

# **ENVIRONMENTAL IMPACT STATEMENT CLARIFICATIONS**

CHAPTER TWO



## 2 Environmental Impact Statement clarifications

This chapter clarifies information included in the Environmental Impact Statement. The following clarifications are discussed:

- Chatswood dive structure – access for maintenance
- Blues Point temporary site – use of barges to transport tunnel boring machine components
- Design resolution for the project
- Over station development
- Design principles for the Sydney Yard Access Bridge
- Clarification of noise receiver types.

### 2.1 Chatswood dive structure – maintenance access arrangements

Chapter 6 (Project description – operation) of the Environmental Impact Statement identifies the maintenance access to the Chatswood dive structure extending as a decline ramp along Nelson Street, Chatswood with access for maintenance vehicles from Nelson Street. The Environmental Impact Statement further identifies that the Frank Channon Walk would be extended from Nelson Street to Mowbray Road on the western side of the railway line to provide an enhanced facility for pedestrians and cyclists as it would provide continuous access between Chatswood Station and residential areas to the south.

Ongoing design refinement has resulted in the access for maintenance vehicles being moved closer and aligned along the dive structure; it is now proposed that this access / egress would be via the Mowbray Road / Hampden Road intersection. Traffic signals would be installed at this intersection as part of the project. The Frank Channon Walk extension would run alongside the access road; however, there may be a requirement for a shared zone to provide vehicular access to the intersection while avoiding any additional direct impacts on Mowbray House (which is a local heritage item).

This arrangement would also enhance opportunities for the residual land at the Chatswood dive site (northern) and provide for the extension of the Frank Channon Walk.

The revised access for maintenance vehicles and extension of the Frank Channon Walk are shown (indicatively) in Figure 2-1. All activities would be contained within the construction site boundary as identified in Chapter 7 (Project description – construction) of the Environmental Impact Statement.

The final arrangement of the Frank Channon Walk extension to Mowbray Road, including any potential shared zone, would be determined during detailed design and would consider design approaches to manage any potential conflicts between pedestrians, cyclists and maintenance vehicles while avoiding additional impacts on Mowbray House. The design of the interface between the Frank Channon Walk extension and the intersection at Mowbray Road / Hampden Road (including any shared zone proposal) would be developed in consultation with Roads and Maritime Services and Willoughby Council. An additional mitigation measure is provided in Chapter 11 of this report (Revised environmental mitigation measures and environmental performance outcomes) to reflect this requirement.

Due to the low anticipated number of vehicles and the infrequent use of the access (refer to Chapter 9 of the Environmental Impact Statement), maintenance access is not expected to result in any impacts on the surrounding road network, or any noticeable increase in road traffic noise. Impacts on receivers along Nelson Street (including visual receivers) are not expected to differ from those presented in the Environmental Impact Statement. The impacts may reduce, given access would no longer be via Nelson Street.



Figure 2-1 Chatswood dive structure – access for maintenance vehicles, and extension of Frank Channon Walk

## 2.2 Blues Point temporary site – use of barges to transport tunnel boring machine components

Chapter 7 (Project description – construction) of the Environmental Impact Statement identifies that the opportunity to transport tunnel boring machine components from Blues Point by barge (as an alternative to truck transport), would be further investigated. This section provides a description of the potential barging arrangements if this is determined to be a feasible solution.

Figure 2-2 shows the potential barging arrangements at Blues Point. Indicatively, a barge would be moored at or close to the existing wharf at the end of Blues Point Road. The water is around four metres deep at this location, which provides sufficient depth without the need for any dredging. A crane would be established at the end of Blues Point Road (within the expanded site area) to lift the tunnel boring machine components onto the barge. Alternatively, a crane mounted on a barge could be used.

No further assessment of this activity is considered necessary as:

- A maximum of four barge trips would occur within the harbour as a result of this activity (if adopted), which would not result in any additional impacts on marine traffic in the harbour
- The extraction and lifting of the tunnel boring machine components is included in the construction noise assessment presented in the Environmental Impact Statement
- The visual assessment in the Environmental Impact Statement identifies the potential for cranes to be present at the site, and the short term occupation of the expanded site area during the extraction of the tunnel boring machine. It concludes that the impact of construction activity at this temporary site would have a high visual landscape impact, and a high adverse visual impact in areas around Blues Point and McMahons Point. The temporary addition of barges would be consistent with the visible construction elements assessed in the Environmental Impact Statement and would have negligible additional impact
- There would be no additional impact on Aboriginal or non-Aboriginal heritage items to that described and assessed in the Environmental Impact Statement. In particular, the work would be undertaken in a manner that would not have an impact on the waterfront wall, which forms part of the Blues Point Waterfront Group, a local heritage item under *North Sydney Local Environmental Plan 2013*
- The barging activities would not result in any change to the social and community infrastructure impacts as described and assessed in the Environmental Impact Statement.

