



Integrated Management System

# Planning Approval Consistency Assessment Form

SM ES-FT-414

Sydney Metro Integrated Management System (IMS)

<b>Assessment Name:</b>	Barangaroo Northern Shaft Shed Height
<b>Prepared by:</b>	Pam Tummers
<b>Prepared for:</b>	Sydney Metro
<b>Assessment number:</b>	TfNSW39
<b>Status:</b>	Final
<b>Version:</b>	0.0
<b>Planning approval:</b>	SSI 15_7400
<b>Date required:</b>	03 August 2020
<b>iCentral number</b>	SM-20-00085315

Form information – do not alter

<b>Form number</b>	SM ES-FT-414
<b>Applicable to:</b>	Sydney Metro
<b>Document Owner:</b>	Principal Manager, Sustainability, Environment & Planning
<b>System Owner:</b>	Executive Director, Safety, Sustainability & Environment
<b>Status:</b>	Final
<b>Version:</b>	2.0
<b>Date of issue:</b>	27 April 2018
<b>Review date:</b>	27 April 2019

© Sydney Metro 2018

## Table of Contents

1.0 Existing Approved Project .....	3
2.0 Description of proposed development/activity/works .....	5
3.0 Timeframe .....	5
4.0 Site description .....	6
5.0 Site Environmental Characteristics .....	6
6.0 Justification for the proposed works .....	7
7.0 Environmental Benefit .....	7
8.0 Control Measures .....	7
9.0 Climate Change Impacts .....	7
10.0 Impact Assessment – Construction .....	8
11.0 Impact Assessment – Operation .....	11
12.0 Consistency with the Approved Project .....	13
13.0 Other Environmental Approvals .....	14
Author certification .....	15
Environmental Representative Review .....	15
Appendix A .....	17
Appendix B .....	20



The Planning Approval Consistency Assessment Form should be completed in accordance with the Sydney Metro Planning Approval Consistency Assessment Procedure (SM ES-PW-314) and Sydney Metro Environmental Planning and Approval Manual (SM ES-ST-216)

## 1.0 Existing Approved Project

Planning approval reference details (Application/Document No. (including modifications)):

SS115\_7400 Sydney Metro City & Southwest – Chatswood to Sydenham

Mod 1 Victoria Cross Station, Artarmon Substation and minor administrative mod

Mod 2 Central Walk mod

Mod 3 Martin Place Station mod

Mod 4 Sydenham Station and Sydney Metro Trains Facility South mod

Mod 5 Blues Acoustic Shed

Mod 6 Administrative Changes

Mod 7 Administrative Changes

Date of determination:

Infrastructure Approval date 09 January 2017

Modification 1 Approval date 18 October 2017

Modification 4 Approval date 13 December 2017

Modification 2 Approval date 21 December 2017

Modification 3 Approval date 22 March 2018

Modification 5 Approval date 02 November 2018

Modification 6 Approval date 21 February 2019

Modification 7 Approval date 29 June 2020

Consistency Assessment Barangaroo Northern Shaft (TfNSW 20 Approved 14 March 2018)

Type of planning approval:

Critical State Significant Infrastructure

Description of existing approved project you are assessing for consistency:

Consistency Assessment TfNSW20 approved the following works within the Hickson Road road reserve associated with the temporary northern shaft at Barangaroo:

- 1) Installation of a 21m high acoustic shed tethered into the Hickson Road rock face cutting (Stage 1).
- 2) Excavation of a shaft within the acoustic shed and subsequent use of the shaft for tunnelling support operations, spoil removal, concrete deliveries TBM assembly and launching,
- 3) Reduced shed height to approximately 16m for tunnel and station fitout activities (Stage 2).

These works were assessed at the time to increase the visual impacts from minor adverse impacts in the EIS, to moderate adverse visual impacts looking south from Hickson Road at the Windmill Street Bridge during Stage 1.

Two additional viewpoints were included in the Consistency Assessment that were not assessed in the EIS, namely:

- a. northeast from the footpath on Dalgety Road.
- b. Southwest from Windmill Street

Both viewpoints were assessed as having high adverse visual impact during Stage 1 due to the shed rising unobstructed above the Dalgety Road and Windmill Street bridges and blocking views of heritage buildings and the harbour bridge, and foreshortening the view.

Relevant background information (including EA, REF, Submissions Report, Director General's Report, MCoA):

Consistency Assessment Barangaroo Northern Shaft (TfNSW 20 Approved 14 March 2018)

## 2.0 Description of proposed development/activity/works

Describe ancillary activities, duration of work, working hours, machinery, staffing levels, impacts on utilities/authorities, wastes generated or hazardous substances/dangerous goods used.

It is proposed to retain the existing 21m high shed for the tunnel and station fitout activities (Stage 2). The reduction in shed height was originally proposed to mitigate visual impacts in the area. In actuality, visual amenity from the 21 m high shed between the Dalgety Road, Argyle Place and Windmill street has not been impacted as considerably as assessed in the Consistency Assessment Barangaroo Northern Shaft (TfNSW20), with the impacts mitigated through the shape, line and colour disguising the form of the enclosure.

**Appendix A** summarises the visual impact assessment contained within TfNSW20 against actual viewpoints with the 21m high shed in place. There is no worsening of visual impacts by retaining the existing shed height, the existing impacts will continue for longer.

There have been no complaints about the visual amenity of the shed.

Not having to remove the shed and replace with one of a lesser height would have no impact on the duration of work with the schedule for decommissioning of the shaft in 2024 remaining in place. Machinery, staffing levels and working hours are expected to remain unchanged also.

