

Engineering consultant's report for the assessment of construction dive site options for WestConnex Stage 3 (M4-M5 Link)

February 2017

Introduction

This desktop study was commissioned by Inner West Council in late 2016 to examine mid-tunnel construction dive site options in the Leichhardt/Lilyfield area for the proposed WestConnex M4-M5 Link. It was undertaken using supplied plans of the area, Google Maps, aerial photos, sketches and cross sections of the proposed tunnel and maps highlighting an indicative alignment of the proposed tunnels in the general area of Darley Road and the other sites examined. Site visits were carried out at Darley Road and other sites examined, and across the general area of the proposed M4-M5 Link constructions. Wider walking surveys were undertaken of the parks, gardens and sporting fields within a moderate distance of these sites. Meetings were held with concerned resident groups, Council planners and engineers and Sydney Motorways Corporation's engineering and public relations staff.

Council's scoping document had asked that the study consider a number of specific questions, as follows.

Question 1

What is the likely suitability of 7 Darley Road as a dive site - what key issues/impacts are there likely to be and are they likely to be resolvable without significant traffic, environmental and residential amenity impact?

Desk top finding

7 Darley Road is a possible dive site, being approximately midway in the run of tunnels between the Haberfield and Rozelle portals and appearing to have little or no topsoil, allowing rock excavation to start immediately. However there are a considerable number of areas of concern with this site.

The site is currently occupied by a commercial concern that has only recently occupied the site and there is every indication this use is intended to remain for the long-term.

Darley Road is a well-used road and is one of few roads in the area that gives direct controlled access to City West Link Road. At peak times the road is heavily congested and there is considerable queuing at the junction of Darley Road and City West Link Road.

SMC has indicated that the working hours for the site (and therefore truck movement times) will be 7am to 6pm, therefore including a major part of morning and afternoon peak traffic times. Consideration needs to be given to restriction the hours of truck movements at this site to (say) 9am to 4pm (off-peak hours), avoiding school and peak traffic times.

Truck movements have been indicated to be at approximately 5-6 minute intervals throughout the day, which would add considerably to traffic congestion in the area. Assuming 5-6 minutes as a reasonable load time for a truck in controlled conditions (a load time found achievable from experience elsewhere), there would be the possibility of loading 10 trucks per hour or 70 trucks per working day of 9am to 4pm duration.

To establish how much material is to be moved through a mid-tunnel exit point, it can be assumed that approx. 1.5km of tunneling would be undertaken in two tunnels with a cross section of approx. 20m wide and 10m high. Using a bulking factor of 1.15, this gives a volume of (say) 700,000 cubic meters. Therefore, using truck and dog combinations of a capacity of 18 meters cubed and working 250 days in a year and 70 loads a day gives a result of approx. 2.2 years of truck hauling.

If the time available to haul material is restricted to a time to avoid impacts on school travel, i.e. 9.30 am to 2.30 pm, then 5 hours are available - giving 50 loads per working day and a total truck hauling period of 3.1 years. These figures are within the realms of discussions held with SMC.

Maintaining pedestrian safety access to the Leichhardt North Light Rail Stop located immediately behind the site would be a major consideration.

The intersection of Darley Road and City West Link Road has a blind approach and a considerable positive elevation change, which would cause loaded trucks difficulty while attempting to traverse the intersection. Phasing of the intersection's traffic signals would need to be considered to allow heavily laden trucks a safe passage through the intersection. Engine noise from the trucks approaching the intersection up the grade would be a constant source of annoyance to residents of Darley Road down to its intersection with Charles Street.

A dive site at this location is on the top of a hill and noise from the site would be hard to contain even with the proposed modern temporary buildings (to contain dust and noise) being provided at other similar sites.

The use of construction sites in built-up urban areas usually creates additional problems throughout their lifespan. This includes road pavement and services under the road breaking down and sometimes failing due to movements of excessively heavy trucks. There is a constant need to maintain and clean roads and footpaths, as well as keeping the hoarding in good repair.

These sites can become points of focus for concern by resident action groups, and on some occasions this can lead to additional traffic disruption due to the erection of permanent protest barriers. This is in addition to maintaining the original conditions placed on the worksite at the beginning of the project.

Question 2

What alternative site(s) or option(s) (if any) exist, including the western end of the Rozelle Rail Yards site?

Desk top finding

Possible sites in the parks, open spaces and playing fields to the west of 7 Darley Road were examined for possible use as dive sites, but these were disregarded mainly for the reason that they are in areas of fill or land reclamation with a high water table which makes the temporary works necessarily complicated. Disturbance of the water table by construction activities would also have a major detrimental impact on buildings/structures in the area.

