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## Item 12.3 refers

# Attachment 2

## **Heritage Impact Statement**





## Ascot Kilns Conservation Project

## Heritage Impact Statement

Prepared for

Department of Planning, Lands and Heritage

By



City of Belmont AMENDED PLANS RECEIVED 18/11/2021 Application No: 483/2021

HOCKING HERITAGE + ARCHITECTURE

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Cover Illustration:

Figure 1 Ascot Kilns, Belmont Hocking H+A July 2021

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## 1.0 INTRODUCTION

This Heritage Impact Statement has been prepared for the proposed conservation works to the Ascot Kilns site in Belmont, for Department of Planning, Lands and Heritage acting on behalf of the Western Australian Planning Commission (WAPC). The eight circular downdraught kilns and five chimney stacks still extant are what remain of a once productive industrial site manufacturing bricks, tiles and clay pipes from 1905 to 1982. These are the largest cluster of kilns and chimneys in Australia contributing to the development of Western Australia's building industry and the City of Belmont. The kilns and the tall chimney stacks represent a landmark and are highly valued by the local community. The formal approval for the installation of the "Brick Man" statue forms part of this application.

The proposed conservation works have been informed by thorough investigations of the site, the extant kilns, chimney stacks and underground tunnels and documented in a Condition Report. The aim of the works is to preserve and retard the deterioration of the structures to avoid structural collapse, arrest decay and maintain the patina and character. Some new work such as the installation of new fencing around the site is to be incorporated to prevent unauthorized access of the site and structures while still providing visual access. Due to the nature of the works, an Archaeological Management Plan has been prepared for the site to appropriately manage the discovery and care of items of archaeological significance.

This Heritage Impact Statement assesses the proposed conservation works against the cultural significance of the place.

#### 1.1 The Site

The structures are prominently located at No. 80 Grandstand Road in Ascot, north of the Perth CBD in the City of Belmont and across four lots: Lot 197, Lot 236, Lot 237 and Lot 713.



Figure 2 Bird's eye view of the Ascot Kilns site Courtesy Nearmap accessed July 2021



#### 1.2 Heritage Listings

"Ascot (The Kilns)" has a Category A Exceptional Significance in the City of Belmont Heritage Inventory. It is also entered as Bristile Kilns (fmr), Belmont in the inHerit database with Place No. 0868 with the following listings:

Listing	Туре	Date
Heritage List	Adopted	22/11/2016
State Register	Registered	15/04/2020
Municipal Inventory	Adopted	31/12/1996
National Trust Classification	Classified	05/10/1988
Register of the National Estate	Nominated	03/05/1989

#### 1.3 Statement of Significance

The following Statement of Significance is drawn from the Register of Heritage Places entry for Warehouse (former) Place No. 0868. Acknowledgement is extended to the author of this document.

Bristile Kilns (fmr), Belmont, an industrial site comprising eight brick circular downdraught kilns and five tall brick chimneys, has cultural heritage significance for the following reasons:

the place is the largest cluster of circular downdraught kilns and associated stacks in Australia, which are an increasingly rare industrial structure nationally;

the eight brick circular downdraught kilns are an unusual built form in the Western Australian landscape, and the five tall brick chimneys dominate the skyline and are a local landmark;

the place was the location of the first specialised pottery works established in Western Australia in 1905;

the place is associated with Sir H.L. Brisbane, the Chairman of the Board of the company from 1929 to 1966. Brisbane developed the Bristile building empire, which has been prominent in the Western Australian building industry since the late 1930s;

the place has the potential, through archaeological investigation, to yield information about the technological, functional, and evolutionary aspects of early kiln design and operation in Western Australia; and,

the place represents the development of the clay industry in the Belmont area and has had a significant impact on the development of the City of Belmont from 1905 to 1982.

