

## PORT AUTHORITY OF NSW HERITAGE INVENTORY

### State Heritage Inventory

SHI Number: 4560032		Study Number: N/A	
Item Name: Chance Brothers Lens			
Location: Port Authority of NSW Corporate Office			
Address: 20 Windmill Street, Millers Point		DUAP Region: Sydney South	
Suburb / Nearest Town: Millers Point 2000		Historic Region: Sydney	
Local Govt Area: Sydney		Parish: St Philip	
State: NSW		County: Cumberland	
Other/Former Names: Hornby Lighthouse - Chance Brothers Lens 1877-1995			
Area/Group/Complex:		Group ID:	
Aboriginal Area: Gadigal clan			
Curtilage/Boundary:			
Item Type: Movable / Collection	Group: Transport – Water		Category: Harbour Lights
Owner: Port Authority of New South Wales			
Current Use: On display (historical interpretation)			
Former Uses: Lighthouse lens			
Assessed Significance: Local		Endorsed Significance:	
Statement of Significance: This fourth order lighthouse lens was manufactured before 1900 by the English firm, Chance Brothers and Company, and likely served as a harbour light at Shark Island Lighthouse from at least 1912 and then at Hornby Lighthouse from 1948 until 1995. The history of the lens reflects the changing needs of shipping in the port and traces the evolution of the modern port operation system. The lens is also a good example of a fourth order-fixed lens made of crown glass of some aesthetic significance.			
Historical Notes or Provenance: <p>This beehive lighthouse lens was manufactured before 1900 by the English firm, Chance Brothers and Company, based on concepts developed by the French engineer and physicist, Augustin-Jean Fresnel (1788–1827). Chance Brothers were a pioneering glass manufacturing firm first established near Birmingham, England in 1822 and in 1851, the firm began manufacturing lighthouse lenses.</p> <p>Item 4560032 is a fourth order fixed lens surrounded by sets of concentric annular prisms in the general shape of a beehive. It features crown glass, which was not used after 1900 (information supplied by Tim Nguyen of Chance Brothers). It operated on the catadioptric system, where both refraction and reflection were used to reflect light.</p> <p>According to the 1902 publication <i>The lighthouse work of Sir James Chance, Baronet</i>, two fourth order lenses were manufactured by Chance Brothers for 'New South Wales' in 1871. One of those lenses was probably installed at the Wollongong Breakwater Lighthouse which was completed in August 1871, as an article in the <i>Australian Town and Country Journal</i> noted the light was 'a fixed one' of the 'fourth order, constructed on the cata-dioptic principle' and 'manufactured by Chance and Co.' It went on to describe</p>			

the lens as containing 'prismatic rings' and placed in a 'gun-metal frame' with the entire apparatus 'fixed on a cast iron column, secured on the lantern floor'.

It is unclear where the other lens was installed and if this lens was item 4560032. According to an article by J Hoey (Engineering Branch) for the Port of Sydney Journal (January 1950), this lens (item 4560032) was installed at Hornby Lighthouse at Inner South Head in November 1948 and 'given an occulting characteristic and equipped with a lamp-changer which, on failure of one lamp, automatically brings a new one into focus'.

Prior to its installation at Hornby Lighthouse, Hoey claims the lens was originally in the lightship 'Bramble' and moored off the Sow and Pigs Shoal near the entrance to Sydney Harbour. There is no evidence this lens was used for this purpose, and it is unlikely it was adopted on a lightship as it operated as a fixed lens and was therefore unsuitable for a vessel (information supplied by Tim Nguyen, Chance Brothers).

According to Hoey, after the lightship was decommissioned in 1912 the lens was then installed in Shark Island Lighthouse. The Sydney Harbour Trust report for the year ending 30 June 1913 possibly refers to item 4560032. It reported a 'new reinforced concrete light tower, fitted with a fourth order dioptric lens and lighted with acetylene gas, was erected in lieu of the old wooden structure on the north-west side of Shark Island' at a cost of £606, and ten pence.

The lens was operative at Hornby Lighthouse from 1948 until 1995, when it was removed and placed in storage at Port Authority of NSW.