Two other sites could possibly be used as dive sites and may provide a viable alternative to the Darley Road site. The first is the western end of the Rozelle Rail Yards. The second is a small site at the intersection of William Street/Derbyshire Road, adjoining the bus depot.

Question 3

What are the key likely issues with the alternative site(s) or option(s) and their relative prioritisation from traffic, environmental and residential amenity impact perspective?

Desk top finding

The Western End of Rozelle Rail Yards

The site at the western end of the Rozelle Rail Yards is approximately the size of the Darley Road site, but at a lower elevation than Darley Road. The site has a rock base and is at a level below all four boundary roads. The site is currently occupied by two old industrial warehouse buildings and a large uncleared area to the west of these buildings.

It is somewhat east of the Darley Road site, therefore requiring a longer temporary tunnel to reach the midpoint. Due to the site's lower elevation, the incline to the tunnel's invert would be flatter than the Darley Road equivalent.

The site is bounded by Lilyfield Road, the Catherine Street bridge, Balmain Road and the City West Link Road. A portal could be established in the far western end of the site, below the level

of Balmain Road. Good access to and from the site is currently available from an existing construction gate opposite Justin Street on Lilyfield Road, with a haul road travelling under the Catherine Street bridge into the site. Construction activity is being undertaken within this site in relation to light rail facilities, so arrangements would need to be made to maintain truck access. The total site is below the level of all existing roads, making the containment of construction noise less difficult than it would be for the Darley Road site.

The surrounding roads are flat and there are traffic lights at the site's exit and entrance to City West Link Road. This would reduce truck engine and road noise.

There are residences near the site on Lilyfield Road, but being generally at a higher elevation and overlooking the site, would not likely be as affected by noise than if they were at a lower elevation.

The William St/Derbyshire Rd Site

This a smaller site than the Darley Road site, but could be enlarged by the truncation of Derbyshire Road at William Street. It is not possible to say how many (or if any) of the heritage buildings could be saved from demolition until the necessary site construction buildings had been laid out on plans of the site. By using the bus station as a limited truck stabling area and careful placement of the temporary construction buildings, some or all of the heritage buildings may be able to be saved.

There have been a number of proposals put forward for the reuse of this site but all have met with strong objections from local residents and all have failed to gain approval. The site is currently unoccupied, derelict and has a local heritage order covering the existing buildings. The site has a high school (Sydney Secondary College Leichhardt), a school playing field, Pioneer Memorial Park and the Leichhardt Sydney Buses Depot on its boundaries.

William Street (a wide road) is used for access to/from the bus depot. The William/Norton Street intersection is a difficult intersection, and use of this intersection by construction traffic is not desirable. However, the bus depot does have its own dedicated entry and exit roads. If a way could be found to use these entry points to the site without excessive disruption to bus operations, then this site may be viable.

Due to the closeness to the school, restrictive working hours will be necessary, say 9:30am to 2:30pm for truck movements.

An advantage of using this site is that should SMC be able to overcome all concerns raised about the site, it could become available after the construction period to local residents and/or school as a clear site able to be put to a beneficial use.

Question 4

Could the overall justification for a Rozelle dive site outweigh the impacts of such a site?

Desk top finding

The Darley Road site was originally identified by SMC as their site to carry out mid-tunnel excavations for the duration of the Stage 3 project. SMC has stated it has no further use for the site once excavations are complete. However, the Darley Road site has several limitations, including its current use, its key position in the road system and visual/environmental impacts. These limitations have been raised in this report and by local and district resident groups.

The Western end of the Rozelle Yards is a possible alternative to the 7 Darley Road site that offers a simpler entry and exit arrangement for trucks and less traffic management problems overall – provided it is not hindered by the complexity of an adjoining light rail station. The necessary resumption process for the Rail Yards site against the Darley Road site appears to be less complicated and less controversial. The main possible disadvantage of the Rail Yards site is the requirement for a longer temporary access tunnel - however, this tunnel would be at a lower gradient.

The Rozelle Rail Yards and the Derbyshire Rd sites have a number of advantages over the Darley Road site, but all sites have their own challenges from the point of view of engineering, social and environmental constraints. All three sites will need to be evaluated in the final selection process to determine if the advantages of their use outweigh the impacts.

There is one other situation that needs to be discussed and I will call that Question 5.