Overall, it is expected that using a barge to transport tunnel boring machine components would result in negligible changes in impacts when compared with those assessed in the Environmental Impact Statement.





Figure 2-2 Potential barging arrangements at the Blues Point temporary site

## 2.3 Design resolution

Chapter 6 (Project description – operation) and Chapter 7 (Project description – construction) describes the key elements of the project including the construction and operation of the project, including the associated stations. Section 6.6 of the Environmental Impact Statement shows an indicative layout and section for each station.

The project defined in the Environmental Impact Statement is based on a concept design with each station subject to further design resolution. The design presents a general arrangement of each station based on current information. Following the determination of the planning approval, the detailed design for each station would be undertaken to ensure that the functional and operational requirements of Sydney Metro are accommodated in the built form to be constructed.

The final built form for each station would be the outcome of the detailed design process that would include consideration of the Chatswood to Sydenham Design Guidelines (refer to Appendix A) and an iterative process and review by Sydney Metro's Design Review Panel. In some cases, the detailed design of the infrastructure may vary from the concept design assessed within the planning approval. For example, the actual size, space and specific use of particular station spaces may change as part of the detailed design. However, the nature of such variations would be generally consistent with the concept design.

## 2.4 Over station development

Chapter 6 of the Environmental Impact Statement identifies that the metro stations would be designed and constructed to take into account, and make physical provision for, any design or other requirements associated with possible future over station development. This could include elements such as:

- Structural elements, building grids, column loadings and building infrastructure and services to enable the construction of future over station development
- Space for future lift cores, access, parking, retail and building services for the future over station development.

This design approach would potentially enable over station development to be more efficiently built and appropriately integrated into the metro station structure. Drawings that show this design interface as it is currently developed are provided in Appendix D of this report. These drawings reflect further design development since the Environmental Impact Statement was exhibited and are indicative only and not to scale. The integration of the over station development elements and the metro station elements would be subject to the design resolution process outlined in Section 2.3 of this report.

It is also intended that the Design Review Panel process, to be established for this project, would be extended following the separate assessment process to apply to the over station developments, including the interface with the metro station elements and (subject to approval) the future built form of the over station development elements.

Provision of space for these elements has been made within the building footprints presented and assessed as part of the Environmental Impact Statement. The proposed location of these elements is to be finalised as part of the detailed design and may result in changes or clarifications to the section diagrams contained in this report and the Environmental Impact Statement.

The Environmental Impact Statement further indicates that over station development above the transfer slab would be subject to a separate assessment process. For clarity, the specific use and fit-out of the spaces below the transfer slab (above ground level, at ground level and below ground level – refer Figure 2-3) does not form part of the project and would be subject to a separate assessment process.

The project also includes a subdivision of the station sites to create separate lots for each of the stations. This will separate the land and air space required for the stations from the space required for future over station development. The subdivision for each station will be registered once the space requirements for the station have been finalised.

The construction of the project is not dependent on over station development proceeding. Should over station development not proceed at any site, it would not affect the project construction elements as identified in the Environmental Impact Statement. In the event that over station development does not proceed at any site, Transport for NSW would consult with key stakeholders (such as the Department of Planning and Environment and local councils) to determine the most appropriate use of the spaces created for potential over station development spaces as well as appropriate planning for the air space above the transfer slab, if necessary. The use of this space would be subject to a separate planning approvals process.

Transport for NSW will manage any vacant over station development spaces and may transfer them to third parties for redevelopment in the longer term. Make safe works and treatments for the transfer slab and other over station development spaces would be undertaken as part of the project as an interim measure. This may include appropriate temporary hoarding and security of the over station development site. Where residual development may not occur in conjunction with operation of the project, Transport for NSW will provide interim uses with the aim of activating street frontages. Interim activities undertaken as part of the project, including retail or commercial uses, will be implemented in consultation with the relevant local council.