## 3.0 Timeframe

When will the proposed change take place? For how long?

Handover of the existing shed for tunnel and station fitout activities is currently scheduled for around mid 2021, and the shed will be in place until 2024.

## 4.0 Site description

Provide a description of the site on which the proposed works are to be carried out, including, Lot and Deposited Plan details, where available. Map to be included here or as an appendix. Detail of land owner.

Barangaroo Station is located between Hickson Road and Nawi Cove / Sydney Harbour, within the suburb of Barangaroo and to the north of the Central Barangaroo development.

The temporary northern shaft is within the northern section of the approved Barangaroo Station Construction Site as shown in Figure 7-13 from the EIS and is entirely within the road surface and road reserve of Hickson Road Millers Point, see **Appendix B** for a map of the site.

## 5.0 Site Environmental Characteristics

Describe the environment (i.e., vegetation, nearby waterways, land use, surrounding land use), identify likely presence of protected flora/fauna and sensitive area.

The site is located at Millers Point and is associated with the construction of the Sydney Metro Barangaroo Station being undertaken south of the shed location. The site comprises of Hickson Road between Dalgety Road, Argyle Place and Windmill Street and is located in the state heritage significant Millers Point Heritage Conservation Area and the Millers Point & Dawes Point Village Precinct Heritage Conservation Area, refer to map in **Appendix C**.

The development of Barangaroo Central is located to the south of the Barangaroo Station site and currently comprises iNSW (formally Barangaroo Delivery Authority (BDA)) construction activities. The Cutaway cultural space, Nawi Cove and on to Sydney Harbour are located to the west of the shed.

Residential properties are located above the cliff wall on Dalgety Road and Windmill Street, and along Hickson Road north of the shed. There is no vegetation or protected species impacted by the site.

## 6.0 Justification for the proposed works

Address the need for the proposed works, whether there are alternatives to the proposed works (and why these are not appropriate), and the consequences with not proceeding with the proposed work.

The alternative to retaining the existing shed height is to reduce it so that it doesn't protrude up between the Dalgety Road and Windmill Street bridges. The two stage approach is no longer appropriate as continuing the visual impacts of the existing shed height is not considered significant enough to be unacceptable. Consequences of not retaining the existing shed height are:

- Increased risk of damage to the Hickson Road wall from demolition of one shed, installation of another, and then a second demolition activity.
- Additional noise impacts from shed reconstruction works.
- Duplicate truck movements from transporting one shed out and a second shed into the site.
- Increase in the amount of waste materials from two sheds instead of one.

## 7.0 Environmental Benefit

Identify whether there are environmental benefits associated with the proposed works. If so, provide details:

The acoustic shed will continue to provide noise and dust mitigation for tunnel and station fitout activities, followed by reinstatement. Additional environmental benefits provide the justification for the proposed works as outlined in section 6.0 above.

## 8.0 Control Measures

Will a project and site specific EMP be prepared? Are appropriate control measures already identified in an existing EMP?

Yes – A site specific Environmental Management Plan will be prepared by the Barangaroo Station contractor for implementing during use of the shed for tunnel and station fitout activities.

## 9.0 Climate Change Impacts

Is the site likely to be adversely affected by the impacts of climate change? If yes, what adaptation/mitigation measures will be incorporated into the design?

The scope is temporary and would not directly be impacted by climate change.

## 10.0 Impact Assessment – Construction

Attach supporting evidence in the Appendices if required. Make reference to the relevant Appendix if used.

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed/activity, relative to the Approved Project	Proposed Control Measures in addition to project COA and REMMs	Minimal Impact Y/N	Endorsed	
				Y/N	Comments
Flora and fauna	No change from approved project.	No additional measures required	Y	Y	
Water	No change from approved project.	No additional measures required	Y	Y	
Air quality	No change from approved project.	No additional measures required	Y	Y	
Noise vibration	Positive impact – no second period of shed construction impacts including steel works, cladding, carnage, some of which was done out of hours for the existing shed.	No additional measures required	Y	Y	
Indigenous heritage	No change from approved project.	No additional measures required	Y	Y	
Non-indigenous heritage	Position impact - retaining the existing shed will reduce the risk of damage to the adjacent Hickson Road wall from dismantling one shed and installing a second (which is also later dismantled) which doubles the amount of construction work in the area.  Localised temporary visual impacts on listed items on Windmill Street will continue for longer, however the design and colour scheme has mitigated these impacts.	No additional measures required.	Y	Y	



Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed/activity, relative to the Approved Project	Proposed Control Measures in addition to project COA and REMMs	Minimal Impact Y/N	Endorsed	
				Y/N	Comments
Community and stakeholder	<p>Public notification issued March 2018 at the time of constructing the existing shed indicated the area would be used for TBM and tunnelling plant and to provide access for workers to the tunnels, with the shed built to minimise noise and dust impacts from excavation and rock breaking (refer to <b>Appendix D</b>).</p> <p>Community consultation was held at the High Street open area following the shed construction and feedback from the public has been positive about the shed's amenity.</p> <p>Newsletters and notifications also advised of the proposal and amenity.</p>	Ongoing community notification	Y	Y	
Traffic	Positive impact – truck movements not required to remove the existing shed, and to deliver materials for a second shed.	No additional measures required.	Y	Y	
Waste	Positive impact – reuse of the existing shed and no new materials required to build a second shed.	No additional measures required.	Y	Y	
Social	No change from the approved project.	No additional measures required.	Y	Y	
Economic	No change from the approved project.	No additional measures required.	Y	Y	

