

Infrastructure NSW

Walsh Bay Arts Precinct

Utilities Infrastructure Report

Infrastructure Report

Issue 3 | 14 November 2016

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 248794

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Executive Summary

This report has been produced in response to the Secretary's Environmental Assessment Requirements (SEARs) Application Number SSD 7689 on behalf of Infrastructure NSW and ArtsNSW in support of the State Significant Development (SSD) Application.

This report assesses environmental impacts of the proposed works, which will be inputted into the Environmental Impact Statement (EIS).

Furthermore, it addresses issues particular to a SEARs application for a SSD and specifically responds to key issue, point 19 Utilities; which reads:

19. Utilities

Address the existing capacity of the site and any augmentation requirements for utilities, including staging of infrastructure arising from the development in consultation with relevant agencies.

Conclusion

The infrastructure loads for the redevelopment of WBAP have been assessed and summarised in Section 4. The analysis shows that the water supply, gas and sewer utility services are capable of supporting the development. A new natural gas service will be required to extend to the Northern end of Pier 2/3 to support the proposed works. The external Jemena infrastructure can comfortably handle the new works. A new meter/regulator set will be required for Pier 2/3 with a new private gas supply serving the Pier for the proposed works.

Power load assessments have identified a need to increase the Pier 2/3 feeders from the existing two 800A to allow for an additional supply capacity of 1100A, achieving 2700A in total.

Power load assessments have identified a need to increase the Wharf 4/5 feeders from the existing two 400A to allow for an additional supply capacity of 300A, achieving 1100A in total (Excluding STC 50 supplies). Early indications are that a new electrical substation will be required to reinforce the local electrical utility network in order to supply the development. Negotiations are ongoing with Ausgrid regarding the above modifications to the feeders and confirm the extent of the local electrical network reinforcement.

1 Introduction

Project Overview

The Site and surrounds

The Walsh Bay Arts Precinct (WBAP) (the “site”) generally comprises Pier 2/3, Pier 4/5 and its shore sheds which make up Wharf 4/5, as well as the adjoining waterway. The site has a street frontage to Hickson Road. The site is shown in Figures 1 and 2. The site is part of the Walsh Bay area which is located adjacent to Sydney Harbour within the suburb of Dawes Point. The site is located within the City of Sydney Local Government Area.

Walsh Bay is strategically located to the north of Sydney’s CBD in the vicinity of major tourist destinations including the Sydney Harbour Bridge, the historic areas of Millers Point and The Rocks, Circular Quay and the Sydney Opera House. The Barangaroo redevelopment precinct is located immediately to the south-west.

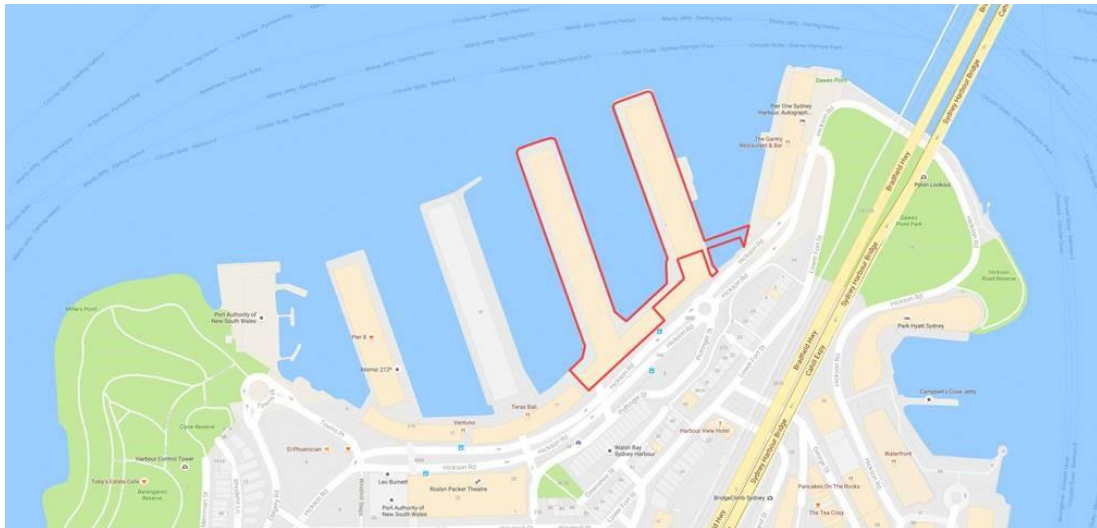


Figure 1: Site Location (Source: Google Maps)

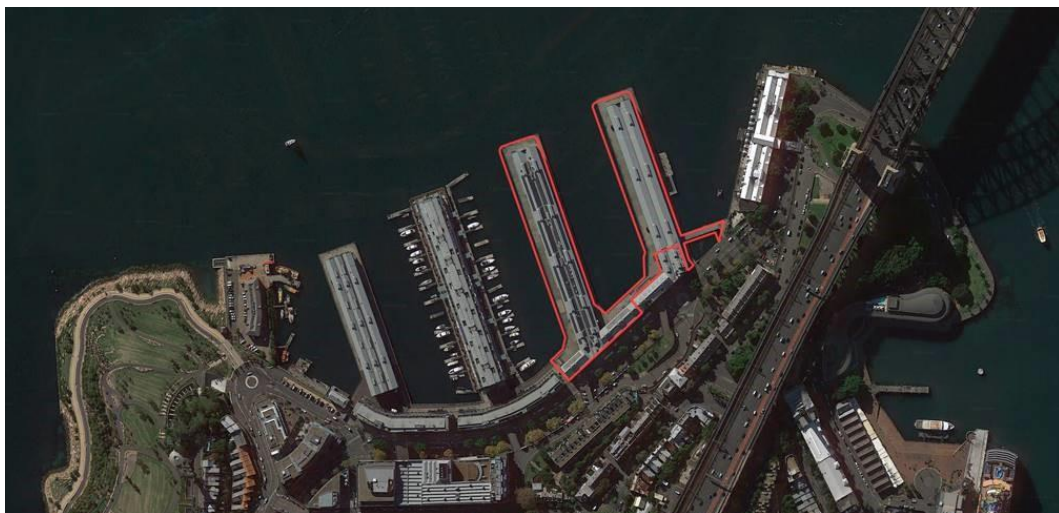


Figure 2: Aerial view (Source: www.nearmap.com)

