Environmental Impact Assessment Checklist

Location: Dapto Station, Dapto NSW
Timeframe: Approximately 12 month construction period commencing mid 2022
Project Name: Dapto Station upgrade
Description of proposed activity *(Describe ancillary activities, duration of work, working hours, machinery, staffing levels, impacts on utilities/authorities, wastes generated or hazardous substances/dangerous goods used). Split into Construction and Operation sections, as required.*
Background and need for the Proposal Transport for NSW (TfNSW) is the government agency responsible for the delivery of major transport infrastructure projects in NSW and is the proponent for the Dapto Station Upgrade (the 'Proposal'). The Proposal is part of the Transport Access Program (TAP), a NSW Government initiative, which aims to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure. Dapto Station has been identified for an accessibility upgrade as it does not currently meet the key requirements of the *Commonwealth Disability Discrimination Act 1992* (DDA) and the *Disability Standards for Accessible Public Transport 2002* (DSAPT). The non-compliant station building entry, ramps, pathways, platform width do not facilitate access for people with reduced mobility, parents or carers with prams, or customers with luggage. The Proposal would provide safe and equitable access to the platforms, station building, station forecourt, car park, and pedestrian network surrounding the station. Location Dapto Station is located in the town of Dapto, within the Wollongong Local Government Area (LGA). Dapto Station is on the South Coast Line and is approximately 75 kilometres (km) south-west from Central Station. The location of the Proposal is provided below in Figure 1 and Figure 2. The red outline in Figure 2 is considered the Project area for the purposes of this checklist. This EIA Checklist assesses the impacts from the proposed activity and scope of works within the Proposal area as shown in Figure 2. Any works outside of the Proposal area or not included in the scope of works as listed below, would be subject to additional assessment and approval prior to commencement.

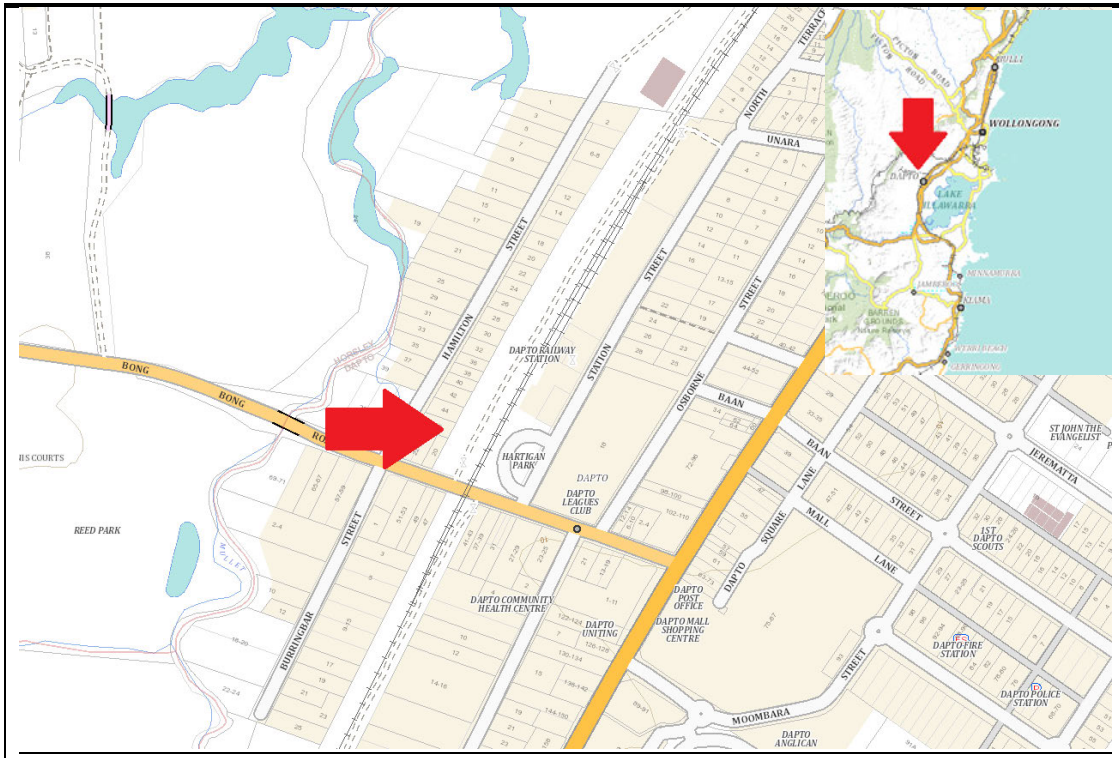

Figure 1: Dapto Station locality plan

Figure 2: Dapto Station aerial photograph showing the indicative Project Area and site compound location

Scope of works

This Proposal involves the upgrade of Dapto Station to provide a station precinct that is more accessible including for people with a disability, limited mobility, parents/carers with prams, and customers with luggage.

The key features of the scope of works for the Proposal are shown in Figure 3, and the full scope of works are shown in the concept design drawings in Appendix A. The concept design drawings will evolve during detailed design.

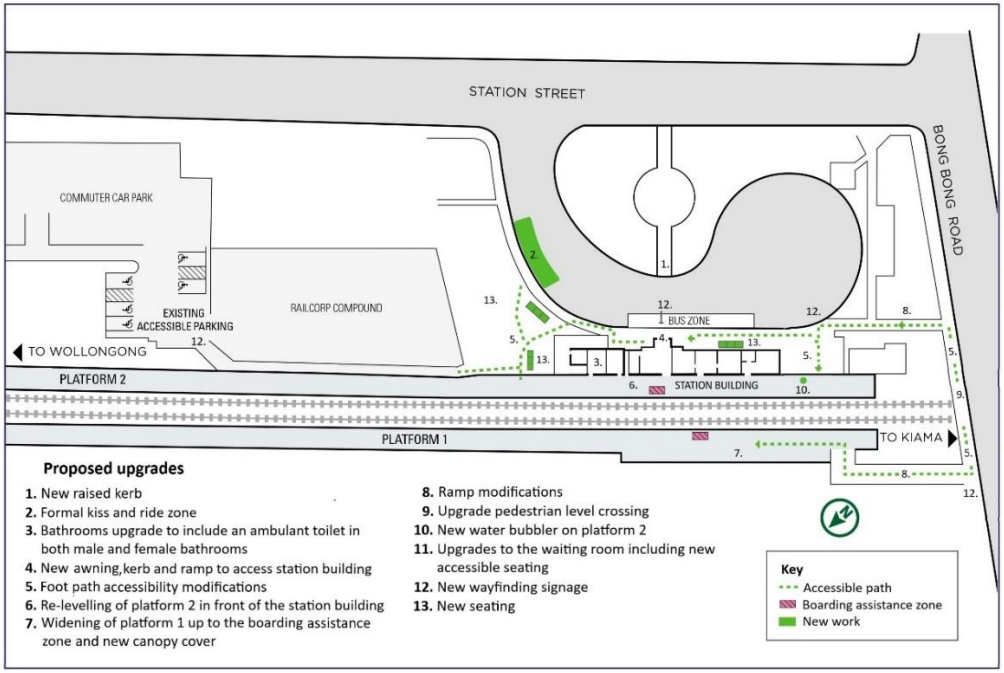

Figure 3: Dapto Station key features plan

Broadly, the Proposal works would entail the following:

Station building

- Modification to the entry ramp, toilets (including providing a new ambulant toilet in the existing male and female toilet), ticket counter, waiting rooms and new seating
- Modifications to the entrance of the station building including:
  - Lift up existing timber awning on the entrance of the station building by 100mm by modifying roof slope.
  - Modify gutter and downpipes and trim timber side cladding. Repaint to match existing
  - Raise up 2035mm high timber door frame and architrave by 100mm and make good the wall cladding
  - New timber column with reproduced decorate chamfered edges
  - Modify steel awning structure to increase head height by 100mm

Station forecourt

- New Kiss and Ride space with new kerb ramps and signage
- Provide an accessible path from the Kiss and Ride/ taxi zone to Platform 2
- Regrading footpath in front of the station building entrance
- Replace kerb ramp west of the war memorial with a new raised kerb

Platform 1

- Widening of Platform 1 from the access point up to the Boarding Assistance Zone (BAZ)
- Provide BAZ markings

Platform 2

- Regrade platform
- Provide BAZ markings
- Provide new accessible double water bubbler

Other

- Provide a new access path between the existing footpath on Bong Bong Road and Platform 2

- Modify pathways and ramps for DSAPT compliance
- Provide new hearing augmentation (AFILS) to the station
- Modify help points, customer assistance panels and payphones
- Upgrade existing level crossing with Velostrail product along the pedestrian section
- Upgrade the approach to the level crossing including footpaths, fences and gates
- New DSAPT complaint LED lighting
- Provide new tactile ground surface indicators (TGIs)
- Relocate or provide new seating
- Provide new wayfinding and DSAPT signage for station and interchange area, where existing signage is impacted
- Modify or upgrade any existing systems impacted by the works
- New Underline Crossing (ULX) to Platform 1 for new power supply and communication services
- Services modifications including connections and disconnections
- Vegetation removal, including three native trees and 120sqm of weeds in the location of Platform 1 widening

Construction duration

Construction work is proposed for approximately 12 months commencing mid 2022.

Construction hours

Construction work is proposed to be undertaken during standard construction hours:

- 7:00am to 6:00pm Monday to Friday
- 8:00am to 1:00pm Saturday
- No works on Sundays or public holidays.

Works are also proposed in four 48-hour rail shutdowns over the duration of the proposal. Works undertaken outside standard hours would be subject to prior approval from TfNSW through submission of the TfNSW Out of Hours Works Application via the online system and in consultation with the local community (where required).

Construction plant and equipment

An indicative list of plant and equipment that would be required is provided below. Additional equipment, if required, would be identified during detailed design by the Construction Contractor.

- power tools (e.g. drill, hammer drill, saw, grinder torque and impact wrenches, nail gun)
- trucks (various types and sizes e.g. sucker truck, skip/tipper truck, traffic control truck, tipper truck, asphalt truck and sprayer, crane truck excavator, hi-rail dump truck)
- concrete pump and truck
- water cart
- generator
- piling rig/ large excavator
- demolition/road saw
- bobcat/skid steer
- hi-rail trucks and plant

Construction personnel

It is anticipated that an average of 8 to 12 construction personnel would be engaged on the construction of the Proposal with a maximum of 40 engaged at any one time.

It is expected that the proposal would generate between 10-16 daily light vehicles trips (vehicles less than two tonnes), and four daily heavy vehicle trips (vehicles greater than eight tonnes).

Site Characteristics
(Describe the environment (i.e. vegetation, nearby waterways, landuse, surrounding landuse), identify likely presence of protected flora/fauna and sensitive areas)

Dapto Station has three platforms with two tracks located centrally between platforms 1 and 2 with another terminating track (platform 3) on the eastern side of the station. Platform 1 heads to Wollongong and is on the western side, accessed via a ramp from Bong Bong Road. Platforms 2 and 3 are on the eastern side, accessed through the station building from Bong Bong Road or Station Street. There is a bus and taxi zone outside the station building, and a commuter car park is located north of the station accessed from Station Street.

Land use

The Proposal is within the existing rail corridor, station building, station forecourt and within the public domain along Bong Bong Road (adjacent to the station). The proposed works are on land zoned SP2 Infrastructure (Railway) under the *Wollongong Local Environmental Plan 2009* (Wollongong LEP).

The Proposal is surrounded by residential properties to the west and north-east, and large scale commercial properties to the east and south, including Dapto Leagues Club to the east. To the north is the commuter car park and vacant railway land.

Bong Bong Road crosses the tracks at the southern end of the station. There is an at-grade level crossing for vehicle and pedestrians. A bus stop is directly outside the station building and south-east of the station along Bong Bong Road.

Flora and fauna

The following biodiversity searches were conducted for the Proposal area on 5 May 2022 to identify any records of threatened species, populations, ecological communities and migratory species listed under the NSW *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act):

- Bionet Wildlife Atlas (maintained by NSW DPE – Environment and Heritage)
- EPBC Act Protected Matters Search Tool (PMST) (maintained by the Department of Agriculture, Water and the Environment).

A review of the EPBC Act Protected Matters Report for the Proposal (refer to Appendix B) identified five threatened ecological communities within one kilometre of the Proposal:

- Coastal Swamp Oak (Casuarina glauca) Forest of the New South Wales and South East Queensland ecological community
- Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland
- Illawarra and south coast lowland forest and woodland ecological community
- Illawarra-Shoalhaven Subtropical Rainforest of the Sydney Basin Bioregion
- River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria

The EPBC Act Protected Matters Report also identified 17 threatened flora species, 32 threatened fauna species, and 19 migratory species within one kilometre of the Proposal. These species are not known to occur on site and the Proposal does not include removal of the migratory species habitat. The proposed work therefore will be unlikely to impact these species.

A review of the NSW Bionet Wildlife Atlas data from a search undertaken for an area of 10 kilometres by 10 kilometres surrounding the Proposal site identified sightings of 11 threatened flora and 34 fauna species. The threatened species identified closest to the site is a threatened flora species, the Illawarra Greenhood, about 1km south-east of the site.

The Proposal is located within disturbed areas subject to previous development and current rail operations.

Heritage

Aboriginal

An Aboriginal Heritage Information Management System (AHIMS) search was undertaken on 5 July 2022 (refer to Appendix C). The search revealed that there are no registered Aboriginal sites or places within a 200 metre radius of the Proposal site. Due to the substantial disturbance of land within the rail and road corridors, Aboriginal sites are unlikely to be present.

Non-Aboriginal

The Proposal site is within the Dapto Railway Station Group, a local heritage item under the Wollongong LEP (item number 6435) and a heritage item on the TAHE Section 170 Heritage and Conservation Register (No. 4801136). There are a number of nearby local heritage items listed on the on Schedule 5 of the Wollongong LEP, including the Dapto Station Master's Residence (#6335) which adjoins the station forecourt (refer to Figure 4).

Figure 4: Local heritage items listed under the Wollongong LEP within the vicinity of the Proposal

Hydrology and flooding

Mullet Creek is about 140 metres west of the site and is identified as containing key fish habitat (see Figure).

A desktop assessment of potential flood risk identified that the Proposal area is partly within a flood planning area (refer to Figure 6 below), as identified in the Mullet Creek Flood Model Update prepared by BMT WBM for Wollongong City Council dated April 2018.

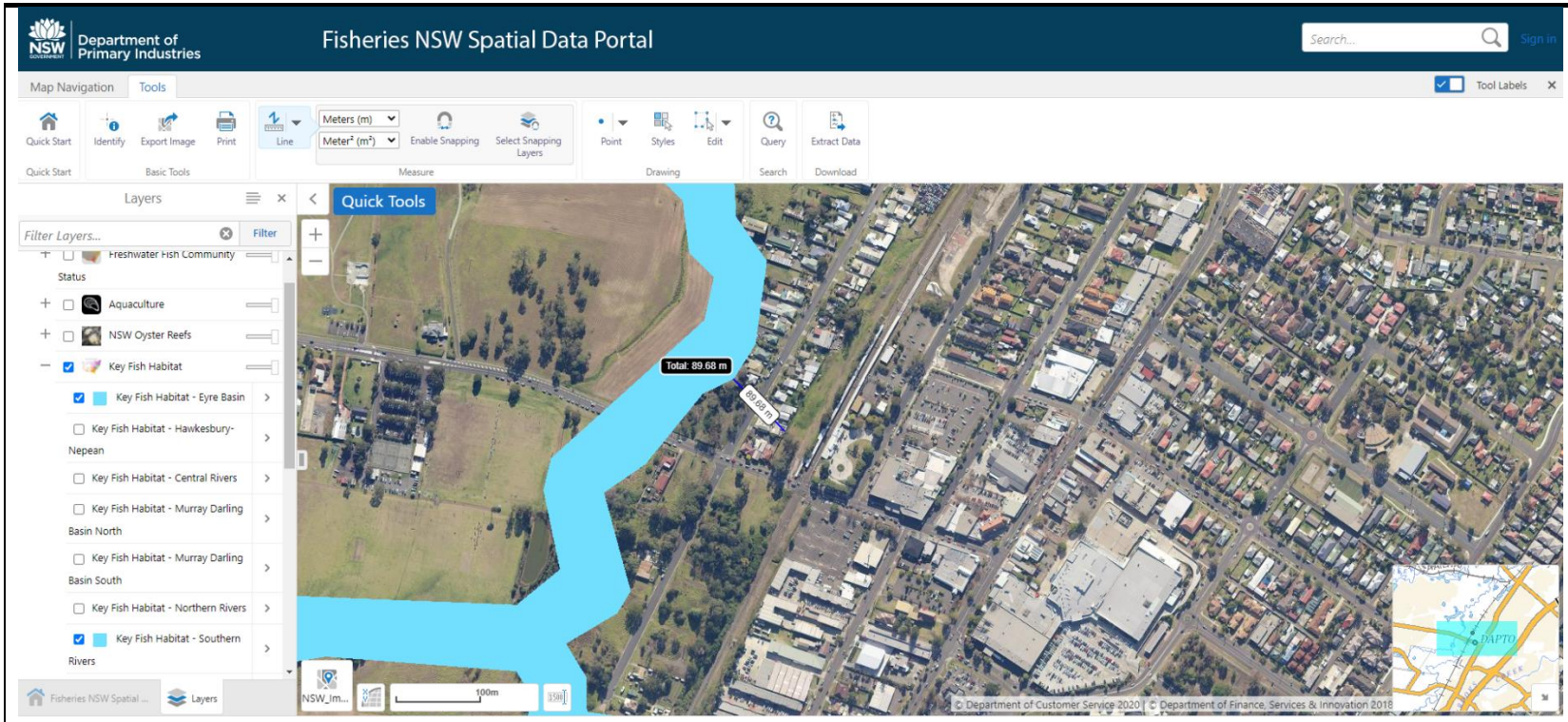

Figure 5: Proximity of the site to mapped key fish habitat (Mullet Creek)

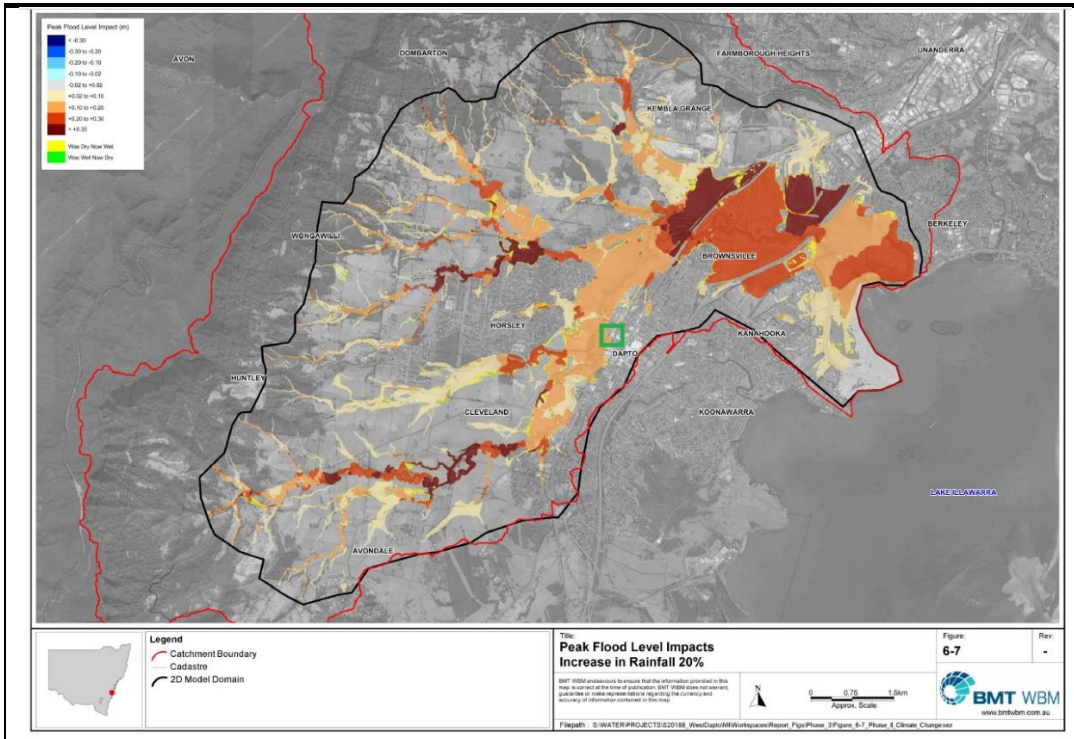

Figure 6: Mullet Creek Flood Study showing flood affectation of the Proposal site and surrounds

Soils and contamination

A search of the NSW contaminated sites list notified to the Environment Protection Authority (EPA) was undertaken on 25 February 2022 and it did not identify any contaminated sites within Dapto.

Nonetheless, railway corridors have the potential to contain various contaminated materials from historical and operational sources. Such sources relate to the long-term operation of the railway and the history of nearby contaminating activities. Possible sources of contamination may include:

- leaks and spills from fuels, oils, solvents, and lubricants
- stockpiles of waste materials
- uncontrolled fill material
- fuels, oils, wash down solvents, lead and asbestos fines from former train brakes
- heavy metals and pesticides associated with insect and weed control.

The Proposal is not within an area mapped as affected by saline soils however, it is within an area mapped as containing class 5 acid sulfate soils, and near to an area mapped as containing class 2 acid sulfate soils.

A Destructive Hazardous Materials Assessment was undertaken by EDP in February 2022. It identified asbestos containing fibre cement sheeting externally on the eastern side of the main station building, lead paint on the waiting room ceiling and externally on the station building.

Utilities

The station is connected to water, sewer, and electricity. All new fittings would be connected to existing services where feasible.

Control Measures

Will a project and site specific EMP be prepared? **Yes** Are appropriate control measures already identified in an existing EMP? **No**

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 Proposal is within a flood planning area (refer to Figure 6), as identified in the Mullet Creek Flood Model Update prepared by BMT WBM for Wollongong City Council dated April 2018. A Climate Change Risk Assessment (CCRA) has been prepared by SMEC dated 29 April 2022. The findings of the CCRA report indicate that no high or extreme (very high) risks have been identified. Six (6) medium inherent risks were identified which correspond to risks an increase in local flooding and access and egress impacts, including inundation of access paths and an increase in incidents of storms caused by climate change could lead to impacts on utility networks, affecting communications, emergency response management. Adaptation options were identified for three (3) medium inherent risks (corresponding to flood risk). No adaptations were identified for risks corresponding to risk from storms. The identified adaptations will be incorporated into the design where recommended. Specifically, the proposed approach to address flooding risk includes incorporating a climate change factor 15% into the station drainage scope, whilst noting track drainage is outside of the scope of this project. However, given the nature and scale of the works, the Proposal is not expected to alter the extent of flood affectation at the site.
Legislative Framework The *Environmental Planning & Assessment Act 1979* (EP&A Act) establishes the system of environmental planning and assessment in NSW. Division 5.1 specifies the environmental impact assessment requirements for activities undertaken by public authorities, such as TfNSW, which do not require development consent under Part 4 of the EP&A Act. Division 15, Section 2.91 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* (Transport and Infrastructure SEPP) allows for the development of 'rail infrastructure facilities' by or on behalf of a public authority without consent on any land. Consequently, development consent is not required for the Proposal, however the environmental impacts of the Proposal have been assessed under the provisions of Division 5.1 of the EP&A Act. Section 171(2) of the Environmental Planning and Assessment Regulation (EP&A Reg) sets out several environmental factors which must be taken into account when the determining authority is considering the impact of an activity on the environment under Division 5.1 of the EP&A Act. A response to the Section 171(2) environmental factors is provided in Appendix D.

Consultation

Early engagement for Dapto Station asked community members and stakeholders to share their experiences of accessibility at the station via an online survey. This was promoted through various Transport for NSW official communications channels, a notification distributed to surrounding residents, and newspaper and radio communications channels. A meeting was also held with Wollongong Council where the initial concept was presented and Council was invited to share projects happening in the vicinity as well as present any issues or opportunities within Transport for NSWs' work. Overall, 12 submissions were received. Community submissions and responses to the submissions are included in Table 1 below.

Table 1: Summary of community submissions and responses

Summary of submissions	Response
Request for additional pedestrian crossings or pedestrian safety zones on the southern end of Station Street, the southern end of Osbourne Street and the northern end of Marshall Street.	Additional pedestrian crossings are outside of the scope of this TAP project. However, Wollongong City Council have plans to install a signalised crossing at the corner of Station Street and Bong Bong Road. This feedback will be forwarded onto Wollongong City Council for consideration.
Request for a new kiosk at the station to buy convenience items from, such as newspapers and coffee.	This falls outside of the scope of works for the TAP project. However, this feedback will be forwarded onto the relevant Sydney Trains team for consideration.
Request that the Station Street car park entrance be relocated to a safer location, and that the entry signage be clearer.	This falls outside of the scope of works for the TAP project. However, this feedback will be passed onto the relevant Sydney Trains team and Wollongong City Council for consideration.
Request that the distance between the platforms and the train be no more than 10cm to reduce the potential for falls.	The gap between the platform and the train is outside the Project's scope of works. However, boarding assistance with a ramp is available from station staff for customers who require this. This Project will be installing Boarding Assistance Zone markings on the platforms, where customers who require assistance can wait to be assisted by staff. This feedback will be passed onto the relevant Sydney Trains team.

Request that the station toilets be accessible with handrails.	The Proposal includes modifications to the existing station female and male toilets to provide one ambulant in each of the cubicles. This includes handrails on both sides. Dapto Station also have an existing family accessible toilet which has more space if a carer is required to assist.
Request that the ramps be made accessible – reduce the length or make them less steep	As part of the TAP project, existing ramps to access the station will be upgraded to comply with DSAPT.
Noted that crowds can cause injury to a disabled person by knocking them over. Request that helpers be available at the station for disabled persons, and that they be trained accordingly to provide the best assistance.	This is outside of the scope of the TAP. However, this feedback will be passed on to the relevant Sydney Trains team.
Noted errors in the notification letters	These errors are noted and have been amended for future use.
Questioned why the station forecourt was previously modified from a drive through to be a closed loop. It is noted that people still drive into the station forecourt even if they are not an authorised vehicle as per the entry signage.	The Proposal involves the installation of a new Kiss and Ride bay within the station forecourt. TfNSW is currently reviewing whether entry signage can be removed and a decision on this will be made during detailed design.
Request for lift and footbridge to improve safety at the level crossing, and to improve functionality of the station when the safety gates are in place at the level crossing.	The decision not to provide lifts and a footbridge at Dapto Station is due to the road level crossing being next to the pedestrian level crossing. As most customers access the station via the pedestrian level crossing, the Transport Access Program will be trialling an innovative level crossing product, Velostrail, to assess if the accessibility can be achieved without the need for lifts and a footbridge. This product would eliminate the gap between the rail and level crossing. Should the trial be successful, it will be installed at Dapto Station.

Request additional station staff on the platform, or the presence of such staff, to improve safety.	This is outside of the scope of the TAP. However, this feedback will be passed on to the relevant Sydney Trains team.
Request that the 'No entry' signage into the station forecourt be removed or changed to clarify that the station forecourt can be used by everyone.	TfNSW is currently reviewing this matter. A decision relating to the signage is likely to be made during construction of the Proposal.

SEPP (Transport and Infrastructure)

Sections 2.10-2.15 of the SEPP (Transport and Infrastructure) require that public authorities undertake consultation with councils and other agencies when proposing to carry out development without consent. Table 2 provides details of consultation requirements for the Proposal under the SEPP (Transport and Infrastructure).

Table 2: SEPP (Transport and Infrastructure) consultation details

Section	Relevance to the Proposal
2.10: Consultation with councils- development with impacts on council-related infrastructure or services	The Proposal does not include any development with impacts on council-related infrastructure or services as set out by this Section of the Transport and Infrastructure SEPP. Accordingly, consultation with Council under Section 2.10 is not required.
2.11: Consultation with councils- development with impacts on local heritage	A Statement of Heritage Impact (SoHI) has been prepared by EMM and is dated July 2022 (Appendix G). The SoHI has concluded that the Proposal does not include development which is likely to affect the heritage significance of a heritage item, or a heritage conservation area, in a way that is more than a minor or inconsequential. Accordingly, consultation with Council under Section 2.11 is not required.
2.12: Consultation with councils- development with impacts on flood liable land	Whilst the Proposal involves development partly on flood liable land, given the nature and extent of all the works they are not expected to change flood pattern levels more than a minor extent. Accordingly, consultation with Council under Section 2.12 is not required.
2.13: Consultation with State Emergency Service- development with impacts on flood liable land	The Proposal is located partly on flood prone land. Therefore, a consultation letter was sent to the NSW State Emergency Service (SES) on 16th May 2022. On 7 June 2022, the NSW SES responded to the consultation letter and provided the following advice:

	• consider the impact of flooding in the design of the proposed works • pursue, if relevant, site design and stormwater management that minimises any risk to the community. • ensure people using the station are aware of the flood risk. • develop an appropriate business emergency plan to assist in being prepared for, responding to and recovering from flooding. The NSW SES has a template which can assist in this process: http://www.sesemergencyplan.com.au/. The consultation response is in Appendix E.
2.14: Consultation with councils- development with impacts on certain land within the coastal zone	The Proposal is not within a coastal vulnerability area. Accordingly, consultation with Council under Section 2.14 is not required.

Impact Assessment - Construction

Aspect	Nature and extent of impacts (negative and positive) during construction if control measures implemented	Proposed Control Measures	Endorsed [for Rail Development and Delivery, E&S Branch use only]	
			Y/N	Comments
Flora and fauna	The Proposal is located within the rail corridor and other areas within a previously disturbed environment that has largely been cleared, including the station forecourt and surrounding pathways. Vegetation within the Proposal area is limited to planted trees and shrubs along the rail corridor and within and surrounding the station forecourt. An Aboricultural Impact Assessment Report dated 23 June 2022 was prepared for the Proposal (Appendix H). The Proposal involves the removal of about 120sqm of weeds (Japanese morning glory and lantana) and three (3) trees (identified as trees T1, T2 and T3 in the Arboricultural Impact Assessment Report) in the location of the piling rig and proposed Platform 1 extension works. The trees are native to NSW (but not endemic to the local area) and include a *Ficus benjamina, Grevillea robusta and Norfolk hibiscus*. These trees	1. Construction of the Proposal would be undertaken in accordance with the Vegetation Management (Protection and Removal) Guideline (DMS-SD-111_ (TfNSW, 2019b) and *Fauna Guideline* DMS-SD_113) (TfNSW 2019c). 2. Weed control measures, consistent with TfNSW's *Weed Management and Disposal Guideline* (DMS-SD-110) (TfNSW, 2019d), would be developed and implemented as part of the Construction Environmental Management Plan (CEMP) to manage the potential dispersal and establishment of weeds during the construction phase of the Proposal. This would include the management and disposal of weeds in accordance with the *Biosecurity Act 2015*. 3. Should there be a need to prune or remove any additional vegetation, approval would be required from TfNSW in accordance with the	Y	

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			Y/N	Comments
	are not endangered or critically endangered species listed under the EPBC Act, nor threatened species listed under the BC Act. Removal of the weeds and non-native trees would be in accordance with the control measures. A total of 16 offset replacement trees would be required to be planted. Other trees identified in the Aboricultural Impact Assessment Report are to be retained and protected in accordance with the recommendations contained within the report. There is limited habitat potential for fauna in the Proposal area as vegetation lacks important features for shelter such as hollow bearing trees, dense litter layer or woody debris. No impacts to threatened fauna or flora is expected. The trees proposed to be removed are not considered to provide crucial habitat for any threatened fauna, noting that no threatened	*Removal or Trimming Vegetation Application DMS-FT-078)* (TfNSW,2019e). 4. Where works are located near any vegetation that is to be retained, it would be appropriately protected and marked as such on the Environment Control Map (ECM). 5. Vegetation removed would be offset in accordance with the TfNSW *Vegetation Offset Guide (DMS-SD-087).* A tree offsetting plan would be submitted to the TfNSW Senior Environment and Sustainability Officer (or E&S equivalent) and endorsed prior to tree offset replanting. The tree offset plan is to include at a minimum, the number of replacement trees, their size, proposed locations, species, and details of any consultation carried out with the landowner. 6. Trees identified as T4, T5, T6, T7, T8, T9, T10, T11, T12, T13 and T14 within the Aboricultural Impact Assessment Report prepared by		

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			Y/N	Comments
	fauna species (under the BC Act) have been identified within a 10 kilometre buffer of the site and the threatened fauna species identified under the EPBC to potentially feature within one kilometre of the Proposal site are not known to occur on site. The works have the potential to introduce weeds into the Proposal area because of construction vehicles movements. This can be appropriately managed with the implementation of weed control measures.	Russell Cleaver and dated 23 June 2022, would be retained and protected in accordance with the specifications detailed in Section 7 of the Aboricultural Impact Assessment Report.		
Water	The site is partly located on flood liable land (see Figure 5) as identified in the Mullet Creek Flood Study undertaken by BMT WBM in April 2018. The flood study shows that the access point from Bong Bong Road, areas south of the station, and the rail corridor are affected by peak maximum flood levels. The only ground disturbing works part of the Proposal involves piling, excavation for the Platform 1 extension, regrading pathways and ramps and for the new ULX to Platform 1. Therefore, the Proposal is not expected to change localised flood patterns, nor increase the	7. Prior to commencement of works a site specific Erosion and Sediment Control Plan or ECM (with erosion and sediment control measures marked) would be prepared in accordance with the 'Blue Book' Managing Urban Stormwater: Soils and Construction Guidelines (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The erosion and sediment control	Y	

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			Y/N	Comments
	susceptibility of the station and surrounding areas to flood. The Proposal is about 140 metres from Mullet Creek which is identified as containing key fish habitat. Potential impacts to key fish habitat can be adequately managed through control measures relating to sediment control, and provision of spill kits. The Proposal would have limited impacts on surface water during the construction phase. Surface water would be diverted around the proposed works, and existing stormwater infrastructure would remain in operation throughout construction. If impacts to existing stormwater infrastructure are required, alternative arrangement (diversions) would be put in place. There is a risk that fuels, chemicals, sediment laden water, or wastewater leaks and spills could flow into nearby stormwater infrastructure which would have the potential to impact the quality of	measures would be implemented prior to commencement of works and maintained throughout construction. 8. The existing drainage systems would remain operational throughout the construction phase. 9. Any stormwater drains within the Proposal area would be marked on the ECM and appropriately controlled, including those nearby the site compound. 10. Vehicles and machinery would be properly maintained and routinely inspected to minimise the risk of fuel/oil leaks. Construction plant, vehicles and equipment would also be refuelled offsite, or in a designated refuelling area. 11. All fuels, chemicals and hazardous liquids would be stored away from drainage lines within an impervious bunded area in accordance with Australian Standards, EPA		

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			Y/N	Comments
	nearby waterways and the associated key fish habitat, however with appropriate controls in place it is expected that this risk can be appropriately managed.	Guidelines and TfNSW's Chemical Storage and Spill response Guidelines (DMS-SD-066) (TfNSW 2019f). 12. A fully stocked spill-kit(s) would be present at all times during construction and situated around areas of high risk (such as drains). 13. In the event of a pollution incident, works would cease in the immediate vicinity and the Contractor would immediately notify the TfNSW Project Manager and TfNSW Senior Environment and Sustainability Officer (or E&S equivalent) in accordance with TfNSW's Environmental Incident Procedure (EMF-EM-PR-0001). The EPA would be notified by TfNSW if required, in accordance with Part 5.7 of the Protection of the Environmental Operations Act 1997 (POEO Act). 14. Appropriate mitigations would be implemented in accordance with		

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			Y/N	Comments
		the requirements of TfNSW's Concrete Washout Guideline (DMS-SD-112) (TfNSW 2019g). 15. Water savings are to be considered in site establishment, construction and site decommissioning including water used to supply site offices and sheds. 16. Appliances and fittings with star ratings under the Water Efficiency Labelling Scheme (WELS) would have at least the following: • Toilets/urinals – 4.5 stars • Taps and flow controllers – 4.5 stars 17. The Contractor would investigate opportunities for using non potable water wherever possible during the construction phase.		
Air quality	Ground disturbing and demolition works have the potential to impact air quality through the generation of dust. Construction machinery and vehicles would also generate minor exhaust	18. Air quality management and monitoring for the Proposal would be undertaken in accordance with the TfNSW Air Quality Management	Y	

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			Y/N	Comments
	emissions. Potential impacts on air quality would be localised, minor and temporary. With appropriate control measures it is expected that any potential adverse impacts to air quality could be appropriately managed. Volatile organic compounds (VOC) emissions contribute to air pollution in NSW and there are major health and economic gains to be made from their reduction. VOCs can have negative health impacts if inhaled and contribute to poor air quality (particularly in indoor environments).	Guideline (DMS-SD-107) (TfNSW, 2019h), as required. 19. Plant and machinery would be regularly checked and maintained in a proper and efficient condition. Plant and machinery would be switched off when not in use, and not left idling. 20. Appropriate measures (including watering or covering exposed areas, covering stockpiles where applicable, and covering spoil/ waste on trucks) would be implemented to minimise or prevent the generation of dust. These measures would be recorded on the ECM. 21. All surface coatings to be used would comply with the Australian Paint Approval Scheme (APAS) VOC limits.		
Soils and contamination	The proposal would involve minor disturbance of soils with some excavation required for works including path and ramp regrading, the Platform 1	22. An erosion and sediment control plan or ECM would be prepared (refer to water section above). This	Y	

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			Y/N	Comments
	extension and new ULX to Platform 1, with the implementation of control measures outlined in this checklist, it is considered that this risk can be adequately managed. The Proposal is not within an area identified as containing saline soils, however, it is within an area mapped as containing class 5 acid sulfate soils (and near an area mapped as containing class 2 acid sulfate soils). Given this, clean spoil is to be used when backfilling excavations. There are no registered contaminated sites within the Proposal area. The nearest EPA registered site is about 3.2 kilometres south east of Dapto Station which is the Tallawarra Power Station Site (Princes Highway, Yallah). Due to the nature of rail corridors, there is a risk of encountering typical rail-related contaminants and hazardous materials within the Proposal area. A Destructive Hazardous Materials Assessment was undertaken by EDP in February 2022. It identified asbestos containing fibre cement	includes appropriate management of potential acid sulfate soils. 23. An unexpected finds protocol, considering asbestos containing materials and other potential contaminants, would be in included in the CEMP. Procedures for handling asbestos containing materials, including licenced contractor involvement as required, record keeping, site personnel awareness and waste disposal to be undertaken in accordance with WorkCover requirements.		

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	sheeting externally on the eastern side of the main station building, lead paint on the waiting room ceiling and externally on the station building (see proposed control measures in the Risk assessment section). There is a risk that leaks, and spills associated with the use of construction vehicles and equipment could contribute to existing soil or water contamination (see above). Appropriate control measures would limit any potential impact and ensure that any spills associated with the use of vehicles and equipment are adequately managed.			
Noise and vibration	A conservative quantitative noise assessment has been undertaken for the construction works and is included in Appendix F. It has been assumed that works would be completed during standard construction hours (i.e. Monday to Friday 7am-6pm and Saturday 8am-1pm). Should any works be undertaken outside standard hours they would be submitted to TfNSW via the OOHW online system, and approved prior to any OOHWs proceeding.	24. Noise and vibration mitigation measures would be applied in accordance with the TfNSW Construction Noise and Vibration Strategy (DMS-ST-157) (TfNSW, 2019i) (plus Addendum). 25. Should plant and equipment to be used differ from that included in the noise predictions (Appendix F), the Contractor would update the	Y	

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	Background noise levels of 38dB, 35dB and 30dB for day, evening and night respectively are used based on noise monitoring data obtained near the site by RWDI Australia Pty Ltd for the MTMS project at Dapto (and adjusted to account for façade reflection) in late 2020. This can be equated to Noise Management Levels (NMLs) of 48dB, 40dB and 35dB during day, evening and night respectively for residential receivers according to the EPA's Interim Construction Noise Guideline (DECC, 2009). The NMLs for non-residential sensitive receivers are an external noise level of 75dB Leq,15min for industrial premises and an external noise level of 70dB Leq,15min for commercial premises when in use. The nearest resident is located approximately 5 metres to the east and west of the works, industrial facilities are located approximately 5 metres west of the works and commercial facilities are located approximately 15 metres east of the works.	noise predictions prior to the works commencing. Additional mitigation measures required under the TfNSW Construction Noise and Vibration Strategy (plus addendum) would be applied as required. 26. Potential affected receivers would be notified prior to works. The purpose of notification is to notify of the time and duration of the construction activities so that residents are informed about the works ahead of time. (Note: Potential affected receivers would be sensitive receivers within 200 metres of the station for residents with a line of sight or 120 metres for residents with no line of sight to works). 27. Works teams would be briefed as part of the site induction, in order to create awareness of the locality, location of sensitive receivers and the importance of minimising noise emissions.		

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	It is predicted at a worst case that during standard construction hours the NML for some activities may be exceeded by up to 43 dBA atadjacent residential receivers. However, this is based on all proposed plant and equipment being used simultaneously which is very unlikely and based on works being located at the closest distance to these receivers, which in reality there would be greater separation distances between the plant and receivers. Therefore, potential impact is expected to be a lot less. In accordance with the TfNSW Construction Noise and Vibration Strategy (plus addendum), this would exceed the highly noise affected construction NML of 75 dBA for a short period of time (i.e. up to or less than a day). Where the predicted noise level is greater than the NMLs, all reasonable and feasible work practices would be applied, as per the TfNSW Construction Noise and Vibration Strategy (plus addendum). Construction noise levels are predicted to exceed the NML for the nearest industrial and commercial receivers during some stages of the	28. Use less noise-intensive equipment where reasonable and feasible. Where noise intensive equipment must be used, a one hour respite period would be observed for every three hours of consecutive use. 29. Non-tonal reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise-sensing alarms would be used for all plant used regularly onsite (greater than one day), and for any OOHW. 30. Works undertaken outside standard hours would be subject to prior written approval from TfNSW via the OOHW online system. OOHW should not proceed until the application is approved and after consultation with the local community (where required). The community would be notified in line with the TfNSW's Construction Noise and Vibration Strategy (plus addendum).		

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	works but as outlined above this is a worst-case assessment. Out of hours works may occur during the works but would generally be limited to approximately four rail shutdowns over the duration of the Proposal (i.e. up to around 12 months). The assessment of OOHW construction noise impacts at residential receivers indicates that noise levels are predicted to exceed relevant NMLs at the nearest sensitive residential receivers during all OOHW activities. As a result of the extent of these predicted exceedances during OOHW works, further noise mitigation and management measures would be required in the event of OOHW works being undertaken. *Sleep disturbance* The noise and vibration assessment (AppendixF) has also assessed potential sleep disturbance from approximately four 48-hour rail shutdowns. The assessment has shown that sleep disturbance levels would be exceeded for surrounding residential receivers during this time.	31. Works will need to comply with the minimum working distances for vibration intensive activities as set out in Appendix D of the TfNSW Construction Noise and Vibration Strategy (plus addendum). This includes that vibration intensive works must not be undertaken within five metres of the Station Master's Residence (5 Station Street, Dapto) without further assessment. As the station itself is a heritage item the following measures should be undertaken when considering vibration intensive works within the curtilage: • Identify and locate heritage significant structures within the station • Undertake inspection to determine if the heritage		

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	However, it is unlikely that all the plant and equipment would be used simultaneously so the potential impact is expected to be a lot less and would be further evaluated in the OOHW assessment. Where the predicted noise level is greater than the NMLs, all reasonable and feasible work practices would be applied, as per the TfNSW Construction Noise and Vibration Strategy (plus addendum). *Construction traffic* Noise levels generated by construction vehicles are anticipated to comply with relevant road noise criteria during the day and night time periods. *Vibration* Dapto Station is a listed local heritage item. The noise and vibration assessment has identified that vibration management and mitigation measures are required where vibration generating works are within the nominated safe working distances of the station's heritage structures.	structure is structurally sound and adopt corresponding vibration criteria (within the CNVS plus addendum) • Where vibration intensive works are proposed within the safe working distance, vibration mitigation measures are required. 32. Regular interface meetings would be established with the MTMS project to ensure cumulative impacts are considered. For OOHW, cumulative noise assessments would be considered with the MTMS Dapto project to ensure cumulative noise impacts are understood and managed. 33. A minimum 2.1 metre high hoarding would be installed along the southern, western and northern boundary of the site compound. The hoarding may be constructed from		

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	No other sensitive receivers (including the Station Master's Residence) are within the nominated safe working distances set out within the CNVS (plus addendum). *Cumulative assessment* A cumulative noise assessment for the Proposal and the remainder of the MTMS works (approximately 6 months) currently being carried out at Dapto Station has been included in the Noise and Vibration assessment (Appendix F). The Noise and Vibration assessment concluded that when works from both sites occur concurrently, there may be instances where there is an increase in construction noise levels at the receivers. This should be managed by scheduling noisy works for each site at different times to minimise cumulative noise impacts where feasible. In addition, there is expected to be a negligible cumulative increase in construction traffic noise levels.	plywood or a product similar to Echo Barrier. 34. A noise monitoring program would be established as part of the CEMP. It would outline when noise monitoring would be carried out (including standard construction hours) as triggered in the CNVS. Monitoring results would be reviewed regularly with the TfNSW Senior Environment and Sustainability Officer (or E&S equivalent), and it is to inform reasonable and feasible management measures to mitigate potential noise impact during standard construction hours.		

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	Consultation and liaison would occur with other TfNSW projects, and any other developers identified during construction to minimise the cumulative construction impacts such as noise and traffic.			
Aboriginal heritage	Construction of the Proposal would involve some minor excavation including for regrading footpaths and ramps, excavation for the ULX for Platform 1 and for the extension of Platform 1. A search of the AHIMS register was undertaken on 5 July 2022 (refer Appendix C) and did not identify any registered Aboriginal heritage items within a 200 metres radius of the Proposal area. The presence of unregistered Aboriginal heritage items at the site is considered unlikely given the extent of previous site disturbance and the site's lack of other landscape features (such as rock outcrops, cliffs, waterways etc) where it may be more likely to contain Aboriginal heritage. Therefore, the Proposal is unlikely to impact Aboriginal heritage during construction and any	35. If unforeseen Aboriginal objects are uncovered during construction, the procedures contained in TfNSW's Unexpected Heritage Finds Guideline (DMSSD-115) (TfNSW, 2019k) would be followed, and works within the vicinity of the find would cease immediately. The TfNSW Project Manager and TfNSW Senior Environment and Sustainability Officer (or E&S equivalent) would immediately be notified so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, Heritage NSW, and the Local Aboriginal Land Council. 36. If human remains are found, work would cease, the site would be	Y	

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	unexpected finds can be reasonably managed in accordance with the proposed control measures.	secured, and the NSW Police and Heritage NSW would be notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained prior to works recommencing at the location. 37. All construction staff would undergo an induction in the recognition of Aboriginal cultural heritage material. This training would cover content within the TfNSW Unexpected Heritage Finds Guideline (DMSSD-115) (TfNSW, 2019k).		
Non-Aboriginal heritage	The Proposal site is within the Dapto Railway Station Group, a local heritage item under the Wollongong LEP (item number 6435) and a heritage item on the TAHE Section 170 Heritage and Conservation Register (No. 4801136). The former Dapto Station Master's Residence is a local heritage item under the Wollongong LEP	38. A heritage induction would be provided to workers prior to construction commencing on site. The induction would inform construction workers of the heritage sensitivities of the site, including the location of the Dapto Railway Station Group heritage curtilage and the former Station	Y	

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	(#6335) and this adjoins the station forecourt (refer to Figure 4). A Statement of Heritage Impact (SoHI) has been prepared (refer to Appendix G) for the proposed works. The SoHI concludes that the proposed works would result in a negligible to minor impact to the heritage significance of the station. The only original fabric impacted by the works include the raising of the entrance awnings to the station building which is considered to have a minor heritage impact on this element. These works will retain and reuse early fabric whilst only raising their height by a minor extent. Overall, other works proposed are to fabric that has been previously modified, such as with the interiors of the main station building, and works to Platform 1. No impacts are expected to result to the nearby locally listed heritage items, including the former Stations Masters building. No works are proposed within the curtilage of these heritage items.	Master's Residence, and the recommended minimum working distances when using vibration intensive plant, and guidelines to follow if unanticipated heritage items or deposits are located during construction. 39. In the event that any unanticipated archaeological deposits are identified within the project site during construction, the procedures contained in TfNSW's Unexpected Heritage Finds Guideline (DMS-SD-115) would be followed, and works within the vicinity of the find would cease immediately. The Contractor would immediately notify the TfNSW Project Manager and the TfNSW Senior Environment and Sustainability Officer (or E&S equivalent) so they can assist in co-ordinating the next steps which are likely to involve consultation with an archaeologist and Heritage NSW. Works in the vicinity of the		

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	The noise and vibration section of this assessment has considered potential vibration impacts to the Dapto Station heritage site, and the former Station Masters residence. *Archaeology* The SoHI has concluded that there is archaeological potential in the area of the infrastructure works, proposed Platform 2 upgrades, station forecourt area, and in and around Bong Bong Road. Impacts to potential archaeology can be managed in accordance with the control measures listed in this assessment. Overall, potential impacts to non-Aboriginal heritage including potential archaeology can be reasonably managed in accordance with the recommendations of the SoHI and control measures.	find would not recommence until clearance has been received by TfNSW. Where required, further archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to works recommencing at the location. 40. Archival recording of the Dapto Railway Station would be undertaken in accordance with the Heritage NSW guideline, *'Photographic Recording of Heritage Items using Film or Digital Capture' (2006).* The archival recording shall be reviewed and endorsed by the TfNSW Heritage Specialist prior works commencing within the heritage curtilage of the station, and prior to submission to Heritage NSW or other government body. Digital copies of the archival recording shall be provided to Heritage NSW, Wollongong City		

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		Council and TfNSW Heritage Specialist Team for future reference. 41. A Heritage Works Methodology would be prepared by the contractor for the disassembly, salvage, modification and reinstatement of the platform 2 building street side awning is to be submitted to the TfNSW Heritage Specialist for review and endorsement a minimum of four weeks prior to works commencing on this component. 42. A suitably qualified and experienced Heritage Consultant who is independent of the design and construction team's personnel would be engaged to the satisfaction of the DES. The Heritage Consultant shall provide ongoing heritage, design and conservation advice throughout detailed design and any subsequent relevant design		

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		modifications to ensure that the final design adheres to the recommendations of the heritage assessments provided in the EIA. The Heritage Consultant involvement and reporting shall include, but not be limited to: a) attendance at design meetings and/or heritage meetings to provide iterative heritage advice to actively inform design development b) summary of the iterative heritage advice provided which should capture (as a minimum): • discussion on why particular heritage sensitive solutions might be discounted • discussion of the relevant detailed design stage • recommendations for next steps to further mitigate heritage impacts		

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		A progress draft of the above is to be provided at each detailed design stage, unless otherwise agreed with the TfNSW Heritage Specialist. A final copy of the summary report is to be provided to TfNSW no later than 1 week after final submission. The summary report is to also include: • confirmation of the extent of involvement of the Heritage Consultant in the detailed design process • identification and assessment of any changes to, and/or additional scope of work from those identified in the EIA which would affect heritage significance • a description of the impacts, and recommended mitigation measures relating to any		

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		new or amended scope of work identified in (ii) above including the requirement for additional heritage approvals for consultation • confirmation that the detailed design is compliant with the requirements of the EIA. 43. The contractor in collaboration with the Heritage Consultant would prepare and submit an illustrated serviced plan to detail all services routes in order to demonstrate compliance with the Heritage Technical Note: Installation of New Electrical and Data Services at Heritage Sites (2017). The illustrated services plan should include, but not be limited to high voltage (HV), low voltage, communications, PA and CCTV. The illustrated services plan must be submitted to, and approved by the TfNSW Heritage Specialist prior to		

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		the commencement of any permanent services work. 44. On completion of the work, an update would be prepared for the Section 170 Heritage and Conservation Register, with required details.		
Community, social and economic	The Proposal has the potential to temporarily impact customers, pedestrians and the surrounding community as a result of: • temporary changes to station access and movements in and around the station • temporary impacts to local traffic such as increased car and truck movements, and temporary impacts to parking • construction amenity impacts such as noise, vibration, dust, and visual impacts. • The construction of the Proposal is not expected to result in any economic impacts or impacts to social infrastructure.	45. The community would be kept informed of construction progress, activities and impacts through regular progress updates. 46. Surrounding residents would be notified prior to work commencing. Doorknocks to sensitive receivers may be conducted prior to work commencing where advised by the TfNSW Community and Place team. 47. Contact details for a 24-hour construction response line, Project Infoline and email address would be provided for ongoing stakeholder	Y	

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		contact throughout the construction phase. 48. Suitable access would be maintained for pedestrians/ customers within the Proposal area (when there is not a possession). 49. The following actions would be considered: • sourcing from local suppliers • employing local subcontractors and tradespeople • investigating opportunities to work with the local community on initiatives that generate legacy outcomes		
Traffic and parking	*Access* During construction of the Proposal, passengers would be subject to detours around the construction zone in order to enter and exit the station forecourt, station building and platforms, and interchange between different modes of transport.	50. A construction Traffic and Management Plan (TMP) would be prepared prior to construction. The TMP would detail traffic and pedestrian management, heavy vehicle routes and parking restrictions for construction workers. It would also outline	Y	

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	Construction vehicle access to the site would primarily be via the vehicle gate on the northern side of Bong Bong Road, west of the level crossing (see Figure 2). Construction vehicle access to the site would also be gained to the station forecourt via Station Street for some of the works such as the station forecourt and station building works. *Traffic* There would be small increase in the number of heavy and light vehicles associated with the works but any impact to the surrounding road network is considered to be negligible and temporary. A Traffic Management Plan is to be prepared which outlines controls to minimise potential traffic and traffic noise impacts to surrounding receivers. *Parking*	control measures to minimise potential noise impacts from construction vehicles and traffic. 51. Pedestrian access to and from the station would be maintained at all times during construction. Where pedestrian access may be temporarily impacted, temporary fencing and way finding signage would be used to indicate clear safe alternative access paths. 52. Car pooling options would be considered by the contractor. 53. Consultation with relevant stakeholders would be carried out to ensure that impacts to the operation of the station forecourt (including operation of the taxi and bus parking) is minimised during construction.		

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	Construction workers would be required to park within the site compound and laydown area, or directly adjacent to it where possible. This would minimise potential parking impacts to surrounding streets and the commuter car park off Station Street.			
Waste	The proposal would likely generate the following waste streams: • Construction and demolition waste (such as concrete or asphalt) • Excavation spoil • General waste from construction staff • Green waste • Hazardous waste (see contamination section above) Waste generated as a result of the construction on the site would be assessed and classified in accordance with the NSW Waste Classification Guidelines (EPA, 2014) prior to disposal.	54. All recyclable waste would be recycled where practicable. 55. All waste would be separated and classified in accordance with the NSW EPA Waste Classification Guidelines 2014 and disposed of to a suitably licensed facility. 56. An appropriate Unexpected Finds Protocol, considering asbestos containing materials and other potential contaminants, would be included in the CEMP. Procedures for handling asbestos containing materials, including licensed contractor involvement as required, record keeping, site personnel awareness and waste disposal,	Y	

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		would be undertaken in accordance with SafeWork NSW requirements. 57. The following actions in relation to minimising waste during construction would be considered (in order of preference, with 'a)' being most preferred): a. waste avoidance, including action to reduce the amount of waste generated b. resource recovery, including re-use, recycling, reprocessing and energy recovery c. waste disposal, including management of all disposal options in the most environmentally responsible manner and in line with legislative requirements.		
Visual	Minor visual impacts may result from: • presence of plant, equipment, materials and stockpiles • construction fencing • disturbed areas	58. Working areas would be maintained, kept free of rubbish and cleaned up at the end of each working day.	Y	

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	• tree removal. However, potential visual impacts are expected to be temporary in nature and relatively minor. Tree replacement planting will be required in accordance with the TfNSW Vegetation Offset Guide which will assist with visual impacts during operation.	59. Worksite compounds would be screened with shade cloth (or similar material where necessary) to minimise visual impacts from key viewing locations, where feasible. 60. During construction, graffiti on the site and associated construction fencing would be removed in accordance with TfNSW's Standard Requirements. 61. Any temporary site equipment (such as fencing) would be removed before the site is vacated following completion of the works.		
Urban design	It is not expected that the construction of the Proposal would result in any urban design impacts throughout construction.	Nil.	Y	
Geotechnical	The works are located in the highly disturbed road and rail corridor, and within the existing station forecourt. The Proposal would involve only relatively minor soil excavation. It is not	Nil.	Y	

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	expected that the construction of the Proposal would result in any geotechnical impacts.			
Land use	The construction of the Proposal would not result in any changes to existing land uses.	Nil.	Y	
Risk	The proposed works carry some potential safety risks which can be managed as identified in this assessment. A Destructive Hazardous Materials Assessment was undertaken by EDP in February 2022. It identified asbestos containing fibre cement sheeting externally on the eastern side of the main station building, lead paint on the waiting room ceiling and externally on the station building. The handling and disposal of these known contaminants can be adequately managed with implementation of the proposed control measures. Risk of unexpected finds are addressed in the Aboriginal and non-Aboriginal heritage sections of this assessment.	62. Services searches would be undertaken prior to works commencing to manage risks to utilities and personnel. 63. Works would be carried out in accordance with an approved safe work method statement (SWMS). 64. Comply with the recommendations of the Deconstructive Hazardous Materials Assessment undertaken by EDP in February 2022.	Y	

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Climate Change	The effects of climate on the region can be assessed in terms of weather changes, storm intensity, flooding and increased risk of fire. A climate change risk assessment or pre-screening would be performed using the TfNSW Climate Risk Assessment Guidelines (DMSSD-081) (TfNSW, 2019l), as part of the design development of the Proposal. The risk assessment would be based on the projected changes in the climate and the estimated design life of Proposal components to assess the potential consequences and likelihood of climate risks occurring. Due to the scale and temporary nature of the construction works, the Proposal would not result in any additional risk of climate change impacts over and above the current risks if the appropriate control measures are implemented. Climate Change Risks which have been identified to have a wider impact on the network that are outside of the scope of this project will be managed through Transport's Strategic Risk Management Plan - Climate Change.	65. Climate risk adaptation measures would be incorporated into the detailed design, informed by the climate risk assessment.		

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Sustainability	Consistent with the Future Transport Strategy 2056, Transport is committed to managing impacts on the environment and operating in an environmentally sustainable manner. These commitments are set out in the Transport Environment and Sustainability Policy. The proposal is being developed and would be delivered in accordance with Transport's Sustainability Plan including Transport's vision - that every journey is people and planet positive. The Transport approach is to drive sustainability through eight key focus areas. These key focus areas and the Sustainability Plan goals are aligned with the United Nations Sustainable Development Goals (UNSDGs) as part of best practice sustainability approaches. The development of the concept design for the Proposal has been undertaken in accordance with the project targets identified in TfNSW's Environmental Management System (EMS) and the NSW *Sustainable Design Guidelines - Version*	66. A suitably qualified and experienced Sustainability Manager who is responsible for implementing the sustainability objectives for the Project would be nominated by the design Contractor. The nominated Sustainability Manager is to be endorsed by the Senior Manager Sustainability (SMS) or delegate prior to the preparation of the sustainability management plan (SMP). 67. A Sustainability Management Plan (SMP) would be prepared and submitted by the design contractor to the SMS (or delegate) for approval. 68. A "Pass" rating under the NSW *Sustainable Design Guidelines - Version 4.0* – (DMS-ST-114) (TfNSW, 2019a) would be obtained.	Y	

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	4.0 – (DMS-ST-114) (TfNSW, 2019a). A Pass rating under these guidelines is required. The Guidelines *'seek to deliver sustainable development practices by embedding sustainability initiatives into the planning, design, construction, operations and maintenance of transport infrastructure projects'*, grouping sustainability into seven key themes: energy and greenhouse gases; climate resilience; materials and waste; biodiversity and heritage; water; pollution control; and community benefit.			
Greenhouse gases	Construction of the Proposal may result in a minor contribution of greenhouse gas emissions associated with the operation of plant and machinery, including those used for transportation of material and personnel to/from the site.	69. Greenhouse gas emissions generated during construction would be kept to a minimum through the implementation of emissions mitigation measures by the construction contractor. 70. Methods to manage emissions would be incorporated into project inductions, training and pre-start/toolbox talks.	Y	

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		71. Plant and machinery would be regularly checked and maintained in a proper and efficient condition. 72. Plant and machinery would be switched off when not in use, and not left idling. 73. Completion of TfNSW Air Emissions Data Collection Workbook would be undertaken during construction.		
Cumulative impacts	A search of the Department of Planning and Environment's (DPE) Major Projects Register in May 2022 and did not identify any major developments in close proximity to the Proposal site. During construction, the works would be coordinated with other construction activities in the area where feasible. This includes the TfNSW MTMS project which is currently being undertaken at Dapto and is expected to be completed alongside the TAP works for about 6 months.	74. The potential cumulative impacts associated with the Proposal would be further considered as the design develops and as further information regarding the location and timing of potential developments are released. Environmental management measures would be developed and implemented as appropriate. 75. Works associated with the Proposal would be coordinated, as required, with construction activities associated with any proposed developments nearby, including the	Y	

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	A cumulative noise and traffic noise assessment has been completed for the Proposal and the remainder of the MTMS works being carried out at Dapto Station in the noise and vibration section of this table. Consultation and liaison would occur with other TfNSW projects, and any other developers identified to minimise the cumulative construction impacts such as traffic.	MTMS project at Dapto Station. This includes the consideration of scheduling noisy works at different times to MTMS works to minimise potential cumulative noise impacts.		
Other	No other potential construction impacts have been identified.	Nil.	Y	
Management and mitigation measures	A Construction Environmental Management Plan (CEMP) would identify appropriate mitigation measures including the project specific control measures identified in this table.	76. A Construction Environmental Management Plan (or equivalent as agreed by the TfNSW Director Environment & Sustainability) would be prepared by the Contractor in accordance with the relevant requirements of Guideline for Preparation of Environmental Management Plans, Department of Infrastructure, Planning and Natural Resources, 2004, for approval by the TfNSW Director	Y	

Aspect	Nature and extent of impacts (negative and positive) during construction if control measures implemented	Proposed Control Measures	Endorsed [for Rail Development and Delivery, E&S Branch use only]	
			Y/N	Comments
		Environment & Sustainability, or delegate, prior to the commencement of construction and following any revisions made throughout construction. 77. An Environmental Controls Map (ECM) would be prepared and implemented in accordance with TfNSW's Guide to Environmental Controls Map (DMS-SD-015) (TfNSW, 2019n) prior to the commencement of construction for implementation for the duration of construction. The ECM shall be submitted to the Director Environment & Sustainability (DES) or delegate for approval, at least 14 days prior to commencement of construction (or such time as is otherwise agreed by the DES). 78. A suitably qualified and experienced environmental management personnel would be available and responsible for implementing the environmental		

Aspect	Nature and extent of impacts (negative and positive) during construction if control measures implemented	Proposed Control Measures	Endorsed [for Rail Development and Delivery, E&S Branch use only]	
			Y/N	Comments
		objectives for the Proposal. Details of the environmental personnel, including relevant experience and resource allocation throughout construction would be submitted to the DES, or delegate, for approval. 79. Prior to the commencement of construction, all contractors would be inducted on the key project environmental risks, procedures, mitigation measures and conditions of approval. 80. Site inspections to monitor environmental compliance and performance would be undertaken during construction at appropriate intervals. 81. Any modifications to the Proposal, would be subject to further assessment and approval by TfNSW and relevant approval agencies. This assessment would need to demonstrate that any environmental impacts resulting		

Aspect	Nature and extent of impacts (negative and positive) during construction if control measures implemented	Proposed Control Measures	Endorsed [for Rail Development and Delivery, E&S Branch use only]	
			Y/N	Comments
		from the modifications have been minimised.		

Impact Assessment - Operation

Aspect	Nature and extent of impacts (negative and positive) during operation	Proposed Control Measures	Endorsed [Rail Development and Delivery, E&S Branch use only]	
			Y/N	Comments
Flora and fauna	No operational impacts are expected.	Nil.	Y	
Water	Most of the works would be within existing paved areas. Any potential alterations to the surface water flows are expected to be within the capacity of the stormwater network and as such, potential impacts would be minor.	Nil.	Y	
Air quality	No operational impacts are anticipated.	Nil.	Y	
Soils and contamination	No operational impacts are anticipated.	Nil.	Y	
Noise and vibration	No operational impacts are anticipated. The new Kiss and Ride space is adjacent to the existing taxi rank and bus stop within the station forecourt, an area already used by vehicles dropping and picking up passengers. Given this, and that the Kiss and Ride is used for short period of times, no adverse operational noise impacts are expected.	Nil.	Y	
Aboriginal heritage	No operational impacts are anticipated.	Nil.	Y	
Non-Aboriginal heritage	No operational impacts are anticipated.	Nil.	Y	

Aspect	Nature and extent of impacts (negative and positive) during operation	Proposed Control Measures	Endorsed [Rail Development and Delivery, E&S Branch use only]	
			Y/N	Comments
Community, social and economic	The Proposal would facilitate improved and equitable access to Dapto Station and its facilities through the provision of modifications to the station building, platforms, station forecourt and modifications to existing, and new, pathways in and around the station.	Nil.	Y	
Traffic	The Proposal would improve pedestrian movements within the station and the surrounding area due to the new and upgraded accessible paths and ramps, upgrades to make the station platforms and building accessible. The Proposal includes the provision of an accessible Kiss and Ride bay within the commuter car park. This will enable customers to be picked up/ dropped off closer to the station entrance. The Proposal would increase accessibility to Dapto Station and improve the customer experience and amenity, potentially leading to a minor increase in utilisation and patronage. A small increase in patronage would have a negligible impact on the surrounding road network or the amenity of local residents. The Proposal does not include changes to existing bus/rail services.	Nil.	Y	

Aspect	Nature and extent of impacts (negative and positive) during operation	Proposed Control Measures	Endorsed [Rail Development and Delivery, E&S Branch use only]	
			Y/N	Comments
	The Proposal would not result in the loss of any parking within the commuter car park or station precinct.			
Waste	No operational impacts are expected.	Nil.	Y	
Visual	The Proposal is not expected to materially change the visual aspect of the station. The Proposal will result in some visual improvements through improved lighting and signage.	Nil.	Y	
Urban design	The Proposal would improve connectivity to the public domain and equitable access to the station.	Nil.	Y	
Geotechnical	No operational impacts are anticipated.	Nil.	Y	
Land use	No operational impacts are anticipated.	Nil.	Y	
Risk	No operational risks are anticipated.	Nil.	Y	
Climate Change	Ongoing operational climate change risks across the rail network would be managed in accordance with the Strategic Risk Management Plan – Climate Change.	Nil.	Y	
Sustainability	Nil.	Nil.	Y	
Greenhouse gases	Sydney Trains and NSW TrainLink have entered into a long-term agreement to offset emissions associated with their electricity consumption. This means that all electricity used by these rail entities is now net zero emissions. This initiative	Nil.	Y	

Aspect	Nature and extent of impacts (negative and positive) during operation	Proposed Control Measures	Endorsed [Rail Development and Delivery, E&S Branch use only]	
			Y/N	Comments
	contributes to Transport for NSW's overarching commitment to be net zero emissions in Transport Operations by 2035.			
Cumulative impacts	No operational impacts are anticipated.	Nil.	Y	
Other	No other operational impacts are anticipated.	Nil.	Y	
Management and mitigation measures	No operational management and mitigation measures have been identified.	Nil.	Y	

Are you confident that the impacts of the activity are known and understood?	Yes
Are you confident that the impacts of the activity can be managed so as not to have an adverse impact?	Yes

I certify that to the best of my knowledge this EIA checklist:

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

[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

THIS SECTION FOR RAIL DEVELOPMENT AND DELIVERY, ENVIRONMENT AND SUSTAINABILITY BRANCH USE ONLY

Project Approvals

Planning Approvals *(Refer to section 3 of the Guide to Planning and Environmental Approvals)*

Is the project a part of an activity/development which has already been approved under the EP&A Act ?

