APPENDIX 10

Copy Archival Record and Statement of Heritage Impact, No 3 Blast Furnace

STATEMENT OF HERITAGE IMPACT

PROPOSED DEMOLITION OF THE No. 3 BLAST FURNACE

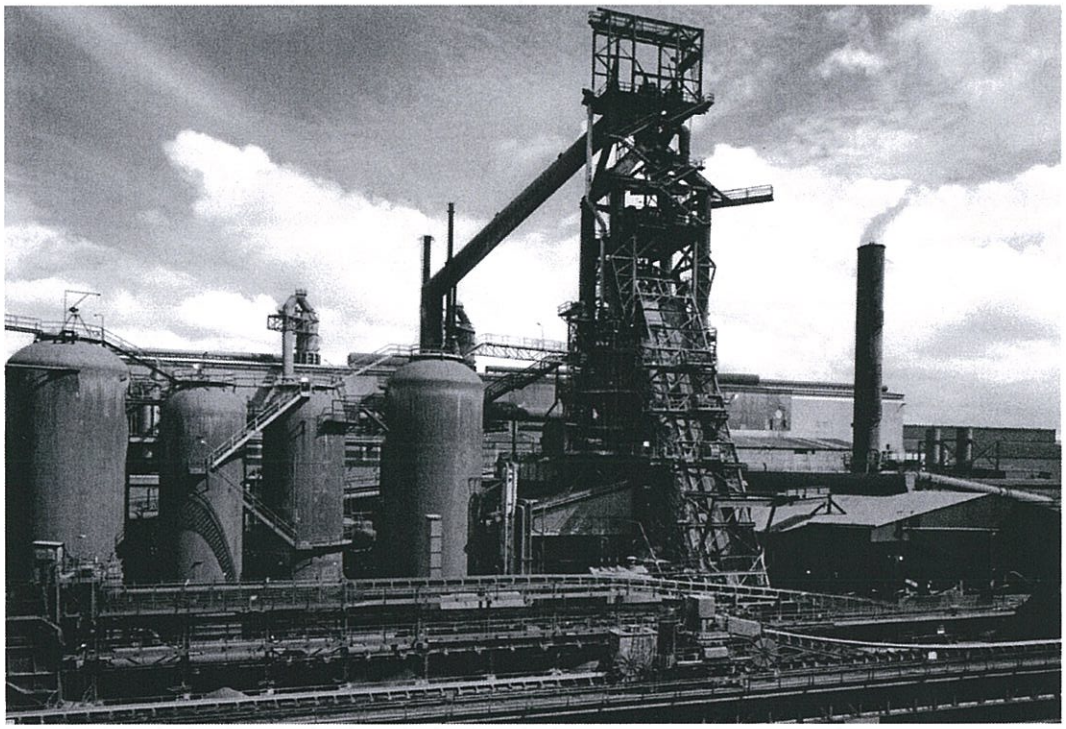

Figure 0.1: No.3 Blast Furnace.
Source: Erzetich. Ref B04/08

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ARCHITECTURE

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Project No. 3882.04 **June 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 Terminal, would require the demolition of all above ground structures located within this area (see Appendices for Terminal and Affected Heritage Items Location Plans) 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 No. 3 Blast Furnace site is located at the north eastern sector of BHP's Port Waratah works. It is the site location of Blast Furnace No. 1, No. 2 and No. 3 which forms the northern-most point of the proposed Multi-Purpose Terminal Precinct. The No. 3 Blast Furnace is located to the North of the No. 1 Blower House and to the east of the No. 1 Blast Furnace remnant.

To the south and west potential industrial, commercial and heritage precincts are proposed.

2.2 Statutory Context

The No. 3 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 Regional-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 Approval Authority 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

The role of the blast furnace was to extract molten iron from iron ore by a process known as reduction. Shaped like a giant bottle, a blast furnace is a steel structure lined with bricks and cooling blocks called staves. Iron making is a continuous process where the raw materials – iron ore, coke and limestone, are fed into the top of the furnace by a skip car (at Newcastle) or conveyor (at some other steelworks). Air which has been preheated to about 1050 degrees C in stoves is blown into the furnace through nozzles called tuyeres, which are spaced circumferentially around the lower section of the furnace. This causes the coke to ignite, producing carbon monoxide which initiates the chemical reaction within the furnace. In this way the iron oxides are reduced to molten iron by removing the oxygen from the ore.

When the furnace is tapped the molten iron runs into rail units called treadwell torpedo ladles and is transported to the steel making department for refining into steel.

The first No. 3 Furnace was built in 1921, and with a minimal shift in location it was rebuilt in 1985. The two centre stoves of the Cowper Air Blast Pre-heating System adjacent to the furnace, are of original riveted steel construction and possibly the only remains of the 1921 establishment phase which assisted in the mid 1920's recovery.

Built as a 600 ton per day furnace, the final capacity of No. 3 Furnace was 1850 tonnes, and, although fitted with the latest technology in heating and gas collecting, the furnace remains representative of 1920's blast furnace technique particularly in respect to the handling of the furnace charge.

The Newcastle steelworks opened in 1915 with one blast furnace but in 1918. Because of high steel demand created by World War I, a second furnace was commissioned. In 1920 an ambitious expansion scheme was announced, which saw the construction of a third blast furnace which began operating in August 1921. No. 3 Blast Furnace, with a capacity of 600 tons, was designed at Newcastle under the direction of the Chief Mechanical Engineer A.I. Hacke.