Pier 2/3 is legally described as Lot 11 in DP 1138931 and Wharf 4/5 is legally described as Lot 65 in DP 1048377. The total area for these lots is 18,090sqm.

The land owner of the site is the Roads and Maritime Services (RMS). Both Pier 2/3 and Wharf 4/5 are occupied under various lease arrangements with Arts NSW, Department of Justice, primarily for arts and cultural uses.

The area of water that the project proposes to build over is also owned by RMS. Its land title description is Lot 12 in DP 1138931.

Walsh Bay comprises ten berths constructed between 1908 and 1922 for international and interstate shipping. These are collectively known as the Walsh Bay Wharves. The Walsh Bay Wharves Precinct is listed as an item on the State Heritage Register.

The Walsh Bay Wharves comprise the following:

- Pier One which contains the Sebel Pier One Sydney Hotel;
- Pier 2/3 the last remaining undeveloped pier (has previously received approval for cultural uses, temporary arts events and some commercial events);
- Wharf 4/5 which is occupied by the Sydney Theatre Company (STC), the Australian Theatre for Youth Program (ATYP), Sydney Dance Company (SDC), Bangarra Dance Theatre and the choirs comprising Gondwana, the Song Company and Sydney Philharmonia;
- Pier 6/7 which has been redeveloped for residential apartments and associated boat marina;
- Pier 8/9 which has been redeveloped for office uses; and,
- Shore sheds aligning Hickson Road which contain a range of commercial activities, including restaurants, bars, shops and offices.

2.4 The Project

The approved Stage 1 development application comprised:

- A new waterfront public square between Pier 2/3 and Wharf 4/5;
- A series of new stairs and balconies on Pier 2/3 and Wharf 4/5 and modification to the roof of Pier 2/3;
- The inclusion of new tenancy spaces in Pier 2/3 and Wharf 4/5 for arts and cultural activities; and,
- The use of the precinct for arts festivals, events and pop-ups and associated uses, including restaurants, cafes and bars.

The WBAP Stage 2 State Significant Development Application seeks consent for construction works for the above to realise the WBAP project, as well as the proposed external alterations and additions to all of Wharf 4/5. It also seeks consent for new commercial and event uses in the precinct. Key aspects of the proposed development are outlined below:

Early works

- Early construction works comprising infrastructure upgrades, demolition, hazmat removal and sub structure works.

Pier 2/3

- Internal alterations and reconfiguration to provide for the following:
 - Performance venues;
 - Rehearsal rooms, production workshops, back of house facilities and offices;
 - Function spaces, bars, cafes and foyer spaces extending onto external gantry platforms (balconies) providing breakout space for internal foyers and allowing views of outdoor performances;
 - Mezzanine spaces for offices and back of house facilities;
 - Upgrades to meet compliance with current BCA, DDA and fire codes;
 - New lifts and stairs;
 - Creation of new commercial tenancies and public toilets;
 - Removal of some storey posts and beams to facilitate internal reconfiguration and new uses; and
 - Retention of a large proportion of the ground floor in its existing 'raw' heritage state for events and festivals including Sydney Writers' Festival and Biennale including venue and commercial hire.
- External alterations and additions comprising:
 - New balconies and external stairs for fire egress;
 - New external lift for access;
 - Installation of glazing in existing cargo sliding door openings and other solid panels on the eastern, western and northern elevations to allow for views into and out of the building;
 - Roof penetrations within the central valley at the southern and northern end to accommodate new performance spaces and associated structural modifications including truss strengthening;
 - Installation of ESD elements, such as photovoltaic panels and seawater heat exchange systems; and
 - Raising of the external floor level on the eastern side by introducing a new raised deck and continuous set of stairs beyond the existing column line.

Wharf 4/5

- Internal alterations and reconfiguration to the Bangarra Dance Theatre (BDT) tenancy to provide for the following:
 - Upgrade of the main rehearsal and performance spaces;
 - Upgraded foyer and exhibition space along the eastern frontage;

- Improved office space at mezzanine level including a new lift and stairs;
- Provision of a function space at ground level of the northern end of wharf with associated kitchen facilities; and
- New entrance and new glazing in bays of sliding cargo doors, opening up the foyer and main studio to the Pier 4 apron.
- Minor internal alterations and additions to the SDC tenancy comprising:
 - Reducing the existing workshop space to create a fifth dance studio; and
 - Upgrading office and reception areas.
- External alterations and additions to SDC tenancy comprising:
 - Raising of the timber wharf deck adjoining the SDC café and opening of the facade with new glazing to activate the waterfront square.
- Creation of new commercial tenancies and public toilets;
- External fabric alterations around the Sydney Theatre Company (STC) tenancy comprising:
 - Improved street entry at Hickson Road involving relocation of the stairs to allow for an improved landing and point of arrival to the STC;
 - New ‘gantry’ balconies, stairs and lifts mid-wharf and at the end of the wharf to provide for improved accessibility and compliance with fire engineering solutions;
 - Minor amendments to the existing façade to accommodate new entries and exits along the wharf;
 - Roof penetrations within the central valley at two locations to accommodate theatre and workshop spaces and associated structural modifications including truss strengthening; and
 - Reinstallation of existing photovoltaic panels where applicable.

