

Appendix B Structural Concept Design Report (TTW 2014)



Walsh Bay Arts Precinct
Concept Structural Design Report

for Bates Smart

26th February 2014

Job No. 131646

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APPENDIX A

APPENDIX B

1.0 BACKGROUND

The existing structures in the Walsh Bay Arts Precinct, namely Pier 2/3, Pier 4/5 and the Shore Sheds are all timber structures originally constructed in the 1920's as cargo wharfs and storage sheds. The original structures have undergone various alterations, upgrades and repairs.

The original two-level structures were built entirely from hardwood timber. They consist of a sub-structure of piles, headstocks and girders supporting a concrete deck around the perimeter of the Piers and a timber deck inside the building, and a superstructure consisting of floor trusses and roof trusses.

2.0 STRUCTURAL ASSESSMENT & MAINTENANCE

Detailed condition surveys and structural assessments of both Pier 2/3 and Wharf 4/5 have been carried over the last decade. This work has been carried out for NSW Public Works with TTW acting as their consultant for Pier 2/3 and GHD for Wharf 4/5. TTW issued their final "Preliminary Structural Assessment" report for Pier 2/3 on 24th November 2010. For both Pier 2/3 and Wharf 4/5 the results of the condition surveys of the sub-structure and super-structure has been used to carry out a structural analysis of the piers for gravity and lateral loads (wind and earthquake) for compliance with current Australian Standards. The results of the analysis and design checks has enabled repair work to be specified and prioritised. Technical Specifications have been prepared by TTW for Pier 2/3 (issued May 2013) and by GHD for Wharf 4/5 (issued November 2010).

The condition surveys consist of visual surveys plus termite monitoring and inspections. From 2011 until now detailed surveys of all of the piles, headstocks and storey posts have been carried out. Structural Maintenance specifications have been prepared for Pier 2/3 and Wharf 4/5 which detail the requirements for pile repair & replacement for piles, headstocks, girders, storey posts and other miscellaneous items.

The structural maintenance work required for the piers has been documented by TTW and GHD including priorities on the importance of the repair work. A 10 year maintenance program is now in place which has both preventative and planned maintenance items. Preventative items include ongoing condition surveys (including pile surveys) every 4 years and termite control. Planned maintenance is the repair/replacement work documented by TTW and GHD. The majority of this work is the repair of timber piles and the replacement of timber piles with jack-up piles in cases where the pile has degraded beyond the point of being repairable. Other maintenance items in the 10 year program consist of repair/replacement of non-structural items such as drainage, doors & windows and weatherboards.

3.0 SUB-STRUCTURE

The original timber piles are set out on a 10ft by 10ft grid in the Piers. In the upgrades and repairs carried out on the Piers many of the piles have been regarded as redundant and not repaired as the live load for the recent use of the Piers is much less than the loads required for its original function as a cargo wharf. The opportunity now exists to add jack-up piles to in these redundant pile locations to provide extra footing capacity to support the additional loads intended for Pier 2/3 as described below.

The proposed new lifts in Pier 2/3 will require pits below deck level. There may also be new water storage tanks located under the deck. Both the lift pits and water tanks could be reinforced concrete structures supported on the timber piles. If required the base of the pits

and tanks could be below the water level.

4.0 PIER 2/3 LEVEL 1 & 3

The new mezzanine floor structures will need to be of lightweight construction to minimise the additional load applied to the existing columns and piles. The new mezzanine construction could be similar to those added to the Shore Sheds about 10 years ago which consisted of steel floor beams, steel joists and a topping slab. The drawings of the Shore Sheds mezzanine structure are enclosed in Appendix B.

5.0 PIER 2/3 LEVEL 2 PERFORMANCE SPACES

Acoustic requirements for the performance spaces will require new concrete jack-up slabs to be constructed over the existing L2 floor structure. The additional load from these concrete slabs will require additional jack-up piles to be installed. In addition where new mezzanines floors are being added resulting in increased column loads, additional jack-up piles will be required.

The existing central row of columns in Pier 2/3 supporting the roof trusses will need to be removed in the performance spaces. The plans enclosed in Appendix A show the locations of the columns to be removed. For both the Bell Rehearsal space and ACO Auditorium it is proposed to retain the existing timber trusses. A new steel supporting beam will be provided above the Bell Rehearsal space and a new steel truss above the ACO Auditorium.

6.0 WHARF 4/5 BANGARRA SPACE

For Studio 2 it is proposed to remove an existing column at Ground level. A new steel beam and jack-up piles will be required as shown on the drawings in Appendix A.

7.0 INFORMATION PROVIDED FOR THE FINAL BUSINESS CASE

Information has been provided for costing of the structural items in the Final Business Case. This included advice regarding pile replacement; new mezzanine floor structure; performance space floor slab to achieve acoustic performance; typical truss design where columns are to be removed; and typical structure for waterfront square.