#### 1.4 References

The following documents have been referenced in the preparation of this report:

- Airey Taylor consulting, February 2016, Kilns & Chimneys at Former Bristile Site Ascot Fields, Belmont Perth, WA.
- Archae-aus, November 2021, Archaeological Management Plan for the Bristile Kilns (fmr.) Belmont Ascot WA.
- Department of Planning, March 2017, Ascot Kilns Heritage Strategy, WA.
- Hocking Heritage + Architecture, July 2021, Ascot Kilns, Bristile Kilns (fmr.) Belmont Condition Report, WA.
- Lewis, M, 1990, Pipe and tile kilns, former Bristile site Ascot Fields, Belmont, Perth, An Assessment of cultural significance for the Department of Planning and Urban Development, WA
- Wood & Grieve Consulting Engineers, September 2005, Ascot Kilns Assessment Report, WA.



### 2.0 DESCRIPTION OF THE PLACE

The Ascot Kilns site is 1.6 hectares in size with a complex of structures comprising masonry downdraught kilns connected by underground tunnels and tall chimney stacks. The site has been unused since the 1980s and the structures do exhibit varying levels of deterioration due to age, exposure to the elements and vandalism.

Above ground is a large expanse of concrete which represents a section of the foundation of the original industrial compound.

A steel roof canopy extends over a limited area of the site protecting 6 out of 8 the kilns.

There are pallets of bricks on the site which are intended to be used where reconstruction of the structures is required to stabilise them.



Figure 3 Pallets of existing brickworks under the existing canopy to be used in the conservation works

As part of the site investigations samples of mortar were obtained for testing in a laboratory. They were varied in their composition with early Portland cement present in thin sections and a sample from chimney stack S5 indicating some hydraulic lime. The variance is attributed to the different dates of construction and repairs which were done regularly due to the high temperatures causing some damage during the firing process. Therefore, for the masonry conservation it is proposed to use Natural Hydraulic Lime which has been known to perform similar to early Portland cement making it an acceptable replacement mortar where repointing is required.

The Archaeological Management Plan has identified the areas with high and moderate levels of archaeological potential and the procedures for managing the risk of impacting any significant archaeological finds and features during future works within the site.

### 3.0 PROPOSED CHANGES TO THE PLACE AND ASSESSMENT OF HERITAGE IMPACT

As the Ascot Kilns site is listed in the State Register of Heritage Places it has cultural heritage significance and must therefore be protected under the Heritage of Western Australia Act, 1990. The proposed conservation works to the place will be conducted in accordance with the principles of the Burra Charter (*The Australia ICOMOS Charter for Places of Cultural Significance*, 2013), which provides guidance for the conservation and management of places of cultural significance in Australia. The Burra Charter defines conservation as "all the processes of looking after a place so as to retain its cultural significance."

#### 3.1 The Site Enclosure

Majority of the site boundary is delineated by a 2.4-metre-high chain link and barbed wire fence. An additional length of fencing surrounds the kilns and the two individual chimney stacks at the southern end of the site.

On the northeast side of the site is fibre cement fencing in poor condition with some broken sections leaving the site open towards the adjoining property.

The fencing will be replaced with sturdier tubular garrison fencing and gates around the structures only, with the boundary fencing to be completely removed. The impact is neutral as it maintains the visual access of the structures, but it will be more secure with the tougher more durable material.

The fibre cement fencing on the northeast will also be replaced. The details of its replacement are yet to be determined.



Figure 4 Existing chainmesh and barbed wire fencing to be replaced with new garrison fencing on the right



The site is partially covered by concrete slabs that originally served as the foundation of the factory. There are ramps and steps in the concrete, with areas where it has sunken above the tunnels. A portion of the slab towards the eastern boundary of the site was removed in the 1960s to accommodate the Grandstand Road.

It is proposed to remove even more concrete. The negative impact associated with this is minimised by the intent to reuse the concrete. It will be crushed to be recycled as landscape treatment over the affected area, reducing construction waste and acting as a mulch to provide a dust barrier.