(Uncontrolled when printed)

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed/activity, relative to the Approved Project	Proposed Control Measures in addition to project COA and REMMs	Minimal Impact Y/N	Endorsed	
				Y/N	Comments
Visual	The existing visual impacts of the 21m high shed will continue until 2024. These impacts have been less than those assessed in the original Consistency Assessment and are considered acceptable.	No additional measures required.	Y	Y	
Urban design	No change from the approved project.	No additional measures required.	Y	Y	
Geotechnical	No change from the approved project.	No additional measures required.	Y	Y	
Land use	No change from the approved project.	The impact is temporary and aligns with the current land use.	Y	Y	
Climate Change	No change from the approved project.	No additional measures required.	Y	Y	
Risk	No change from the approved project.	No additional measures required.	Y	Y	
Other	No change from the approved project.	No additional measures required.	Y	Y	
Management and mitigation measures	No change from the approved project.	No additional measures required.	Y	Y	

## 11.0 Impact Assessment – Operation

Attach supporting evidence in the Appendix if required. Make reference to the relevant Appendix if used.

Aspect	Nature and extent of impacts (negative and positive) during operation (if control measures implemented) of the proposed activity/works, relative to the Approved Project	Proposed Control Measures in addition to project COA and REMMs	Minimal Impact Y/N	Endorsed	
				Y/N	Comments
Flora and fauna	No change from the approved project.	No additional measures required.	Y	Y	
Water	No change from the approved project.	No additional measures required.	Y	Y	
Air quality	No change from the approved project.	No additional measures required.	Y	Y	
Noise vibration	No change from the approved project.	No additional measures required.	Y	Y	
Indigenous heritage	No change from the approved project.	No additional measures required.	Y	Y	
Non-indigenous heritage	No change from the approved project.	No additional measures required.	Y	Y	
Community and stakeholder	No change from the approved project.	No additional measures required.	Y	Y	
Traffic	No change from the approved project.	No additional measures required.	Y	Y	
Waste	No change from the approved project.	No additional measures required.	Y	Y	
Social	No change from the approved project.	No additional measures required.	Y	Y	
Economic	No change from the approved project.	No additional measures required.	Y	Y	

Aspect	Nature and extent of impacts (negative and positive) during operation (if control measures implemented) of the proposed activity/works, relative to the Approved Project	Proposed Control Measures in addition to project COA and REMMs	Minimal Impact Y/N	Endorsed	
				Y/N	Comments
Visual	No change from the approved project.	No additional measures required.	Y	Y	
Urban design	No change from the approved project.	No additional measures required.	Y	Y	
Geotechnical	No change from the approved project.	No additional measures required.	Y	Y	
Land use	No change from the approved project.	No additional measures required.	Y	Y	
Climate Change	No change from the approved project.	No additional measures required.	Y	Y	
Risk	No change from the approved project.	No additional measures required.	Y	Y	
Other	No change from the approved project.	No additional measures required.	Y	Y	
Management and mitigation measures	No change from the approved project.	No additional measures required.	Y	Y	

## 12.0 Consistency with the Approved Project

<p>Based on a review and understanding of the existing Approved Project and the proposed modifications, is there is a transformation of the Project?</p>	<p>No. The proposed retention of the existing shed height will not transform the project.</p>
<p>Is the project as modified consistent with the objectives and functions of the Approved Project as a whole?</p>	<p>Yes. Consistency with the objectives and functions of the approved project is maintained.</p>
<p>Is the project as modified consistent with the objectives and functions of elements of the Approved Project?</p>	<p>Yes. Consistency with the objectives and functions of elements of the approved project is maintained.</p>
<p>Are there any new environmental impacts as a result of the proposed works/modifications?</p>	<p>No new adverse environmental impacts are anticipated.</p>
<p>Is the project as modified consistent with the conditions of approval?</p>	<p>Yes. The proposed retention of the existing shed height is consistent with the conditions of approval.</p>
<p>Are the impacts of the proposed activity/works known and understood?</p>	<p>Yes. The impacts of the existing shed are understood.</p>
<p>Are the impacts of the proposed activity/works able to be managed so as not to have an adverse impact?</p>	<p>Yes. The impacts of tunnel and station fitout activities being undertaken in the existing shed can be managed so as to avoid an adverse impact.</p>

## 13.0 Other Environmental Approvals

Identify all other approvals required for the project:

N/A

## Author certification

To be completed by person preparing checklist.

I certify that to the best of my knowledge this Consistency Checklist:

- Examines and takes into account the fullest extent possible all matters affecting or likely to affect the environment as a result of activities associated with the Proposed Revision; and
- Examines the consistency of the Proposed Revision with the Approved Project; is accurate in all material respects and does not omit any material information.

Name:	Pam Tummers	Signature:	
Title:	Environment & Sustainability Manager		
Company:	Sydney Metro	Date:	30-Jul-2020

## Environmental Representative Review


(Additional step for City & Southwest projects only – if this is a CA against a Northwest Project or REF delete this table)

As an approved ER for the Sydney Metro City & Southwest project, I have reviewed the information provided in this assessment. I am satisfied that mitigation measures are adequate to minimise the impact of the proposed work.

Name:	Michael Woolley	Signature:	
Title:	Environment Representative	Date:	4 August 2020

This section is for Sydney Metro only.


### Application supported and submitted by

Name:	Yvette Buchli	Date:	7/8/2020
Title:	Associate Director Planning Approvals	Comments:	
Signature:			

Based on the above assessment, are the impacts and scope of the proposed activity/modification consistent with the existing Approved Project?