Question 5

What are the implications of having no mid-tunnel dive site?

Desk top finding

Without a mid-tunnel construction dive site, any necessary tunnel excavation would be carried out from the permanent portals at each end of the tunnel system, i.e. the Haberfield portal and the Rozelle Rail Yards portal (not at the western end of the Rail Yards site). Other possible portals are the Birkenhead Point portal (part of the Iron Cove Link) and the exit portals towards the Western Harbour (motorway) Crossing. The latter two portals may be considered to be part of separate projects – not part of Stage 3. All these portal sites are within the Inner West Council's boundaries. SMC is yet to say how it will use these sites and how the necessary construction traffic will be integrated into the existing high traffic flows. However, without a mid-tunnel dive site heavy construction traffic will increase in these portal areas.

SMC has stated that if it were unable to use a mid-tunnel site to carry out excavation the total construction program would be extended by 12 months. Accepting this statement as a fact would mean that the 700,000 cubic meters ear-marked for extraction from the mid-tunnel site would need to go out through any or all of the other portal sites identified above over this extra year. It is not an extension so much as adding a year of excavation into the middle of the program.

The M4-M5 Link project is almost totally within the boundaries of the Inner West Council area, and construction activities will continue for an additional year, affecting residents of Inner West Council for a longer period than originally thought.

It is true to say that without a mid-tunnel dive site, residents adjoining the possible Darley Road, Derbyshire Road and Rozelle Rail Yards dive sites will avoid direct and prolonged traffic and construction disruption - however other residents in the Inner West Council area will endure an additional year of traffic and construction activity.

General summary

The use of Darley Road or Derbyshire Road as construction sites for an extended period will be a controversial decision that will have lasting effects on residents, SMC and Inner West Council. Consideration needs to be given to finding a less controversial location than the Darley Road site - in which case, the western end of the Rozelle Rail Yards offers considerable possibilities.

The 'no dive site' option in the Inner West Council area, whilst appearing to satisfy the concerns of a number of local residents near the three potential sites does not reduce combined impacts on residents of the Inner West Council area and would extend this inconvenience for an additional year.

James Holt

Professional Civil Engineer



INNER WEST COUNCIL

16/6107

2 May 2017

Mr Peter Jones
Project Director WestConnex M4-M5 Link
Sydney Motorway Corporation
GPO Box 3905
SYDNEY NSW 2001

Dear Mr Jones

Re: WestConnex Stage 3 (M4-M5 Link) construction dive-site options

At its February 2017 meeting, Council resolved (among other things) *"That Council requests Council officers to further consider the suitability of the site at the western end of the Rozelle Rail Yards as a possible mid-tunnel construction dive-site and report back to Council."*

Accordingly, Council officers, in consultation with Council's independent consultant engineer, undertook a further assessment of the Rozelle Rail Yards (RRY) site. This is included in a report to Council's 11 April 2017 Local Representation Advisory Committee (LRAC) meeting. A copy of that report is attached.

After undertaking this assessment, Council officers have determined that the following additional information is required:

- further details (including reference to relevant background reports) explaining why the RRY site's geography and light rail interface make it unsuitable for use as a dive site; and
- the precise alignment of the main tunnel in the vicinity of the RRY site - to allow the length and grade of the access tunnel to be determined.

It would be appreciated if you could provide Council with this information at the earliest opportunity to enable the assessment to be completed.

Should your office have any queries, please contact Kendall Banfield, Council's Manager WestConnex Unit, on 9335 2179.

Yours sincerely

Richard Pearson
Administrator

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18 August 2017

Mr Richard Pearson
Administrator
Inner West Council
PO Box 45
Leichhardt NSW 2040

Response to your letter re WestConnex Stage 3 (M4-M5 Link) construction dive-site options

Thank you for your letter of 2 May 2017 regarding the suitability of the site at the western end of the Rozelle Rail Yards as a possible mid-tunnel construction site.

Please find attached response.

Yours faithfully,



Peter Jones
Project Director, M4-M5 Link

Response to the Holt Report Mid-tunnel site options for construction of WestConnex Stage 3 M4 - M5 Link

Sydney Motorway Corporation Pty Limited (ACN 601 507 591)

August 2017

Table of Contents

1	Introduction	3
1.1	Constructability assessment	3
2	Response to the Holt report findings	4
2.1	Response to Question 1	4
2.2	Response to Question 2, 3 and 4.....	6
2.3	Response to Question 5	9
3	Review summary	9

1 Introduction

The Inner West Council issued Sydney Motorway Corporation with a report prepared by an engineering consultant, Mr James Holt. The report, dated February 2017, provided a desktop assessment of construction site options for WestConnex Stage 3 (M4-M5 Link) project.