The furnace was relined in 1925 and again in 1930, when the original furnace top was replaced with a McKee top to improve the distribution of furnace charges. A Ross dust catcher was also fabricated and erected during the 1929 reline, and the furnace capacity increased by 15%.

During a coal strike in 1940 which resulted in a restriction of coal supplies, and consequently a shortage of coke essential for blast furnace operation, the opportunity was taken to replace the brick lining and generally recondition the whole furnace. The hearth size was increased to 16'3", the downcomers were demolished and replaced and the design of the tuyere stock was altered to take care of the expansion in the blowpipe and the penstock, and to give easier adjustment after changing tuyeres or blowpipes. Brickwork in No's 1, 2 and 3 stoves was demolished and the checker work changed from 6" square checker openings to circular checkers 2 ½" in diameter. Each stove was fitted with pressure burners, each with its own fan and instruments for measuring and recording the amounts of gas used.

The furnace was relined for the fifth time in 1950 and the hearth increased to 17'9".

Cowper Stoves have been an adjunct to efficient blast furnace operation since developed in Britain in the 1860's. The first such stoves in Australia were installed at Lithgow in 1906 but have long since been demolished.

Between January and April 1960, the furnace was demolished and completely rebuilt. The hearth diameter was extended to 20ft. On completion of this work, the size and capacity of No. 3 furnace was equal to that of No. 2 furnace, which had been rebuilt and enlarged in 1957. Now situated over 8 feet to the south of its original position, the furnace was blown in for its sixth campaign on 18 April 1960. Fuel oil injection was also introduced during this year.

The furnace underwent its sixth reline in 1967, and its seventh in 1977 when the hearth was increased to 2'3".

The early 1980's heralded a deterioration in economic conditions at the steelworks, resulting in No. 3 furnace being shut down (and subsequently being relined). No. 1 Blast Furnace, No's 1 and 2 battery coke ovens and the 60 ton BOS furnace were also taken out of service. However, the development of a Steel Industry Plan between BHP, the unions and the government saw further investment in Newcastle, including a rebuild of No. 3 furnace involving enlargement and reshaping. The furnace was recommissioned in March 1985. A second cast house and slag granulation was added to the operating furnace in May 1989.

A mid-campaign repair was carried out in 1991, using one of the largest cranes ever seen in Newcastle. As part of the repair, the scrubber was removed and replaced, a task which involved a lift of over 200 tonnes, 30 metres into the air.

No. 3 Blast Furnace was decommissioned September 1999. At the time of "Front End" closure it bore little resemblance to the furnace which was built in 1921.

4.0 SUMMARY CONDITION ASSESSMENT

No. 3 Blast Furnace remains intact, as decommissioned.

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.

Asbestos in the No.3 Blast Furnace:
AC sheeting was used in the office block ceilings on both the upper and lower floors, the electrical workshop and control rooms. The blast furnace stoves all have a layer of asbestos bricks between the shell plate and the checker bricks as an insulating layer.

5.0 ASSESSMENT OF SIGNIFICANCE

The No. 3 Blast Furnace has been assessed (1991 Port Waratah Steelworks Construction Plan) as having Regional heritage significance within the context of the development of the Steelworks.

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

Historic Significance

Through its function, location and scale within the Newcastle Steelworks, The No. 3 Blast Furnace represents a significant contributory element in the development of iron and steel manufacture in New South Wales. It remains a highly significant visual reminder of the role BHP played in the development of Newcastle's industrial development.

It is clearly associated with an activity and historical phase of greatest possible significance to the Region and State and demonstrates the evolution/continuity of that phase. It has STATE HISTORIC significance.

Aesthetic Significance

No. 3 Blast Furnace stands some forty metres above ground level and along with adjacent associated structures, creates a landmark defining Newcastle as a major industrial centre of iron and steel production. Of its type and similar to the few remaining in the state, it shows high-level STATE AESTHETIC Significance for its technical innovation and its distinctive aesthetic.

Social Significance

No. 3 Blast Furnace has significance for its association with the development of steel making in Newcastle and for its important linkage with the creation of work and social fabric of Newcastle resulting from that work. It has special educational and associational value to the people of the Region and makes a substantial contribution to the visual definition of the Steel works. As such it has STATE SOCIAL Significance.

Technical Significance

Along with adjacent structures, the No. 3 Blast Furnace demonstrates the growth of local technical expertise and knowledge, enabling it to be developed by BHP Steelworks. As such it provides information about local and Regional resources and craft skills available in the early decades of the 20th Century.

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 available elsewhere on a very limited scale. For these reasons No. 3 Blast Furnace must be considered to have STATE TECHNICAL Significance.

Overall, the item has highest-level 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.

If the No. 3 Blast Furnace remains, it cannot be readily adapted to accommodate another use within the Development proposal, it will require continuous expensive stabilisation and maintenance, or will otherwise deteriorate and become a potential health and safety hazard.

a) Remediation of this area of the site is required. The remediation proposal involves capping the proposed Multi Purpose Terminal site with a wearing pavement.

b) The item as a whole cannot be relocated. However, major components can be salvaged for re-use or interpretation at other locations.