Wharf 4/5 Shore Sheds

- Internal alterations to reconfigure the choir spaces, including provision of a mezzanine for choir administration;
- Creation of new commercial tenancies at ground and mezzanine levels; and
- Provision of office space at ground level.

Public Domain

- Construction of a new waterfront square comprising a deck on piled structure;
- Shaded informal performance space on piled structure; and
- Changes to existing levels and steps down to facilitate access between the existing apron and new waterfront square.

New Uses

- Use of the precinct for arts festivals, events and pop ups as well as a range of activating uses such as retail, restaurants, cafes and bars.

2 Infrastructure Provider Consultations

The Hydraulic utilities surrounding the Walsh Bay Arts Precinct satisfy the requirements from the onsite sewer, water and gas demands of the site.

Power load assessments have identified a need to increase the Pier 2/3 feeders from the existing two 800A to allow for an additional supply capacity of 1100A, achieving 2700A in total.

Power load assessments have identified a need to increase the Wharf 4/5 feeders from the existing two 400A to allow for an additional supply capacity of 300A, achieving 1100A in total (excluding STC 50 supplies).

Early indications are that there is a requirement for the augmentation of the local electrical utility network in order to supply the development. Negotiations are ongoing with Ausgrid regarding the above modifications to the feeders and the local electrical network reinforcement arrangements.

3 SEARs Issues Addressed

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19. Utilities

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4 Building Loads

In order to assess the capabilities of the surrounding utility services infrastructure Arup have undertaken a preliminary load take down assessment for the development.

The estimates of the demands imposed upon different existing utilities by the WBAP project are as follows:

4.1 WBAP Infrastructure Loads

Proposed WBAP Loads		
Utility Service	Pier 2/3 (Including Shore Sheds)	Wharf 4/5 (Including STC50)
Potable Water Supply	4.2 L/s	4.5 L/s
Gas	2,052 MJ/hr	4,745 MJ/h
Sewer	9.95 L/s	11.30 L/s
General Stormwater;	Roofs 1:100 year ARI to be piped (270 mm/hr)	Roofs 1:100 year ARI to be piped (270 mm/hr)
Power	2700A + (SS 1 x 800 A supply)	1100A + (STC50 2 x 630 A supply)

Table 1: Proposed WBAP Load estimates for utility services

5 Utilities Services

The development is a refurbishment of the existing buildings located on Pier 2/3 and Wharf 4/5. The function of the buildings on-site have changed use slightly with the overall site demands increasing. The initial studies suggest the existing infrastructure (outlined below) can comfortably cater for the increased load from the revamped buildings. The following provides an outline of the existing infrastructure serving the development.

5.1 Water, Sewer and Stormwater

The Arup design team have reviewed the Dial Before You Dig (DBYD) information for the precinct and have identified the existing utility infrastructure around the precinct.

5.1.1 Existing Infrastructure Services

Utility services are present around the precinct. The existing services are described as follows and are detailed in the figures below. The following legend can be used as a reference for diagrams outlined below:

Sewer		Water	
Sewer Main (with flow arrow & size type text)		WaterMain - Potable (with size type text)	
Disused Main		Disconnected Main - Potable	
Rising Main		Proposed Main - Potable	
Maintenance Hole (with upstream depth to invert)		Water Main - Recycled	
Sub-surface chamber		Special Supply Conditions - Potable	
Maintenance Hole with Overflow chamber		Special Supply Conditions - Recycled	
Ventshaft EDUCT		Restrained Joints - Potable	
Ventshaft INDUCT		Restrained Joints - Recycled	
Property Connection Point (with chainage to downstream MH-)		Hydrant	
Concrete Encased Section		Maintenance Hole	
Terminal Maintenance Shaft		Stop Valve	
Maintenance Shaft		Stop Valve with By-pass	
Rodding Point		Stop Valve with Tapers	
Lamphole		Closed Stop Valve	
Vertical		Air Valve	
Pumping Station		Valve	
Sewer Rehabilitation		Scour	
		Reducer / Taper	
		Vertical Bends	
		Reservoir	
		Recycled Water is shown as per Potable above. Colour as indicated	

Existing water mains are available running along Hickson Road as follows:

- 200 mm oriented polyvinylchloride water main

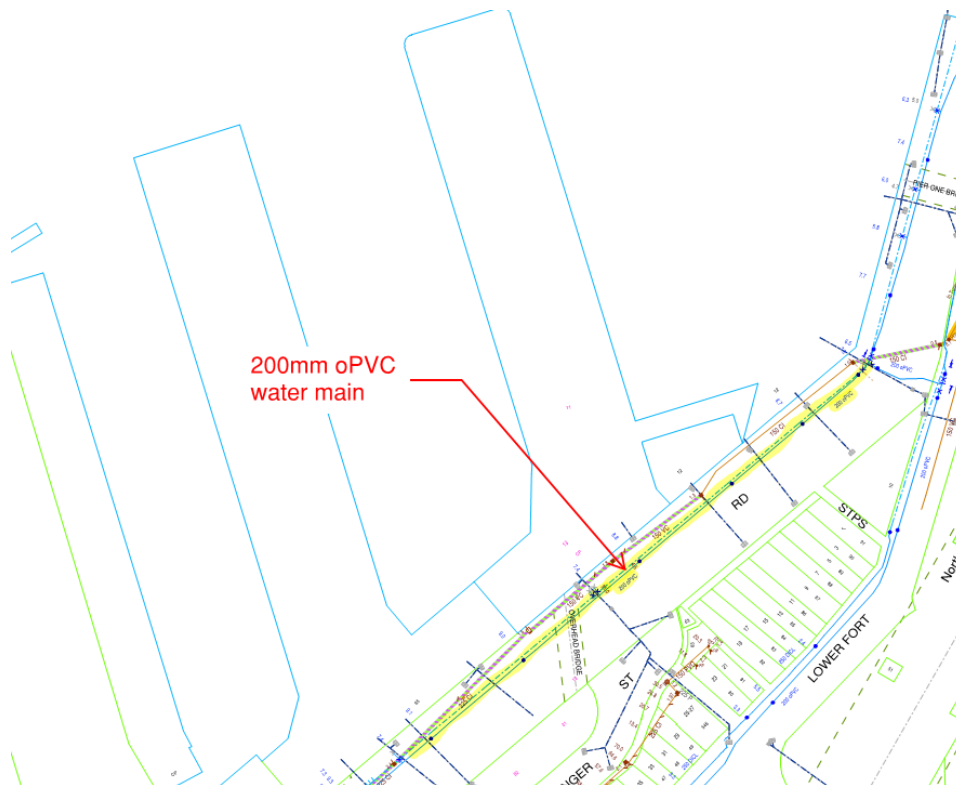


Figure 1 – Sydney Water, Water Supply infrastructure overview

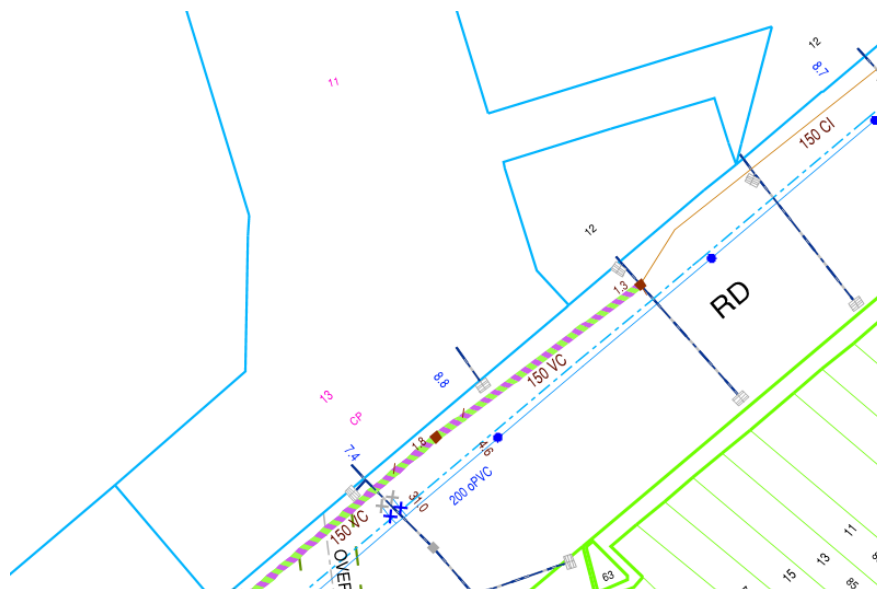


Figure 2 – Pier 2/3 water infrastructure

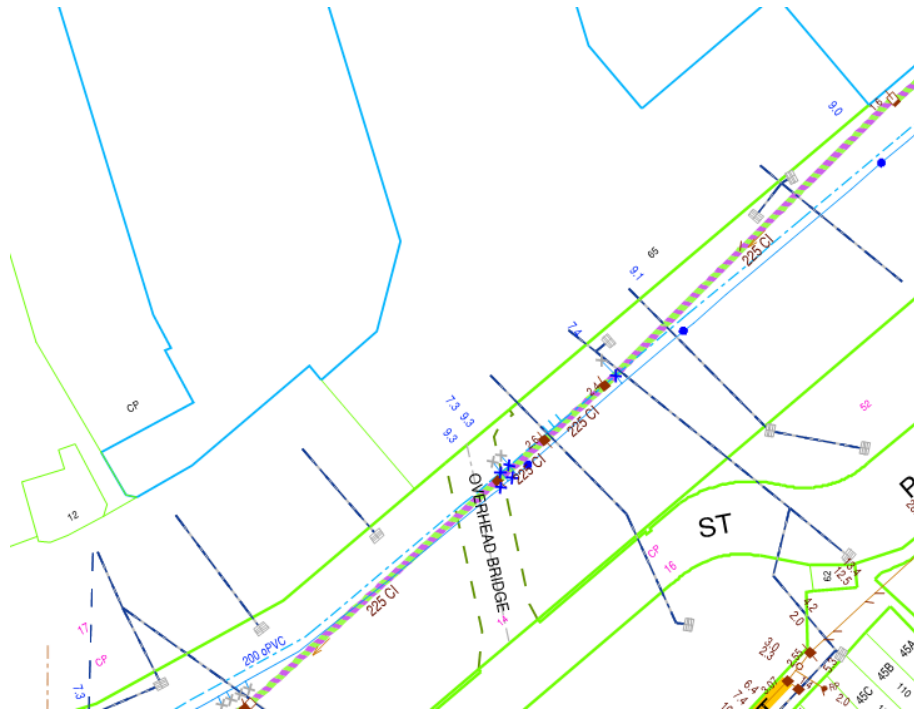


Figure 3 – Wharf 4/5 water infrastructure

The water supply infrastructure within the Sydney CBD is considered a critical asset by Sydney Water. The mains are heavily interconnected and served from multiple reservoirs. The mains therefore are very reliable and are maintained to a high degree by Sydney Water commensurate with their critical asset status. Sydney Water has management plans in place to redirect supplies should failures occur resulting in a high degree of security for the developments served from this infrastructure.