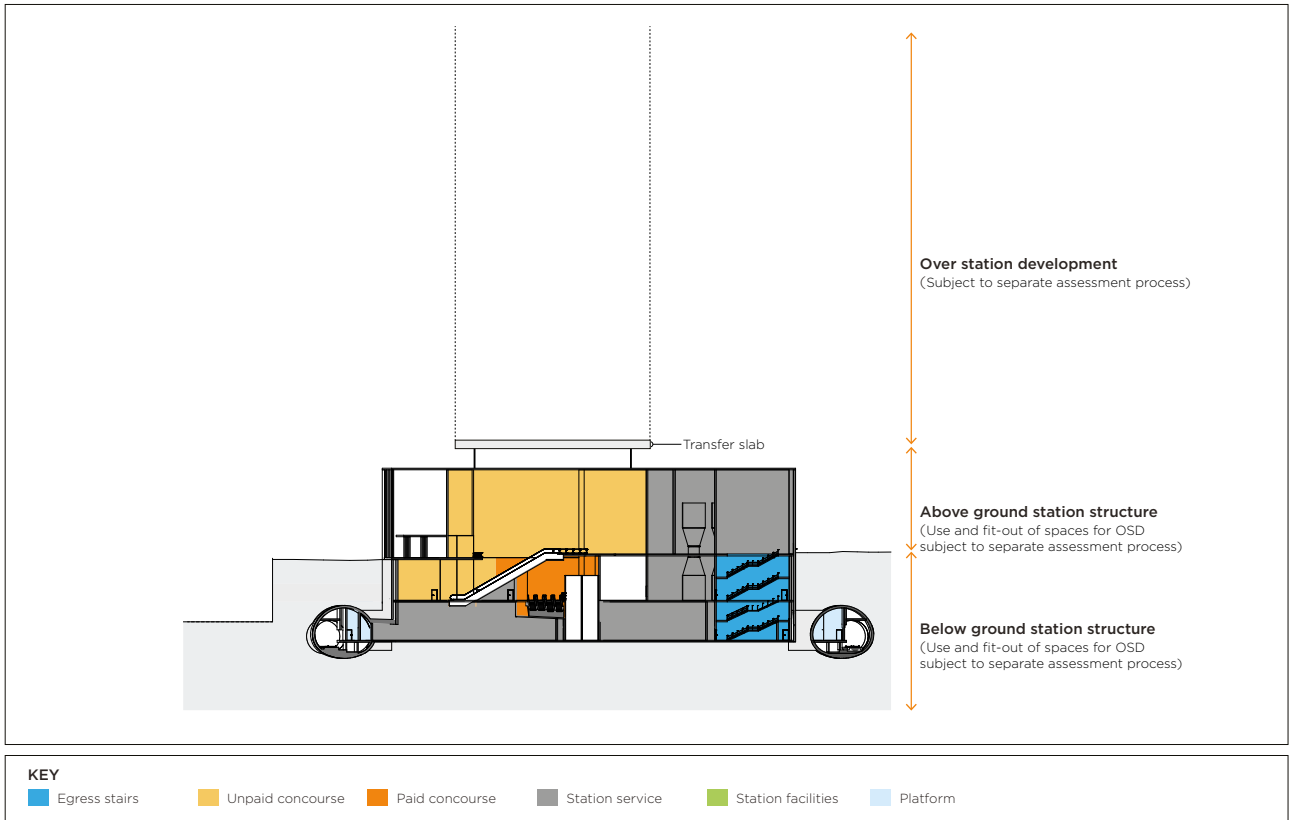


Figure 2-3 Typical over station development interface (not to scale)

## 2.5 Design principles for Sydney Yard Access Bridge

Section 6.9.2 of the Environmental Impact Statement provides preliminary principles to guide the detailed design of the Sydney Yard Access Bridge. In recognition of the sensitive visual and heritage setting in which the bridge would be placed, additional architectural analysis was carried out (with input from heritage specialists), which resulted in a more detailed set of design principles for the bridge. These principles replace the principles listed in the Environmental Impact Statement, and have also been incorporated into an updated version of the Chatswood to Sydenham Design Guidelines (Appendix A). The design objective of the Sydney Yard Access Bridge is as follows:

*The bridge will be of a high architectural and urban design quality, utilising structures, forms and materials that respond to and respect the industrial rail context and aesthetic of the Sydney Yard and setting of Mortuary Station.*

The refined design principles (developed in consultation with the Department of Planning and Environment, Sydney Trains and the Heritage Council of NSW) are:

- The design shall be visually unobtrusive and minimise adverse impacts on existing views of significant heritage and provide wide and clear spans over the tracks.
- The bridge shall minimise impacts on the heritage values of Sydney Terminal and Central Railway Stations Group, the Chippendale Heritage Conservation Area (HCA), the Mortuary Station or the former Co-Masonic Temple.
- The bridge shall demonstrate best practice in integrated bridge engineering, architectural and urban design and construction.
- The bridge shall have a predominantly continuous compound curvature, with no sharp transitions or deviations, to create a simple elegant form with a gentle sinuous curvature in plan and elevation.
- The bridge shall have a low profile form with shallow deck and low super-structure; with low profile parapet, edge beams, and traffic barriers.
- The bridge approach to Regent Street shall be designed to integrate with the surrounding context and minimise the visual intrusion onto the streetscape.
- The entry driveway and access site off Regent Street is to ensure pedestrian safety and good sightlines across the vehicular driveway; allowing for a pedestrian pavement that continues across the driveway without a kerb or step.
- Landscape screening of dense hedge planting and / or climbing plants shall be provided to adjacent buildings and vertical surfaces to deter graffiti.
- Low maintenance native landscaping together with medium-sized native trees shall be provided to the residual spaces between the approach ramp and the site boundaries to soften the appearance of the site from Regent Street.
- The abutments shall be sympathetic to the existing surrounding viaducts, with bridge piers incorporated within the envelope of the bridge, and shall be of concrete construction with precast concrete panels.
- All screens, balustrades and fences shall be light weight and transparent, and be visually consistent in their aesthetic appearance.
- The bridge shall have no signage or advertising.
- Lighting of the bridge shall be inconspicuous and avoid spill lighting into the adjacent public domain or Mortuary Station and must also not distract train drivers.

## 2.6 Clarification of noise receiver types

Since the exhibition of the Environmental Impact Statement, further information has been obtained on specific noise receiver types. This information has been reviewed with respect to the noise and vibration assessment. It is noted that the predicted noise and vibration levels as a result of the project have not changed, rather the degree of impact considering the change in receiver type (ie commercial receivers and residential receivers have different noise management levels). The relevant sites are:

- Northern surface track works
- Crows Nest Station (the clarification of receiver types is included as part of the assessment associated with the removal of rock breaking outside standard construction hours – refer Section 9.6)
- Victoria Cross Station (the clarification of receiver types is included as part of the assessment associated with the removal of rock breaking outside standard construction hours – refer Section 9.6)
- Blues Point temporary site
- Barangaroo Station (the clarification of receiver types is included as part of the assessment associated with the barging option at Barangaroo – refer Section 3.2)
- Martin Place Station (the clarification of receiver types is included as part of the further assessment of the O’Connell Street future underground pedestrian link entry – refer Section 3.3)
- Pitt Street Station (the clarification of receiver types is included as part of the assessment associated with the removal of rock breaking outside standard construction hours – refer Section 9.6)
- Central Station (the clarification of receiver types is included as part of the assessment associated with the changes at Central Station – refer Section 9.4).

Consistent with the approach taken for the noise impact assessment, the noise and vibration modelling considers a worst case scenario for each phase of construction where the concurrent use of relevant plant and equipment is assumed to be working at the boundary of the construction site that is closest to the receiver. This is consistent with the *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009a).

The actual noise and vibration levels associated with construction activities are likely to be lower than the predictions given that construction equipment would be moving around the construction site and would not always be closest to a particular receiver for the full duration of that construction phase.

### 2.6.1 Northern surface track works

In the vicinity of the northern surface track works, one receiver located to the west on Ellis Street (Area C) was correctly identified and assessed as education. It was also identified as being the closest receiver type of that category in Area C. However, the results were not presented in the summary table in the Environmental Impact Statement.

This receiver location is shown in Figure 2-4, and the predicted airborne noise level exceedances for this receiver are shown in Table 2-1.