Yes  The proposed activity/works are consistent and no further assessment is required.

No  The proposed works/activity is not consistent with the Approved Project. A modification or a new activity approval/ consent is required. Advise Project Manager of appropriate alternative planning approvals pathway to be undertaken.

Endorsed by			
Name:	Fil Cerone	Date:	10 Aug 2020
Title:	Principal Manager City & Southwest, Sustainability, Environment & Planning	Comments:	
Signature:			



## Appendix A – Reconciliation of Visual Impact Viewpoints



Viewpoint 4: View south from Hickson Road at the Windmill Street Bridge (from the EIS)



The shed can be seen extending across the eastern (left) half of the tunnel and rising above the Windmill Street Bridge.

The visual impact was originally assessed as **moderate adverse** as the structure obscures the sky and introduced a new built form. These facts can be observed in the photo above, however they are not excessive, such that increasing the duration of the viewpoint impact would not be inappropriate.



Viewpoint a: View northeast from footpath on Dalgety Road (from Consistency Assessment)



The shed can be seen rising above the Argyle Place Bridge.

It was originally expected that the shed would result in a considerable reduction in the amenity of this view resulting in a **high adverse visual impact** assessment.

The enclosure does block view to the west facing heritage buildings on Windmill Street, however views to the Sydney Harbour Bridge are not partially obstructed and the depth of view from the location is not as impacted such that increasing the duration of the viewpoint impact would not be inappropriate.





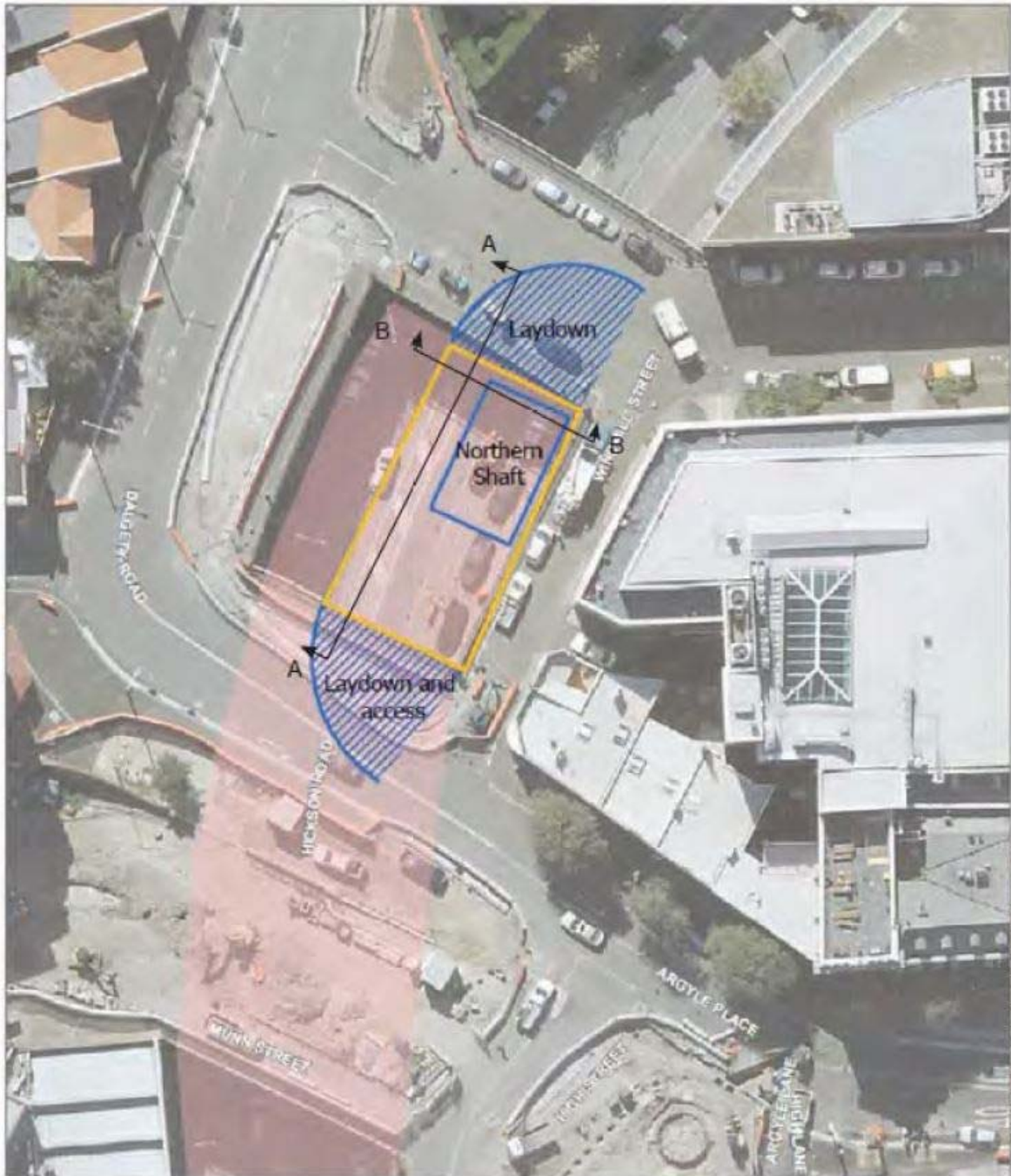
Viewpoint b: View southwest from Windmill Street (from Consistency Assessment)



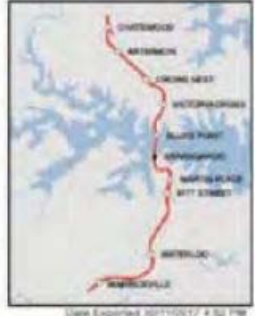
The shed rises above the Windmill Street Bridge and obstructs views to the cutting, Argyle Place bridge, Palisade Hotel and surrounding terraces. The shed is the dominant element in this modified view.