In general, the size of the water mains in Hickson Road can easily support this development based on the flow rates identified in Section 3. The design is progressing with the existing water mains connecting from Hickson Road.

Sewer

The existing rehabilitated sewer mains are available running along Hickson Road as follows:

- 225 mm cast iron main
- 150 mm vitrified clay main

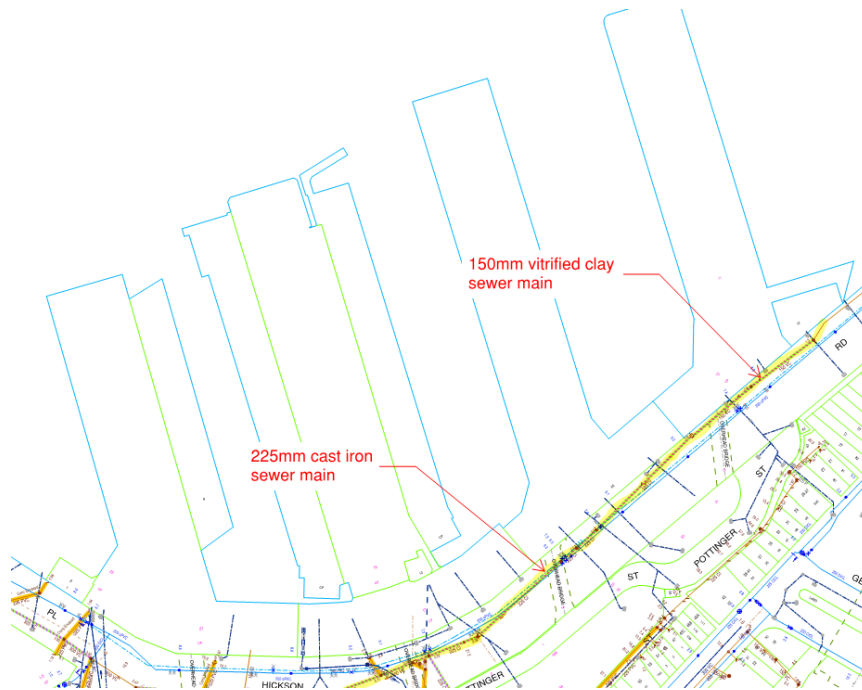


Figure 2 – Sydney Water, Sewer Infrastructure overview

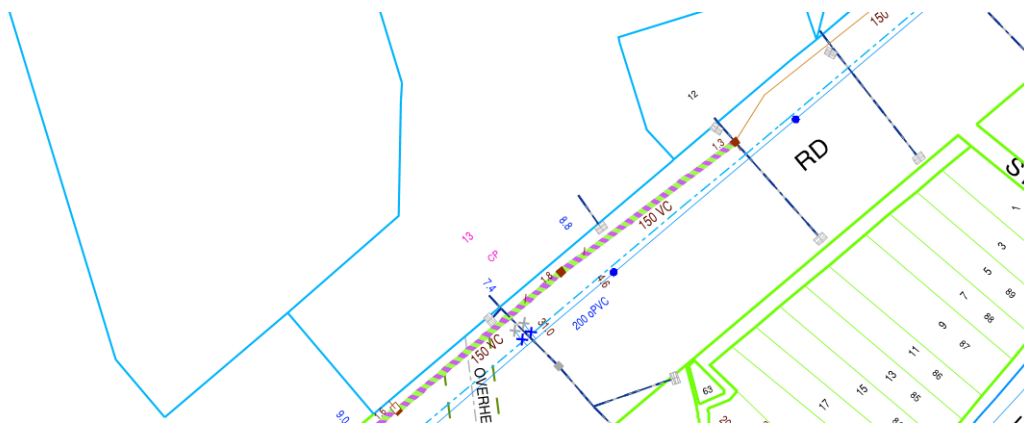


Figure 3 – Pier 2/3 sewer infrastructure

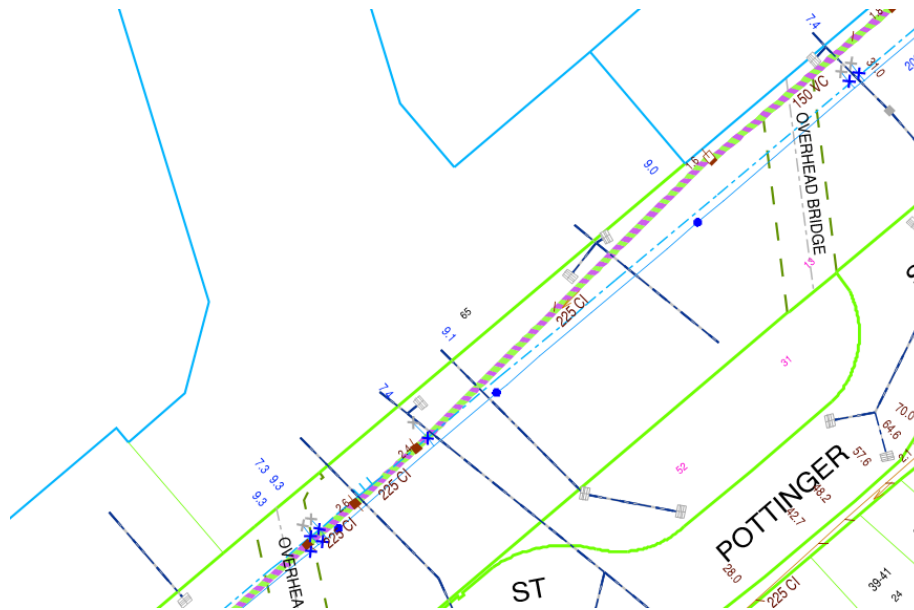


Figure 4 – Wharf 4/5 sewer infrastructure

Sewer lines will drop to below the wharf and gravitate to sewer. Where this is not possible wastes will be pumped into the gravity lines from underslung pump out pits.