#### 3.3 Kilns

The 8 masonry kilns have the same structural design consisting of circular masonry walls with two main entrances at opposite sides. The oculus or circular opening at the centre of each dome which caps the kilns is intact. The 12 fireboxes which penetrate the kiln walls externally and terminate at a flash wall internally show the most signs of damage.

Due to different levels of exposure to the weather and ad hoc remedial works that occurred when the factory was in operation, every kiln is in a different state of deterioration with the main issues being structural collapse and efflorescence. The proposals to combat these are described in detail in the following section.

#### 3.3.1 Dome

The conservation works to the domes include:

- Repositioning of the loose bricks on the outer layer of the dome that served as a counterweight against thermal expansion.
- Repointing the internal leaves including the flat edges of the domes using a sacrificial lime-based mortar.
- Removing large vegetation whose roots are causing damage to the bricks which is prevalent on the domes with the most exposure to the elements.
- Retaining the glazed patina in the interior of the domes which serve to glue the bricks together and enhance aesthetic, historic and scientific value.
- Graffiti extant on the inside surface of some of the domes is to be carefully removed to prevent damage to the masonry substrate and to reinstate aesthetic value. A test sample will be done first to ensure that the graffiti removal methodology does not cause damage to the substrate.
- Remediation of the cracks by crack stitching where required to provide a measure of stability to the domes for their ongoing preservation.

#### 3.3.2 Walls

The walls of the circular kilns present different levels of spalling, loose masonry and cracking with degrees of severity. The conservation works will include the following repairs and interventions:

- Mechanical removal of large salt deposits which in turn has created the right conditions for lichen growth
- Careful removal of graffiti and acrylic paint, the latter exacerbating efflorescence from rising damp.
- Removing all loose debris within the interior of the kilns and the fireboxes
- Rebuilding loose masonry on the outer layers crucial to the stability of the structure, especially around the arches
- Removing loose bricks on the flash walls which are unstable

- Repairs to the corroded and detached steel straps which restrained the kilns during the firing process. Some badly corroded areas of the straps are causing subsequent damage to the brick face beneath. The recommended approach for the treatment of the steel straps is to remove them and:
  - cut out and discard pieces of the severely corroded steel
  - wire brush moderately corroded sections remove the corroded outer layer
  - welding a new steel plate of 10mm thickness and equivalent length and width dimensions to the retained sections
  - complete reconstruction of straps which are beyond repair to match like for like
  - applying rust treatment to the steel prior to reinstalling them in their original locations.

#### 3.3.3 Arches

Four of the arched entrances into the kilns have or are near collapse and need repair. All the arches require a measure of restoration to stabilize the masonry.

The conservation will involve the following

• Reconstruction of the archways which have collapsed

All the archways which are collapsed will be reconstructed. The Article 20.1 of the Burra Charter states: "Reconstruction is appropriate only where a place is incomplete through damage or alteration, and only where there is sufficient evidence to reproduce an earlier state of the fabric."

In most instances the opposite archways are intact and will be used as the evidence for the repair work. Despite the use of the original bricks already on the site the reconstruction will not be able to recreate the patina of the arches impacting on its authenticity, but it will provide stability to the kilns.



Figure 5 One of a few archways which have collapsed and require careful restoration



• Installation of a steel structural mesh support

Where the archways are intact, they will be restored by reassembling loose bricks and repointing. The structural engineer will determine where additional support by way of a steel mesh is required to be installed to the underside of the archways. This intervention has the benefit of preserving the relatively sound brick arches and their existing patina.

It does introduce an intrusive element, the steel mesh members, which will partially conceal the view of the bricks and impact the presentation of the kilns. They will be supported on the ground and will not require additional footings making them reversible and minimising impact to the structures.



## Figure 6 An example of an archway requiring restoration to avoid further structural damage and eventual collapse of the circular kiln

Each archway will be treated on a case-by-case basis, reinstating the integrity of the archways through restoration and reconstruction where required while also retaining their patina by the introduction of the intrusive steel element only to necessary openings.