Authorised by:
TAYLOR THOMSON WHITTING (NSW) PTY LTD


David Carolan
Director

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131646

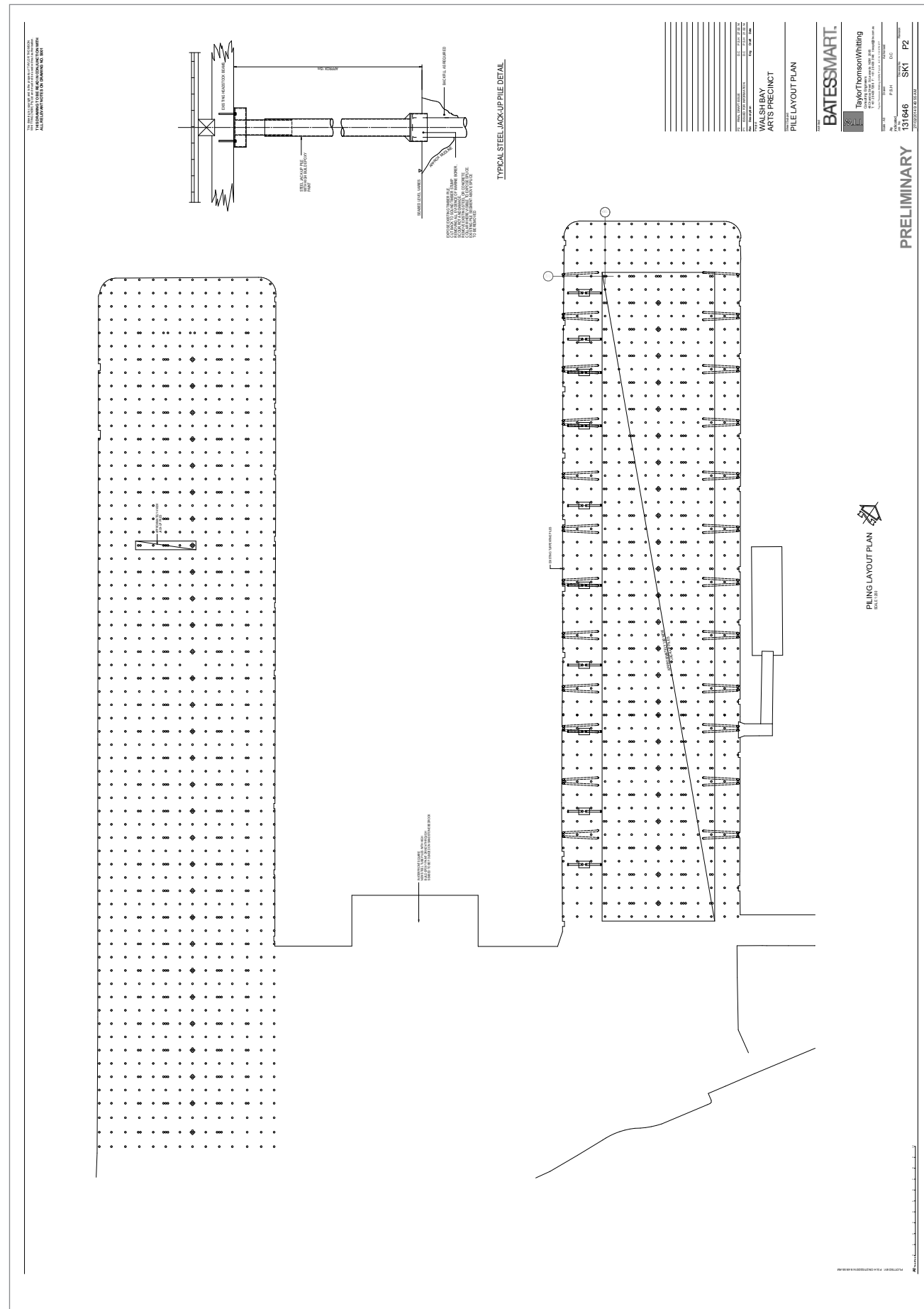
Appendix A

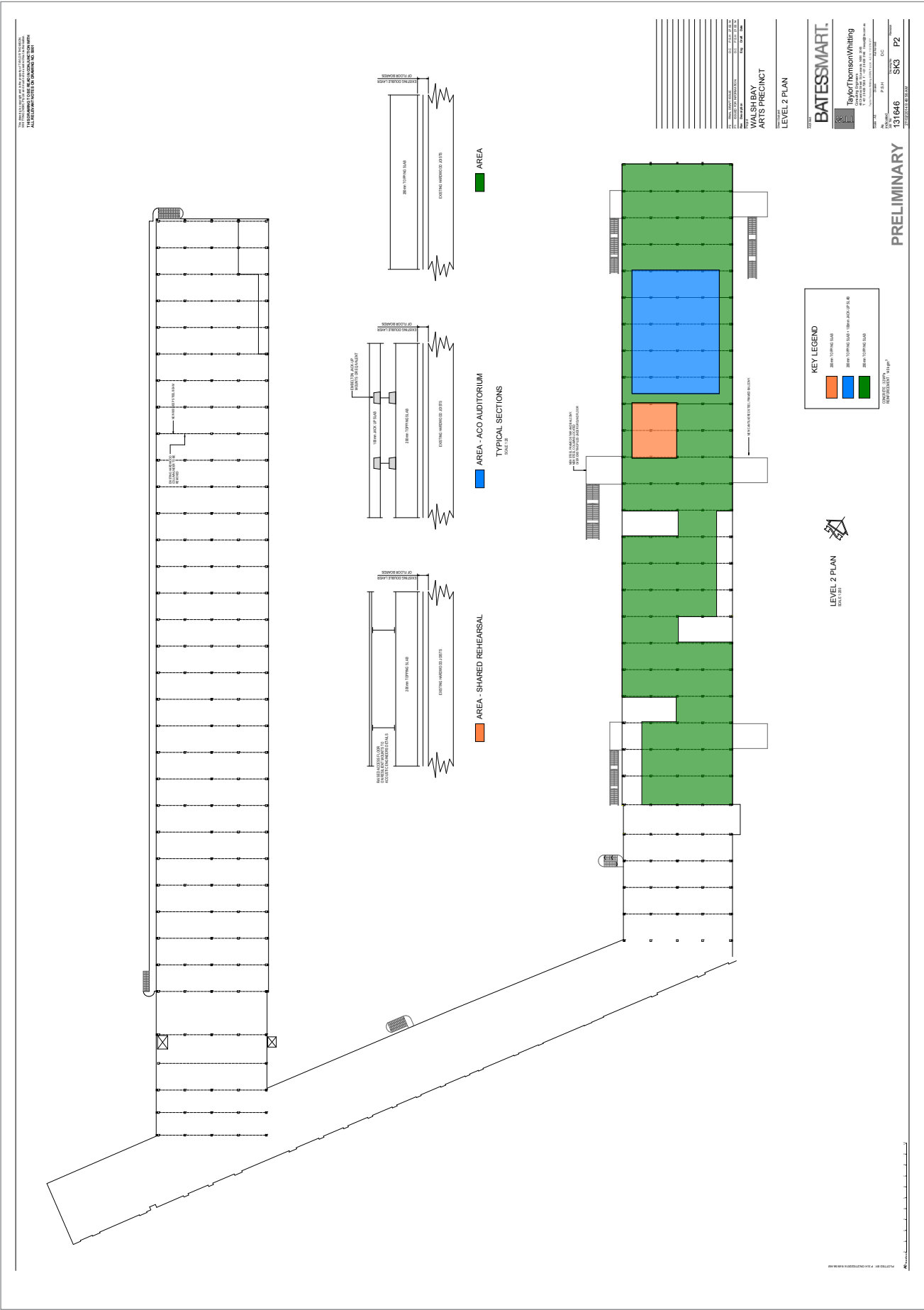