Stormwater

The existing roof drainage will be adjusted to cater for the raised roof sections and new valley gutters for both Pier 2/3 and Wharf 4/5.

These roofs will be configured to connect into the existing external down pipes. The roof area remains unchanged and all runoff will collect to the existing infrastructure.

5.1.2 Required Alterations

Cold water

At present, Arup anticipate a marginal increase in cold water demand over and above the existing site supplies for Wharf 4/5. A significant increase is anticipated for Pier 2/3, a new cold water supply will be extended from the boundary meter.

Sewer drainage

At present, Arup anticipate marginal increases in sewer discharge over and above the existing site capacity for Wharf 4/5. However a significant increase is anticipated for Pier 2/3. A new sewer service will be provided to Pier 2/3 to cater for the additional loads.

Stormwater drainage

The existing below ground/wharf drainage systems will be maintained and new gutters and roofs will be provided where required for the new roof structures.

5.2 Natural gas

The site is currently served by a dedicated external meters from Hickson Road that separately feed both Pier 2/3 and Wharf 4/5.

5.2.1 Existing Services

The existing gas services are described as follows.

- 7 kPa 160 mm polyethylene main
- 7 kPa 110 mm nylon inserted into 11NB cast iron main

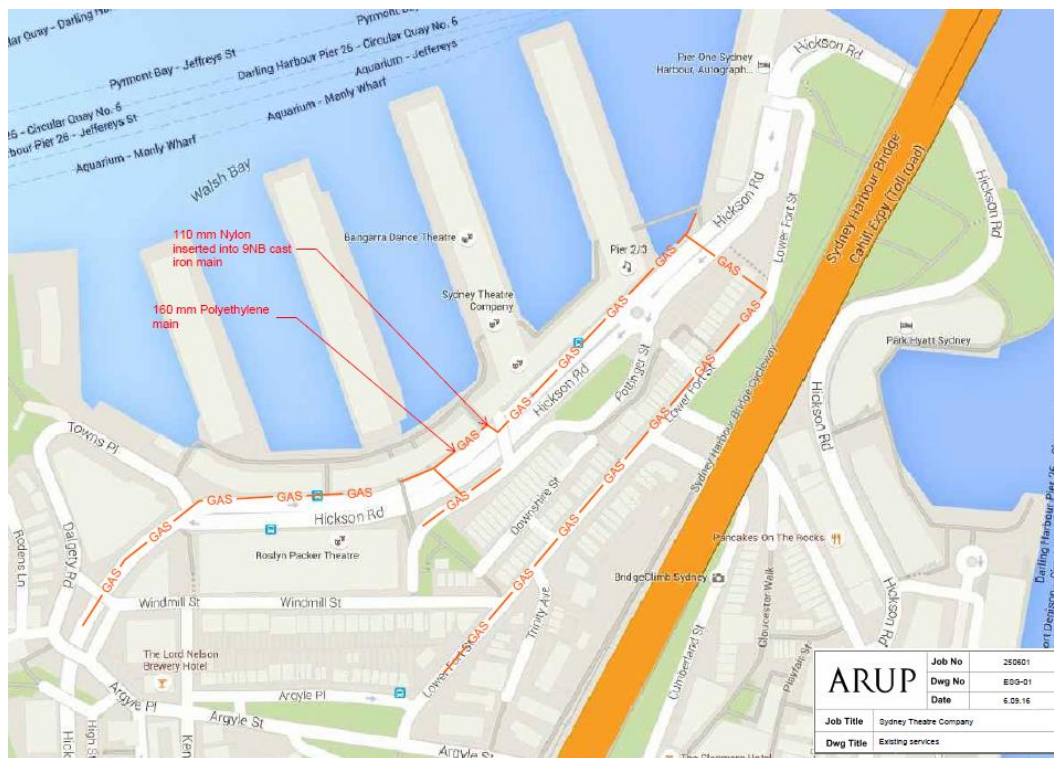


Figure 3 – Natural Gas Infrastructure

5.2.2 Required Alterations

We anticipate the new loads from the proposed works will increase marginally for both Wharf 4/5 and Pier 2/3. A new dedicated meter/regulator set will need to be provided for Pier 2/3. No additional meter/regulator is required for Wharf 4/5 based on site investigations as there appears to be enough capacity from the existing pipework on site. The external (Jemena) gas mains can provide ample gas for the proposed works onsite.

5.3 Power Supply

The Walsh Bay Arts Precinct is supplied at low voltage from the local Ausgrid network. The Ausgrid substations supporting the site are located adjacent to the site, on the south side of Hickson Road.

Incoming customer mains reticulate through an underground network of conduits and cable pits from the supplying substations, beneath Hickson Road, and upturn within the respective switch rooms.

Pier 2/3 Existing Supplies

Two existing 800A incoming supplies are located within Pier 2/3 Main Switchroom, supplying Pier 2/3.

The two supplies are referenced as;

- Pier 2/3 Main Switchboard 1, supplying;
 - Pier 2/3 House Services
 - Pier 2/3 Safety Services
 - Pier 2/3 Lift
- Pier 2/3 Main Switchboard 2, supplying;
 - No documented outgoing services

These two 800A incoming supplies are routed from the Walsh Bay Precinct Substation S4807, located across Hickson road, opposite the development.