Yes ☐ If yes, does the approval need to be modified to accommodate the project?

If yes, identify requirements for modification. ----------

No ☒ If no, is the project to be assessed under Part 4 or Division 5?

If the project is to be assessed under Division 5.1, is it an activity that is likely to significantly affect the environment (including critical habitat) or threatened species, populations or ecological communities, or their habitats?

☐ Yes if yes, the project is required to be assessed under Division 5.2 .

☒ No, with the inclusion of the proposed control measures the project can be appropriately assessed under Division 5.1.

The environmental assessment has been undertaken in the context of Section 171(2) of the Environmental Planning & Assessment Regulation 2021 (refer to Appendix A).

☒ Yes

☐ No – further assessment required (planning approval cannot be granted).

Environmental Approvals *(Refer to section 2 of the Guide to Planning and Environmental Approvals)*
Identify all other approvals required for the project:

Tick appropriate box

No further assessment required.	**X**			Further Assessment is required	

Approved		
I have examined and considered the Proposed Activity outlined in this Environmental Impact Assessment Checklist. Under delegation from the Secretary Transport of New South Wales, I determine that the Proposed Activity may be carried out subject to the following conditions of approval. **1.** Works are to be undertaken in accordance with the Proposed Control Measures (including any Planning and Environment endorsement comments) identified in the impact assessment tables in this Environmental Impact Assessment Checklist	Signature [redacted] Name [redacted]	Date 8/7/2022

Abbreviations

Term	Meaning
AHIMS	Aboriginal Heritage Information Management System
AS	Australian Standard
ASS	Acid Sulfate Soils
BCA	Building Code of Australia
BC Act	*Biodiversity Conservation Act 2016* (NSW)
CEMP	Construction Environmental Management Plan
CCTV	Closed Circuit Television
DDA	*Disability Discrimination Act 1992* (Cwlth)
DES	TfNSW Director Environment & Sustainability
DPE	NSW Department of Planning and Environment
DSAPT	*Disability Standards for Accessible Public Transport (2002)*
E&S	Environment and Sustainability Branch of TfNSW
ECM	Environmental Controls Map
EMS	Environmental Management System
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EP&A Regulation	*Environmental Planning and Assessment Regulation 2021* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EPL	Environment Protection Licence
Heritage Act	*Heritage Act 1977* (NSW)
LEP	Local Environmental Plan
LGA	Local Government Area
MTMS	More Trains More Services
NML	Noise Management Level
NSW	New South Wales
OEH	Former NSW Office of the Environment and Heritage
PoEO Act	*Protection of the Environment Operations Act 1997* (NSW)
SEPP	State Environmental Planning Policy

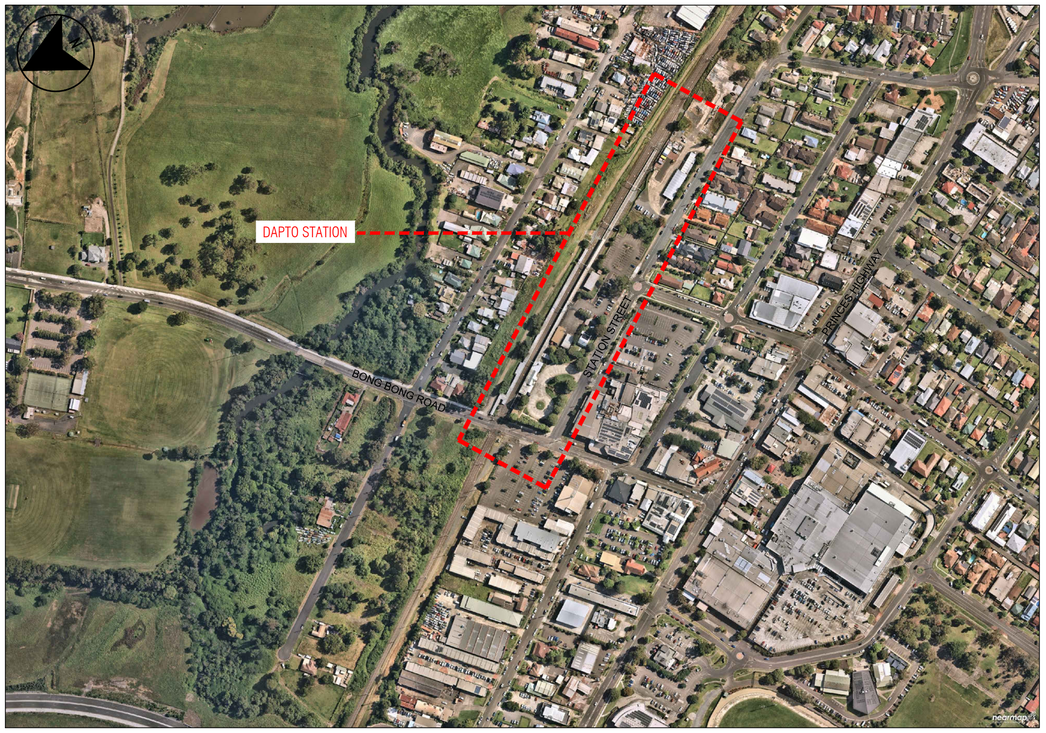
Term	Meaning
SEPP (Transport and Infrastructure)	*State Environmental Planning Policy (Transport and Infrastructure) 2021* (NSW)
SHI	State Heritage Inventory
SoHI	Statement of Heritage Impact
VOC	Volatile Organic Compounds

Definitions

Term	Meaning
Concept design	The concept design is the preliminary design presented in this EIA Checklist, which would be refined by the Contractor (should the Proposal proceed) to a design suitable for construction (subject to Transport for NSW acceptance).
Construction	Includes all work in respect of the Project, other than survey, acquisitions, fencing, investigative drilling or excavation, building/road dilapidation surveys, or other activities determined by the TfNSW DES to have minimal environmental impact such as minor access roads, minor adjustments to services/utilities, establishing temporary construction compounds (in accordance with this approval), or minor clearing (except where threatened species, populations or ecological communities would be affected, unless otherwise agreed by the DES).
Contractor	The entity appointed by Transport for NSW to undertake the construction of the Proposal. The Contractor is therefore responsible for all work on the proposal, both design and construction.
Determining authority	A Minister or public authority on whose behalf an activity is to be carried out or public authority whose approval is required to carry out an activity (under Division 5.1 of the EP&A Act).
Disability Standards for Accessible Public Transport	The Commonwealth Disability Standards for Accessible Public Transport 2002 (as amended), authorised under the Commonwealth *Disability Discrimination Act 1992* (DDA).
More Trains More Services	A TfNSW program of works to simplify and modernise the rail network creating high capacity, turn up and go services for many customers.
Out of hours work	Defined as work undertaken *outside* standard construction hours (i.e. outside of 7am to 6pm Monday to Friday, 8am to 1pm Saturday and no work on Sundays/public holidays).
Proponent	A person or body proposing to carry out an activity under Division 5.1 of the EP&A Act.
The Proposal	The construction and operation of the Dapto Station Transport Access Program upgrade work.
Sensitive receivers	Land uses which are sensitive to potential noise, air and visual impacts, such as residential dwellings, schools and hospitals.

Appendix A – Concept design drawings

TRANSPORT ACCESS PROGRAM 3
DAPTO STATION
SOUTH COAST LINE 95.047km
ARCHITECTURE



01 - LOCATION PLAN
NTS

DRAWING LIST			
EDMS NO.	DRAWING NO.	DRAWING NAME	SCALE
	150329-SMC-DAP-AR-DRG-000001	COVER SHEET, LOCATION & DRAWING INDEX	NTS
	150329-SMC-DAP-AR-DRG-000002	NOTES AND LEGENDS	NTS
	150329-SMC-DAP-AR-DRG-000010	SITE LAYOUT PLAN	1:500
	150329-SMC-DAP-AR-DRG-000011	SITE PLAN - SHEET 1	1:200
	150329-SMC-DAP-AR-DRG-000050	PLATFORM DEMOLITION PLAN	1:100
	150329-SMC-DAP-AR-DRG-000100	FORECOURT GENERAL ARRANGEMENT PLAN	1:100
	150329-SMC-DAP-AR-DRG-000101	PLATFORM GENERAL ARRANGEMENT PLAN - SHEET 1	1:100
	150329-SMC-DAP-AR-DRG-000102	PLATFORM GENERAL ARRANGEMENT PLAN - SHEET 2	1:100
	150329-SMC-DAP-AR-DRG-000150	PLATFORM 2 BUILDING DETAIL PLAN	1:50
	150329-SMC-DAP-AR-DRG-000201	PLATFORM 1 CANOPY SECTION	1:50
	150329-SMC-DAP-AR-DRG-000202	PLATFORM 2 BUILDING SECTIONS	1:50
	150329-SMC-DAP-AR-DRG-000203	RAMP 1, 2 AND 3 SECTIONS	1:50

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REV	DESCRIPTION	DESIGNER INITIAL/DATE	VERIFIED INITIAL/DATE	APPROVED INITIAL/DATE
A	ISSUED FOR SYSTEM DEFINITION REVIEW	H.N/14.04.21	R.W/14.04.21	D.C/14.04.21

CO-ORDINATE SYSTEMMGA2020 TBC | HEIGHT DATUM: A.H.D TBC | SCALE: NTS

Transport for NSW

DEGNAN

CCG ARCHITECTS
NOMINATED ARCHITECTS: DAVID COOK (5098) / HISHAM NOORI (5678)
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ARCHITECTURE

DRAWN	RONNIE MAISNAM	14.04.22
DESIGNED	HISHAM NOORI	04.04.22
DRG CHECK	HISHAM NOORI	14.04.22
DESIGN CHECK	ROBERT WILLOUGHBY	14.04.22
APPROVED	DAVID COOK	04.04.22

DAPTO
SOUTH COAST LINE 95.047km
TRANSPORT ACCESS PROGRAM 3
ARCHITECTURE
COVER SHEET, LOCATION AND DRAWING INDEX

FILE No. 150329-SMC-DAP-AR-DRG-000001 | SHEET: 1 OF 1 | A1
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150329-SMC-DAP-AR-DRG-000001	A	0		

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Plotted by RONNIEM
Plot Date & Time 4/20/2022 7:01 PM
File Plotted 150329-SMC-DAP-AR-DRG-000001 21-141 TINSW_Dapto Station TAP Upgrade_Degnan\AutoCad\Drawings\150317-SMC-DAP-AR-DRG-000001.dwg

NOTES:

BEFORE THE COMMENCEMENT OF ANY WORK, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL EXISTING SERVICES , THROUGH 'DIAL BEFORE YOU DIG' OR ANY OTHER METHOD/S. THESE SERVICES INCLUDE WATER, ELECTRICAL , GAS, SEWER, TELSTRA, ETC.

EXISTING SERVICES HAVE BEEN PLOTTED FROM SUPPLIED DATA. CCG ARCHITECTS DOES NOT GUARANTEE THEIR ACCURACY AND IT IS THE CONTRACTOR'S RESPONSIBILITY TO ESTABLISH THE LOCATION AND LEVEL OF ALL EXISTING SERVICES SERVICING OTHER OPERATIONAL AREAS TO BE RETAINED.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

VERIFY ALL DIMENSIONS AND LEVELS ON SITE AND REPORT ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF WORK.

USE FIGURED DIMENSIONS ONLY. DO NOT SCALE FROM DRAWINGS.

DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL CONTRACT DOCUMENTS.

THE COMPLETION OF THE ISSUE DETAILS CHECKED AND AUTHORISED SECTION IS CONFIRMATION OF THE STATUS OF THE DRAWING. THE DRAWING SHALL NOTBE USED FOR CONSTRUCTION UNLESS ENDORSED 'FOR CONSTRUCTION' AND AUTHORISED FOR ISSUE.

CCG ARCHITECTS PTY. LTD. CANNOT GUARANTEE THE ACCURACY OF CONTENT AND FORMAT FOR COPIES OF DRAWINGS ISSUED ELECTRONICALLY.

ABBREVIATIONS & SYMBOLS LEGEND

AHD	AUSTRALIAN HEIGHT DATUM
AF	ABUTMENT FLASHING
AMB	AMBULANT TOILET
AB	AMENITIES BUILDING
AP	ACCESS PANEL
APT	ACCESSIBLE PUBLIC TELEPHONE
B	BOLLARDS
BAL	BALUSTRADE
BAZ	BOARDING ASSISTANCE ZONE
BL	BIKE LOCKER
BR	BIKE RACKS
BRC	BOARDING RAMP CABINET
BCT	BABY CHANGE TABLE
BSN	BUS STOP SIGN
BKR	BACKREST
BN	BASIN
CAB	CUSTOMER ASSISTANCE BUTTON
CB	CALL BUTTON
CC	CONCRETE COLUMN
CCTV	CLOSED CIRCUIT TELEVISION
CFC	COMPRESSED FIBRE CEMENT
CH	COAT HOOK
CJ	CONTROL JOINT
CK	CONCRETE KERB
CKG	CONCRETE KERB AND GUTTER
CON	CONCRETE
CL	CENTER LINE
COS	CONFIRM ON SITE
D	DOOR
DF	DOOR FRAME
DHW	DRAINAGE HEAD WALL
DB	ELECTRICAL DISTRIBUTION BOARD
DDA	DISABLED CAR SPACE
DP	DOWNPIPE
DPS	DOWNPIPE & SPREADER
EA	EQUAL ANGLE
EB	BITUMEN EDGE
EF	EXHAUST FAN
EG	EDGE GUTTER
EHP	EMERGENCY HELP POINT
ELP	ELECTRICAL PIT
FAT	FAMILY ACCESSIBLE TOILET
FFL	FLOOR FINISH LEVEL
FG	FIXED GLASS
FP	FOOTPATH
GD	GRATED DRAIN
GR	GRAB RAIL
GST	GALVANISED STEEL TROUGH
HD	HAND DRYER
HR	HAND RAIL
HP	HELP BUTTON
ISMSB	INSTALLATION SUPPLY MAIN SWITCHBOARD
KG	KERB GUTTER
KR	KERB RAMP
K&R	KISS & RIDE
LA	LADDER ACCESS
L1	LIFT 1
L2	LIFT 2
LCB	LIFT CONTROL BOX
LV	LOUVRE
LP	LIGHT POLE
MB	MOBILE BIN
MF	MECHANICAL FAN
MV	MECHANICAL VENT
NC	NATURAL CONCRETE
NTS	NOT TO SCALE
OCR	OPAL CARD READER
OFC	OFF FORM CONCRETE
OHW	OVERHEAD WIRE
OHWS	OVERHEAD WIRE STANCHION
P1	PLATFORM 1
P2	PLATFORM 2
PB	PHONE BOOTH
PP	POWER POLE
PT	PAINT FINISH
PX	PEDESTRIAN CROSSING
RB	REMOVABLE BOLLARD
RC	REINFORCED CONCRETE
RL	REDUCED LEVEL
RW	RETAINING WALL
S	SEAT
SC	STEEL COLUMN
SD	SOAP DISPENSER
SDU	SANITARY DISPOSAL UNIT
SG	SIGN POST
SMO	STATION MANAGERS OFFICE
SPI	STATION PASSENGER INFORMATION
SSN	STATION SIGN
SR	STEP RAMP
SS	STAINLESS STEEL
SSER	STATION SERVICES EQUIPMENT ROOM
ST	STAIRS
SWP	STORM WATER PIT
TB	TRAFFIC BARRIER
TC	TIMBER COLUMN
TBC	TO BE CONFIRMED
TME	TO MATCH EXISTING
TO	TOP OF
TOK	TOP OF KERB
TOW	TOP OF WALL
TP	TELECOM POLE
TRH	TOILET ROLL HOLDER
TSP	TRAFFIC SIGN POST
TVM	TICKET VENDING MACHINE
TX	ELECTRICAL TRANSFORMER
TYP	TYPICAL
UB	UNIVERSAL BEAM
VM	VENDING MACHINE
VP	VENT PIPE
W	WINDOW
WB	WHEELCHAIR BAY 800x1300mm
WC	WATER CLOSET
WCC	WHEELCHAIR CIRCULATION 1740x2270mm (180 DEGREE TURN)

PREFIX E=EXISTING
R=RELOCATED

HATCH LEGEND

- ACCESSIBLE PATH WIDTH 1350OMM & 600MM OFFSETS
- EXISTING TO BE DEMOLISHED
- EXISTING STRUCTURE
- NEW TACTILE GROUND SURFACE INDICATOR
- EXTENT OF NEW WORKS
- GARDEN BEDS REFER TO LANDSCAPE PLANS
- BOUNDARY LINE

AMENITIES LEGEND

BCT	BABY CHANGE TABLE
BKR	BACKREST
BN	BASIN
CH	COAT HOOK
COS	CONFIRM ON SITE
DP	DOWNPIPE
FG	FIXED GLASS
GR	GRABRAIL
HD	HAND DRYER
HR	HANDRAIL
HP	HELP BUTTON
LV	LOUVRE
SD	SOAP DISPENSER
SDU	SANITARY DISPOSAL UNIT
TRH	TOILET ROLL HOLDER
VP	VENT PIPE
W	WINDOW
WC	WATER CLOSET

MATERIALS LEGEND

BIT:1	BITUMEN
CFT:1	CERAMIC FLOOR TILE TME
CON:1	CONCRETE - BROOM FINISH
CON:2	CONCRETE - OFF FORM
FE:1	1200 MM HIGH LOOPTOP STEEL FENCE - 'WHITE' COLOUR TME
FE:2	1800MM HIGH GALVANISED CHAIN WIRE FENCE TME
FE:3	1500 MM HIGH GALVANISED SMORGON STEEL A.R.C. WELDMESH (WATTLE) STANDARD PEDESTRIAN LEVEL CROSSING FENCE TME
FE:4	BLACK RMS STEEL FENCE TME
HR:1	40MM DIAMETER GRADE 316 STAINLESS STEEL HANDRAIL
KR:1	100MM x 8 mm GRADE 316 STAINLESS STEEL PLATE KERB RAIL
RS:1	COLORBOND CUSTOM-ORB ROOF SHEET - 'SURF GREY' COLOUR
SCN:1	GALVANISED EXPANDED MESH SCREEN ON EA FRAME TME
SS:1	GRADE 316 STAINLESS STEEL
TGSI:1	HAZARD TACTILE GROUND SURFACE INDICATOR
TGSI:2	DIRECTIONAL TACTILE GROUND SURFACE INDICATOR

GENERAL FINISHES NOTE:

1. PLATFORM 1 NEW CANOPY STRUCTURAL COLUMNS AND BEAMS TO BE HOT DIP GALVANISED STEEL

2. PLATFORM 2 HERITAGE BUILDING PAINT FINISHES TO MATCH EXISTING. TEST SAMPLE ON SITE.

3. TOILET BUILDING INTERNAL FINISHES TO MATCH EXISTING.

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REV	DESCRIPTION	DESIGNER INITIAL/DATE	VERIFIED INITIAL/DATE	APPROVED INITIAL/DATE
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CO-ORDINATE SYSTEMMGA2020 TBC | HEIGHT DATUM: A.H.D TBC | SCALE: NTS

NSW GOVERNMENT Transport for NSW

DEGNAN

CCG ARCHITECTS
NOMINATED ARCHITECTS:
DAVID COOK (5066) | HISHAM NOORI (5678)
CCG ARCHITECTS
ARCHITECTURE

DRAWN	RONNIE MAISNAM	14.04.22
DESIGNED	HISHAM NOORI	14.04.22
DRG CHECK	HISHAM NOORI	14.04.22
DESIGN CHECK	ROBERT WILLOUGHBY	14.04.22
APPROVED	DAVID COOK	14.04.22

DAPTO

SOUTH COAST LINE 95.047km

TRANSPORT ACCESS PROGRAM 3

ARCHITECTURE

NOTES AND LEGEND

FILE No. 150329-SMC-DAP-AR-DRG-000002 | SHEET: 1 OF 1 | A1

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150329-SMC-DAP-AR-DRG-000002	A	0		

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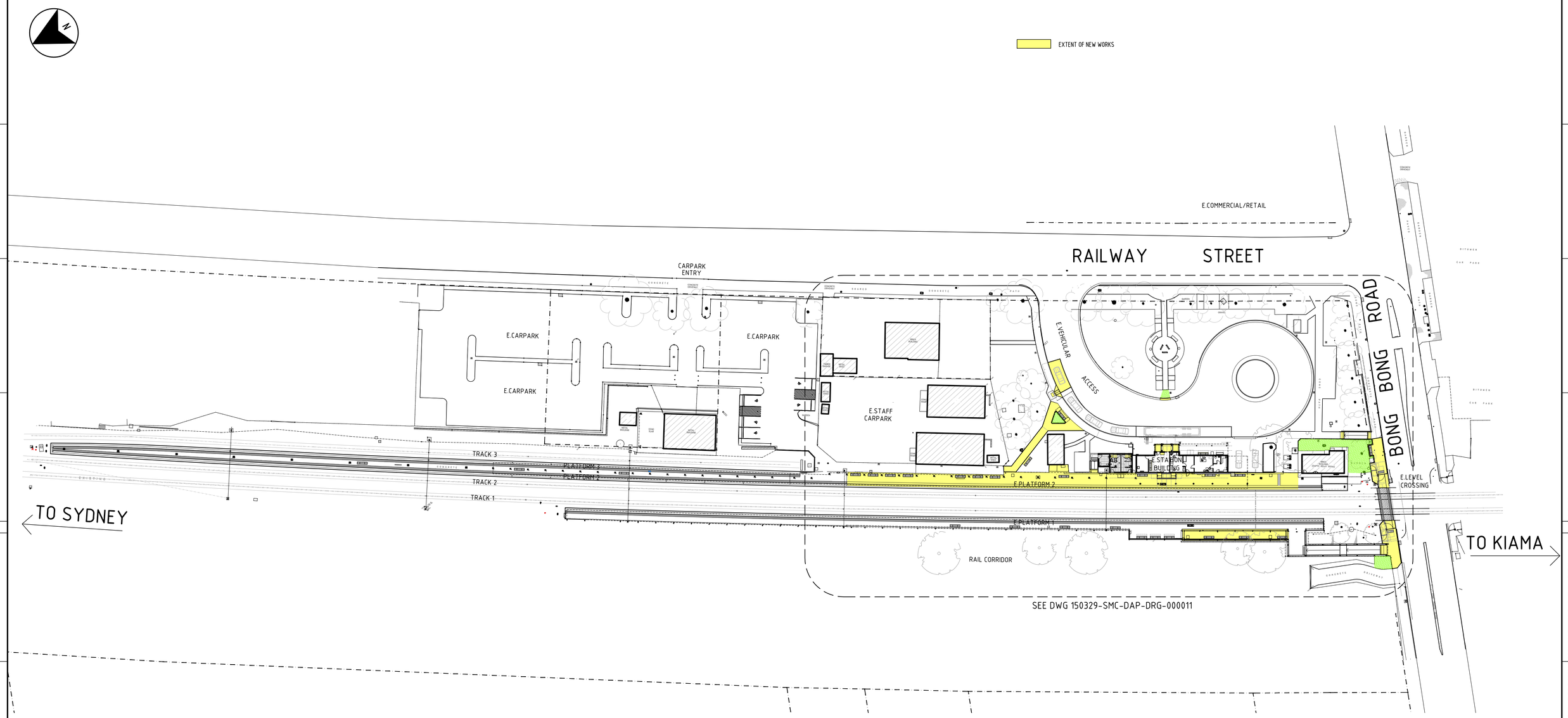

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CO-ORDINATE SYSTEM: MGA2020 | HEIGHT DATUM: A.H.D | SCALE: 1:500

NSW GOVERNMENT Transport for NSW

DEGNAN

CCG ARCHITECTS
NOMINATED ARCHITECTS: DAVID COOK (5086) / HISHAM NOORI (5678)
CCG ARCHITECTS
ARCHITECTURE

DRAWN	RONNIE MAISNAM	14.04.22
DESIGNED	HISHAM NOORI	04.04.22
DRG CHECK	HISHAM NOORI	14.04.22
DESIGN CHECK	ROBERT WILLOUGHBY	04.04.22
APPROVED	DAVID COOK	14.04.22

DAPTO

SOUTH COAST LINE 95.047km

TRANSPORT ACCESS PROGRAM 3
ARCHITECTURE
SITE LAYOUT PLAN

FILE No. 150329-SMC-DAP-AR-DRG-000010 | SHEET: 1 OF 1 | A1

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DRG No.	REV	VER	EDMS No.	AMD No.
150329-SMC-DAP-AR-DRG-00010	A	0		

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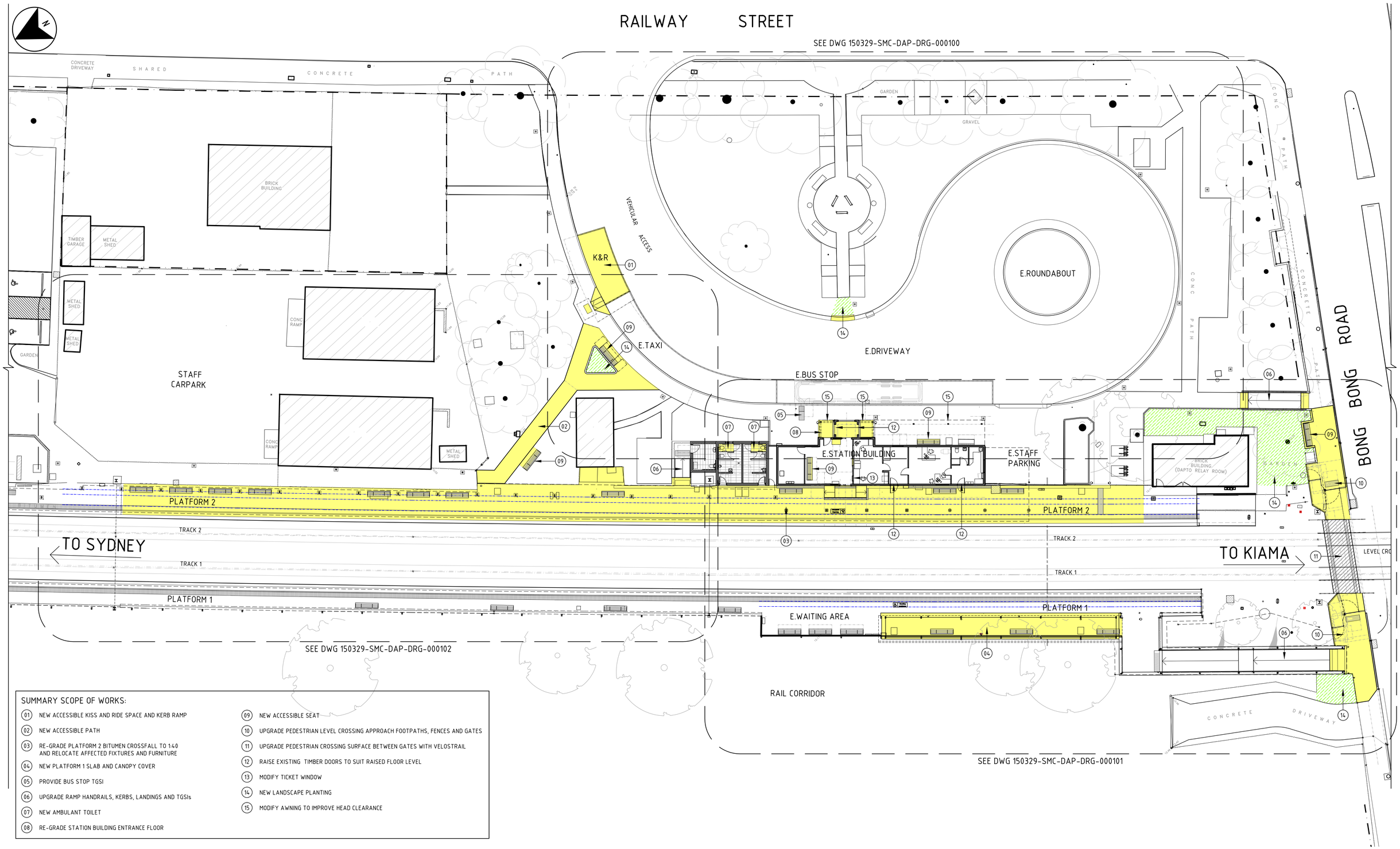
File Plot 160829-SMC-DAP-AR-DRG-000010 P:\21-141 TfNSW_Dapto Station TAP Upgrade_Degnan\AutoCad\Drawings\150317-SMC-DAP-AR-DRG-000010.dwg

Plot Date & Time 4/20/2022 7:21 PM

Plotted by RONNIEM



SUMMARY SCOPE OF WORKS:

01 NEW ACCESSIBLE KISS AND RIDE SPACE AND KERB RAMP
02 NEW ACCESSIBLE PATH
03 RE-GRADE PLATFORM 2 BITUMEN CROSSFALL TO 1:40 AND RELOCATE AFFECTED FIXTURES AND FURNITURE
04 NEW PLATFORM 1 SLAB AND CANOPY COVER
05 PROVIDE BUS STOP TGSI
06 UPGRADE RAMP HANDRAILS, KERBS, LANDINGS AND TGSIs
07 NEW AMBULANT TOILET
08 RE-GRADE STATION BUILDING ENTRANCE FLOOR
09 NEW ACCESSIBLE SEAT
10 UPGRADE PEDESTRIAN LEVEL CROSSING APPROACH FOOTPATHS, FENCES AND GATES
11 UPGRADE PEDESTRIAN CROSSING SURFACE BETWEEN GATES WITH VELOSTRAIL
12 RAISE EXISTING TIMBER DOORS TO SUIT RAISED FLOOR LEVEL
13 MODIFY TICKET WINDOW
14 NEW LANDSCAPE PLANTING
15 MODIFY AWNING TO IMPROVE HEAD CLEARANCE

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2 0 2 4 6 8 10m
1 : 200 FULL SIZE A1

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CO-ORDINATE SYSTEM: MGA2020 TBC | HEIGHT DATUM: A.H.D TBC | SCALE: 1:200

NSW GOVERNMENT Transport for NSW

DEGNAN

CCG ARCHITECTS
NOMINATED ARCHITECTS: DAVID COOK (5086) / HISHAM NOORI (5678)
CCG ARCHITECTS
ARCHITECTURE

DRAWN	RONNIE MAISNAM	4.04.22
DESIGNED	HISHAM NOORI	14.04.22
DRG CHECK	HISHAM NOORI	04.04.22
DESIGN CHECK	ROBERT WILLOUGHBY	14.04.22
APPROVED	DAVID COOK	14.04.22

DAPTO
SOUTH COAST LINE 95.047km
TRANSPORT ACCESS PROGRAM 3
ARCHITECTURE
PROPOSED SITE PLAN SHEET 1

FILE No. 150329-SMC-DAP-AR-DRG-000011 | SHEET: 1 OF 2 | A1
STATUS: SYSTEM DEFINITION REVIEW ©
DRG No. 150329-SMC-DAP-AR-DRG-000011 | REV A | VER 0 | EDMS No. | AMD No.

DF 801*554

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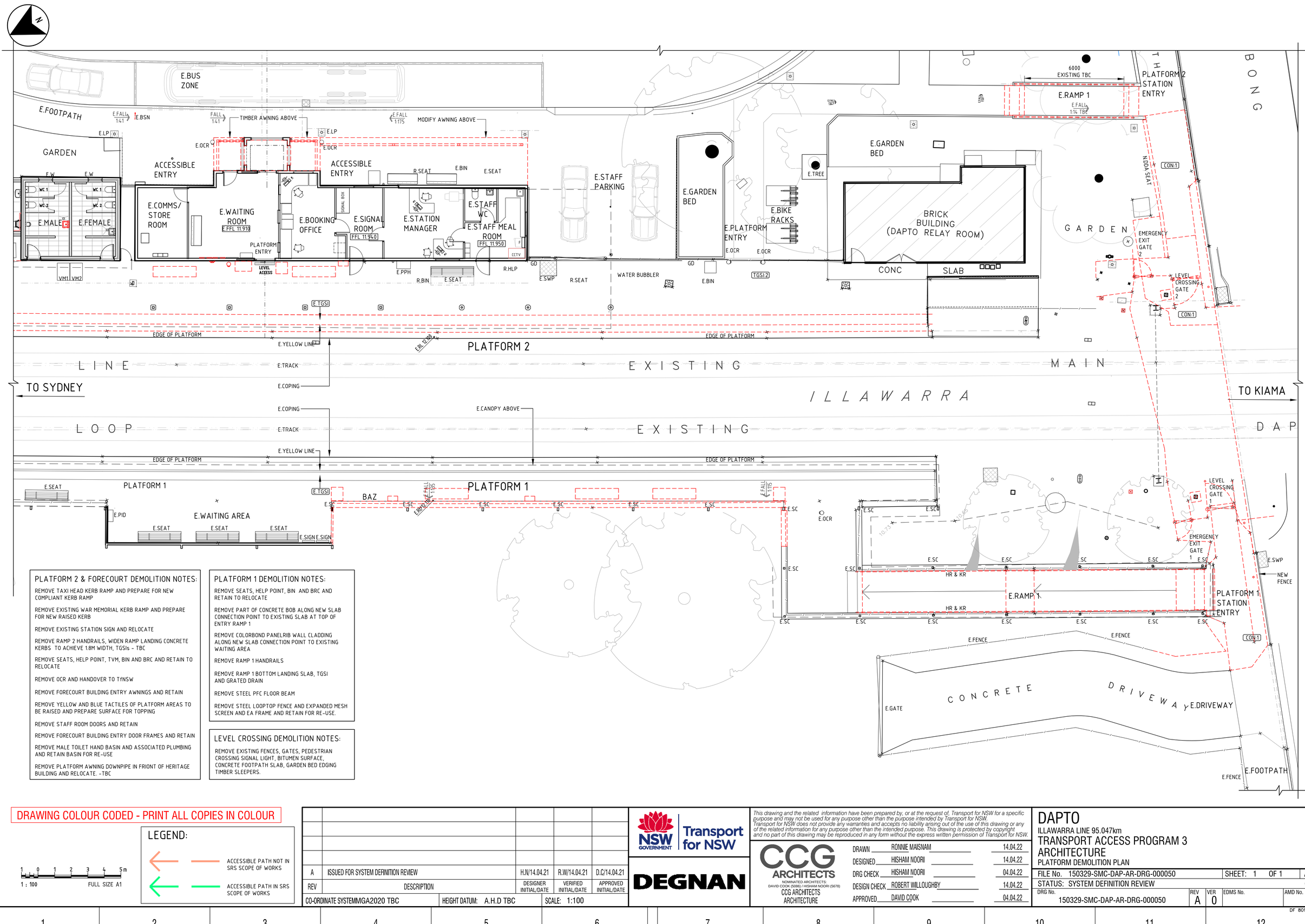
Plot Date & Time 4/20/2022 7:21 PM
Plotted by RONNIEM



PLATFORM 2 & FORECOURT DEMOLITION NOTES:

REMOVE TAXI HEAD KERB RAMP AND PREPARE FOR NEW COMPLIANT KERB RAMP

REMOVE EXISTING WAR MEMORIAL KERB RAMP AND PREPARE FOR NEW RAISED KERB

REMOVE EXISTING STATION SIGN AND RELOCATE

REMOVE RAMP 2 HANDRAILS, WIDEN RAMP LANDING CONCRETE KERBS TO ACHIEVE 1.8M WIDTH, TGSIs - TBC

REMOVE SEATS, HELP POINT, TVM, BIN AND BRC AND RETAIN TO RELOCATE

REMOVE OCR AND HANDOVER TO TfNSW

REMOVE FORECOURT BUILDING ENTRY AWNINGS AND RETAIN

REMOVE YELLOW AND BLUE TACTILES OF PLATFORM AREAS TO BE RAISED AND PREPARE SURFACE FOR TOPPING

REMOVE STAFF ROOM DOORS AND RETAIN

REMOVE FORECOURT BUILDING ENTRY DOOR FRAMES AND RETAIN

REMOVE MALE TOILET HAND BASIN AND ASSOCIATED PLUMBING AND RETAIN BASIN FOR RE-USE

REMOVE PLATFORM AWNING DOWNPIPE IN FRIONT OF HERITAGE BUILDING AND RELOCATE. -TBC

PLATFORM 1 DEMOLITION NOTES:

REMOVE SEATS, HELP POINT, BIN AND BRC AND RETAIN TO RELOCATE

REMOVE PART OF CONCRETE BOB ALONG NEW SLAB CONNECTION POINT TO EXISTING SLAB AT TOP OF ENTRY RAMP 1

REMOVE COLORBOND PANELRIB WALL CLADDING ALONG NEW SLAB CONNECTION POINT TO EXISTING WAITING AREA

REMOVE RAMP 1 HANDRAILS

REMOVE RAMP 1 BOTTOM LANDING SLAB, TGSI AND GRATED DRAIN

REMOVE STEEL PFC FLOOR BEAM

REMOVE STEEL LOOPTOP FENCE AND EXPANDED MESH SCREEN AND EA FRAME AND RETAIN FOR RE-USE.

LEVEL CROSSING DEMOLITION NOTES:

REMOVE EXISTING FENCES, GATES, PEDESTRIAN CROSSING SIGNAL LIGHT, BITUMEN SURFACE, CONCRETE FOOTPATH SLAB, GARDEN BED EDGING TIMBER SLEEPERS.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

LEGEND:

ACCESSIBLE PATH NOT IN SRS SCOPE OF WORKS

ACCESSIBLE PATH IN SRS SCOPE OF WORKS

1 0 1 2 3 4 5m

1 : 100 FULL SIZE A1

REV	DESCRIPTION	DESIGNER INITIAL/DATE	VERIFIED INITIAL/DATE	APPROVED INITIAL/DATE
A	ISSUED FOR SYSTEM DEFINITION REVIEW	H.N/14.04.21	R.W/14.04.21	D.C/14.04.21

CO-ORDINATE SYSTEMMGA2020 TBC | HEIGHT DATUM: A.H.D TBC | SCALE: 1:100

NSW GOVERNMENT Transport for NSW

DEGNAN

CCG ARCHITECTS
NOMINATED ARCHITECTS: DAVID COOK (5086) / HISHAM NOORI (5678)
CCG ARCHITECTS
ARCHITECTURE

DRAWN	RONNIE MAISNAM	14.04.22
DESIGNED	HISHAM NOORI	14.04.22
DRG CHECK	HISHAM NOORI	04.04.22
DESIGN CHECK	ROBERT WILLOUGHBY	14.04.22
APPROVED	DAVID COOK	04.04.22

DAPTO

ILLAWARRA LINE 95.047km

TRANSPORT ACCESS PROGRAM 3

ARCHITECTURE

PLATFORM DEMOLITION PLAN

FILE No. 150329-SMC-DAP-AR-DRG-000050 | SHEET: 1 OF 1 | A1

STATUS: SYSTEM DEFINITION REVIEW ©

DRG No. 150329-SMC-DAP-AR-DRG-000050 | REV A | VER 0 | EDMS No. | AMD No.

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File Plotted

Plot Date & Time 4/21/2022 12:57 PM

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STATION STREET
STATION ST ENTRY NORTH
STATION ST ENTRY SOUTH
FORECOURT SUMMARY SCOPE OF WORKS:
01 NEW ACCESSIBLE KISS AND RIDE SPACE AND KERB RAMP
02 NEW ACCESSIBLE PATH
05 PROVIDE BUS STOP TGSI
09 NEW ACCESSIBLE SEAT
12 RAISE EXISTING TIMBER DOORS TO SUIT RAISED FLOOR LEVEL
14 NEW LANDSCAPE PLANTING
EXISTING CONCRETE DRIVEWAY
NEW ACCESSIBLE KISS & RIDE
E.WAR MEMORIAL
E.ROUNDABOUT
E.BIKE LOCKERS
E.CONCRETE DRIVEWAY
E.TAXI ZONE
E.BUS ZONE
E.FOOTPATH
PLATFORM 2 HERITAGE BUILDING
ACCESSIBLE ENTRY
E.STAFF PARKING
E.BUILDING
STATION ENTRY FROM BONG BONG ROAD
NEW LINE MARKING TO CIVIL ENG'S DETAIL
DEMOLISH EXISTING LINE MARKING AND REPLACE WITH NEW LINE MARKING TO CIVIL ENG'S DETAIL
REPLACE EXISTING KERB RAMP WITH NEW RAISED KERB. MAKE GOOD GARDEN BED
DEMOLISH EXISTING CONCRETE PATH
NEW COMPLIANT FOOTPATH TO PLATFORM 2 - 1800 MIN. WIDTH
EXISTING LINEMARKING
E.CONCRETE PATH

SEE DWG TAP3150317-SMC-DAP-DRG-000102 FOR CONTINUATION

SEE DWG TAP3150317-SMC-DAP-DRG-000101 FOR CONTINUATION

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

LEGEND:

- ACCESSIBLE PATH NOT IN SRS SCOPE OF WORKS
- ACCESSIBLE PATH IN SRS SCOPE OF WORKS

1 : 100 FULL SIZE A1

REV	DESCRIPTION	DESIGNER INITIAL/DATE	VERIFIED INITIAL/DATE	APPROVED INITIAL/DATE
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CO-ORDINATE SYSTEM: MGA2020 TBC | HEIGHT DATUM: A.H.D TBC | SCALE: 1:100

NSW GOVERNMENT Transport for NSW

DEGNAN

CCG ARCHITECTS
NOMINATED ARCHITECTS: DAVID COOK (5086) / HISHAM NOORI (5678)
CCG ARCHITECTS ARCHITECTURE

DRAWN	RONNIE MAISNAM	14.04.22
DESIGNED	HISHAM NOORI	14.04.22
DRG CHECK	HISHAM NOORI	14.04.22
DESIGN CHECK	ROBERT WILLOUGHBY	14.04.22
APPROVED	DAVID COOK	14.04.22

DAPTO

SOUTH COAST LINE 95.047km

TRANSPORT ACCESS PROGRAM 3 ARCHITECTURE

FORECOURT GENERAL ARRANGEMENT PLAN

FILE No. 150329-SMC-DAP-AR-DRG-000100 | SHEET: 1 OF 1 | A1

STATUS: SYSTEM DEFINITION REVIEW ©

DRG No. 150329-SMC-DAP-AR-DRG-000100 | REV A | VER 0 | EDMS No. | AMD No.

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SEE DWG 150317-SMC-DAP-DRG-000100 FOR CONTINUATION

SEE DWG 150317-SMC-DAP-DRG-000102 FOR CONTINUATION

BUS BOARDING AREA REGRADED TO 1:40 OR SHALLOWER

E.BUS ZONE 2000 (LANDING)

E.FOOTPATH

E.FALL 1:41

R.BSN

TGSI:1

FALL 1:40

MODIFY AWNING ABOVE

E.FALL 1:175

MODIFY AWNING ABOVE

E.LP

E.OCR

ACCESSIBLE ENTRY

ACCESSIBLE ENTRY

E.W

E.MALE

E.FEMALE

E.COMMS/ STORE ROOM

E.WAITING ROOM

E.FFL 11.910

E.BOOKING OFFICE

E.SIGNAL ROOM

FFL 11.940

E.STATION MANAGER

R.SEAT

E.BIN

E.SEAT

E.STAFF WC

E.STAFF MEAL ROOM

FFL 11.950

PLATFORM ENTRY

E.STAFF PARKING

E.GARDEN BED

E.TREE

E.BIKE RACKS

E.PLATFORM ENTRY

BRICK BUILDING (DAPTO RELAY ROOM)

NEW HANDRAILS & TACTILES TO COMPLY WITH AS1428.1

6000 EXISTING TBC

E.RAMP 1

E.FALL 1:14 TBC

PLATFORM 2 STATION ENTRY

NODA SEAT

RECONFIGURE GATE LAYOUT AND & RE-GRADE SURFACES TO COMPLY WITH AS1428.1

EMERGENCY EXIT GATE 2

LEVEL CROSSING GATE 2

VM1 VM2

R.SEAT

WCH1

WCH2

R.ABP

E.PPH

R.BIN

E.SEAT

R.HLP

E.SWP

R.SEAT

WATER BUBBLER

E.BIN

GD

BAZ

EDGE OF PLATFORM

YELLOW LINE

E.TRACK

E.COPING

E.TRACK

E.YELLOW LINE

EDGE OF PLATFORM

PLATFORM 2

E.FL 12.100

TO SYDNEY

REGRADE BITUMEN PLATFORM TO 1:40 MAX CROSS FALL GRADE

NEW CANOPY ABOVE

E.CANOPY ABOVE

REFER TO TfNSW SIGNAL ENGINEERING DRAWING M06-244 FOR PEDESTRIAN CROSSING DETAILS

TO KIAMA

RECONFIGURE GATE LAYOUT AND & RE-GRADE SURFACES TO COMPLY WITH AS1428.1

LEVEL CROSSING GATE 1

EMERGENCY EXIT GATE 1

E.SWP

NEW FENCE

PLATFORM 1 STATION ENTRY

E.SEAT

E.PID

PLATFORM 1

E.WAITING AREA

E.SEAT

E.SEAT

E.SEAT

E.SIGN

R.BRC

E.TGSI

Boarding assistance

BAZ

E.FALL 1:15

EMERGENCY EXIT

R.BIN

WCH1WCH2

R.SEAT

DP

CON:1

R.HP

R.SEAT

R.BIN

R.SEAT

E.SC

4070 COS

4540 COS

4540 COS

4540 COS

4540 COS

4020 COS

500

NEW EXTENSION TO PLATFORM & CANOPY

E.FALL 1:15

2272 COS

E.OCR

NEW CANOPY WITH EDGE GUTTER

RELOCATED LOOPTOP FENCE AND EXPANDED MESH SCREEN

NEW HANDRAILS & TACTILES TO COMPLY WITH AS1428.1

HR & KR

E.RAMP 1

HR & KR

E.FENCE

E.FENCE

NEW GARDEN BED

RETURN FENCE TO COLUMN

CONCRETE DRIVEWAY

E.DRIVEWAY

E.GATE

E.FENCE

E.FOOTPATH

SUMMARY SCOPE OF WORKS:

02 NEW ACCESSIBLE PATH

03 RE-GRADE PLATFORM 2 BITUMEN CROSSFALL TO 1:40 AND RELOCATE AFFECTED FIXTURES AND FURNITURE

04 NEW PLATFORM 1 SLAB AND CANOPY COVER

05 PROVIDE BUS STOP TGSI

06 UPGRADE RAMP HANDRAILS, KERBS, LANDINGS AND TGSIs

07 PROVIDE NEW GRAB RAILS FOR AMBULANT TOILET

08 RE-GRADE STATION BUILDING ENTRANCE FLOOR TO MAX 1:40

09 NEW ACCESSIBLE SEAT

10 UPGRADE PEDESTRIAN LEVEL CROSSING APPROACH FOOTPATHS, FENCES AND GATES

11 UPGRADE PEDESTRIAN CROSSING SURFACE BETWEEN GATES WITH VELOSTRAIL

12 RAISE EXISTING TIMBER DOORS TO SUIT RAISED FLOOR LEVEL

13 MODIFY TICKET WINDOW

14 NEW LANDSCAPE PLANTING

15 MODIFY AWNING TO IMPROVE NON-COMPLIANT HEAD CLEARANCE

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LEGEND:

ACCESSIBLE PATH NOT IN SRS SCOPE OF WORKS

ACCESSIBLE PATH IN SRS SCOPE OF WORKS

1 0 1 2 3 4 5m

1 : 100 FULL SIZE A1

REV	DESCRIPTION	DESIGNER INITIAL/DATE	VERIFIED INITIAL/DATE	APPROVED INITIAL/DATE
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CO-ORDINATE SYSTEMMGA2020 TBC | HEIGHT DATUM: A.H.D TBC | SCALE: 1:100

NSW GOVERNMENT Transport for NSW

DEGNAN

CCG ARCHITECTS
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CCG ARCHITECTS
ARCHITECTURE

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DRG CHECK	HISHAM NOORI	04.04.22
DESIGN CHECK	ROBERT WILLOUGHBY	14.04.22
APPROVED	DAVID COOK	04.04.22

DAPTO

SOUTH COAST LINE 95.047km

TRANSPORT ACCESS PROGRAM 3

ARCHITECTURE

PLATFORM GENERAL ARRANGEMENT PLAN - SHEET 1

FILE No. 150329-SMC-DAP-AR-DRG-000101	SHEET: 1 OF 3		A1
STATUS: SYSTEM DEFINITION REVIEW			©
DRG No. 150329-SMC-DAP-AR-DRG-000101	REV A	VER 0	EDMS No. / AMD No.

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LEGEND:

ACCESSIBLE PATH NOT IN SRS SCOPE OF WORKS

ACCESSIBLE PATH IN SRS SCOPE OF WORKS

1 : 100 FULL SIZE A1

REV	DESCRIPTION	DESIGNER INITIAL/DATE	VERIFIED INITIAL/DATE	APPROVED INITIAL/DATE
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CO-ORDINATE SYSTEM MGA2020 TBC | HEIGHT DATUM: A.H.D TBC | SCALE: 1:100

Transport for NSW

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CCG ARCHITECTS ARCHITECTURE

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APPROVED	DAVID COOK	14.04.22

DAPTO

SOUTH COAST LINE 95.047km

TRANSPORT ACCESS PROGRAM 3 ARCHITECTURE

PLATFORM GENERAL ARRANGEMENT PLAN - SHEET 2

FILE No. 150329-SMC-DAP-AR-DRG-000102 | SHEET: 2 OF 2 | A1

STATUS: SYSTEM DEFINITION REVIEW ©

DRG No. 150329-SMC-DAP-AR-DRG-000102 | REV A | VER 0 | EDMS No. | AMD No.

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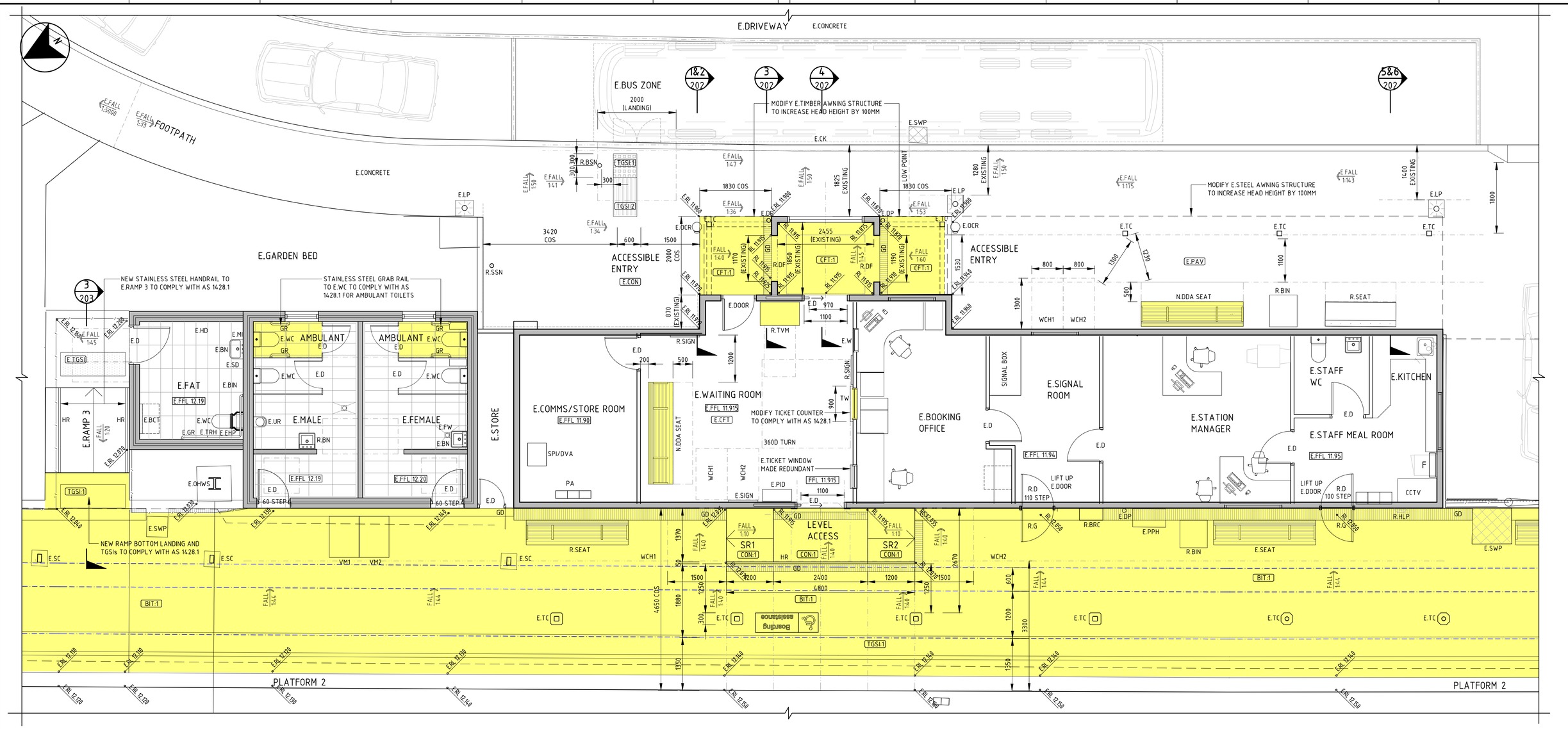

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0,5 0 1 2m

1 : 50 FULL SIZE A1

REV	DESCRIPTION	DESIGNER INITIAL/DATE	VERIFIED INITIAL/DATE	APPROVED INITIAL/DATE
A	ISSUED FOR SYSTEM DEFINITION REVIEW	H.N/14.04.21	R.W/14.04.21	D.C/14.04.21

CO-ORDINATE SYSTEM: MGA2020 | HEIGHT DATUM: A.H.D | SCALE: 1:50

NSW GOVERNMENT Transport for NSW

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DAPTO

SOUTH COAST LINE 95.047km

TRANSPORT ACCESS PROGRAM 3

ARCHITECTURE

PLATFORM 2 BUILDINGS DETAIL PLAN

FILE No. 150329-SMC-DAP-AR-DRG-000150	SHEET: 1 OF 1		A1
STATUS: SYSTEM DEFINITION REVIEW			©

DRG No.	REV	VER	EDMS No.	AMD No.
150329-SMC-DAP-AR-DRG-000150	A	0		

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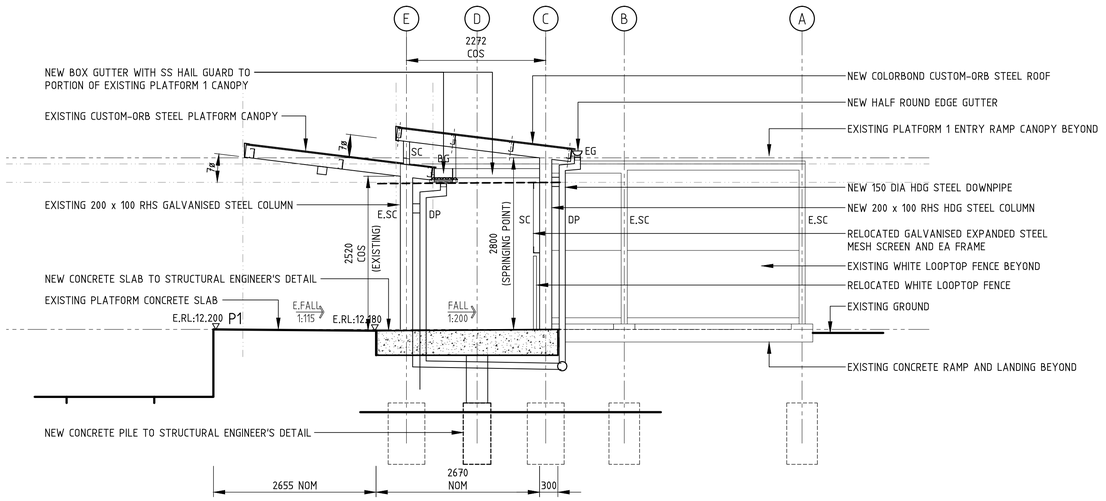

P1 CANOPY SECTION 1/–

SCALE 1:50

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1 : 50 FULL SIZE A1

REV	DESCRIPTION	DESIGNER INITIAL/DATE	VERIFIED INITIAL/DATE	APPROVED INITIAL/DATE
A	ISSUED FOR SYSTEM DEFINITION REVIEW	H.N/14.04.21	R.W/14.04.21	D.C/14.04.21

CO-ORDINATE SYSTEM: MGA2020 | HEIGHT DATUM: A.H.D | SCALE: 1:50

NSW GOVERNMENT Transport for NSW

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DESIGN CHECK	ROBERT WILLOUGHBY	14.04.22
APPROVED	DAVID COOK	14.04.22

DAPTO

SOUTH COAST LINE 95.047km

TRANSPORT ACCESS PROGRAM 3

ARCHITECTURE

PLATFORM 1 CANOPY SECTION

FILE No. 150329-SMC-DAP-AR-DRG-000201 | SHEET: 1 OF 1 | A1

STATUS: SYSTEM DEFINITION REVIEW ©

DRG No.	REV	VER	EDMS No.	AMD No.
150329-SMC-DAP-AR-DRG-000201	A	0		

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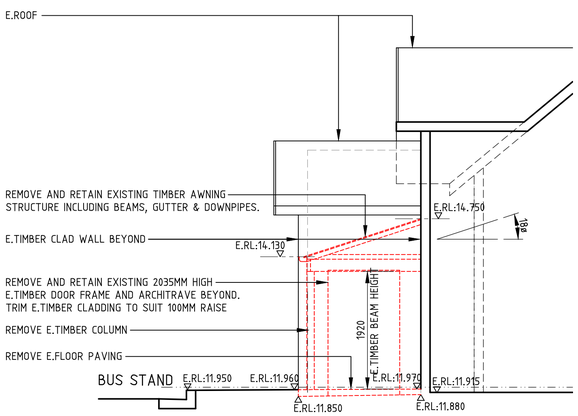
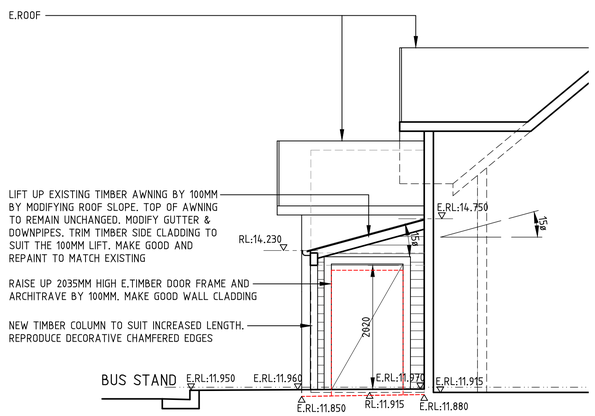
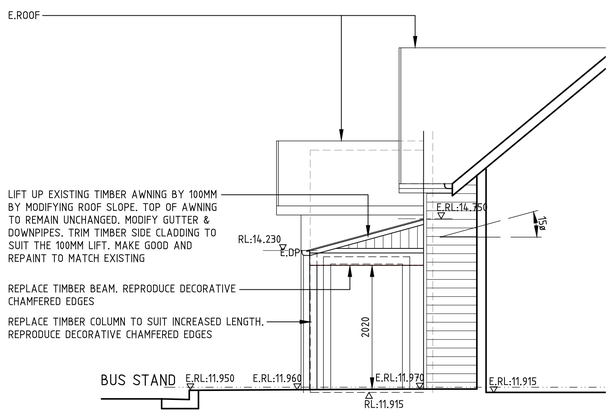


P2 TIMBER AWNING SECTION – DEMOLITION 1
SCALE 1:50



P2 TIMBER AWNING SECTION – PROPOSED 3
SCALE 1:50



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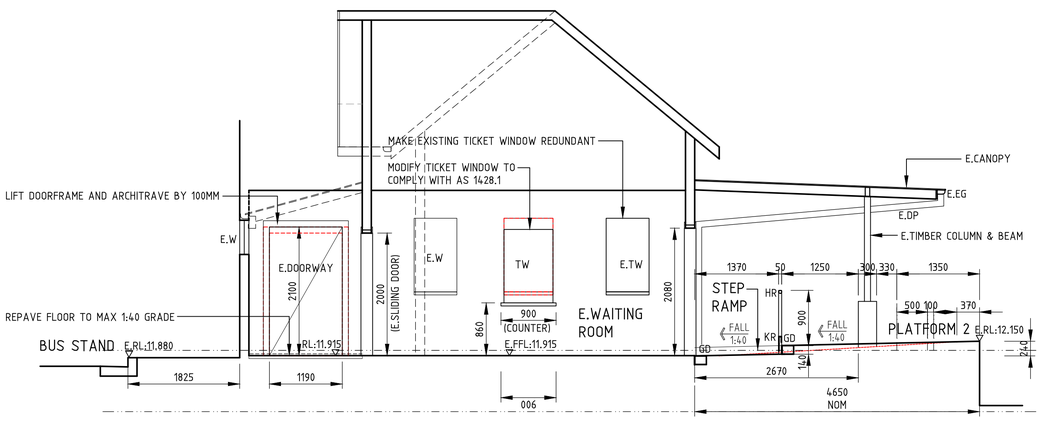
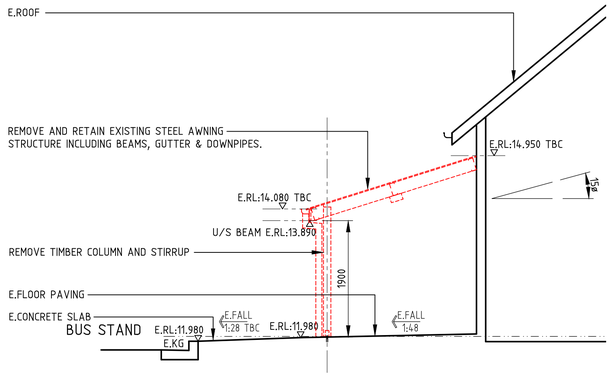
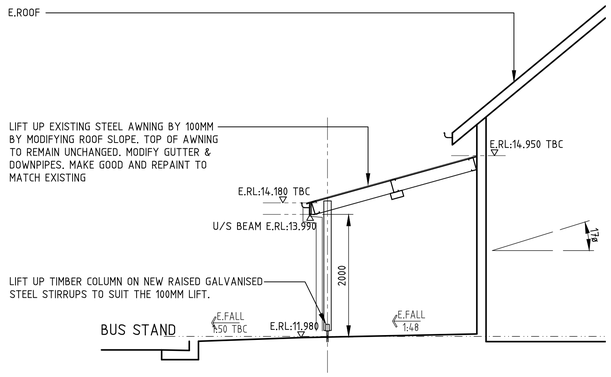
SCALE 1:50



P2 BUILDING CROSS SECTION 4
SCALE 1:50



P2 STEEL AWNING SECTION – DEMOLITION 5
SCALE 1:50



P2 STEEL AWNING PROPOSED SECTION 6
SCALE 1:50

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0.5 0 1 2m
1 : 50 FULL SIZE A1

REV	DESCRIPTION	DESIGNER INITIAL/DATE	VERIFIED INITIAL/DATE	APPROVED INITIAL/DATE
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CO-ORDINATE SYSTEM: MGA2020 | HEIGHT DATUM: A.H.D | SCALE: 1:50

NSW GOVERNMENT Transport for NSW

DEGNAN

CCG ARCHITECTS
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CCG ARCHITECTS
ARCHITECTURE

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APPROVED	DAVID COOK	14.04.22