The only items which might be relocated and re-used at other BHP Group sites, include the: weigh feeders; tap hole gun equipment, motors, pumps and associated transportable items.
Items identified as having been removed or with potential for removal elsewhere is tabled as follows:

Items transferred / sold to other BHP Centres	Items sold Externally
>Dust collection bag-houses >Torpedo Ladles >Cast House Floor equipment >Heat exchangers >Taphole gun / Taphole drill >Hot blast valves >Skip hoist drum >Pumps >Electrical equipment >Material bins >Weight feeders	>Cast House Floor Bag-house (de-dusting equipment >Dust collection equipment >Nine Torpedo Ladles >Blast Furnace Plant & equipment *

* Represents item receiving expression of interest from external customer.

As part of the overall interpretation of the Heritage of iron and steel making at Newcastle it is proposed to relocate some components to a location adjacent to the proposed main entry roundabout. This will ensure accessibility to the item for the public and allow a major heritage element to retain and define the heavy industrial character of the site and will enable interpretation of this significant item.

7.0 THE HERITAGE IMPACT OF 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 on the significance of the item. The closure of operations at the Newcastle Steelworks had an impact on 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 and interpreting the item as required and through 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 will identify the extent of the item while accommodating the operation of the Terminal. The processes associated with the item will be further interpreted on the main site at Port Waratah and within the Delprat Interpretive Centre and/or supplemented by selected items being deposited in the proposed State Archaeological Repository which is proposed to be accommodated within the Tool Room adjacent to the Delprat Interpretive Centre. However, the physical site will remain and its location will be identified through interpretive design within the pavement of the Multi Purpose Terminal and through the sealing off of any below ground evidence.

8.0 APPENDICIES

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

8.2 Site Development Masterplan – showing identified Heritage Items

8.3 Conceptual Design for Heritage Interpretation of No. 3 Blast Furnace

ARCHIVAL RECORD

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

No. 3 BLAST FURNACE

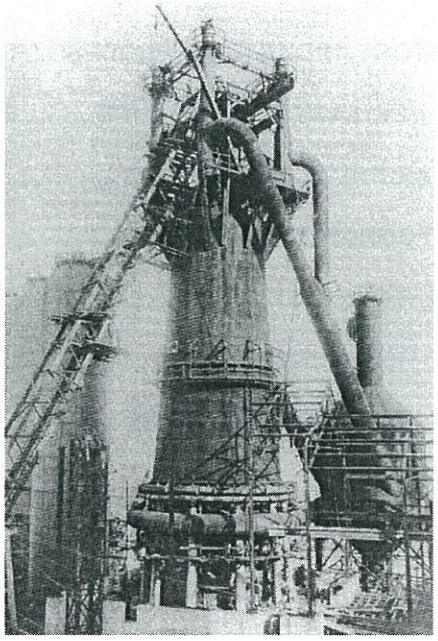

Figure 1.1: No 3 Blast Furnace in 1921
Source: Jay (1999: 109) (BHPA N1875)

Prepared by:

EJE ARCHITECTURE

In Association with:

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September 2000
Our Ref: 3882-04-rec-004

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. 3 Blast Furnace - an item classified as having a 'Regional 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

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

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.

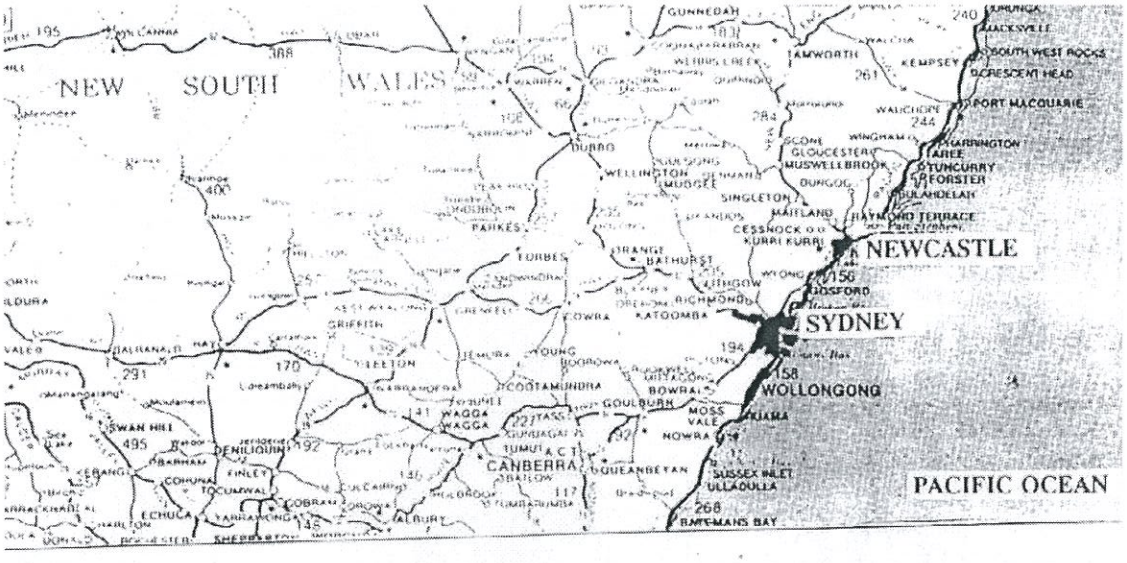
The written descriptions provide a background to the building and the functions that it housed and incorporate relevant photographs. As an essential part of the written component, a statement on the item's heritage significance details why the item is valued.