Themes:	National Theme: 3. Economy	State Theme: Technology	Local Theme: (none)
	3. Economy	Transport	(none)
Designer: Augustin-Jean Fresnel (1788–1827)			
Maker / Builder: Chance Brothers and Company			
Year Started:	Year Completed: before 1900	Circa: Yes	
Physical Description: A single 500mm. Catadioptric type lens. Originally used with kerosene then an acetylene burner, then later a 110volt 100watt pearl lamp. The lens is constructed in a shape likened to a beehive structure, to allow for the provision of lenses of large aperture and short focal length, through a reduced volume of material. This design allowing for the construction of a thinner/lighter lens able to pass more light and subsequently be visible from further distances, is known as a Fresnel lens.			
Physical Condition: Restored in 2022, the lens is considered in generally good condition.			
Modification Dates: 2022 - Restored and displayed at Port Authority of NSW with interpretation.			
Recommended Management: Conserve and display  Preparation of a Heritage Assessment to provide a comprehensive understanding of the significance of the item and assist with long-term conservation.  Preparation of a Moveable Heritage Management Plan for Port Authority of NSW moveable heritage assets including the Chance Brothers Lens to provide a comprehensive guide to the future conservation and management of the items.			
Management: Statutory Instrument			
Further Comments:			

Criteria a) The lens is a good example of a fourth order-fixed lens made of crown glass, evidence of the types of lenses utilised for maritime navigational purposes in Australia throughout the twentieth century, used specifically in the Hornby Lighthouse from 1948-1995.					
Criteria b)					
Criteria c) Although some of the glass was damaged (post removal) the light is an attractive creation of clear, specially crafted 'crown' glass.					
Criteria d)					
Criteria e)					
Criteria f)					
Criteria g)					
Integrity / Intactness: The light has suffered minor damage and is missing some of the glass prisms. It was restored in 2022.					
References:	Author:	Title:		Year:	
	<i>Australian Town and Country Journal</i>	'A Tour to the South'		26 August 1871, page 17, <a href="http://nla.gov.au/nla.news-article70468682">http://nla.gov.au/nla.news-article70468682</a>	
	<i>Empire</i>	'Parliament'		22 November 1873, page 4, <a href="http://nla.gov.au/nla.news-article63237414">http://nla.gov.au/nla.news-article63237414</a>	
	James Frederick Chance	The lighthouse work of Sir James Chance, Baronet (London, UK: Smith, Elder)		1902, Appendix	
	Sydney Harbour Trust	The Sydney Harbour Trust Commissioners' Thirteenth Report being for the year ended 30 June, 1913		1913, pages 13 and 19	
	Hoey, J	'The Hornby Light – Inner South Head', Port of Sydney Journal, Vol 2, No. 7		1950, page 224-226	
	Chance Brothers	<a href="http://chancebrothers.com/">http://chancebrothers.com/</a>		2021	
Studies:	Author:	Title:		Number:	Year:
Parcels:	Parcel Code:	Lot Number:	Section:	Plan Code:	Plan Number:
Latitude:			Longitude:		
Listings:	Name:	Title:	Number:	Date:	
	Heritage Act – S.170 NSW State agency heritage register	Chance Brothers Lens	4560032	1/07/2004	
Data Entry:	Date First Entered:	Date Updated: 20/12/2022		Status: Basic	

Image: 1



Caption: Hornby Lighthouse Lens 1948-1995

Copyright: Port Authority of NSW

Image By: Susan McIntyre-Tamwoy Heritage Consultants

Image Date:

Image File: 4560032b1.jpg

Image: 2



Caption: Chance Brothers Lens at Port Authority of NSW

Copyright: Port Authority of New South Wales

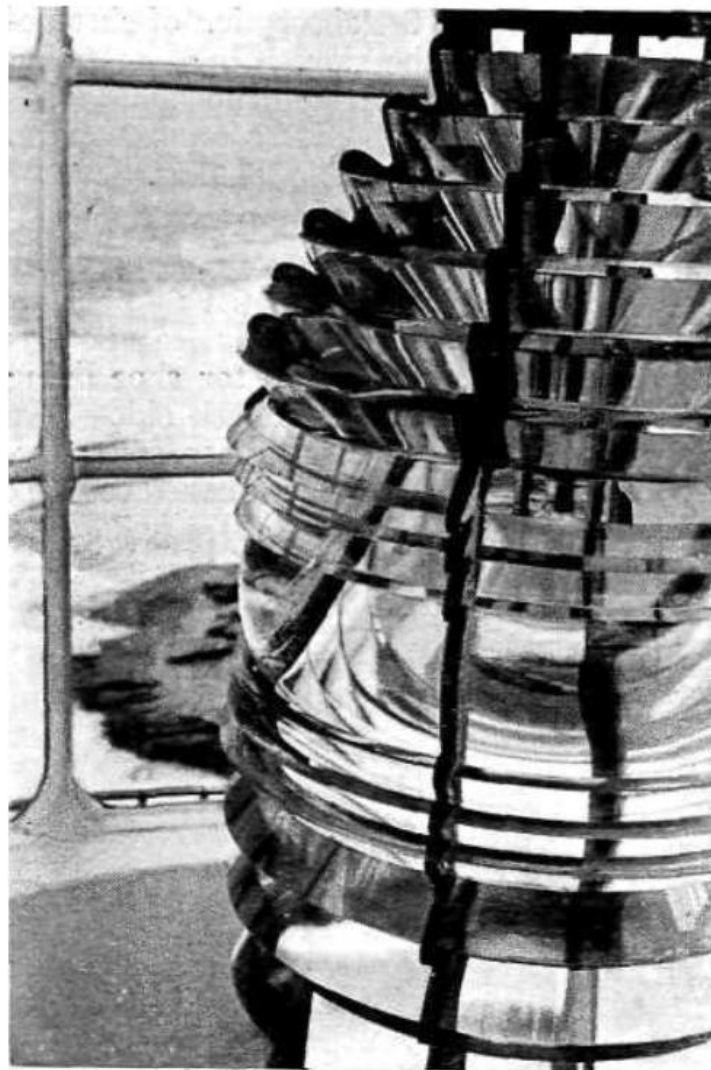
Image By: Nicole Cama - NBR

Image Date: 21/09/2022

Image File: 4560032b2.jpg



Image: 3



Caption: Chance Brothers Lens at Hornby Lighthouse

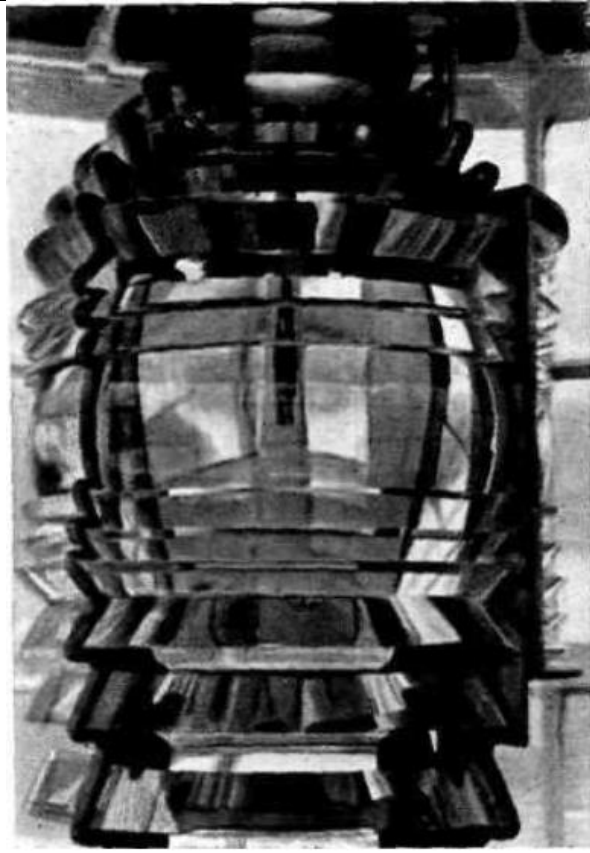
Copyright:

Image By: Reproduced from J Hoey, 'The Hornby Light – Inner South Head', Port of Sydney Journal, 1950, Vol 2, No. 7, page 224

Image Date: c1950

Image File: 4560032b3.jpg

Image: 4



Caption: Close up of Chance Brothers Lens at Hornby Lighthouse

Copyright:

Image By: Reproduced from J Hoey, 'The Hornby Light – Inner South Head', Port of Sydney Journal, 1950, Vol 2, No. 7, page 226

Image Path:

Image File: 4560032b4.jpg

Image: 5



**Looking North-east from Hornby Light, across the entrance to Port Jackson (Sydney Harbour), with North Head beyond.**

Caption: Hornby Lighthouse featuring Chance Brothers Lens

Copyright:

Image By: Reproduced from J Hoey, 'The Hornby Light – Inner South Head', Port of Sydney Journal, 1950, Vol 2, No. 7, page 225

Image Date: c1950

Image File: 4560032b5.jpg



Image: 6



Caption: Shark Island Lighthouse shortly after its construction

Copyright:

Image By: Reproduced from Sydney Harbour Trust, The Sydney Harbour Trust Commissioners' Thirteenth Report being for the year ended 30 June, 1913, page 48

Image Date: 1913

Image File: 4560032b6.jpg