**Table 2-1 Predicted airborne noise level exceedances for the educational receiver near northern surface track works**

Receiver area	Scenario													
	Enabling Works	Track Works	Earthworks	Acoustic Shed Construction	Tunnelling with Shed	Fitout								
	Day	Day	Day	DOOH <sup>2</sup>	Day	DOOH <sup>2</sup>	Evening	Night	Sleep	Day	DOOH <sup>2</sup>	Evening	Night	Sleep
<i>C Educational south of Ellis St</i>	●	●	●	●	●	●	●	●	●	●	●	●	●	●

**Legend**

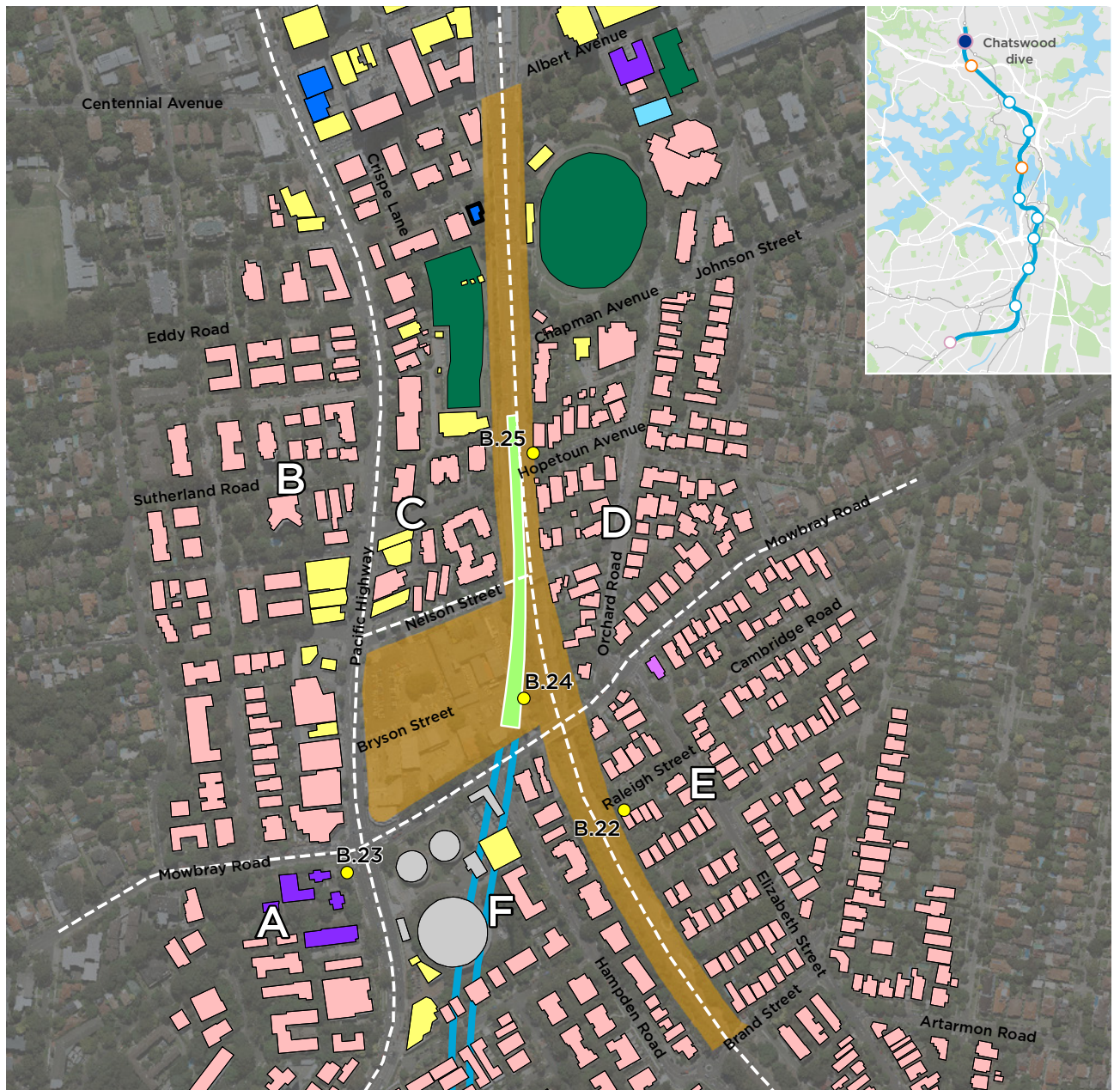
- NML compliance
- NML exceedance of less than 10 dB
- NML exceedance between 10 dB and 20 dB
- NML exceedance of more than 20 dB

*Note 1: The results presented in the Environmental Impact Statement are shown in brackets ( )*  
*Note 2: DOOH = Daytime out of hours (i.e Saturdays 1pm to 6pm and Sundays 7am to 6pm)*  
*Note 3: Additional or clarified receiver types are shown in italics.*

Table 2-1 indicates that there would be exceedances of the noise management levels of more than 20 dB during enabling works, track works and earthworks. The exceedance during earthworks accounts for the change in construction methodology as outlined in Section 9.1 of this report.