DAPTO
SOUTH COAST LINE 95.047km
TRANSPORT ACCESS PROGRAM 3
ARCHITECTURE
PLATFORM 2 HERITAGE BUILDING SECTIONS

FILE No. 150329-SMC-DAP-AR-DRG-000202 | SHEET: 1 OF 1 | A1
STATUS: SYSTEM DEFINITION REVIEW ©

DRG No.	REV	VER	EDMS No.	AMD No.
150329-SMC-DAP-AR-DRG-000202	A	0		

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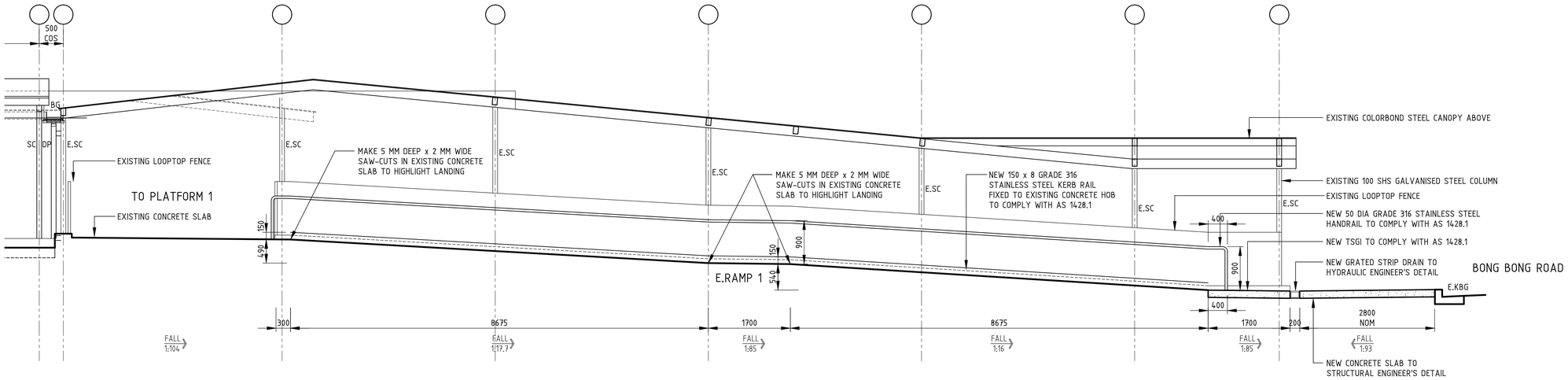

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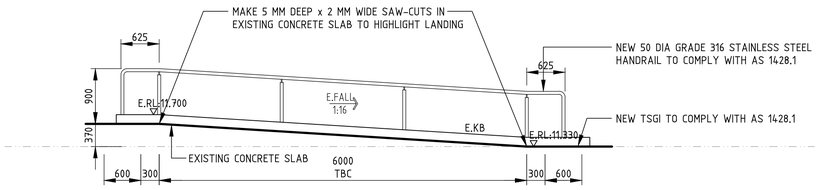
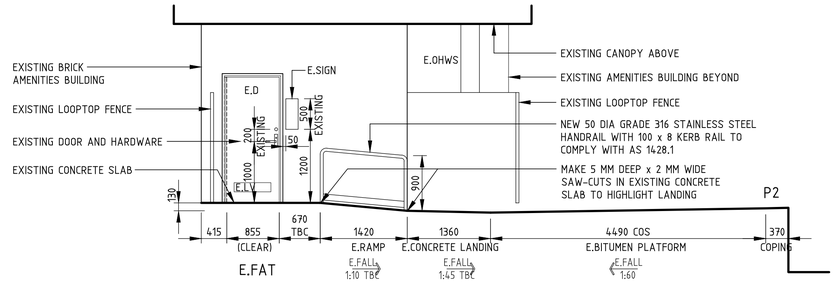
SCALE 1:50



RAMP 2 SECTION (2/101)
SCALE 1:50



RAMP 3 SECTION (3/101)
SCALE 1:50

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A	ISSUED FOR SYSTEM DEFINITION REVIEW	H.N/14.04.21	R.W/14.04.21	D.C/14.04.21

CO-ORDINATE SYSTEM: MGA2020 | HEIGHT DATUM: A.H.D | SCALE: 1:50

NSW GOVERNMENT Transport for NSW

DEGNAN

CCG ARCHITECTS
NOMINATED ARCHITECTS: DAVID COOK (5086) / HISHAM NOORI (5678)
CCG ARCHITECTS
ARCHITECTURE

DRAWN	RONNIE MAISNAM	14.04.22
DESIGNED	HISHAM NOORI	14.04.22
DRG CHECK	HISHAM NOORI	14.04.22
DESIGN CHECK	ROBERT WILLOUGHBY	14.04.22
APPROVED	DAVID COOK	14.04.22

DAPTO
SOUTH COAST LINE 95.047km
TRANSPORT ACCESS PROGRAM 3
ARCHITECTURE
RAMP 1, 2 AND 3 SECTIONS

FILE No. 150329-SMC-DAP-AR-DRG-000203 | SHEET: 1 OF 1 | A1
STATUS: SYSTEM DEFINITION REVIEW ©
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Appendix B – EPBC Search

Australian Government
Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 05-May-2022

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	49
Listed Migratory Species:	19

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	5
Commonwealth Heritage Places:	None
Listed Marine Species:	26
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	5
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area	In feature area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community may occur within area	In feature area
Illawarra and south coast lowland forest and woodland ecological community	Critically Endangered	Community likely to occur within area	In feature area
Illawarra-Shoalhaven Subtropical Rainforest of the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area	In feature area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat likely to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area	In buffer area only
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius madagascariensis			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pachyptila turtur subantarctica			
Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Pycnoptilus floccosus			
Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rostratula australis			
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Sternula nereis nereis			
Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area	In feature area
FISH			
Prototroctes maraena			
Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area	In feature area
FROG			
Heleioporus australiacus			
Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat may occur within area	In feature area
Litoria aurea			
Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Mixophyes balbus			
Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat may occur within area	In buffer area only
MAMMAL			
Chalinolobus dwyeri			
Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat known to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population)			
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Isoodon obesulus obesulus](#)			
Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat may occur within area	In buffer area only
[Petauroides volans](#)			
Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Petaurus australis australis](#)			
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Petrogale penicillata](#)			
Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)](#)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
[Pseudomys novaehollandiae](#)			
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Pteropus poliocephalus](#)			
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
PLANT			
[Acacia bynoeana](#)			
Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat may occur within area	In feature area
[Caladenia tessellata](#)			
Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Cryptostylis hunteriana](#)			
Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Cynanchum elegans](#)			
White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Genoplesium baueri Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid [7528]	Endangered	Species or species habitat likely to occur within area	In feature area
Haloragis exalata subsp. exalata Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Melaleuca biconvexa Biconvex Paperbark [5583]	Vulnerable	Species or species habitat may occur within area	In feature area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Persoonia hirsuta Hairy Geebung, Hairy Persoonia [19006]	Endangered	Species or species habitat may occur within area	In feature area
Pimelea spicata Spiked Rice-flower [20834]	Endangered	Species or species habitat likely to occur within area	In feature area
Pterostylis gibbosa Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood [4562]	Endangered	Species or species habitat likely to occur within area	In feature area
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area	In buffer area only
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat may occur within area	In feature area
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Zieria granulata Hill Zieria, Hilly Zieria, Illawarra Zieria [17147]	Endangered	Species or species habitat likely to occur within area	In buffer area only
REPTILE			
Hoplocephalus bungaroides Broad-headed Snake [1182]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Symposiachrus trivirgatus as Monarcha trivirgatus](#) Spectacled Monarch [83946]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
[Calidris canutus](#) Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
[Charadrius leschenaultii](#) Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area	In feature area
[Limosa lapponica](#) Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Pandion haliaetus](#) Osprey [952]		Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa nebularia			
Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [12228]	NSW	In feature area
Unknown		
Commonwealth Land - [12231]	NSW	In buffer area only
Commonwealth Land - [12230]	NSW	In buffer area only
Commonwealth Land - [12232]	NSW	In buffer area only
Commonwealth Land - [12229]	NSW	In feature area

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis			
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area overfly marine area	In feature area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area	In buffer area only
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rostratula australis as Rostratula benghalensis (sensu lato)			
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus			
Spectacled Monarch [83946]		Species or species habitat may occur within area overfly marine area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area overfly marine area	In feature area

Extra Information

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Lake Illawarra entrance works, Stage 2	2004/1696	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Lake Illawarra Entrance Works (stage 2)	2005/1997	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Bioregional Assessments			
SubRegion	BioRegion	Website	Buffer Status
Sydney	Sydney Basin	BA website	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

Department of Agriculture Water and the Environment
GPO Box 858
Canberra City ACT 2601 Australia
+61 2 6274 1111

Appendix C – AHIMS search

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : Dapto Railway Station

Client Service ID : 697584

[redacted]

Date: 05 July 2022

7 Harvest Street
Macquarie Park New South Wales 2113

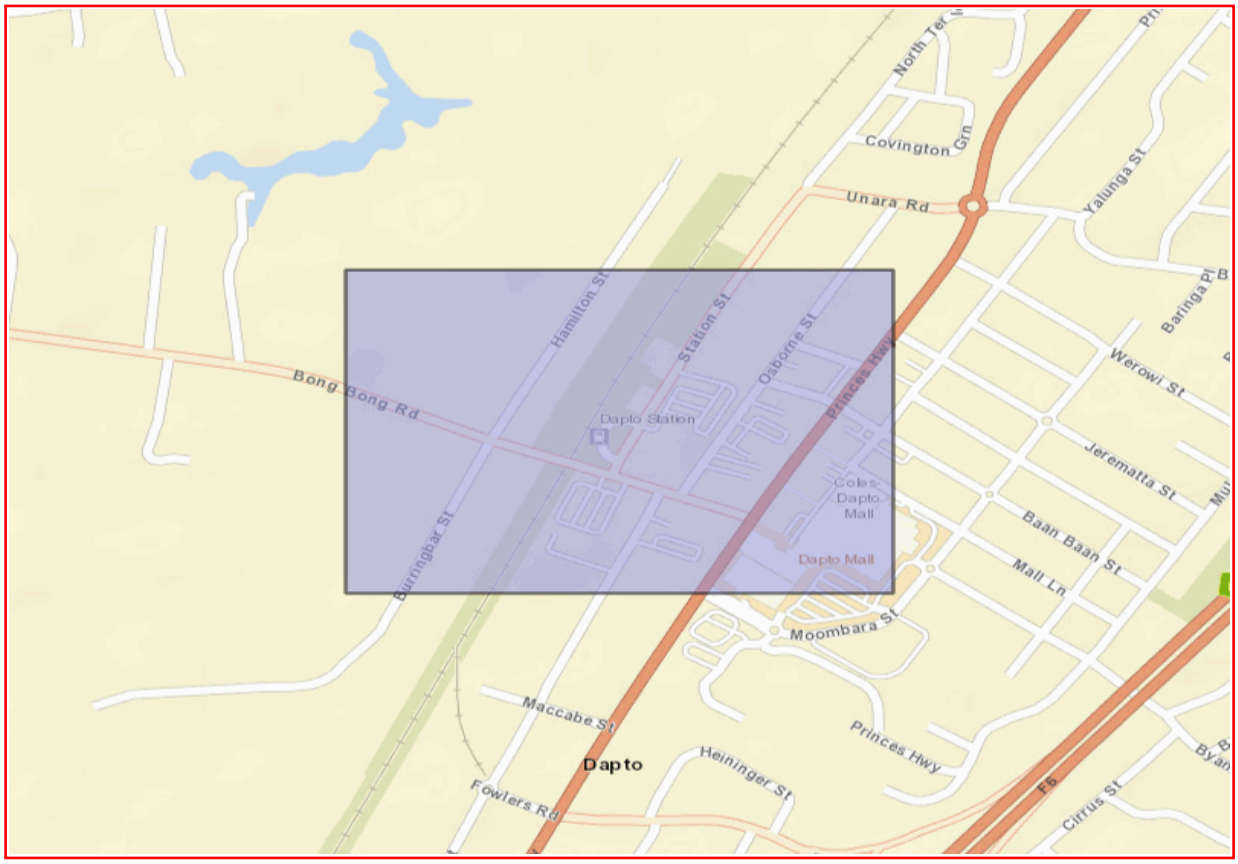
Attention: [redacted]

Email: [redacted]

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -34.4953, 150.7883 - Lat, Long To : -34.4909, 150.796, conducted by [redacted] on 05 July 2022.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

Level 6, 10 Valentine Ave, Parramatta 2150
Locked Bag 5020 Parramatta NSW 2124
Tel: (02) 9585 6345

ABN 34 945 244 274
Email: ahims@environment.nsw.gov.au
Web: www.heritage.nsw.gov.au

Appendix D - Consideration of Section 171(2)

The following environmental factors, listed in section 171(2) of the *Environmental Planning and Assessment Regulation 2021,* have been considered taken into account to assess the likely impacts of the proposal on the environment.

Factor	Impacts
(a) Any environmental impact on a community? There would be some temporary impacts to the community during construction, particularly in relation to noise, traffic, access, and visual amenity. The proposed control measures in this document would be implemented to manage and minimise potential adverse impacts to the community.	Minor
(b) Any transformation of a locality? The Proposal would involve the minor visible changes to pathways, the station building, platforms and the station forecourt. The appearance of the new and modified elements would be consistent with the existing station elements and are considered to be common features in urban areas, and those expected within and near station infrastructure. The Proposal would have a positive contribution to the locality by creating accessible entrances and pathways to the station building, platforms, station forecourt and connections to other modes of transport. Therefore, the Proposal is not expected to result in the transformation of the locality.	Minor
(c) Any environmental impact on the ecosystem of the locality? The Proposal is not expected to result in any environmental impact on the ecosystem of the locality. Vegetation removal has been minimised however, three native trees are proposed to be removed that are in the location of the Platform 1 extension works. These native trees are not threatened species, and no threatened fauna has been identified within the vicinity of the works. Impact from tree removal will be offset by replacement tree planting required by the control measures. Whilst key fish habitat is identified within Mullet Creek about 140m from the site, this potential impact to this habitat can be managed by the control measures included in this assessment. Overall, the proposal is not likely to result in any adverse temporary or long-term impacts on the ecosystem of the locality.	Minor
(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? There would be some temporary impacts during construction particularly in relation to noise, traffic, access and visual amenity. The Proposal would not result in any substantial reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality. Once the Proposal is complete it is expected to result in an improved aesthetic for the station area resulting from upgrades to pathways, better signage and lighting.	Minor
(e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations? An AHIMS search on 5 July 2022 did not identify any registered Aboriginal heritage sites within 200 metres of the site. Given the highly disturbed nature of the Proposal site, encounters with Aboriginal heritage is not expected.	Minor

Factor	Impacts
A Statement of Heritage Impact (SoHI) has been prepared (refer to Appendix G) for the proposed works. The SoHI concludes that the proposed works result in a negligible to minor impact to the heritage significance of the station. The only original fabric impacted by the works include the raising of the entrance awnings to the station building which is considered to have a minor heritage impact on this element. These works will retain and reuse early fabric whilst only raising their height by a minor extent. The SoHI has concluded that there is the archaeological potential in the area of the infrastructure works, proposed Platform 2 upgrades, station forecourt area, and in and around Bong Bong Road. Impacts to potential archaeology can be managed in accordance with the control measures listed in this assessment.	
(f) Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974*)? The requirement for tree removal has been minimised has much as possible. However, three native trees are proposed to be removed within the area of the proposed Platform 1 extension works. No threatened fauna has been identified within the vicinity of the site and therefore the Proposal is unlikely to have any impact on the habitat of protected fauna.	Nil
(g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air? The Proposal is unlikely to endanger any species of animal, plant or other form of life, whether living on land, in water or in the air.	Nil
(h) Any long-term effects on the environment? The Proposal is unlikely to have any long-term effects on the environment given the nature and extent of the works, and control measures to be implemented during construction	Nil
(i) Any degradation of the quality of the environment? The Proposal is unlikely to result in degradation of the quality of the environment. During construction there would be minor and temporary impacts to the environment, primarily from noise and localised dust emissions and reduction in visual amenity	Nil
(j) Any risk to the safety of the environment? The Proposal is unlikely to cause any pollution or safety risks to the environment provided the recommended control measures are implemented.	Nil
(k) Any reduction in the range of beneficial uses of the environment? The Proposal is unlikely to result in the reduction in the range of beneficial uses of the environment.	Nil
(l) Any pollution of the environment? Construction of the Proposal has the potential to result in pollution of the environment (e.g. noise and dust emissions), however, provided the recommended control measures are implemented, the potential impact is expected to be minor (and temporary).	Minor
(m) Any environmental problems associated with the disposal of waste? The Proposal is unlikely to cause any environmental problems associated with the disposal of waste. Given the historical use of the station as a rail corridor, there is potential for contaminants to be present within the soils nearby the station. Hazardous waste (including asbestos, if found) may be generated by the Proposal. Contamination identification would occur prior to construction to confirm the presence of hazardous materials. All waste would be managed and disposed of with a site-specific Waste Management Plan. Mitigation measures would be implemented to ensure waste is reduced, reused or recycled where practicable.	Nil
(n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? The Proposal is unlikely to increase demand on resources that are, or are likely to become, in short supply.	Nil

Factor	Impacts
(o) Any cumulative environmental effect with other existing or likely future activities? Cumulative impacts have been assessed earlier in this assessment, including in regards to potential cumulative noise and vibration impacts with the More Trains More Services works currently being carried out at Dapto Station. To minimise any cumulative construction impacts with other construction works occurring at the same time in the surrounding area, environmental control measures would be coordinated with these projects where feasible.	Nil
(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? The Proposal would not affect or be affected by any coastal processes or coastal hazards.	Nil
(q) Applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1 The *Illawarra Shoalhaven Regional Plan 2041* has four themes guiding it's 30 objectives, where one theme is: '*A smart, connected and accessible region.'* The *Wollongong Local Strategic Planning Statement 2020* (LSPS) has six interconnected goals, with the sixth being: *'We have affordable and accessible transport'.* In addition, Chapter 4 of the LSPS identifies that Wollongong's population is aging. The Proposal provides an accessibility upgrade to Dapto Station and seeks to comply with the key requirements of the Commonwealth Disability Discrimination Act 1992 (DDA) and the Disability Standards for Accessible Public Transport 2002 (DSAPT). The Proposal will facilitate access to the station for people with reduced mobility, parents or carers with prams, or customer with luggage. Therefore, the Proposal is considered to be consistent with the LSPS and Shoalhaven Regional Plan 2041.	N/A
(r) Other relevant environmental factors In considering the potential impacts of this proposal all relevant environmental factors have been considered in this environmental impact assessment, refer to the Impact Assessment Construction and Operation tables.	N/A

Appendix E – Section 2.13 of the State Environmental Planning Policy (Transport and Infrastructure) 2021 – NSW SES consultation response

Our Ref: ID 1627
Your Ref:

07 June 2022

[redacted]
Transport for NSW
PO Box K659
Haymarket NSW 1240

Via email: [redacted]

Dear [redacted]

Notification under section 2.13 of the State Environmental Planning Policy (Transport and Infrastructure) 2021 in relation to the proposed Dapto Station Accessibility Upgrade

Thank you for the notification under sections 2.13 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* in relation to the proposed accessibility upgrade at Dapto Station.

The NSW State Emergency Service (NSW SES) is the agency responsible for dealing with floods, storms and tsunami in NSW. This role includes, planning for, responding to and coordinating the initial recovery from floods. As such, the NSW SES has an interest in the public safety aspects of the development of flood prone land, particularly the potential for changes to land use to either exacerbate existing flood risk or create new flood risk for communities in NSW.

The NSW SES has reviewed the proposed upgrade using the information provided with the proposal and the flood risk information (e.g. local flood Plan, flood studies etc.) available to the NSW SES. Based on this review the NSW SES provides the following advice:

- consider the impact of flooding in the design of the proposed works.
- pursue, if relevant, site design and stormwater management that minimises any risk to the community.
- ensure people using the station are aware of the flood risk.
- develop an appropriate business emergency plan to assist in being prepared for, responding to and recovering from flooding. The NSW SES has a template which can assist in this process: http://www.sesemergencyplan.com.au/.

Please feel free to contact me via email at rra@ses.nsw.gov.au should you wish to discuss any of the matters raised in this correspondence.

Yours sincerely,

STATE HEADQUARTERS
93 - 99 Burelli Street, Wollongong 2500
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F (02) 4251 6190
www.ses.nsw.gov.au
ABN: 88 712 649 015

NSW State Emergency Service

Appendix F – Noise and vibration assessment

Design for a better *future* /

Transport for NSW

Transport Access Program (TAP) Dapto

Construction Noise and Vibration Impact Assessment

May 2022

Confidential

Question today
Imagine tomorrow
Create for the future

Transport Access Program (TAP) Dapto
Construction Noise and Vibration Impact Assessment

Transport for NSW

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Rev	Date	Details
4	22/06/2022	Final

	Name	Date	Signature
Prepared by:	Neil Macabenta	22/06/2022	
Reviewed by:	Ben Ison Jarryd Barton	22/06/2022	
Approved by:	Ben Ison	22/06/2022	

WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

Table of contents

Glossary

Term	Meaning
Detailed design	Detailed design broadly refers to the process that the Contractor undertakes (should the Proposal proceed) to refine the concept design to a design suitable for construction (subject to Transport for NSW acceptance).
Disability Standards for Accessible Public Transport	The Commonwealth *Disability Standards for Accessible Public Transport 2002* ('Transport Standards') (as amended) are a set of legally enforceable standards, authorised under the Commonwealth *Disability Discrimination Act 1992* (DDA) for the purpose of removing discrimination 'as far as possible' against people with disabilities. The Transport Standards cover premises, infrastructure and conveyances, and apply to public transport operators and premises providers.
Feasible	A work practice or abatement measure is feasible if it is capable of being put into practice or of being engineered and is practical to build given project constraints such as safety and maintenance requirements.
Interchange	Transport interchange refers to the area/s where passengers transit between vehicles or between transport modes. It includes the pedestrian pathways and cycle facilities in and around an interchange.
Noise sensitive receiver	In addition to residential dwellings, noise sensitive receivers include, but are not limited to, hotels, entertainment venues, pre-schools and day care facilities, educational institutions (eg schools, TAFE colleges), health care facilities (eg nursing homes, hospitals), recording studios and places of worship/religious facilities (eg churches).
Opal card	The integrated ticketing smartcard being introduced by Transport for NSW.
Out of hours work	Defined as work *outside* standard construction hours (i.e., outside of 7am to 6pm Monday to Friday, 8am to 1pm Saturday and no work on Sundays/public holidays).
Proponent	A person or body proposing to carry out an activity under Division 5.1 of the EP&A Act - in this instance, Transport for NSW.
Rail shutdown	Rail shutdown is the term used by railway building/maintenance contractors to indicate that they have taken possession of the track (usually a block of track) for a specified period, so that no trains operate for a specified time. This is necessary to ensure the safety of workers and rail users.
Reasonable	Selecting reasonable measures from those that are feasible involves making a judgment to determine whether the overall benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the measure.
Sensitive receivers	Land uses which are sensitive to potential noise, air and visual impacts, such as residential dwellings, schools and hospitals.
Tactiles	Tactile tiles or Tactile Ground Surface Indicators (TGSIs) are textured ground surface indicators to assist pedestrians who are blind or visually impaired. They are found on many footpaths, stairs and train station platforms.
The Proposal	The construction of the Dapto Station accessibility upgrade.

Abbreviations

Term	Meaning
AFIL	Audio Frequency Induction Loop systems
BAZ	Boarding Assistance Zone
CCTV	Closed Circuit TV
CEMP	Construction Environmental Management Plan
CNVMP	Construction Noise and Vibration Management Plan
CNVS	Construction Noise and Vibration Strategy
DECC	Department of Environment and Climate Change
DEC	Department of Environment and Conservation
DSAPT	Disability Standards for Accessible Public Transport
EPA	Environment Protection Authority
HNA	Highly Noise Affected
ICNG	*Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2000).
LED	Light-emitting diode
LGA	Local Government Area
MTMS	More Trains More Services project
NML	Noise Management Level
NSW	New South Wales
NVIA	Noise and Vibration Impact Assessment
OOHW	Out of hours work
RBL	Rating Background Level
SH	Standard Hours
SPW	Sound Power Level
TfNSW	Transport for New South Wales
TGSI	Tactile Ground Surface Indicators (‘tactiles’)
TMP	Traffic Management Plan

Executive Summary

WSP Australia Pty Ltd (WSP) has been engaged by Transport for NSW (TfNSW) to undertake a noise and vibration impact assessment for construction of the proposed Dapto Station accessibility upgrade ('the Proposal'). This upgrade forms part of the Transport Access Program (TAP), and this construction noise and vibration assessment has been conducted with reference to the *Construction Noise and Vibration Strategy DMS-ST-157* (CNVS) (TfNSW, 2019) (including the Construction Noise and Vibration Strategy Addendum) (CNVS) (TfNSW, 2019).

The Proposal is intended to improve accessibility and amenities for customers and includes platform upgrades including modification to existing station buildings, improved ramp entry access, upgrade to provide accessibility paths and a kiss and ride bay.

A total of seven worst-case construction activities were assessed. Typically, the work would occur during standard construction hours, however there may be instances where Out of Hours Work (OOHW) may be required. The total duration of work is expected to be up to around 12 months.

The assessment of construction noise impact indicates that noise levels are predicted to exceed relevant Noise Management Levels (NMLs) at the nearest affected residential receiver during all activities, with SC01 (site establishment) presenting the greatest impact to sensitive receivers. The closest residences to the construction work are predicted to be highly noise affected when work occurs at the closest distance to the sensitive receivers. Generally, the receivers would be highly noise affected for very short periods (up to or less than a day) as it is not anticipated that the work would be located at the closest distance to the receivers throughout the proposed works.

Construction noise levels are predicted to exceed relevant NMLs at the nearby industrial receivers (R03 and R04) during construction stages SC01 (site establishment), SC02 (track systems), SC05 (site wide services) and SC07 (finalisation). Construction noise levels are predicted to exceed relevant NMLs for the nearest commercial receiver (R06) during SC01 (site establishment), SC02 (track systems), SC04 (approach and interchange works), SC05 (site wide services), SC06 (platform works) and SC07 (finalisation).

Out of hours works may occur during any of the seven construction scenarios but would be generally limited to approximately four 48-hour rail shutdowns over the duration of the Proposal (i.e. up to around 12 months). It is noted that some other works may be required to occur outside of standard hours which are not part of rail shutdowns. The assessment of OOHW construction noise impacts indicates that noise levels are predicted to exceed relevant NMLs at the nearest sensitive residential receivers during all OOHW activities. As a result of the magnitude of these predicted exceedances during OOHW works, further noise mitigation and management measures would be required in the event of OOHW works being undertaken.

Any night time works are likely to generate sleep disturbance impacts at residential receivers near the construction footprint. These activities would generally be limited to approximately four 48-hour rail shutdowns. The potential for sleep disturbance has been identified in this report, and noise management and mitigation measures would be required to manage OOHW works.

Dapto Station is listed as a heritage item and therefore works are likely to occur within the proposed heritage minimum working distances. Where vibration intensive works occur within the proposed minimum working distances management, mitigation measures are required and have been discussed in this report.

Proposal related construction traffic noise impacts are considered acceptable during the day time and night time periods.

Recommended mitigation and management measures are presented in this report.

1 Introduction

Transport for NSW (TfNSW) proposes accessibility upgrades to Dapto Station ('the Proposal') as part of the Transport Access Program (TAP). WSP has been engaged to undertake a noise and vibration assessment to support the Environmental Impact Assessment (EIA) for the Proposal.

This document assesses noise and vibration impacts associated with the Proposal. Consistent with previous assessments of similar TAP projects, the assessment has been conducted with reference to the *Construction Noise and Vibration Strategy DMS-ST-157* (including the Construction Noise and Vibration Strategy Addendum) (CNVS) (TfNSW, 2019).

It is understood that the accessibility upgrades would not change the way the station currently operates and therefore it is not anticipated that there would be any change in operational noise from the station. Therefore, operational noise and vibration has not been assessed further.

1.1 Proposal Description

Dapto Station has been identified for an accessibility upgrade to ensure that it would meet key requirements of the Commonwealth *Disability Discrimination Act 1992* (DDA) and associated requirements of the *Disability Standards for Accessible Public Transport 2002* (DSAPT).

The Proposal is in the Wollongong Local Government Area (LGA) on the South Coast Line. Dapto station is surrounded by residential development to the west and commercial properties, including the Dapto Leagues Club, to the east.

The Proposal is generally within a low-density residential neighbourhood, with commercial and industrial activities in the immediate surrounds of the station. An overview of the Proposal location is presented in Figure 1.1.

The Proposal involves an accessibility upgrade of Dapto Station which would improve accessibility and amenity for customers. The Proposal would include the following scope of works:

- Works within station forecourt including:
  - Providing a formal accessible kiss and ride zone next to the existing taxi zone. This would be made compliant with the new kerb ramps and signage
  - Providing a new kerb ramp near the station building entrance, opposite the kerb ramp from the war memorial
  - Providing an access path from the formalised kiss and ride/taxi zone to Platform 2 to the north of the station building
  - Providing a new access path from the station forecourt to Platform 2 through the station building. This would include a new ramp to the station building entrance
  - Providing an access path between the existing footpath on Bong Bong Road and Platform 2
- Works within Platform 1 including:
  - Providing an access path between the existing footpath on Bong Bong Road and Platform 1
  - Providing new wheelchair waiting spaces where required for DSAPT compliance
  - Widening of the platform from the existing access point up to the proposed boarding assistance zone to comply with relevant standards, and construction of associated awning
  - Providing boarding assistance zone markings on the platform
  - New underline crossing (ULX) to Platform 1 for new power supply and communications services

- Works within the station building and Platform 2 including:
  - Modifying the existing male and female toilet to provide a new ambulant toilet
  - Altering the existing waiting rooms in the station building on Platform 2 to a DSAPT complaint standard
  - Modification to the existing operational ticket counter to comply with DSAPT standards. This would include installation of an audio- frequency induction loop system (AFILS)
  - Regrading the existing platform to achieve a maximum crossfall of 1:40 (2.5%) along all access paths
  - Existing help points, customer assistance panels, and pay phones to be made accessible
  - Providing boarding assistance zone markings on the platform
  - Providing a new accessible double water bubbler with bottle refill
  - Installation of sliding doors within the existing station building to be replaced with DSAPT compliant sliding doors.
- Works along Bong Bong Road including:
  - Upgrading the existing level crossing including upgrades to gates and fencing where required.
- Works throughout whole site including:
  - Providing new DSAPT compliant LED lighting to all new infrastructure, access paths and platforms. This would only including light fittings where required.
  - Installation of tactile ground surface indicators (TGSI)
  - Line marking, stencilling and installation of new tactiles on platforms where impacted by Contractor's activities
  - Relocation and/or provision of new seating where required for DSAPT compliance (including rest stops along access paths)
  - Installation of new wayfinding and DSAPT signage for the station and interchange areas impacted by Contractor's activities
  - Relocating and/or protecting existing services to applicable codes and standards, where required to construct the new works
  - Relocating and suitably reinstating any existing infrastructure impacted by the Contractor's activities – including seats, signage, guards indicators, Opal car readers, lighting, CCTV, fencing and rubbish bins on the station
  - Modifying and/or up upgrading any existing systems impacted by the works or temporary works – e.g. stormwater, hydraulics, machinal, fire services
  - Anti-graffiti coating to all new hard and existing surfaces affected by the works that are prone to vandalism up to a height of three metres above foot hold level

Subject to approval, construction is expected to start in mid 2022 and take up to around 12 months to complete.

The majority of work is anticipated to be undertaken during standard hours. Certain works may need to occur outside recommended standard hours and would include night works and works during routine rail shutdowns. Rail shutdowns are scheduled closures that would occur regardless of the Proposal when part of the rail network is temporarily closed for maintenance and trains are not operating.

Out of hours works would be required in some cases to minimise disruptions to customers, pedestrians, motorists and nearby sensitive receivers; and to ensure the safety of railway workers and operational assets. It is estimated that up to around four rail shutdowns would be utilised to facilitate the following activities:

- Detailed site survey, services investigations and/or geotechnical investigations within and around the rail corridor

- Service relocations
- Any other works identified within the rail corridor that require additional protection.

All other work associated with the Proposal would typically be completed during the standard construction working hours of:

- Monday to Friday, 7.00am to 6.00pm
- Saturday, 8.00am to 1.00pm
- No work on Sundays or public holidays.

During construction a temporary construction compound would be required. The indicative location of the site compound is shown in Figure 1.1.

Figure 1.1 Site overview and representative noise sensitive receivers (Source: NSW Six Maps)

1.2 Scope of Assessment

The purpose of this assessment is to outline the potential noise and vibration impacts associated with construction of the accessibility upgrades at Dapto Station (the Proposal).

The objectives of this study are to:

- Establish noise and vibration criteria at the nearest potentially affected sensitive receivers
- Determine acoustically significant plant required for the construction works to predict noise levels at the nearest sensitive receivers
- From results of the noise predictions, assess construction noise levels against relevant criteria
- Assess potential vibration impact from construction activities
- Recommend impact mitigation and management, where necessary.

1.3 Sensitive Receivers

The Proposal has the potential to adversely impact nearby properties that are considered sensitive to noise and vibration. The Proposal is located next to residential, commercial and industrial receivers.

The following sensitive receiver types surrounding the Proposal were identified using aerial imagery:

- Residential receivers west and east of the station
- Non-residential receivers, including commercial premises and industrial receivers.

In addition to the surrounding residential receivers, the following vibration sensitive structures, including heritage items, were identified:

- Dapto Railway Station – local heritage item and s170 item – Station Street, Dapto
- Dapto Station Master's residence – local heritage item – 1 Station Street, Dapto
- Horsley Homestead – State heritage item – Bong Bong Road, Dapto
- Dapto Hotel – local heritage item – 102-110 Princes Highway, Dapto
- Fairley's building (former) – local heritage item – 1-11 Bong Bong Road, Dapto
- Bunya Pine (Uniting Church grounds) – local heritage item – 126-128 Princes Highway, Dapto
- Crystal clothing factory (former) – local heritage item – 14-16 Marshall Street, Dapto
- Bunya Pine – local heritage item – 93-109 Princes Highway, Dapto.

The nearest representative noise sensitive receivers were identified in Table 1.1. Figure 1.1 presents the location of the Proposal and the nearest representative noise sensitive receivers.

Table 1.1 Noise catchment areas and classification of representative receivers

RECEIVER ID	ADDRESS	RECEIVER TYPE	MINIMUM DISTANCE TO PROPOSAL [1]
R01	20 Bong Bong Road, Dapto	Residential	20m west of work
R02	44 Hamilton Street, Dapto	Residential	5m west of work
R03	38 Hamilton Street, Dapto	Industrial	5m west of work

RECEIVER ID	ADDRESS	RECEIVER TYPE	MINIMUM DISTANCE TO PROPOSAL [1]
R04	20 Hamilton Street, Dapto	Industrial	10m west of work
R05	28 Station Street, Dapto	Residential	65m east of work
R06	18 Bong Bong Road, Dapto	Commercial	15m east of work
R07	23-25 Bong Bong Road, Dapto	Commercial	50m southeast of work
R08	6-8 Marshall Street, Dapto	Commercial	95m south of work
R09	5 Station Street, Dapto (station master's residence)	Residential	5m east of work

(1) Minimum distance of the sensitive receiver buildings to the limits of the construction footprint.

1.4 Relevant Guidelines

This report has been written with reference to the following documents:

- TfNSW *Construction Noise and Vibration Strategy DMS-ST-157 2019* (including the *Construction Noise and Vibration Strategy Addendum – Replacing Tables 8 & 9, November 2019*) (CNVS)
- NSW DECC *Interim Construction Noise Guideline 2009* (ICNG)
- NSW EPA *Road Noise Policy 2011* (RNP)
- NSW DEC *Assessing Vibration: a Technical Guideline 2006* (AVTG)
- NSW EPA *Noise Policy for Industry 2017* (NPfI).

Furthermore, the following standards are referenced in this report:

- British Standard *BS 7385-2-1993: Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration*
- German Standard *DIN 4150-3-2016: Vibrations in buildings – Part 3. Effects on structures* (DIN 4150)
- Australian Standard *AS 2436:2010 - Guide to noise and vibration control on construction, demolition and maintenance sites*
- *International Standard ISO9613-2: Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation*
- Department for Environment Food and Rural Affairs (DEFRA) (United Kingdom), *Update of noise database for prediction of noise on construction and open sites – Phase 3: Noise measurement data for construction plant used on quarries.*

2 Existing Noise Environment

Noise monitoring data was adopted from the noise assessment previously undertaken by RWDI Australia Pty Ltd, *Dapto Station – Noise and Vibration Impact Assessment* dated 26 May 2021 (MTMS assessment). Unattended noise monitoring was conducted at one monitoring location between 24 November and 1 December 2020. It is noted that the noise monitor was installed one metre from the building façade therefore the measured values presented below include façade reflections.

The adopted rating background levels (RBL) are summarised in Table 2.1.

Table 2.1 Measured background noise levels (L_{A90})

NOISE MONITORING LOCATION	RBL[1] (dBA)		
	DAY[2]	EVENING[2]	NIGHT[2]
NM01 – 22 Station Street, Dapto	41	38	30

(1) RBL – rating background level. The overall single-figure background level representing each assessment period (daytime/evening/night-time) as defined in the EPA Noise Policy for Industry (NPfI)

(2) Time periods defined in the NPfI – Day: 7.00 am to 6.00 pm Monday to Saturday, 8.00 am to 6.00 pm Sunday; Evening: 6.00 pm to 10.00 pm; Night: the remaining periods.

Additionally, the ambient noise (L_{Aeq}) was measured for the Day (7.00 am to 10.00 pm) and Night (10.00 pm to 7.00 am) periods as presented in Table 2.2.

Table 2.2 Measured ambient noise levels (L_{Aeq})

MEASUREMENT LOCATION	PERIOD	$L_{Aeq, period}$ dB	$L_{Aeq,1hr}$ dB
NM01 – 22 Station Street, Dapto	Day (7.00 am to 10.00 pm)	59	60
	Night (10.00 pm to 7.00 am)	54	59

3 Assessment Criteria

3.1 Construction Noise

The CNVS establishes assessment methods for construction noise impacts at sensitive receivers from TfNSW projects. The strategy includes reference to objectives in the ICNG.

As the Proposal duration would be greater than six weeks, a detailed assessment method has been adopted per the CNVS.

3.1.1 Construction Noise Assessment Periods

Table 3.1 outlines the CNVS assessment periods applicable to the Proposal.

Table 3.1 CNVS assessment periods

NAME	RBL PERIOD	TIME PERIODS
Standard Hours (SH)	Day	Monday to Friday - 7.00 am to 6.00 pm Saturday - 8.00 am to 1.00 pm Sunday/Public Holiday - Nil
Out of Hours Works (OOHW) Period 1	Day	Saturday - 7.00 am to 8.00 am and 1.00 pm to 6.00 pm Sunday and public holidays - 8.00 am to 6.00 pm
	Evening	Monday to Saturday - 6.00 pm to 10.00 pm
Out of Hours Works (OOHW) Period 2	Day	Sunday and public holidays - 7.00 am to 8.00 am
	Evening	Sunday and public holidays - 6.00 pm to 10.00 pm
	Night	All days 10.00 pm to 7.00 am

3.1.2 Construction Noise Management Levels

The CNVS provides the methodology by which noise and vibration from construction projects can be assessed and mitigation measures identified and applied. The strategy specifies that construction Noise Management Levels (NML) are to be defined using the method specified in the ICNG. This requires the development of the NML based on existing Rating Background Levels (RBL) and a comparison of the predicted construction noise levels with the NML for identified work periods.

Recommended standard hours represent the times of the day when receivers are likely to be less sensitive to noise impact. Where work is proposed outside of standard hours, justification is required and more stringent NMLs apply. For non-residential receiver types, the NMLs only apply when the premise is being used.

Table 3.2 sets out the application of the management levels for noise at residential receivers.

Table 3.2 Application of the ICNG NMLs for residential receivers

TIME OF DAY	NML, dBA $L_{eq,15min}$	HOW TO APPLY
Recommended standard hours: Monday to Friday 7.00am to 6.00pm Saturday 8.00am to 1.00pm No work on Sundays or public holidays	Noise affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured $L_{Aeq,15\ min}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of work to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dBA	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account times identified by the community when they are less sensitive to noise (such as before and after school for work near schools, or mid-morning or mid-afternoon for work near residences) if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected RBL + 5 dB	A strong justification would typically be required for work outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5 dBA above the noise affected level, the proponent should consult with the community.

It is noted that the monitoring was undertaken one metre from a building façade. In accordance with the NPfI, the RBL should represent free field measured levels. Therefore, to account for the façade reflection from the building façade a correction of -2.5 dB has been applied to the measured RBLs measured in Table 2.1. The NMLs were based on the free field corrected RBL as presented in Table 3.3.

Table 3.3 NMLs at residential receivers

RECEIVER	RBL dBA [4]			NML dBA $L_{eq,15min}$ [1]			
	DAY	EVENING	NIGHT	SH	OOHW [1]	OOHW [2]	HNA [2,3]
Residential	38	35	30 [5]	48	40	35	75

(1) Time periods as defined in Table 3.1.

(2) HNA - Highly Noise Affected

(3) Criteria applies during SH only

(4) A -2.5 dB correction has been applied to the measured RBLs to account for façade reflection

(5) In accordance with the NPfI, a minimum background noise level of 30 dBA is adopted for the night time period

Table 3.4 lists the NMLs that have been adopted for non-residential sensitive receivers. The NMLs apply when the premises are in use during any assessment period.

Table 3.4 NMLs for non-residential sensitive receivers

RECEIVER TYPE	NMLs dBA $L_{eq,15min}$[1]
Industrial	External noise level – 75
Commercial	External noise level – 70

(1) Criteria apply when in use.

3.1.3 Site Specific Construction Noise Management Levels

The specific NMLs for construction activities at surrounding receivers are presented in Table 3.5.

NMLs have been presented for OOH work (OOHW) periods as it is expected that construction work may occur outside of standard hours.

Table 3.5 Site Specific NMLs

RECEIVER TYPE	NML dBA $L_{eq,15min}$[1]			
	SH	OOHW 1	OOHW 2	HNA
Residential Receivers	48	40	35	75
Industrial[2]	75	n/a	n/a	n/a
Commercial[2]	70	70	70	n/a

(1) Time periods as defined in Section 3.1.1.

(2) Criteria apply when in use.

3.1.4 Sleep Disturbance

Some of the proposed construction work may be required to take place during the night-time periods (10.00 pm to 7.00 am), which has the potential to lower sleep quality of the residents near the work due to maximum noise level events. Potential impacts include sleep disturbance and sleep awakening reactions. Typically, these periods would occur in conjunction with the approximately four scheduled rail shutdown periods.

Section 4.3 of the ICNG discusses the method for quantifying and assessing sleep disturbance (sleep awakening). This guidance references the NSW *Road Noise Policy* (RNP) (EPA, 2013) which discusses criteria for the assessment of sleep disturbance.

The RNP suggests a screening level of $L_{1,1min}$ dBA, equivalent to the RBL + 15 dB. Where this level is exceeded, further analysis should be carried out. Section 5.4 of the RNP also states that:

- Maximum internal noise levels below 50 to 55 dBA would be unlikely to result in people's sleep being disturbed
- If the noise exceeds 65 to 70 dBA once or twice each night, the disturbance would be unlikely to have any notable health or wellbeing effects.

The guidance within the RNP indicates that internal noise levels of 50 to 55 dBA are unlikely to cause sleep awakening reactions. Therefore, at levels above 55 dBA, sleep disturbance would be considered likely. Assuming that receivers may have windows partially open for ventilation, a 10 dB outside to inside correction has been adopted as indicated in the ICNG.

Based on the above, the noise level 65 dBA L_{max} (external) has been adopted as sleep disturbance screening criterion for assessment purposes. Feasible and reasonable safeguards should be considered where there are night-time predicted exceedances above this limit.

It should be noted that this assessment method (sleep disturbance criteria based on guidance for sleep awakening) may not capture the full extent of impact during the early and late stage of sleep (difficulty falling asleep and waking up early). However, this assessment method would provide an indication of the potential sleep disturbance when work occur in the night-time period. The night-time impact due to construction works are quantified and managed through the $L_{eq,15\ min}$ assessment.

Based on this guidance, site specific sleep disturbance noise goals used to assess the likelihood for sleep disturbance within residences due to night-time construction activity are presented in Table 3.6.

Table 3.6 Sleep disturbance NMLs at residential receivers

RECEIVER TYPE	SLEEP DISTURBANCE CRITERIA, dBA $L_{1,1min}$	
	RNP SCREENING CRITERION	RNP AWAKENING GOAL
Residential	45	65

3.2 Construction Traffic Noise

The RNP provides guidance on the assessment of noise impact from road traffic noise on sensitive receivers.

The RNP criteria apply to traffic generated by construction activities. For a conservative assessment, it is assumed that the existing roads immediately surrounding the Proposal, including Bong Bong Road and Station Street, are local roads. Local roads are assessed over a one hour period (typically the peak hour) within the respective day and night periods.

Table 3.7 presents a summary of the applicable criteria for residences.

Table 3.7 Road traffic noise criteria for residential receivers on existing roads affected by additional traffic from land use developments

ROAD TYPE	ROAD TRAFFIC NOISE CRITERIA	
	DAY[1]	NIGHT[1]
Local Roads	55 dBA $L_{eq,1hr}$	50 dBA $L_{eq,1hr}$

(1) Time periods as defined in the RNP: Day (7.00 am to 10.00 pm) and Night (10.00 pm to 7.00 am)

The RNP application notes state that '*for existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level as a result of the development should be limited to 2 dBA above that of the noise level without the development. This limit applies wherever the noise level without the development is within 2 dBA of, or exceeds, the relevant day or night noise assessment criterion*'.

Therefore, if the road traffic noise levels increase by more than 2 dBA as a result of the proposed construction traffic and the criteria in Table 3.7 are exceeded, investigation of mitigation options would be required.

3.3 Construction Vibration

Vibration associated with construction activities can result in impacts on human comfort or the damage of physical structures such as dwellings. These two impacts have different criteria, with the effects of vibration on human comfort having a lower threshold.

In accordance with Section A.3 of the CNVS, the construction vibration objectives for the Proposal have been determined using the following guidelines:

- For cosmetic damage vibration - *British Standard BS 7385 Part 2-1993 Evaluation and measurement for vibration in buildings for standard structures*
- For human exposure to vibration - *Assessing Vibration: A Technical Guideline* which includes *British Standard BS 6472:1992 Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz)*
- For heritage buildings that have been found to be structurally unsound - *German Standard DIN 4150-3-2016: Vibrations in buildings – Part 3. Effects on structures.*

3.3.1 Cosmetic Building Damage

The applicable limits for vibration regarding cosmetic damage have been referenced from *British Standard BS 7385-2: 1993 Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration.*

A summary of the limits is provided in Table 3.8. These peak vibration limits are set so that the risk of cosmetic damage is minimal. They have been set at the lowest level above which damage has been credibly demonstrated. The limits also assume that the equipment causing the vibration is only used intermittently.

Table 3.8 BS 7385-2 Guideline vibration limits for cosmetic damage

GROUP	TYPE OF STRUCTURE	PEAK COMPONENT PARTICLE VELOCITY, mm/s [1]		
		4–15 Hz	15–40 Hz	40 Hz and above
1	Reinforced or framed structures Industrial or heavy commercial buildings	50		
2	Un-reinforced or light framed structures Residential or light commercial buildings	15 – 20[2]	20 – 50	50

(1) Values referred to are at the base of the building, on the side of the building facing the source of vibration (where feasible).

At frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) should not be exceeded.

3.3.2 Human Comfort

Assessing Vibration: a Technical Guideline (DECC, February 2006) presents the limits (vibration dose values) above which there is considered to be a risk that the amenity and comfort of people occupying buildings would be adversely affected by construction work.

The applicable criteria for intermittent vibration are shown in Table 3.9 as vibration dose value ($m/s^{1.75}$).

The vibration guideline also specifies limits for continuous and impulsive vibration. These vibration limits are expressed in acceleration (m/s^2) and peak particle velocity (mm/s) as presented in Appendix C of the AVTG and reproduced in Table 3.10.

Table 3.9 Vibration limits for human exposure from intermittent vibration

LOCATION	ASSESSMENT PERIOD[1]	VIBRATION DOSE VALUE ($M/S^{1.75}$)	
		PREFERRED VALUES	MAXIMUM VALUES
Residences	Daytime	0.2	0.4
	Night-time	0.13	0.26

(1) Daytime is 7.00 am to 10.00 pm and night-time is 10.00 pm to 7.00 am

Table 3.10 Preferred and maximum values for continuous and impulsive vibration

LOCATION	ASSESSMENT PERIOD	RMS ACCELERATION m/s^2				PEAK PARTICLE VELOCITY mm/s	
		PREFERRED VALUES		MAXIMUM VALUES		PREFERRED VALUES	MAXIMUM VALUES
		Z-AXIS	X AND Y AXES	Z-AXIS	X AND Y AXES	ALL AXES	ALL AXES
Continuous Vibration							
Residences	Daytime	0.010	0.0071	0.020	0.017	0.28	0.56
	Night-time	0.007	0.005	0.014	0.010	0.20	0.40
Impulsive Vibration							
Residences	Daytime	0.3	0.21	0.60	0.42	8.6	17.0
	Night-time	0.10	0.071	0.20	0.14	2.8	5.6

(1) Daytime is 7.00 am to 10.00 pm and night-time is 10.00 pm to 7.00 am

3.3.3 Structurally Unsound Heritage Buildings

Section A.3.5 of the CNVS stipulates that when a heritage building, or structure is found to be structurally unsound (following inspection) a more conservative cosmetic damage objective should be adopted. It is recommended that a cosmetic damage objective of 2.5 mm/s, taken from DIN 4150, should be considered for structurally unsound heritage buildings.

4 Construction Noise and Vibration Assessment

This section outlines the assessment of construction noise and vibration impacts from the Proposal.

4.1 Construction Noise Assessment

To assess the potential noise impact during construction, scenarios comprising typical plant and equipment have been developed based on indicative staging information.

4.1.1 Construction Stages and Duration

The Proposal would be constructed in stages with the stages occurring concurrently and at different times depending on the activity. Table 4.1 presents the assessed construction scenarios and working periods developed in consultation with TfNSW based on the indicative construction methodology. Out of hours works are expected to occur during approximately four nominated 48-hour rail shutdowns throughout the construction program.

Table 4.1 Modelling scenarios

SCENARIO ID	STAGE/ACTIVITIES	TIME PERIOD	INDICATIVE DURATION (TOTAL)
SC01	Site establishment	Standard hours and rail shutdowns	1 month
SC02	Track systems	Standard hours and rail shutdowns	4 months
SC03	Building work	Standard hours and rail shutdowns	4 months
SC04	Approach and interchange	Standard hours and rail shutdowns	7 months
SC05	Site wide services	Standard hours and rail shutdowns	7 months
SC06	Platform work	Standard hours and rail shutdowns	4 months
SC07	Finalisation	Standard hours and rail shutdowns	1 month

Construction compounds would be established within the construction boundary to contain construction amenities and materials laydown. Figure 1.1 presents the indicative location for the construction compound. The work areas for each construction scenario are outlined in the figures presented in Appendix A.

The exact location of the compound and works areas would be finalised by the construction contractor and approved by TfNSW.

4.1.2 Working Hours

Construction work is expected to take place over a period of approximately 12 months, beginning in mid 2022.

Certain works may need to occur outside standard hours to maintain a safe work environment or to minimise impacts to operational transport infrastructure and services. Works outside standard hours would require approval from TfNSW for such work, and further assessment would be required.

4.1.3 Noise Source Levels

The nominated equipment for the construction work scenarios and the sound power level (SWL) of each item are detailed in Table 4.2. SWLs have been sourced from the CNVS, *AS 2436:2010 - Guide to noise and vibration control on construction, demolition and maintenance sites* and the DEFRA noise database.

Table 4.2 Plant and equipment sound power levels

EQUIPMENT	SWL, dBA	NO. OF EQUIPMENT PER SCENARIO						
		SC01	SC02	SC03	SC04	SC05	SC06	SC07
Asphalt truck and sprayer	106						1	
Concrete Pump	109	1		1	1		1	
Concrete Truck	109	1		1	1		1	
Crawler crane (Steel canopy)	113						1	
Delivery vehicles	103				1			
EWP	97						1	
Excavators	100		1		1	1	1	1
Hiab truck (deliveries)	103	1		1				
Hiab truck (Pile cage delivery)	103						1	
Hi-rail trucks and plant	103						1	
Pavement profiler	117				1			
Piling rig /large excavator (Piles or pad footing)	112						1	
Powered hand tools	104	1	1	1	1	1	1	1
Small excavator	90	1		1				
Sucker truck	109		1		1		1	
Tactile drilling rig	104						1	
Truck	103		1			1		1
Generator	103	1	1	1	1	1	1	1
Scenario total SWL, dBA		114	112	114	119	109	120	109

4.1.4 Noise Modelling Methodology

Prediction of construction noise impacts from the Proposal has been completed using CADNAA (version 2021) noise modelling software using the ISO 9613-2 calculation method. A three-dimensional model of the Proposal was developed, including elevation contours, locations of sensitive receivers, noise generating equipment and intervening buildings. The model considered noise sources, receivers and the effect of distance, ground topography, atmospheric attenuation and obstacles such as barriers and buildings.

The parameters used and values adopted in the noise modelling are presented in Table 4.3.

Table 4.3 Modelling parameters

PARAMETER	INPUT
Buildings	Building footprints and number of floors taken from aerial photography. Building heights and number of floors were estimated from Google Street View as follows: per floor 3 metres, pitched roof 2.5 metres.
Topography	Sourced from SIXMaps NSW (1 metre contour intervals)
Façade calculation	Impacts calculated at the most affected facade of nearby receivers
Prediction algorithm	ISO9613-2 1996
Meteorological conditions	Default meteorological conditions were used for all assessment periods, representative of downwind propagation conditions between 1 and 5 m/s, and equivalent to a moderate temperature inversion
Ground surface / absorption	Model assumed a ground absorption coefficient of 0.5
Sources	All equipment has been modelled as point sources and all equipment per work stage has been modelled to operate simultaneously
Source heights	Construction plant and equipment heights are modelled 2 metres above ground.

The noise modelling is considered to be conservative as it assumes all equipment operating simultaneously. Actual measured noise levels would be expected to be lower.

4.1.5 Predicted Noise Levels

The predicted noise levels for each scenario are presented in Table 4.4 outlining the noise level for each representative receiver. The predicted noise levels are presented as a range, which represents the calculated noise levels based on the noise sources being located at the closest distance to the receiver (first number) and when the noise source is located the furthest distance to the receiver (second number). Due to the footprint of the project area this approach allows an understanding of the range of potential noise impacts between when the works would be at their closest or farthest from the receiver. The highest noise levels were then compared with the relevant NMLs to quantify the noise impacts and assist with mitigation and management measures.

Predicted noise levels at buildings surrounding the Proposal were assessed and the results presented graphically as exceedances of NMLs during Standard Hours in Appendix A.

Where a predicted noise level exceeds the standard hours NMLs, the OOHW NMLs are also exceeded.

The formatting of the construction noise assessment results (Table 4.4) indicates the following:

- The orange shaded cells show exceedances of the SH day period.
- The green shaded cells show exceedances of the OOHW 1 period.
- The blue shaded cells exceedances of the OOHW 2 period.
- The **cells with red text** show exceedances of highly noise affected noise management levels (SH only).

Table 4.4 Range of predicted construction noise levels per scenario

RECEIVER ID[4]	RECEIVER TYPE	NML, dBA $L_{eq,15min}$[1]				PREDICTED NOISE LEVEL RANGE PER SCENARIO, dBA $L_{eq,15min}$[2,3]						
		SH	OOHW 1	OOHW 2	HNA	SC01	SC02	SC03	SC04	SC05	SC06	SC07
R01	Residential	48	40	35	75	**78 - 48**	**77 - 46**	71 - 56	**77 - 61**	74 - 43	**77 - 62**	74 - 43
R02	Residential	48	40	35	75	**91 - 50**	**90 - 49**	67 - 58	73 - 63	**87 - 46**	73 - 64	**87 - 46**
R03	Industrial	75	n/a	n/a	n/a	94 - 50	92 - 49	66 - 55	72 - 60	89 - 46	72 - 61	89 - 46
R04	Industrial	75	n/a	n/a	n/a	84 - 49	82 - 47	55 - 49	60 - 55	79 - 44	61 - 55	79 - 44
R05	Residential	48	40	35	75	64 - 42	62 - 41	61 - 51	67 - 56	59 - 37	67 - 57	59 - 37
R06	Commercial	70	70	70	n/a	79 - 49	78 - 47	69 - 62	75 - 68	75 - 44	75 - 68	75 - 44
R07	Commercial	70	n/a	n/a	n/a	69 - 42	68 - 41	66 - 58	71 - 63	64 - 38	72 - 64	64 - 38
R08	Commercial	70	n/a	n/a	n/a	64 - 45	62 - 43	64 - 52	69 - 57	59 - 40	70 - 58	59 - 40
R09	Residential	48	40	35	75	**90 - 53**	**88 - 51**	75 - 58	**81 - 64**	**85 - 48**	**81 - 64**	**85 - 48**

(1) Assessment periods as defined in Section 3.1.1, HNA – Highly noise affected.

(2) Predicted noise levels are represented by a single point for each representative receiver

(3) Where a predicted noise level exceeds a less stringent management level (SH), it follows that the more stringent (OOHW) management levels are also exceeded.

(4) Receiver locations as shown in Figure 1.1.

4.1.6 Standard Hours

The majority of construction activities are proposed to be completed within Standard Hours (Scenarios SC01 to SC07).

The assessment of construction noise impact at the nearest representative residential receivers indicate that the predicted noise levels generally exceed the NML when works occur at the closest proximity to receivers. The activities with the greatest potential for impact occur during SC01 (site establishment), where it is anticipated that plant and equipment would be required to initially establish the site compound. However, it is noted that the duration of this construction stage is typically short (approximately one month) and therefore it is anticipated that the residents would not experience these noise levels throughout the entire construction period.

The worst case construction noise levels are predicted to exceed the NML for standard hours by up to 43 dBA during SC01 (site establishment) when work occurs at the closest distance to the residential receiver. These receivers are generally located along Hamilton Street and Station Street. During the remaining scenarios the noise levels are predicted to exceed the NML by up to 42 dBA. The closest residences to the construction work are predicted to be highly noise affected when works are at their closest during most scenarios. As the works move further away from the receivers, they would no longer be highly noise affected.

For industrial receivers (R03 and R04), the worst case construction noise levels are predicted to comply with the NML during construction scenarios SC03, SC04 and SC06. However, exceedances of up to 19 dBA are predicted at industrial receivers during all other construction scenarios while works are undertaken closest to the receiver. For commercial receivers (R06 to R08), the worst case construction noise levels are predicted to exceed the NML for standard hours by up to 9 dBA during SC01 (site establishment) when works are closest to the receiver.

Furthermore, noise levels presented in this assessment are conservative, with noise sources assumed to operate simultaneously. In reality noise impacts are likely to be lower as plant items may not be operating simultaneously at all times and therefore it would be likely that the predicted noise levels would be reduced for some receivers. For example, the louder noise levels during SC04 (approach and interchange works) are attributable to the use of the pavement profiler. The pavement profiler would not be in use continuously throughout the duration of SC04 (approach and interchange works) but would be used intermittently over the construction period. When the pavement profiler is not in operation the predicted noise levels reduce by 4 dBA.

As a result of the predicted exceedances, noise mitigation and management measures have been outlined in Section 5 to reduce the potential noise impacts at nearest affected receivers.

4.1.7 Outside Standard Hours

The assessment of OOHW construction noise impacts at residential receivers indicates that noise levels are predicted to exceed relevant NMLs at the nearest residential sensitive receivers during all OOHW activities.

During OOHW period 1, noise levels are predicted to result in exceedances of the OOHW criteria by up to 48 dBA during SC01 (site establishment) at the nearest affected residential receiver. Exceedances up to 47 dBA are predicted for the remaining scenarios. The closest residences to the construction work are predicted to be highly noise affected when works are at their closest during most scenarios. As the works move further away from the receivers, they would no longer be highly noise affected.

During OOHW period 2, noise levels are predicted to result in exceedances of the OOHW criteria by up to 56 dBA during SC01 (site establishment) at the nearest affected residential receiver. Exceedances up to 55 dBA are predicted for the remaining scenarios. The closest residences to the construction work are predicted to be highly noise affected when works are at their closest during most scenarios. As the works move further away from the receivers, they would no longer be highly noise affected.

It is assumed that R06 would be the only commercial receiver in use during the OOHW periods. The worst case construction noise levels are predicted to exceed the NML for OOHW periods by up to 9 dBA when works are closest to the receiver.

Noise levels would exceed OOHW management levels for the majority of the works, however the implementation of mitigation measures and considering the spatial distribution of noise sources, impacts would be substantially lower than presented. Where equipment such as the pavement profiler are in use, exceedances of relevant noise levels are notably above management levels, as a result it is recommended that works involving this equipment be strictly limited to standard hours where possible.

Noise levels presented in this assessment are conservative, with noise sources assumed to operate simultaneously. In reality, noise impacts are likely to be lower as plant items may not be operating simultaneously at all times. Works are expected to take place intermittently over any construction period, so these exceedances would not be expected to occur continuously over the duration of the Proposal.

Out of hours works would take place during rail shutdowns (occurring over a 48-hour period on a weekend) with approximately four rail shutdowns expected to occur over the 12 month duration of the Proposal. Other works may also be required to occur outside of standard hours which are not part of rail shutdowns, however the bulk of the works would occur during these shutdowns.

As a result of the predicted exceedances during OOHW, further noise mitigation and management measures would be required in the event of OOHW works being undertaken, and an overview has been outlined in Section 5 to reduce the potential noise impacts at the nearest affected receivers.

4.1.8 Sleep Disturbance

Out of Hours Works have the potential to generate sleep disturbance impacts. These activities would generally be limited to approximately four 48-hour rail shutdowns.

The ICNG requires a quantitative assessment for construction works that extend over two consecutive nights. The maximum noise level assessment presented in Table 4.5 provides an indication for the potential for sleep disturbance at nearby residential receivers. The predicted noise levels have been assessed at the representative residential receivers.

The formatting within the maximum noise level results (Table 4.5) indicates the following:

- The grey shaded cells show exceedances of the RNP screening criteria.
- The blue shaded cells show exceedances RNP awakening criteria.

The potential for sleep disturbance impacts would be largely constrained to the approximately four shutdown periods, therefore the potential for sleep disturbance impact would be of short duration, as any works undertaken during the night period would occur over two consecutive nights over the construction period.

Noise levels are predicted to result in exceedances of both the RNP screening criteria and the awakening goals.

The potential for work to generate maximum noise level events should be considered as part of the construction noise management plan for the works. Mitigation measures are discussed further in Section 5.

Table 4.5 Predicted sleep disturbance noise impacts (residences only)

RECEIVER ID	ADDRESS	NML, dBA $L_{eq,15min}$[1]		MODELLED MAXIMUM NOISE LEVEL PER SCENARIO, dBA $L_{eq,15min}$						
		RNP SCREENING CRITERION	RNP AWAKENING GOAL	SC01	SC02	SC03	SC04	SC05	SC06	SC07
R01	20 Bong Bong Road, Dapto	45	65	78	77	71	77	74	77	74
R02	44 Hamilton Street, Dapto	45	65	91	90	67	73	87	73	87
R05	28 Station Street, Dapto	45	65	64	62	61	67	59	67	59
R09	5 Station Street, Dapto	45	65	90	88	75	81	85	81	85

(1) Sleep disturbance criteria applicable to residential receivers only.

4.2 Construction Traffic Noise

4.2.1 Introduction

The construction traffic (when travelling on public roads) associated with The Proposal must comply with the local road noise criteria determined in Section 3.2.

The Proposal includes a site compound in the western area of the site. The site compound would be accessed via Bong Bong Road to the south. Additionally, construction traffic may enter the site via Station Street for works on Platform 2 and the forecourt.

4.2.2 Haulage Routes and Traffic Volumes

The construction traffic generated by the Proposal would be up to 20 vehicles per day during peak construction periods. Additionally, it is assumed that as a worst case scenario a single heavy vehicle would enter and exit the site within a one hour period. Most of this construction traffic would be due to construction workers moving to and from site. Heavy vehicles would be required for the delivery and removal of materials, plants, and equipment.

Construction traffic is expected to travel along Bong Bong Road and Station Street to reach the Proposal site. Bong Bong Road and Station Street are two-lane roads, with speed limits of 50 km/h.

The final construction haulage route would be determined by the nominated construction contractor during the detailed design of the Proposal, however these routes have been adopted for the purpose of this assessment. It is expected that traffic diversions would not be required for the Proposal.

4.2.3 Traffic Noise Impacts

The potential for noise impacts to occur due to light and heavy vehicle movements on public roads generated by the construction work as a result of additional vehicle movements has been assessed.

For construction traffic accessing the site via Bong Bong Road or Station Street, it is expected that up to around 19 light vehicles and a single heavy vehicle would be generated during peak construction. As a conservative assumption, it is assumed that these vehicles would enter or leave the site through Bong Bong Road or Station Street within a one hour period (the start or end of a working shift). It is assumed that the traffic travels at the posted speed limit for the road.

Based on the assumption above, the noise from additional traffic along Bong Bong Road and Station Street were predicted and presented in Table 4.6.

Table 4.6 Predicted construction traffic noise levels

RECEIVER LOCATION	DISTANCE FROM RECEIVER[1]	TIME PERIOD[2]	CRITERIA	EXISTING[3]	PREDICTED	RELATIVE INCREASE, dB	COMPLIANCE
Residences along Bong Bong Road and Station Street	10 m	Day	55 dBA $L_{eq,1hr}$	60 dBA $L_{eq,1hr}$	55 dBA $L_{eq,1hr}$	1	Yes
		Night	50 dBA $L_{eq,1hr}$	59 dBA $L_{eq,1hr}$	55 dBA $L_{eq,1hr}$	1	Yes

(1) Distance from typical residential receiver to the closest carriageway

(2) Time periods as defined in the RNP: Day (7.00 am to 10.00 pm) and Night (10.00 pm to 7.00 am)

(3) Existing traffic noise levels measured in the MTMS assessment. For a conservative assessment, the traffic noise levels measured at the monitoring location (along Station Street) has also been adopted for Bong Bong Road and Station Street receivers.

It is noted that the actual noise levels during construction would be lower as vehicle movements would not occur within a one hour period; instead the vehicle movements would likely be staggered throughout the day.

The noise associated with construction traffic from the Proposal travelling on public roads is predicted to comply with the day time criteria. Additionally, the increase in traffic noise levels is predicted to be below 2 dB.