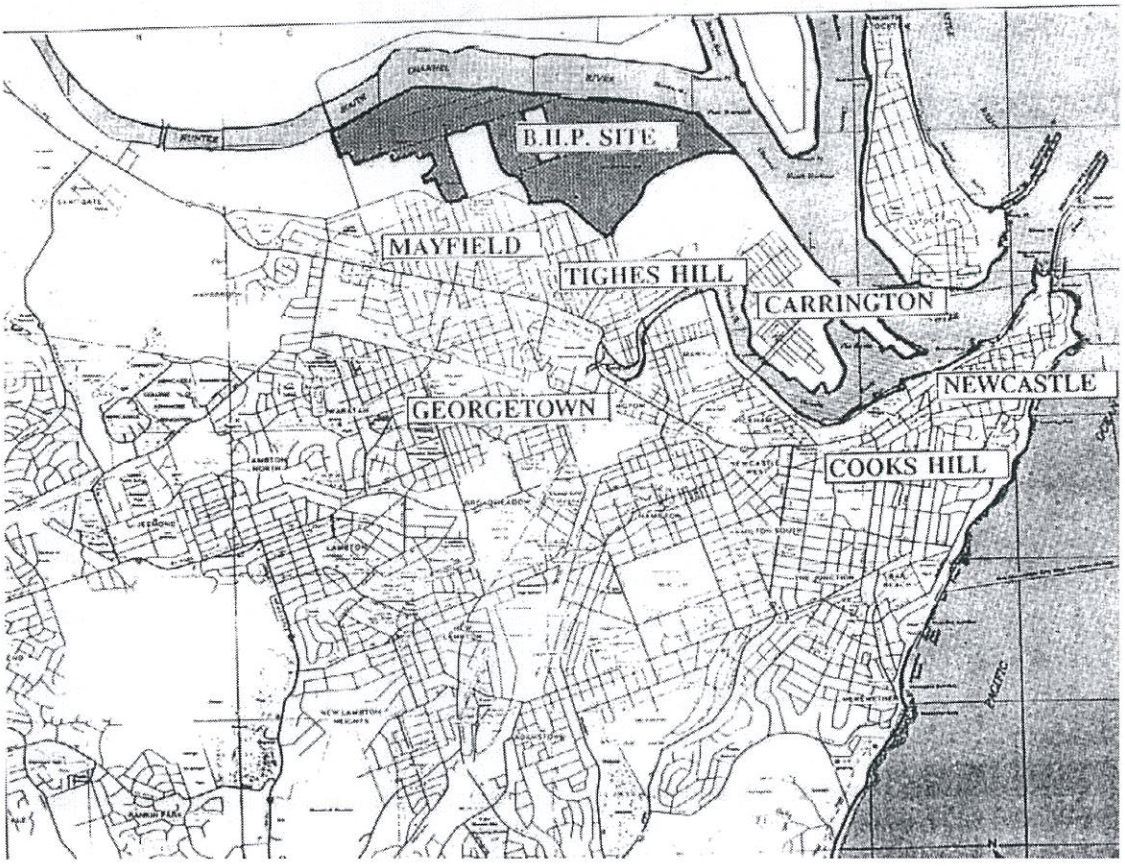
The bulk of the information in this report comes from the pictorial descriptions. Comprising of both historic and contemporary photographs, an account of the building fabric, the various industrial processes contained and the changes that have taken place through time is made. In addition, a selection 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.

