i.e. galvanizing or zinc-rich coating) on major structural elements.

If major structural elements were to be retained on the site for a period in excess of 10 years the Standard gives the following coating systems:

(i) galvanizing plus a two coat paint system (not possible in situ);

(ii) various two and three coat paint systems applied after abrasive blast cleaning and having either a zinc based primer or high-build epoxy;

(iii) a sprayed metal coating followed by a two coat painting system.

Of these, only (ii) is likely to be practical. All would be extremely expensive and require continuing maintenance. Maintenance painting similar in magnitude to that carried out on the Sydney Harbour Bridge would be one way of evaluating the problem.

4.0 STATEMENT OF HERITAGE SIGNIFICANCE

The No. 1 Blast Furnace is identified within the group identification forming Part B of Schedule 4 (Port Waratah – BHP Steelworks and Office) of "The Hunters Heritage" – Hunter Regional Environmental Plan 1989. It is identified individually within Schedule 4 of The Newcastle Local Environmental Plan 1987 as being an item of State – level heritage significance. (This ascribed level of significance is consistent with the level of significance determined in the Port Waratah Steelworks Conservation Plan prepared by EJE Architecture in 1991). The item does not fall within a Conservation Area and is not included on the State Heritage Register.

The following detailed Assessment of Significance has been undertaken to reflect current NSW Heritage Act, Heritage Amendment Act and Burra Charter requirements.

Historic Significance

The remains of the No. 1 Blast Furnace identify an item that was once the first fully mechanised Blast Furnace in Australia and first to be located on the BHP Steelworks site in Newcastle. Although no longer interpretable as such, the remains of No. 1 Blast Furnace are inextricably associated with the initially significant establishment phase of the steelworks, and also with landmark technology in Australia. As such it has HIGHEST level STATE HERITAGE significance.

Aesthetic Significance

Because of its resultant form, the remnant "button" is not interpretable aesthetically. It has no Aesthetic significance.

Social Significance

The remnant of No. 1 Blast Furnace forms a key component of the emergence of iron and steel making in NSW and has important linkages with the creation of work and with the social fabric of Newcastle resulting from that work.

The remnant is a most significant indicator of a major event in the history of the steelworks. This event has been identified by a plaque at the site and is one which has special social and educational associations for the thousands of regional families for which its story has a special place. The event and the remnant are one of the central identifiers of the site and the remnant is held in great esteem by that easily identified group within the regional community. For this reason, the remnant No. 1 Blast Furnace "button" has REGIONAL SOCIAL significance.

Technical Significance

Archival records and photographs of No. 1Blast Furnace illustrate, that in the context of the BHP steelworks in Newcastle, it formed a key role in the technical production of iron and steel in Australia. As such, it forms a benchmark reference site providing evidence of an evolution of technology unavailable elsewhere other than at very few sites.

5.0 INVENTORY OF ARCHIVAL DOCUMENTS

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