#### 3.3.4 Kiln Gates

A structural steel portal is proposed to be installed to fasten the lower steel straps which are currently disconnected and loosen to create additional tension necessary to stabilize the kilns. To minimize any impact on the masonry, the portal has been designed to be self-supported, with a concrete pad footing located outside each archway. A lightweight gate with steel frame and black coloured tensioning wire will be fixed to the frame, allowing visibility of the arched entrances and the interior of the kilns. Despite the intrusive nature of the gate, it is necessary to prevent unauthorized access and acts of vandalism that have compromised the place in the past.



Figure 7 Proposed structural steel portal and gate to support the lower straps of the "bursting" kiln

The oculus of each kiln will also receive a lightweight mesh grate to prevent access from the top of the dome.



#### 3.3.5 Fireboxes and flash walls

The fireboxes are pulling away from the kiln walls. To retain this patina but still provide support a steel plate has been designed to prop up the fireboxes at each end with anchoring to the existing masonry pavers. This intervention is visually intrusive and to minimise the impact the short plates will be painted black. These supports are essential to prevent eccentric loading that could lead to further deterioration of the kilns.





#### 3.3.6 Equipment

There are redundant pipes running at high level above the kilns. They are rusted and in poor condition. Most of these will be removed, including the vertical droppers around the kilns.

The top level of service pipes running along the edge of the dome will be retained as a remnant of the evolution of the change of fuel from wood to oil in the burning process. This will give context to some of the valves which will be retained in situ as there is minimal equipment left from the working site. This will enhance scientific value.



Figure 9 Example of valves and services boxes to be retained in situ

#### 3.3.7 Floor

Small areas of missing bricks are present in some of the perforated flooring of the downdraught kilns. It is proposed to restore these areas using bricks already on site. The restoration of the perforated floor using existing bricks on site will have a positive impact of enhancing the integrity of the kilns.

Kiln 5 has the largest expanse of damaged flooring caused by missing bricks. A trafficable glass floor is to be installed to cover the area after the subfloor has been cleaned out to provide visual access to the underground infrastructure allowing the interpretation of the connections to the chimney stacks.

To minimise impact to the structure and potential archaeological deposits, the works to the sub-floor will be monitored by an Archaeologist following the recommendations of the Archaeological Management Plan. This will ensure that any interpretation is appropriately presented and the new intrusive works are carefully detailed so as not to harm significant fabric.



Figure 10 Extent of new glass flooring to cover the large area of missing bricks in the floor of Kiln 5



The five chimney stacks on site, are about 30 metres high with steel straps running vertically along each corner, and some horizontal steel members. The masonry presents various level of deterioration with evidence of lose bricks, cracking and spalling. The proposed works include:

- Stabilisation for wind and earthquake resistance using long post tensioning cables running from the top of the stacks to new footings cast under each chimney stack. The impact of this is neutral as the cables will be inserted internally and therefore will be out of sight.
- Installation of a new concrete capping at the top each chimney. The impact is minimal as they will be located up high and out of visual range to prevent water ingress, deter animal habitation and support the new tension straps.
- Conservation of the masonry walls by stabilizing loose bricks with lime mortar and rebuilding local sections that have become loose, severely cracked and have missing pointing. Large vertical cracks will be stitched using carbon fibre or glass fibre rods to avoid future corrosion issues and acrylic paint at low level removed to minimise efflorescence on the masonry.
- Cleaning and treatment of corroded steel straps to enhance their longevity.
- Chimney stacks S4 and S5 will have an additional grate installed at the opening of the tunnel at the base as these tunnels are above ground. The impact to heritage significance is minimal as it will be internal and out of view.