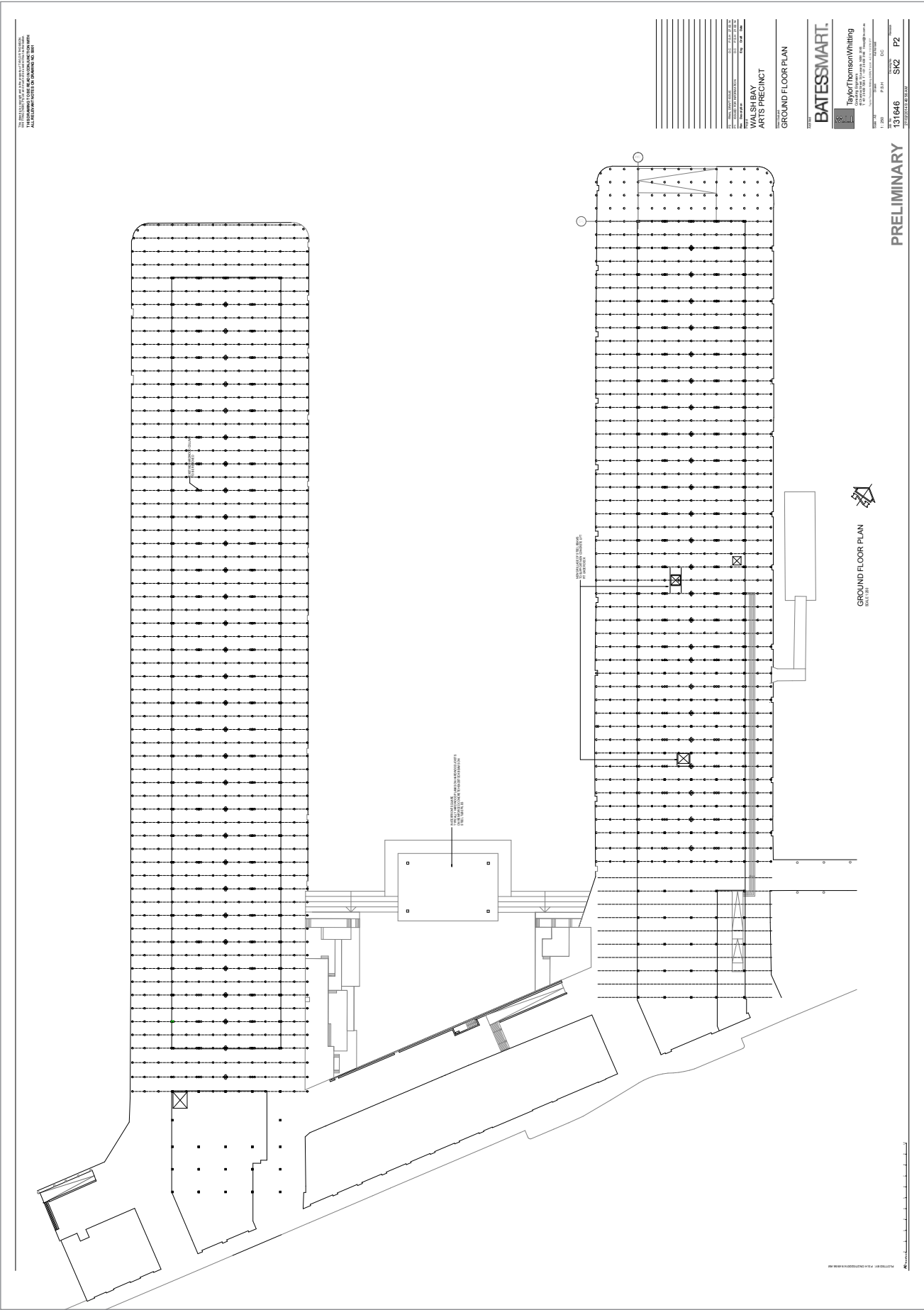
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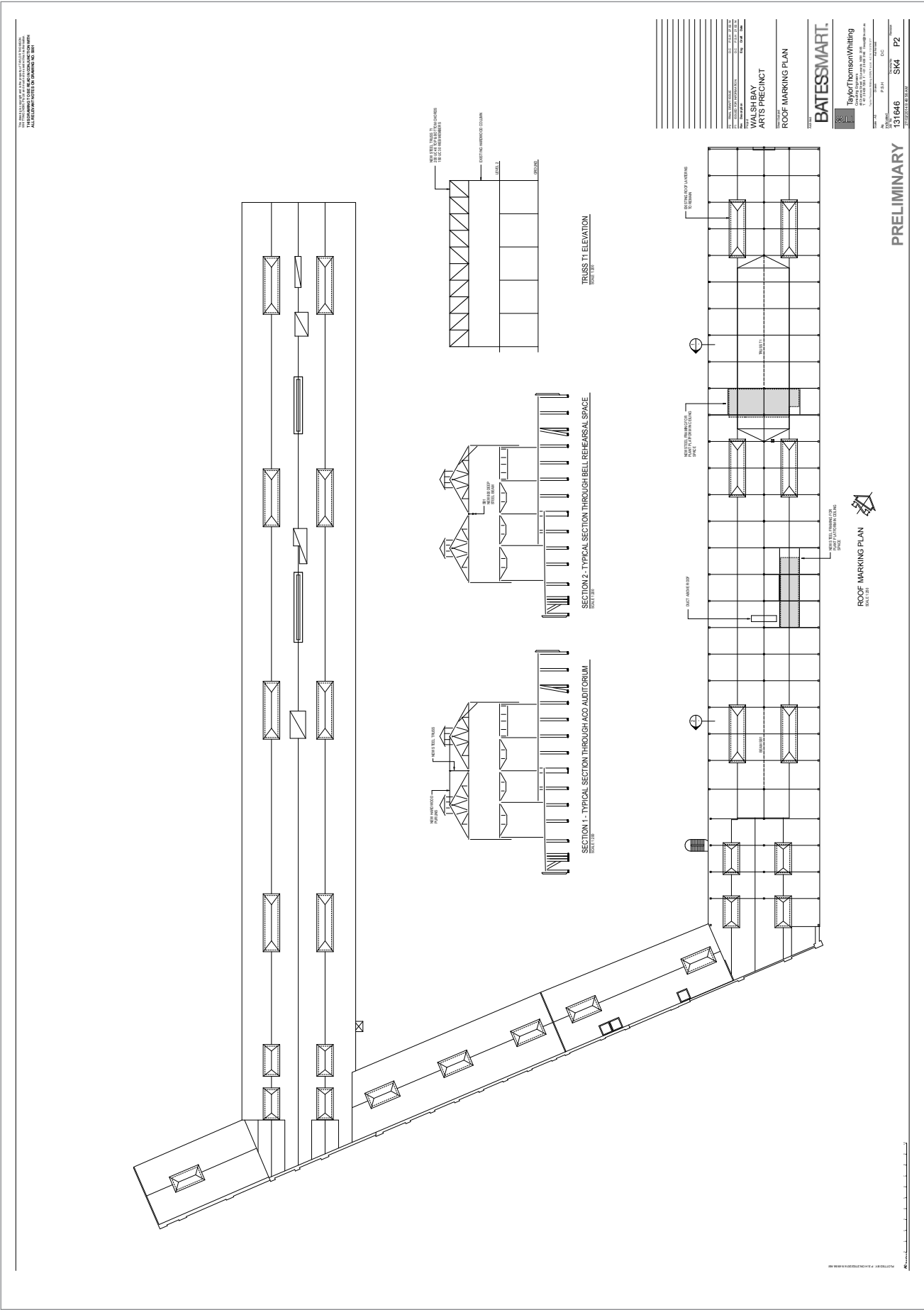