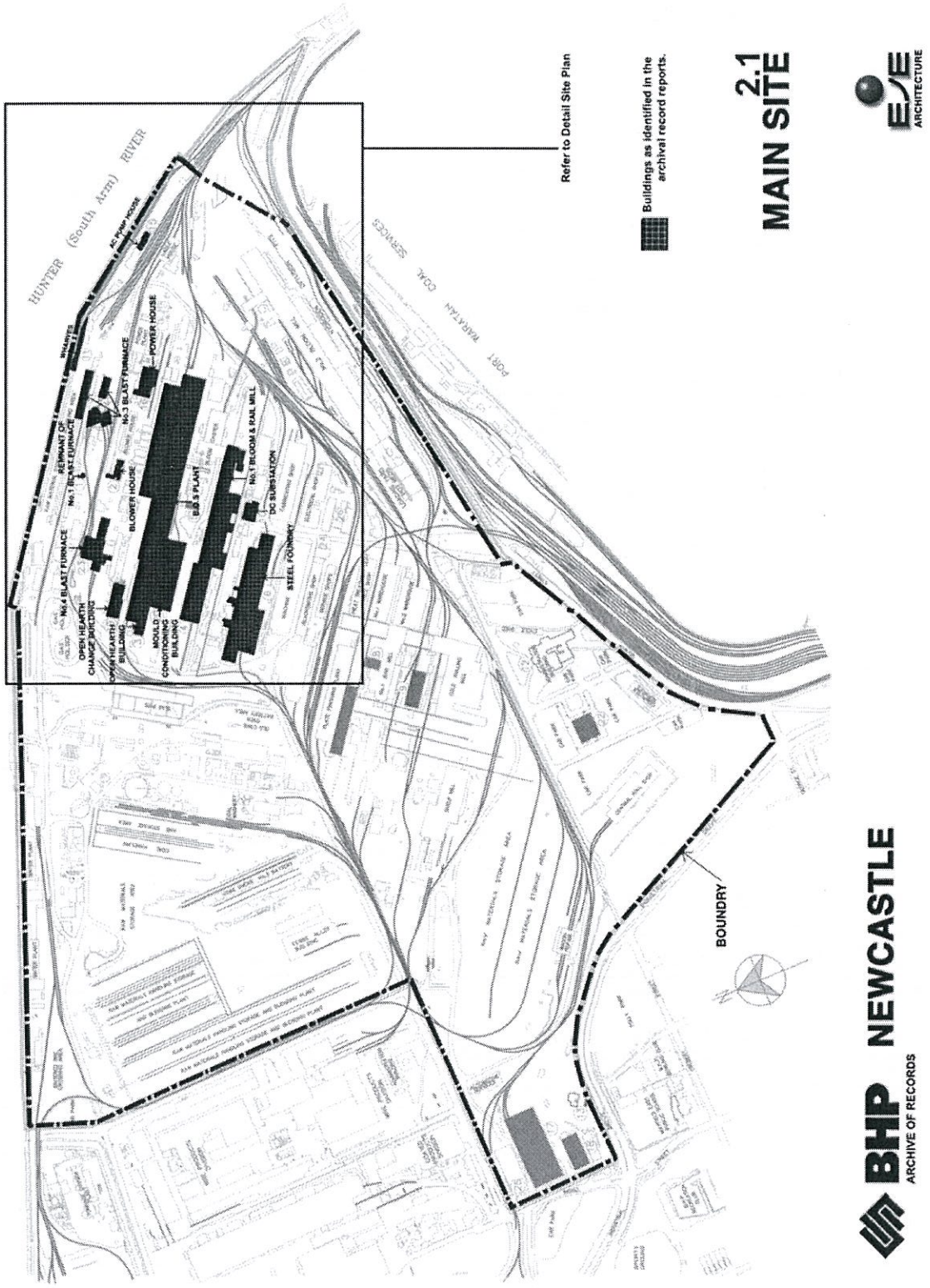
Supporting both the written and pictorial information is a series of inventories and tables which provide details of equipment contained within the building, cross referenced descriptions of photographs and shot locations, and bibliographical information.

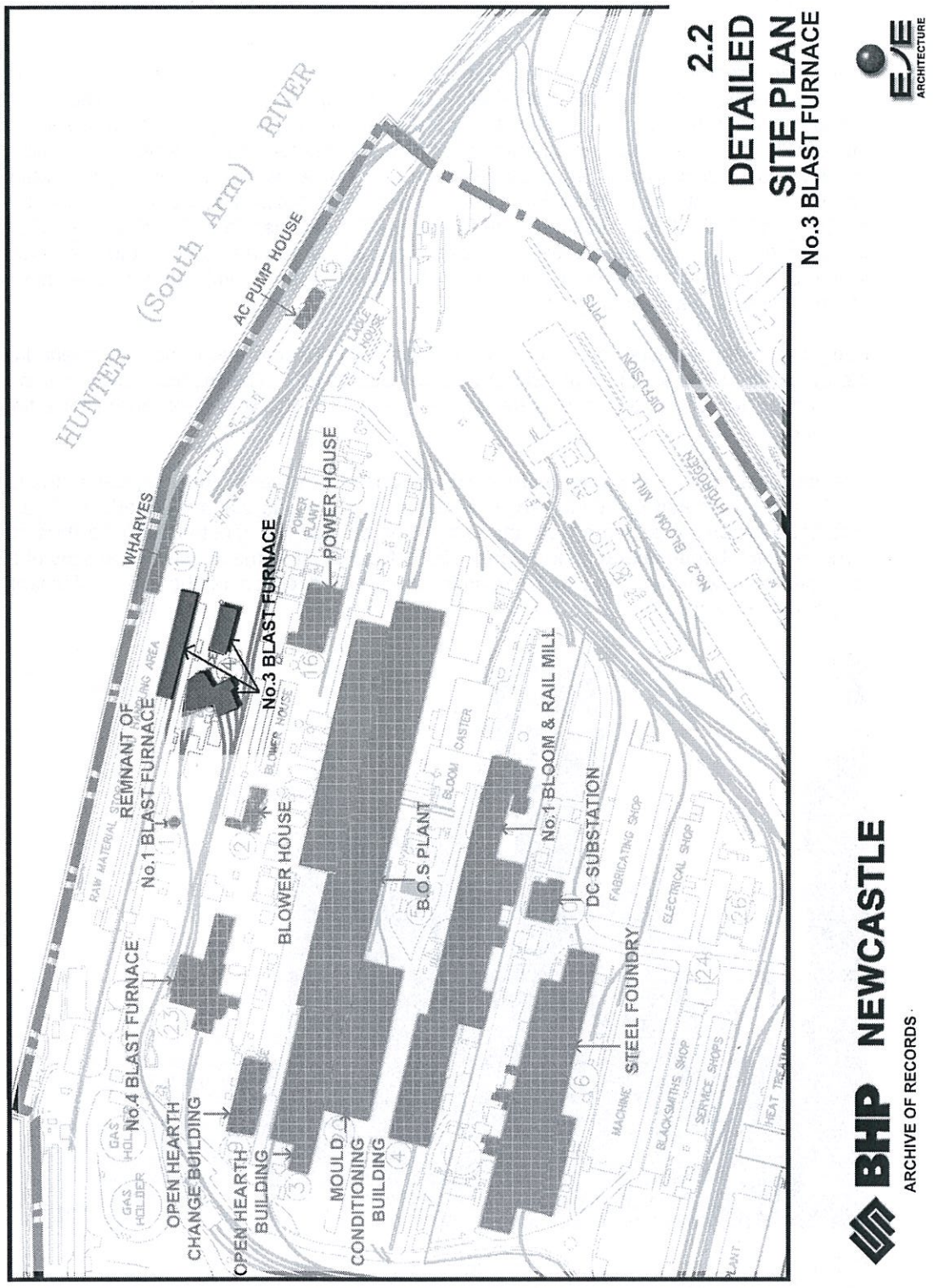
The process of documenting the heritage items involved a number of input teams, of which EJE was the coordinator.