The Sydney Motorway Corporation response is to the content of the report and not on recommendations made by Inner West Council.

1.1 Constructability assessment

As part of design development, the M4-M5 Link project team has undertaken necessary constructability assessments to identify suitable construction sites required (including mid-tunnel) to meet the M4-M5 Link construction program and NSW Government commitments. The assessment criteria used to identify suitable construction sites that has been applied are as listed below:

- a) Maximising the use of arterial roads rather than local:
The construction sites should be close to arterial roads or RMS-managed roads to reduce impact to local roads and communities. This will provide the most direct route to designated spoil reuse and disposal sites (predominately located in greater Sydney).
- b) Close to the mainline-tunnel alignment:
A mid-tunnel site needs to be close to the proposed mainline tunnel alignment to optimise efficiency and make the mid-tunnel site viable. It enables tunnel declines to meet the mainline tunnel alignment as soon as possible so main tunneling activities can commence. Sites located far from the mainline tunnel are not ideal due to the extended time required to construct the tunnel declines, which would cause significant delays to construction.
- c) Using existing government land or properties:
Where possible, the M4-M5 Link project will utilise existing government properties for construction sites to minimise impacts on local communities.
- d) Using existing WestConnex sites (already in use by other stages):
Where possible, the M4-M5 Link project will utilise existing WestConnex sites to minimise impacts on local communities.
- e) Limit acquisition of residential properties;
If acquisition is required for a construction site, the M4-M5 Link project will prioritise commercial properties over residential wherever feasible.

- f) Avoid public open spaces

The M4-M5 Link project team has reconfigured the concept design to avoid public open spaces such as parks and sporting grounds. This is a direct result of community feedback.

In addition, the M4-M5 Link project team is investigating additional measures to reduce impacts on local roads and the community by:

- g) Assessing suitable marshalling areas to mitigate trucks queuing/waiting along main and local roads;
- h) Developing a construction methodology using the mainline tunnels as soon as feasible to remove spoil thus minimising truck movements from construction sites on surface roads; and
- i) Where possible, optimising access to arterial roads.

2 Response to the Holt report findings

2.1 Response to Question 1

Question 1 - What is the likely suitability of 7 Darley Road as a dive site - what key issues/impacts are there likely to be and are they likely to be resolvable without significant traffic, environmental and residential amenity impact?

1. Holt report finding paragraph 3:

“Darley Road is a well-used road and is one of few roads in the area that gives direct controlled access to City West Link Road. At peak times the road is heavily congested and there is considerable queuing at the junction of Darley Road and City West Link Road.”

Response: The Holt report has made several statements on traffic movements based on assumptions that may not be accurate or do not reflect actual traffic conditions.

The phasing of the traffic lights from Darley Road to City West Link (CWL) is on a 150-second cycle which allows for 24 traffic movements per hour from Darley Road to City West Link. Based on this information, heavy vehicle utilisation of this intersection would result in one movement every two to three cycles. The assessment shows this will not add considerably to traffic congestion in the area.

2. Holt report finding paragraph 6 and 7:

“Therefore, using truck and dog combinations of a capacity of 18m³ and working 250 days in a year and 70 loads a day gives a result of approx. 2.2 years of truck hauling.

If the time available to haul material is restricted to a time to avoid impacts on school travel, i.e. 9.30 am to 2.30 pm, then 5 hours are available - giving 50 loads per working day and a total truck hauling period of 3.1 years. These figures are within the realms of discussions held with SMC.”

Response: The recommended truck-and-dog load capacity to be used on the M4-M5 Link project will be 12m³. It should also be noted, that truck-and-dog haulage is focused on the excavation period of the project and not the total construction program (which includes tunnel mechanical and electrical fit-out).

It is envisaged that a total of 1200m³ spoil per day will be excavated from the Darley Rd site. Based on this number, 100 truck movements per day would be required.

Additionally, by extending tunneling time from 2.2 years to 3.1 years as suggested in the report, the current program would be extended by 11 months. This is excluding consideration for subsequent activities required to reach completion such as infrastructure fit-outs (10 months), commissioning (4 months), and contingency for wet weather, latent conditions etc. (6 months).