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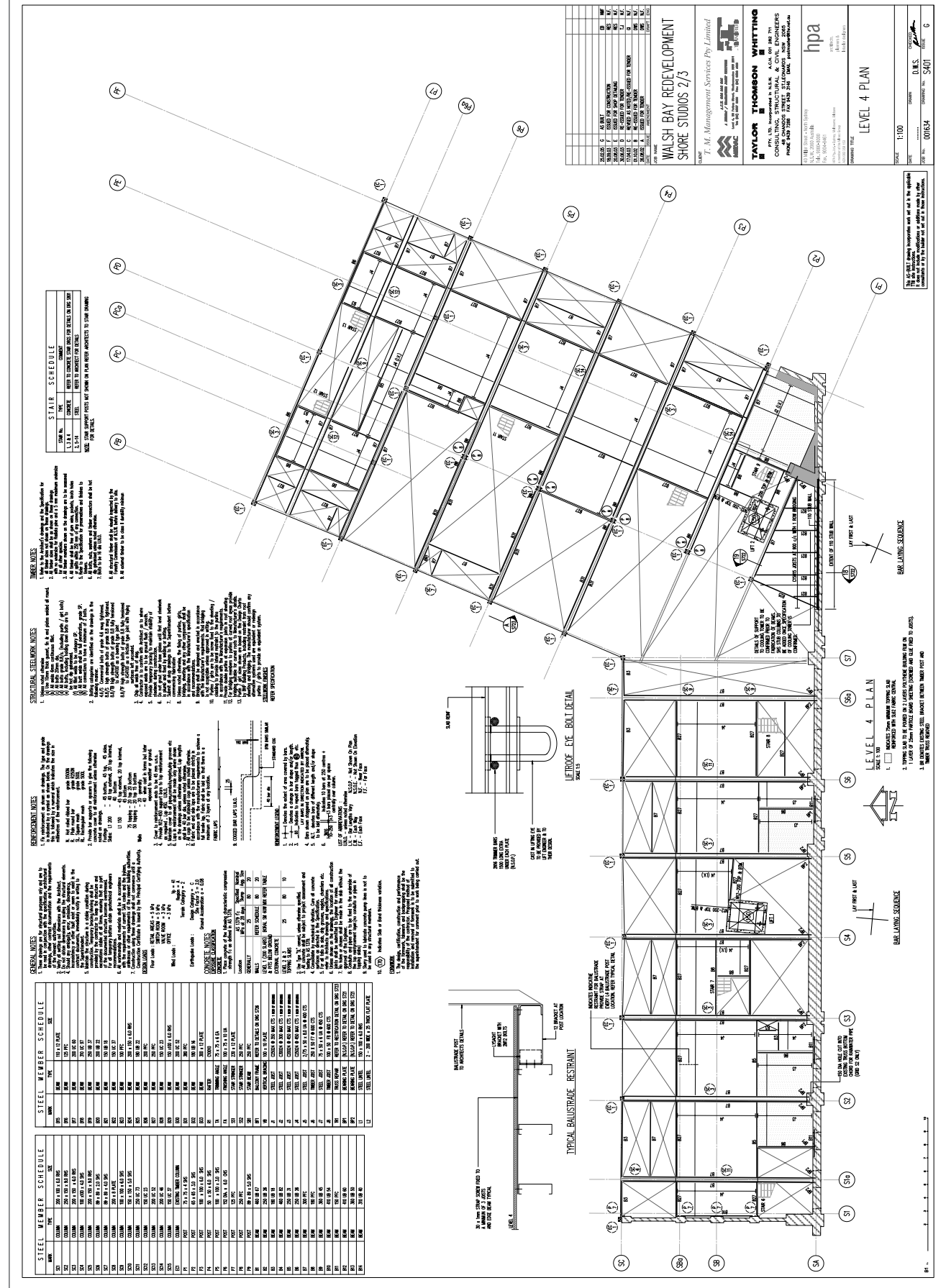






