

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 Railyards 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.

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