2.0 LOCATION PLANS






HUNTER (South Arm) RIVER
PORT WARATAH COAL SERVICES
Refer to Detail Site Plan
Buildings as identified in the archival record reports.
2.1
MAIN SITE
BOUNDRY
BHP NEWCASTLE
ARCHIVE OF RECORDS
EJE ARCHITECTURE


2.2
DETAILED
SITE PLAN
No.3 BLAST FURNACE
EJE ARCHITECTURE
BHP NEWCASTLE
ARCHIVE OF RECORDS
HUNTER (South Arm) RIVER
AC PUMP HOUSE
WHARVES
REMNANT OF No.1 BLAST FURNACE
No.3 BLAST FURNACE
POWER HOUSE
No.4 BLAST FURNACE
OPEN HEARTH CHANGE BUILDING
OPEN HEARTH BUILDING
BLOWER HOUSE
MOULD CONDITIONING BUILDING
B.O.S PLANT
No.1 BLOOM & RAIL MILL
DC SUBSTATION
STEEL FOUNDRY
No.2 BLOOM MILL
HYDROGEN
DISPOSAL
RAW MATERIAL STORAGE AREA
GAS HOLDER
BLOOM CASTER
FABRICATING SHOP
ELECTRICAL SHOP
BLACKSMITHS SHOP
SERVICE SHOPS
MACHINE SHOP
HEAT TREATMENT PLANT

3.0 OUTLINE OF HISTORY, INDUSTRIAL PROCESS & DESCRIPTION

The blast furnace produced molten iron for steelmaking and iron foundries. The No3 furnace is a roughly cylindrical steel shell about 30m high, lined with water cooled castings called staves and refractory bricks. Ironmaking is a continuous process where the raw materials – iron ore, coke and limestone, are fed into the top of the furnace by a skip car (at Newcastle) or conveyor (at some other steelworks). Air which has been pre-heated to about 1050°C in stoves is blown into the furnace through nozzles called tuyeres, which are spaced around the lower section of the furnace. This causes the coke to burn, producing carbon monoxide which reacts with iron oxide to produce iron and carbon dioxide. Molten iron and slag collect in the bottom (hearth) of the furnace and combustion gases pass out of the top into a gas cleaning plant.

Every two or three hours one of the two tapholes at the base of the furnace is opened and the molten iron and slag is drained from the furnace hearth. The molten iron runs into rail units called torpedo ladles and is transported to the steelmaking department for refining into steel.[2]

The Newcastle steelworks opened in 1915 with one blast furnace. In 1918, due to the high steel demand created by World War I, a second furnace was commissioned. In 1920 an ambitious expansion scheme was announced, which saw the construction of a third blast furnace which began operating in August 1921. No.3 Blast Furnace, with a capacity of 600 tons per day, was designed at Newcastle under the direction of the Chief Mechanical Engineer A.K. Hacke.[3]