The visual impact was originally assessed as **high adverse** as the structure would result in considerable reduction in the view. These facts can be observed in the photo above, however they are mitigated by the form and colour of the shed such that increasing the duration of the viewpoint impact would not be inappropriate.

## Appendix B – Map of the Northern Shaft Shed Site



**SYDNEY METRO CITY & SOUTHWEST -TSE WORKS**  
**Consistency Assessment**  
Barangaroo





# Appendix C – Millers Point & Dawes Point Village Precinct

Heritage Council of New South Wales



State Heritage Register - SHR:01682 - Plan:1921  
 Millers Point & Dawes Point Village Precinct  
 Upper Fort Street, Millers Point

Gazettal Date: 21 November 2003

0 50 100 150 200  
 Metres

Scale: 1:5,000 @A4  
 Datum/Projection: GCS GDA 1994



- SHR C-urtillage
- Land Parcels
- Railways
- Roads
- LGAs
- Suburbs

---

## Appendix D – March 2018 Community Notification





Piling underway at Barangaroo Station site

## Works well underway at the Barangaroo Station site

Sydney Metro is Australia's biggest public transport project. It will transform Sydney, delivering more trains and faster services for customers across the network.

Sydney Metro City & Southwest extends the new metro network from the end of Sydney Metro Northwest at Chatswood, under Sydney Harbour, through the CBD, and west to Bankstown.

John Holland CPB Ghella (JHCPBG) is building the 15.5 kilometre long twin railway tunnels between Chatswood and Sydenham and excavating six new metro stations.

Work is well underway at the Barangaroo Station site and the construction team has already achieved some important milestones. In late January 2018, traffic was relocated to the western side of Hickson Road and a

pedestrian detour was set up around the work site to allow a temporary support structure to be built on Hickson Road. This structure will enable Hickson Road to remain open to two-way traffic while the new station is excavated underneath. Piling for the new station and temporary support structure has already begun and will continue for the next three months.

Work is also underway further north on Hickson Road between the Windmill Street and Dalgety Road bridges, where a temporary access shaft will be constructed. A large crane will be used in this area to lower in parts of the under-harbour tunnel boring machine (TBM) and plant, such as road headers, cranes and excavators. A temporary acoustic shed will be built above the access shaft to minimise noise and dust impacts on the community from excavation and rock breaking activities.

### Three-month look ahead

Activity (subject to change)	March	April	May
Installing rock bolts in the cliff face wall on Hickson Road	●		
Setting up a separation plant at Barangaroo foreshore	●	●	●
Utility relocations on Hickson Road (intermittent works)	●	●	●
Constructing a temporary street level support structure on Hickson Road	●	●	●
Piling and concrete works	●	●	●
Excavating Barangaroo Station	●	●	●
Constructing a temporary acoustic shed between Dalgety Road and Windmill Street bridges		●	●
Excavating a temporary access shaft on Hickson Road between Dalgety Road and Windmill Street bridges			●

### Treatment plants

Two treatment plants will be set up on the Barangaroo foreshore. A water treatment plant will ensure water is a suitable standard before it is released in accordance with our Environment Protection Licence.

The other plant will separate the crushed rock and soil from the fluid, known as slurry, that the specialised under harbour TBM uses to maintain pressure while it excavates. The TBM will reuse the treated fluid as it excavates the tunnels between Barangaroo and Blues Point.

A storage shed will also be built in this area for the excavated material before it is removed from the site on barges.

### KEY

- Site area
- Acoustic cover over station excavation
- Hoarding
- Fencing
- Excavation of underground station and cavern area
- Environmental control barrier
- Pedestrian access
- Traffic management barrier
- Vehicle lane access

### Temporary traffic and pedestrian changes - Hickson Road

A temporary pedestrian detour is in place while the support structure is built on Hickson Road.

The support structure will allow excavation of the new Barangaroo Station underneath, while keeping Hickson Road open to two-way traffic.

Access between Barangaroo South and Barangaroo Reserve will remain open.

Pedestrians access along Hickson Road is expected to reopen in September 2018.

### Temporary access shaft

A temporary access shaft will be excavated between the Dalgety Road and Windmill Street bridges. The access shaft will be about 30 metres deep and level with the metro tunnels. The access shaft is where the parts of the specialised TBM will be lowered in and excavated material retrieved.