As presented in the Environmental Impact Statement, the vibration at this receiver would be below the screening criteria of 7.5 mm/s. As the receiver is not located near the dive structure, ground-borne noise and vibration impacts from tunnelling activities would not occur.

There would be no change to the predicted operational airborne noise levels for this receiver.



**KEY**

- Chatswood to Sydenham
- Proposed construction site area
- Proposed dive structure
- Monitoring location
- Receiver area boundary

Receiver types

- |  |   |  |
|--|---|--|
| <span style="display: inline-block; width: 20px; height: 10px; background-color: pink; border: 1px solid black; margin-right: 5px;"></span> Residential  | <span style="display: inline-block; width: 20px; height: 10px; background-color: purple; border: 1px solid black; margin-right: 5px;"></span> Other (Medical)     | <span style="display: inline-block; width: 20px; height: 10px; background-color: blue; border: 1px solid black; margin-right: 5px;"></span> Other (Education)      |
| <span style="display: inline-block; width: 20px; height: 10px; background-color: yellow; border: 1px solid black; margin-right: 5px;"></span> Commercial | <span style="display: inline-block; width: 20px; height: 10px; background-color: darkpurple; border: 1px solid black; margin-right: 5px;"></span> Other (Worship) | <span style="display: inline-block; width: 20px; height: 10px; background-color: darkgreen; border: 1px solid black; margin-right: 5px;"></span> Active Recreation |
| <span style="display: inline-block; width: 20px; height: 10px; background-color: grey; border: 1px solid black; margin-right: 5px;"></span> Industrial   | <span style="display: inline-block; width: 20px; height: 10px; background-color: cyan; border: 1px solid black; margin-right: 5px;"></span> Other (Child Care)    | <span style="display: inline-block; width: 20px; height: 10px; border: 1px solid black; margin-right: 5px;"></span> Updated receiver type                          |

Indicative only, subject to design development



Figure 2-4 Sensitive noise receiver types near northern surface track works



### **2.6.2 Blues Point temporary site**

East of the Blues Point temporary site, and south of Henry Lawson Avenue (Area D), one receiver was identified in the Environmental Impact Statement as a commercial receiver. However, this has since been identified as a residential receiver. This receiver location is shown in Figure 2-5.

The noise criteria (and therefore noise management levels) for residential receivers are more stringent than for commercial receivers. Therefore, although the predicted noise and vibration levels have not changed since the exhibition of the Environmental Impact Statement, the level of potential exceedances at this location has increased.



**KEY**

- Chatswood to Sydenham
- Monitoring location
- Proposed construction site area
- Receiver area boundary
- Receiver types
- Residential
- Updated receiver type
- Passive Recreation

Indicative only, subject to design development



Figure 2-5 Revised classification of noise receiver at the Blues Point temporary site

### Construction airborne noise

The predicted airborne noise level exceedances of the noise management levels for this reclassified receiver at the Blues Point temporary site are presented in Table 2-2. The following exceedances are predicted:

- Enabling works (one month) – exceedances of more than 20 dB are predicted
- Earthworks and shaft excavation (one month) – exceedances of between 10 dB and 20 dB are predicted
- Site reinstatement (12 months) – exceedances of between 10 dB and 20 dB are predicted.

**Table 2-2 Predicted airborne noise level exceedances for reclassified receiver at the Blues Point temporary site**

Receiver area	Noise modelling scenario			
	Enabling works	Earthworks	Excavation	Site reinstatement
D Residential receiver to the east on Henry Lawson Avenue	Day	Day	Day	Day
	●	●	●	●

**Legend**

- NML compliance
- NML exceedance of less than 10 dB
- NML exceedance between 10 dB and 20 dB
- NML exceedance of more than 20 dB

*Note 1: DOOH = Daytime out of hours (i.e Saturdays 1pm to 6pm and Sundays 7am to 6pm)*

### Construction ground-borne noise and human comfort vibration

Potential ground-borne noise impacts due to vibration-intensive construction activities (namely, rock breaking) have been considered based on the updated receiver type. It was found that daytime ground-borne noise levels would be up to 10 dBA higher than the noise management level for this receiver. Construction activities would only occur during the day at this location.

### Operational ground-borne noise

The ground-borne noise levels would comply with the relevant criterion at the receiver during operation of the project.