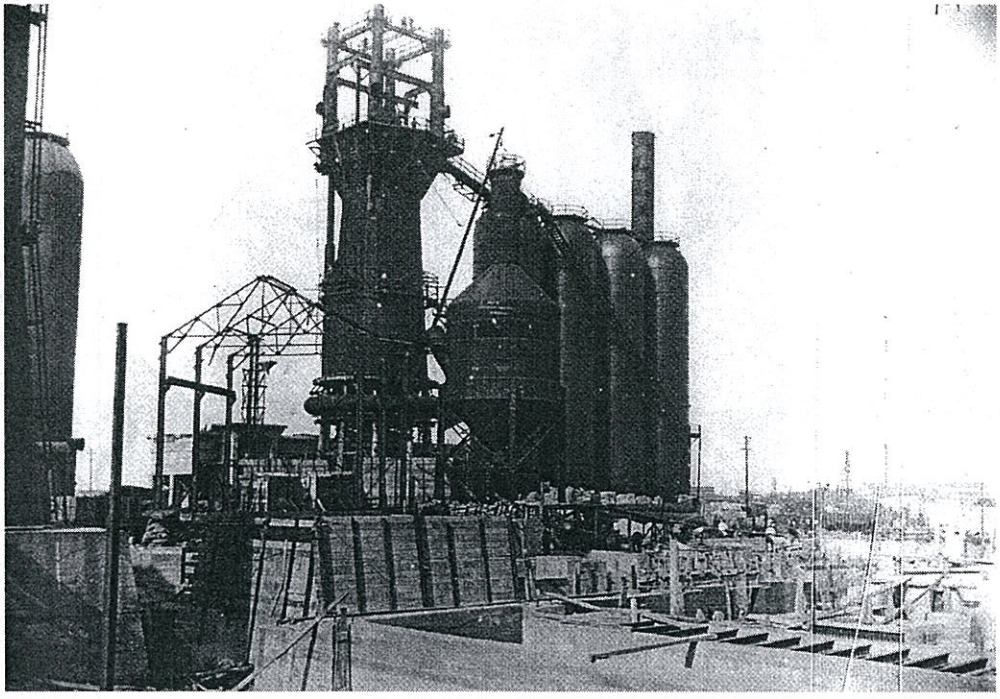


Figure 3.1: No 3 Blast Furnace under construction 12/05/21
Source: Sansom (1999:23)

[2] J. Sansom (ed.) *The Blast is Past,* BHP Newcastle, 1999, *p.7.*
[3] D. Baker, "Reminiscences of the Broken Hill Proprietary Company's Adventure in Steel", *BHP Review,* April 1936, p.4.

furnace capacity increased by 15%.[4] However, the full benefit of this additional capacity was not immediately realised, as reduced production during the Depression years saw the furnace produce as little as 330 tons per day.[5]

During a coal strike in 1940 which resulted in a restriction of coal supplies, and consequently a shortage of coke essential for blast furnace operation, the opportunity was taken to replace the brick lining and generally recondition the whole furnace. Although the upper portion of the lining in the region of the armour plating had been repaired on several occasions, the main lining of the furnace below this stockline had remained untouched.[6] The hearth size was increased to 16'3", the downcomers were demolished and replaced and the design of the tuyere stock was altered to take care of the expansion in the blowpipes and the tuyere stock, and to give easier adjustment after changing tuyeres or blowpipes. Brickwork in Nos.1, 2 and 3 stoves was demolished and the checkerwork changed from 6" square checker openings to circular checkers 2 ½" in diameter. This increased the heating surface of each stove from 59,700 sq.ft. to 125,470 sq.ft. Each stove was fitted with pressure burners, each with its own fan and instruments for measuring and recording the amounts of gas used. It was estimated that these modifications would result in a saving of up to 50% in the gas used, as well as producing higher blast heats.[7]

The furnace was relined in 1950 and the hearth increased to 17'9".

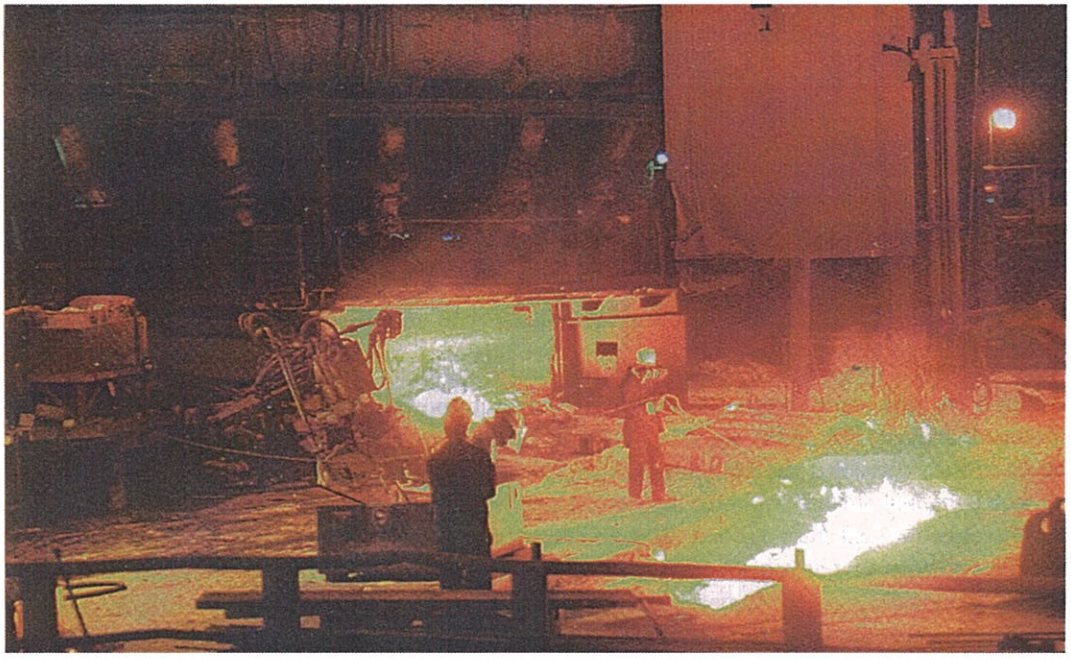


Figure 3.2: Operator taking temperature on No 3 Blast Furnace Floor
Source: Sansom (1999: 48)

[4] Report for six months ended 31 May 1927, p.42.
[5] *BHP Review*, June 1939.
[6] *BHP Review*, June 1940, p.17.
[7] Report for Half-Year ended 31st May, 1940

Between January and April 1960, the furnace was demolished and completely rebuilt as a larger furnace. However, the area in which the blast furnaces were located was too congested to allow the introduction of much of the new technology that was developed after 1950. The hearth diameter was extended to 20ft. and the rated capacity increased to 950 tons of basic iron per day. On completion of this work, which cost £1.3 million, the size and capacity of No.3 furnace was equal to that of No.2 furnace, which had been rebuilt and enlarged in 1957. Now situated over 8 feet to the south of its original position[8], the furnace was blown in for its next campaign on 18 April 60.[9] Fuel oil injection was also introduced during this year.[10]

The furnace was underwent a further reline in 1967 and another in 1977 when the hearth was increased to 21'3".