### Station excavation

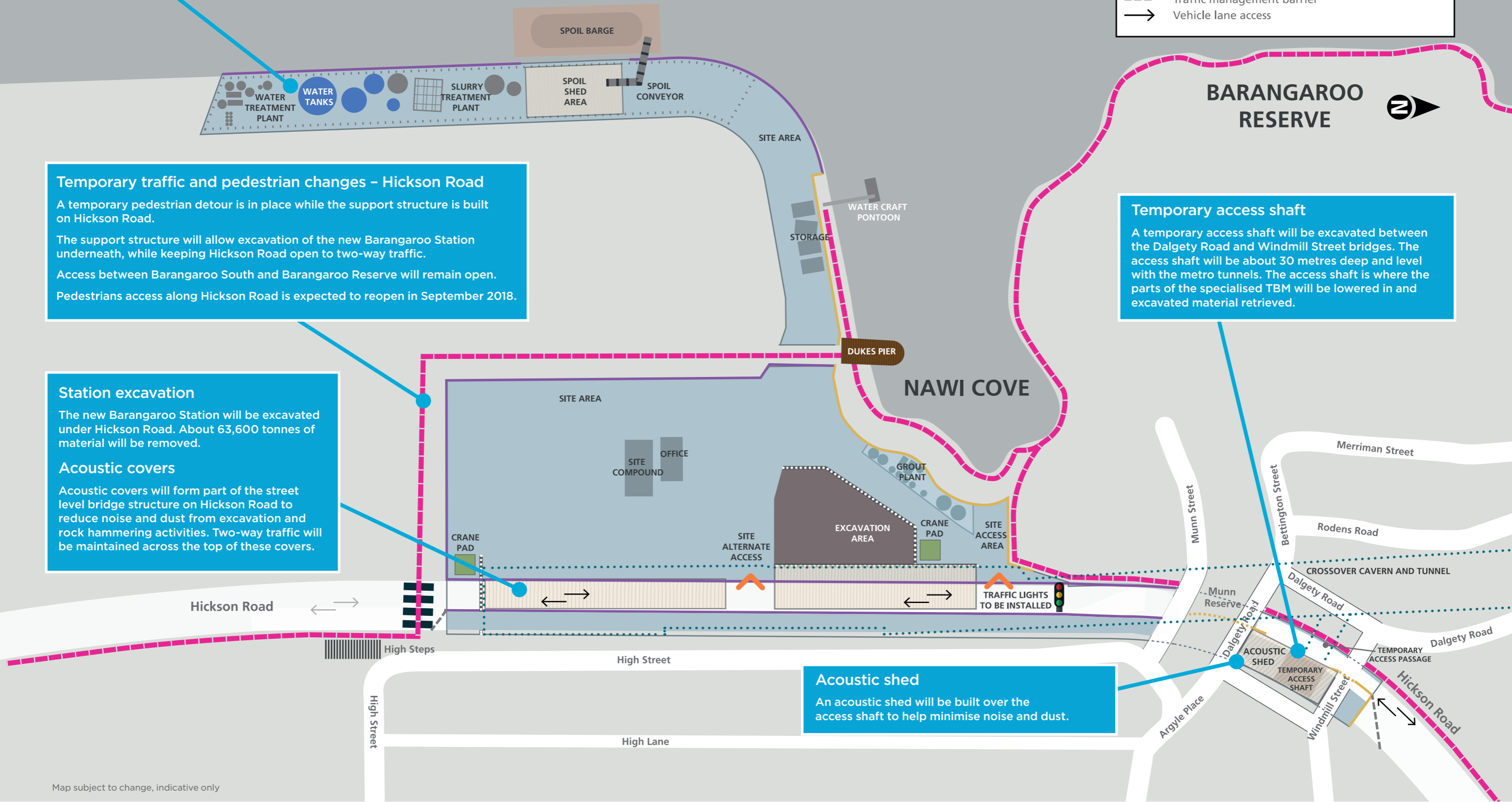
The new Barangaroo Station will be excavated under Hickson Road. About 63,600 tonnes of material will be removed.

### Acoustic covers

Acoustic covers will form part of the street level bridge structure on Hickson Road to reduce noise and dust from excavation and rock hammering activities. Two-way traffic will be maintained across the top of these covers.

### Acoustic shed

An acoustic shed will be built over the access shaft to help minimise noise and dust.



Map subject to change, indicative only



## Temporary access shaft

A temporary access shaft will be excavated on Hickson Road between the Dalgety Road and Windmill Street bridges. The access shaft will be about 30 metres deep reaching down to the level where the new metro tunnels will be built.

The shaft will be used to:

- ▶ lower in TBM parts and support equipment
- ▶ provide access for road headers and excavators to excavate the rail crossover cavern
- ▶ install pipes to carry excavated material from the TBM to the treatment plant at Barangaroo foreshore
- ▶ provide access for workers to the tunnels and rail crossover cavern.

Excavating the shaft requires rock hammers, rock saws and excavators. High noise activities will be done during the day, while less noisy works will be carried out at night.

An acoustic shed will be built to minimise construction impacts on the community before major excavation of the access shaft starts.

## Temporary acoustic shed

An acoustic shed will be built directly above the temporary access shaft to fully enclose the site. This will significantly reduce the impacts of noise and dust on the community during excavation and rock breaking activities.

The shed will be about 32 metres long, 14 metres wide and 21 metres high (from Hickson Road). It needs to be large enough to fit plant and equipment inside, such as cranes, excavators and the TBM parts.

A gantry crane will be installed inside the shed and used to lower down the TBM parts so that it can be assembled ready for tunnelling. Excavated material will also be lifted to the surface within the acoustic shed. The material will be loaded into storage containers or directly onto trucks and transported to the Barangaroo foreshore where it will be removed from the site on barges.

The shed will have a ventilation system that provides fresh air for the underground workers.