Figure 11 The patina of chimney stacks S4 and S5 will be retained as much as possible in the conservation of these structures



Figure 12 Post tensioned steel cables to be installed inside the chimney stacks and connected to new footings installed under the existing

#### 3.5 Tunnels

A network of brick tunnels connects the kilns to the chimney stacks. The underground tunnels are concealed by the concrete slab that was the foundation of the factory and are flooded due to the high water table. The recent inspections revealed that they are in fair condition with isolated areas of collapse. Chimneys S4 and S5 however have remanent sections of tunnels which are above ground. They represent an opportunity for interpretation of the flue system and their retention and conservation enhances scientific value.





Figure 6 View of an underground tunnel

Figure 7 Exposed section of the tunnel at chimney S4

To repair collapsed sections of the tunnels a concrete culvert of a suitable diameter will be inserted from above, bricks re-laid over and the disturbed area of concrete patched up with new concrete to match existing. Though intrusive in nature the culvert will not be visible from above the ground.

A steel pit grate will be installed above the openings to the existing tunnels providing greater level of security from unauthorised access compared to the existing steel mesh currently extant.



#### Figure 13 Sketch of the metal grating at the end of the tunnel and chimney stack opening

#### 3.6 Roof Canopy

The existing roof canopy which partially covers the site was constructed in the 1990s, sheltering only 6 of the 8 kilns. It is made of a light steel structure and corrugated roof sheeting. The steel work presents a moderate corrosion, with some of the purlin in poor condition. A section of the structure along Grandstand Road has been compromised after a vehicle hit one of the steel posts.

It is proposed to replace the existing canopy and instal a new roof to shelter all the kilns present on site. It will be of similar height to the existing, a simple hipped profile that will blend with the palette of existing structures minimizing the visual impact but performing the vital role of protecting the heritage fabric below from the weather and related deterioration.



Figure 14 Proposed new steel roof canopy providing support from the elements



#### 3.7 Site Services

The site is to be equipped with security and decorative lighting to the structures. This will involve upgrading electricity services to the site and installing controls and physical cabling to strategically selected locations to minimize any impact on the existing above and below ground structures. It is proposed to run cables along the outer boundary walls and have wires for the lighting suspended from the new canopy structure to avoid damage to potential archaeological deposits.



Figure 15 Concept of new external lighting to all Kilns with an internal lamp for Kiln 5



#### Figure 16 Concept of new external lighting to chimney stacks mounted at the base of \$4 and \$5

The new canopy will have downpipes which will drain into below-ground soak wells for on-site storage.



#### 3.8 'Brick Man' Statue

The brick statue which was installed south of the kilns in late 2020 is assumed to be of the late Sir HL Brisbane who developed the Bristile building empire in the 1930s. It will be relocated to a more appropriate location on the site after the completion of the conservation works with interpretive signage. These details will be provided when the specifics have been finalised.



Figure 17 The existing 'Brick Man' statue to be relocated to a more appropriate location on the site



### 4.0 CONCLUSION

The proposed conservation works to the Ascot Kilns are aimed at sensitively and carefully conserving the remnant structures on this historic site. The new elements being introduced are necessary to stabilize and preserve the structures and provide additional security to the site.

The proposed restoration and reconstruction of the masonry structures has been limited to areas where the damage is severe compromising their stability. Works to the chimneys stacks and tunnels are under the ground and internal with minimal visual impact, enhancing the seismic resistance of the tall prominent structures.

The archways to the kilns will receive the greatest intervention as their deterioration affects the stability of the walls and dome. The additional steel portals will reduce the works required to the arches which need minimal restorative work and will maintain the patina of these archways. They are intrusive elements which are reversible.

The gates and grates to the openings of the kilns, tunnels and chimney stacks are necessary to secure them from unauthorised access. Together with the high garrison fencing they will function as a deterrent while still permitting visual access of the heritage structures.

The proposed works are considered essential and urgent conservation and if undertaken by skilled tradesmen will ensure that the heritage listed Ascot Kilns site maintains its cultural heritage significance.



Figure 18 Kiln K5 previously earmarked for demolition will be repaired and preserved