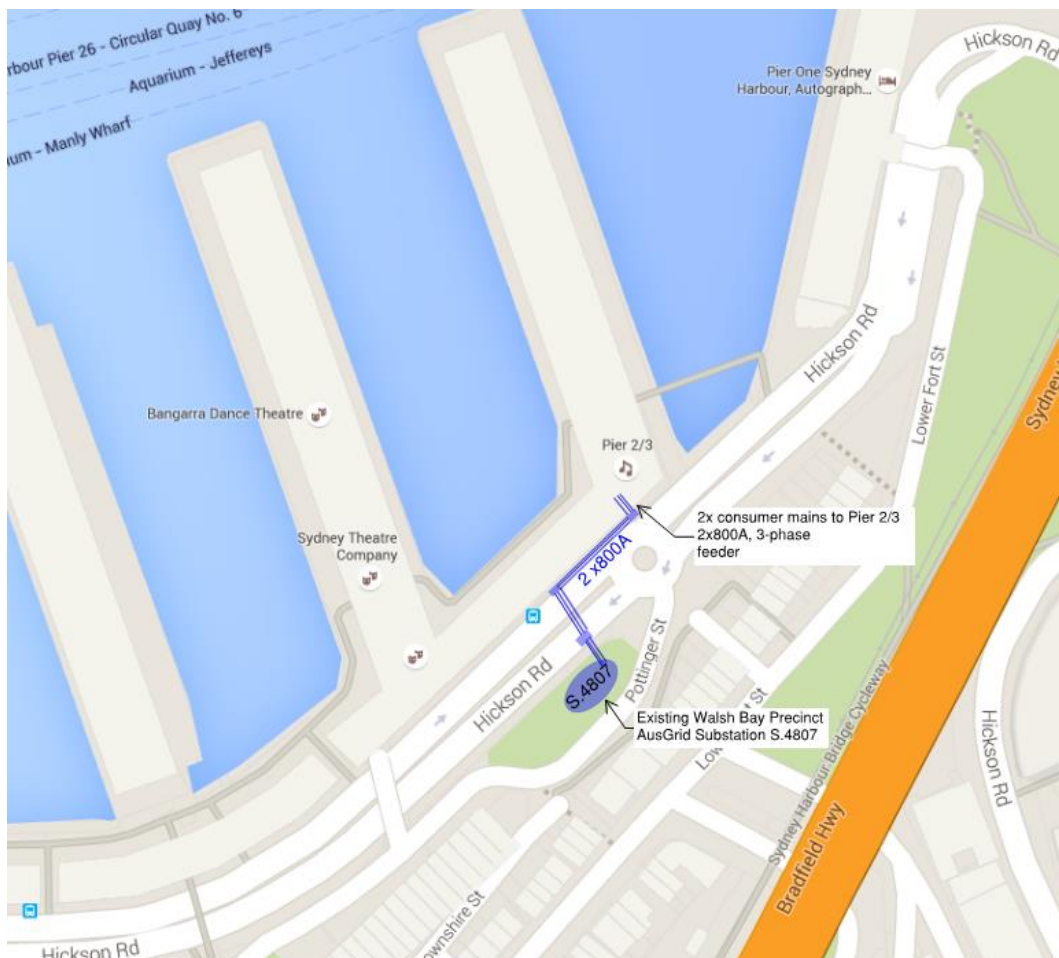


Figure 4 – Pier 2/3 Existing Incoming Supplies

A third incoming supply is located within the Pier 2/3 switchroom, supplying the Shore Sheds.

This supply is referenced as;

- Shore Sheds Main Switchboard 2, supplying;
 - Shore Sheds (East) and Pier 2/3 Safety Services
 - Shore Sheds Lifts

- Charter Vessel Mooring Supply
- Shore Sheds (East) House Services
- Shore Sheds (East) Tenant Services

However, these tenant spaces are out of scope and are intended to remain unaffected though the redevelopment of the site.

Wharf 4/5 Existing Supplies

Two existing 400A supplies are located within the Wharf 4/5 Main Switchrooms, supplying Wharf 4/5.

The two switchboards are referenced as;

- Wharf 4/5 Main Switchboard 1, supplying;
 - Bangarra
 - Sydney Dance Company
 - Solar DBs
 - Sydney Theatre Company Mechanical Services
 - Wharf 4/5 Main Switchboard 2
- Wharf 4/5 Main Switchboard 3, supplying;
 - Shore Sheds (West) House Services
 - Shore Sheds (West) Tenant Services
 - Wharf 4/5 Tenant Services located across Hickson road, opposite the development.

Wharf 4/5 Main Switchboard 1 400A incoming supply is routed from the Walsh Bay Precinct Substation S4807, located across Hickson Road, opposite the development.

Wharf 4/5 Main Switchboard 3 400A incoming supply is routed from the Walsh Bay Precinct Substation S5704, located North East along Hickson Road.