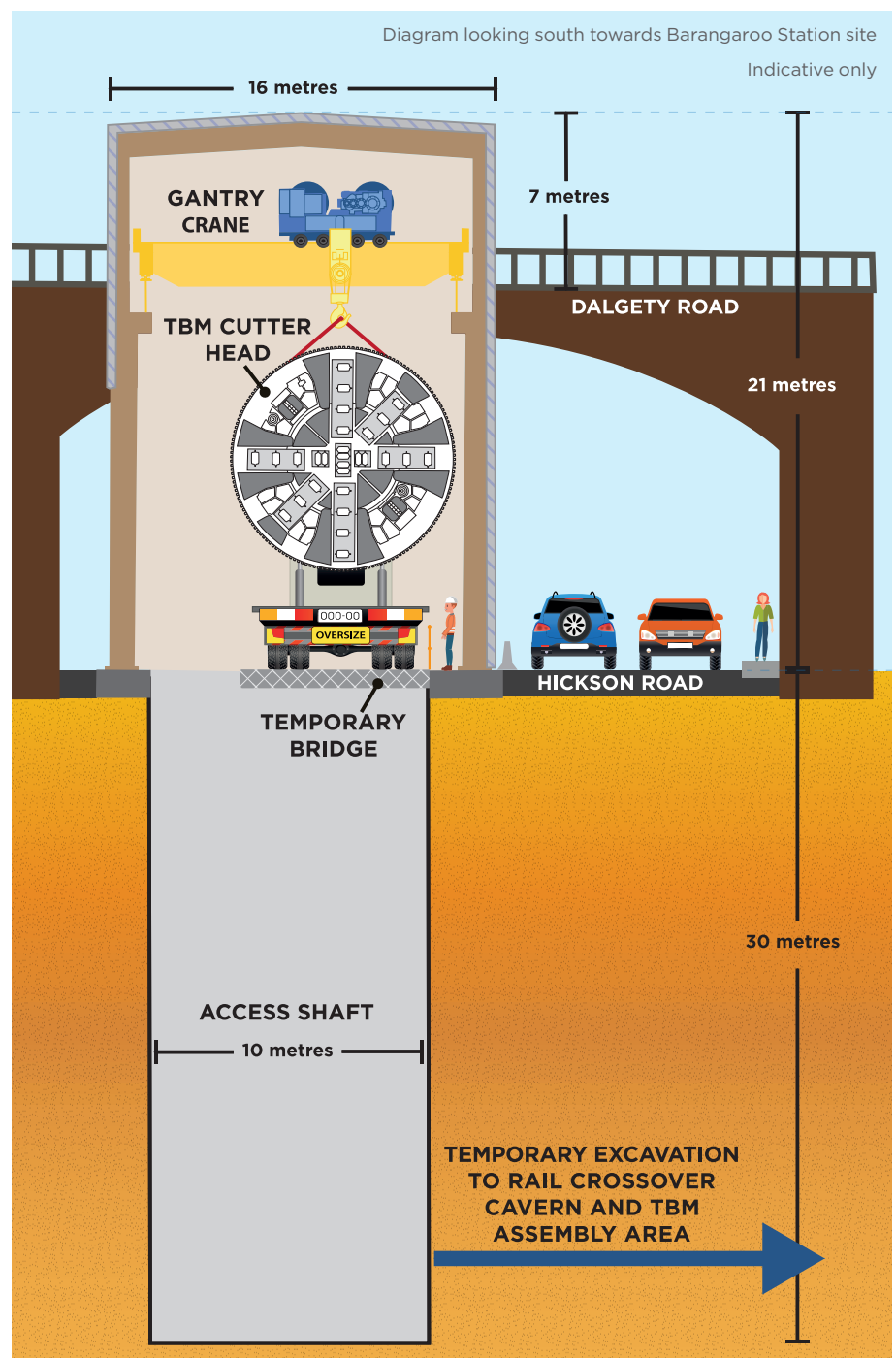
Construction of the shed will start in late March 2018 and is expected to take about one month to complete. Excavation of the access shaft is expected to be completed in July 2018, depending on site and ground conditions.

There will be some short-term impacts while the shed is built, including occasional out-of-hours works and temporary lane and/or road closures. This will allow large cranes to be set up on the road to lift the shed walls into position. Detailed notifications about shed construction activities and any impacts will be sent to residents and businesses before work starts.

## What happens when excavation of the access shaft is completed?

At the base of the access shaft, a temporary access passage will be excavated to the site of a rail crossover cavern.

The cavern is an important underground structure that allows trains to change tracks, if required. It will be excavated with a road header and used as an area to assemble the TBM. Once built, the TBM will start tunnelling under Sydney Harbour towards Blues Point.



## Respite hours for high-impact noise activities

Excavating the new Barangaroo Station and temporary access shaft involves digging through a combination of soil, general fill and sandstone. When digging through sandstone, rock breaking equipment such as rock saws, jack hammers and rock hammers will be required. When using this equipment, work hours will be reduced to minimise noise and vibration impacts on the community.

The support structure on Hickson Road above Barangaroo Station will further reduce noise impacts by acting as a shield between the excavation and surrounding residents.

Most of these activities will be carried out from Monday to Friday between 8am and 6pm and Saturday between 8am and 1pm. Work will continue for up to three hours followed by a minimum of one hour respite. Based on feedback from residents and businesses most affected by these works, respite periods will occur Monday to Friday between:

- ▶ 9.30am and 10.30am
- ▶ 12.30pm and 1.30pm.

While no specific respite period was requested on Saturdays, a minimum of one hour respite will still occur after every three hours of high impact works.