Appendix B
Information for FBC

Existing Shore Shed mezzanine
drawings





Appendix C Historical Aerial Images



Source: Base Image - © Department of Lands

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Datum: GDA 1994 MGA Zone 56 - AHD			
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Rev	Description	Drm.	Date:

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Approximate Site Boundary

JBS&G Figure: Walsh Bay - 1930

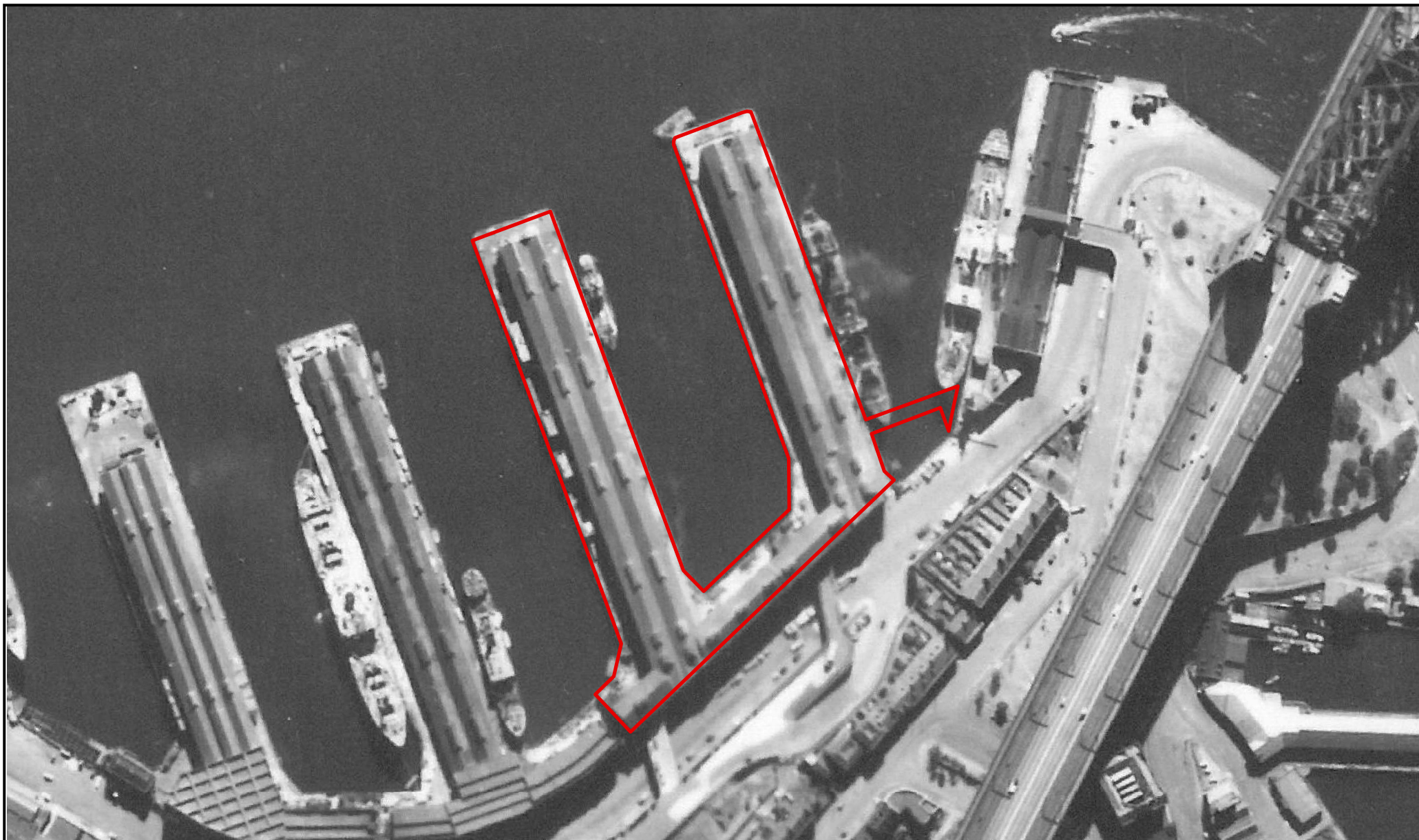
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Project: Walsh Bay Preliminary Site Assessment

Job No: 43329

File Name: 43329_1930





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Rev	Description	Drm.	Date:

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Approximate Site Boundary

JBS&G Figure: Walsh Bay - 1951

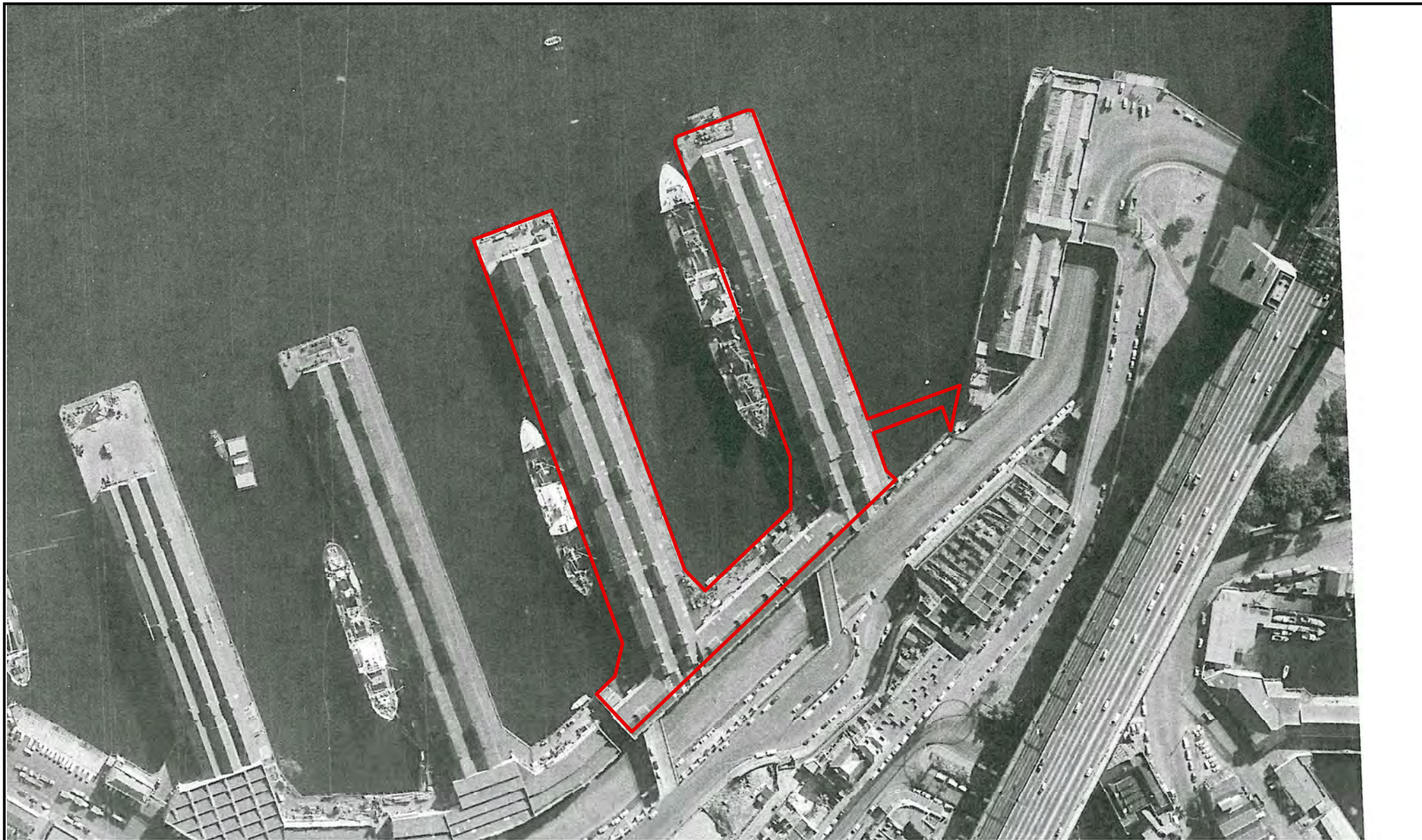
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Job No: 43329