The construction traffic noise levels are predicted to exceed the night time criteria, however it would not increase the existing traffic noise levels by more than 2 dB. Given that a 2 dB increase is considered minor, as it is considered barely perceptible by the average person, mitigation measures are not required.

To minimise the impact from construction traffic, mitigation and management measures are recommended in Section 5, which should be outlined in a Traffic Management Plan (TMP) for the project.

4.3 Cumulative Construction Noise Assessment

It was advised that the construction works proposed in the MTMS assessment is currently being undertaken and therefore there may be instances where the TAP Dapto construction works occurs concurrently with the MTMS works. The construction stage timeline for both projects are detailed in Table 4.7. An assessment of the predicted noise impacts associated with concurrent construction works has been undertaken in Section 4.3.1.

Table 4.7 Concurrent Construction Works Timeline

PROJECT	CONSTRUCTION ACTIVITIES	2022				2023			
Dapto MTMS works	Site establishment and enabling works	X							
	Construction of new maintenance facility		X						
	Demolition of existing maintenance facility		X						
	Earthworks and installation of footings	X	X						
	Platform extension works		X	X	X				
	Finish civil works for platform extensions				X	X			
TAP Dapto works	Site establishment		X	X					
	Track systems		X	X	X				
	Building work			X	X				
	Approach and interchange			X	X	X			
	Site wide services			X	X	X			
	Platform work			X	X	X	X		
	Finalisation					X	X		

4.3.1 *Cumulative Construction Noise*

Table 4.8 summarises the potential for noise impacts associated with concurrent construction works in the area.

Table 4.8 Cumulative Construction Noise Predictions

TAP DAPTO ID	DAPTO MTMS ID	PREDICTED CONSTRUCTION NOISE LEVELS dBA $L_{eq,15min}$[1]							COMMENT
TAP DAPTO CONSTRUCTION SCENARIOS		SC01[2]	SC02[2]	SC03[3]	SC04[3]	SC05[3]	SC06[3]	SC07[3]	
R01	P1	78	77	71	77	74	77	74	The construction noise from the Proposal is significantly louder than the construction noise from the MTMS works. It is expected that construction noise from the MTMS works would not be discernible at the receiver when the construction for the Proposal is being undertaken.
		59	59	57	57	57	57	57	
		78	77	71	77	74	77	74	
R02	C1	91	90	67	73	87	73	87	Where both construction sites are concurrently undertaking works, it is anticipated that the construction noise levels may increase by up to 3 dBA.
		68	68	67	67	67	67	67	
		91	90	70	74	87	74	87	
R03	C1	94	92	66	72	89	72	89	Where both construction sites are concurrently undertaking works, it is anticipated that the construction noise levels may increase 3 dBA above the predicted TAP Dapto works. The maximum increase in noise level occurs during SC03 (Building works) where the dominant noise source is from the MTMS works.
		68	68	67	67	67	67	67	
		94	92	70	73	89	73	89	
R04	C1	84	82	55	60	79	61	79	Where both construction sites are concurrently undertaking works, it is anticipated that the construction noise levels may increase up to 12 dBA above the predicted TAP Dapto works. The maximum increase in noise level occurs during SC03 (Building works) where the dominant noise source is from the MTMS works.
		68	68	67	67	67	67	67	
		84	82	67	68	79	68	79	
R05	R3	64	62	61	67	59	67	59	Where both construction sites are concurrently undertaking works, it is anticipated that the construction noise levels

TAP DAPTO ID	DAPTO MTMS ID	PREDICTED CONSTRUCTION NOISE LEVELS dBA $L_{eq,15min}$[1]							COMMENT
		68	68	67	67	67	67	67	may increase 9 dBA above the predicted TAP Dapto works. The maximum increase in noise level occurs during SC05 (site wide services) and SC07 (finalisation). During these periods it is expected that construction noise from the Proposal would not be discernible at the receiver when MTMS works are being undertaken.
		69	69	68	70	68	70	68	
R06	C2	79	78	69	75	75	75	75	Where both construction sites are concurrently undertaking works, it is anticipated that the construction noise levels may increase by up to 1 dBA.
		66	66	64	64	64	64	64	
		79	78	70	75	75	75	75	
R07	C2	69	68	66	71	64	72	64	Where both construction sites are concurrently undertaking works, it is anticipated that the construction noise levels may increase 3 dBA above the predicted TAP Dapto works. The maximum increase in noise level occurs during SC05 (site wide services) and SC07 (finalisation) where the dominant noise source is from the MTMS works.
		66	66	64	64	64	64	64	
		71	70	68	72	67	73	67	
R08	C2	64	62	64	69	59	70	59	Where both construction sites are concurrently undertaking works, it is anticipated that the construction noise levels may increase 6 dBA above the predicted TAP Dapto works. The maximum increase in noise level occurs during SC05 (site wide services) and SC07 (finalisation) where the dominant noise source is from the MTMS works.
		66	66	64	64	64	64	64	
		68	67	67	70	65	71	65	
R09	C2	90	88	75	81	85	81	85	The construction noise from the Proposal is significantly louder than the construction noise from the MTMS works. It is expected that construction noise from the MTMS works would not be discernible at the receiver when the construction for the Proposal is being undertaken.
		66	66	64	64	64	64	64	
		90	88	75	81	85	81	85	

(1) **Orange** shaded cells represent predicted construction noise from the Proposal, **Blue** shaded cells represent predicted construction noise from the MTMS works, **Green** shaded cells represent the cumulative noise levels from both sites operating concurrently

(2) The loudest MTMS construction activity that is proposed to occur concurrently is the earthworks and installation of footings stage (stage 4)

(3) The loudest MTMS construction activity that is proposed to occur concurrently is the civil works for platform extension stage (stage 6)

Based on the Table 4.8, when works from both sites occur concurrently there may be instances where there is an increase in construction noise levels at the receivers. This should be managed by scheduling noisy works for each site at different times to minimise the cumulative noise impacts.

4.3.2 Cumulative Construction Road Traffic

The MTMS assessment predicted traffic noise levels at receivers along Bong Bong Road. The predicted noise levels presented in the MTMS assessment have been reproduced in the table below.

Table 4.9 MTMS Construction Traffic Noise Levels

RECEIVER LOCATION	TIME PERIOD[2]	PREDICTED
Residences along Bong Bong Road and Station Street	Day	46 dBA $L_{eq,1hr}$
	Night	45 dBA $L_{eq,1hr}$

(1) Time periods as defined in the RNP: Day (7.00 am to 10.00 pm) and Night (10.00 pm to 7.00 am)

Based on the predicted noise levels in Table 4.6 and Table 4.9 there will be a negligible increase in construction traffic noise levels. Nevertheless, traffic movements from both construction sites should be reviewed to minimise the impacts from cumulative construction traffic noise impacts.

4.4 Construction Vibration Assessment

The major potential sources of vibration from the proposed construction activities are during pile boring (platform works – SC06).

4.4.1 Safe Working Distances for Vibration Intensive Plant

Table 4.10 presents the indicative minimum working distances for the nominated construction plant to minimise the risk of structural damage and human comfort for sensitive receivers, based on the data provided in the CNVS. The distances are based on the typical distance from receivers, work can be carried out to meet the limits set out in Section 3.3.

Table 4.10 Recommended minimum working distances for vibration intensive plant

PLANT ITEM	RATING/ DESCRIPTION	MINIMUM WORKING DISTANCE		
		COSMETIC DAMAGE	HUMAN RESPONSE	HERITAGE
Piling Rig - Bored	≤ 800mm	2 metres (nominal)	N/A	5 metres
Jackhammer	Hand held	1 metre (nominal)	Avoid contact with structure	3 metres

The distances are indicative only and results may vary depending on the activity, equipment, local geotechnical conditions. They apply to typical buildings under typical geotechnical conditions.

Dapto Station itself is classified as having heritage significance. Vibration management and mitigation measures are required where vibration generating works are within the nominated safe working distances of the station's heritage structures. Note that that when a heritage building, or structure is found to be structurally unsound a more conservative cosmetic damage objective should be adopted. This objective would be identified where structurally unsound elements are identified during a building inspection.

No other sensitive receiver (including the heritage items listed in Section 1.3) are within the nominated safe working distances. Additionally, the Station Master's residence is located more than five metres from the proposed works. Therefore vibration impacts have not been considered further in this assessment. However, if different plant and equipment or if the work areas change during the detailed design stage, then the construction vibration impact should be reviewed.

5 Construction Noise and Vibration Mitigation and Management

5.1 Standard Construction Noise and Vibration Mitigation

The CNVS outlines standard measures for mitigating and managing construction noise and vibration to be implemented across all TfNSW Infrastructure and Place (I&P) construction proposals where reasonable and feasible. These standard measures are outlined in Appendix B.

Reasonable and feasible noise and vibration measures would be applied in accordance with the TfNSW CNVS. Reasonable and feasible noise mitigation measures which would be considered include:

- Avoiding any unnecessary noise when carrying out manual operations and when operating plant
- Ensuring spoil is placed and not dropped into awaiting trucks
- Avoiding/limiting simultaneous operation of noisy plant in discernible range of a sensitive receiver where practicable
- Switching off any equipment not in use for extended periods e.g. heavy vehicles engines would be switched off whilst being unloaded
- Restriction of heavy vehicle movements to and from the site to standard hours where feasible and avoiding deliveries at night/evenings wherever practicable
- No idling of delivery trucks
- Keeping truck drivers informed of designated routes, parking locations and acceptable delivery hours for the site
- Compounds, refuelling areas and work areas designed to promote one-way traffic so that vehicle reversing movements are minimised
- Minimising talking loudly; no swearing or unnecessary shouting, or loud stereos/radios onsite; no dropping of materials from heights where practicable, no throwing of metal items and slamming of doors
- Maximising offset distances between noisy plant and adjacent sensitive receivers and determining safe working distances
- Using the most suitable equipment necessary for the construction work at any one time
- Directing noise emitting plant away from sensitive receivers
- Regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc
- Using non-tonal reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise sensing alarms for all plant used regularly onsite (greater than one day), and for all out of hours works
- Use of quieter and less vibration emitting construction methods where feasible and reasonable.

The most applicable standard management measures are outlined as follows:

- Site compound hoarding:
    - It is recommended that 2.1 metre high hoarding is installed along the southern, western and northern boundary of the site compound. The hoarding may be constructed from plywood or a product similar to Echo Barrier.

- Construction hours and scheduling:
    - Works would generally be carried out during standard construction hours (i.e. 7.00 am to 6.00 pm Monday to Friday; 8.00 am to 1.00 pm Saturdays). Any works outside these hours may be undertaken if approved by TfNSW and the community is notified prior to these works starting. An Out of Hours Work application form would need to be prepared by the Contractor and submitted to the TfNSW Senior Environment and Sustainability Officer or Manager for approval before commencement of any works outside standard hours.
- Respite periods:
    - Where the $L_{Aeq\ (15min)}$ construction noise levels are predicted to exceed 75 dBA and/or >30 dB above the Rating Background Level at nearby affected sensitive receivers, respite periods would be observed, where practicable, and in accordance with the CNVS. This would include restricting the hours that very noisy activities can occur.
- Vibration intensive work:
    - As the station itself is considered a heritage item, the following measures should be undertaken
        - Identify and locate the heritage significant structures within the station
        - Undertake inspection to determine if the heritage structure is structurally unsound and adopt the corresponding vibration criteria
        - Determine safe working distances from the heritage structures for vibration intensive equipment
        - Where vibration intensive works are proposed within the safe working distance, vibration mitigation measures are required
    - Vibration intensive works must not be undertaken within five metres of the Station Master's residence (5 Station Street, Dapto) without further assessment.

Table 5.1 provides indicative benefits of typical engineering control mitigation measures for construction activities, based on guidance in AS 2436 and experience on similar construction proposals.

Table 5.1 Indicative noise reduction from construction controls

ENGINEERING CONTROLS	POSSIBLE NOISE REDUCTION, dB
Portable temporary screens	5-10
Screen or enclosure for stationary equipment	10-15
Maximising the offset distance between noisy plant items and sensitive receivers.	3-6
Avoiding using noisy plant simultaneously and/or close together, adjacent to sensitive receivers.	2-5
Orienting equipment away from sensitive receivers.	3-5
Carrying out loading and unloading away from sensitive receivers.	3-5
Using noise source controls, such as the use of residential class mufflers, to reduce noise from all plant and equipment including bulldozers, cranes, graders, excavators and trucks	5-10
Selecting site access points and roads as far as possible away from sensitive receivers	3-6

5.2 Site Specific Construction Noise Mitigation

The following site-specific construction noise mitigation measures should be considered:

- Noise and vibration mitigation measures would be applied in accordance with the TfNSW CNVS
- Should plant and equipment to be used differ from that included in the noise predications, the findings of this noise assessment should be revisited prior to commencement of construction. Additional mitigation measures required under the TfNSW CNVS should be applied.
- Potential affected receivers would be notified no less than 7 days prior to works. The purpose of notification is to notify of the time and duration of the construction activities so that residents are informed about the work ahead of time.
- Brief the work team in order to create awareness of the locality of sensitive receivers and the importance of minimising noise emissions as part of the site induction
- Use less noise intensive equipment where reasonable and feasible. Where noise intensive equipment with special audible characteristics or vibration generating activities must be used, a one hour construction respite period would be observed for every three hours of consecutive use.
- Use non-tonal reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise-sensing alarms for all plant used regularly onsite (greater than one day), and for any OOHW.
- Work undertaken outside standard hours would be subject to prior written approval from TfNSW via the OOHW online system. OOHW should not proceed until the application is approved and after consultation with the local community (where required). The community would be notified in line with the TfNSW CNVS.

5.3 Additional Construction Noise Mitigation

Where all reasonable and feasible standard mitigation measures have been applied and exceedances are still predicted to occur, the CNVS provides guidance on additional mitigation measures to be implemented for each receiver depending on level of exceedance for the predicted noise level above the NML. Additional mitigation measures and their associated acronyms are outlined in Appendix B. Table 5.2 outlines when to implement the additional noise management measures.

Table 5.2 Implementation of additional management measures

CONSTRUCTION HOURS	RECEIVER PERCEPTION	dB ABOVE RBL	dB ABOVE NML	ADDITIONAL MANAGEMENT MEASURES[1]
Standard Hours	Noticeable	5 to 10	0	-
Monday-Friday (7.00 am-6.00 pm)	Clearly audible	> 10 to 20	< 10	-
Saturday (8.00 am-1.00 pm)	Moderately intrusive	> 20 to 30	> 10 to 20	PN, V
	Highly intrusive	> 30	> 20	PN, V
	75dBA or greater	N/A	N/A	PN, V, SN

CONSTRUCTION HOURS	RECEIVER PERCEPTION	dB ABOVE RBL	dB ABOVE NML	ADDITIONAL MANAGEMENT MEASURES[1]
OOHW Period 1	Noticeable	5 to 10	< 5	-
Monday-Friday (6.00 pm-10.00 pm)	Clearly audible	> 10 to 20	5 to 15	PN, RP[2], DR[2]
Saturday (7.00 am-8.00 am, 1.00 pm-10.00 pm)	Moderately intrusive	> 20 to 30	> 15 to 25	PN, V, SN, RO, RP[2], DR[2]
Sunday/PH (8.00 am-6.00 pm)	Highly intrusive	> 30	> 25	PN, V, SN, RO, RP[2], DR[2]
OOHW Period 2	Noticeable	5 to 10	< 5	PN
Monday-Saturday (12.00 am-7.00 am, 10.00 pm-12.00 am)	Clearly audible	> 10 to 20	5 to 15	PN, V, SN, RO[3], RP[2], DR[2]
Sunday/PH (12.00 am-8.00 am, 6.00 pm-12.00 am)	Moderately intrusive	> 20 to 30	> 15 to 25	PN, V, SN, RO[3], RP[2], DR[2]
	Highly intrusive	> 30	> 25	PN, V, SN, RO[3], RP[2], DR[2], AA

(1) PN = Project notification, SN = Specific notification, individual briefings, or phone call, V = Verification monitoring, DR = Duration Reduction, RP = Respite Period, RO = Project specific respite offer, AA = Alternative accommodation

(2) Respite periods and duration reduction are not applicable when works are carried out during OOHW Period 1 Day only (i.e. Saturday 6am-7am and 1pm-6pm, Sundays / Public Holidays 8am-6pm)

(3) Respite offers during OOHW Period 2 are only applicable for evening periods (i.e. Sundays / Public Holidays (6pm-10pm), and may not be required if a respite offer has already been made for the immediately preceding OOHW Period 1.

5.4 Traffic Management

This assessment has demonstrated that the Proposal would generate a minor increase in traffic noise on affected roads associated with the construction activities, however levels are expected to remain within RNP criteria. The Proposal's construction traffic is not expected to be significant compared with the existing traffic volumes.

As best practice, it is recommended that a TMP be developed for the Proposal, and its findings used to inform the Construction Environmental Management Plan.

5.5 Additional Construction Vibration Mitigation

Where vibration intensive activities occur within the minimum working distances, all reasonable and feasible standard mitigation measures have been applied, and exceedances of vibration management levels are expected, the CNVS provides guidance on additional mitigation measures to be implemented for each receiver. Additional mitigation measures and the associated acronyms are outlined in Appendix B.

Table 5.3 outlines how to implement the additional vibration management measures.

Table 5.3 Implementation of additional vibration management measures

CONSTRUCTION HOURS	RECEIVER PERCEPTION	ABOVE VIBRATION LIMIT	ADDITIONAL MANAGEMENT MEASURES[3]
Standard hours	Human disturbance	> HVML[1]	PN, V, RO
	Building damage	> DVML[2]	V, AC
OOHW Period 1	Human disturbance	> HVML[1]	PN, V, SN, RO, RP, DR
	Building damage	> DVML[2]	V, AC
OOHW Period 2	Human disturbance	> HVML[1]	PN, V, SN, RO, AA, RP, DR
	Building damage	> DVML[2]	V, AC

(1) Human vibration management level – see maximum vibration dose values for human comfort outlined in Section 3.3

(2) Damage vibration management level – see screening criteria for cosmetic damage outlined in Section 3.3

(3) PN = project notification, V = verification monitoring, DR = duration reduction, RP = respite period, SN = specific notification, individual briefings, or phone call, AA = alternative accommodation, RO = project specific respite offer, AC = alternative construction methodology

6 Conclusion

WSP has undertaken a construction noise and vibration assessment for the proposed Dapto Station Transport Access Program upgrade. The assessment was conducted with reference to the *Construction Noise and Vibration Strategy* (CNVS) (TfNSW, 2019) (including the *Construction Noise and Vibration Strategy Addendum*) (CNVS) (TfNSW, 2019).

Sensitive receivers surrounding the Proposal include residential, commercial, and industrial receivers.

To assess the potential noise impacts during construction, seven representative construction scenarios were developed based on indicative staging information. Precise construction methodology would be confirmed by the construction contractor, however potential noise impacts associated with an indicative construction staging has been conservatively assessed to facilitate community consultation and effective noise management and mitigation prioritisation.

The assessment of construction noise impacts indicates that noise levels are predicted to exceed relevant NMLs at the nearest affected residential receiver during all activities, with SC01 (site establishment) presenting the greatest impact to sensitive receivers. The closest residences to the construction works are located along Hamilton Street and are predicted to be highly noise affected when works occur at the closest distance to the sensitive receivers. Generally, the receivers would be highly noise affected for very short periods (up to or less than a day) as it is not anticipated that the works would be located at the closest distance to the receivers throughout the proposed works.

Construction noise levels are predicted to exceed the NML at the nearest industrial receivers (R03 and R04) during construction stages SC01 (site establishment), SC02 (track systems), SC05 (site wide services) and SC07 (finalisation). Construction noise levels are predicted to exceed relevant NMLs for the nearest commercial receiver (R06) during SC01 (site establishment), SC02 (track systems), SC04 (approach and interchange works), SC05 (site wide services), SC06 (platform works) and SC07 (finalisation).

Out of hours works may occur during any scenario but would generally limited to approximately four rail shutdowns over the duration of the Proposal (i.e. up to around 12 months). It is noted that some other works may be required to occur outside of standard hours which are not part of rail shutdowns. The assessment of OOHW construction noise impacts at residential receivers indicates that noise levels are predicted to exceed relevant NMLs at the nearest sensitive residential receivers during all OOHW activities. As a result of the magnitude of these predicted exceedances during OOHW works, further noise mitigation and management measures would be required in the event of OOHW works being undertaken.

Any night time works are likely to generate sleep disturbance impacts at residential receivers near the construction footprint. These activities would generally be limited to approximately four 48-hour rail shutdowns. The potential for sleep disturbance has been identified in this report, and noise management and mitigation measures would be required to manage OOHW works.

Proposal-related construction traffic noise impacts are considered acceptable during the day time and night time periods.

Dapto Station is listed as a heritage item and therefore works may occur within the proposed heritage minimum working distances. Where vibration intensive works occur within the proposed minimum working distances management and mitigation measures are required as discussed in this report. An inspection of this site should be undertaken prior to the commencement of works to determine if the heritage structure is structurally unsound and identify suitable management measures.

Noise and vibration mitigation and management measures have been outlined to reduce the potential noise and vibration impacts associated with the construction of the Proposal.

Appendix A

Predicted Noise Exceedance Maps

Legend

- Work Area

dB Above NML (Receiver Perception)

- 0 dB (Noticeable)
- 0 to 10 dB (Clearly Audible)
- 10 to 20 dB (Moderately Intrusive)
- > 20 dB (Highly Intrusive)
- Highly Noise Affected

Hamilton Street

Station Street

Baan Baan Street

Bong Bong Road

Osborne Street

Burringbar Street

Marshall Street

	Author: IV / DK
Date: 02/06/2022	Approved by: NM

0 20 40 60 m

Map Source: NSW SIX Maps

Transport Access Program (TAP) Dapto - SH Noise Level Exceedances

Scenario 01 - Site establishment

Legend

- Work Area

dB Above NML (Receiver Perception)

- 0 dB (Noticeable)
- 0 to 10 dB (Clearly Audible)
- 10 to 20 dB (Moderately Intrusive)
- > 20 dB (Highly Intrusive)
- Highly Noise Affected

Hamilton Street
Station Street
Baan Baan Street
Osborne Street
Bong Bong Road
Burringbar Street
Marshall Street

	Author: IV / DK
Date: 02/06/2022	Approved by: NM

0 20 40 60 m

Map Source: NSW SIX Maps

Transport Access Program (TAP) Dapto - SH Noise Level Exceedances

Scenario 02 - Track systems

Legend

Work Area

dB Above NML (Receiver Perception)

0 dB (Noticeable)

0 to 10 dB (Clearly Audible)

10 to 20 dB (Moderately Intrusive)

> 20 dB (Highly Intrusive)

Highly Noise Affected

Hamilton Street

Station Street

Baan Baan Street

Osborne Street

Bong Bong Road

Burringbar Street

Marshall Street

	Author: IV / DK	
Date: 02/06/2022	Approved by: NM	

0 20 40 60 m

Transport Access Program (TAP) Dapto - SH Noise Level Exceedances

Scenario 03 - Building work

Legend

Work Area

dB Above NML (Receiver Perception)

0 dB (Noticeable)

0 to 10 dB (Clearly Audible)

10 to 20 dB (Moderately Intrusive)

> 20 dB (Highly Intrusive)

Highly Noise Affected

Hamilton Street

Station Street

Baan Baan Street

Osborne Street

Bong Bong Road

Burringbar Street

Marshall Street

	Author: IV / DK	
Date: 02/06/2022	Approved by: NM	

0 20 40 60 m

Map Source: NSW SIX Maps

Transport Access Program (TAP) Dapto - SH Noise Level Exceedances

Scenario 04 (Approach and interchange) and Scenario 06 (Platform work)

Legend

- Work Area

dB Above NML (Receiver Perception)

- 0 dB (Noticeable)
- 0 to 10 dB (Clearly Audible)
- 10 to 20 dB (Moderately Intrusive)
- > 20 dB (Highly Intrusive)
- Highly Noise Affected

Hamilton Street

Station Street

Baan Baan Street

Bong Bong Road

Osborne Street

Burringbar Street

Marshall Street

	Author: IV / DK
Date: 02/06/2022	Approved by: NM

0 20 40 60 m

Map Source: NSW SIX Maps

Transport Access Program (TAP) Dapto - SH Noise Level Exceedances

Scenario 05 (Site wide services) and Scenario 07 (Finalisation)

Appendix B

Standard and Additional Noise and Vibration Mitigation Measures

B1 Standard Mitigation Measures

Table B.1 Standard management measures to reduce construction noise and vibration

ACTION REQUIRED	APPLIES TO	DETAILS
Implementation of any proposal specific mitigation measures required	Airborne noise Ground-borne noise & vibration	In addition to the measures set out in this table, any project specific mitigation measures identified in the EIA documentation (e.g. REF, submissions or representations report) or approval or licence conditions must be implemented.
Implement stakeholder consultation measures (refer to Sections 8.2.1 and 8.3 for further details of community consultation measures)	Airborne noise Ground-borne noise & vibration	Periodic notification (monthly letterbox drop and website notification) detailing all upcoming construction activities delivered to sensitive receivers at least 7 days prior to commencement of relevant works. In addition to Periodic Notification, the following strategies may be adopted on a case-by-case basis: • Project Specific Website • Project Infoline • Construction Response Line • Email Distribution List • Web-based Surveys • Social Media • Community and Stakeholder Meetings and • Community Based Forums (if required by approval conditions).
Register of noise and vibration sensitive receivers	Airborne noise Ground-borne noise & vibration	A register of most affected noise and vibration sensitive receivers (NVSRs) would be kept on site. The register would include the following details for each NVSR: • Address of receiver • Category of receiver (e.g. Residential, Commercial etc.) • Contact name and phone number. The register may be included as part of the Project's Community Liaison Plan or similar document and maintained in accordance with the requirements of this plan.
Construction hours and scheduling	Airborne noise Ground-borne noise & vibration	Where feasible and reasonable, construction should be carried out during the standard daytime working hours. Work generating noise with special audible characteristics and/or vibration levels should be scheduled during less sensitive time periods.
Construction respite period	Ground-borne noise & vibration Airborne noise	Noise with special audible characteristics and vibration generating activities (including jack and rock hammering, sheet and pile driving, rock breaking and vibratory rolling) may only be carried out in continuous blocks, not exceeding 3 hours each, with a minimum respite period of one hour between each block. 'Continuous' includes any period during which there is less than a 1 hour respite between ceasing and recommencing any of the work. No more than two consecutive nights of noise with special audible characteristics and/or vibration generating work may be undertaken in the same NCA over any 7-day period, unless otherwise approved by the relevant authority.

ACTION REQUIRED	APPLIES TO	DETAILS
Site inductions	Airborne noise Ground-borne noise & vibration	All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: • All relevant project specific and standard noise and vibration mitigation measures • Relevant licence and approval conditions • Permissible hours of work • Any limitations on noise generating activities with special audible characteristics • Location of nearest sensitive receivers • Construction employee parking areas • Designated loading/unloading areas and procedures • Site opening/closing times (including deliveries) • Environmental incident procedures.
Behavioural practices	Airborne noise	No swearing or unnecessary shouting or loud stereos/radios on site. No dropping of materials from height, throwing of metal items and slamming of doors. No excessive revving of plant and vehicle engines. Controlled release of compressed air.
Monitoring	Airborne noise Ground-borne noise & vibration	A noise monitoring program should be carried out for the duration of works in accordance with the Construction Noise and Vibration Management Plan and any approval and licence conditions.
Attended vibration measurements	Ground-borne vibration	Attended vibration measurements shall be undertaken at all buildings within 25 metres of vibration generating activities when these activities commence to confirm that vibration levels are within the acceptable range to prevent cosmetic building damage.
Update Construction Environmental Management Plans	Airborne noise Ground-borne noise & vibration	The CEMP must be regularly updated to account for changes in noise and vibration management issues and strategies.
Building condition surveys	Vibration Blasting	Undertake building dilapidation surveys on all buildings located within the buffer zone prior to major project construction activities with the potential to cause property damage.

Table B.2 Standard source measures to reduce construction noise and vibration

ACTION REQUIRED	APPLIES TO	DETAILS
Plan worksites and activities to minimise noise and vibration	Airborne noise Ground-borne vibration	Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site.
Equipment selection	Airborne noise Ground-borne noise & vibration	Use quieter and less vibration emitting construction methods where feasible and reasonable, see Appendix C of the CNVS. For example, when piling is required, bored piles rather than impact-driven piles would minimise noise and vibration impacts. Similarly, diaphragm wall construction techniques, in lieu of sheet piling, would have significant noise and vibration benefits.

ACTION REQUIRED	APPLIES TO	DETAILS
Maximum noise levels	Airborne-noise	The noise levels of plant and equipment must have operating Sound Power or Sound Pressure Levels compliant with the allowable noise levels in Appendix C of the CNVS.
Rental plant and equipment	Airborne-noise	The noise levels of plant and equipment items are to be considered in rental decisions and in any case cannot be used on site unless compliant with the allowable noise levels in Appendix C of the CNVS.
Use and siting of plant	Airborne-noise	Simultaneous operation of noisy plant within discernible range of a sensitive receiver is to be avoided. The offset distance between noisy plant and adjacent sensitive receivers is to be maximised. Plant used intermittently to be throttled down or shut down. Noise-emitting plant to be directed away from sensitive receivers.
Non-tonal reversing alarms	Airborne noise	Non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out-of-hours work, including delivery vehicles.
Minimise disturbance arising from delivery of goods to construction sites	Airborne noise	Loading and unloading of materials/deliveries is to occur *as far as possible* from sensitive receivers.
Minimise disturbance arising from delivery of goods to construction sites *continued*		Select site access points and roads as far as possible away from sensitive receivers. Dedicated loading/unloading areas to be shielded if close to sensitive receivers. Delivery vehicles to be fitted with straps rather than chains for unloading, wherever possible.
Construction Related Traffic	Airborne noise	Schedule and route vehicle movements away from sensitive receivers and during less sensitive times. Limit the speed of vehicles and avoid the use of engine compression brakes. Maximise on-site storage capacity to reduce the need for truck movements during sensitive times.
Silencers on Mobile Plant	Airborne noise	Where possible reduce noise from mobile plant through additional fittings including: Residential grade mufflers Damped hammers such as ‘City’ Model Rammer Hammers Air Parking brake engagement is silenced.
Prefabrication of materials off-site	Airborne noise	Where practicable, pre-fabricate and/or prepare materials off-site to reduce noise with special audible characteristics occurring on site. Materials can then be delivered to site for installation.
Engine compression brakes	Airborne noise	Limit the use of engine compression brakes at night and in residential areas. Ensure vehicles are fitted with a maintained original equipment manufacturer exhaust silencer or a silencer that complies with the National Transport Commission’s ‘In-service test procedure’ and standard.

Table B.3 Standard path measures to reduce construction noise and vibration

ACTION REQUIRED	APPLIES TO	DETAILS
Shield stationary noise sources such as pumps, compressors, fans etc	Airborne noise	Stationary noise sources should be enclosed or shielded whilst ensuring that the occupational health and safety of workers is maintained. Appendix F of AS 2436: 1981 lists materials suitable for shielding.
Shield sensitive receivers from noisy activities	Airborne noise	Use structures to shield residential receivers from noise such as site shed placement; earth bunds; fencing; erection of operational stage noise barriers (where practicable) and consideration of site topography when situating plant.

B2 Additional Mitigation Measures

Table B.4 Additional mitigation measures

MEASURE	DESCRIPTION	ABBREVIATION
Periodic Notification	For each IP project, a notification entitled 'Project Update' or 'Construction Update' is produced and distributed to stakeholders via letterbox drop and distributed to the project postal and/or email mailing lists. The same information would be published on the TfNSW website (www.transport.nsw.gov.au). Periodic notifications provide an overview of current and upcoming works across the project and other topics of interest. The objective is to engage, inform and provide project-specific messages. Advanced warning of potential disruptions (e.g. traffic changes or noisy works) can assist in reducing the impact on stakeholders. The approval conditions for projects specify requirements for notification to sensitive receivers where works may impact on them. Content and length is determined on a project-by-project basis and must be approved by TfNSW prior to distribution. Most projects distribute notifications on a monthly basis. Each notification is graphically designed within a branded template. In certain circumstances media advertising may also be used to supplement Periodic Notifications, where considered effective. Periodic Notification may be advised by the IP Community Engagement Team in cases where AMMM are not triggered as shown in Tables 9 to 11, for example where community impacts extend beyond noise and vibration (traffic, light spill, parking etc). In these circumstances the IP Community Engagement Team would determine the community engagement strategy on a case-by-case basis.	PN
Verification Monitoring	Verification monitoring of noise and/or vibration during construction may be conducted at the affected receiver(s) or a nominated representative location (typically the nearest receiver where more than one receiver has been identified). Monitoring can be in the form of either unattended logging (i.e. for vibration provided there is an immediate feedback mechanism such as SMS capabilities) or operator attended surveys (i.e. for specific periods of construction noise). The purpose of monitoring is to confirm that: • construction noise and vibration from the project are consistent with the predictions in the noise assessment • mitigation and management of construction noise and vibration is appropriate for receivers affected by the works Where noise monitoring finds that the actual noise levels exceed those predicted in the noise assessment then immediate refinement of mitigation measures may be required and the CNVIS amended. Refer to Section 8.4 for more details.	V

MEASURE	DESCRIPTION	ABBREVIATION
Specific Notification	Specific notifications are in the form of a personalised letter or phone call to identified stakeholders no later than seven calendar days ahead of construction activities that are likely to exceed the noise objectives. Alternatively (or in addition to), communications representatives from the contractor would visit identified stakeholders at least 48 hours ahead of potentially disturbing construction activities and provide an individual briefing. • Letters may be letterbox dropped or hand distributed • Phone calls provide affected stakeholders with personalised contact and tailored advice, with the opportunity to provide comments on the proposed work and their specific needs • Individual briefings are used to inform stakeholders about the impacts of noisy activities and mitigation measures that would be implemented. Individual briefings provide affected stakeholders with personalised contact and tailored advice, with the opportunity to comment on the project Specific notifications are used to support periodic notifications, or to advertise unscheduled works and must be approved by TfNSW prior to implementation/distribution.	SN
Respite Offer	The purpose of a project specific respite offer is to provide residents subjected to lengthy periods of noise or vibration respite from an ongoing impact. The offer could comprise pre- purchased movie tickets, bowling activities, meal vouchers or similar offer. This measure is determined on a case-by-case basis, and may not be applicable to all IP projects.	RO
Alternative Accommodation	Alternative accommodation options may be provided for residents living in close proximity to construction works that are likely to incur unreasonably high impacts. Alternative accommodation would be determined on a case-by-case basis and should provide a like-for-like replacement for permanent residents, including provisions for pets, where reasonable and feasible.	AA
Alternative construction methodology	Where the vibration assessment identifies that the proposed construction method has a high risk of causing structural damage to buildings near the works, the proponent would need to consider alternative construction options that achieve compliance with the VMLs for building damage. For example, replace large rock breaker with smaller rock breakers or rock saws.	AC
Respite Period	OOHW during evening and night periods would be restricted so that receivers are impacted for no more than 3 consecutive evenings and no more than 2 consecutive nights in the same NCA in any one week, except where there is a Duration Respite. A minimum respite period of 4 evenings/5 nights shall be implemented between periods of evening and/or night works. Strong justification must be provided where it is not reasonable and feasible to implement these period restrictions (e.g. to minimise impacts to rail operations), and approval must be given by TfNSW through the OOHW Approval Protocol (Section 6). Note; this management measure does not apply to OOHW Period 1 – Days (See Table 1).	RP

MEASURE	DESCRIPTION	ABBREVIATION
Duration Reduction	Where Respite Periods (see management measure above) are considered to be counterproductive to reducing noise and vibration impacts to the community it may be beneficial to increase the number of consecutive evenings and/or nights through Duration Reduction to minimise the duration of the activity. This measure is determined on a project-by-project basis, and may not be applicable to all IP projects. Impacted receivers must be consulted and evidence of community support for the Duration Reduction must be provided as justification for the Duration Reduction. A community engagement strategy must be agreed with and implemented in consultation with IP Community Engagement Representatives.	DR

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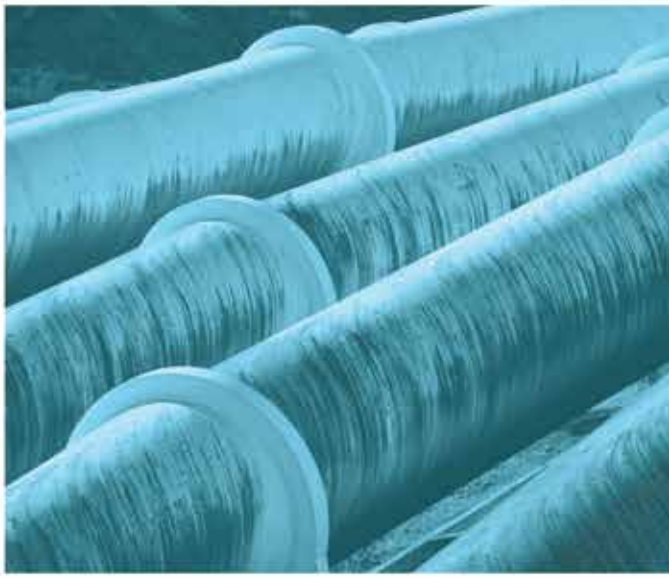
Appendix G – Statement of Heritage Impact


Dapto Railway Station

Assessment of built heritage, archaeological values and significant landscapes & statement of heritage impact

Prepared for Transport for New South Wales
July 2022

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Dapto Railway Station

Assessment of built heritage, archaeological values and significant landscapes & statement of heritage impact

Report Number

E220319

Client

Transport for New South Wales

Date

06 July 2022

Version

Final

Prepared by

Dr Vidhu Gandhi
National Technical Leader - Build Heritage Associate
6 July 2022

Approved by

Dr Susan Lampard
Associate Archaeologist
6 July 2022

Executive Summary

As part of the NSW Government's Transport Access Program (TAP) Dapto Railway Station, which is part of the South Coast railway line, has been identified by Transport for New South Wales (TfNSW) for upgrade works. The works proposed seek to provide a station precinct that is accessible to those with a disability, limited mobility, parents/carers with prams and customers with luggage.

Dapto Railway Station is listed on the *Transport Asset Holding Equity Section 170 Heritage and Conservation Register* (Section 170 Register) and the *Wollongong Local Environmental Plan 2009* as an item of local heritage significance. The station has an 1887 weatherboard building that has rarity and aesthetic significance as it is one of four such remaining types of station buildings in the Illawarra region. Other features that contribute to the significance of the station include the station forecourt comprising of Hartigan Park, Buckley Walk and a war memorial. A statement of heritage impact (SoHI) is required by TfNSW to assess the impacts of the proposed works on the station, its buildings, platforms and surroundings. EMM has been engaged by TfNSW to prepare a SoHI that addresses these potential impacts on the built heritage and the archaeological potential of the site.

The proposed works upgrade Dapto Station to provide Disability Standards for Accessible Transport (DSAPT) compliant facilities to benefit station users. This includes the provision of accessible pathways to and from the station platforms and its surroundings; a new kiss and ride zone; widening of Platform 1; a regrading of the station platform; provision of boarding assistance zones on platforms; provision of ambulant toilets, compliant station building waiting rooms, ticket windows, audio systems, lighting systems, customer assistance panels, help points and pay phones; and provision of wayfinding and DSAPT signage during the construction phases of proposed works.

Overall, the works proposed will have minor impact on the heritage significance of the station, its platforms, buildings and surroundings. Works proposed to the interior of the 1887 Main Station building are considered as having no impact as the station building has undergone upgrades and modifications before. A few changes, notably in terms of raising of the height of awnings on either side of the station entry and the addition of a ramp to Platform 2, will impact early fabric. The changes to the awnings will be minor and are considered as acceptable changes, as the proposed works will retain and reuse the awning materials namely early fabric including timber beams and side cladding while modifying the slope of the awning roofs and replacement of later fabric like the existing columns and roofing material. The modifications to the existing ramp and footpath to Platform 2 will be to the southern end of the platform and while this does have archaeological potential in terms of finding earlier fabric, the finds if any, will not yield new or substantial information nor meet the threshold for local significance, thereby the impact will be minor. Apart from these works all other works proposed will not impact any of the original/early fabric remaining notably the weatherboard building exteriors. Existing views to and from the station and its surroundings, especially from the station forecourt and from the level crossing at Bong Bong Road, will be maintained.

While the works proposed will improve the accessibility of and to the Station, and are broadly acceptable, it is recommended that further design input is required from a heritage consultant. This input is required in terms of the design and specification detailing DSAPT compliant features; the proposed relocation of services, infrastructure, signage and systems so as to avoid damage to significant fabric; and development of detailed instructions for storage, dismantling and reassembly of these features.

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Plates

Abbreviations and acronyms

Abbreviation/acronym	Long form
CBD	central business district
CHL	Commonwealth Heritage List
DSAPT	Disability Standards for Accessible Public Transport
EP&A Act	*Environmental Planning and Assessment Act 1979*
Heritage Act	NSW *Heritage Act 1977*
LEP	Local environmental plan
NHL	National Heritage List
NSW	New South Wales
SEPP	State Environmental Planning Policy
SHR	State Heritage Register
TAP	Transport Access Program
TfNSW	Transport for New South Wales

Glossary

Term	Definition
Archaeological site	Buried evidence of the past; may or may not be 'relics' as defined by the *Heritage Act NSW*
Earthworks	All works involving the loosening, excavating, placing, shaping and compacting of soil or rock
Embankment	that portion of a road located on an earthen structure where the subgrade level is above the natural surface.
Kerb	A hard stone or concrete shaped to inhibit passage by vehicles. Used for bordering a road and limiting the shared user paths/footways
Relic	As defined by the *Heritage Act 1977*: A "relic" means any deposit, artefact, object or material evidence that: a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and b) is of State or local heritage significance.

1 Introduction

1.1 Overview

The Transport Access Program (TAP) – a NSW Government initiative – is a rolling program of works established to deliver public transport that complies with the *Disability Standards for Accessible Public Transport Act 2002* (DSAPT); that seeks to improve customer experience and encourage public transport use; meet patronage growth and future demand requirements; and ensure functional connectivity at interchanges.

As part of the TAP program, Dapto Railway Station has been identified for upgrades to provide a station precinct that is accessible to those with a disability, limited mobility, parents/carers with prams and customers with luggage. Currently in its planning stage, the Dapto Station Upgrade is expected to be completed in 2023.

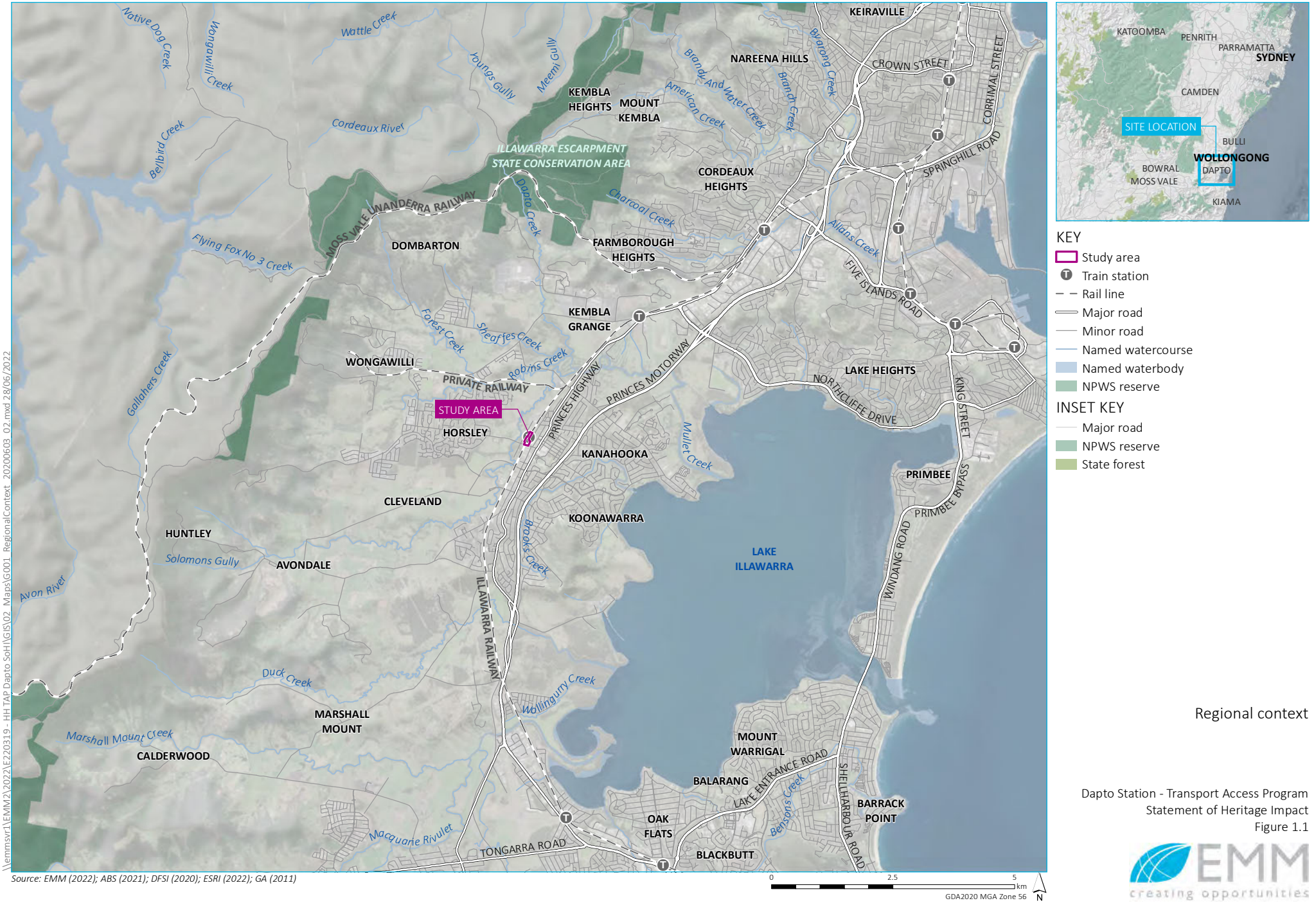
Dapto Railway Station is listed on the Section 170 Register and the *Wollongong Local Environmental Plan 2009* as an item of local heritage significance. As part of Transport for New South Wales' (TfNSW's) impact assessment of the proposed works at Dapto Station, a Statement of Heritage Impact (SoHI) needs to be prepared. EMM has been engaged by TfNSW to provide heritage consultancy services to prepare a SoHI that addresses the proposed upgrade works to Dapto Railway Station. The assessment of heritage impact is based on an onsite visual inspection of the station – its buildings, platforms and surroundings, and an evaluation of the architectural documentation and information provided by TfNSW.

1.2 Site Description

Dapto Railway Station is located in the Wollongong Local Government Area and is part of the South Coast railway line. Dapto lies to the south-west of the Greater Sydney region and is 14.4 kilometres (km) from the Wollongong central business district (Figure 1.1). The Station is accessed from Station Street, via Hartigan Park, and from a level crossing or Hartigan Park on Bong Bong Street to its south (Figure 1.2). The station is surrounded by residential development to the west and commercial properties, including Dapto Leagues Club, to the east.

The Station has three rail tracks and three platforms. Platform 1, which is a side platform, serves as the down (country-bound) platform, and Platform 2 at its southern end is a side platform and serves as up (city-bound) platform. Platform 2 to its north combines with Platform 3 which is a terminating platform. All buildings are located along Platform 2 and Platform 3.

The station forecourt comprises Hartigan Park, Buckley Walk and the war memorial. A circular drive-way through Hartigan Park provides access to the station from Station Street.



KEY

- Study area
- Train station
- Rail line
- Major road
- Minor road
- Named watercourse
- Named waterbody
- NPWS reserve

INSET KEY

- Major road
- NPWS reserve
- State forest

Source: EMM (2022); ABS (2021); DFSI (2020); ESRI (2022); GA (2011)

0 2.5 5 km

GDA2020 MGA Zone 56

N

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Regional context

Dapto Station - Transport Access Program
Statement of Heritage Impact
Figure 1.1

EMM creating opportunities

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Source: EMM (2022); DFSI (2020); Metromap (2022)

Local context

Dapto Station - Transport Access Program
Statement of Heritage Impact
Figure 1.2

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1.3 Assessment guidelines and requirements

This historical heritage assessment and SoHI has been prepared in accordance with the relevant government assessment requirements, guidelines and policies. The report and field survey were undertaken using the principles of *The Australian International Council on Monuments and Sites, Charter for Places of Cultural Significance* (also known as the *Burra Charter,* Australia ICOMOS 2013) and the New South Wales (NSW) *Heritage Manual* (Heritage Office 1996 with regular additions).

The Burra Charter: The Australian ICOMOS charter for places of cultural significance (ICOMOS (Australia) 2013) sets a standard of practice for those who provide advice, make decisions about, or undertake works to places of cultural significance including owners, managers and custodians. The *Burra Charter* defines the concept of cultural significance as 'aesthetic, historic, scientific, social or spiritual value for past, present or future generations' (Australia ICOMOS 2013, Article 1.2). It identifies that conservation of an item of cultural significance should be guided by the item's level of significance.

The *Heritage Manual* comprises the following guidance documents:

- Statements of Heritage Impact Guidelines (Heritage Office 2006);
- Investigating Heritage Significance (Heritage Office 2004);
- Assessing Heritage Significance (Heritage Office 2001); and
- Assessing Significance for Historical Archaeological Sites and 'Relics' (Heritage Branch Department of Planning 2009).

These documents have been used to guide this historical heritage assessment and SoHI.

1.4 Authorship

This report was prepared by EMM Consulting Pty Limited, written by Vidhu Gandhi (EMM, National Technical Lead – Built Heritage). The historical section research and writing was undertaken by Amelia O'Donnell (EMM, Historian) and the site inspection and photography of the station, its buildings and surroundings was conducted by Anthony Dakhoul (EMM, Heritage Consultant). Unless otherwise noted, all of the images and photographs in this report have been produced by EMM.

2 Statutory framework

2.1 Legislation

In NSW, heritage items and relics, that is archaeological sites assessed to be of local or State significance, are protected by two main pieces of legislation: the EP&A Act and the NSW *Heritage Act 1977*.

2.1.1 Heritage Act 1977 (NSW)

The *Heritage Act 1977* (Heritage Act) serves to conserve the heritage places, items and objects of NSW. The Heritage Council of NSW is constituted under the Heritage Act to advise the Minister with responsibility for heritage on matters relating to the conservation of the State's heritage. In practice, this power is largely delegated to Heritage NSW.

ARCHAEOLOGY AND RELICS

Relics, defined as "any deposit, artefact, object or material evidence that relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and is of State or local significance", are protected under Section 139 of the Heritage Act. A person cannot knowingly disturb or excavate land when they suspect a relic to be present without holding an excavation permit or an exemption. Section 139 applies to all land in NSW not listed on the SHR. Section 146 requires persons to notify the Heritage Council of NSW within a reasonable time if an unanticipated relic is discovered. The Heritage Act identifies the category of 'works', which refers to historical infrastructure, and is viewed as separate to that of archaeological 'relics' under the Heritage Act. 'Works' may be buried, and are therefore archaeological in nature, but exposing a 'work' does not trigger reporting obligations under the Heritage Act unless it is of demonstrable significance.

STATE GOVERNMENT HERITAGE AND CONSERVATION (S170) REGISTERS

Section 170 of the Heritage Act requires State government agencies establish and maintain a register of heritage items, to be known as a Heritage and Conservation Register. State agencies are required to undertake due diligence with regard to the care, control and management of items listed on their Section 170 Heritage and Conservation Register. Additionally, State agencies must notify the Heritage Council of NSW 14 days in advance if they intend to remove an item from their register, transfer ownership, cease occupation, demolish. Section 170 does not place statutory requirements on individuals or non-State government entities.

2.1.2 Environmental Planning and Assessment Act 1979 (NSW)

The *EP&A Act* establishes the framework for development assessment within NSW, with one of the objects of the Act being to promote the sustainable management of built and cultural heritage, including Aboriginal cultural heritage. The *EP&A Act* outlines the making of environmental planning instruments including state environmental planning policies and local environmental plans. The two such plans relevant to the project are discussed in Sections 2.1.3 and 2.1.4.

2.1.3 State Environmental Planning Policy (Transport and Infrastructure) 2021

Section 2.11 (a) of the SEPP (Transport and Infrastructure) 2021 requires consultation with councils for development that "may be carried out without consent" that is "is likely to affect the heritage significance of a local heritage item, or of a heritage conservation area" in a way that is "more than minor or inconsequential". This applies to rail infrastructure facilities that "may be carried out without consent" under Section 2.91(1) of this SEPP. As the works proposed are to rail infrastructure facilities, and as the affect of these works on the heritage significance of Dapto Station are not more than minor or inconsequential, consultation with Wollongong local council under Section 2.11 of this SEPP is not considered necessary.

2.1.4 Wollongong Local Environmental Plan 2009

Schedule 5 of the Wollongong Local Environmental Plan 2009 (LEP) provides a list of heritage items, conservation areas and archaeological sites within the Wollongong City LGA. While Dapto Station is listed on Schedule 5 of the LEP, the controls and provisions of the LEP will not apply to the Station TAP upgrade works, as the SEPP (Transport and Infrastructure) 2021 overrides the LEP.

2.2 Identifying listed heritage items

Listing on statutory registers provides a basis under which the item or place is protected, and change is managed through project approval. Statutory listings provide legal protection for heritage items under the legislation outlined above.

Statutory registers reviewed as a part of this assessment include:

- World Heritage List;
- National Heritage List;
- Commonwealth Heritage List;
- State Heritage Register;
- Transport Asset Holding Equity Section 170 Heritage and Conservation Register - this register is made under Section 170 of the Heritage Act;
- Schedule 5 of the Wollongong LEP 2009 – the LEP is made in accordance with the EP&A Act 1979 and the Standard Instrument; and
- State Heritage Inventory (SHI), which was cross-checked with Schedule 5 of the Wollongong Local Environmental Plan 2009 and the s170 register. The SHI is not a single statutory register, but a central collection of State and locally listed statutory heritage items maintained by Heritage NSW.

2.3 Heritage listings

Dapto Railway Station and items its vicinity that have heritage significance as per Schedule 5 of the Wollongong LEP 2009 are indicated in Table 2.1 and Figure 2.1 below.

Table 2.1 Nearby items of heritage significance – Schedule 5 Environmental Heritage Wollongong LEP

Item No.	Item name	Property description	Significance
6435	***Dapto Railway Station***	**Station Street (Part of Lot 2, DP 856667)**	**Local**
6335	*Station Master's residence*	1 Station Street (Lot 1, DP 856667)	Local
61022	*Dapto Hotel*	102–110 Princes Highway (Lot 1, DP 564523)	Local
61021	*Fairley's building (former)*	1–11 Bong Bong Road (Lot 10, DP 1048264)	Local
61026	*Bunya Pine (Uniting Church grounds)*	126–128 Princes Highway (Lot B, DP 157162)	Local
61025	*Bunya Pine*	93–108 Princes Highway (Lot 1, DP 1050533)	Local
61023	*Crystal clothing factory (former)*	14–16 Marshall Street (Lot 112, DP 1007288)	Local

Figure 2.1 Listed sites and items under the LEP: Source Wollongong LEP 2009

3 Historical background

3.1 Key phases

Historical analysis has allowed for the division of region's development into phases. These phases and the themes below provide a framework for understanding the site and therefore its significance.

Phase 1: Pre contact

Phase 2: Exploration and early settlement

Phase 3: Daisy Bank

Phase 4: Subdivision and the railway

Phase 5: Expansion of Dapto

3.2 The environment of pre and early contact

Information about the socio-cultural structure of Aboriginal society prior to European contact largely comes from ethno-historical accounts made by colonial settlers. Such accounts and observations were made after massive disruption due to disease and physical and cultural displacement. As a result, this information in often contentious, particularly in relation to language group boundaries.

People have inhabited Australia for at least 50,000 years with occupation in the Illawarra dating to around 20,000 years ago (Attenbrow 2010, 3; Bursill, Donaldson, and Jacobs 2015, 1). Dapto is located in Dharawal (also Tharawal) Country which encompassed the area south of Botany Bay, to the north of the Shoalhaven River and west to Campbelltown and Camden (Tindale 1974). Traditional Dharawal stories tell of their Ancestors' arriving in Lake Illawarra carrying the sacred Dharawal or cabbage tree palm with them in their canoes (Attenbrow 2010). Dharawal clans were categorised as "fresh water", "bitter water" or "salt water" people and the area of Dapto is within the traditional lands of the "salt water" Wodi Wodi clan whose territory is believed to stretch from Wollongong to the Shoalhaven (Attenbrow 2010).

The marine and hinterland landscapes of the Illawarra contained plentiful water, food and textile resources and offered places to camp and shelter (Bursill, Donaldson, and Jacobs 2015). Groups are believed to have travelled seasonally between the coast, occupied in the warmer months, and the Illawarra escarpment in the colder months (Bursill, Donaldson, and Jacobs 2015). Dharawal people came together for ceremonies and exchanged objects such as ground edged hatchets and raw materials (Stokes 2015). At the time of European settlement in the Illawarra region, Dharawal groups had established complex regional trade and songline networks linking the highlands west of the Illawarra escarpment and the coastal plain (Stokes 2015; Bursill, Donaldson, and Jacobs 2015).

By 1800 the Dharawal people had already felt the impacts of European settlement to the north as a smallpox epidemic spread through Indigenous communities from 1789 (Donaldson, Bursill, and Jacobs 2017, 6). Permanent European settlement of the region over the next decades caused social and cultural dislocation for the Dharawal people. Nevertheless, many Dharawal people continue to live in the local regions and continue to care for Country.

3.3 Colonial exploration and settlement

The earliest colonial evidence of the Illawarra region was noted by James Cook during an unsuccessful landing at Collins Rock, Woonona in 1770 (Cousins 1994, 9). In fact, the first recorded European engagement with the region was unintentional, with the expedition of George Bass and Mathew Flinders in 1796, during which their boat *Tom Thumb II* ran aground in the area south of Port Kembla, and was recovered along the banks of Lake Illawarra assisted by local Aboriginal groups (Cousins 1994). The following year the survivors of the failed *Sydney Cove* rescue mission travelled through the Illawarra, potentially passing through the Dapto area, as they made their way from Ulladulla to Sydney (McDonald 1976, 9; Cousins 1994). A more continuous European presence in the region began in 1801 as whaling and sealing ships started to work the South Coast (Donaldson, Bursill, and Jacobs 2017).

In 1805, James Meehan surveyed the Shoalhaven River noting the presence of cedar in the area (Cousins 1994; Donaldson, Bursill, and Jacobs 2017). The hunt for cedar drove European settlers to the Illawarra from 1807 and the first cargo of "red gold" floated from the Shoalhaven in 1812 (Cousins 1994). Surveyors, cedar getters and hunters noted that the land of Five Islands, later Illawarra, had good grazing land, which remained inaccessible to pastoralists until Charles Throsby's expedition opened the area to cattle and their caretakers in 1815 (Secomb 1999, 13; Cousins 1994). Cattle was then run throughout the Illawarra, overseen by stockmen occupying "primitive huts", likely in the vicinity of the creeks of the Illawarra lowlands (Illawarra Mercury 1894, 3). Macquarie released the first land grants around the western and northern shores of Lake Illawarra in 1817 (Secomb 1999).

The area of Dapto Station is located in the 500 acres (202.3 ha) granted to George Brown in 1823, later known as *Daisy Bank* (Plate 3.1) (McDonald 1976). Although, Brown's grant was officially issued in May of 1833, he had already sold his grant to Richard Brooks six month earlier (McDonald 1976). Brooks' son Henry sold the grant to Henry Osborne who in turn sold the property to his brother Alick in 1839 for the sum of £250 (McDonald 1976). The *Daisy Bank* estate remained in the Osbourne family until the death of Alick's daughter Anne Marshall (nee Osbourne) in 1888 (McDonald 1976).

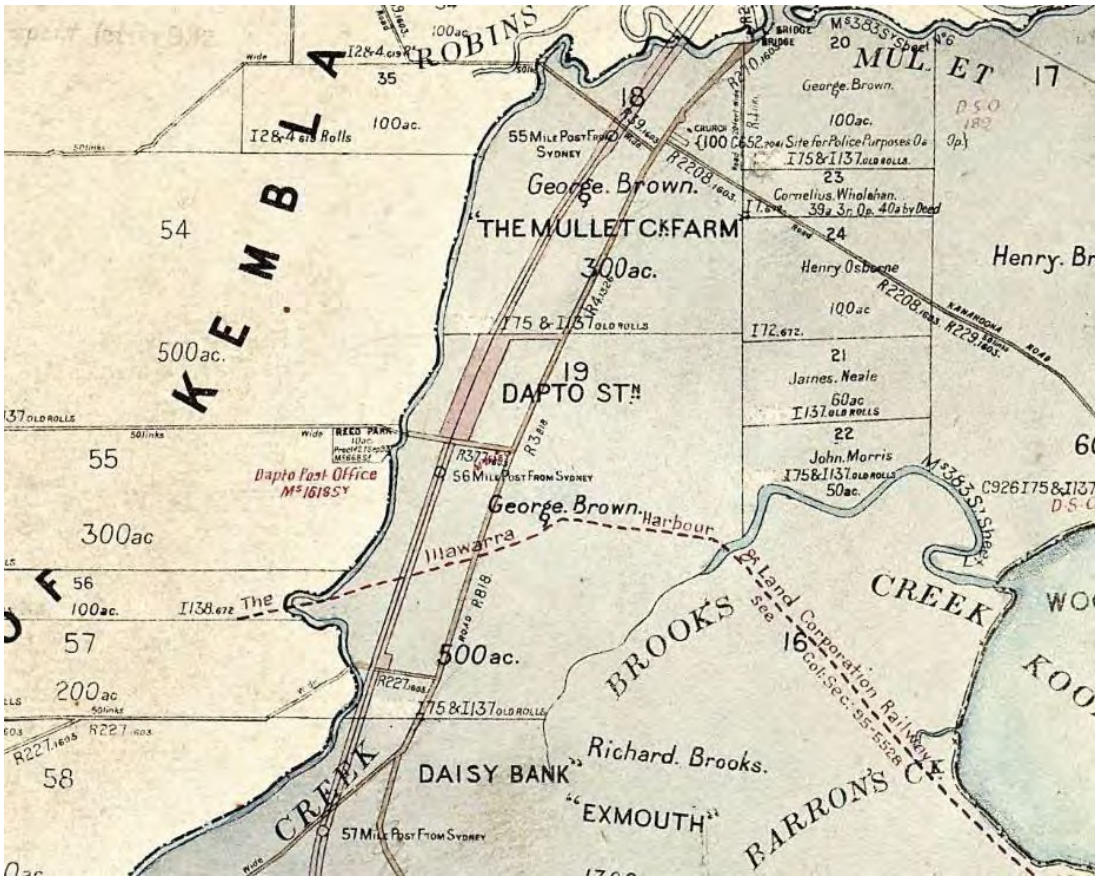

Plate 3.1 Detail. Parish of Calderwood 4th edition 1895. Source: HLRV

The first reference to the name Dapto came in instructions given to Surveyor Knapp in April of 1829, which stated he was "to survey ten 100 acre lots for veterans on Dapto Creek" (Wollongong Library n.d.). The original Dapto village, located at Brownsville, was established to the north of the current Dapto township on the 300 acre (121.4 ha) *Mullet Creek Farm* granted to a different George Brown in 1833— supposedly the cousin of the *Daisy Bank* grantee (Cousins 1994). Brown had established the Ship Inn in Wollongong in 1831 but transferred the licence to his Dapto property in 1834 creating the nexus for the future village (Cousins 1994). The Great South Road was constructed through the region between 1834 and 1836 connecting Dapto to Sydney (McDonald 1976).

Early industry in the Dapto area focused on the production of wheat and flour with Brown constructing a windmill on Mullet Creek in 1839 (Cousins 1994). The windmill was replaced by a steam flour mill near Brown's Illawarra Hotel (the Ship Inn had burnt down in 1837) two years later (Plate 3.2) (Cousins 1994). By 1856, the village consisted of the inn, flour mill, post office, store, three churches, school, and half a dozen or so houses (Cousins 1994). A rust outbreak led to Dapto's wheat industry being abandoned from 1865 and farmers transitioning to dairying (McDonald 1976). John Lindsay converted Brown's flour mill to a cheese factory, but as cheese was only produced when the price for butter was low, the mill was changed to a butter factory in 1887 (McDonald 1976). A Council Chambers, police station, butcher's shop and blacksmith had been constructed in the village by the 1870s, however, in 1879 Dapto village was described as "the most straggling village in Illawarra" (Australian Town and Country Journal 1879, 32; Cousins 1994). Dapto was transformed with the coming of the railway in 1887 (Wollongong Library n.d.).

Plate 3.2 Dapto Mill ca. 1853. Source: NLA PIC Solander Box A17 #R6563

Development of the new Dapto township was closely related to the presence of the station. A milk depot was constructed adjoining the station in 1890 (Wollongong Library n.d.). In 1891 a coal stage and water pump were installed in the station yard. A private trainline with three dead-end exchange sidings was connected to the station for the Dapto smelting company in 1895 (Wollongong Library n.d.). The Smelting Company of Australia Ltd closed the Dapto smelting works in 1905 and the private line was decommissioned with one track retained for refuging (Singleton 1984, 51).

The railway station allowed for the development of the larger Dapto area. The earliest subdivision in the area was of *Daisy Bank* estate following the death of Anne Marshall in 1888 (McDonald 1976). Advertised in June 1890, as the Marshall Estate the first phase of the subdivision focused on the land east and west of Dapto Station (Plate 3.3, Plate 3.4). The executors of the subdivision knew the presence of the railway station would attract people and businesses south of the Dapto village and the sale was considered the largest since first settlement (Secomb 1999). By the following year the commercial centre of the Dapto township had already begun to shift south and the early village became known as Brownsville (McDonald 1976; Cousins 1994).