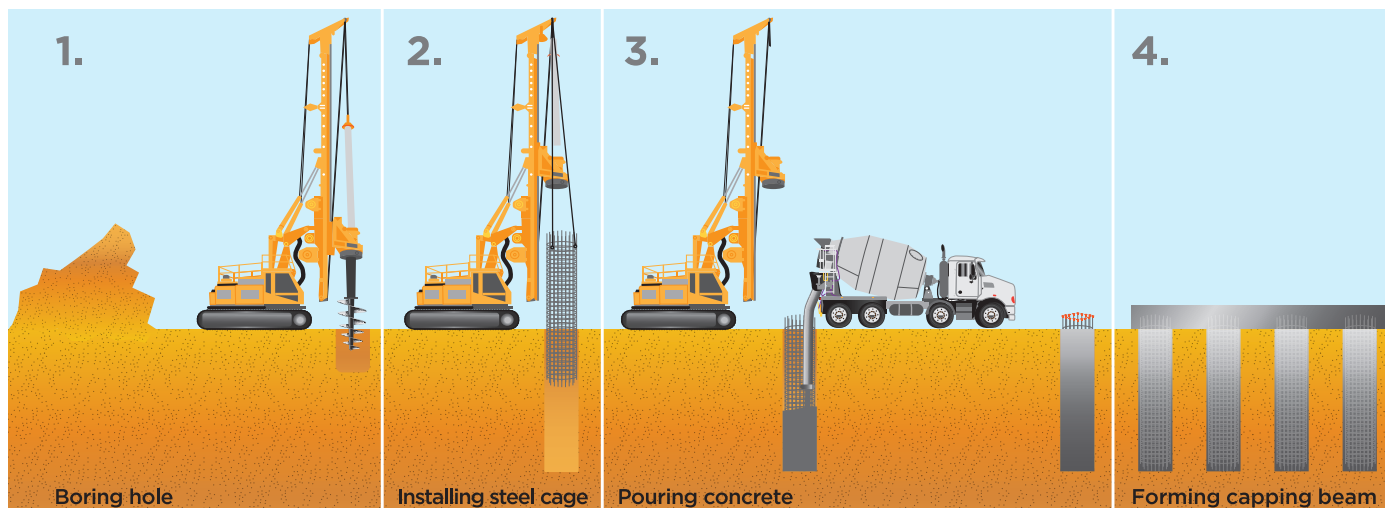
Other construction activities that do not generate high noise will still occur during these respite periods, such as piling and excavation.

Some works to build the acoustic shed may need to be done outside of standard construction hours when traffic volumes are lower. The community will be notified before any out-of-hours works occur.

## Reducing impacts on local roads

Some large machines, such as cranes, will need to be delivered outside of standard construction hours to minimise impacts on the local road network. Standard construction hours are Monday to Friday between 7am and 6pm and Saturday between 8am and 1pm.

### Steps in the piling process



## Piling commences at Barangaroo Station

Piling has started at the Barangaroo Station site to support the ground and soil before major excavation begins. Over 250 concrete piles are planned to be installed around the station area.



### What is piling?

Piling is a process of installing concrete columns into the ground to form a retaining wall or foundation for deep excavations.

This process involves:

- ▶ boring holes into the ground using a large drill
- ▶ using a crane to install a steel cage to reinforce each hole
- ▶ pouring concrete into each hole
- ▶ installing a capping beam.

A concrete capping beam is formed across the top of the piles to link them together and hold them in place. Once the piles are installed around the edge of the station area, excavators and rock hammers will be used to remove soil and rock. As the excavation continues, rock anchors will be installed and concrete sprayed over the walls to hold the station area in place.

## Temporary road closure in April 2018 – Hickson Road and Windmill Street

Some sections of Hickson Road and Windmill Street at Millers Point will be temporarily closed to allow construction of the temporary acoustic shed. These closures include:

- ▶ Hickson Road between Towns Place and Napoleon Street – 10pm to 5am on Tuesday 17, Wednesday 18 and Thursday 19 April 2018
- ▶ Windmill Street between the Dalgety Road and Windmill Street bridges – 24-hour full road closure from Friday 20 April to late May 2018.

Detours will be in place during these road closures and access to driveways will be maintained at all times.



Traffic changes on Hickson Road

## Support structure on Hickson Road

Over the coming months, a temporary support structure will be built at street level on Hickson Road. This structure will ensure traffic access on Hickson Road is maintained at all times, while excavation occurs for the new Barangaroo Station below. The support structure will be built in two stages:

- ▶ stage one - eastern side of Hickson Road
- ▶ stage two - western side of Hickson Road.

Stage one will start construction in late March 2018 and is expected to finish in July 2018. After stage one is complete, traffic will be moved to the eastern side of Hickson Road to allow construction of stage two, which is expected to be completed in September 2018. Staging this work ensures pedestrian and motorist access can be maintained during construction.

An acoustic cover will form part of the street level structure to significantly reduce noise while the new station is excavated. Nearby residents will be notified before works start on the support structure.



Location of the temporary access shaft on Hickson Road between Windmill Street and Dalgety Road

## Thank you for your cooperation

Thank you for your patience and cooperation over the past few months while the Barangaroo site was established. Construction can cause some disruption and your cooperation is appreciated as utilities are relocated and important traffic and pedestrian changes are made on Hickson Road.

Works will be managed to minimise impacts on the community and you will be kept informed as works progress.

## Want to stay up to date?

Register today for community email updates at [tunnels@transport.nsw.gov.au](mailto:tunnels@transport.nsw.gov.au).

## Contact us

For more information, enquiries or complaints please contact us at:

**1800 171 386** 24-hour community information line

[tunnels@transport.nsw.gov.au](mailto:tunnels@transport.nsw.gov.au)

[sydneymetro.info](http://sydneymetro.info)

[www.facebook.com/SydneyMetro](http://www.facebook.com/SydneyMetro)

**Sydney Metro City & Southwest**  
PO Box K659, Haymarket NSW 1240

If you need an interpreter, call TIS National on **131 450** and ask them to call **1800 171 386**