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Approximate Site Boundary

JBS&G Figure: Walsh Bay - 1961

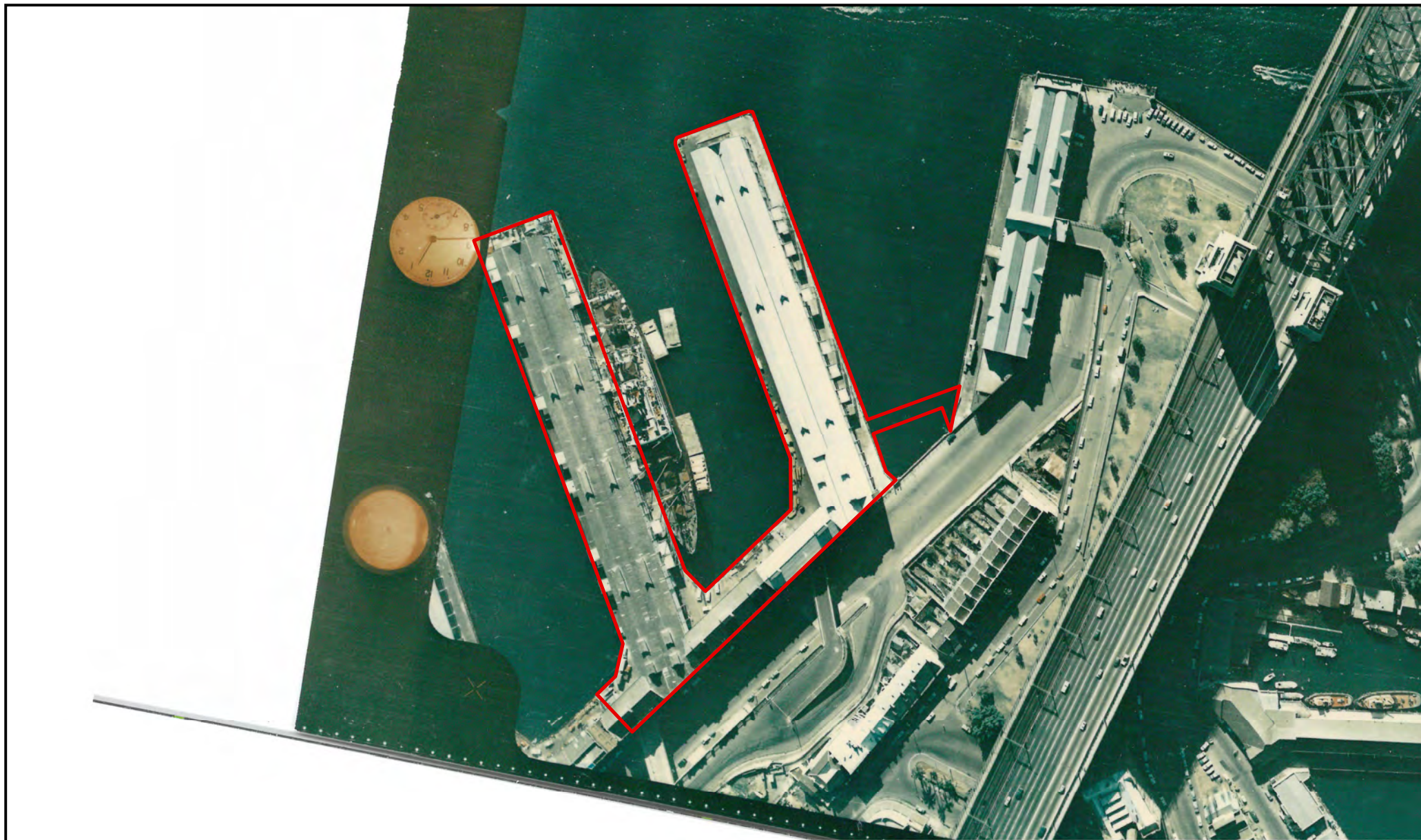
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Rev	Description	Drm.	Date:

Legend:

Approximate Site Boundary

JBS&G Figure: Walsh Bay - 1970

Client: ARTS NSW

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File Name: 43329_1970





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Legend:

Approximate Site Boundary

JBS&G Figure: Walsh Bay - 1986

Client: ARTS NSW

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Job No: 43329

File Name: 43329_1986





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Rev	Description	Drm.	Date:

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Approximate Site Boundary

JBS&G Figure: Walsh Bay - 1999

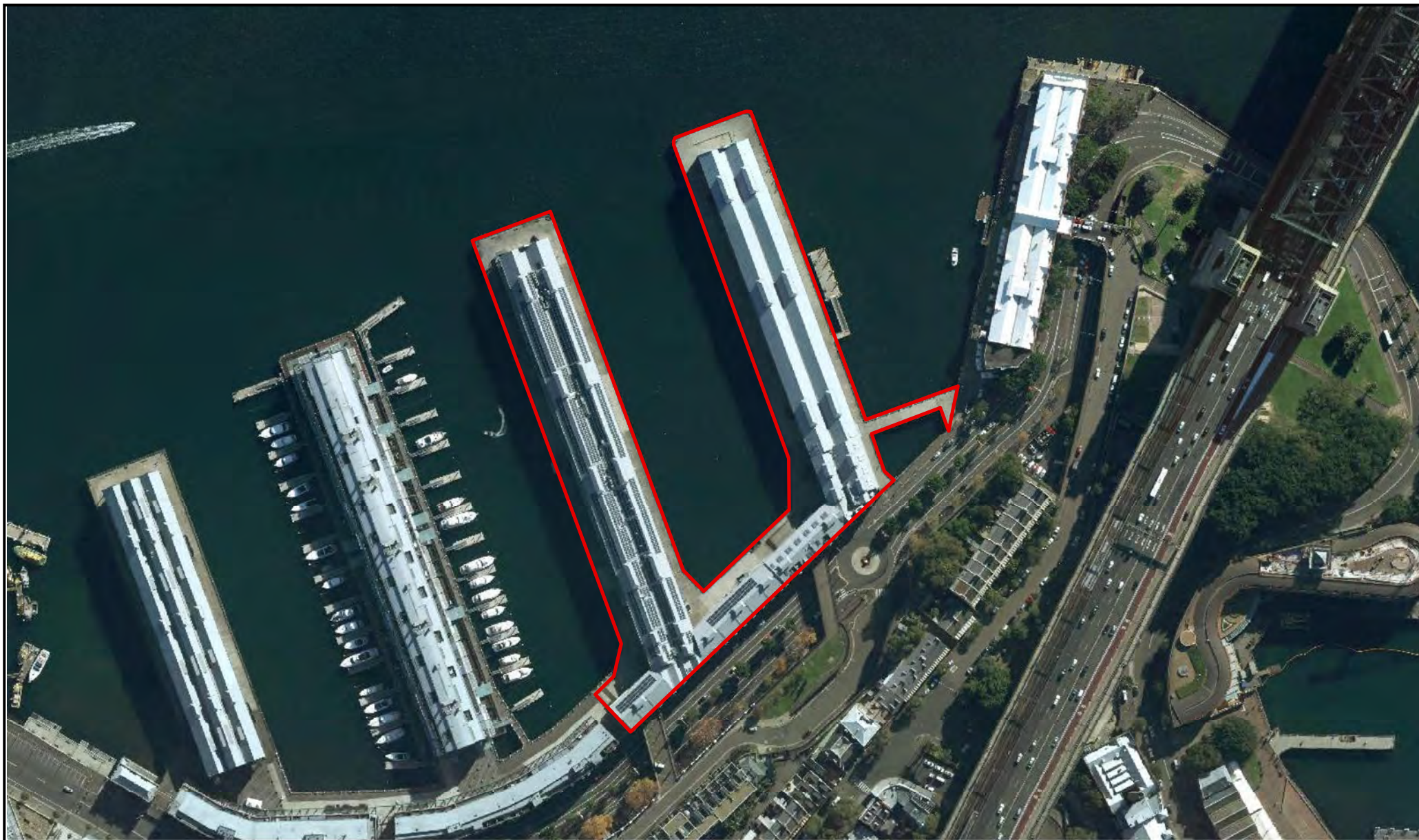
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Project: Walsh Bay Preliminary Site Assessment

Job No: 43329

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Source: Base Image - © SIX Maps www.maps.six.nsw.gov.au, Imagery Date: 13/04/2011, Accessed: 26/02/2014

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Scale: 1:2,500

Datum: GDA 1994 MGA Zone 56 - AHD

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Rev	Description	Drm.	Date:

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Approximate Site Boundary

JBS&G Figure: Walsh Bay - 2011

Client: ARTS NSW

Project: Walsh Bay Preliminary Site Assessment

Job No: 43329

File Name: 43329_2011