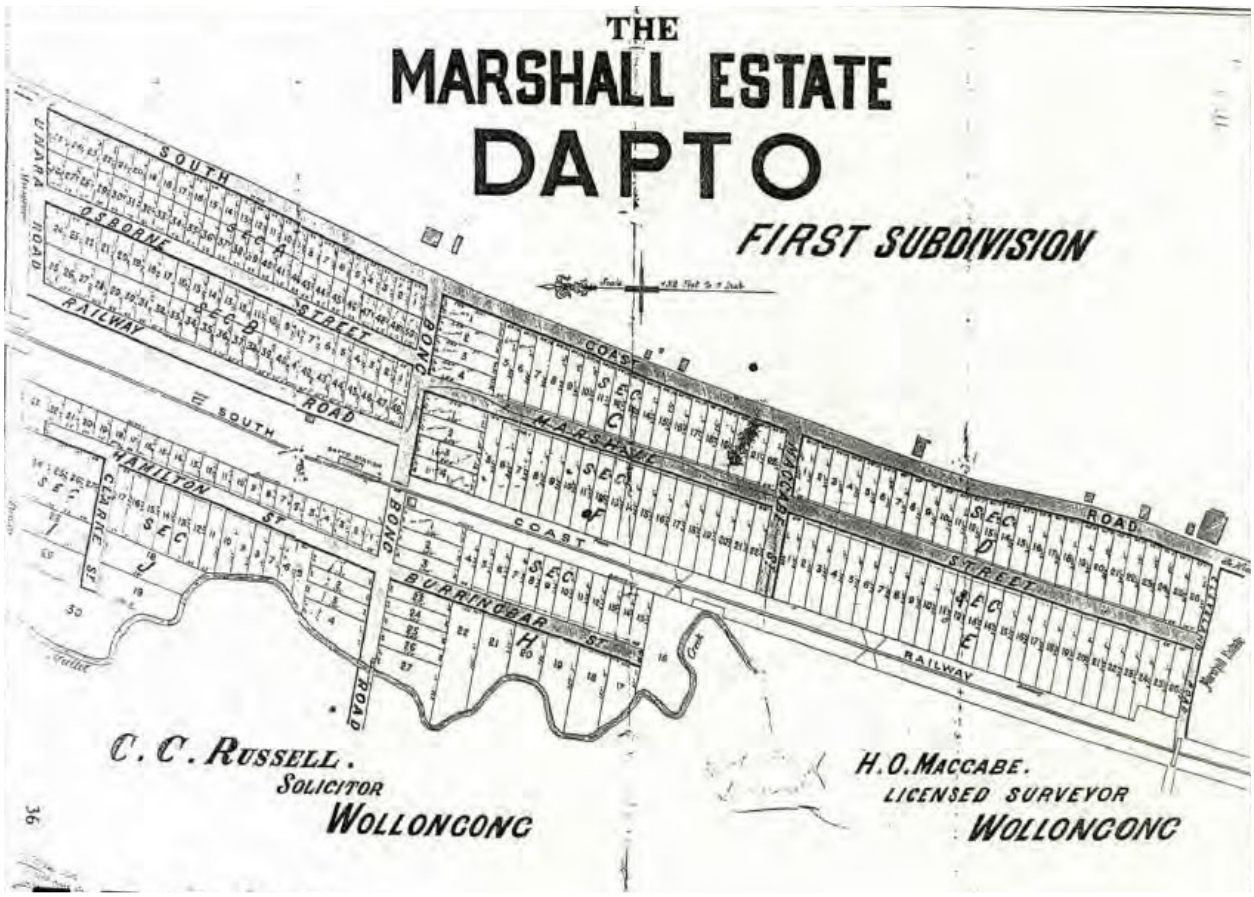

Plate 3.3 Marshall Estate, Dapto, first subdivision 1890. Source: Secomb 1999, p.36.

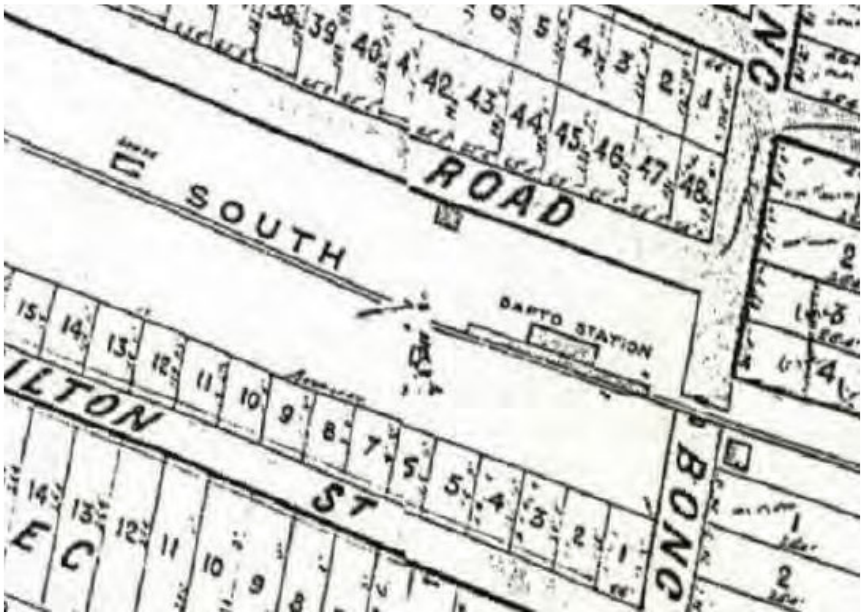

Plate 3.4 Dapto station detail in Marshall Estate, Dapto, first subdivision 1890. Source: Secomb 1999, p.36.

3.4 Dapto Railway Station

During the nineteenth century the majority of produce and products from the Illawarra region were transported to Sydney by sea (Singleton 1984). By 1872 the unsatisfactory condition of roads and the tenuous nature of sea travel led the people to petition for the construction of a railway line between the Illawarra and Sydney (Singleton 1984). Routes were surveyed from 1874 and the construction contract for the first section of the Illawarra Railway was signed on the 12th of September 1882 (Singleton 1984). The Illawarra Railway was first constructed as an isolated line between Wollongong to Bombo, which was connected to Sydney in 1888 (McDonald 1976). The Wollongong to Bombo line, and associated Dapto station, was opened on the 9th of November 1887 (McDonald 1976).

Dapto station was constructed southwest of the original Dapto village, away from the low, swampy ground of Mullet Creek between the villages Dapto and Charcoal (Unanderra) (Wollongong Library n.d.). The station was constructed on Bong Bong Road, which had been used as a cattle route, and it featured a timber platform and 3rd class timber station building, which was the most substantial example of a station building on the southern portion of the line (Singleton 1984). The station building contained a general and ladies waiting rooms, a ticket office and men's toilet. A brick Station Master's residence, shed, forecourt and stockyards were constructed around the station and a water tank connected to a timber viaduct was built on Mullet Creek (SHI I6435 Dapto Railway Station (Singleton 1984). Apart from servicing the movement of people, Dapto Station serviced the local dairy processing industry in the area and several features introduced into the station between 1890 and 1926 including the expansion of station and goods yard, the addition of a siding, and the construction of a water tank and water column were driven by the needs of the dairy industry (Forsyth 1988:157).

By 1913, the station included a gatekeeper's residence south west of Bong Bong Road, level crossing, ramps at both end of the eastern platform, toilet on the 1887 platform, station masters residence, coal bin, cattle yard, trucking yard, shed, loading dock and tank stand (SHI I6435 Dapto Railway Station). A bore pipe and water tank was installed in 1926, these were later decommissioned and the tank removed. The Dapto township was further subdivided after the Second World War and c. 1968 a second platform was constructed west of the original platform (Secomb 1999). Earliest evidence of the larger precinct of the station, including the existing Hartigan Park, can be traced to the late nineteenth or early twentieth century, with 1940 plans of the station precinct indicating a semi-circular carriage loop and park, and a 1963 plan showing the park name as Hartigan Park.

Modifications to individual buildings at the station include changes to original configuration of the weatherboard station building, with the demolition of the male toilet block in 1971 – a gable roof weatherboard structure – and its replacement with the existing pale brick toilet block (Plate 3.5 and Plate 3.7). The station building had two chimneys that seemed to have been removed by 1994 (Plate 3.12), following the full electrification of the station in 1993. The front street facing entry of the station building was modified in 1981, as the two small porches that formed part of the station entry were retained, but the original decorative posts and brackets to these were removed (as seen in Plate 3.8). This was followed by the removal of the one of the small porches and the extension of the verandah awning (Plate 3.13). Modifications to canopies and awnings at the station were undertaken at the same time as the full electrification of the station. The 1990s also saw the sale of the Station Master's residence into private ownership. More recent changes to the station precinct were undertaken in 2013, including reconfiguration of the semi-circular driveway to the station entry and the layout of Hartigan Park, and a few changes to increase the accessibility of Platform 2 from Bong Bong Road and the front entrance.

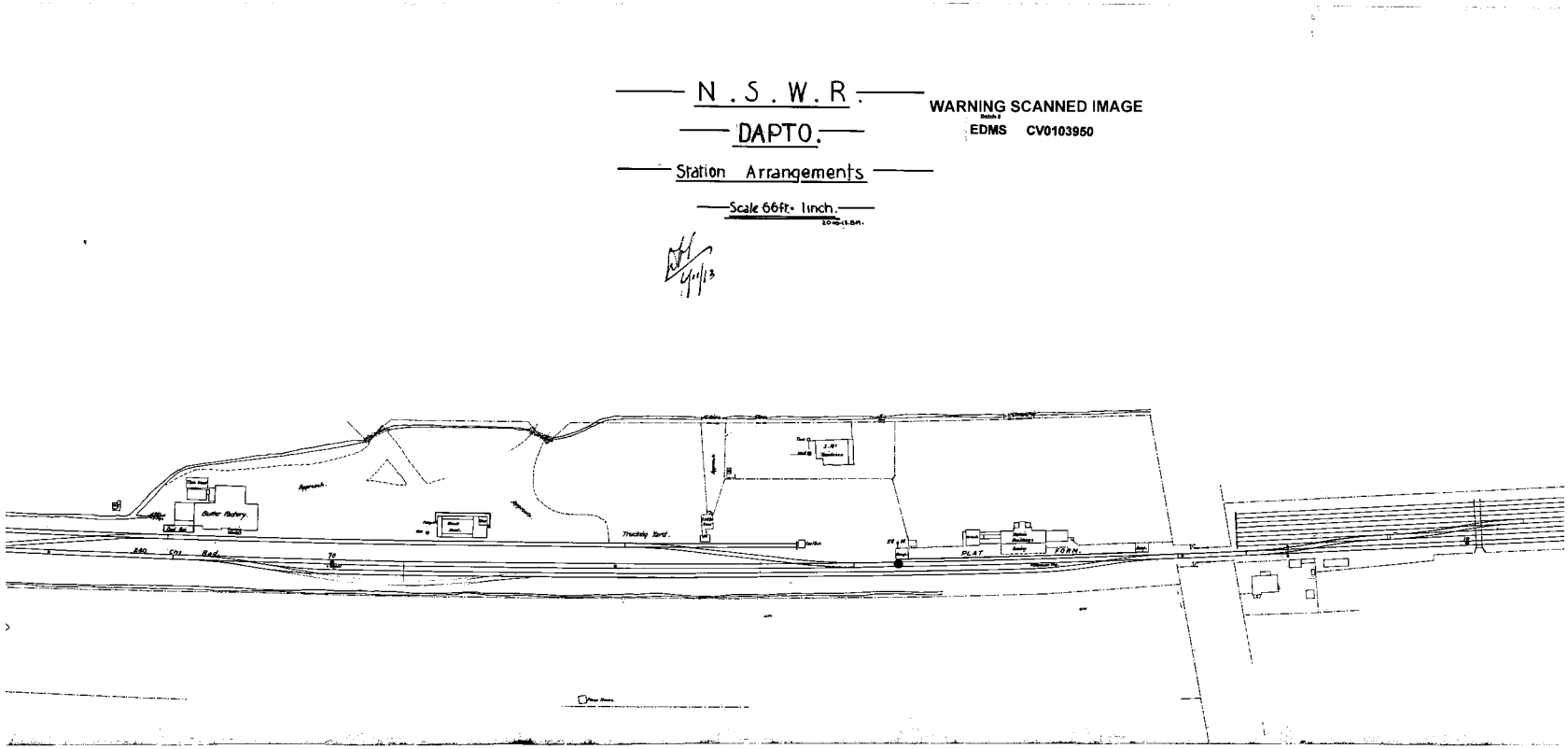

Plate 3.5 Dapto Railway Station 1913. Source: TfNSW 2022

Plate 3.6 **Dapto Railway Station, nd. Source: TfNSW 2022**

Plate 3.7 **Dapto Railway Station, nd. Source: TfNSW 2022**

Plate 3.8 Scouts at Dapto Railway Station, 1919. Source: TfNSW 2022

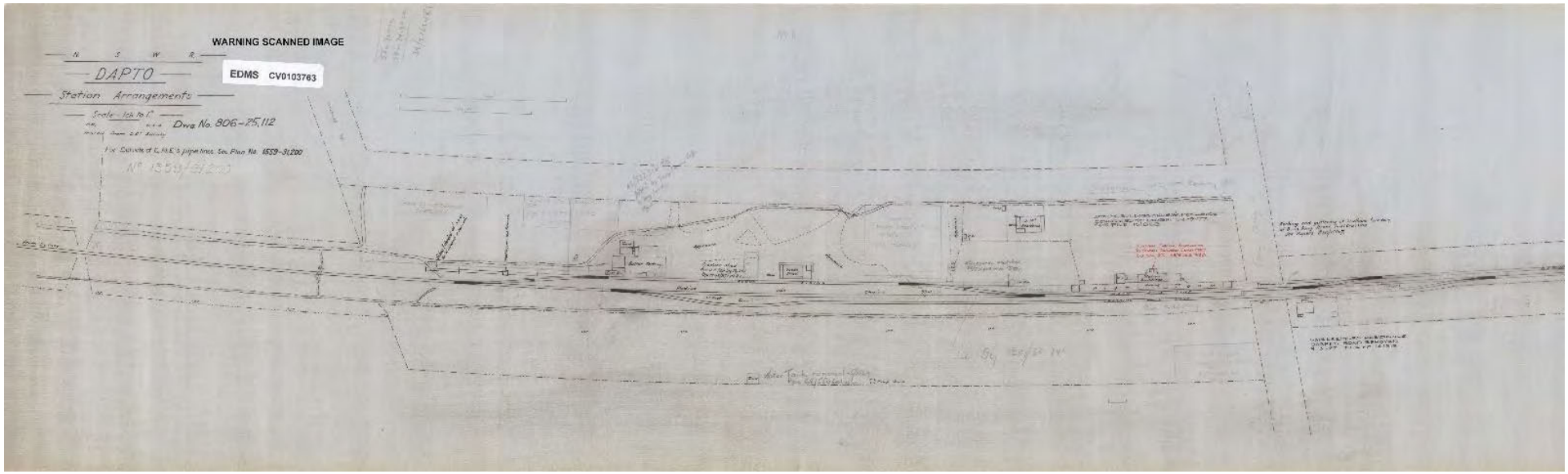

Plate 3.9 Dapto Railway Station 1930. Source: TfNSW 2022

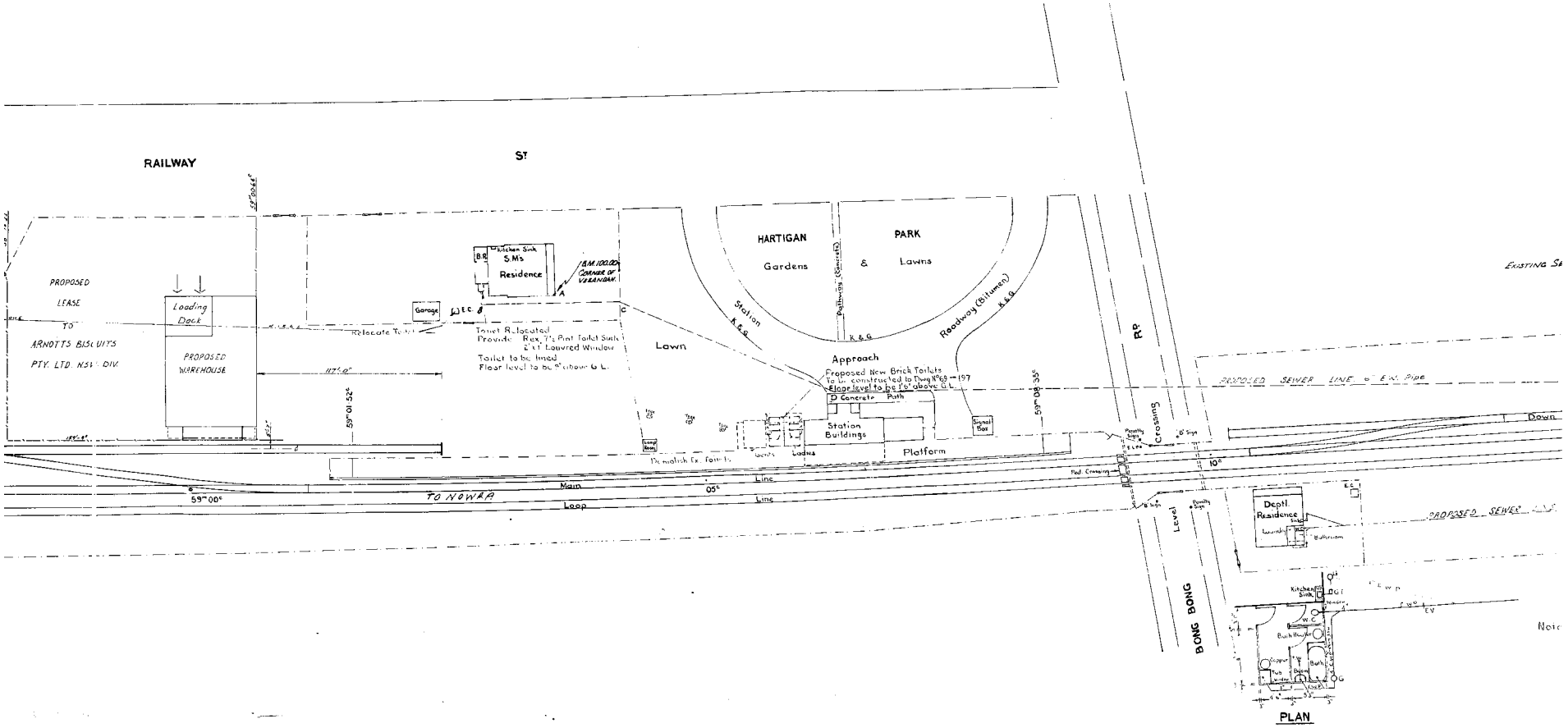

Plate 3.10 Dapto Railway Station 1971. Source: TfNSW 2022

Plate 3.11 Dapto Railway Station 1981. Source: TfNSW 2022

Plate 3.12 Dapto Railway Station 1994. Source: TfNSW 2022

Plate 3.13 Dapto Railway Station 1999. Source: TfNSW 2022

3.5 Key findings

The project area is located in the boundaries of *Daisy Bank*, granted to George Brown in 1823. *Daisy Bank* was occupied by members of the Osbourne family from 1839 and the Daisy Bank homestead is located south of the project area. The land use of the Daisy Bank property is not clear, though it is likely to have followed the wider economic patterns of the Dapto region, moving from wheat growing to dairying sometime in the mid-nineteenth century. Bong Bong Road was originally a cattle route, as such it is possible stockyards may have been present in the project area.

Dapto railway station was opened in 1887 and formed the nexus of the developing Dapto township. A number of the original station buildings are present within the station curtilage, however, technological developments and the changing use of the station over the twentieth century have meant items have been decommissioned, removed and replaced over time.

4 Physical analysis

4.1 Introduction

An onsite, physical inspection was undertaken for Dapto Station on 9 May 2022. This was a visual study that included inspecting and photographing the buildings, platforms and landscaped areas of the station. The aim was to assess the significance and condition of the built elements on site and the landscape setting. The immediate surroundings of the station were also part of the onsite investigations, as views to and from the Station and the settings of the Station are also part of the assessment.

4.2 Built elements

Dapto Railway Station precinct comprises of the following built elements:

The Station perimeters are fenced with white powder coated aluminium fencing. Dapto station group is a good example of a moderate scale late 1880s station complex with an intact larger class 3 station building.

Platform 1 (1993): is a side platform that serves as the down (country-bound) platform. The platform comprises an open concrete base with concrete decking, and a white, power coated, steel looptop fence and a metal mesh screen to the rear. A canopy of corrugated metal roofing covers the full length of the platform. Platform 1 is accessed from a level crossing on Bong Bong Road.

Platform 2 (1887): is a combination of a side (its southern, city bound end) and an island platform (its northern end which is shared with Platform 3). The southern end comprises the original (1887) platform, and is a brick faced structure with a concrete deck and asphalt finish. The northern end of Platform 2 (1993) combines with Platform 3 (1993) and is a precast concrete post and beam structure with a concrete deck. Platform 2 is also accessible from Station Street via a semi-circular driveway through Hartigan Park, which provides kiss-and-ride access for cars and taxis. There is a narrow ramp that provides access to Platform 2 from the level crossing on Bong Bong Road, but at the time of the site inspection this ramp did not seem to be in use.

Main Station Building Platform 2 (1887): The main station building is the original 1887 class 3 (or commonly also referred to as standard or roadside) station building on Platform 2. It is a weatherboard structure with a corrugated metal, complex gable roof and decorative timber barge boards. The eastern side of the building faces Station Street and has a gabled entry porch with flanking side verandahs, that provides access to the station, namely Platform 2, from the roundabout driveway. A corrugated metal awning supported by stop chamfered posts, over Platform 2 marks the western edge of the building.

The building houses a number of functions including a waiting room, a booking office with a ticketing window, a station manager's office, a staff meal room, a signal room and store/communications room. The building has been altered externally and internally. A number of original features have been removed including brick chimneys, decorative brackets to awnings and timber finials, and early timber window frames have been replaced with aluminium frames. A mix of corrugated metal and polycarbonate awnings cover Platform 2 and station entry. Internally the building has been modified and updated to include ceramic floor tiles, timber veneer wall panelling, drop-panel ceilings, and modern ticket windows.

Platform 2 Toilet Block (1970s): A pale brick toilet block with a flat roof is located to the north of the main station building, and it has male and female toilets and a disabled toilet.

Platform 2 ancillary buildings: A weatherboard structure with a corrugated metal, gabled roofed building with aluminium windows and timber doors is located to the south of the main station building. There is a brick signal relay room (1982) with a skillion metal roof at the south end of Platform 2. This structure has a mural painted to its Station Street façade.

Platform 2 and 3 ancillary buildings: at the time of the site inspection a section of Platform 2 had been covered by a TfNSW scaffold wrap, and there was construction equipment and two demountable sheds visible from Platforms 2 and 3 as part of the *More Trains More Services* program of works. These were contained within the car parking areas for the station, which are located to the east of Platforms 2 and 3, and to the north of Hartigan Park. Other buildings along Platform 2 include a brick building with a skillion metal roof. Two sheds made of ribbed metal walls and skillion metal roofs are located along the terminating end of Platform 3.

Plate 4.1 Dapto Station from Station Street

Plate 4.2 Dapto Station circular driveway

Plate 4.3 War memorial at Hartigan Park

Plate 4.4 Central axis from Station Street via the war memorial to the central entry porch of the 1887 Main Station Building

Plate 4.5 1887 Main Station Building

Plate 4.6 Central entry porch of the 1887 Main Station Building

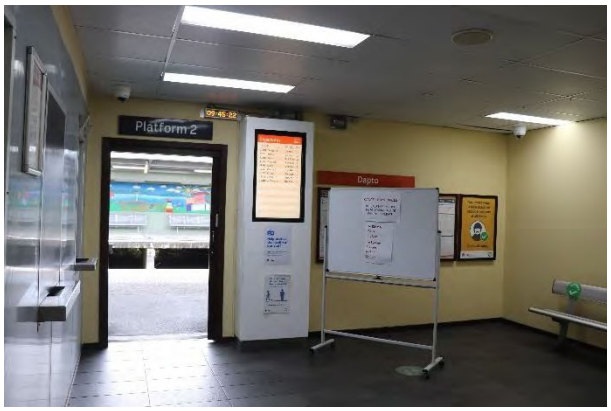

Plate 4.7 Internal view of the waiting room of the Main Station building

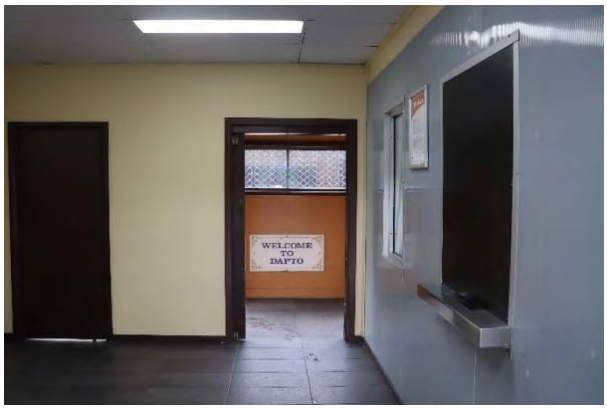

Plate 4.8 Internal view of the waiting room of the Main Station building with ticket windows

Plate 4.9 Platform 2 – southern end

Plate 4.10 Platform 2 – northern end – precast post and beam structure

Plate 4.11 Platform 2 northern end combined with Platform 3

Plate 4.12 Weatherboard building to east of Platform 2

Plate 4.13 Brick signal relay room along Platform 2

Plate 4.14 Pale brick toilet block along Platform 2

Plate 4.15 Platform 1

Plate 4.16 Ramp from level crossing at Bong Bong Road Platform

Plate 4.17 Level crossing at Bong Bong Road

Plate 4.18 Former Postmaster's residence as viewed from Station Street

4.2.1 Phasing and modifications

The Main Station Platform 2 Building has been modified, as previously mentioned. An analysis of the as built plans (Plate 4.19, Plate 4.20) in comparison to the present building plans (Plate 4.21), indicates what alterations have been made to the interior of the building. These include:

- Demolition of the men's toilets (far left of Plate 4.20) and covered way, replaced by the present toilets (refer to area outlined in green on Plate 4.21). This modification dates to the 1970s. The interior of the toilets have been upgraded within the last ten years.
- The wall between the ladies' waiting room and general waiting room, including the fire places, has been removed.
- The wall between the general waiting room and the ticket office has been removed.
- The shed, with tank and yard, has been demolished and replaced with the station manager's office, staff WC and staff meal room/kitchen. The date of this extension is unknown.
- A non-original wall has been erected within the original ladies' waiting room to form the existing comms/ store room.
- A non-original wall has been erected within the original general waiting room to form a booking office.
- The original booking office is now partially within the existing booking office and partially a signals room.

It is therefore evident that the interior of the Main Station building has been modified to the extent that the original spaces and functions cannot be distinguished.

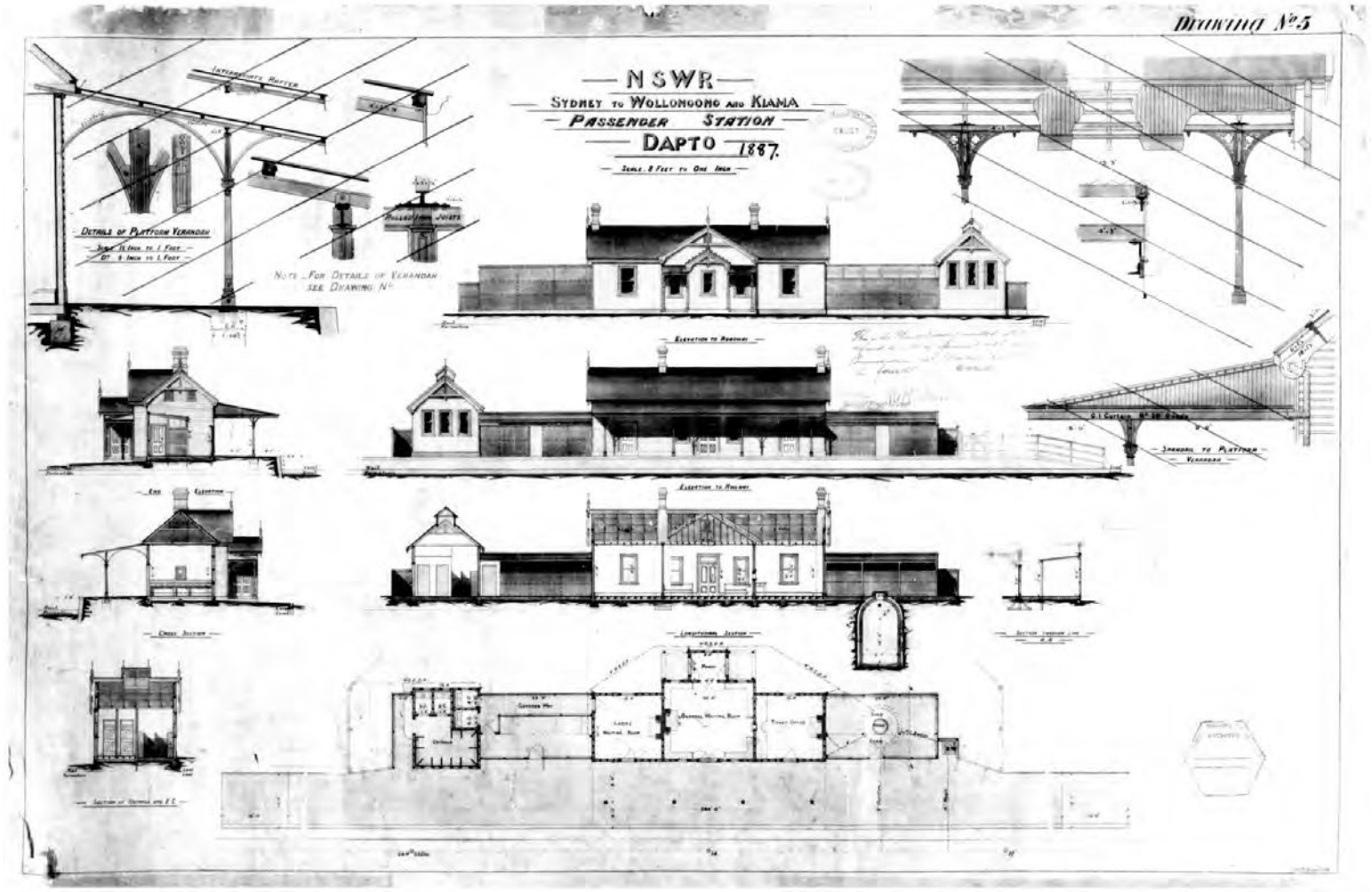

Plate 4.19 **Dapto Station Platform 2 early plans, 1887. Source: Australian Railway Historical Society**

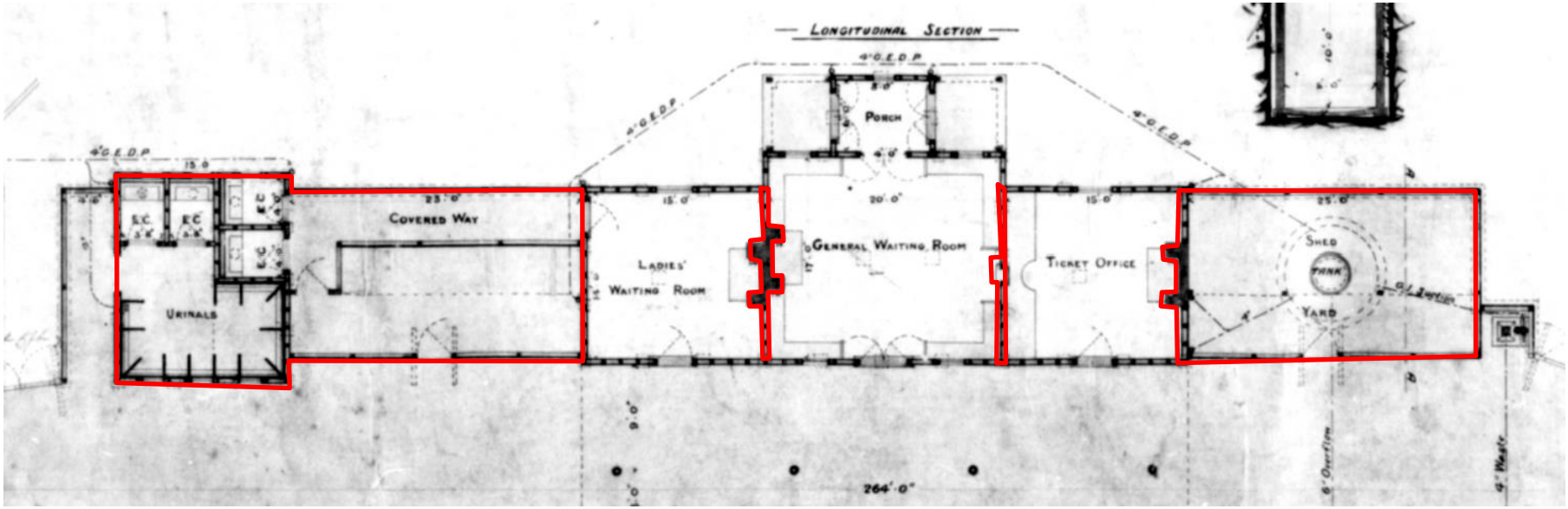

Plate 4.20 **Excerpt from Dapto Station Platform 2 building early plans, 1887 showing initial internal configuration. Source: Australian Railway Historical Society. Red denotes demolished elements**

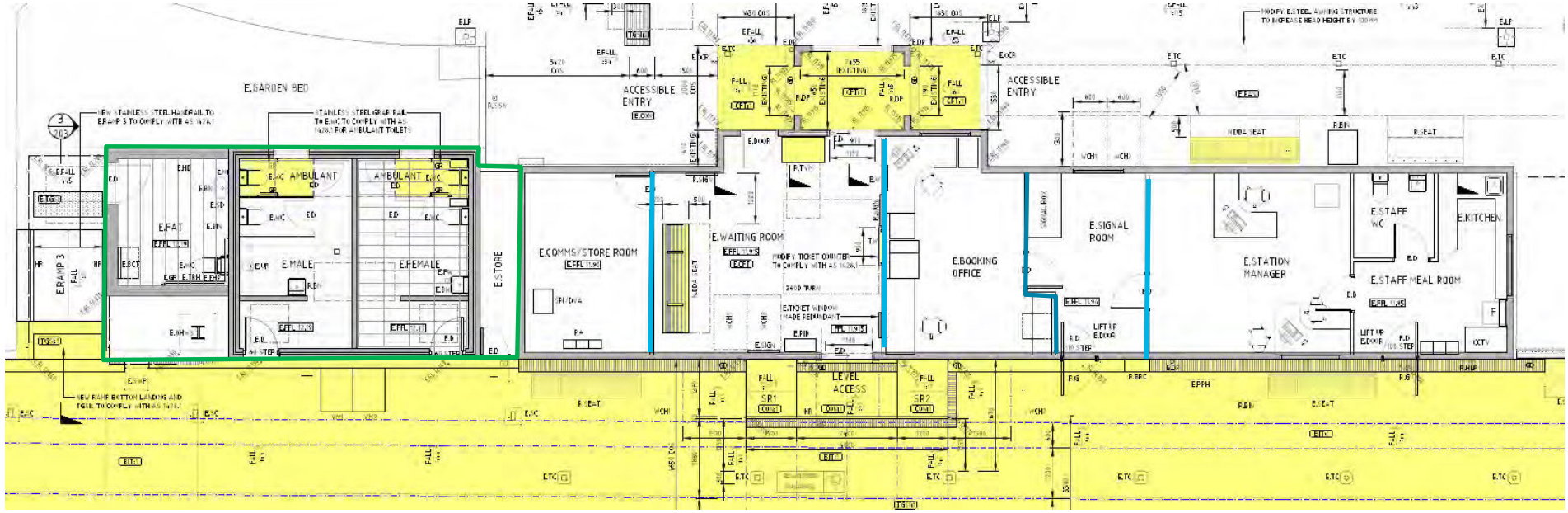

Plate 4.21 **Excerpt from the architectural plans showing the current internal layout of the Main Station Platform 2 building. Source: TfNSW. Green denotes 1970s toilet block. Blue denotes new walls**

Alterations to the exterior include modifications to the awnings over the verandahs on either side of the gable station entry to the roadway elevation. A comparison of Plate 4.22 and Plate 4.23 indicates the awnings on each side of the central gabled station entry have been modified; that on the southern side (left of plates) has been extended to cover the length of the building, while that on the northern side appears to have been altered in terms of the roofing, while keeping the original configuration. A closer examination of the southern verandah awning (Plate 4.24) reveals that the structure of the former southern verandah has been incorporated into the current extension. Both the former southern verandah and northern verandah awnings (Plate 4.25 and 4.26 respectively) contain early, but not original, fabric namely the timber side cladding and timber beams that support the awnings.

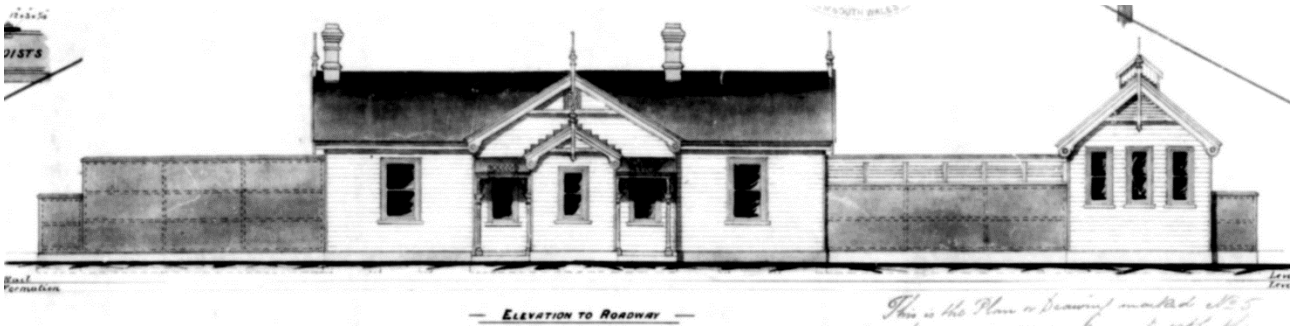

Plate 4.22 **Excerpt from Dapto Station Platform 2 building early plans, 1887 showing proposed 1887 elevation to Station Street. Source: Australian Railway Historical Society**

Plate 4.22 **Awnings to Station Street elevation – central gabled station entry with flanking verandahs**

Plate 4.23 **Eastern verandah awning showing the former verandah incorporated into building length verandah extension**

Plate 4.24 **(left) Former southern verandah awning**

Plate 4.25 **(right) Northern verandah awning have early fabric including timber side cladding and beams**

4.3 Views and surroundings

Station forecourt: Hartigan Park forms the foreground to Dapto Station from Station Street. The roundabout configuration driveway connects the main station building to Station Street. Comprising a lawn with mature trees and some smaller trees and shrubs, the Park houses a community war memorial in the centre. The memorial was constructed in 1996 and commemorates men and women who served in WW I, WW II, the Korean and Vietnam Wars. The memorial is situated along a central axis called Buckley Walk, which connects the main station building with the memorial and Station Street, physically and visually. The design and landscaping of the park allows for a heritage sensitive setting for the Station building, and this is furthered by the simple three panels design of the memorial along with a series of commemorative plaques and inscriptions. To the north of Hartigan Pak is the former Station Master's Residence which is a small brick building currently in private ownership. Views to and from the former residence and Dapto Station are no longer maintained.

Level Crossing at Bong Bong Road: the level crossing at Bong Bong Road has ramps leading to Platform 1 and 2. The ramp leading to Platform 1 has white, power coated, steel looptop fences on either side with DDA compliant steel handrails, whereas the ramp leading to Platform 2 and 3, has only white, power coated, steel looptop fences on either sides but no handrails. At the time of the site inspection of the station the ramp leading to Platform 2 and 3 seemed to have been closed off and was not operational.

4.4 Landscaping

The landscaping of the station is primarily in the station forecourt with Hartigan Park, Buckley Walk and the war memorial forming the focal points around which trees, shrubs and gardens are located. Most of the trees are located along the edges of Station Street and Bong Bong Road, and to the edges of the circular driveway. The landscaping does not interfere with views to and from the main station building. There is very little historical evidence available regarding the existing trees and plants that are part of the landscaping of the station. There are no current arborists reports which would allow for an assessment of the age of planting of trees and shrubs in the station forecourt. Therefore, while the layout of Hartigan Park, Buckley Walk and the war memorial contribute to the significance of the station in terms of their being part of the station forecourt since 1940s, the existing trees and plants are not significant as individual elements, but as a collective which adds to the aesthetic setting of the station.

4.5 Archaeological potential and sensitivity

The project area formed part of a grant to George Brown in 1823. It does not appear that Brown occupied the grant as he had passed the land to Richard Brooks prior to its issue in 1833. The first permanent settlers on the land were likely Alick Osbourne and his family. Early land use on Daisy Bank is not clearly discernible from historical records, however, it is likely activity in and around the project area reflects the broader agriculture and pastoral patterns of the Dapto region. Changes to the landscape of the project area during the Osbourne's tenure may have included tree clearance, planting of crops, the construction of buildings, animal sheds and fences. Bong Bong Road was also cleared and used as a cattle track during this period of occupation. Given the substantial alterations to the landscape associated with the development of Dapto Railway Station, it is considered unlikely that archaeological evidence of the pre-railway phases would remain.

The rural landscape of the project area was transformed with the coming of the railway in 1887. Construction works for the railway line cut though the topography of the project area with overburden or fill also deposited along the line to level the landscape. The area around the station was also cleared of vegetation and levelled to create a foundation for the station and platform as well as the forecourt and associated stockyards. A private line with three dead-end exchange sidings were constructed for the Dapto Smelting Company in 1895. The second platform to the west of the original platform was constructed c.1968. Various buildings/structures, signals, and water, sewage, coal and electrical infrastructure were also constructed and removed around the project area over the nineteenth and twentieth century.

Upgrade and maintenance work currently being undertaken at the station as part of a separate program of works has identified works associated with earlier modifications to the station. Piling as part of the Transport for Tomorrow program of works uncovered on Platform 3 a brick and concrete feature (Artefact Heritage Services 2022). Artefact (2022, p.5) interpreted the find as being associated with a coal bin installed prior to 1913 and removed in the 1960s.

A earlier find was identified in October 2021, during excavation associated with the construction of new disabled car parking spaces near the northern side of Platform 3 (Biosis 2021). A cylindrical brick structure was uncovered. Analysis by Biosis suggests the structure to be a beehive cistern associated with the adjacent butter factory, or possibly related to the previous functions of the site as a cheese factory or flour mill. As works were altered to avoid directly impacting the cistern, no further interpretation or excavation of the feature was undertaken. The memo does not include a significance assessment, but does refer to the cistern as a relic, indicating Biosis considered the threshold for local significance.

A review historical plans and aerials indicates the area now known as Hartigan Park and war memorial was open, with no known structures. While plans show stockyards to the east of the proposed works, the known development is contained to garden beds and driveways. Changes have been made to the arrangement of the garden paths and driveways over time. There may be archaeological surfaces or evidence of former garden bed edgings retained beneath the surface. Such evidence is unlikely to provide new or additional evidence of the Park and is unlikely to meet the threshold for local significance and would therefore not be considered a relic.

Within the rail corridor, Plate 4.26 indicates the presence of 12 inch (30.48 cm) diameter half pipe dish drains running north – south under tracks at various locations. These drains are likely to have been formed using terracotta pipes or sandstock bricks. If extant, these drains would meet the definition of a work rather than a relic under the *Heritage Act, 1977*. Similarly, evidence of the former surfaces of Bong Bong Road could be preserved, which may include previous asphalt, gravel, cobbles or wood blocks. While unlikely, these former surfaces would be a work rather than a relic.

The 1913 plan shows an unnamed building, shown in the later 1971 plan as a lamp room, located to the north of the Main Station Building. The former lamp room is now under the current Platform 2, which was extended across this area. The lamp room is visible on the 1951 aerial photograph and archaeoelogical features associated with the building may be extant sub-surface (Plate 4.30). However, later aerial images indicate substantial earthworks in the vicintiy, which may have removed the footings, prior to the exention of the platform through this area. The lamp room is shown in an historical photograph (Plate 4.30) as being a small weatherboard structure, likely to have been constructed on brick or concrete footings, with a timber floor supported on timber joists and bearers. Geotechnical works in this area did not encounter archaeoelogical evidence of the structure and it is considered that the construction is also unlikely to. Given the function and modesty of the building, it is unlikely that archaeolgical evidence would contribute to the understanding of the development of the station and would not meet the threshold for local significance and therefore would not be a relic under the Heritage Act.

Based on the identified archaeological finds, it is considered that there is the potential for other features associated with the decommissioned elements of station infrastructure to survive below ground level. However, these would not contribute to an understanding of the development of station, are unlikely to be of local significance and would therefore not be relics under the Heritage Act.

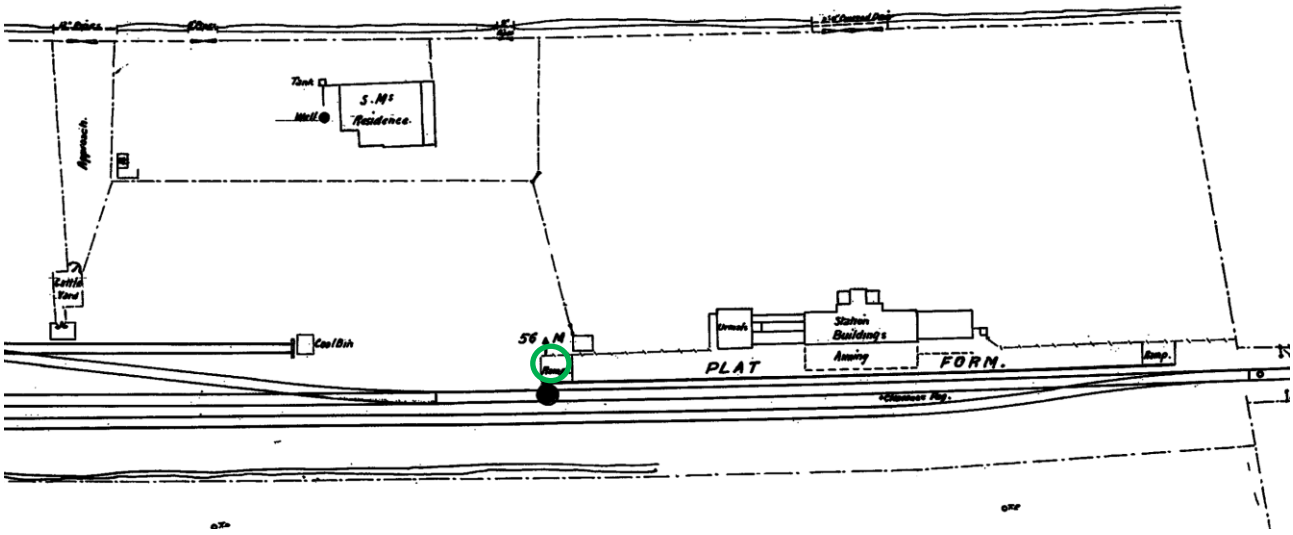

Plate 4.26 **Excerpt from plan "NSWR Dapto Station Arrangements", 1913. Source: Sydney Trains plan EDMS CV0103950. Lamp room identified in green circle**

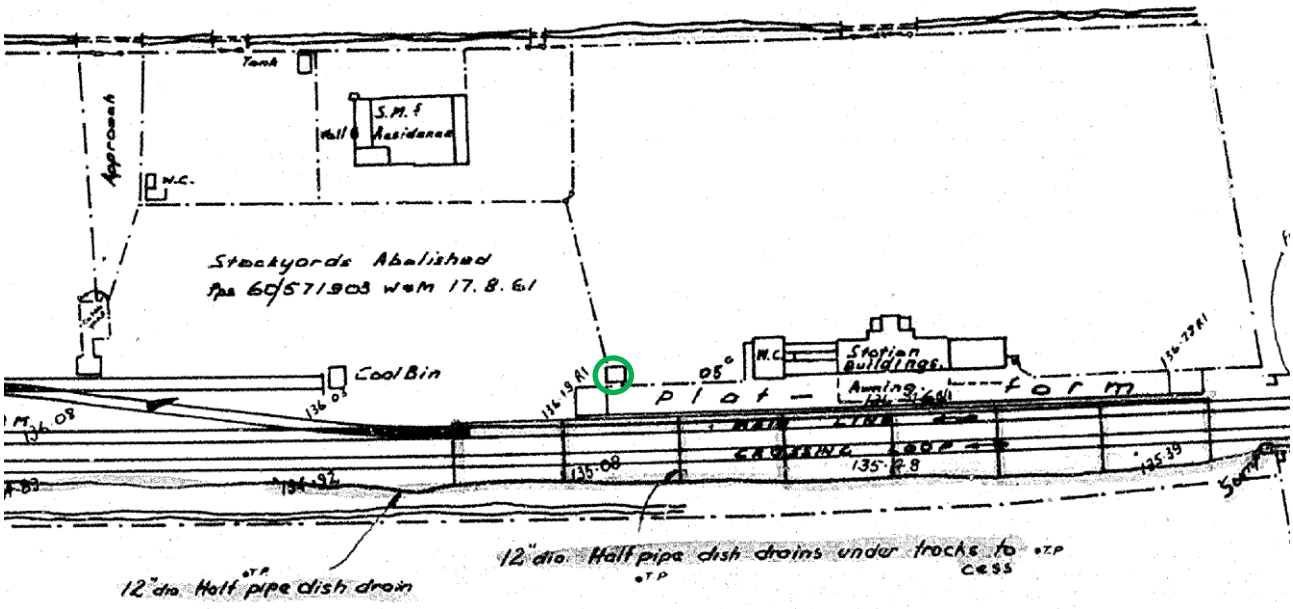

Plate 4.27 **Excerpt from plan "NSWR Dapto Station Arrangements and Drainage", 1962. Source: Sydney Trains plan EDMS CV0444358**

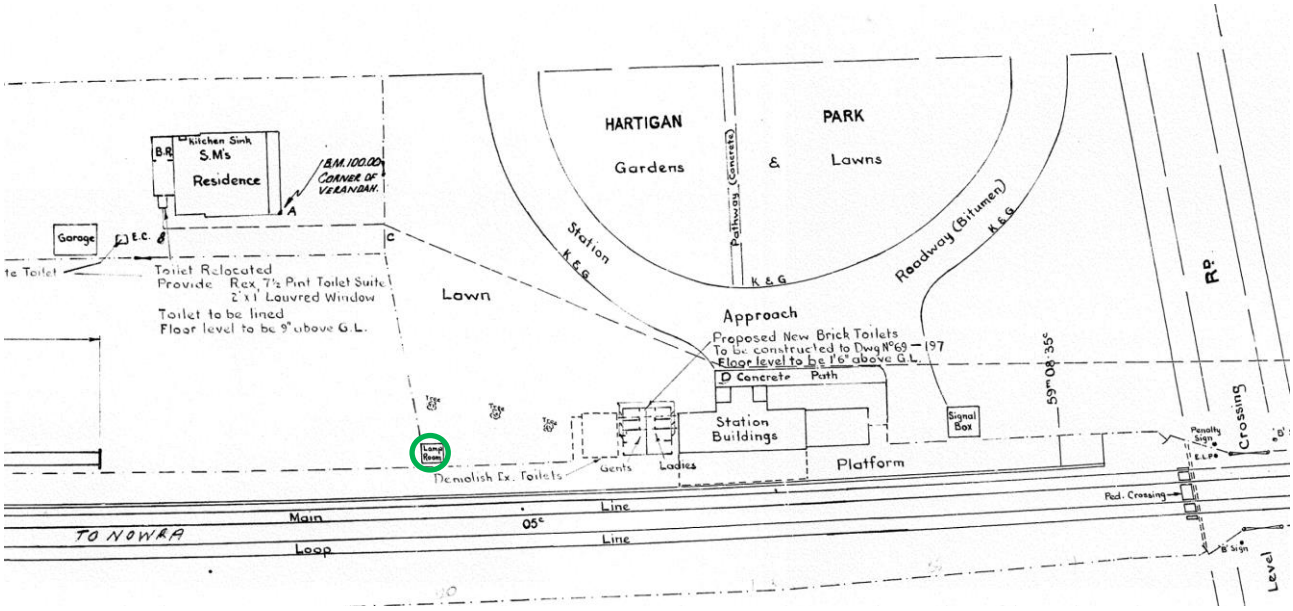

Plate 4.28 **Excerpt from plan "NSWR Dapto Station Arrangements", 1971. Source: Sydney Trains plan EDMS CV0445049**

Plate 4.29 1951 Aerial photograph of Dapto. Blue circle shows “lamp room”. Red arrow shows the Bong Bong Road crossing. Source: NSW Historical Imagery Viewer GW201_23_013

Plate 4.30 Dapto Railway Station, no date. Note former lamp room at right of image. Source: Australian Railway Historical Society

4.5.1 Summary

The archaeological potential of the project area is *moderate* to *high* with archaeoloigcal resources likely to be primarily associated with the construction and modification of the railway line and Dapto Station. Areas with potential for archaeological resources associated with the station have been identified. However, it is considered doubtful that such resources would meet the threshold for relics as they are unlikely to yield new or significant information regarding Dapto Railway Station that is not available from other sources.

There is no clear evidence indicating structures associated with Daisy Bank were present in the project area. Moreover, the colonial landscape of the project area was heavily modified during the construction of Dapto Station. The proposed upgrade works will occur within the developed footprint of the station as such the archaeological potential for intact relics associated with the Daisy Bank period is *low*.

The construction of Dapto Station in 1887 and modifications over the late nineteenth and twentieth century have left an archaeological footprint within the station curtliage. In May 2022 piling works for Platform 3 and extension of the terminating road, north of the main station building, uncovered remanants of a brick and concrete feature identified as a pre-1913 “coal bin” 300 mm below the current platform level.

5 Assessments of significance

5.1 The significance framework

In NSW, historical value is ascribed to buildings, places, archaeological sites and landscapes modified in the Australian historical period for purposes other than traditional Aboriginal use. The assessment of heritage significance in NSW is based on the *Burra Charter* (Australia ICOMOS 2013) and further expanded upon in *Assessing Heritage Significance* in the NSW Heritage Manual (Heritage Office 2001). The heritage manual lists seven criteria to identify and assess heritage values that apply when considering if an item is of state or local heritage significance, which are set out in Table 5.1. It also provides a framework to identify the heritage gradings for which items (or features or components) that were recorded on site have been assessed against, which are set out in Table 6.2, and which provide context for each individual item's contribution to the cultural landscape. The result of the assessments of significance may determine that an individual component does not meet the threshold for local or State significance as an individual item, but that it does contribute to the significance of the larger item.

The criteria against which heritage significance has been assessed are reproduced in Table 5.1. Gradings of significance are reproduced in Table 5.2. Unless they are visible in the ground, the assessment of relics is hypothetical as their existence as intact and substantial sites is a prediction based on background research and site conditions.

The following assessment of significance is provided in the State Heritage Inventory database for Dapto Railway Station Group

Table 5.1 NSW heritage assessment criteria

Criterion	Explanation	SHI Assessment	EMM Assessment
a)	An item is important in the course or pattern of NSW's (or the local area's) cultural or natural history (Historical Significance).	*The 1887 Dapto Railway Station Platform 2 building is of historical significance as evidence of the first phase of the construction of the Illawarra line, and for its role as a transport hub for Dapto since 1887.*	Dapto Railway Station has been integral to the historical development of Dapto, and along with other stations on the South Coast Railway Line, it has enabled the development of the larger Illawarra region, and therefore meets this criterion.
c)	An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area) (Aesthetic Significance).	*The 1887 Dapto Railway Station Platform 2 building and its landscape setting off Station Street is of aesthetic significance as an example of a 3rd class late 19th century weatherboard platform building with a landscaped setting. The access upgrade (2013) has impacted the station's aesthetic significance, reducing the landscaped area of the park and introducing a large hard-surface area thereby impacting the station's historic and picturesque setting.*	The Main Station building on Platform 2 fulfills this criterion as it is a good example a 3rd class weatherboard station building. While upgrade works to the station in 2013 did impact its historic and picturesque settings, the foregrounding of the Main Station building as viewed from Station Street continues to be enhanced by Hartigan Park, Buckley Walk and the war memorial.
D)	An item has a strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons (Social Significance).	*The place has the potential to contribute to the local community's sense of place, and can provide a connection to the local community's past.*	Dapto Station as an integral part of the historic development of Dapto fulfills the criterion.

Table 5.1 NSW heritage assessment criteria

Criterion	Explanation	SHI Assessment	EMM Assessment
f)	An item possesses uncommon, rare or endangered aspects of NSW's (or the local area's) cultural or natural history (Rarity).	*The 1887 Dapto Railway Station Platform 2 building is a rare Type 4 weatherboard platform building, though not wholly intact, and is one of four extant on the Illawarra line. The most intact examples are at Albion Park and Bulli.*	The Platform 2 Main station building is one of the four remaining examples of a 3rd class weatherboard platform building on the Illawarra Line, and so it fulfils the criterion of rarity.
g)	An item is important in demonstrating the principal characteristics of a class of NSW's (or the local area's) cultural or natural places or environments (Representativeness).	*The 1887 Dapto Railway Station Platform 2 building is extensively altered, however retains its form and much of its external materials (chimneys are missing). Its context has lost considerable significance due to the loss of all the goods yard structures, and an accumulation of late 20th century ancillary buildings and platform canopies on Platform 2 which are of little significance. However, the Platform 2 building retains its significant landscape setting to Station Street. The access upgrade (2013) has impacted the station's aesthetic significance, reducing the landscaped area of the park and introducing a large hard-surface area. These works have also altered the original layout of the station entrance.*	Dapto Station with its Platform 2 Main Station building, its landscape setting along Station Street and its continuing use as an operational railway station, is representative of a railway station built in the 19th century in NSW.

Source: Assessing heritage significance (NSW Heritage Office 2001, p.9).

Table 5.2 NSW heritage assessment gradings

Grading	Justification	Status
Exceptional	Rare or outstanding element directly contributing to an item's local or state significance.	Fulfils criteria for local or State listing.
High	High degree of original fabric. Demonstrates a key element of the item's significance. Alterations do not detract from significance.	Fulfils criteria for local or State listing.
Moderate	Altered or modified elements. Elements with little heritage value, but which contribute to the overall significance of the item.	Fulfils criteria for local or State listing.
Little	Alterations detract from significance. Difficult to interpret.	Does not fulfil criteria for local or State listing.
Intrusive	Damaging to the item's heritage significance.	Does not fulfil criteria for local or State listing.

Source: Assessing heritage significance (NSW Heritage Office 2001, p.11).

Table 5.3 NSW heritage assessment gradings

Element	Grading
Platform 1	Moderate
Platform 2	High
Platform 3	Moderate
Main Station Building Platform 2	High
Platform 2 buildings, including 1970s toilet block	Little
Hartigan's Park and War Memorial	High

Dapto Railway Station is an item of local heritage significance, with individual elements of the precinct having exceptional to moderate levels of significance.

5.2 Statement of significance

The Statement of Significance for Dapto Railway Station has been sourced from the State Heritage Inventory Listing:

> Dapto Railway Station, specifically the 1887 Platform 2 building, early station sign, and the station's streetscape setting from Station Street – is of local heritage significance. The 1887 Dapto Railway Station Platform 2 building is of historical significance as evidence of the first phase of the construction of the Illawarra line, and for its role as a transport hub for Dapto since 1887. The 1887 Dapto Railway Station Platform 2 building and its landscape setting off Station Street is of aesthetic significance as a representative example of late 19th century railway station architecture and landscaping, though now modified. The 1887 Platform 2 building, though altered, is relatively rare, being one of four extant weatherboard '3rd class platform buildings on the Illawarra Line.

EMM 's Statement of Significance for Dapto Railway Station:

Dapto Railway Station is a locally significant heritage item as it has been integral to the historical development of Dapto since its inception in 1887. The station with its extant historic fabric including the 1887 Main Station building on Platform 2, and a landscape setting which enhancing its aesthetic value, is rare in terms of its being one of the four remaining 3rd class platform buildings on the Illawarra Line, and is representative of station buildings built in NSW during the 19th century.

6 Proposed works

The scope of works proposed at Dapto Station are described in the table below. The full scope of works are shown in the design drawings prepared by CCG Architects (Appendix A), who have also prepared the Architectural Design Report for Dapto Station in which the different design options for the station have been presented, and the justifications for the chosen option have been explained. The analysis included consideration of the heritage significance of the station Landscape drawings prepared by Taylor Brammer have also been referred to identify scope of works for landscaping at the station precinct including Hartigan Park, Buckley Walk and the War Memorial. The drawings of proposed works are at System Review Definition stage. Civil and CSR drawings by SMEC have also been examined from an archaeological impact perspective.

6.1 Proposed works to Built Elements and Landscape

Scope item	Scope description
Station building and Platform 2	• The alterations to the entrance of the station building including: – Lift up existing timber awning on the entrance of the station building by 100mm by modifying roof slope. – Modify gutter and downpipes and trim timber side cladding. Repaint to match existing – Raise up 2035mm high timber door frame and architrave by 100mm and make good the wall cladding – New timber column with reproduced decorate chamfered edges – Modify steel awning structure to increase head height by 100mm • Modify the existing male and female toilet to include an ambulant toilet • Existing waiting rooms in station building on Platform 2 shall be made DSAPT complaint • Modification to existing operational ticket counter to comply with DSAPT. This includes installation of audio- frequency induction loop system (AFILS) • Regrade platform • Provide BAZ markings on platform • Provide new accessible double water bubbler on platform • Existing help points, customer assistance panels, and pay phones to be made accessible
Station forecourt	• New Kiss and Ride space with new kerb ramps and signage • Provide an accessible path from the Kiss and Ride/ taxi zone to Platform 2 • Regrading footpath in front of the station building entrance • Replace existing kerb ramp with new raised kerb west of the War Memorial
Platform 1	• Widening of Platform 1 from the access point up to the Boarding Assistance Zone (BAZ) • Provide BAZ markings and wheelchair waiting spaces • New underline crossing (ULX) to Platform 1 for new power supply and communication services
Other	• Provide a new access path between the existing footpath on Bong Bong Road and Platform 2 • Modify pathways and ramps for DSAPT compliance • Upgrade pathway and ramp connecting Platform 2 and the kiss and ride area • Provide new hearing augmentation (AFILS) to the station • Modify help points, customer assistance panels and payphones • Upgrade existing level crossing with Velostrail product along the pedestrian section • Upgrade the approach to the level crossing including footpaths, fences and gates • New DSAPT complaint LED lighting • Provide new tactile ground surface indicators (TGIs) • Relocate or provide new seating

Scope item	Scope description
	• Line markings, stencilling and new tactile on platforms where impacted by Contractor's activities • Anti-graffiti coating to all new hard and existing surfaces affected by the works that are prone to vandalism up to a height of 3m above foot hold level • Provide new wayfinding and DSAPT signage for station and interchange area, where existing signage is impacted • Modify or upgrade any existing systems impacted by the works • Services modifications including connections and disconnections • Vegetation removal.