The early 1980s heralded a deterioration in economic conditions at the steelworks, resulting in No.3 furnace being shut down (and subsequently being relined). No.1 Blast Furnace, Nos.1 and 2 battery coke ovens and the 60 tonne BOS furnace were also taken out of service at this time.[11]

However, the development of a Steel Industry Plan between BHP, the unions and the government saw further investment in Newcastle. Major changes were made to No.3 furnace, which was totally rebuilt and reshaped, an exercise which involved cutting the shell beneath the top cone and replacing everything beneath that level. The furnace was recommissioned in March 1985. A second cast house and slag granulator was added to the operating furnace in May 1989.[12]

A mid-campaign repair was carried out in 1991, using one of the largest cranes ever seen in Newcastle. As part of the repair, the scrubber was removed and replaced, a task which involved a lift of over 200 tonnes over 30 metres into the air.

No.3 Blast furnace was decommissioned September 1999. Although the records show that average daily production increased from 279 tons in 1921 to 2,106 tons in 1999, it must be remembered that No.3 Blast Furnace, at closure, was essentially a 1985 furnace and bore little resemblance to No.3 Blast Furnace which was built in 1921.

[8] J. Sansom (ed) *The Blast is Past,* p.16.
[9] BHP Review October 1960, pp.16-17.
[10] G. Blaxell, Timeline of Significant Events at BHP Newcastle Steelworks, 1998.
[11] B.N. Black and J.R. Ellis, "A Century in Engineering in BHP, 1885-1985", Unpublished draft, May 1985, p.20
[12] G. Blaxell, "Timeline of Significant Events..."

3.1 Steel condition & protection at BHP Steelworks site

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.

4.0 STATEMENT OF HERITAGE SIGNIFICANCE

The No. 3 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 Regional – level heritage significance. (pending amendment to state level) (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 Assessment of Significance has been undertaken to reflect the current Burra Charter, NSW Heritage Act and Heritage Amendment requirements.

Historic Significance
Through its function, location and scale within the Newcastle Steelworks, The No. 3 Blast Furnace represents a significant contributory element in the development of iron and steel manufacture in New South Wales. It remains a highly significant visual reminder of the role BHP played in the development of Newcastle's industry.

It is clearly associated with an activity and historical phase of greatest possible significance to the Region and State and demonstrates the evolution/continuity of that phase. It has highest-level REGIONAL and possibly STATE, HISTORIC significance.

Aesthetic Significance
No. 3 Blast Furnace stands some forty metres above ground level and along with adjacent associated structures, creates a landmark, defining Newcastle as a major industrial centre of iron and steel production. Of its type and similar to the few remaining in the state, it shows STATE AESTHETIC Significance for its technical innovation and its distinctive aesthetic characteristics.

Social Significance
No. 3 Blast Furnace has significance for its association with the development of steel making in Newcastle and for its important linkage with the creation of work and the development of the social fabric of Newcastle resulting from that work. It has special educational and associational value to the people of the Region and makes a substantial contribution to the visual definition of the Steel works. As such it has STATE SOCIAL Significance.

Technical Significance
Along with adjacent structures, the No. 3 Blast Furnace demonstrates the growth of local technical expertise and knowledge, enabling it to be developed by BHP Steelworks. As such it provides information about local and Regional resources and skills available in nearly every decades of the 20th Century.

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 available elsewhere at a very limited scale. For these reasons No. 3 Blast Furnace must be considered to have STATE TECHNICAL Significance.

5.0 INVENTORY OF ARCHIVAL DOCUMENTS

The Following list constitutes the archival documents used for this report and other documents that contain related material for this archival record. For archival drawings, the BHP drawings document register (documents located in the BHP archive, Melbourne) may be found on the computer disk located in the appendix.

Baker, D. "Reminiscences of the Broken Hill Proprietary Company's Adventure in Steel", *BHP Review,* April 1936

Black, B.N. and Ellis, J.R. "A Century in Engineering in BHP, 1885-1985", Unpublished draft May 1985.

Blaxell, G. Timeline of Significant Events at BHP Newcastle Steelworks, 1998 (unpublished)

Sansom, J. (ed.) *The Blast is Past: a collection of stories about the iron makers of Newcastle,* Newcastle, 1999.

BHP Review, June 1939, June 1940, October 1960

BHP Newcastle, Report for Half Year ended 31 May 1927, 31 May 1940

Discussions with retired Newcastle Steelworks employees:
G. Blaxell, former Senior Design Engineer (Blast Furnaces)
E. McNiven, former Chief Works Engineer
M. Oughton, former Superintendent Blast Furnaces
D. Ruddell, former Chief Construction Engineer