Consequently, the total time added to the program would be 31 months. Assuming some optimisation of activities could be achieved, there is a possibility that the extended time could be reduced from 31 months to 28 months. This would result in practical completion (first cars) of November 2024 rather than July 2022 as currently programmed, prolonging the period of community disruption.

3. Holt report finding paragraph 8:

“Maintaining pedestrian safety access to the Leichhardt North Light Rail Stop located immediately behind the site would be a major consideration.”

Response: There is a signalised pedestrian-crossing at the intersection of Darley Road and City West Link which is currently used to access the light rail station, this access will be maintained throughout the construction period. There is also an existing secondary entry from Charles Street under the rail bridge, which would be modified during construction to ensure safe access to the light rail is maintained.

4. Holt report finding paragraph 9:

“Engine noise from the trucks approaching the intersection up the grade would be a constant source of annoyance to residents of Darley Road down to its intersection with Charles Street.”

Response: Noise from construction traffic using the public road network is assessed under the Roads and Maritime Noise Criteria Guideline (NCG), which documents Roads and Maritime’s approach to implementing the Road Noise Policy (RNP). Under the NCG, an initial screening test is carried out to determine whether noise levels would increase by more than two decibels (dBA). This represents an increase in the number of vehicles of approximately 60 per cent due to construction traffic or a temporary reroute due to a road closure. Where increases are 2dBA or less, then further assessment is required as noise level changes would most likely not be perceptible to most people. Where noise levels increase by more than 2dBA (i.e. 2.1 dBA or greater) further assessment is required using criteria presented in the NCG.

Darley Road is currently being used by heavy vehicles and light commercial vehicles (construction, delivery etc) that contribute to background noises. The predicted traffic noise increase (dBA) at the Darley Road site is around 0.5dBA.

5. Holt report finding paragraph 11:

“The use of construction sites in built-up urban areas usually creates additional problems throughout their lifespan. This includes road pavement and services under the road breaking down and sometimes failing due to movements of excessively heavy trucks. There is a constant need to maintain and clean roads and footpaths, as well as keeping the hoarding in good repair.”

Response:

There are several criteria applied in identifying a suitable construction site. One of these is the proximity to arterial roads, which minimises the impact to local roads. Where there are damages to local roads due to construction, there is a contractual requirement for the D&C contractor to undertake remediation work.

In addition, the D&C contractor has an obligation to undertake a dilapidation survey on all likely impacted existing assets including local roads before works could commence.

2.2 Response to Question 2, 3 and 4

Question 2 – What alternative site(s) or option(s) (if any) exist, including the western end of the Rozelle Rail Yards site?

SMC considered several sites with a focus on Government-owned sites noting that there are limited options in the project area. Other suitable locations such as parks were ruled out based on community feedback.

Question 3 – What are the key issues with the alternative site(s) or option(s) and their relative prioritisation from traffic, environmental and residential amenity impact perspective?

Question 4 – Could the overall justification for a Rozelle dive site outweigh the impacts of such a site?

6. Holt report finding question 3 paragraph 3:

“Good access to and from the site is currently available from an existing construction gate opposite Justin Street on Lilyfield Road, with a haul road travelling under the Catherine Street bridge into the site.”

Response: Proposal to use the western-end of Rozelle Rail Yards as a site.

The site proposed is as indicated in yellow below (Figure 1).



Figure 1 Land identified within Holt report

The site is bounded by Lilyfield Road, the Catherine Street Bridge, Balmain Road and the City West Link Road.

A portion of the site has been transferred to Transport for NSW and is currently occupied by ALTRAC Light Rail for the delivery of the new Lilyfield Light Rail Stabling and Maintenance Depot located to the east of Catherine Street (see figure 2 below).



Figure 2 Overview of the area in discussion showing neighbouring TfNSW SLR land

The site nominated is approximately one-hectare -wide which is more than double the size of 7 Darley Road. This would provide a better capacity to house construction plant and materials for the project.

However, the location of the site proved to be unfavorable due to:

- Single shared access – the site only has one access gate opposite Justin Street which is a shared access between ALTRAC Light Rail and local businesses. Having a mid-tunnel site here for the project will significantly compound the number of construction vehicles (heavy and light) using Lilyfield Road to access City West Link.
- Considerable difference in levels between Lilyfield Road and the suggested site - A new dedicated access road for the project could be constructed joining Lilyfield Road but the requirement for ramps and a turning circle would take much of the possible construction area.
- Longer tunnel-decline – due to the location, the decline length would be 200m longer in order to meet the mainline tunnels. This would result in longer tunneling timeframes and additional spoil to be removed before primary excavation can occur, thus increasing community disruption.
- Interface with Inner West Light Rail – problematic, particularly in relation to depth of decline tunnel under the rail line.