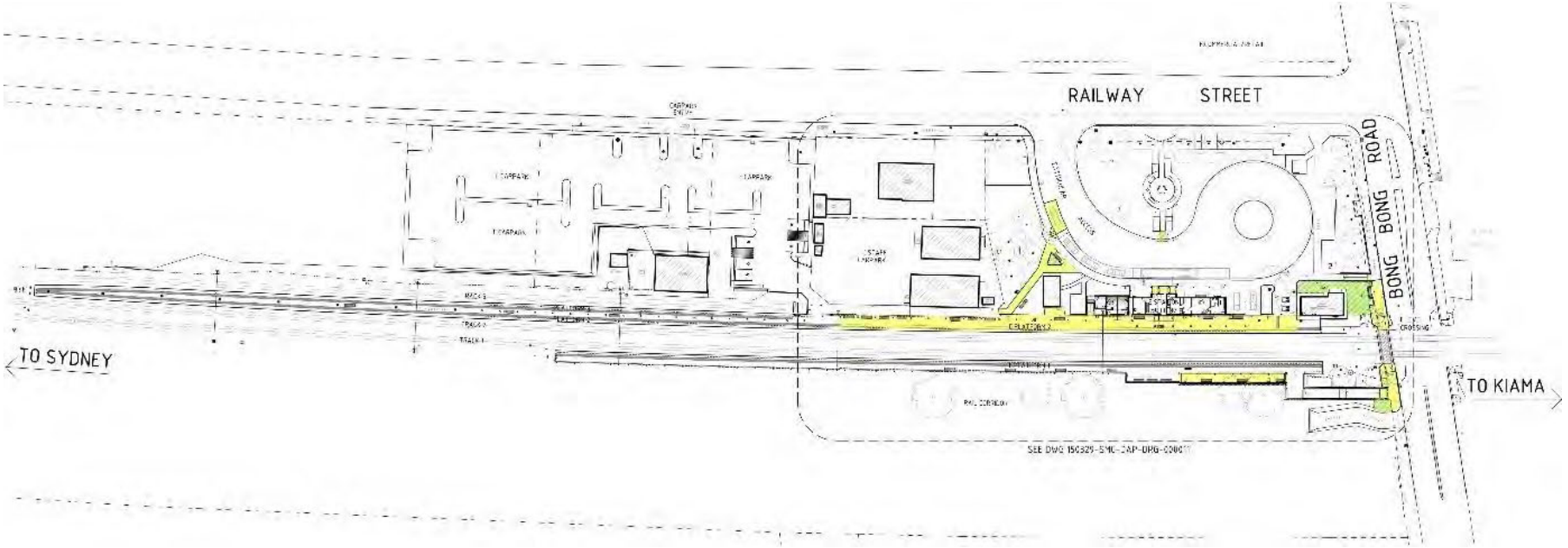

Plate 6.1 Proposed works to Dapto Railway Station as part of TAP upgrades

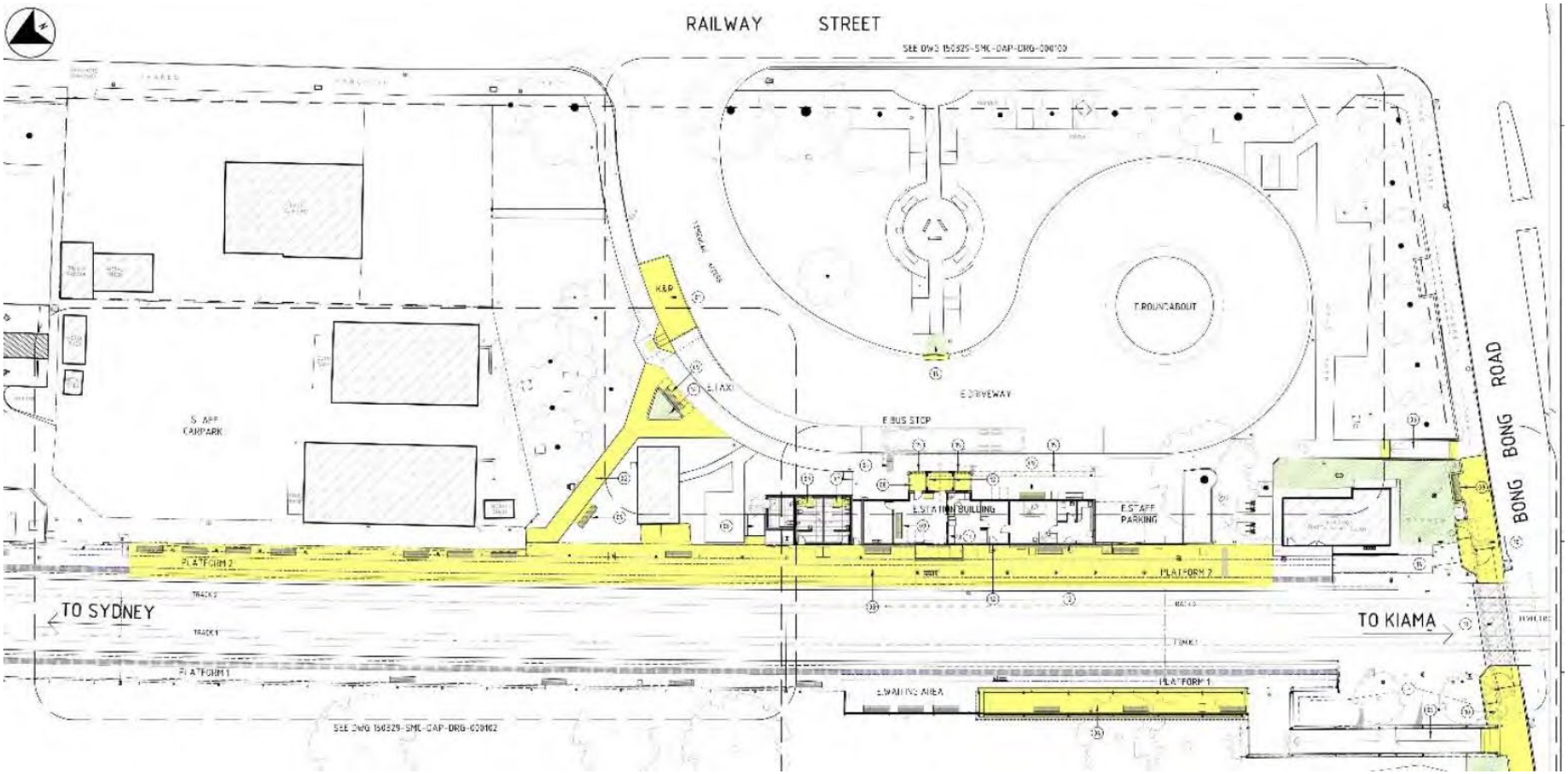

Plate 6.2 **Proposed works to Dapto Railway Station works proposed to Platforms 1 and 2, the Main Station building and station forecourt and level crossings along Bong Bong Road**

7 Heritage impact assessment

7.1 Background to assessing impacts

7.1.1 Introduction

The assessment of a project's impacts to the heritage significance of a place or an item is to understand change, if it is beneficial to the place or item, and how changes can be managed to best retain significance. That agreement is codified in legislation, the intent of which is to encourage the conservation of cultural heritage by incorporating it into development where feasible. In many situations avoiding impacts is impossible, but the aim is to reduce those impacts by either project re-design or managing the loss of information through methods that reduce and/or record significance before it is removed.

The framework around assessing significance and therefore suitable levels of impact is to understand how the place or item came to be, how important it was (and may be still) in the development of the local area or the state (the colony at the time) and providing guidance on its management. This is what this report aims to do.

7.2 Impact types

Two main types of heritage impacts have been predicted to occur as a result of the project: physical; and visual. These types are described below.

- physical impacts are those impacts that will materially affect the features and sites that are present within the development footprint whether they were found or if they are unanticipated; and
- visual impacts are those impacts that will affect the views and the setting of the cultural landscape and nearby built items within the development footprint and surrounds.

Table Scope of works	Assessment of Impact
Station building and Platform 2	
The southern end of Platform 2 and the main station building have high significance as they contain original or early fabric, and the station building retains the original 1887 external building configuration. Therefore, works proposed would impact the significance of particular elements on Platform 2 and the main station building.	
The alterations to the entrance of the station building including: • Lift up existing timber awning on the entrance of the station building by 100mm by modifying roof slope. • Modify gutter and downpipes and trim timber side cladding. Repaint to match existing • Raise up 2035mm high timber door frame and architrave by 100mm and make good the wall cladding • New timber column with reproduced decorate chamfered edges • Modify steel awning structure to increase head height by 100mm	Works proposed to the existing steel awning over the southern extended verandah section of the entrance are to fabric that has been altered and extended during the 1990s. However, it does contain early fabric namely beams and timber side claddings of the former southern verandah. Similarly, the timber awning over the smaller (northern) section of the entry has been modified in terms of the removal of original brackets, and introduction of new columns that support the awning. However, the timber beams and timber side cladding of the awnings is early fabric. The corrugated metal roofing over both awnings is not original fabric. The works proposed to both the timber and steel awnings, involve lifting the awning height by modifying the roof slope, while retaining the existing top of the awning and all the existing fabric of the awning. The raising of the two sections of awning on either side of the central gabled entrance will refer to the original entrance configuration as a clear visual distinction between the two awnings, and the 1990s extended verandah awning will be achieved. The accompanying raising of

Table Scope of works	Assessment of Impact
	the timber door frames and architraves will be to the existing door elements which will be retained and therefore the impact is considered to be minimal. However, care will be needed while removing the door frames and architraves so as to ensure the impact to the weatherboard wall cladding is minimised as far as possible.
Modify the existing male and female toilet to include an ambulant toilet	The modification proposed to the existing male and female toilet for inclusion of an ambulant toilet would allow for disability access at the Station. As the toilet block is a 1970s structure, it has been graded as being of low heritage significance. In addition, the fittings and fixtures have been replaced within the last 10 years. As such, the works proposed would not impact original fabric and therefore is not a heritage impact.
Existing waiting rooms in station building on Platform 2 shall be made DSAPT complaint	Works proposed to make waiting rooms in station building DSAPT compliant need to be outlined further. As the internal fabric of the station building including the floors, walls, ceilings and openings have been previously modified, the works proposed to the waiting room would not impact significant fabric.
Modification to existing operational ticket counter to comply with DSAPT. This includes installation of audio- frequency induction loop system (AFILS)	The existing ticket windows are recent introductions (Plate 4.21), and the works proposed to modify these windows to comply with DSAPT would not impact significant fabric. Installation of AFILS need to be detailed so as to ensure that there is minimal impact to original or early fabric in the building. A heritage consultant should be involved in the detailed design to ensure heritage impacts are minimised.
Regrade platform	The proposed regrading of the existing platform is limited to the floor surface of Platform 2 only. As the surfaces of the platforms have been resurfaced before, there is unlikely to be original fabric associated with the early surface of the platforms retained. Regardless, the retention of such surfaces are unlikely to materially aid in an understanding of the historical development of the station and therefore do not support its significance. Furthermore, these works will not impact the main station building.
Provide BAZ markings on platform	Provision of boarding assistance, and an access path from Bong Bong Road to Platform 2 would ensure that the Station is current and compliant with DDA standards, ensuring equitable access. As the platform surfaces of Platform 1 and 2 have been regarded and existing furniture, fixtures and fences are all recent additions, the provision of BAZ features will not impact any original fabric.
Provide new accessible double water bubbler on platform Existing help points, customer assistance panels, and pay phones to be made accessible	Provision of accessible services, help points, customer assistance panels and pay phones need to be detailed so as to ensure that these provisions are sensitive in terms of their design, installation and location along Platform 2. A heritage consultant should be involved in the detailed design to ensure heritage impacts are minimised.
Station forecourt	
New Kiss and Ride space with new kerb ramps and signage Provide an accessible path from the Kiss and Ride/ taxi zone to Platform 2	The path proposed from the kiss and ride/taxi zone and from the station forecourt to the section of Platform 2, which is a recent extension, and it is limited to the north of main station building. There would be no impact to significant fabric at either Platform 2 or the station building. Excavation may uncover former road surfaces, garden beds or curbs. These

Table Scope of works	Assessment of Impact
	archaeological features, if uncovered, can be addressed through an unexpected finds procedure. It is unlikely that their exposure or removal would form a substantial heritage impact.
Regrading footpath in front of the station building entrance	The new kerb ramp proposed to the entrance of the station building will be to the north of the pale brick toilet block and will therefore have minimal visual or physical impact on the main station building or Platform 2.
Replace existing kerb ramp with new raised kerb west of the War Memorial	The existing kerb ramp is along the side of the brick signal relay building, and its revision will ensure that it will be compliant with DDA standards, ensuring equitable access. It will have no impact on the main station building and Platform 2.
Platform 1	
Widening of Platform 1 from the access point up to the Boarding Assistance Zone (BAZ) Provide BAZ markings and wheelchair waiting spaces New underline crossing (ULX) to Platform 1 for new power supply and communication services	Works proposed to Platform 1 in terms of boarding assistance and wheelchair accessibility would ensure that the Station is current and compliant with DDA standards, ensuring equitable access. As Platform 1 is a recent (1993) structure and it does not have buildings on it, the impacts of the proposed works are considered minimal to the physical fabric of the platform and do not constitute an impact to the heritage significance of the station
Other	
Provide a new access path between the existing footpath on Bong Bong Road and Platform 2 Upgrade existing level crossing with Velostrail product along the pedestrian section Upgrade the approach to the level crossing including footpaths, fences and gates	The upgrades to the level crossings at Bong Bong Road would not impact significant station fabric, including the platforms and buildings as the works will be limited to the road and track surfaces of the crossings. The details of materials and finishes of proposed fences and gates match the existing gates and fences details, thereby ensuring that visually there will be no impact to the station and its surroundings. Archaeological, there is some potential for former road surfaces to be uncovered. Such surfaces are unlikely to meet the definition of relic under the Heritage Act, but an archeological research design and methodology should be prepared to direct works in this area.
Modify pathways and ramps for DSAPT compliance Upgrade pathway and ramp connecting Platform 2 and the kiss and ride area	Archaeologically, there is some potential for evidence of the former lamp room to be uncovered adjacent to Platform 2. However, the features or deposits are unlikely to yield new or substantial information and would not meet the threshold for local significance and would therefore not be a relic under the Heritage Act. The features or deposits, if identified, can be managed under an unexpected finds procedure
New DSAPT complaint LED lighting	LED lighting details need to be included as part of materials and finishes schedules so as to ensure that the lighting proposed does not impact the heritage items on site, notably the 1887 weatherboard building which is and will be painted in accordance with TfNSW Heritage's paint scheme. The location and positioning of these lights has to also be detailed so as to ensure that the installation of these LED lights does not harm or damage any significant fabric.
Modify or upgrade any existing systems impacted by the works	Works proposed in terms of providing access paths and circulation spaces needs to be detailed, notably in terms of the waiting room which is part of the 1887 main station building, so as to ensure that significant fabric is not impacted by proposed changes.
Provide new hearing augmentation (AFILS) to the station Modify help points, customer assistance panels and payphones	Provision of new AFILS and modifications to existing assistance services are acceptable measures.

Table Scope of works	Assessment of Impact
Provide new tactile ground surface indicators (TGIs) Line markings, stencilling and new tactile on platforms where impacted by Contractor's activities Provide new wayfinding and DSAPT signage for station and interchange area, where existing signage is impacted	Tactile indicator, line markings and stencilling will be to regraded bitumen surface of platforms which would impact only the surface of the platforms, and would have minimal impact to the overall structure and configuration of the platforms.
Relocate or provide new seating	Proposed new seating is to match existing seats, which will allow for consistency of furniture across the station. This would not impact any significant fabric as there is no original or early furniture at the station.
Services modifications including connections and disconnections	Details need to be provided for all proposed relocation of services, infrastructure, signage and systems affected by Contractor's activities so as to ensure that none of the proposed changes, even if temporary, impact any fabric of significance.
Anti-graffiti coating to all new hard and existing surfaces affected by the works that are prone to vandalism up to a height of 3m above foot hold level	Anti-graffiti coating measures and sliding door replacements are acceptable measures.
Vegetation removal.	A total of four (4) trees will be removed as part of works proposed to Dapto Station. However, none of these trees are part of original or early planting and landscaping around the station and therefore their removal will have minimal impact on the heritage significance of the station. Three of the trees are located to the rear, southern end of Platform 1 and their removal will improve views from Bong Bong Road across Platform 1 and toward Platform 2. The fourth tree is located alongside the ramp that borders the brick relay building. Its removal will allow for revision of the ramp to make it DDA standard compliant. No views to or from the station will be impacted by the removal of this tree.

7.3 Views and settings

Works proposed to Dapto Railway Station are primarily limited to the station buildings and platforms. Works proposed to the station forecourt include landscaping works such as the removal of four trees – three to the rear of Platform 1 and one from the station forecourt along Bong Bong Road. Other works proposed include the replanting of existing gardens along access paths and ramps along Bong Bong Road, the station entrance and Platform 1 (as shown in Landscape drawings by Taylor Brammer). However, none of these changes will impact the heritage significance of Hartigan Park, Buckley Walk or the war memorial. The layout and landscaping of the park, and the war memorial will not be impacted by any of the works proposed. Views to and from the Station to Hartigan Park, Buckley Walk and the war memorial will be retained, and the central visual and physical axis that connects the station with the park, the memorial and Station Street will be retained. None of the works proposed to the Station will impact any views to and from the former Station Master's residence along Station Street

Works proposed to the level crossings along Bong Bong Road are at the road and track level, and involve possible replacement of gates and fences with matching materials and finishes, thereby ensuring that visually there will be no impact to the station and its surroundings.

7.4 Archaeological impacts

Platform 2 upgrades: The platform will be regraded and fixtures and furniture relocated. The original Dapto station building on Platform 2 is in intact, although it has been modified over time**.** There is potential for excavation within the platform to uncover the earlier platform walls or other obselete features, such as boot scrapers outside of door ways and fixing points associated with former benches, lighting or signage. These elements contribute to an understanding of the former station arrangements, but are unlikely to meet the threshold for relics under the *Heritage Act, 1977*. The access pathway may Such finds can be managed through the unexpected finds procedure.

Forecourt: A kiss and ride area and new kerb ramp will be constructed in the covered roadway of the forecourt. The forecourt may contain sub-surface archaeological resources relating to previous road surfaces and garden beds. Examination of the historical plans and aerials do not indicate the presence of previous structures. Historically, stockyards were located to the east of the proposed works, but not within the works area. Previous disturbance associated with the installation of the kerb, guttering and late twentieth century landscaping, specifically the 2013 upgrades, reduces potential for intact features relating to the early station to be present in the construction boundary.

Platform 1 accessibility path: The accessibility path will be replaced through an open area north of the main station building. No archaeological potential has been identified in works area.

Platform 1: Part of the slab and canopy of Platform 1 will be replaced and extended. Platform 1 was constructed c.1968. Prior to the construction of the platform, the area was an embankment likely created during the construction of the railway line. It is unlikely intact relics will be present in this area.

Infrastructure works: An under line crossing (ULX) conduit is proposed for installation running due north – south from the car park adjacent to the Platform 2 Main Station building to the south side of Platform 1 (Plate 7.1). Plate 7.1 indicates the presence of 12 inch (30.48 cm) diameter half pipe dish drains running north - south under tracks at various locations. An intial assessment indicates that the proposed alignment is not likely to interact with the historical drains, if extant. Installation of other elements of infrastucture have the potential to intersect with features such as boot scrappers and fixing points, as discussed above and can be managed in identical manner.

Bong Bong Road: The pedestrian level crossing approach and crossing between gates will be upgraded. Bong Bong Road a cattle route through the mid nineteenth century. Stock routes are ephemeral features that would be difficult to identify archaeologically and it is considered that the stock route phase of Bong Bong Road is unlikely to be preserved archaeologically. The 1951 aerial photograph shows that Bong Bong Road was cut through during railway construction reducing the likelihood of intact relics (Plate 4.21). There is, however, potential that earlier phases of the Bong Bong Road rail crossing itself to be intact beneath the current raised road and footpaths. The nature of the potential archaeological resource are unlikely to make the threshold for local significance and are therefore unlikely to be relics. Management could therefore be achieved via an ‘unexpected finds’ procedure.

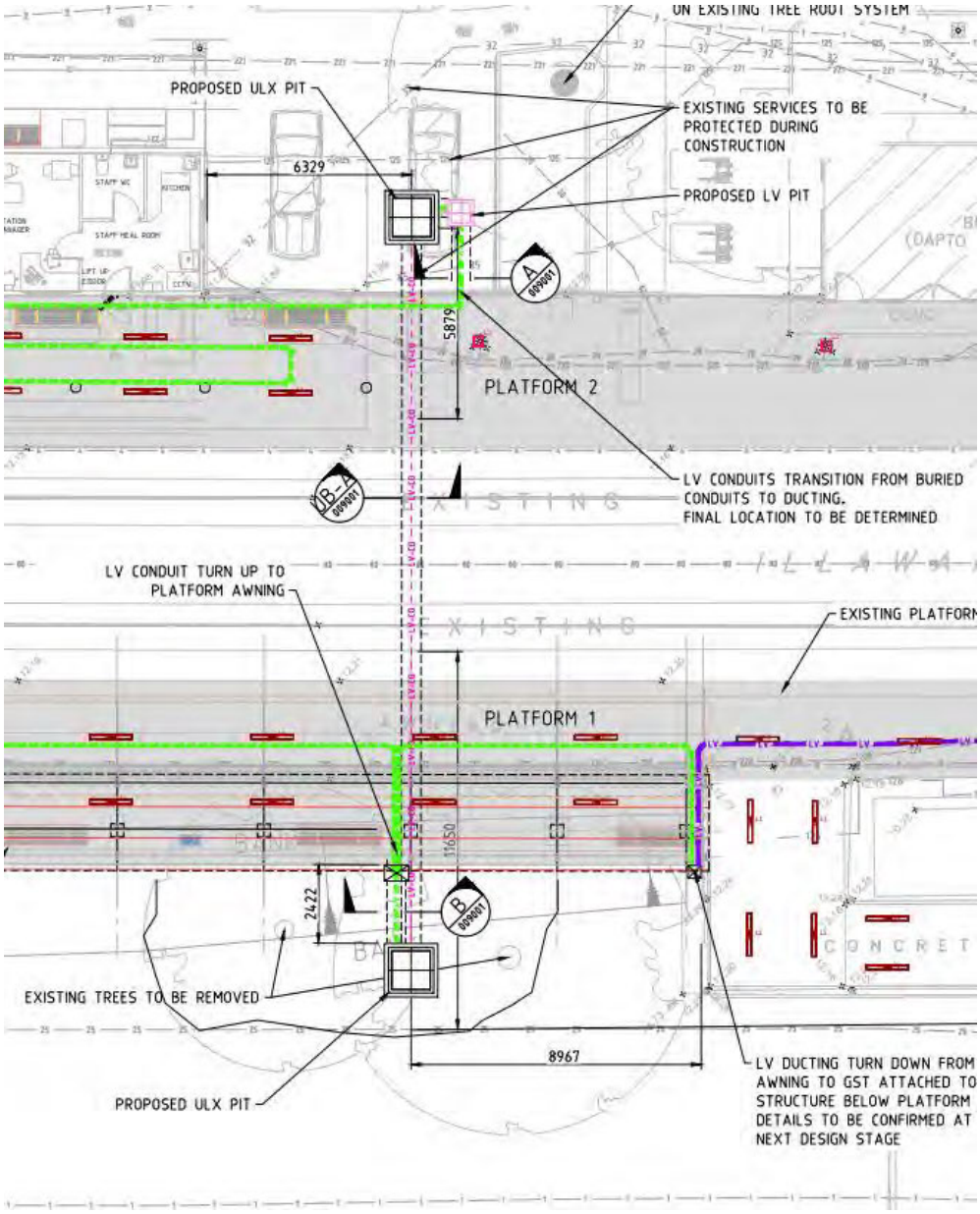

Plate 7.1 Excerpt from plan services plan. Source: TfNSW

7.5 Statement of heritage impact

The works proposed to Dapto Station, its platforms and buildings is considered necessary so as to allow for DSAPT compliance of the station and its infrastructure. The majority of the works proposed will have a little or no impact on the built fabric of the station and views to and from the station precinct.

The only work which will directly impact early fabric is the proposal to raise the height of the awnings at the station entrance, but as this will involve retaining and reusing early fabric while marginally modifying the slope of the awnings, the impact is considered as minor. Overall, other works proposed are to fabric that has been previously modified as in the case of the interiors of the main station building, or to fabric that is recent such as Platform 1. However more detailing is needed in terms of certain proposed works so as to ensure that the design, specifications and installation of these works do not harm or inadvertently impact significant fabric. The works proposed do not

impact, alter or modify the historical or aesthetic significance of the Station. None of the works proposed will either physically or visually impact the surroundings and settings of the Station. Further, while some archaeological potential has been identified, the nature of the potential features are such that they are unlikely to add substantially to our understanding of the historical development of the station.

8 Conclusion

This statement of heritage impact has reviewed the proposal for works to Dapto Railway Station, which has been identified as part of the TAP program, for upgrades to provide a station precinct that is accessible to those with a disability, limited mobility, parents/carers with prams and customers with luggage.

Dapto Railway Station is listed on the *Transport Asset Holding Equity Section 170 Heritage and Conservation Register* and *the Wollongong Local Environmental Plan 2009* as an item of local heritage significance. The 1887 Main Station building on Platform 2 has high significance, and the southern end of Platform 2 and Hartigan's Park and War Memorial that form the station forecourt have high significance.

Works proposed as part of the TAP upgrade are considered to be minimal or negligible in terms of impact to the heritage significance of Station. A few changes, notably the raising of the entrance awnings and the modifications to the existing ramp and footpath to Platform 2, are works that will have an impact but as the changes proposed are to built fabric that has been modified over the years, the impacts will be minor. Furthermore, the raising of the two sections of awning on either side of the central gabled entrance will refer to the original station building entrance configuration as a clear visual distinction between the two awnings, and the 1990s extended verandah awning will be achieved. While there is little or no heritage impact to Platform 2 and the interior of the Main Station building, and all views to and from the station forecourt have been retained, there are some areas of concern regarding particular works with greater detailing of design, installation and specifications of materials.

With consideration to the assessment of heritage impact, the following recommendations have been outlined to ensure the mitigation of potential negative impacts to the heritage fabric of Dapto Station and its surroundings:

- Prior to the commencement of works, contractors must be briefed on the heritage sensitive nature of the site and informed of any recommended mitigation measures or controls required.
- A photographic archival recording of the Station and all its built and landscape elements should be undertaken.
- In the event that any unanticipated archaeological deposits are identified within the project site during construction, the procedures contained in TfNSW's *Unexpected Heritage Finds Guideline* (TfNSW, 2015a) would be followed and works within the vicinity of the find would cease immediately.
- Heritage Works Methodology, to be prepared by the contractor for the disassembly, salvage, modification and reinstatement of the platform 2 building street side awning and submitted to the Transport for NSW Heritage Specialist for review and endorsement.
- Design and specification detailing is needed in terms of DSAPT compliant features such as LED lights on the platforms, provision of AFILS, help points, customer assistance panels and pay phones. The design, installation, and location of these features needs to be worked out especially if these are to be provided along Platform 2 and the Main Station building.
- While the proposal does include mitigative measures that need to be followed during construction, more details are needed to guide the works that propose relocation of services, infrastructure, signage and systems so as to avoid impact to any significant fabric during the construction phase.
- On completion of works, an update should be prepared for the Section 170 Heritage and Conservation Register, with required details.

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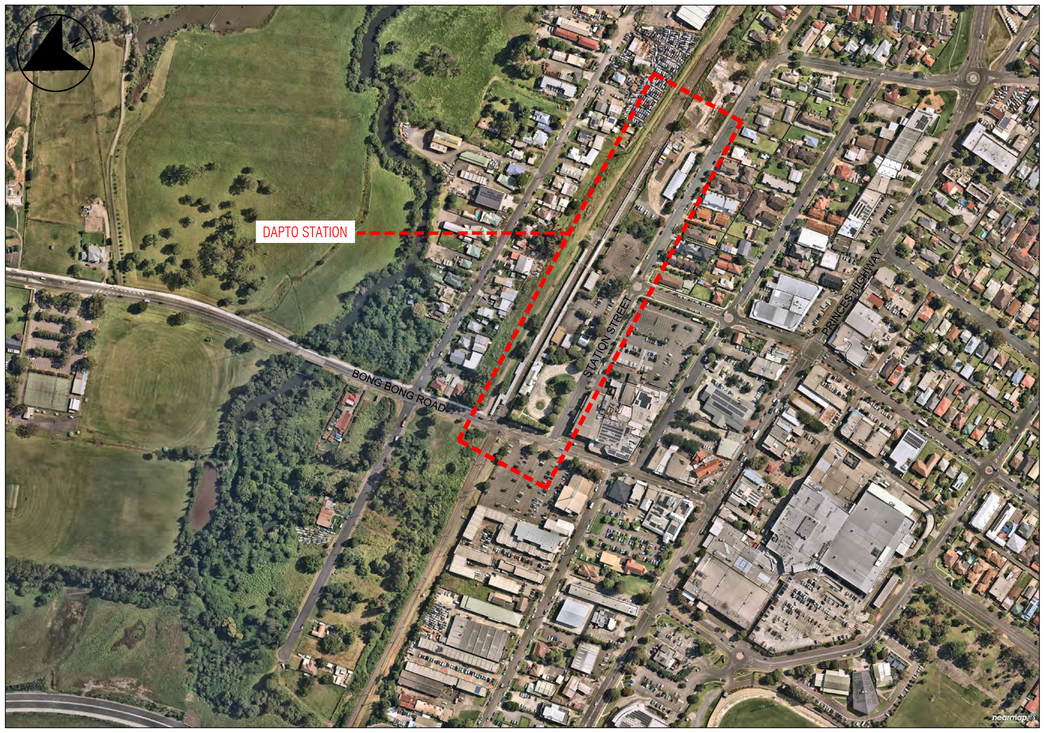
Appendix A

Architectural drawings

EMM
creating opportunities

TRANSPORT ACCESS PROGRAM 3
DAPTO STATION
SOUTH COAST LINE 95.047km
ARCHITECTURE



01 - LOCATION PLAN
NTS

DRAWING LIST			
EDMS NO.	DRAWING NO.	DRAWING NAME	SCALE
	150329-SMC-DAP-AR-DRG-000001	COVER SHEET, LOCATION & DRAWING INDEX	NTS
	150329-SMC-DAP-AR-DRG-000002	NOTES AND LEGENDS	NTS
	150329-SMC-DAP-AR-DRG-000010	SITE LAYOUT PLAN	1:500
	150329-SMC-DAP-AR-DRG-000011	SITE PLAN - SHEET 1	1:200
	150329-SMC-DAP-AR-DRG-000050	PLATFORM DEMOLITION PLAN	1:100
	150329-SMC-DAP-AR-DRG-000100	FORECOURT GENERAL ARRANGEMENT PLAN	1:100
	150329-SMC-DAP-AR-DRG-000101	PLATFORM GENERAL ARRANGEMENT PLAN - SHEET 1	1:100
	150329-SMC-DAP-AR-DRG-000102	PLATFORM GENERAL ARRANGEMENT PLAN - SHEET 2	1:100
	150329-SMC-DAP-AR-DRG-000150	PLATFORM 2 BUILDING DETAIL PLAN	1:50
	150329-SMC-DAP-AR-DRG-000201	PLATFORM 1 CANOPY SECTION	1:50
	150329-SMC-DAP-AR-DRG-000202	PLATFORM 2 BUILDING SECTIONS	1:50
	150329-SMC-DAP-AR-DRG-000203	RAMP 1, 2 AND 3 SECTIONS	1:50

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A	ISSUED FOR SYSTEM DEFINITION REVIEW	H.N/14.04.21	R.W/14.04.21	D.C/14.04.21

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Transport for NSW

DEGNAN

CCG ARCHITECTS
NOMINATED ARCHITECTS: DAVID COOK (5098) / HISHAM NOORI (5678)
CCG ARCHITECTS
ARCHITECTURE

DRAWN	RONNIE MAISNAM	14.04.22
DESIGNED	HISHAM NOORI	04.04.22
DRG CHECK	HISHAM NOORI	14.04.22
DESIGN CHECK	ROBERT WILLOUGHBY	14.04.22
APPROVED	DAVID COOK	04.04.22

DAPTO
SOUTH COAST LINE 95.047km
TRANSPORT ACCESS PROGRAM 3
ARCHITECTURE
COVER SHEET, LOCATION AND DRAWING INDEX

FILE No. 150329-SMC-DAP-AR-DRG-000001 | SHEET: 1 OF 1 | A1
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150329-SMC-DAP-AR-DRG-000001	A	0		

DF 801*554

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Plot Date & Time 4/20/2022 7:01 PM
File Plotted 150329-SMC-DAP-AR-DRG-000001 21-141 TINSW_Dapto Station TAP Upgrade_Degnan\AutoCad\Drawings\150329-SMC-DAP-AR-DRG-000001.dwg

NOTES:

BEFORE THE COMMENCEMENT OF ANY WORK, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL EXISTING SERVICES , THROUGH 'DIAL BEFORE YOU DIG' OR ANY OTHER METHOD/S. THESE SERVICES INCLUDE WATER, ELECTRICAL , GAS, SEWER, TELSTRA, ETC.

EXISTING SERVICES HAVE BEEN PLOTTED FROM SUPPLIED DATA. CCG ARCHITECTS DOES NOT GUARANTEE THEIR ACCURACY AND IT IS THE CONTRACTOR'S RESPONSIBILITY TO ESTABLISH THE LOCATION AND LEVEL OF ALL EXISTING SERVICES SERVICING OTHER OPERATIONAL AREAS TO BE RETAINED.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

VERIFY ALL DIMENSIONS AND LEVELS ON SITE AND REPORT ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF WORK.

USE FIGURED DIMENSIONS ONLY. DO NOT SCALE FROM DRAWINGS.

DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL CONTRACT DOCUMENTS.

THE COMPLETION OF THE ISSUE DETAILS CHECKED AND AUTHORISED SECTION IS CONFIRMATION OF THE STATUS OF THE DRAWING. THE DRAWING SHALL NOTBE USED FOR CONSTRUCTION UNLESS ENDORSED 'FOR CONSTRUCTION' AND AUTHORISED FOR ISSUE.

CCG ARCHITECTS PTY. LTD. CANNOT GUARANTEE THE ACCURACY OF CONTENT AND FORMAT FOR COPIES OF DRAWINGS ISSUED ELECTRONICALLY.

ABBREVIATIONS & SYMBOLS LEGEND

AHD	AUSTRALIAN HEIGHT DATUM
AF	ABUTMENT FLASHING
AMB	AMBULANT TOILET
AB	AMENITIES BUILDING
AP	ACCESS PANEL
APT	ACCESSIBLE PUBLIC TELEPHONE
B	BOLLARDS
BAL	BALUSTRADE
BAZ	BOARDING ASSISTANCE ZONE
BL	BIKE LOCKER
BR	BIKE RACKS
BRC	BOARDING RAMP CABINET
BCT	BABY CHANGE TABLE
BSN	BUS STOP SIGN
BKR	BACKREST
BN	BASIN
CAB	CUSTOMER ASSISTANCE BUTTON
CB	CALL BUTTON
CC	CONCRETE COLUMN
CCTV	CLOSED CIRCUIT TELEVISION
CFC	COMPRESSED FIBRE CEMENT
CH	COAT HOOK
CJ	CONTROL JOINT
CK	CONCRETE KERB
CKG	CONCRETE KERB AND GUTTER
CON	CONCRETE
CL	CENTER LINE
COS	CONFIRM ON SITE
D	DOOR
DF	DOOR FRAME
DHW	DRAINAGE HEAD WALL
DB	ELECTRICAL DISTRIBUTION BOARD
DDA	DISABLED CAR SPACE
DP	DOWNPIPE
DPS	DOWNPIPE & SPREADER
EA	EQUAL ANGLE
EB	BITUMEN EDGE
EF	EXHAUST FAN
EG	EDGE GUTTER
EHP	EMERGENCY HELP POINT
ELP	ELECTRICAL PIT
FAT	FAMILY ACCESSIBLE TOILET
FFL	FLOOR FINISH LEVEL
FG	FIXED GLASS
FP	FOOTPATH
GD	GRATED DRAIN
GR	GRAB RAIL
GST	GALVANISED STEEL TROUGH
HD	HAND DRYER
HR	HAND RAIL
HP	HELP BUTTON
ISMSB	INSTALLATION SUPPLY MAIN SWITCHBOARD
KG	KERB GUTTER
KR	KERB RAMP
K&R	KISS & RIDE
LA	LADDER ACCESS
L1	LIFT 1
L2	LIFT 2
LCB	LIFT CONTROL BOX
LV	LOUVRE
LP	LIGHT POLE
MB	MOBILE BIN
MF	MECHANICAL FAN
MV	MECHANICAL VENT
NC	NATURAL CONCRETE
NTS	NOT TO SCALE
OCR	OPAL CARD READER
OFC	OFF FORM CONCRETE
OHW	OVERHEAD WIRE
OHWS	OVERHEAD WIRE STANCHION
P1	PLATFORM 1
P2	PLATFORM 2
PB	PHONE BOOTH
PP	POWER POLE
PT	PAINT FINISH
PX	PEDESTRIAN CROSSING
RB	REMOVABLE BOLLARD
RC	REINFORCED CONCRETE
RL	REDUCED LEVEL
RW	RETAINING WALL
S	SEAT
SC	STEEL COLUMN
SD	SOAP DISPENSER
SDU	SANITARY DISPOSAL UNIT
SG	SIGN POST
SMO	STATION MANAGERS OFFICE
SPI	STATION PASSENGER INFORMATION
SSN	STATION SIGN
SR	STEP RAMP
SS	STAINLESS STEEL
SSER	STATION SERVICES EQUIPMENT ROOM
ST	STAIRS
SWP	STORM WATER PIT
TB	TRAFFIC BARRIER
TC	TIMBER COLUMN
TBC	TO BE CONFIRMED
TME	TO MATCH EXISTING
TO	TOP OF
TOK	TOP OF KERB
TOW	TOP OF WALL
TP	TELECOM POLE
TRH	TOILET ROLL HOLDER
TSP	TRAFFIC SIGN POST
TVM	TICKET VENDING MACHINE
TX	ELECTRICAL TRANSFORMER
TYP	TYPICAL
UB	UNIVERSAL BEAM
VM	VENDING MACHINE
VP	VENT PIPE
W	WINDOW
WB	WHEELCHAIR BAY 800x1300mm
WC	WATER CLOSET
WCC	WHEELCHAIR CIRCULATION 1740x2270mm (180 DEGREE TURN)

PREFIX E=EXISTING
R=RELOCATED

HATCH LEGEND

- ACCESSIBLE PATH WIDTH 1350OMM & 600MM OFFSETS
- EXISTING TO BE DEMOLISHED
- EXISTING STRUCTURE
- NEW TACTILE GROUND SURFACE INDICATOR
- EXTENT OF NEW WORKS
- GARDEN BEDS REFER TO LANDSCAPE PLANS
- BOUNDARY LINE

AMENITIES LEGEND

BCT	BABY CHANGE TABLE
BKR	BACKREST
BN	BASIN
CH	COAT HOOK
COS	CONFIRM ON SITE
DP	DOWNPIPE
FG	FIXED GLASS
GR	GRABRAIL
HD	HAND DRYER
HR	HANDRAIL
HP	HELP BUTTON
LV	LOUVRE
SD	SOAP DISPENSER
SDU	SANITARY DISPOSAL UNIT
TRH	TOILET ROLL HOLDER
VP	VENT PIPE
W	WINDOW
WC	WATER CLOSET

MATERIALS LEGEND

BIT:1	BITUMEN
CFT:1	CERAMIC FLOOR TILE TME
CON:1	CONCRETE - BROOM FINISH
CON:2	CONCRETE - OFF FORM
FE:1	1200 MM HIGH LOOPTOP STEEL FENCE - 'WHITE' COLOUR TME
FE:2	1800MM HIGH GALVANISED CHAIN WIRE FENCE TME
FE:3	1500 MM HIGH GALVANISED SMORGON STEEL A.R.C. WELDMESH (WATTLE) STANDARD PEDESTRIAN LEVEL CROSSING FENCE TME
FE:4	BLACK RMS STEEL FENCE TME
HR:1	40MM DIAMETER GRADE 316 STAINLESS STEEL HANDRAIL
KR:1	100MM x 8 mm GRADE 316 STAINLESS STEEL PLATE KERB RAIL
RS:1	COLORBOND CUSTOM-ORB ROOF SHEET - 'SURF GREY' COLOUR
SCN:1	GALVANISED EXPANDED MESH SCREEN ON EA FRAME TME
SS:1	GRADE 316 STAINLESS STEEL
TGSI:1	HAZARD TACTILE GROUND SURFACE INDICATOR
TGSI:2	DIRECTIONAL TACTILE GROUND SURFACE INDICATOR

GENERAL FINISHES NOTE:

1. PLATFORM 1 NEW CANOPY STRUCTURAL COLUMNS AND BEAMS TO BE HOT DIP GALVANISED STEEL

2. PLATFORM 2 HERITAGE BUILDING PAINT FINISHES TO MATCH EXISTING. TEST SAMPLE ON SITE.

3. TOILET BUILDING INTERNAL FINISHES TO MATCH EXISTING.

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REV	DESCRIPTION	DESIGNER INITIAL/DATE	VERIFIED INITIAL/DATE	APPROVED INITIAL/DATE
A	ISSUED FOR SYSTEM DEFINITION REVIEW	H.N/14.04.21	R.W/14.04.21	D.C/14.04.21

CO-ORDINATE SYSTEMMGA2020 TBC | HEIGHT DATUM: A.H.D TBC | SCALE: NTS

NSW GOVERNMENT Transport for NSW

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CCG ARCHITECTS
NOMINATED ARCHITECTS:
DAVID COOK (5066) | HISHAM NOORI (5678)
CCG ARCHITECTS
ARCHITECTURE

DRAWN	RONNIE MAISNAM	14.04.22
DESIGNED	HISHAM NOORI	14.04.22
DRG CHECK	HISHAM NOORI	14.04.22
DESIGN CHECK	ROBERT WILLOUGHBY	14.04.22
APPROVED	DAVID COOK	14.04.22

DAPTO

SOUTH COAST LINE 95.047km

TRANSPORT ACCESS PROGRAM 3

ARCHITECTURE

NOTES AND LEGEND

FILE No. 150329-SMC-DAP-AR-DRG-000002 | SHEET: 1 OF 1 | A1

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DRG No.	REV	VER	EDMS No.	AMD No.
150329-SMC-DAP-AR-DRG-000002	A	0		

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EXTENT OF NEW WORKS

E.COMMERCIAL/RETAIL

RAILWAY STREET

CARPARK ENTRY

E.CARPARK

E.CARPARK

E.CARPARK

E.STAFF CARPARK

E.VEHICULAR ACCESS

BONG BONG ROAD

E.STATION BUILDING

E.LEVEL CROSSING

TRACK 3

PLATFORM 3

PLATFORM 2

TRACK 2

TRACK 1

E.PLATFORM 2

E.PLATFORM 1

RAIL CORRIDOR

TO SYDNEY

TO KIAMA

SEE DWG 150329-SMC-DAP-DRG-000011

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5 0 10 20m

1 : 500 FULL SIZE A1

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A	ISSUED FOR SYSTEM DEFINITION REVIEW	H.N/14.04.21	R.W/14.04.21	D.C/14.04.21

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NSW GOVERNMENT Transport for NSW

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NOMINATED ARCHITECTS: DAVID COOK (5086) / HISHAM NOORI (5678)
CCG ARCHITECTS
ARCHITECTURE

DRAWN	RONNIE MAISNAM	14.04.22
DESIGNED	HISHAM NOORI	04.04.22
DRG CHECK	HISHAM NOORI	14.04.22
DESIGN CHECK	ROBERT WILLOUGHBY	04.04.22
APPROVED	DAVID COOK	14.04.22

DAPTO

SOUTH COAST LINE 95.047km

TRANSPORT ACCESS PROGRAM 3

ARCHITECTURE

SITE LAYOUT PLAN

FILE No. 150329-SMC-DAP-AR-DRG-000010 | SHEET: 1 OF 1 | A1

STATUS: SYSTEM DEFINITION REVIEW ©

DRG No. 150329-SMC-DAP-AR-DRG-00010 | REV A | VER 0 | EDMS No. | AMD No.

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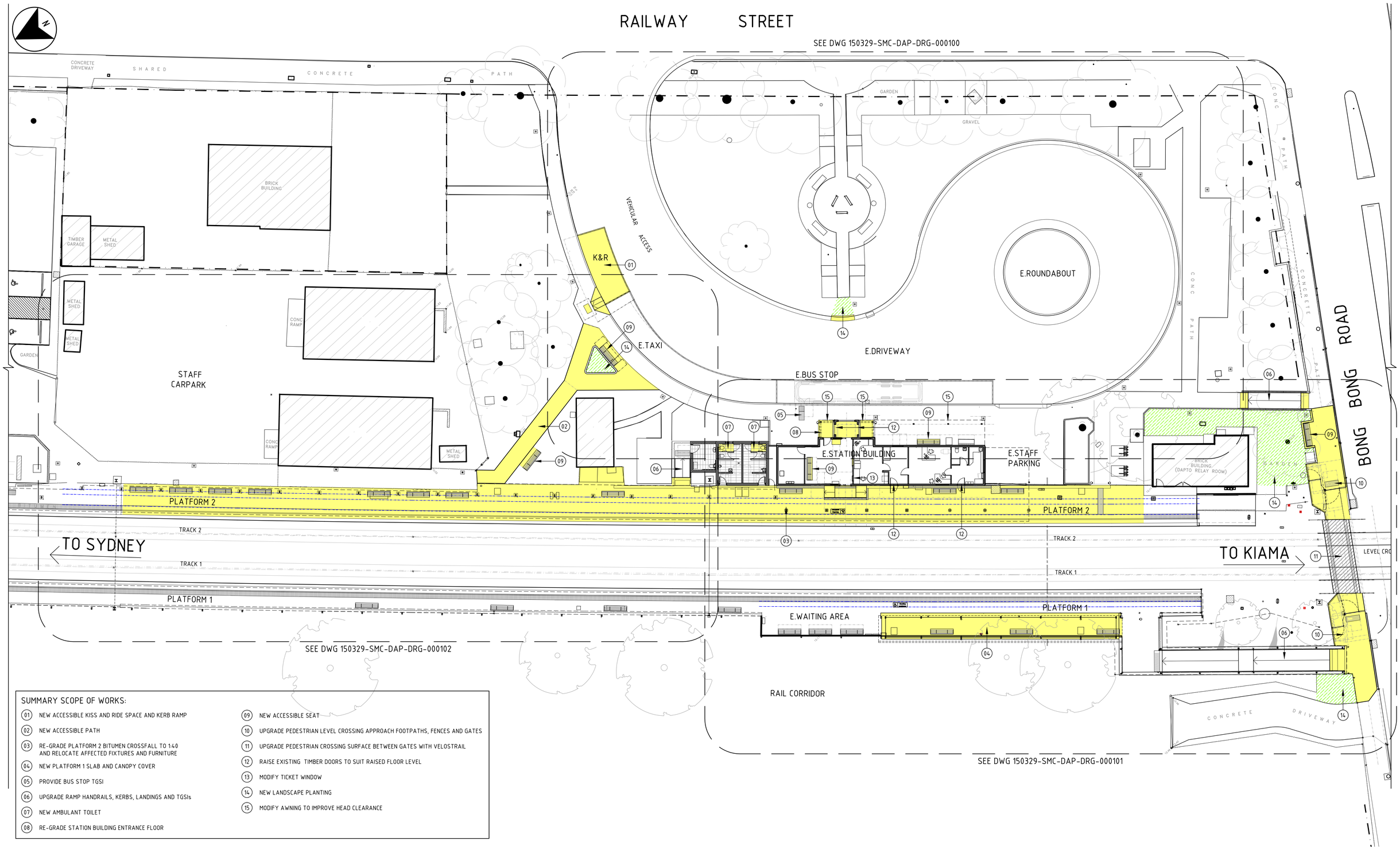

SUMMARY SCOPE OF WORKS:

01. NEW ACCESSIBLE KISS AND RIDE SPACE AND KERB RAMP
02. NEW ACCESSIBLE PATH
03. RE-GRADE PLATFORM 2 BITUMEN CROSSFALL TO 1:40 AND RELOCATE AFFECTED FIXTURES AND FURNITURE
04. NEW PLATFORM 1 SLAB AND CANOPY COVER
05. PROVIDE BUS STOP TGSI
06. UPGRADE RAMP HANDRAILS, KERBS, LANDINGS AND TGSIs
07. NEW AMBULANT TOILET
08. RE-GRADE STATION BUILDING ENTRANCE FLOOR
09. NEW ACCESSIBLE SEAT
10. UPGRADE PEDESTRIAN LEVEL CROSSING APPROACH FOOTPATHS, FENCES AND GATES
11. UPGRADE PEDESTRIAN CROSSING SURFACE BETWEEN GATES WITH VELOSTRAIL
12. RAISE EXISTING TIMBER DOORS TO SUIT RAISED FLOOR LEVEL
13. MODIFY TICKET WINDOW
14. NEW LANDSCAPE PLANTING
15. MODIFY AWNING TO IMPROVE HEAD CLEARANCE

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2 0 2 4 6 8 10m
1 : 200 FULL SIZE A1

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A	ISSUED FOR SYSTEM DEFINITION REVIEW	H.N/14.04.21	R.W/14.04.21	D.C/14.04.21

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NOMINATED ARCHITECTS: DAVID COOK (5086) / HISHAM NOORI (5678)
CCG ARCHITECTS
ARCHITECTURE

DRAWN	RONNIE MAISNAM	4.04.22
DESIGNED	HISHAM NOORI	14.04.22
DRG CHECK	HISHAM NOORI	04.04.22
DESIGN CHECK	ROBERT WILLOUGHBY	14.04.22
APPROVED	DAVID COOK	14.04.22

DAPTO
SOUTH COAST LINE 95.047km
TRANSPORT ACCESS PROGRAM 3
ARCHITECTURE
PROPOSED SITE PLAN SHEET 1

FILE No. 150329-SMC-DAP-AR-DRG-000011 | SHEET: 1 OF 2 | A1
STATUS: SYSTEM DEFINITION REVIEW ©
DRG No. 150329-SMC-DAP-AR-DRG-000011 | REV A | VER 0 | EDMS No. | AMD No.

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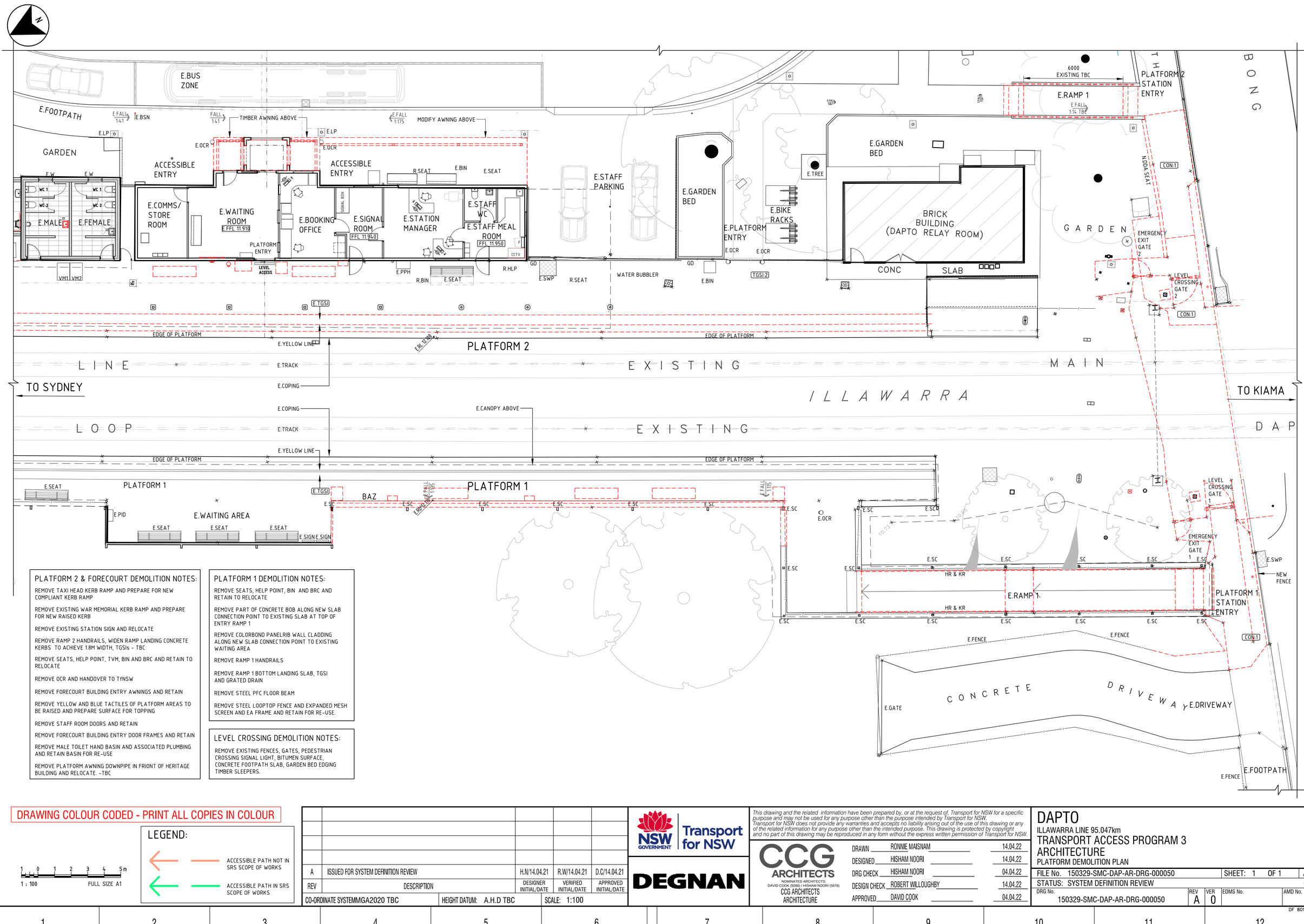
File Plotted
Plotted by RONNIEM



PLATFORM 2 & FORECOURT DEMOLITION NOTES:

REMOVE TAXI HEAD KERB RAMP AND PREPARE FOR NEW COMPLIANT KERB RAMP

REMOVE EXISTING WAR MEMORIAL KERB RAMP AND PREPARE FOR NEW RAISED KERB

REMOVE EXISTING STATION SIGN AND RELOCATE

REMOVE RAMP 2 HANDRAILS, WIDEN RAMP LANDING CONCRETE KERBS TO ACHIEVE 1.8M WIDTH, TGSIs - TBC

REMOVE SEATS, HELP POINT, TVM, BIN AND BRC AND RETAIN TO RELOCATE

REMOVE OCR AND HANDOVER TO TfNSW

REMOVE FORECOURT BUILDING ENTRY AWNINGS AND RETAIN

REMOVE YELLOW AND BLUE TACTILES OF PLATFORM AREAS TO BE RAISED AND PREPARE SURFACE FOR TOPPING

REMOVE STAFF ROOM DOORS AND RETAIN

REMOVE FORECOURT BUILDING ENTRY DOOR FRAMES AND RETAIN

REMOVE MALE TOILET HAND BASIN AND ASSOCIATED PLUMBING AND RETAIN BASIN FOR RE-USE

REMOVE PLATFORM AWNING DOWNPIPE IN FRIONT OF HERITAGE BUILDING AND RELOCATE. -TBC

PLATFORM 1 DEMOLITION NOTES:

REMOVE SEATS, HELP POINT, BIN AND BRC AND RETAIN TO RELOCATE

REMOVE PART OF CONCRETE BOB ALONG NEW SLAB CONNECTION POINT TO EXISTING SLAB AT TOP OF ENTRY RAMP 1

REMOVE COLORBOND PANELRIB WALL CLADDING ALONG NEW SLAB CONNECTION POINT TO EXISTING WAITING AREA

REMOVE RAMP 1 HANDRAILS

REMOVE RAMP 1 BOTTOM LANDING SLAB, TGSI AND GRATED DRAIN

REMOVE STEEL PFC FLOOR BEAM

REMOVE STEEL LOOPTOP FENCE AND EXPANDED MESH SCREEN AND EA FRAME AND RETAIN FOR RE-USE.

LEVEL CROSSING DEMOLITION NOTES:

REMOVE EXISTING FENCES, GATES, PEDESTRIAN CROSSING SIGNAL LIGHT, BITUMEN SURFACE, CONCRETE FOOTPATH SLAB, GARDEN BED EDGING TIMBER SLEEPERS.

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LEGEND:

ACCESSIBLE PATH NOT IN SRS SCOPE OF WORKS

ACCESSIBLE PATH IN SRS SCOPE OF WORKS

1 0 1 2 3 4 5m

1 : 100 FULL SIZE A1

REV	DESCRIPTION	DESIGNER INITIAL/DATE	VERIFIED INITIAL/DATE	APPROVED INITIAL/DATE
A	ISSUED FOR SYSTEM DEFINITION REVIEW	H.N/14.04.21	R.W/14.04.21	D.C/14.04.21

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NSW GOVERNMENT Transport for NSW

DEGNAN

CCG ARCHITECTS
NOMINATED ARCHITECTS: DAVID COOK (5086) / HISHAM NOORI (5678)
CCG ARCHITECTS
ARCHITECTURE

DRAWN	RONNIE MAISNAM	14.04.22
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DRG CHECK	HISHAM NOORI	04.04.22
DESIGN CHECK	ROBERT WILLOUGHBY	14.04.22
APPROVED	DAVID COOK	04.04.22

DAPTO

ILLAWARRA LINE 95.047km

TRANSPORT ACCESS PROGRAM 3

ARCHITECTURE

PLATFORM DEMOLITION PLAN

FILE No. 150329-SMC-DAP-AR-DRG-000050 | SHEET: 1 OF 1 | A1

STATUS: SYSTEM DEFINITION REVIEW ©

DRG No. 150329-SMC-DAP-AR-DRG-000050 | REV A | VER 0 | EDMS No. | AMD No.

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File Plotted

Plot Date & Time 4/21/2022 12:57 PM

Plotted by RONNIEM

STATION STREET

STATION ST ENTRY NORTH

STATION ST ENTRY SOUTH

E.CONCRETE PATH

E.CONCRETE PATH

GARDEN

GRAVEL

E.GARDEN BED

E.GARDEN BED

E.BRICK PAVING

E.BIKE LOCKERS

EXISTING CONCRETE DRIVEWAY

E.TURF

E.CONCRETE PATH

E.LP

7590 TBC

E.RL 11.940

1950 EXISTING

3200

E.RL 12.880

E.RL 12.950

01

NEW ACCESSIBLE KISS & RIDE

7800

E.CONCRETE

E.RL 11.800

E.RL 12.000

NEW LINE MARKING TO CIVIL ENG'S DETAIL

DEMOLISH EXISTING LINE MARKING AND REPLACE WITH NEW LINE MARKING TO CIVIL ENG'S DETAIL

E.LP

E.FALL 1:50

RL 12.150

KR1 1:50

2650 EXISTING

550

E.RL 12.350

E.RL 12.300

E.FALL 1:8

E.RL 12.350

TGSI-1

E.TURF

E.CONCRETE

E.TAXI ZONE

E.CONCRETE

E.CONCRETE DRIVEWAY

E.TURF

E.BRICK PAVING

E.GARDEN BED

E.GARDEN BED

E.TURF

14

E.RL 11.630

KG

E.RL 11.630

E.SWP

REPLACE EXISTING KERB RAMP WITH NEW RAISED KERB. MAKE GOOD GARDEN BED

EXISTING CONCRETE DRIVEWAY

E.ROUNDABOUT

E.CONCRETE

E.CONCRETE PATH

E.KG

E.GARDEN BED

CONC PATH

CON:1

WMC

DDA SEAT

09

NEW GARDEN BED

02

1850

1850

FALL 1:100

FALL 1:72

CON:1

RL 12.250

FALL 1:45

1850

RL 12.210

CON:1

1650

NEW COMPLIANT FOOTPATH TO PLATFORM 2 - 1800 MIN. WIDTH

E.BUILDING

DEMOLISH EXISTING CONCRETE PATH

E.LP

E.CONC

E.FOOTPATH

E.RL 12.340

E.RL 12.290

E.RL 12.340

E.RL 12.290

E.FALL 1:45

E.CONCRETE

E.RL 12.130

E.RL 11.940

E.FALL 1:65

E.FALL 1:41

E.GARDEN BED

ACCESSIBLE ENTRY

E.BUS ZONE

E.CONCRETE

E.RL 11.700

E.SWP

EXISTING LINEMARKING

E.RL 11.650

E.FALL 1:90

E.RL 11.870

E.RL 11.980

E.FALL 1:41

PLATFORM 2 HERITAGE BUILDING

E.FFL 11.910

ACCESSIBLE ENTRY

E.FALL 1:175

E.RL 11.930

E.RL 11.910

E.DRIVEWAY

E.FALL

E.RL 11.870

E.RL 11.980

E.SIGN

E.FALL 1:72

E.RL 11.870

E.RL 11.940

STATION ENTRY FROM BONG BONG ROAD

E.LP

E.GARDEN BED

E.TREE

E.GARDEN BED

E.TREE

E.STAFF PARKING

E.SEAT

E.WAR MEMORIAL

E.SEAT

E.PATH

E.SEAT

E.SEAT

FORECOURT SUMMARY SCOPE OF WORKS:

01 NEW ACCESSIBLE KISS AND RIDE SPACE AND KERB RAMP
02 NEW ACCESSIBLE PATH
05 PROVIDE BUS STOP TGSI
09 NEW ACCESSIBLE SEAT
12 RAISE EXISTING TIMBER DOORS TO SUIT RAISED FLOOR LEVEL
14 NEW LANDSCAPE PLANTING

SEE DWG TAP3150317-SMC-DAP-DRG-000102 FOR CONTINUATION

SEE DWG TAP3150317-SMC-DAP-DRG-000101 FOR CONTINUATION

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LEGEND:

ACCESSIBLE PATH NOT IN SRS SCOPE OF WORKS

ACCESSIBLE PATH IN SRS SCOPE OF WORKS

1 0 1 2 3 4 5m
1 : 100 FULL SIZE A1

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NSW GOVERNMENT Transport for NSW

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CCG ARCHITECTS
NOMINATED ARCHITECTS:
DAVID COOK (5098) | HISHAM NOORI (5678)
CCG ARCHITECTS
ARCHITECTURE

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DRG CHECK	HISHAM NOORI	14.04.22
DESIGN CHECK	ROBERT WILLOUGHBY	14.04.22
APPROVED	DAVID COOK	14.04.22

DAPTO

SOUTH COAST LINE 95.047km

TRANSPORT ACCESS PROGRAM 3

ARCHITECTURE

FORECOURT GENERAL ARRANGEMENT PLAN

FILE No. 150329-SMC-DAP-AR-DRG-000100 | SHEET: 1 OF 1 | A1

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SEE DWG 150317-SMC-DAP-DRG-000102 FOR CONTINUATION

BUS BOARDING AREA REGRADED TO 1:40 OR SHALLOWER

E.BUS ZONE 20m (LANDING)

E.FOOTPATH

E.FALL 1:41

R.BSN

TGSI:1

TGSI:2

FALL 1:40

MODIFY AWNING ABOVE

E.FALL 1:175

E.LP

E.OCR

ACCESSIBLE ENTRY

E.W

E.MALE

E.FEMALE

E.COMMS/ STORE ROOM

E.WAITING ROOM

E.FFL 11.910

E.BOOKING OFFICE

E.SIGNAL ROOM

FFL 11.940

E.STATION MANAGER

R.SEAT

E.BIN

E.SEAT

E.STAFF WC

E.STAFF MEAL ROOM

FFL 11.950

PLATFORM ENTRY

E.STAFF PARKING

E.GARDEN BED

E.TREE

E.BIKE RACKS

E.PLATFORM ENTRY

BRICK BUILDING (DAPTO RELAY ROOM)

NEW HANDRAILS & TACTILES TO COMPLY WITH AS1428.1

6000 EXISTING TBC

E.RAMP 1

E.FALL 1:14 TBC

PLATFORM 2 STATION ENTRY

NODA SEAT

CON:1

E.FE:4

RECONFIGURE GATE LAYOUT AND & RE-GRADE SURFACES TO COMPLY WITH AS1428.1

EMERGENCY EXIT GATE 2

FE:4

1285

LEVEL CROSSING GATE 2

FE:3

1550

VM1 VM2

WCH1

WCH2

R.ABP

E.PPH

R.BIN

R.HLP

GD

E.SWP

WATER BUBBLER

BAZ

EDGE OF PLATFORM

YELLOW LINE

E.RL 12.100

PLATFORM 2

TO SYDNEY

REGRADE BITUMEN PLATFORM TO 1:40 MAX CROSS FALL GRADE

E.TRACK

E.COPING

E.YELLOW LINE

NEW CANOPY ABOVE

E.CANOPY ABOVE

1/201

REFER TO TfNSW SIGNAL ENGINEERING DRAWING M06-244 FOR PEDESTRIAN CROSSING DETAILS

TO KIAMA

RECONFIGURE GATE LAYOUT AND & RE-GRADE SURFACES TO COMPLY WITH AS1428.1

3000

LEVEL CROSSING GATE 1

E.SEAT

E.PID

PLATFORM 1

E.WAITING AREA

E.SIGN

R.BRC

Boarding assistance

E.FALL 1:175

BAZ

E.SC

EMERGENCY EXIT

DP

CON:1

R.HP

R.BIN

WCH1WCH2

4070 COS

4540 COS

4020 COS

500

04

NEW CANOPY WITH EDGE GUTTER

NEW EXTENSION TO PLATFORM & CANOPY

RELOCATED LOOPTOP FENCE AND EXPANDED MESH SCREEN

2272 COS

E.OCR

1/203

NEW HANDRAILS & TACTILES TO COMPLY WITH AS1428.1

HR & KR

E.RAMP 1

PLATFORM 1 STATION ENTRY

NEW FENCE

2500

E.FENCE

FE:2

NEW GARDEN BED

RETURN FENCE TO COLUMN

CONCRETE DRIVEWAY

E.DRIVEWAY

E.GATE

E.FOOTPATH

SUMMARY SCOPE OF WORKS:

02 NEW ACCESSIBLE PATH

03 RE-GRADE PLATFORM 2 BITUMEN CROSSFALL TO 1:40 AND RELOCATE AFFECTED FIXTURES AND FURNITURE

04 NEW PLATFORM 1 SLAB AND CANOPY COVER

05 PROVIDE BUS STOP TGSI

06 UPGRADE RAMP HANDRAILS, KERBS, LANDINGS AND TGSIs

07 PROVIDE NEW GRAB RAILS FOR AMBULANT TOILET

08 RE-GRADE STATION BUILDING ENTRANCE FLOOR TO MAX 1:40

09 NEW ACCESSIBLE SEAT

10 UPGRADE PEDESTRIAN LEVEL CROSSING APPROACH FOOTPATHS, FENCES AND GATES

11 UPGRADE PEDESTRIAN CROSSING SURFACE BETWEEN GATES WITH VELOSTRAIL

12 RAISE EXISTING TIMBER DOORS TO SUIT RAISED FLOOR LEVEL

13 MODIFY TICKET WINDOW

14 NEW LANDSCAPE PLANTING

15 MODIFY AWNING TO IMPROVE NON-COMPLIANT HEAD CLEARANCE

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

LEGEND:

ACCESSIBLE PATH NOT IN SRS SCOPE OF WORKS

ACCESSIBLE PATH IN SRS SCOPE OF WORKS

1 0 1 2 3 4 5m

1 : 100 FULL SIZE A1

REV	DESCRIPTION	DESIGNER INITIAL/DATE	VERIFIED INITIAL/DATE	APPROVED INITIAL/DATE
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APPROVED	DAVID COOK	04.04.22

DAPTO

SOUTH COAST LINE 95.047km

TRANSPORT ACCESS PROGRAM 3

ARCHITECTURE

PLATFORM GENERAL ARRANGEMENT PLAN - SHEET 1

FILE No. 150329-SMC-DAP-AR-DRG-000101		SHEET: 1 OF 3		A1
STATUS: SYSTEM DEFINITION REVIEW				©
DRG No. 150329-SMC-DAP-AR-DRG-000101	REV A	VER 0	EDMS No.	AMD No.