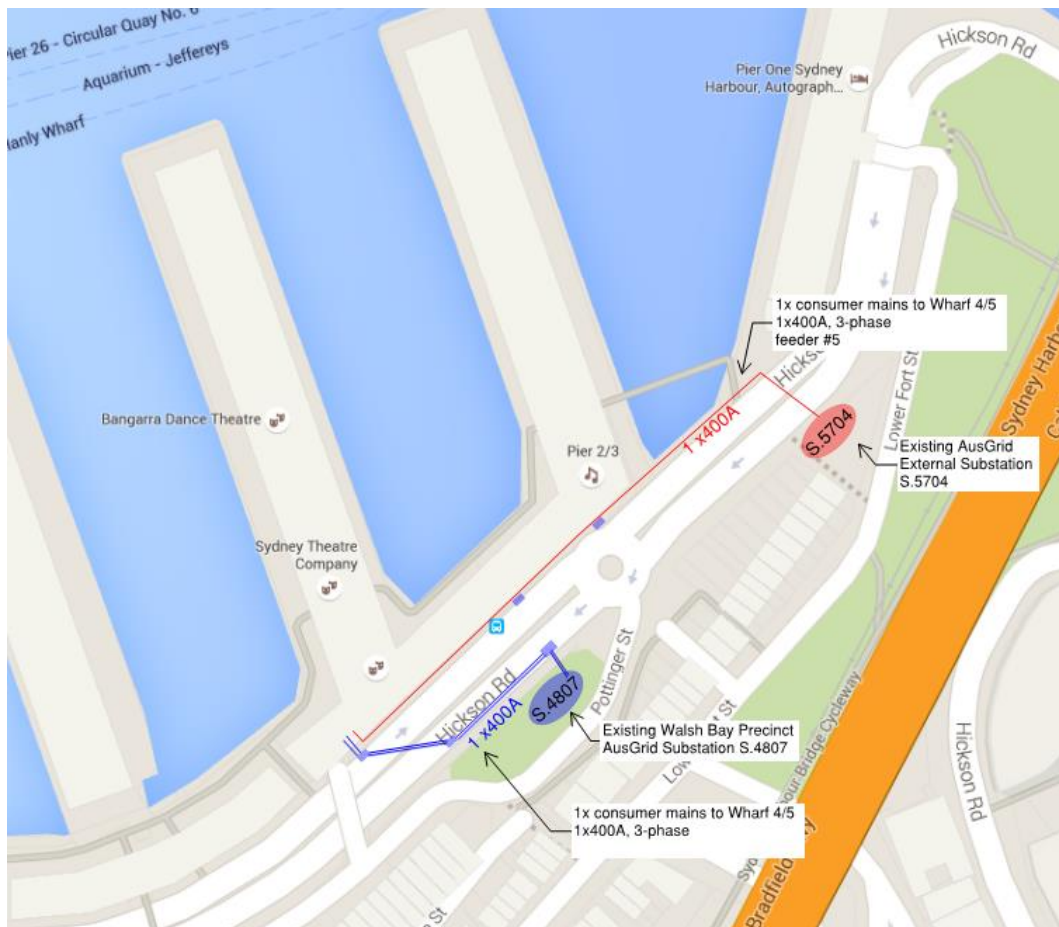


Figure 1 – Wharf 4/5 Existing Incoming Supplies

A third incoming supply is located within Wharf 4/5 switchroom, supplying Sydney Theatre Company.

This supply is referenced as;

- Wharf 4/5 Main Switchboard 2, supplying;
 - Sydney Theatre Company Safety Services
 - Sydney Theatre Company Services
 - Solar DBs

However, this STC internal spaces are out of the scope of this application

5.3.1 Future Loads

Pier 2/3 is undergoing substantial redevelopment, including the incorporation of new theatre, rehearsal and event spaces, with new catering facilities, each of which yield an increase in electrical demand. This increase in demand will see the current 1600A of supply increase to a 2700A requirement.

Wharf 4/5 spaces are being upgraded. Included in this, is an enhancement to stage lighting and audio provisions, and new catering facilities, yielding an increase in electrical demand. This increase in demand will see the current 800A of supply increase to close to a 1100A requirement.

Ausgrid have advised that an increase in supply of this magnitude will require augmentation to the local utility network as;

- There is insufficient capacity in the local substation S4807 to cater for the further required connections to the current configuration of the site.
- There are no further connections permissible from the existing outdoor enclosure substation S.5704 as the substation is planned for decommission.
- Three 800A connections is the Ausgrid typical limit of connections to a remote single site.+
- Augmentation arrangements of the local utility network are currently being negotiated with Ausgrid. This will be achieved by either an upgrade to the existing S4807 substation, or the formation of a new chamber substation. Two chamber substation locations are currently being negotiated with Ausgrid; Adjacent to S4807 opposite the development.

5.4 Communications

Pier 2/3 and Wharf 4/5 each has an existing MDF, which are located within the Main Switch rooms.

New lead-in cable routes will be provided for multiple service providers. Lead in conduits will go to a new Building Distributor Rooms situated in Pier 2/3 and Wharf 4/5. Methods of reticulation need to be further developed in discussion with communication service provider with regards to complexities of trenching and water ingress, but existing service routing will be utilised where possible.

Fibre optic lead-in cables from communication services provider will be provided depending on agreement with the respective carriers.

6 Conclusion

The infrastructure loads for the redevelopment of WBAP have been assessed and summarised in Section 4. The analysis shows that the water supply, gas and sewer utility services are capable of supporting the development. A new natural gas service will be required to extend to the Northern end of Pier 2/3 to support the proposed works. The external Jemena infrastructure can comfortably handle the new works. A new meter/regulator set will be required for Pier 2/3 with a new private gas supply serving the Pier for the proposed works.

Power load assessments have identified a need to increase the Pier 2/3 feeders from the existing two 800A to allow for an additional supply capacity of 1100A, achieving 2700A in total.

Power load assessments have identified a need to increase the Wharf 4/5 feeders from the existing two 400A to allow for an additional supply capacity of 300A, achieving 1100A in total (Excluding STC 50 supplies). Early indications are that a new electrical substation will be required to reinforce the local electrical utility network in order to supply the development. Negotiations are ongoing with Ausgrid regarding the above modifications to the feeders and confirm the extent of the local electrical network reinforcement.