7. Holt report finding paragraph 6:

“This a smaller site than the Darley Road site, but could be enlarged by the truncation of Derbyshire Road at William Street. It is not possible to say how many (or if any) of the heritage buildings could be saved from demolition until the necessary dive site construction buildings had been laid out on plans of the site.”

SMC response: Proposal to consider Derbyshire Road site.

This site was assessed by Roads and Maritime and the M4-M5 Link project as a potential construction site. The location of this site is suitable due to its proximity to the proposed mainline alignment and utilising an area that is currently unoccupied.

Since the area available is smaller than 7 Darley Road (current preferred construction site), the entire site would be required resulting in the demolition of both heritage buildings. Construction trucks movements would be from 7am to 6pm which may impact school drop-off and pick-up times, however, investigations were being undertaken into the utilisation of the bus depot as an access/ egress.

The benefits of this site were seen to be:

- use of an unoccupied, derelict site
- direct access to CWL via the bus depot, resulting in no trucks on local roads
- remediation of the land for future use by the school or local community.

Following community feedback, this site is no longer being pursued as a potential construction site. This was formally confirmed by Minister for WestConnex, Stuart Ayres, announcing that investigations into a potential mid-tunnel construction site at 29 Derbyshire Road will not continue.

2.3 Response to Question 5

Question 5 – What are the implications of having no mid-tunnel dive site?

8. Holt report finding paragraph 2:

“SMC has stated that if it were unable to use a mid-tunnel site to carryout excavation the total construction program would be extended by 12 months. Accepting this statement as a fact would mean that the 700,000 cubic meters’ ear-marked for extraction from the mid-tunnel site would need to go out through any or all of the other portal sites identified above over this extra year. It is not an extension so much as adding a year of excavation into the middle of the program.”

SMC response: Tunneling activities are on the critical path of the M4-M5 Link program. The extra excavation required from the Haberfield and Pymont Bridge Road sites would increase the duration of the project by approximately 12 months. Without a mid-tunnel site, the duration of the civil, mechanical and electrical fit-out of the tunnel would also increase due to the additional distance travelled to each fit-out location. SMC agrees with Council’s engineer that this would result in the avoidance of construction activity to residents near the Darley Road site, but would add an additional year of construction activity to Inner West residents living near the other proposed sites.

3 Review summary

SMC is investigating alternative access arrangements to the site to minimise the impact on local roads and the community. Heavy vehicle access and egress from the site would be via City West Link. Temporary entry and exit ramps would be constructed to optimise access to City West Link. See Figure 3: Darley Road – Indicative Site Layout.

Access: Heavy vehicles would turn left onto the exit ramp from the westbound carriageway off City West Link, about 130m west of the Darley Road intersection. The exit ramp runs from City West Link to Charles Street. Trucks would then turn left onto Charles Street under the Rail Bridge and left onto Darley Road.

Egress: Heavy vehicles would turn right out of the acoustic shed onto Darley Road, turn right under the rail bridge at Charles Street, and then turn right at the temporary intersection on Charles Street onto a westbound entry ramp to City West Link. The on ramp would be at least 100m in length to allow trucks to achieve a speed of 70km/hour to safely merge into traffic. Temporary traffic control would be in place to allow traffic to exit the acoustic shed and make a right turn onto Darley Road. See Figure 4.

Light vehicles will enter and exit the site carpark via Darley Road.

The temporary access and egress would be constructed on land owned by Roads and Maritime or the NSW Government, and would be reinstated on completion. It is important to note that this is an option under consideration and has not yet been approved by all parties involved.

Additionally, heavy vehicles may be able to use the new connection between the M4 East tunnel stubs and Darley Road to transport spoil, keeping trucks of surface roads.. We anticipate the underground connection to be completed for use approximately 12-16 months from the commencement of works.

The assessment criteria applied to establish a suitable mid-tunnel construction site include:

- No acquisition of residential properties
- Minimal impact to communities
- Minimal impact to environment and existing road network
- Direct access to arterial roads
- Construction site decline is close to mainline tunnel
- Construction area will need to accommodate three road-headers as a minimum

Based on the assessment criteria above, 7 Darley Road has been identified as the most suitable site when compared to other sites investigated.



Figure 3 Darley Road – Indicative Site Layout.



Figure 4 Darley Road Tunnel Site Egress to City West Link.