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File Plotted

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SUMMARY SCOPE OF WORKS:

(02) NEW ACCESSIBLE PATH
(03) RE-GRADE PLATFORM 2 BITUMEN CROSSFALL TO 1:40 AND RELOCATE AFFECTED FIXTURES AND FURNITURE
(06) UPGRADE RAMP HANDRAILS, KERBS, LANDINGS AND TGSIs
(09) NEW ACCESSIBLE SEAT
(14) NEW LANDSCAPE PLANTING

METAL SHED
METAL SHED
DEN
CONC RAMP
E.BUILDING
CONC RAMP
E.BUILDING
METAL SHED
E.BUILDING
TURF
RAMP
EXISTING
DDA SEAT
WCH
NEW 1850MM WIDE ACCESSIBLE PATH
N.DDA SEAT
FALL 1:40
FALL 1:72
TO E.CARPARK
TO P3
E.LP
E.OCR
E.BIN
E.FENCE
E.OHWS
E.BRC
E.SC
E.SEAT
E.LP
E.FENCE
E.TW
R.BIN
E.PIDE PID
E.FENCE
06
TGSI:1
YELLOW LINE
E.TRACK
E.COPING
E.PLATFORM 2
REGRADE BITUMEN PLATFORM TO 1:40 MAX CROSS FALL GRADE
TO SYDNEY
TO KIAMA
E.CANOPY ABOVE
E.COPING
E.TRACK
E.YELLOW LINE
E.TGSI
E.PLATFORM 1
E.ERL 12.200
E.ERL 12.100
E.ERL 12.000
E.ERL 12.300
E.ERL 12.400
E.ERL 12.500
E.ERL 12.600
E.ERL 12.700

SEE DWG 150317-SMC-DAP-DRG-000101 FOR CONTINUATION

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LEGEND:
ACCESSIBLE PATH NOT IN SRS SCOPE OF WORKS
ACCESSIBLE PATH IN SRS SCOPE OF WORKS

1 0 1 2 3 4 5m
1 : 100 FULL SIZE A1

REV	DESCRIPTION	DESIGNER INITIAL/DATE	VERIFIED INITIAL/DATE	APPROVED INITIAL/DATE
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APPROVED	DAVID COOK	14.04.22

DAPTO
SOUTH COAST LINE 95.047km
TRANSPORT ACCESS PROGRAM 3
ARCHITECTURE
PLATFORM GENERAL ARRANGEMENT PLAN - SHEET 2

FILE No. 150329-SMC-DAP-AR-DRG-000102 | SHEET: 2 OF 2 | A1
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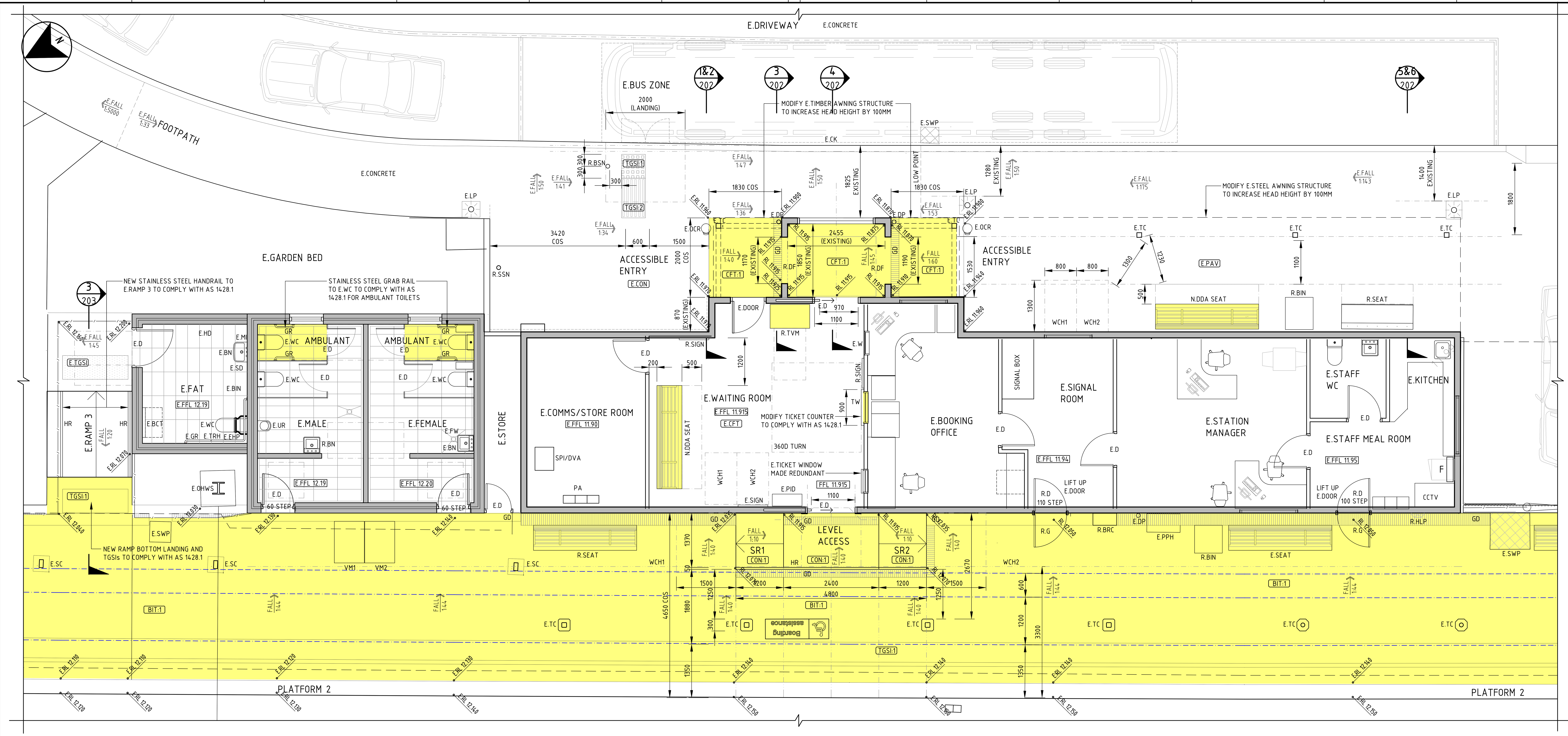

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NSW GOVERNMENT Transport for NSW

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CCG ARCHITECTS ARCHITECTURE

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APPROVED	DAVID COOK	14.04.22

DAPTO
SOUTH COAST LINE 95.047km
TRANSPORT ACCESS PROGRAM 3
ARCHITECTURE
PLATFORM 2 BUILDINGS DETAIL PLAN

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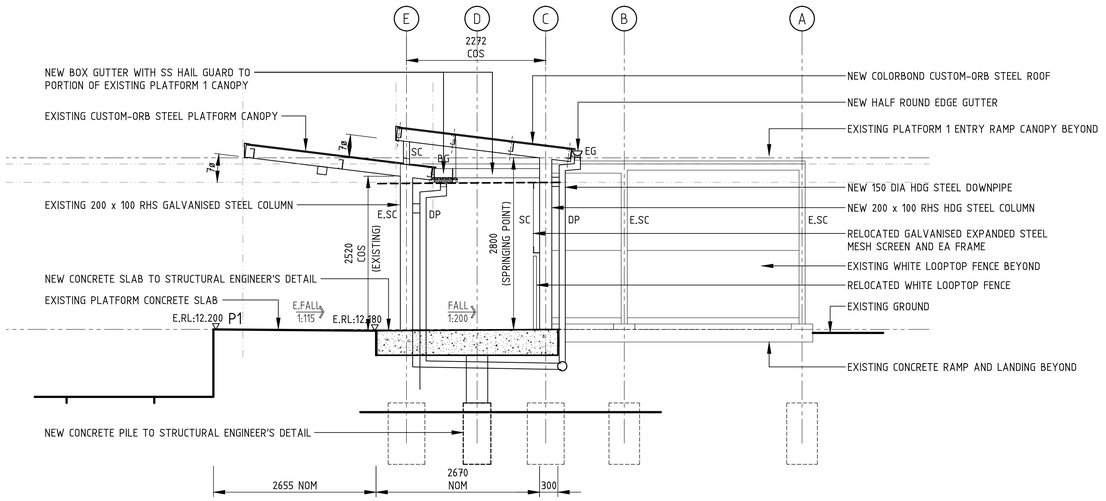

P1 CANOPY SECTION 1/–

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APPROVED	DAVID COOK	14.04.22

DAPTO

SOUTH COAST LINE 95.047km

TRANSPORT ACCESS PROGRAM 3
ARCHITECTURE
PLATFORM 1 CANOPY SECTION

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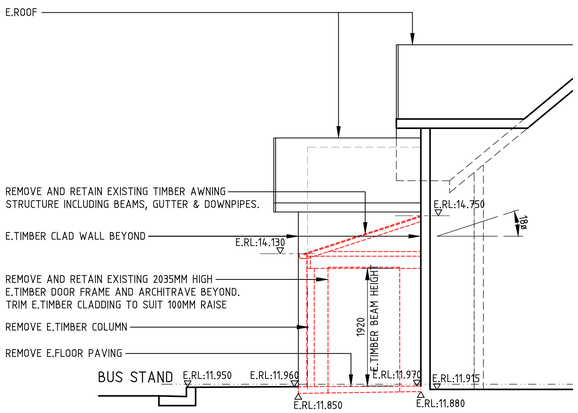

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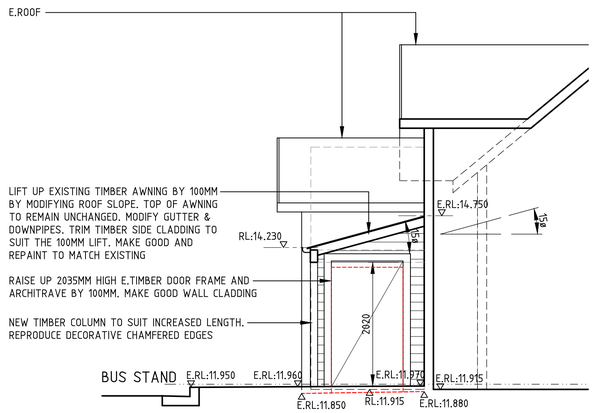

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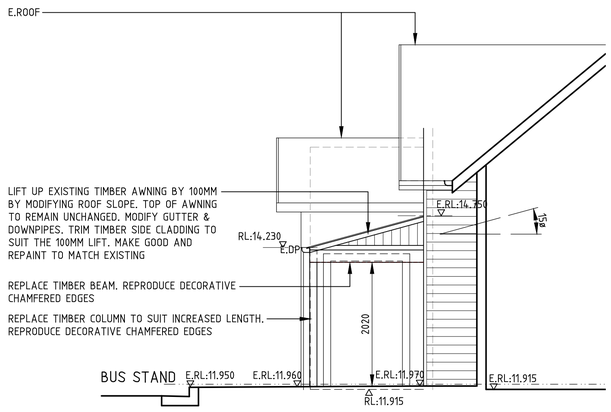

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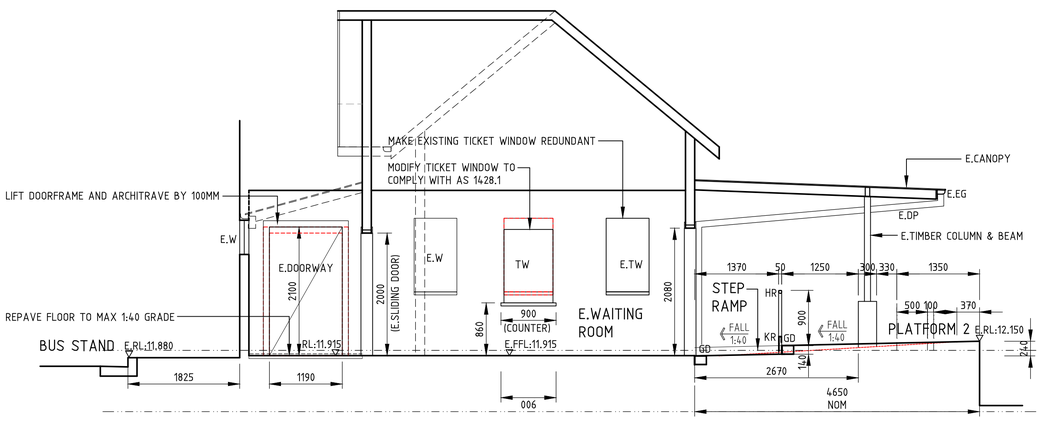

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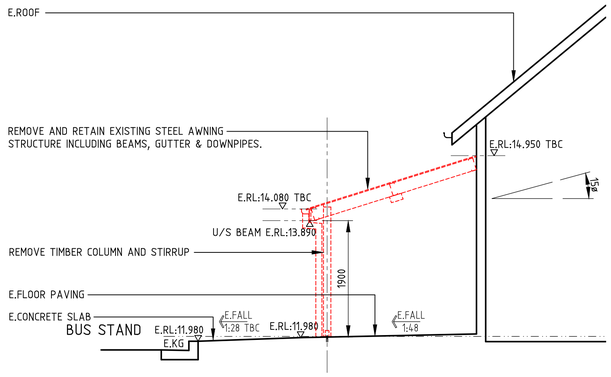

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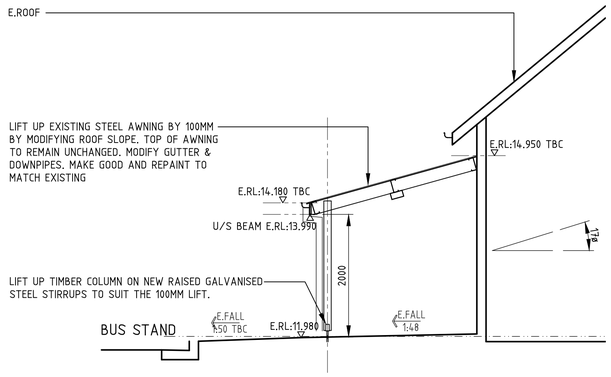

P2 STEEL AWNING PROPOSED SECTION 6
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NSW GOVERNMENT Transport for NSW

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CCG ARCHITECTS
ARCHITECTURE

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APPROVED	DAVID COOK	14.04.22

DAPTO
SOUTH COAST LINE 95.047km
TRANSPORT ACCESS PROGRAM 3
ARCHITECTURE
PLATFORM 2 HERITAGE BUILDING SECTIONS

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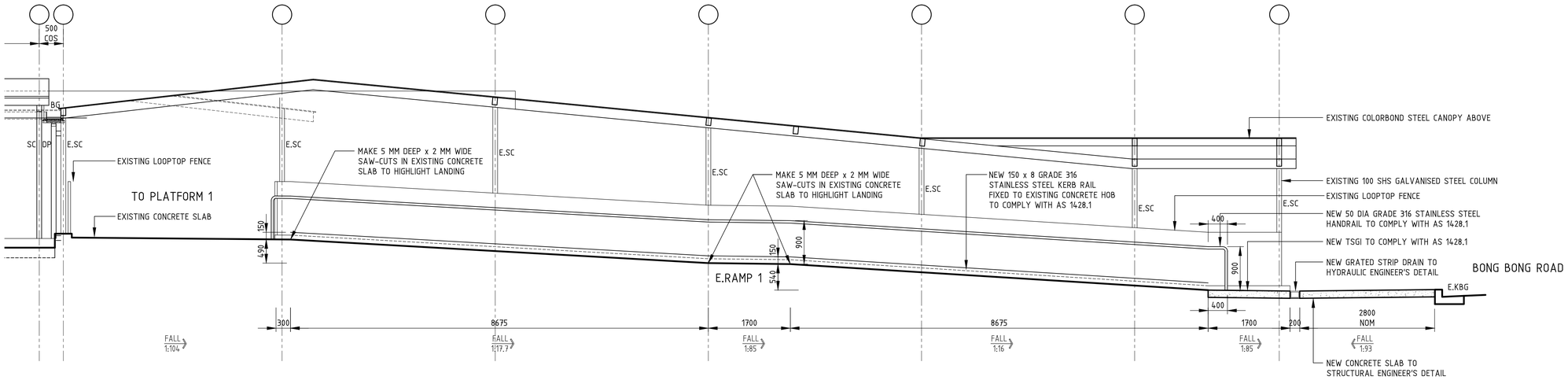

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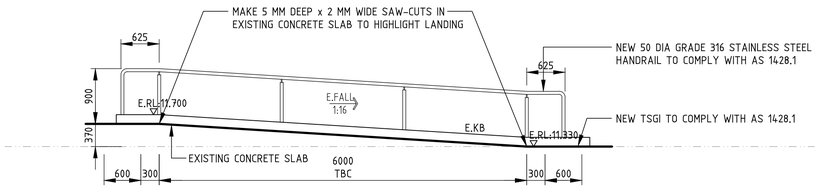

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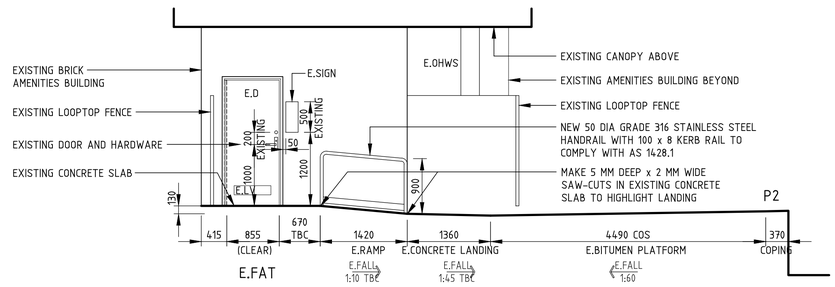

RAMP 3 SECTION (3/101)

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APPROVED	DAVID COOK	14.04.22

DAPTO

SOUTH COAST LINE 95.047km

TRANSPORT ACCESS PROGRAM 3

ARCHITECTURE

RAMP 1, 2 AND 3 SECTIONS

FILE No. 150329-SMC-DAP-AR-DRG-000203 SHEET: 1 OF 1 A1

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Plotted by RONNIEM

Appendix B

Reference documents

EMM
creating opportunities

Dapto Railway Station Group Statement of Heritage Impact

Prepared by Australian Museum Business Services
for Transport for NSW

February 2013

120335

AMBS
Australian Museum Business Services - 6 College Street, Sydney NSW 2010, Ph (02) 9320 6311, Fax (02) 9320 6428
australianmuseum.net.au/AMBS ambs@austmus.gov.au

Document Information 120335 Dapto

Citation:	AMBS 2013 *Dapto Railway Station Group Statement of Heritage Impact*. Report for Transport for NSW
Versions:	Version 1: Draft Report issued January 2013 Version 2: Report issued February 2013
Recipient:	Catherine Barlow, Environment and Planning Manager, Transport Projects, Transport for NSW
Approved by:	Jennie Lindbergh, Senior Project Manager, AMBS Archaeology & Heritage

Contents

Figures

1 Introduction

1.1 Preamble

Australian Museum Business Services (AMBS) has been commissioned by Transport for NSW (TfNSW) to prepare a Statement of Heritage Impact for Dapto Railway Station Group. The station group is listed on the RailCorp Heritage and Conservation Register and the *Wollongong Local Environmental Plan (West Dapto) 2010* as a place of local heritage significance. The report addresses proposed upgrades to the transport interchange on the east side of the station precinct and associated impacts on the heritage significance of the station group. It builds upon preliminary technical advice provided by AMBS to TfNSW in May 2012.

1.2 Study Area

Dapto Railway Station is on the South Coast Line, between Wollongong and Kiama. It is on the west side of Dapto Central Business District (CBD), approximately 12km southwest of Wollongong, in the Wollongong Local Government Area (LGA) (Figure 1.1). The study area focuses on the east side of the station precinct, west of Station Street and north of Bong Bong Road.

1.3 Methodology

This report is informed by the principles and guidelines of the Burra Charter (*The Australia ICOMOS charter for the conservation of places of cultural significance*).

The report has been prepared in accordance with current best-practice heritage guidelines as identified in the *NSW Heritage Manual (*Heritage Office and Department of Urban Affairs and Planning 1996), including *Statements of Heritage Impact* (1996, updated 2002) and other associated documents.

A survey of the study area was conducted by Libby Percival and Jenna Weston on 27 March 2012 and by Libby Percival on 21 January 2013.

1.4 Authorship and Acknowledgements

This report has been prepared by AMBS Project Manager Libby Percival. AMBS Senior Project Manager Jennie Lindbergh provided technical advice and reviewed the report for quality and consistency.

The author acknowledges the assistance of Catherine Barlow, Environment and Planning Manager, Transport for NSW; Norm Leslie, RSL Dapto Sub-Branch.

Figure 1.1 Study Area.

2 Statutory Context

The conservation and management of historic heritage items, places, and archaeological sites takes place in accordance with relevant Commonwealth, State and local government legislation. Non-statutory heritage lists and registers, conservation policies, and community expectations can also affect the management, use, and development of heritage items. The relevant heritage legislation, and statutory and non-statutory heritage listings for the study area are summarised below.

2.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legal framework for the protection and management of places of national environmental significance. Several heritage lists are addressed by the EPBC Act, including the National Heritage List (NHL) and the Commonwealth Heritage List (CHL). The NHL protects places that have outstanding value to the nation. The CHL protects items and places owned or managed by Commonwealth agencies. The Australian Government Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) is responsible for the implementation of national policy, programs and legislation to protect and conserve Australia's environment and heritage and to promote Australian arts and culture. Approval from the Minister is required for controlled actions which would have a significant impact on items and places included on the NHL or CHL.

There are no heritage items listed on the NHL or CHL within the study area or in its vicinity.

2.2 Heritage Act 1977

The *Heritage Act 1977* (Heritage Act) provides protection for heritage places, buildings, works, relics, moveable objects, precincts and archaeological sites that are important to the people of NSW. These include items and places of Aboriginal and non-Aboriginal heritage significance. Where these items have particular importance to the State of NSW, they are listed on the State Heritage Register (SHR).

Part 4 of the Heritage Act refers to the effects of listing on the SHR and interim heritage orders (IHOs). There are no items or places within the study area or its vicinity listed on the SHR.

Part 6 Division 9 refers to the protection of archaeological relics, features or deposits. Sections 139 to 145 of the Act require that excavation or disturbance of land that is likely to contain, or is believed may contain archaeological relics is undertaken in accordance with an excavation permit issued by the Heritage Council (or in accordance with a gazetted exception under Section 139(4) of the Act). Section 146 requires that a person who is aware or believes that he or she has discovered or located a relic must notify the Heritage Council of the location of the relic.

The Heritage Act defines an archaeological relic as any deposit, artefact, object or material evidence that:

> *(a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and*
> *(b) is of State or local heritage significance.*

Part 8 Section 170 of the Heritage Act requires government departments and agencies to maintain a Heritage and Conservation Register (Section 170 Register). Part 4 Clause 21 of the *Heritage Regulation 2012* describes the assets that must be included on a Section 170 Register:

> *(a) items that are listed as heritage items under an environmental planning instrument made under the Environmental Planning and Assessment Act 1979,*
> *(b) items that are subject to an interim heritage order,*
> *(c) items that are listed on the State Heritage Register,*

(d) items identified by the government instrumentality concerned as having State heritage significance.

Section 170A of the Heritage Act requires that a government department or agency must give the NSW Heritage Council not less than 14 days written notice before the government instrumentality:

(a) removes any item from its register under section 170, or
(b) transfers ownership of any item entered in its register, or
(c) ceases to occupy or demolishes any place, building or work entered in its register.

The government department or agency is also responsible for ensuring that the items listed on its Section 170 Register are maintained with due diligence in accordance with State Owned Heritage Management Principles. These include:

4. Conservation Outcomes
Heritage assets should be conserved to retain their heritage significance to the greatest extent feasible. State agencies should aim to conserve assets for operational purposes or to adaptively reuse assets in preference to alteration or demolition. (NSW Heritage Office 2005:5)

9. Alterations
Alterations should be planned and executed to minimise negative impacts on heritage significance (including curtilage and setting), and appropriate mitigating measures should be identified. (NSW Heritage Office 2005:6)

Most activities that impact on heritage items, other than maintenance and cleaning, will require the preparation of a Heritage Impact Assessment.

2.2.1 RailCorp Section 170 Register

The following item is listed on the RailCorp Section 170 Register:

Ref	Name	Primary Address	Significance
	Dapto Railway Station Group	Station Street, Dapto, NSW 2530	Local

The Section 170 Register Inventory includes the following summary statement of significance:

Dapto Railway Station, specifically the 1887 Platform 2 building, early station sign, and the station's streetscape setting from Station Street - is of local heritage significance. The 1887 Dapto Railway Station Platform 2 building is of historical significance as evidence of the first phase of the construction of the Illawarra line, and for its role as a transport hub for Dapto since 1887. The 1887 Dapto Railway Station Platform 2 building and its landscape setting off Station Street is of aesthetic significance as a representative example of late 19th century railway station architecture and landscaping. The 1887 Platform 2 building, though altered, is relatively rare, being one of four extant weatherboard '3rd class' platform buildings on the Illawarra Line.

The heritage curtilage for the station group is:

North: 5m north of the end of the eastern platform; East: a line parallel to the eastern platform to a point adjacent to the south boundary of the former Station Master's residence, then a line out to Station Street, along the west side of Station Street (including Hartigan Park and the circular drive adjacent to the 1887 Platform building) to Bong Bong Road; South: the north side of Bong Bong Road level crossing; West: a line parallel to the western platform. Note this curtilage excludes Bong Bong Road, excludes the former Station Masters residence (now in private ownership), and includes Hartigan Park and the circular drive adjacent to the 1887 eastern platform building.

Figure 2.1 Heritage curtilage for the Dapto Railway Station Group, RailCorp Section 170 Register (Source: State Heritage Inventory, http://www.environment.nsw.gov.au/maritimeheritageapp/resources/Heritage/shi/480/dapto_railway_station_group.jpg).

2.3 Environmental Planning & Assessment Act (1979)

The *Environmental Planning and Assessment Act* 1979 (EP&A Act) is the main act regulating land use planning and development in NSW. The EP&A Act controls the making of environmental planning instruments (EPIs). Two types of EPIs can be made: Local Environmental Plans (LEPs), covering local government areas; and State Environment Planning Policies (SEPPs), covering areas or issues of State or regional environmental planning importance. LEPs commonly identify, and have provisions for, the protection of local heritage items and heritage conservation areas. The study area is located in the Wollongong LGA.

Clause 228(2)(e) of the *Environmental Planning and Assessment Regulation 2000* states that, for the purposes of Part 5 of the EP&A Act, the factors to be taken into account when consideration is being given to the likely impact of an activity on the environment include:

> *any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations.*

2.3.1 State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (SEPP Infrastructure 2007) provides provisions and development controls for essential infrastructure projects, such as roads and railways. Division 15 of SEPP 2007 includes specific provisions for infrastructure developments undertaken in rail corridors and rail infrastructure facilities. The SEPP defines rail infrastructure facilities as including:

…
(d) railway stations, station platforms and areas in a station complex that commuters use to get access to the platforms, and
(e) public amenities for commuters, and
(f) associated public transport facilities for railway stations …

Clause 79 'Development permitted without consent – rail infrastructure facilities generally' confirms that the development of rail infrastructure facilities may be carried out by or on behalf of a public authority, in this case TfNSW, without consent on any land. Therefore, any proposed upgrades to the Dapto transport interchange do not require the consent of the local Council.

However, Clause 14 'Consultation with councils – development with impacts on local heritage' requires that a public authority should consult with Council where the development:

(a) is likely to have an impact that is not minor or inconsequential on a local heritage item (other than a local heritage item that is also a State heritage item) or a heritage conservation area.

2.3.2 Wollongong Local Environmental Plan (West Dapto) 2010

Part 5, Clause 5.10 'Heritage conservation' of the Wollongong LEP (West Dapto) 2010 provides for the protection of items, places, and archaeological sites which have been identified in the LEP as having heritage significance.

Schedule 5 'Environmental Heritage' lists the following heritage items within the study area or its near vicinity:

Ref	Name	Primary Address	Significance
	Dapto Railway Station	Station Street, Dapto	Local
	Station Master's Residence	1 Station Street, Dapto	Local

2.4 National Trust of Australia

The National Trust of Australia is a private, not-for-profit organisation committed to conserving Australia's heritage. Listing with the National Trust of Australia does not have statutory authority; however, it does have a role in raising public awareness of heritage issues. The following item is classified by the National Trust:

Ref	Name	Primary Address
2163	Dapto Railway Station Group	Station street, Dapto

2.5 Register of the National Estate

The Register of the National Estate (RNE) was originally established under Section 22 of the *Australian Heritage Commission Act 1975* (AHC Act). Since the establishment of the NHL and CHL, there is now a considerable level of overlap between the RNE and heritage lists at the national, state and territory, and local government levels. In February 2012, all reference to the RNE was removed from the EPBC Act and the AHC Act. The RNE is now maintained on a non-statutory basis as a publicly available archive. The following place is listed on the RNE:

Ref	Name	Primary Address
101108	Dapto Railway Station Group	Station St, Dapto, NSW, Australia

3 Historic Context

3.1 Early European Settlement and Industry in Dapto

On 1 May 1833, Governor Richard Bourke granted 300 acres (121.4 ha) on the southeast bank of Mullet Creek to George Brown. This property was known as Mullet Creek Farm (Figure 3.1). A further 500 acres (202.3 ha) adjoining the southern boundary of Mullet Creek Farm was also granted to a George Brown (likely a cousin of the first Brown) on 1 May 1833. This property was later sold to Dr Alexander Osborne, who called it Daisy Bank (McCaffrey 1922:170, 185).

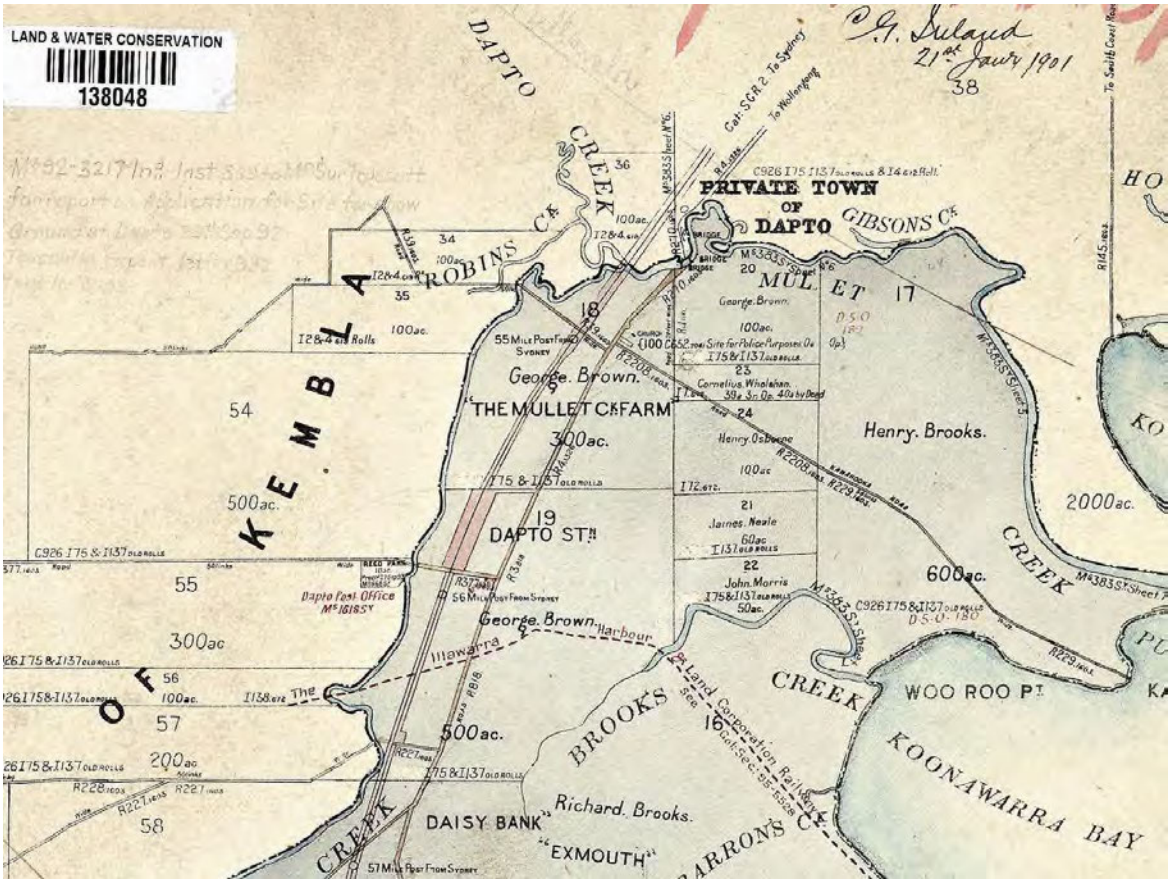

Figure 3.1 Detail of map of Parish of Calderwood, 1895-1901, showing early land grants in the vicinity of Dapto Station (Source: Spatial Information eXchange, NSW Land and Property Information, 138048).

George Brown of Mullet Creek Farm was born in Fifeshire, Scotland in 1794 and immigrated to the NSW colony as a young man. He moved to the Illawarra District from Liverpool in 1829, and opened a public hotel named The Ship Inn on Edmond Bourke's grant at Wollongong. In 1834, following receipt of the land grant at Mullet Creek, Brown relocated his hotel to Mullet Creek Farm. A small village known as Dapto developed in the vicinity of the hotel, providing services to the surrounding farms. When the hotel was destroyed by fire, Brown constructed a new hotel, called the Illawarra Hotel. He also constructed a wind-powered flour mill, and by 1840 had decided to erect a steam-powered mill near the hotel (Figure 3.2). By the 1850s, when Brown died, the village of Dapto had a semblance of order, with half a dozen houses, a post office and store, three churches, the inn and Brown's flour mill, and a school nearby (McCaffrey 1922:185; Kass 2010:109).

Figure 3.2 Brown's Mill, nd (Source: Wollongong City Library, P01/P01338).

Brown was an inaugural member of the first Illawarra Agricultural Society, formed in 1844. The society's first ploughing match was held in September 1846 in Brown's paddock at Dapto, and various meetings were subsequently held at the Illawarra Hotel. In 1857, the first Dapto Agricultural Society Show was also held at Brown's Mill (McCaffrey 1922:215, 218, 231).

Following the widespread failure of wheat crops in the 1850s and 1860s, dairying replaced grain growing as the dominant rural industry of the Illawarra area. The introduction of refrigeration in 1879 and mechanical cream separators boosted the industry, and provided the impetus for the formation of local dairy co-operative organisations, which would manufacture and market dairy products. In 1879, J and T Wilson of Victoria opened a cheese factory in Brown's old mill at Dapto, giving the building a new lease of life. However, butter proved to be a more popular profitable product and in 1887, following the construction of the railway to Dapto, a Mr Harvey of the Country Milk Company established a butter factory in the same building. By the early 1890s there were two milk trains daily, and the NSW Fresh Food and Ice Co had built a new factory on a three-acre site south of Dapto railway station. By 1900, there was a Farmers and Dairyman's Company works to the west of the station and a Dapto Co-operative Dairy Company factory on the east side of the station (Figure 3.3) (Kass 2010:99, 109, 138).

Figure 3.3 Dapto Co-operative Dairy Co. Ltd, 1920 (Source: Wollongong City Library, P01/P01847).

With the coming of the railway in 1887, the focus of settlement also moved southwards from area surrounding Brown's hotel to the area surrounding the new Dapto railway station. The station was sited approximately 1.5 km to the south of the original settlement to ensure it was above the flood level of the creek. The Marshall Mount Estate was subdivided on the east side of the station in 1890. The original area of settlement surrounding the hotel subsequently became known as Brownsville, to distinguish it from the new township of Dapto. Brown's hotel, then known as the Lake Illawarra, continued to trade until 1937 (Forsyth 1988:157; Kass 2010:109-110).

Proximity to the railway, sources of coal, and the port at Wollongong also led to metal refining became an important local industry at the end of the nineteenth century. In 1895, the Illawarra Harbour and Land Corporation erected a smelter at Dapto to process ore for the Broken Hill Pty Ltd. The works were soon smelting lead, silver, zinc, copper and gold from Broken Hill, Zeehan, Mount Morgan and Western Australia. At its peak, the smelter employed over 400 men. In 1903, as a result of the smelting and dairying traffic, the Commissioner of Railways declared that Dapto Station was the most valuable station on the Illawarra Line. However, with the closure of the smelter in 1905, traffic declined substantially and Dapto turned back into a quiet rural village (Kass 2010:110, 140).

3.2 Development of the Railways

3.2.1 The Illawarra Railway

The first steam railway line in NSW, from Sydney to Parramatta, opened on 26 September 1855. By the early 1870s, land owners and residents of the Wollongong area began to lobby for the construction of an Illawarra Railway, to provide passenger and transport services for the local agricultural and coal mining industries. In 1873 the Public Works Department initiated an official railway survey, between Sydney and the Illawarra. In 1881, after a lengthy public debate about the most appropriate route, the NSW Government approved construction of a railway from Sydney to Kiama, and in 1882 called for tenders for the construction of the first section of the line, from the Illawarra Junction (near Macdonaldtown Station) to Waterfall. A single track line between Illawarra Junction and Hurstville was completed by October 1884, and extended to Sutherland by 1885, and Waterfall by 1886. The sections from Clifton (now Scarborough) to Wollongong, and Wollongong to North Kiama (now Bombo) were completed in 1887. However, the intermediate section from Waterfall to Clifton comprised numerous large culverts and tunnels, and the opening was delayed until 1888 (Singleton 1945:50-53; Forsyth 1988:100; Cottee 2004:225-229).

The line was duplicated as far as Waterfall by 1890, and Wollongong by 1923. This work included a series of double track deviations between Waterfall and Coalcliff, which replaced the notoriously steep grades with a more winding route. The line was electrified between Sydney and Royal National Park in 1926. Electricity was extended to Waterfall in 1980, Helensburgh in 1984, Wollongong in 1985-86, Dapto in 1993, and Kiama in 2001 (Forsyth 1988:100-101; RailCorp Section 170 Register).

3.2.2 Dapto Station

Dapto Railway Station originally opened on 9 November 1887, on the Wollongong to Bombo section of the Illawarra Line. The station was provided with a platform, a standard Third class weatherboard railway station building, a brick Station Master's Residence, a large road forecourt, a timber goods shed, and stockyards. The yard also had a crossing loop and waiting facilities. The station buildings were designed by government architect R Spiers. Early photographs show the Victorian Gothic detailing, including steep pitched gable roofs, timber barge boards and finials, and an awning over the platform (Figure 3.4). The street facing entrance was provided with two small porches, with decorative posts and brackets (Figure 3.5) (Forsyth 1988:157; RailCorp Section 170 Register).

Figure 3.4 Dapto Railway Station, nd (Source: Wollongong City Library, P02/P02341).

Figure 3.5 Pte Edward Acland Hargrave returns to Dapto wounded; and Scouts at Dapto Railway Station, 1919 (Source: Wollongong City Library, P03/P03678 and P01/P01652).

The station and goods yard at Dapto station was expanded during the 1890s to accommodate the growing local dairy processing industry. In 1904, an additional siding was installed for the Dapto Cooperative Dairy Company. In 1926, the loop line was extended to hold 55 vehicles, a water tank to receive water from the town supply was constructed, and a water column installed at the Sydney end of the platform (Forsyth 1988:157).

Plans of the station precinct indicate that a roughly semi-circular carriage loop and park had been formalised by at least 1940, between the platform building and Station Street, although it is possible that the loop and park were established much earlier, in the late nineteenth or early twentieth century (Figure 3.6). A pathway intersected the park, leading from the street to the entrance to the platform

building. A 1963 plan of the station shows that the park had been named Hartigan Park by at least this date, while a 1971 plan indicates that the concrete path was surrounded by gardens and lawns (Figure 3.7-Figure 3.8). The layout of the path was modified in the mid-1990s to accommodate the construction of a war memorial.

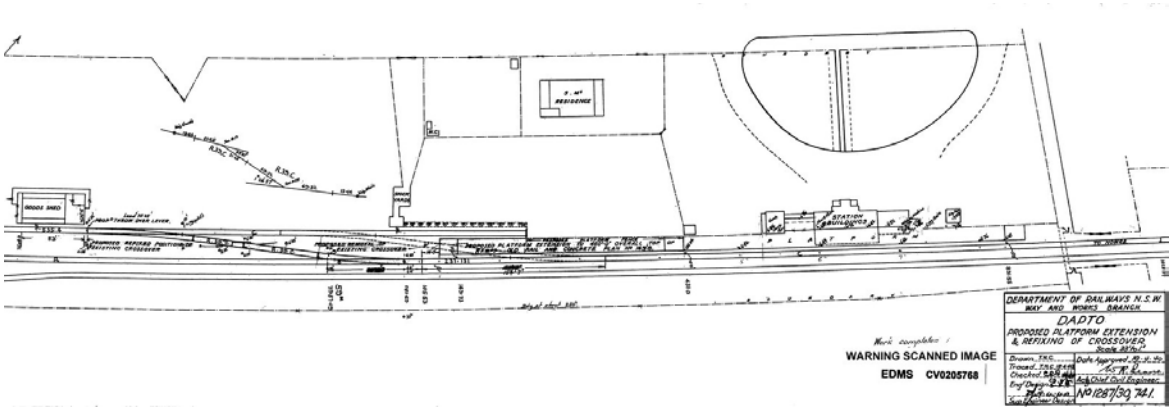

Figure 3.6 Detail of schematic plan of Dapto railway station and yard, 1940, showing the semi-circular layout of the park between the platform building and Station Street (Source: RailCorp Plan Room, 0205768).

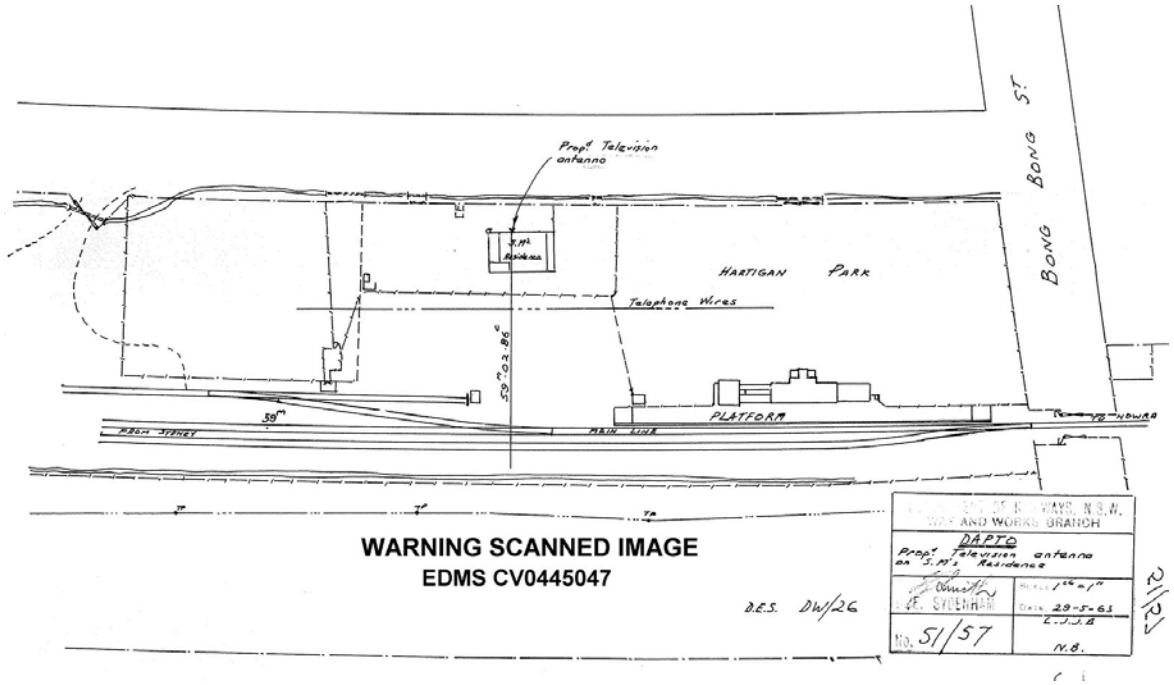

Figure 3.7 Schematic plan of Dapto Station, 1963, showing that the park was named Hartigan Park (Source: RailCorp Plan Room, 0445047

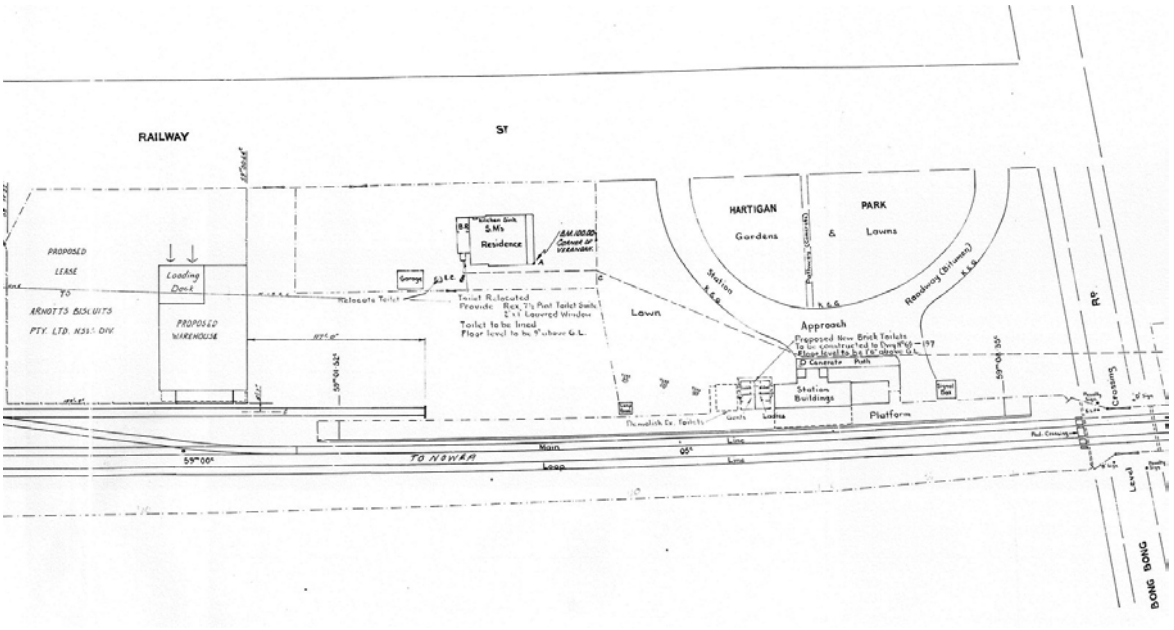

Figure 3.8 Schematic plan of Dapto Station, 1971, showing the layout of Hartigan Park (Source: RailCorp Plan Room, 0445049).

Use of the goods yard declined in the second half of the twentieth century, such that there are very few features of the yard extant today. The main station building was modified during the same period, and the toilet block to north of the main station building was replaced with new brick toilet block (Figure 3.9-Figure 3.11). With electrification of the line in 1993, most of the station canopies and awnings were also altered, a concrete platform extension was added to the original station platform, and a new concrete platform (Platform 1) was built on the crossing loop. The Station Master's Residence was sold around the same time and is now used as a private residence. The yard to the north of the residence was adapted for use as a commuter car park. These changes have resulted in some loss of integrity of the station group. However, the original 1887 weatherboard station building is still in use on Platform 2 and the park and carriage loop to the east of the building is retained in its original form (RailCorp Section 170 Register).

Figure 3.9 Dapto Railway Station, 1981 (Source: Wollongong City Library, P01/P01673).

Figure 3.10 Dapto Railway Station, 1994; photo by Patricia Vidal (Source: Wollongong City Library, P01/P01674).

Figure 3.11 Dapto Railway Station, 1999 (Source: Wollongong City Library, P17/P17674).

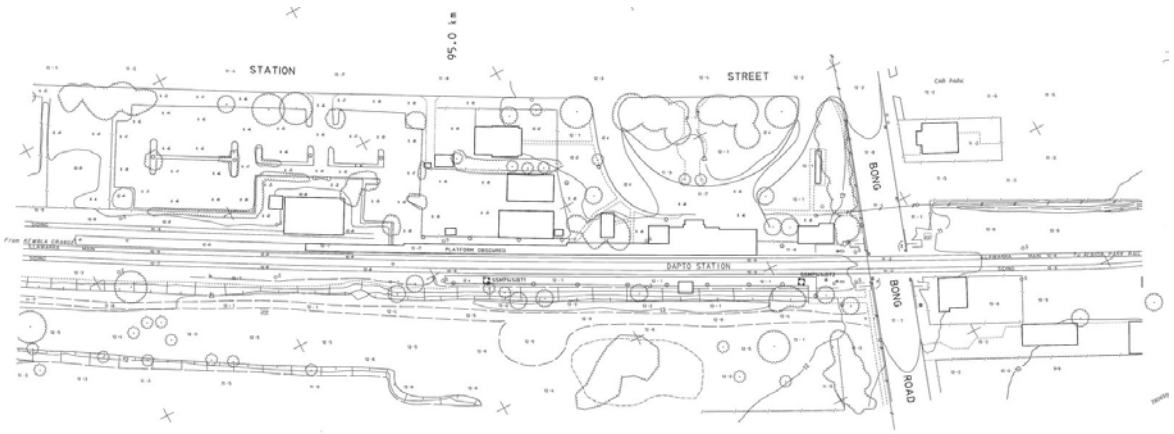

Figure 3.12 Survey plan of Dapto Station, 1998, showing changes to the layout the station platforms, Hartigan Park, and a commuter car park on the north side of the former Station Master's Residence (Source: RailCorp Plan Room, 0388077).

3.3 Memorialisation

The erection of public monuments or the creation and naming of commemorative spaces provides a context for remembering important people and events in the local community, and the wider world, and as such is a form of public history. The process of memorialisation reflects a public desire to experience and share a process of commemoration and public ritual, particularly in the context of death or other forms of human suffering. The ongoing maintenance and use of memorials and commemorative spaces act as a buttress against forgetting and the loss of a common local history. As a consequence, memorials and commemorative spaces often become the focus for community gatherings and social activities, including general recreational activities, which help to reinforce a sense of community identity and belonging.

War memorials are some of the most common forms of memorialisation in local communities, outside of cemeteries. War memorials are often located within public spaces such as town squares, the intersection of major roads, public parks and recreational reserves. They are often erected by the local community for the local community, and serve as the focus of community remembrance services.

3.3.1 Hartigan Park War Memorial and Buckley's Walk

A war memorial was installed in Hartigan Park in front of Dapto Railway Station in approximately 1996 by the Returned and Services League of Australia (RSL) Dapto Sub-Branch, funded by a grant from the federal Department of Veterans Affairs, and the site continues to be used as the conclusion of the local ANZAC day march and for memorial services (Norm Leslie, pers. comm. 18 December 2012). The war memorial is dedicated to the men and women who served, suffered and died in the conflicts of World Wars I and II, the Korean and Vietnam Wars. A plaque attached to the memorial commemorates the death of 268 people in the tragic sinking of the Australian Hospital Ship Centaur off Point Dangar, near Coolangatta QLD on 14 May 1943. A plaque installed in the garden surrounding the memorial remembers the death of four servicemen in the crash of RAAF Lockheed Hudson A16-173 at Bong Bong Mountain, Dapto on 4 November 1942.

Figure 3.13 Dapto War Memorial, 1999 (Source: Wollongong City Library, P17/P17673).

Figure 3.14 Dapto War Memorial, 2001; photo by Marisa O'Connor (Source: Wollongong City Library, P14/P14595).

The war memorial is centred on a pathway across Hartigan Park, which has historically provided a formal entrance to Dapto Railway Station from Station Street. The path was renamed Buckley Walk in the 1990s, after the late Albert Buckley, veteran of WWI and former President of the Dapto RSL Sub-Branch (Norm Leslie, pers. comm. 18 December 2012).

Figure 3.15 Buckley Walk war memorial, 1999 (Source: Wollongong City Library, P17/P17624).

3.4 Conclusion

The coming of the railway and the siting of Dapto Railway Station in 1887 effectively led to the relocation of Dapto village to the area surrounding the station, and the ongoing development of local dairying industry, with dairy products manufactured and transported by rail from factories constructed adjacent to the rail corridor. Although this industry has now declined in importance, and the associated rail goods yard has closed, the station precinct continues to provide important public transport services to the local community. Located at the heart of the central business district, the station precinct has social value to the community, illustrated by the construction of a new local war memorial at the station in the 1990s.

4 Physical Analysis

4.1 Dapto Railway Station

Dapto Railway Station is an operational passenger station on the South Coast Line. The station has two side platforms (Platforms 1 and 2) and an additional platform on the north side of the station for terminating trains (Platform 3). Platforms 1 and 2 are accessed from the south end of the station by ramps leading from a level crossing on Bong Bong Road (Figure 4.1-Figure 4.3). The ramp access to Platform 2 is narrow and winding. Platform 2 is also accessed from the east through the main platform building, from Hartigan Park and Station Street. A semi-circular driveway around Hartigan Park, off Station Street, provides kiss-and-ride access for cars and taxis (Figure 4.4). Current DDA access to the platforms is from DDA car parking bays in a commuter car park on Station Street, to the north east of the station, and via a long, at-grade bitumen pathway adjacent to Platform 2 (Figure 4.5-Figure 4.6).

Figure 4.1 View from Bong Bong Rd level crossing towards entrance to Platform 2.

Figure 4.2. Ramp access to Platform 2.

Figure 4.3 Ramp access to Platform 1.

Figure 4.4 Circular driveway entrance to the main platform building on Platform 2; view from Station Street.

Figure 4.5 View from commuter car park to Platforms.

Figure 4.6 Bitumen pathway from commuter car park, alongside Platform 2 (March 2012).

Platform 1 is a modern concrete platform with a simple metal shelter shed and awnings, constructed in the early 1990s in association with the electrification of the line (Figure 4.7-Figure 4.8).

Figure 4.7 Modern concrete platform on Platform 1 (2012).

Figure 4.8 Interior of waiting shed on Platform 1 (2012).

Platform 2 is constructed of brick and is the earliest platform on the site. The main platform building on Platform 2 is the focal point of the station precinct (Figure 4.9). It is the original 1887 station building, historically providing access to the platform, ticketing services, and shelter to passengers. The building is a Type 4 Third Class weatherboard station building with a transverse gable roof and decorative timber barge boards. It has a central gabled entry porch facing the semi-circular driveway, flanked by small side verandahs, and a longer awning over the platform supported by stop chamfered timber posts (Figure 4.10). An old station sign stating *Dapto Stn* and another with the date *1887* are attached to the gable end of the entry porch (Figure 4.11). A small weatherboard skillion roof building is attached to the south side of the main building.

Figure 4.9 Original 1887 platform building on Platform 2; view from Hartigan Park (2012).

Figure 4.10 Awning supported by timber posts on Platform 2 (2012).

Figure 4.11 Station signs at the entry porch. The original vertical window below the sign has been replaced with a small horizontal window and a CCTV camera attached below the bargeboard.

The main building has been heavily modified since it was first constructed, including the removal or alteration of original window openings, the removal of brick chimneys, timber finials, and decorative brackets to the awnings. Timber window frames have been replaced with aluminium frames. New awnings were installed in the 1990s, covering the platforms beyond the original building and the footpath adjacent to the circular driveway. CCTV cameras have been attached to the building, including the main east façade (Figure 4.11). The footpath and kerbing in front of the building entry have been replaced with a graded asphalt surface (Figure 4.12). The interior waiting area has also been modernised, with new ticket windows, vinyl flooring, timber veneer wall panelling, and a dropped

panel ceiling (Figure 4.13-Figure 4.14). The original toilet block to the north of the main building was replaced in the 1970s by a pale brick toilet block with a flat roof (Figure 4.15). Various other modern buildings in the vicinity of Platform 2 include a brick signal relay room as the south end of the platform, which is partially painted with a mural, a metal demountable building to the north of the toilet, and a metal clad shop with a low gable roof (Figure 4.16-Figure 4.17).

Figure 4.12 Graded asphalt and awning installed in the 1990s, adjacent to the circular driveway.

Figure 4.13 New ticket windows in the central waiting room of the main platform building.

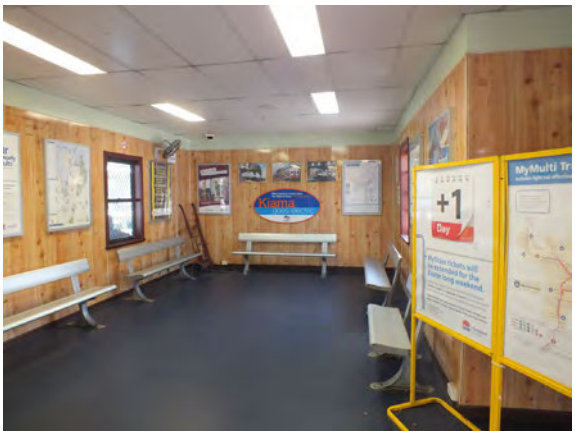

Figure 4.14 Interior of central waiting room in the main platform building (2012).

Figure 4.15 Modern toilet block, attached to the north end of the main platform building (2012).

Figure 4.16 Brick relay room with painted mural at the south end of Platform 2.

Figure 4.17 Demountable and shop building, north of the main platform building (2012).

4.2 Hartigan Park and War Memorial

Hartigan Park provides a picturesque setting to the entrance to the main platform building. The main area of the park is defined by the roughly semi-circular layout of the driveway off Station Street, which was established in this location by at least 1940 (Figure 4.18-Figure 4.20). The driveway opens up leafy views to the main platform building from Station Street to the northeast and from the Station Street / Bong Bong Road intersection to the southeast (Figure 4.18). The park's landscaping primarily consists of lawn and a number of large mature Brush Box trees, a Canary Island date palm, a fan leafed palm (likely *Washingtonia*), and a few other smaller trees and shrubs. The Brush Box trees are planted in formal rows along Station Street and Bong Bong Road, and to the north and south of the main station building, adjacent to Platform 2 (Figure 4.20-Figure 4.23). A number of the smaller trees are more recent plantings, laid out in a radial pattern around a community war memorial in the centre of the park (Figure 4.24 and see Figure 4.26 below).

Figure 4.18 Hartigan Park and semi-circular driveway; view from the intersection of Station Street and Bong Bong Road.

Figure 4.19 View from the southwest corner of the park, adjacent to Bong Bong Road, showing the fan leafed palm in the foreground.

Figure 4.20 Row of mature Brush Box trees along Station Street.

Figure 4.21 Row of Brush Box trees along Bong Bong Road.

Figure 4.22 Path leading from the main platform building to Bong Bong Road; view from the north.

Figure 4.23 Path leading from the main platform building to Bong Bong Road; view from the south, showing Brush Box trees beside Platform 2.

Figure 4.24 More recently plantings including ring of smaller trees around the war memorial.

The war memorial commemorates men and women who served in WW I, WW II, the Korean and Vietnam Wars. Constructed in 1996, the war memorial is sited on the central axis of the park, along a pathway originally laid out as a formal entrance to the station precinct from Station Street (Figure

4.25-Figure 4.26). The pathway is now known as Buckley Walk. The path also sets up key sightlines between Station Street, the war memorial, and the main entrance to the station building beyond. The formal, almost symmetrical layout of the park and sightlines along the Buckley Walk contribute to the aesthetic significance of the park, and provide a dignified setting for the memorial. This symmetrical design and landscaping of the park also provide a significant landscape setting for the main platform building, and the trees in the park shield the station building from the modern commercial development across Station Street and Bong Bong Road. Garden beds surrounding the memorial have been recently replanted with roses and rosemary, demonstrating ongoing community care of the landscape setting of the memorial (Figure 4.26).

Figure 4.25 The war memorial is sited on the central axis of the park, along a pathway originally laid out as a formal entrance to the station precinct from Station Street. View from Station Street.

Figure 4.26 View of the war memorial and Hartigan Park from the main platform building (2012 above and 2013 below).

The war memorial is within the heritage curtilage of Dapto Railway Station Group, and contributes to the landscape setting and social significance of the station precinct. Although the war memorial is not individually listed on the Wollongong City LEP 2010, it is likely to have historic, associative, and social significance for the local Dapto community. The war memorial consists of three large pink granite slabs, set in a triangular pattern: one panel is dedicated to WW I, one to WW II, and one for both the Korean and Vietnam Wars (Figure 4.27-Figure 4.30). Commemorative inscriptions on the

panels face outwards, towards the main body of the park. The memorial is surrounding by a circular area paved with coloured concrete and brick, park bench seating, and the circular garden beds, which reflect the layout of the circular driveway access to the main station building. A bronze plaque commemorating the sinking of Australian Hospital Ship Centaur off Point Dangar QLD in 1943 is attached to the WW II stone slab (Figure 4.29). A bronze plaque commemorating the loss of RAAF crew who crashed the Lockheed Hudson A16-173 into Bong Bong Mountain in 1942 is also located beside the path, in the garden adjacent to the war memorial (Figure 4.31-Figure 4.32). AMBS understands that the RSL is also planning to install additional commemorative plaques beside the path (Norm Leslie, pers. comm. 18 December 2012).

Figure 4.27 View of war memorial from the west, showing the WW I panel.

Figure 4.28 Side view of the WW II panel (2012).

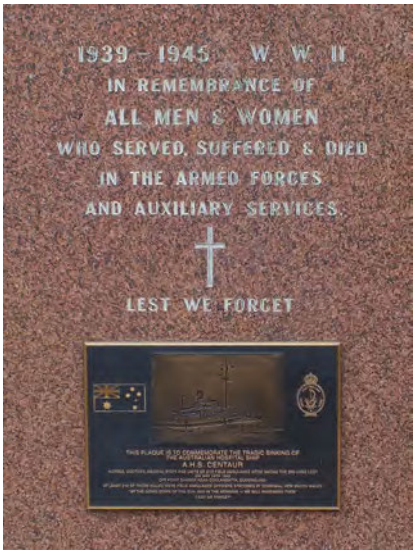

Figure 4.29 Detail of inscription on WW II panel, with Bronze plaque commemorating the sinking of AHS Centaur below.

Figure 4.30 View of Korea and Vietnam Wars panel, with landscaped surrounds.

Figure 4.31 Bronze plaque set in garden bed, commemorating the crash of RAAF Lockheed Hudson A16-173 at Bong Bong Mountain.

Figure 4.32 Detail of bronze plaque.

The former Station Master's Residence is a small brick building to the north of Hartigan Park, beside Station Street (Figure 4.33). Views of the residence are obscured by trees alongside the circular drive and adjacent to a picket fence in front of the house (Figure 4.34). The rear of the residence is separated from the commuter car park by a tall palisade fence (Figure 4.35-Figure 4.36). The residence is now in private ownership.

Figure 4.33 Path leading from the circular drive to former Station Master's Residence (2012).

Figure 4.34 View to the east, showing the verge in front of the Station Master's Residence (2012).

Figure 4.35 Rear of Station Master's Residence, separated from the commuter car park by a palisade fence.

Figure 4.36 View of commuter car park from the south.

5 The Proposal

TfNSW is proposing to improve the transport interchange facilities and access at Dapto Railway Station by:

- constructing a low speed bus and vehicle turnaround access road at the main entrance to Platform 2, with an entrance point away from the high activity area at the Station Street / Bong Bong Road intersection (Figure 5.1);
- redesigning the layout and landscaping of Hartigan Park to accommodate the new bus turnaround, including:
    - removing the southeast entrance to the driveway off Station Street, to be replaced with a new footpath and landscaping;
    - removing the west entrance to the concrete footpath across Hartigan Park, to be replaced with turf;
    - providing new semi-circular hedging to the south of the war memorial, to visually buffer against the bus turnaround;
    - removing five trees from the immediate area of the bus turnaround, but retaining mature trees lining Station Street and Bong Bong Road (Figure 5.2);
- constructing and widening footpaths to provide better access to the station and to the bicycle lockers (Figure 5.3);
- constructing a new DDA compliant ramp on the east side of the station to provide access from Bong Bong Road to Platform 2. The existing non-compliant timber ramp will also be removed (Figure 5.4);
- paving the footpath at the eastern entrance to the main platform building on Platform 2 (Figure 5.5);
- installing clear way-finding signage, as well as providing more bus route and timetable information;
- improving lighting at bicycle lockers, taxi zone and the 'kiss and ride' zone along Station Street; and
- improving CCTV at the station.

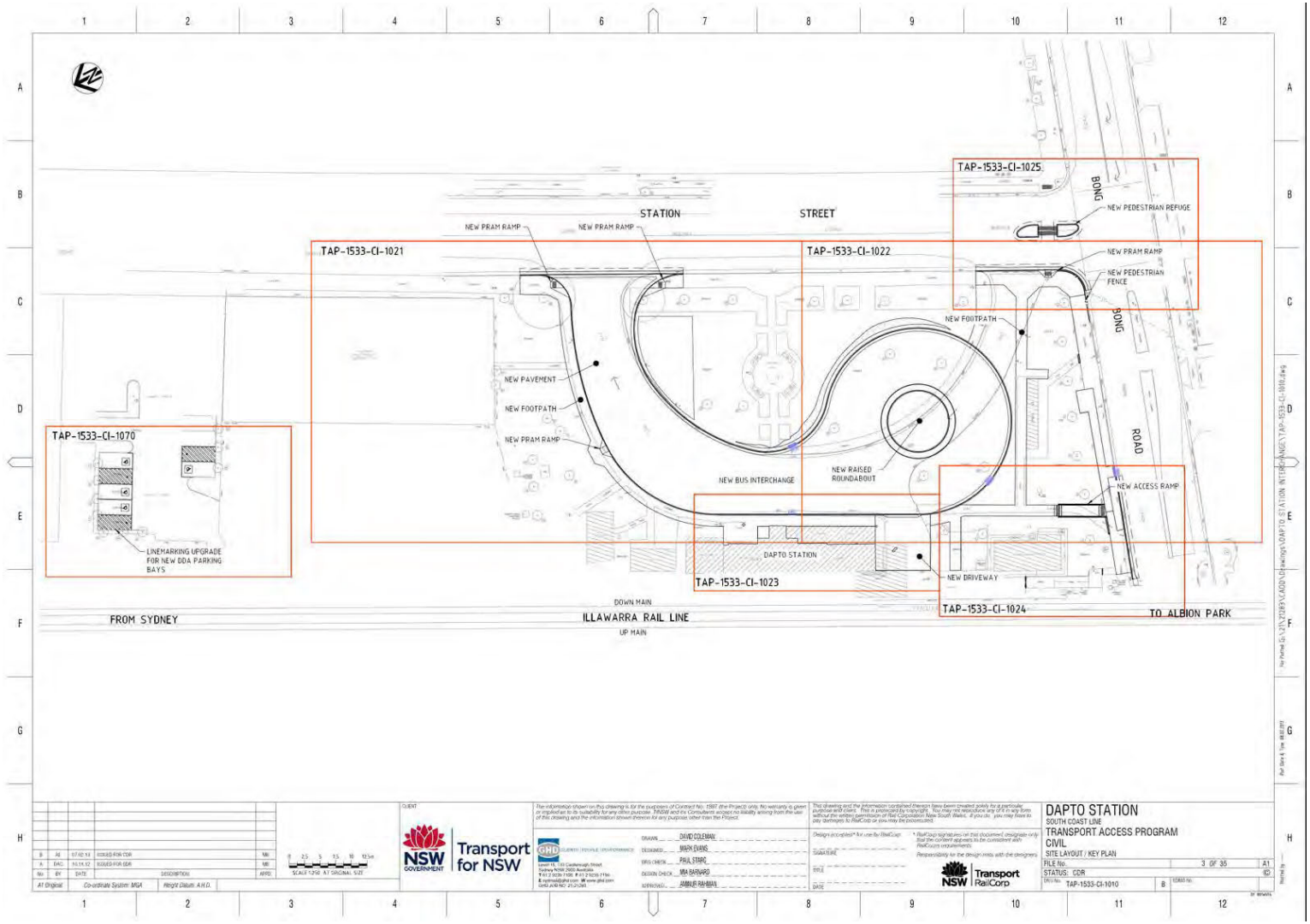

Figure 5.1 Dapto Station Transport Access Program: Civil Works Site Layout Plan, showing a new bus and vehicle turnaround access road at the main entrance to the station (Source: TfNSW, TAP-1533-Cl-1010).

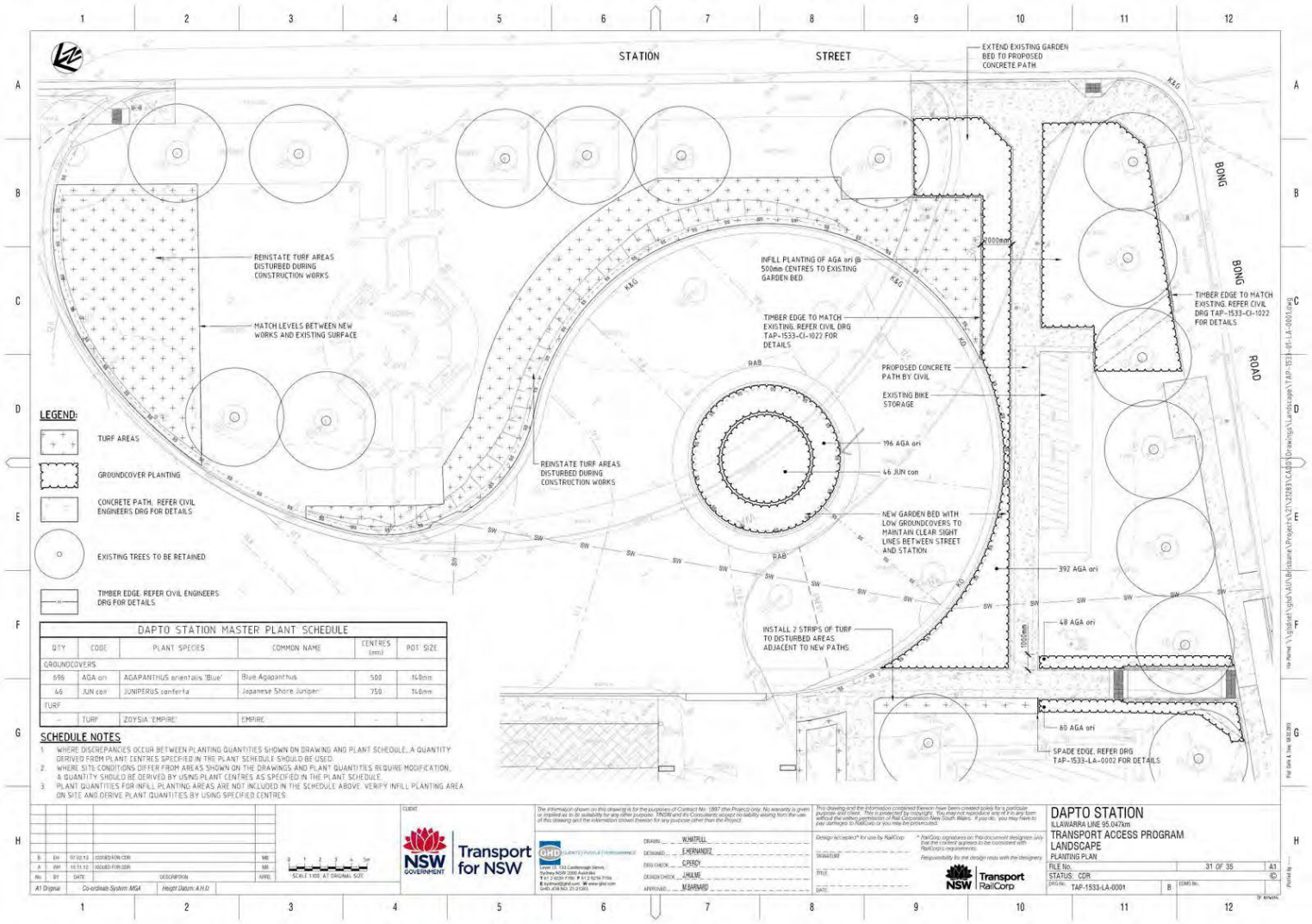

Figure 5.2 Dapto Station Transport Access Program: Landscape Plan (Source: TfNSW, TAP-1533-LA-0001).

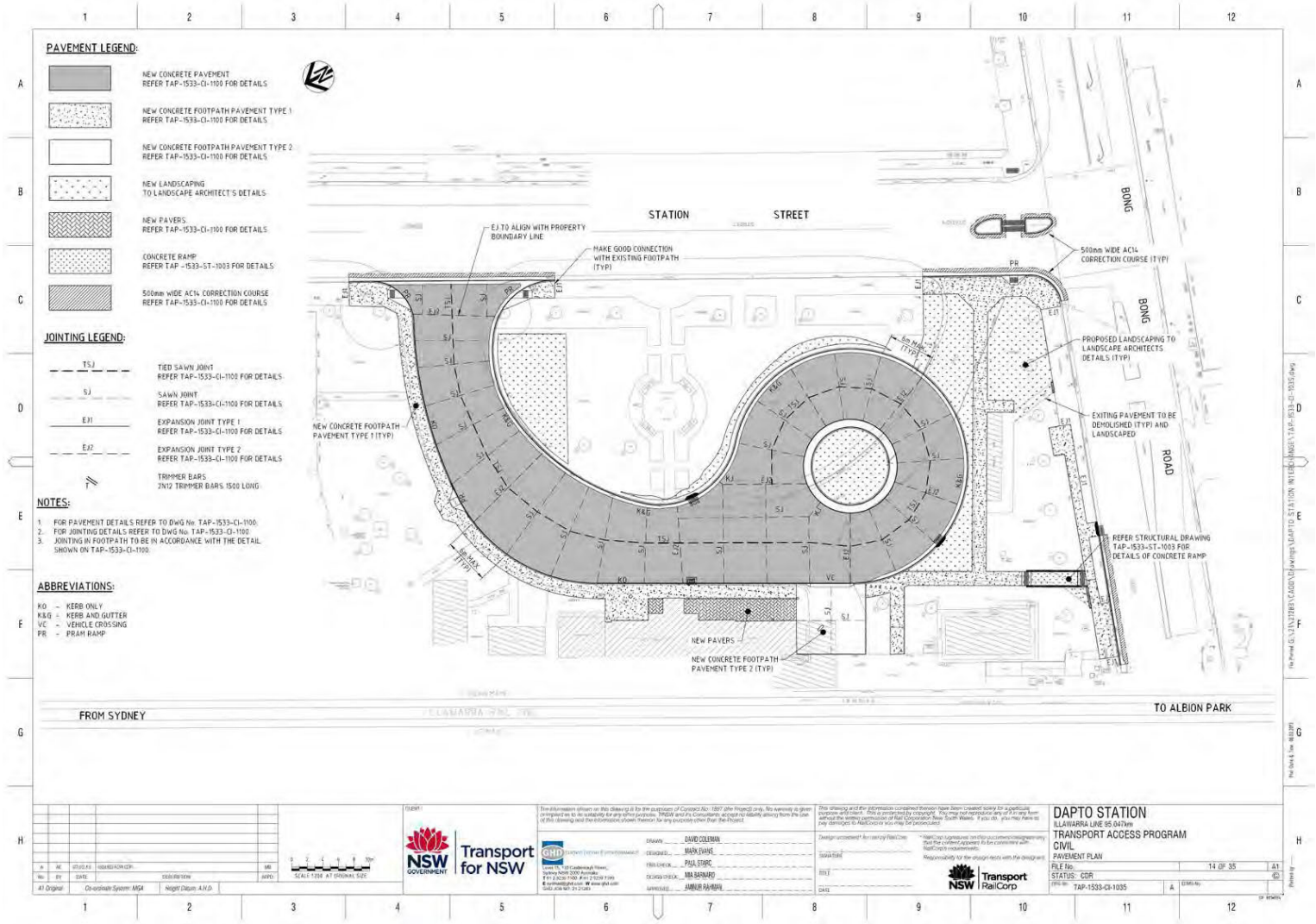

Figure 5.3 Dapto Station Transport Access Program: Pavement Plan (Source: TfNSW, TAP-1533-CI-1035).

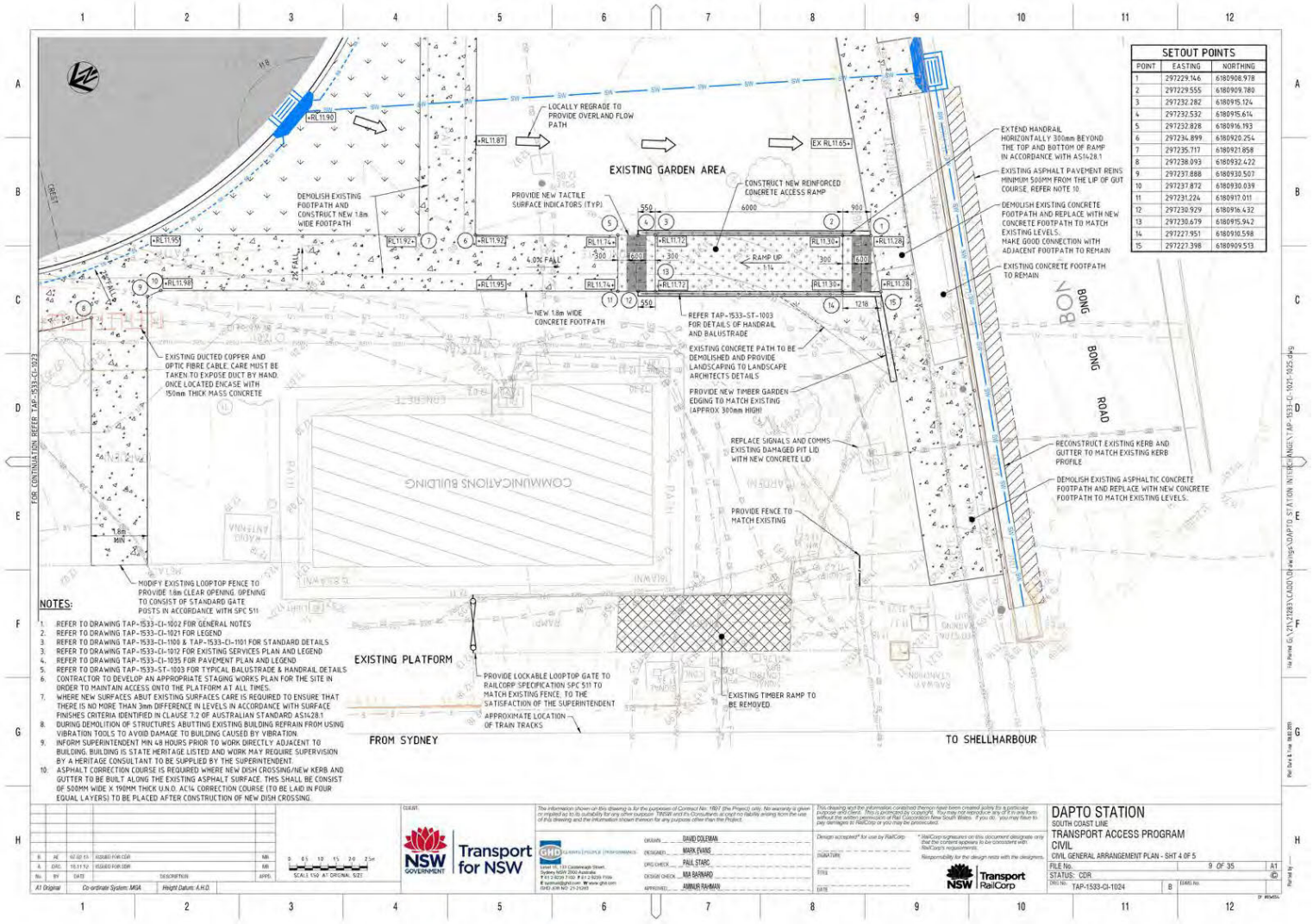

Figure 5.4 Dapto Station Transport Access Program: Detail of new ramp (Source: TfNSW, TAP-1533-Cl-1024).

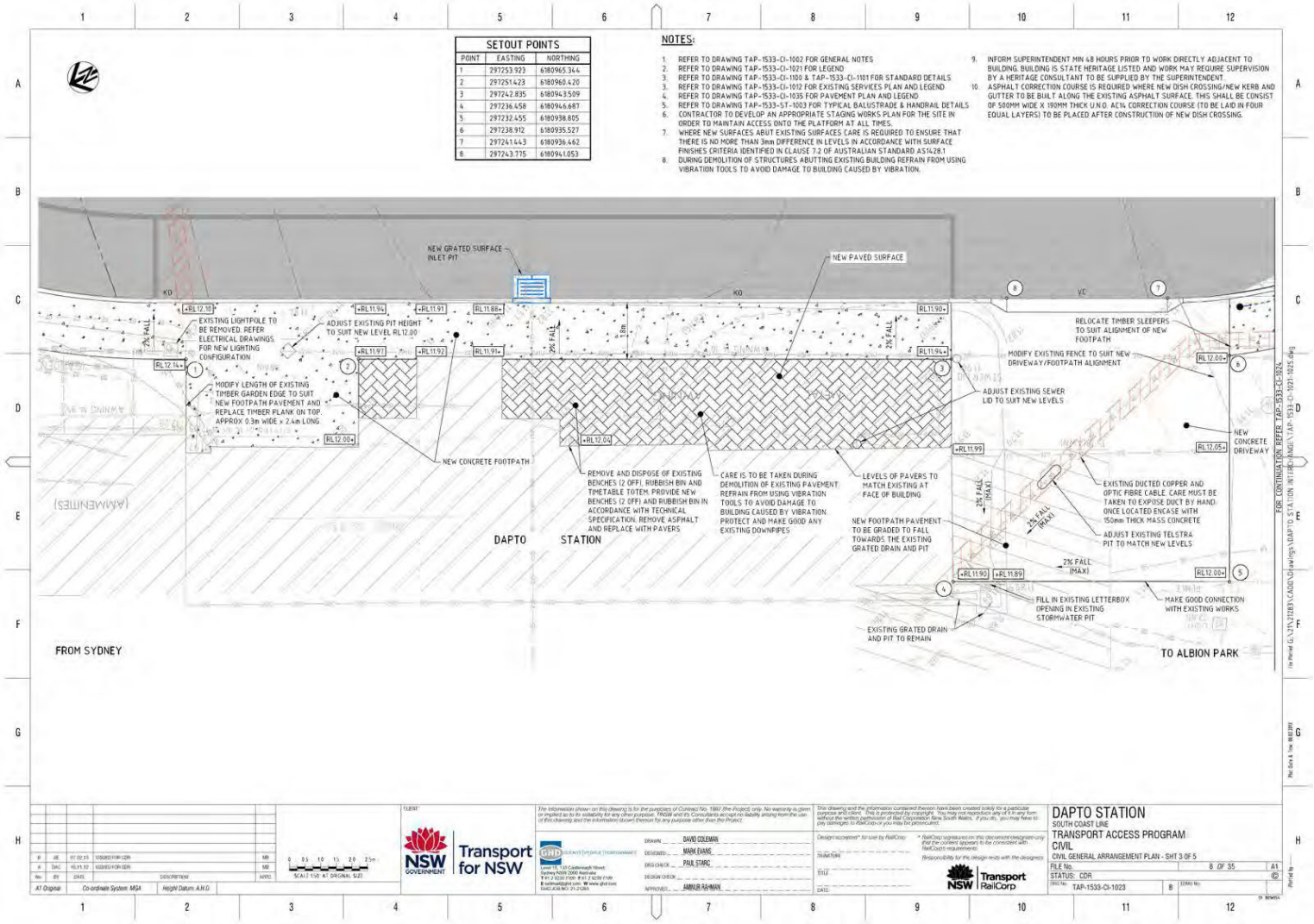

Figure 5.5 Dapto Station Transport Access Program: Detail of pavement adjacent to the main station building (Source: TfNSW, TAP-1533-Cl-1023).

6 Assessment of Heritage Impacts

Dapto Railway Station Group has historic, aesthetic, and social significance, associated with its role as a transport hub for Dapto since 1887. This section details the impacts of the proposed works on the identified heritage values of the station group.

The following aspects of the proposal respect or enhance the heritage significance of the item or conservation area for the following reasons:

- Construction of the new low speed bus and vehicle turnaround access road aims to improve the safety and accessibility of Dapto Station and as such respects the historic and social significance of Dapto Railway Station Group as an early and ongoing transport hub for the town of Dapto.

- Construction of a new DDA compliant access ramp to Platform 2 aims to upgrade the station interchange to current operational standards and as such respects the historic and social significance of Dapto Railway Station Group as an early and ongoing transport hub for the town of Dapto. Care would be taken to avoid damage to original brickwork of the 1887 platform during works.

- Construction of new concrete pavement around the turning circle, the removal of asphalt surface alongside the original 1887 platform building, and replacement of the asphalt with pavers would improve the aesthetic appearance of the main platform building and as such respects the historic, aesthetic and social value of the building. Care would be taken to avoid damage to original fabric of the building during works.

- CCTV cameras will provide enhanced security for the station's buildings, which may in turn contribute to the conservation of heritage values of the station group. New CCTV cameras will not be attached to original fabric of the 1887 platform building.

- The proximity and scale of the new low speed bus and vehicle turnaround and associated pavement works would not affect the historic or aesthetic significance of the former Station Master's Residence.

The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:

- Construction of the new low speed bus and vehicle turnaround access road will have major adverse impacts on the aesthetic significance of the station precinct by:
    - radically altering the semi-circular layout of Hartigan park and the driveway off Station Street, which were established in front of the station in the late nineteenth or early twentieth century, centred on the original 1887 station building;
    - substantially reducing the landscaped area of the park, including the removal of five trees;
    - altering the leafy view corridor from the Station Street / Bong Bong Road intersection to the main station building;
    - removing the traditional point of access to/from the main station building from/to the pathway across Hartigan Park and the local war memorial;
    - altering the roughly symmetrical layout of the park around the local war memorial, constructed in 1996;
    - introducing a larger hard-surface area to the east of the main station building.

These changes will detract from the historic, picturesque setting of the main station building. However, the proposed turning circle is seen as providing a safer outcome for all users of the interchange, insofar as it provides an opportunity to:

- eliminate the southern interchange access point. This access is located too close to Bong Bong Road, and there is the potential for traffic and pedestrian accidents at this point;
- install a pedestrian refuge near the Station Street / Bong Bong Road intersection, to enhance the safety of pedestrians and bus commuters who must cross Station Street to enter the station;
- discourage pedestrians from entering and/or leaving the station precinct via the war memorial. There is potential for pedestrian and vehicle conflicts in front of the main station building. Pedestrians will therefore be directed around the turnaround via improved and widened footpaths; and
- provide a better bus set down location for all buses under future local traffic management arrangements.

Adverse impacts on heritage values will be mitigated by:

- preservation of the existing mature street trees along Station Street and Bong Bong Road;
- preservation of the original pathway alignment from Station Street to the war memorial and associated view corridors leading from Station Street to the main platform building; and
- new landscaping within the park and along the former southern access road following the construction of the turnaround.

- Construction of the new low speed bus and vehicle turnaround access road will have minor adverse impacts on the social significance of the station precinct by reducing the landscaped area surrounding the war memorial that would be available for community memorial services. Proximity of the bus turnaround to the memorial will also detract from the dignity of the place.

  Adverse impacts would be mitigated by

  - retention of the war memorial in its original location;
  - preservation of the original pathway alignment from Station Street and associated view corridors leading from Station Street and the main platform building to the war memorial;
  - preservation of the existing radial layout of the garden beds surrounding the memorial; and
  - new landscaping within the park following the construction of the turnaround, taking into consideration feedback from the RSL Dapto Sub-Branch, including semi-circular hedging to the south of the war memorial, to buffer against the bus turnaround.

The following sympathetic solutions have been considered and discounted for the following reasons:

- No alternative solutions have been considered to-date.

6.1 Statement of Heritage Impact

Construction of the new low speed bus and vehicle turnaround access road, access ramp, and other works aim to improve the safety and accessibility of Dapto Station and as such respects the historic and social significance of Dapto Railway Station Group as an early and ongoing transport hub for the town of Dapto. However, the works will have major adverse impacts on the aesthetic significance of the station precinct, and minor impacts on the social significance of the station precinct, by altering the semi-circular layout of Hartigan Park and the driveway off Station Street, which was established in front of the station in the late nineteenth or early twentieth century, centred on the original 1887 station building. The changes will detract from the historic, picturesque setting of the main station building and the dignity of the local war memorial, and reduce the landscaped area surrounding the memorial that is available for community memorial services. Adverse impacts on heritage values will be mitigated by the preservation of the existing mature street trees along Station Street and Bong Bong Road; preservation of the original pathway alignment from Station Street and associated view corridors leading from Station Street to the main platform building; and new landscaping following the construction of the turnaround.

7 Conclusions and Recommendations

The proposed upgrades to the transport interchange on the east side of Dapto Railway Station will improve the safety and accessibility of the station for the local community. The station precinct provides important public transport services to the community; however, implementation of the upgrades should observe the principles of the Burra Charter, which define standards of best practice for the conservation and management of heritage places. The aim of conservation is to retain the cultural significance of a place. This report has identified two heritage items or places in the immediate vicinity of the development:

- Dapto Railway Station Group, listed on RailCorp Section's 170 Register and Wollongong LEP 2010; and
- Station Master's Residence, listed on Wollongong LEP 2010.

A local war memorial sited within the heritage curtilage of Dapto Railway Station Group is also likely to have a high degree of social value to the local community.

7.1 Consultation

Under Section 170 of the Heritage Act, RailCorp must ensure that the items listed on its Heritage and Conservation Register are maintained with due diligence and in accordance with the State Owned Heritage Management Principles. As such, RailCorp should be notified of the proposed works. Most activities that impact on a heritage item require the preparation of a heritage impact statement. This report satisfies this requirement.

Recommendation 1

RailCorp should be notified of the proposed works and be provided with a copy of this report. Changes to the form, fabric and landscape setting of the Dapto Railway Station Group should be recorded in the Heritage Inventory for this item.

Under Clause 14 of SEPP Infrastructure, TfNSW should consult with Wollongong City Council regarding the impact of the development on local heritage items. Wollongong City Council should be informed in writing of the intention to carry out the development, and a copy of this report should be provided to Council. TfNSW should take into consideration Council's response received within 21 days.

Recommendation 2

TfNSW should inform Wollongong City Council in writing of the details of the proposed upgrades to Dapto Railway Station, once the designs have been finalised. A copy of this report should be provided to Council as supporting documentation. The TfNSW should take into consideration Council's response received within 21 days.

7.2 Retaining Significance

The proposed upgrades support the historic significance of Dapto Railway Station Group as a viable transport hub, providing public transport services to the local community since 1887. However, the proposed bus and vehicle turnaround will have adverse impacts on the landscape setting and aesthetic values of the station precinct, and the social value of the local war memorial. These impacts will be mitigated by the preservation of the existing mature street trees along Station Street and Bong Bong Road; preservation of the original pathway alignment from Station Street and associated view corridors leading from Station Street to the main platform building; and landscaping within the park and along the former southern access road following the construction of the turnaround.

Recommendation 3

Future landscaping of Hartigan Park should aim to preserve the picturesque landscape setting and views of the main 1887 station building from Station Street, including the original pathway alignment across the park and access to the path from the street. It should also provide a dignified setting for the local war memorial, taking into consideration the requirements of the RSL and other groups who may use the park for memorial services.

The construction of a new easy access ramp to Platform 2, changes to CCTV, and the installation of new paving are minor works, and are unlikely to have an adverse impact on the 1887 fabric of the platform or the main platform building. However, care should be taken to avoid inadvertent damage to the platform and the platform building during works, particularly during removal of the existing asphalt pavement and timber ramp. Contractors should be appropriately briefed about the heritage significance of the place prior to the start of works.

7.3 Recording Change

A documentary record of changes to the aesthetic values of the Dapto Railway Station Group should be maintained for the appreciation of future generations.

Recommendation 4

Copies of construction plans and photographs illustrating the completed works should be lodged with RailCorp's Office of Rail Heritage, as a documentary record of changes to the station precinct.

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Singleton, C C 1945, 'The Illawarra line', *Australasian Railway Locomotive Historical* Society Bulletin, Vol 16, No 96, pp 50-54.

Websites

Spatial Information eXchange, Historical Land Records Viewer
http://images.maps.nsw.gov.au/pixel.htm

State Heritage Inventory (SHI)
http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx

Wollongong City Library, Illawarra Images
http://mylibrary.wollongong.nsw.gov.au/cgi-bin/spydus.exe/MSGTRN/PIC/BSEARCH

Other Sources

RailCorp Plan Room

Appendix A – Heritage Inventories

SHI: RailCorp Section 170 Register

Dapto Railway Station Group

SHI: Wollongong City Council Heritage Inventory

Dapto Station Masters Cottage

Dapto Railway Station Group

Item details

Name of item: Dapto Railway Station Group
Type of item: Built
Group/Collection: Transport - Rail
Category: Railway Platform/ Station
Primary address: Station Street, Dapto, NSW 2530
Local govt. area: Wollongong City

Boundary:

North: 5m north of the end of the eastern platform; East: a line parallel to the eastern platform to a point adjacent to the south boundary of the former Station Master's residence, then a line out to Station Street, along the west side of Station Street (including Hartigan Park and the circular drive adjacent to the 1887 Platform building) to Bong Bong Road; South: the north side of Bong Bong Road level crossing; West: a line parallel to the western platform. Note this curtilage excludes Bong Bong Road, excludes the former Station Masters residence (now in private ownership), and includes Hartigan Park and the circular drive adjacent to the 1887 eastern platform building.

All addresses

Street Address	Suburb/town	LGA	Parish	County	Type
Station Street	Dapto	Wollongong City			Primary Address
Bong Bong Road	Dapto	Wollongong City			Alternate Address

Owner/s

Organisation Name	Owner Category	Date Ownership Updated
RailCorp	State Government	
RailCorp	State Government	
RailCorp	State Government	

Statement of significance:

Dapto Railway Station, specifically the 1887 Platform 2 building, early station sign, and the station's streetscape setting from Station Street - is of local heritage significance. The 1887 Dapto Railway Station Platform 2 building is of historical significance as evidence of the first phase of the construction of the Illawarra line, and for its role as a transport hub for Dapto since 1887. The 1887 Dapto Railway Station Platform 2 building and its landscape setting off Station Street is of aesthetic significance as a representative example of late 19th century railway station architecture and landscaping. The 1887 Platform 2 building, though altered, is relatively rare, being one of four extant weatherboard '3rd class' platform buildings on the Illawarra Line.

Date significance updated: 29 May 09

Note: There are incomplete details for a number of items listed in NSW. The Heritage Branch intends to develop or upgrade statements of significance and other information for these items as resources become available.

Description

Designer/Maker: NSW Government Railway
Builder/Maker: D. Proudfoot & T. Logan (line), Robert Spiers (station buildings)
Construction years: 1887-1993
Physical description: PRECINCT ELEMENTS
Platform 2 modern buildings:
- Shop (c.2001)
- Skillion Roofed Building (modern)
- Toilet Block (1970)

Platform 2 Building (1887) Type 4
Platforms:

- Platform 1 (1993)
- Platform 2 (1887)
Platform canopies and shelter (modern)
Landscape: semi-circular entrance drive and park area to east of station (west of Station Street)
Moveable items: Early station sign

CONTEXT:
Dapto Railway Station is located to the west of Station Street, with the Bong Bong Road level crossing at the southern end of the station. The station is entered off Station Street via a semi-circular driveway. The Station perimeters are fenced with white powder coated aluminium fencing.

PLATFORM 2 SHOP (c.2001)
Exterior: A metal clad building with a hipped corrugated steel roof.

Interior: Not accessed 2009.

PLATFORM 2 SKILLION ROOFED BUILDING (modern)
Exterior: A weatherboard skillion roofed building with aluminium framed sliding windows and timber flush doors.

Interior: Not accessed 2009.

TOILET BLOCK (1970)
Exterior: A square blond texture brick toilet block with a flat roof.

Interior: Not accessed 2009.

MAIN PLATFORM 2 BUILDING (1887)
Exterior: Attached to the south elevation of the skillion roofed building is the 1887 weatherboard platform building. This weatherboard building is the main station building. The building has a complex corrugated steel clad gabled roof form with projecting central bay facing Station Street with a separate gabled entry porch flanked by small side verandas. On the platform (west) side the building has a platform awning supported on timber stop-chamfered posts. These posts now have concrete bases. The building has c.1920s architraves to doors, and aluminium framed double hung windows. There are timber sliding doors to both entries to the waiting area. On the station car park (west) side of the building is an awning on timber posts and a gabled weatherboard entry porch with a weatherboard wall to the street (west) side, a pendant, decorative timber barge boards and the date "1887" and a old metal station sign stating "Dapto Station" on the gable end. The gable end has detailed timberwork. There are no chimneys (these have been removed). The building is entered from a circular driveway on the Station Street (east) side.

Interior: The building has a central waiting room/booking office with Station Master's office and ladies' waiting room to either side. The waiting area has been modernised, with modern tiling and vinyl floor coverings, timber veneer wall panelling, a c.1970s drop-in panel ceiling, and modern ticket windows.

PLATFORM 1(1993)
This is the west platform, which has an open concrete base and concrete decking. The platform has security mesh and aluminium powder coated fencing to the rear.

PLATFORM 2(1887)
This is the partly original east platform which has a brick edge with concrete capping, until it joins a more modern island section of platform at the northern end. Platform 2 has an asphalt surface.

PLATFORM CANOPIES & SHELTER (modern)
Platform 1 (west) platform has a modern corrugated steel roofed canopy with steel posts on concrete bases, and a corrugated steel platform shelter in approximately the centre of the platform's length. The platform canopy has fluorescent strip lighting along the underside of the roof. Platform 2 (west) platform has modern canopies on steel posts with concrete bases to the posts, and a corrugated steel roof, at the north and south ends of the platform.

LANDSCAPE/NATURAL FEATURES
The circular drive to the east, off Station Street, with its strip of park (Hartigan Park) separating the drive from the street, planted with brush box and canary island date palms, is a significant streetscape setting for the main platform building. Hartigan Park contains a Korean and Vietnam War Memorial.

MOVEABLE ITEMS
Early station sign on 1887 Platform 2 building.

Physical condition and/or Archaeological potential:
Platform 2 modern buildings (various): good
Platform 2 (east platform) main platform building (1887): good
Platforms: good
Platform canopies and shelter (modern): good
Landscape/Natural Features: good
Date condition updated:11 Jul 09

Modifications and dates:
c.1920s: Platform 2 main building joinery added
Prior to 1970s: Removal of goods yard structures.
1970: Platform 2 main building- new fitout to waiting area.
1971: Toilet block to north of Platform 2 building replaced with new brick toilet block.
c. 1990: Platform canopy additions and street awning to Platform 2 altered.
1993: .Platform No. 1 added with platform canopy and line electrified 1993.
2001: Plans show addition of a shop to the northern end of Platform 2.
N.d: The Platform 2 main building has been altered with concrete bases to early timber stop-chamfered awning posts and all chimneys have been removed.

Current use: Railway Station
Former use: Nil

History

Historical notes:

The name Dapto is said to be an Aboriginal word either from "Dabpeto" meaning "water plenty", or from "tap-toe" which described the way a lame Aboriginal chief walked. The aborigines called the area "Mookoonburro" meaning "grub".

One of the first references to the name Dapto was in instructions issued to Surveyor Knapp on 10 April 1829. Knapp was instructed "to survey ten 100 acre lots for veterans on Dapto Creek". In 1833 George Brown received a grant of 300 acres south of Mullet Creek. George Brown transferred the Ship Inn from Wollongong to Mullet Creek Farm in 1834 and thereby established the nucleus of Dapto.

With the coming of the railway in 1887, however, the centre of the township was moved south and the original Dapto, where the inn was located, later became known as Brownsville. A new town began to grow up around the station.

The line between Wollongong and Bombo opened as an isolated line in 1887 with a series of timber station buildings being constructed at each site, the size depending on the importance of the location. Dapto was the most substantial station building on that section of line.

Dapto station was opened as a typical 3rd class timber railway station building, usually built for medium sized country towns, and the station included a brick Station Master’s residence, timber goods shed, timber platform, a large road forecourt and stockyards, the yard also having a crossing loop and waiting facilities.

A plan dated 1913 shows the station as having at that time (from south to north): a Gatekeeper's residence to the southwest of the Bong Bong Road level crossing; ramps at both ends of the single (eastern) platform; the 1887 platform building, a toilet on the platform to the north, a Station Master's residence; a coal bin at the southern end of an extensive goods siding, a cattle yard, trucking yard, goods shed, and butter factory with adjacent coal bin, loading dock and tank stand.

A plan dated 1930 with later annotations shows (from south to north): a Gatekeeper's residence (annotated as having been removed in 1970) to the southwest of the Bong Bong Road level crossing; the single 1887 platform building (annotated as having "additional parcels accommodation" completed in 1970); WC to the north on the platform; on the eastern side of the line an extensive goods siding; a Station Master's residence (still extant) with well and tank behind; a coal bin; a cattle yard (annotated "stockyards abolished 17/8/1961); an area leased to Arnott's Biscuits; a goods shed (no longer extant); a produce shed for J.F. Fairley Pty Ltd; a butter factory with coal bin and tank adjacent; and a wheat hopper.

Plans dated 1971show demolition of toilets to the north of the platform building and construction of a new brick toilet block, and to the north of the platform, a proposed new warehouse with loading dock adjacent to an area marked "proposed lease to Arnott's Biscuits Pty Ltd NSW Div".

The major changes to the immediate station environment appear to have been caused by the electrification of the line southwards from Wollongong in 1993, which altered most of the station canopies and awnings. A concrete platform extension was also added to the original station platform, as well as the new Platform No 1 on the crossing loop.

About 15 years ago the Station Master's residence was sold, and is now used as a private residence.
The goods yard structures have been removed, and the only significant structure at Dapto still extant and in RailCorp ownership is the 1887 weatherboard station building on Platform 2. The landscape setting of the 1887 platform building from Station Street, with its semicircular drive is also significant.
In 2001, the entire interior of the 1887 Platform building is shown as a booking office, with a toilet building to the north and a shop to the north of that, on the platform.

Assessment of significance

SHR Criteria a) [Historical significance]	The 1887 Dapto Railway Station Platform 2 building is of historical significance as evidence of the first phase of the construction of the Illawarra line, and for its role as a transport hub for Dapto since 1887, in a relatively important location indicated by provision of a substantial 3rd class platform building and goods yard which by 1913 included a butter factory, goods shed and cattle yard.
SHR Criteria c) [Aesthetic significance]	The 1887 Dapto Railway Station Platform 2 building and its landscape setting off Station Street is of aesthetic significance as an example of a 3rd class late 19th century weatherboard platform building with a landscaped setting.
SHR Criteria d) [Social significance]	The place has the potential to contribute to the local community's sense of place, and can provide a connection to the local community's past.
SHR Criteria f) [Rarity]	The 1887 Dapto Railway Station Platform 2 building is a rare Type 4 weatherboard platform building, though not wholly intact, and is one of four extant on the Illawarra line. The most intact examples are at Albion Park and Bulli.
Integrity/Intactness:	The 1887 Dapto Railway Station Platform 2 building is extensively altered, however retains its form and much of its external materials (chimneys are missing). Its context has lost considerable significance due to the loss of all the goods yard structures, and an accumulation of late 20th century ancillary buildings and platform canopies on Platform 2 which are of little significance. However, the Platform 2 building retains its significant landscape setting to Station Street.
Assessment criteria:	Items are assessed against the State Heritage Register (SHR) Criteria to determine the level of significance. Refer to the Listings below for the level of statutory protection.

Recommended management:

Recommendations

Management Category	Description	Date Updated
Recommended Management	Produce a Conservation Management Plan (CMP)	29 May 09

Listings

Heritage Listing	Listing Title	Listing Number	Gazette Date	Gazette Number	Gazette Page
Heritage Act - s.170 NSW State agency heritage register	SRA s.170 Register				

Study details

Title	Year	Number	Author	Inspected by	Guidelines used
State Rail Authority Heritage Register Study	1999	SRA136	State Rail Authority		No
Heritage and Conservation Register State Rail Authority of NSW	1993	9	Paul Davies for SRA		No

References, internet links & imagess

Type	Author	Year	Title	Internet Links
Written			Brief locality history from www.wollongong.nsw.gov.au/library/localhistory.asp	
Written	C. C. Singleton	1981	Railway History in Illawarra, NSW	
Written	David Sheedy	2009	Historical Research for RailCorp S170 Register Update	

Note: internet links may be to web pages, documents or images.










(Click on thumbnail for full size image and image details)

Data source

The information for this entry comes from the following source:

Name:	State Government
Database number:	4801136

Return to previous page

Dapto Station Masters Cottage

Item details

Name of item: Dapto Station Masters Cottage
Type of item: Complex / Group
Group/Collection: Transport - Rail
Category: Railway Residence/Quarters
Primary address: Station Street, Dapto, NSW 2530
Local govt. area: Wollongong City

All addresses

Street Address	Suburb/town	LGA	Parish	County	Type
Station Street	Dapto	Wollongong City			Primary Address

Statement of significance:

Typical vernacular architecture of the late Victorian period. Designed by government architect, complements railway station.
Date significance updated: 27 Mar 00
Note: There are incomplete details for a number of items listed in NSW. The Heritage Branch intends to develop or upgrade statements of significance and other information for these items as resources become available.

Description

Physical description: Single storey brick house, corrugated metal roof. Draped front verandah.
Further information: Now in private ownership.

Current use: house
Former use: Stationmasters house

Historic themes

Australian theme (abbrev)	New South Wales theme	Local theme
3. Economy-Developing local, regional and national economies	Transport-Activities associated with the moving of people and goods from one place to another, and systems for the provision of such movements	(none)-

Assessment of significance

SHR Criteria a) [Historical significance] The item has historic value.
SHR Criteria c) [Aesthetic significance] The item has group, architectural, townscape and aesthetic value.
Integrity/Intactness: The item has integrity.
Assessment criteria: Items are assessed against the State Heritage Register (SHR) Criteria to determine the level of significance. Refer to the Listings below for the level of statutory protection.

Listings

Heritage Listing	Listing Title	Listing Number	Gazette Date	Gazette Number	Gazette Page
Local Environmental Plan			07 Jan 00	1/2000	69

Study details

Title	Year	Number	Author	Inspected by	Guidelines used
	1991	B32-SW		Rob Gansi	No

City of Wollongong Heritage Study	McDonald McPhee Rogers Conacher Fullarton

References, internet links & imagess

None

Note: internet links may be to web pages, documents or images.

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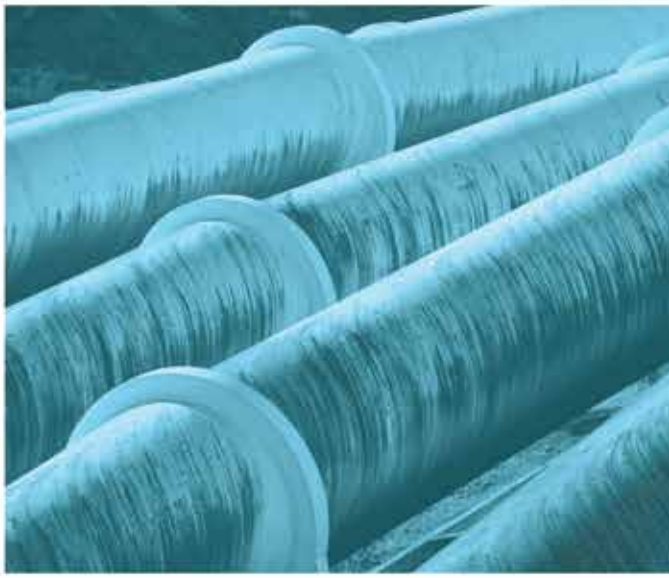
Data source

The information for this entry comes from the following source:

Name: Local Government
Database number: 2700572



Appendix H – Aboricultural Impact Assessment Report

HUNTER BRUCE
TREE CONSULTING

Arboricultural Impact Assessment Report (AIA)

Date: 23/06/2022

Prepared For: Degnan Constructions
50 Barry Ave,
Mortdale NSW 2223

Site Address: Dapto Train Station
Dapto NSW 2518

Prepared By: Russell Cleaver

Consulting arborist
Diploma of Arboriculture (AQF 5)
ISA Tree Risk Assessment Qualified

1 Contents

2 Background

2.1 Introduction

An Arboricultural Assessment Report was commissioned by Degnan Constructions to identify and assess the trees impacted by the Dapto Station Upgrade works. The report aims to determine each tree's useful life expectancy (ULE), determine tree retention values, and make recommendations on tree sensitive construction methods and/or design modifications to preserve trees where possible.

Only trees located on the survey were assessed and included in the report.

The conclusions and recommendations of this report are based on the Australian Standard, AS 4970-2009, Protection of Trees on Development Sites, and the findings from the site inspection.

2.2 The Site

The site forms part of Dapto Train Station (figure 1), and includes planted locally indigenous tree species, planted exotic tree species and self-seeded exotic tree species.

FIGURE 1 - THE SITE (NEARMAPS.COM.AU)

2.3 The Proposal

The upgrade at Dapto Station is being delivered as part of the Transport Access Program (TAP), which is a NSW Government initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure across the state. As part of the program, the Dapto Station Upgrade would aim to provide a station precinct that is accessible to those with a disability, limited mobility, parents/carers with prams and customers with luggage[1].

The proposed upgrades include:

- Updating the level crossing pedestrian zone
- Upgrading ramps
- Creating a formal kiss and ride zone
- Upgrading bathrooms to include an ambulant toilet in both male and female bathrooms
- Upgrades to existing footpaths to the station entrance
- Upgrading Platform 2 in front of the station building to achieve a compliant level
- Widening Platform 1 up to the Boarding Assistance Zone.
- Upgrading existing lighting to increase security.

2.4 Statutory Requirements

It was found that the following statutory regulations applied to the land:

- *Environmental Planning and assessment Act 1979 (NSW)*
- *Australian Standard 4970 – Protection of Trees on Development Sites (2009)*
- *Australian Standard 4373 Pruning of Amenity Trees (2007)*
- *Australian Standard 2303 Tree Stock for Landscape Use (2015)*
- *Safe Work Australia Guide for Managing Risks of Tree Trimming and Removal Work (2016)*

2.5 Subject Trees

A site inspection was carried out by Russell Cleaver (AQF 5 Arborist) on the 3rd of May 2022 and fourteen (14) trees were assessed and included in the report. Details of each tree can be found in the 'Tree Schedule' in **Appendix 1** and photos of each tree can be found in **Appendix 2**.

2.6 Documents and Plans Referenced

- *Dapto Station - ILLAWARRA LINE 95.047km, TRANSPORT ACCESS PROGRAM 3, Civil and Drainage works plan*.
- *Dapto Station - ILLAWARRA LINE 95.047km, TRANSPORT ACCESS PROGRAM 3, Architecture.*
- *Dapto Station - ILLAWARRA LINE 95.047km, TRANSPORT ACCESS PROGRAM 3, CSR.*

[1] https://www.transport.nsw.gov.au/projects/current-projects/dapto-station-upgrade

3 Methodology

3.1 Visual Tree Assessment

An assessment of each tree and vegetation area was undertaken by AQF level 5 arborist Russell Cleaver and was made using the Visual Tree Assessment (VTA) procedure[2]. All the trees were assessed in view from the ground. No aerial inspection or diagnostic testing has been undertaken as part of this assessment. Tree height, and canopy spread were estimated. Diameter at breast height (DBH) was measured using a diameter tape when required.

3.2 Safe Useful Life Expectancy

The remaining Safe Useful Life Expectancy of the tree is an estimate of the sustainability of the tree in the landscape, calculated based on an estimate of the average age of the species in an urban area, less its estimated current age. The life expectancy of the tree has been further modified where necessary in consideration of its current health and vigour, condition, and suitability to the site. Detailed methodology can be found in **Appendix 6.**

The following ranges have been allocated to each tree:

- Greater than 40 years (Long)
- Between 15 and 40 years (Medium)
- Between 5 and 15 years (Short)
- Less than 5 years (Transient)
- Dead or immediately hazardous (defective or unstable)

3.3 Tree Retention value

The trees have been allocated a sustainable retention value determined by using the Institute of Australian Consulting Arboriculturalists Significance of a Tree Assessment Rating System (STARS©) and can be found in **Appendix 7**.

The retention value of each tree was calculated by assessing both the estimated life expectancy and the significance of the tree. In relation to life expectancy, the health, condition, and suitability of the tree to the site was assessed. The landscape significance of each tree was determined by assessing the amenity, heritage, and ecological values of the tree.

A rating has been given to the trees as a measure of the significance of the tree in the landscape and to assist in determining priorities for retention. The recommended actions for each retention value category are listed in **Table 1** below.

[2] VTA is an internationally recognised practice in the visual assessment of trees as formulated by Mattheck & Breloer (1994). Principle explanations and illustrations are contained within the publication, Field Guide for Visual Tree Assessment by Mattheck, C., and Breloer, H. Arboricultural Journal, Vol 18 pp 1-23 (1994).

Retention Value	Recommendations
High	• These trees are considered important for retention and should be retained and protected. • Design modification or relocation of buildings should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970. • Tree sensitive construction measures must be implemented e. pier and beam etc if works are to proceed within the TPZ.
Medium	• The retention of these trees is desirable, but not essential.. • Their removal should only be considered if adversely affecting the proposed building/works, and all other alternatives have been considered and exhausted. • If these trees must be removed, replacement planting should be considered in accordance with Council's Tree Replenishment Policy to compensate for loss of amenity.
Low	• These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention. • These trees should not be considered as a constraint to the future development of the site.

3.4 Tree Protection Zones

There are two types of zones (as defined by AS 4970-2009) that need to be considered when undertaking an arboricultural impact assessment:

- Tree protection zone (TPZ): The TPZ is the optimal combination of crown and root area (as defined by AS 4970-2009) that requires protection during the construction process so that the tree can remain viable. The TPZ is calculated by measuring the diameter at breast height (DBH) and multiplying it by twelve (12). The resulting value is applied as a radial measurement from the centre of the trunk to delineate the TPZ. The maximum TPZ should be no more than 15m radius and the minimum should be no less than 2m radius.

- Structural root zone (SRZ): The SRZ is the area of the root system used for stability, mechanical support, and anchorage of the tree. This is the minimum area recommended to maintain tree stability but does not reflect the area required to sustain tree health. Works within this zone are not permitted as it may compromised structural stability.

3.5 Encroachment into the Tree Protection Zone

Encroachment within the TPZ is acceptable, providing that the arborist can demonstrate that the tree will remain viable. There are three (3) levels of encroachment (as defined by AS 4970-2009):

- **No encroachment (0%): No encroachment within the TPZ.**
- **Minor encroachment (<10%): The encroachment is less than 10% of the TPZ.**
- **Major encroachment (>10%): The encroachment is greater than 10% of the TPZ.**

3.5.1 Minor Encroachment

Encroachment into the TPZ of less than 10% is considered acceptable, though this is dependent on-site conditions and tree characteristics. The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ. Detailed root investigations should not be required. Examples of acceptable incursions are shown in **Appendix 8**.

3.5.2 Major Encroachment

When encroachment into the TPZ exceeds 10%; the project arborist must demonstrate why the tree will remain viable; non-destructive root investigation may be required to investigate and identify the location of roots within the proposed area of encroachment; the area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ; and the project arborist will be required to supervise any works within the TPZ area.

4 Results

4.1 High retention Trees

Trees numbered 5, 6, 7, 8, 13 and 14 were given a 'High' retention value.

The recommendations made by 'IACA Australian Consulting Arboriculturalists Significance of a Tree Assessment Rating System (STARS©)', state the following where trees are determined to have a 'High' retention value:

'Design modification or relocation of buildings should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970.'

4.2 Medium Retention Trees

Trees numbered 1, 4, 10 and 11 were given a 'Medium' retention value.

The recommendations made by 'IACA Australian Consulting Arboriculturalists Significance of a Tree Assessment Rating System (STARS©)', state the following where trees are determined to have a 'Medium' retention value:

'These trees may be retained and protected. These trees are considered less critical; however, their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.'

4.3 Low Retention Trees

Trees numbered 2, 3, 9 and 12 were given a 'Low' retention value.

The recommendations made by 'IACA Australian Consulting Arboriculturalists Significance of a Tree Assessment Rating System (STARS©)', state that following trees are determined to have a 'Low' retention value:

'These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.'

5 Proposed Design Impact on Trees – Discussion

5.1 Trees 1, 2 and 3

T1, T2 and T3 are located in the area required for piling operations as shown in figure 2. The retention of these trees will not be possible using the proposed construction methodology.

FIGURE 2

5.2 Tree 4

There is no impact on T4 in the proposed construction plans, however tree protection measures detailed in **Section 7** must be employed to successfully retain the tree during the project.

5.3 Tree 5

There is no impact on T5 in the proposed construction plans, however tree protection measures detailed in **Section 7** must be employed to successfully retain the tree during the project.

5.4 Tree 6

Two (2) pedestrian ramps are proposed inside the TPZ of T6, and excavation will be required to facilitate the construction of these ramps. However, the total incursion is minor (2.2%) and will therefore have a minor impact on T6.

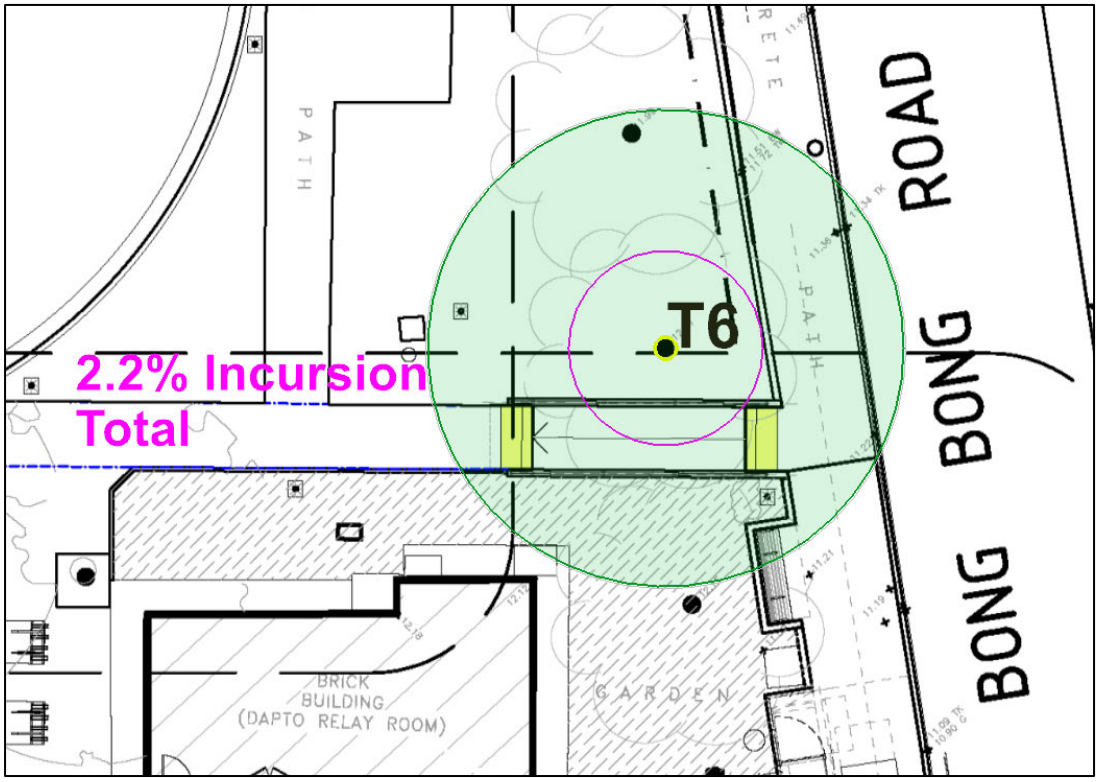


FIGURE 3

5.5 Tree 7

There is no impact on T7 in the proposed construction plans, however tree protection measures detailed in **Section 7** must be employed to successfully retain the tree during the project.

5.6 Tree 8

The proposed location for the ULX pit and LV pit will have a minor impact on T8 as shown in figure 4.

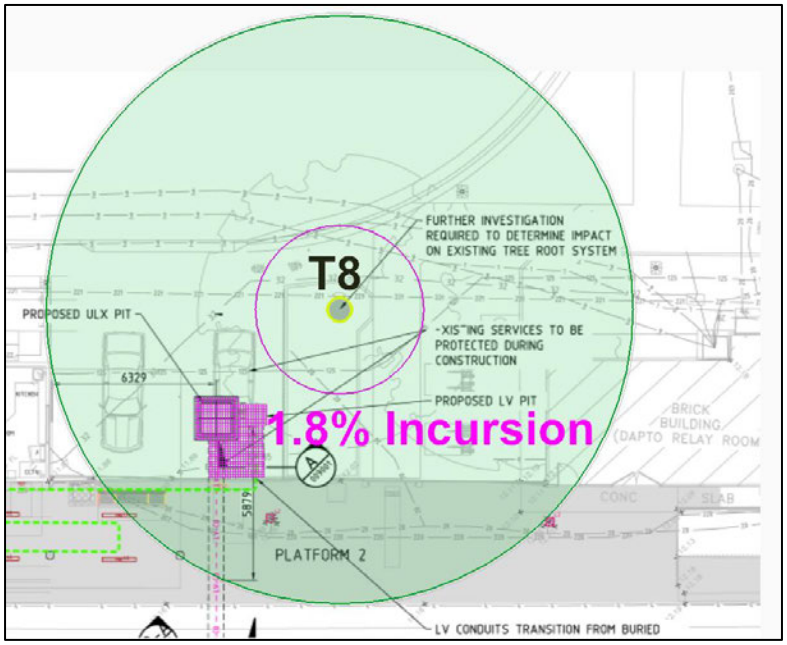


FIGURE 4

5.7 Trees 9, 10, 11, 12, 13, and 14

There is no direct impact on T9, T10, T11, T12, T13 and T14 in the proposed construction plans, however tree protection measures detailed in **Section 7** must be employed to successfully retain the tree during the project.

6 Recommendations

6.1 Trees to be removed

T1, T2, and T3, require removal to facilitate the piling operations for platform 1.

6.2 Trees to be retained and protected

The following trees must be retained and protected as per the specifications detailed in **Section 7**:

T4, T5, T6, T7, T8, T9 T10, T11, T12, T13 and T14.

7 Tree Protection Requirements

Tree protection is required around all trees to be retained. Fencing must be erected as per *AS 4687-2007 Temporary Fencing and Hoardings* and *AS 4970-2009 Protection of Trees on Development Sites* prior to construction commencing on this site. The exact location of the fencing is detailed in the Tree Protection Plan in **Appendix 5**.

The area inside the TPZ should be mulched during the works (except where concrete or other hard surfaces exist), to a depth of 50–100 mm using material that complies with *AS 4454-2012 - Composts, Mulches & Oil Conditioners*.

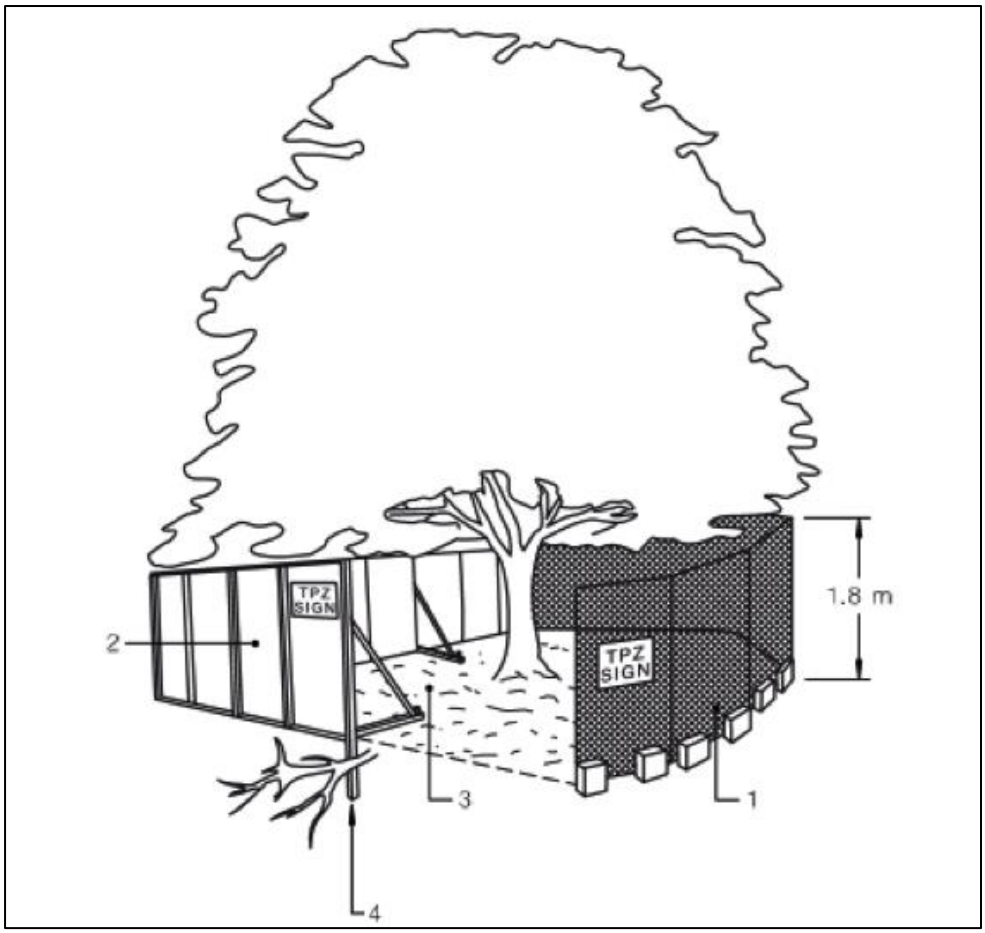


FIGURE 5 - TREE PROTECTION FENCING

7.1 Trunk, Branch and Ground Protection

Where necessary, install protection to the trunk and branches of trees shown in figure 6.

The stem and branches of trees to be retained must be protected as follows:

- Two layers of carpet underlay (or other padding approved by the Project Arborist) shall be installed around the stem and branches. Stem protection shall cover the stem from ground level; and
- Hardwood or treated pine timbers (100 mm x 50 mm) the same length as the stem or branch shall be positioned over the padding and next to each other around the stem or branch, secured

together with galvanised wire or strapping. Boards shall not be nailed or screwed into the stem or branch. No part of the protection shall be secured to the tree.

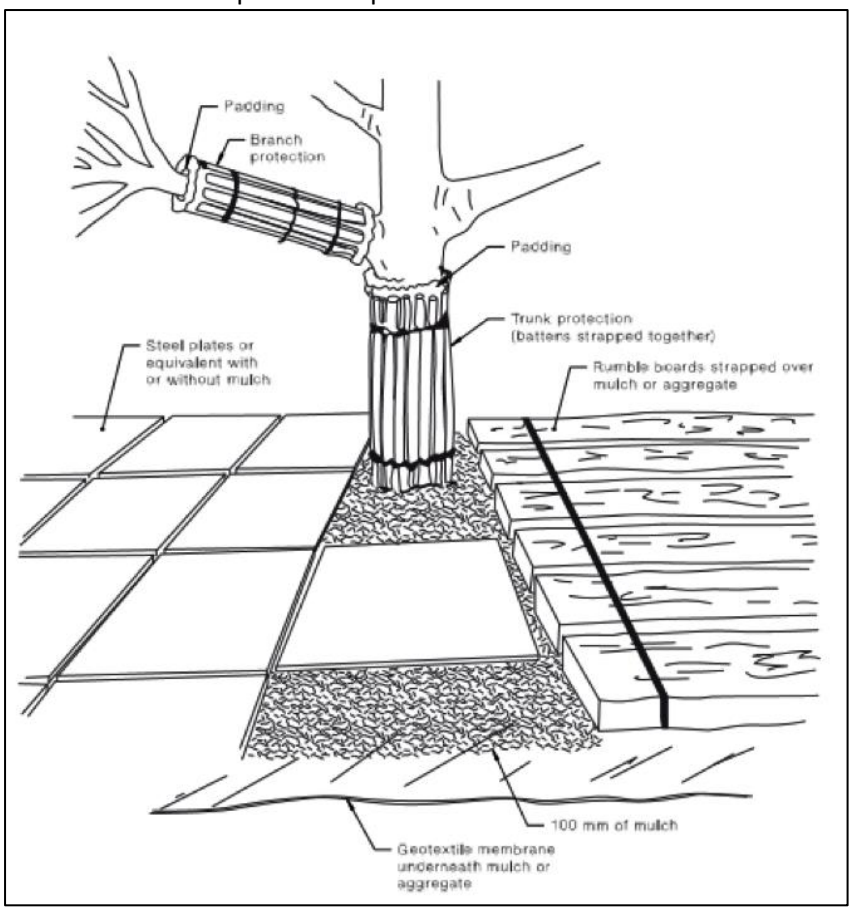


FIGURE 6 - TRUNK, BRANCH AND GROUND PROTECTION

The ground surface within the Tree Protection Zone shall be protected by placing geotextile fabric on the ground surface, covering this with a layer of mulch to a depth of 75 mm and then placing boarding (scaffolding board, plywood sheeting or similar material) on top. The geotextile fabric and mulch shall be kept clear of tree stems by at least 50 mm.

7.2 Signage

Below is an example of signage that can be utilized on tree protection zones.

FIGURE 7 – SIGNAGE – SOURCE AS 4970

7.3 Restricted Activities in TPZ

The following activities are restricted in the TPZ as per AS 4970-2009

- Machine excavation including trenching
- Excavation for silt fencing
- Cultivation
- Storage
- Preparation of chemicals
- Parking of vehicles and plant
- Refuelling
- Dumping of waste
- Wash down and cleaning of equipment
- Placement of fill
- Lighting of fires
- Soil level changes
- Temporary or permanent installation of utilities and signs
- Physical damage to the tree

7.4 Activities in TPZ needing supervision

The following activities shall not be carried out within any Tree Protection Zone unless under the supervision of the Project Arborist:

- increasing or decreasing soil levels (including cut and fill)
- soil cultivation, excavation or trenching
- placing offices or sheds
- erection of scaffolding or hoardings
- any other act that may adversely affect the vitality or structural condition of the tree.

All work undertaken within or above a Tree Protection Zone shall be supervised by the Project Arborist.

Excavation within the Tree Protection Zone of any tree to be retained shall be undertaken using non-destructive methods (eg. an Airspade or by hand).

8 Draft Tree Management Plan

Stage	Tasks	Outcomes
Pre-construction Phase		
Prepare and finalise Arboricultural Impact Assessments for submission to Council	Project Arborist to be appointed Review tree details in all approved Arboricultural reports following any new issue of plans	Submit Arboricultural reports including Arboricultural Impact Assessment for final Council Approval
Project Arborist to conduct Prestart Meeting with all representatives involved in construction	Prior to meeting: TPZs to be mulched and TPZ temporary protection/fencing installed	Prestart Certification and approvals in place
Commencement - Construction Phase		
Initial Site Preparation	Project Arborist to supervise all work within TPZ's Piled soil or mulch must not to be stockpiled within TPZ of identified trees.	Arborist certification of TPZ measures.
Prestart Toolbox Meeting	Project arborist must be given sufficient notified and be on site when works are being conducted inside the TPZ area.	Arborist Site Audit Reporting system to be in place
Construction Phase		
Site Establishment	Project Arborist to monitor tree health during establishment phase including bulk earthworks, changes in hydrology etc.	Instigate remedial tree care measures if required
Construction work	Site Manager to liaise with and ensure Project Arborist is advised in time to allow them to be present for all work carried out within TPZ area including any work likely to affect identified tree/s. Any deviation/s from approved plans to be approved by Project Arborist.	Any remedial tree works to be carried out by qualified arborists under supervision of Project Arborist.
Practical Completion	Project Arborist to carryout review of tree health and vigour and advise on TPZ fencing.	On Project Arborist approval, carryout removal of remaining temporary tree protection measures
Post Construction Phase		
Final Arborist inspection	Carryout tree health review and provide recommendations for required tree care.	Issue of final Arborist Site Audit Compliance Statement for inclusion in final DA documentation.

9 References

Australian Standards AS 4373 (2007) Pruning of Amenity Trees. Sydney: Standards Australia.

Dictionary for Managing Trees in Urban Environments - Institute of Australian Consulting Arboriculturists (IACA) 2009.

E. Thomas Smiley, Nelda Matheny, and Sharon Lilly (2011) Tree Risk Assessment & Principles. ISA Printed USA.

Mattheck, C & Breloer, H (1994) 'Field Guide for Visual Tree Assessment' Arboricultural Journal, Vol 18 pp 1-23.

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Nearmaps.com

10 Glossary

Dictionary for Managing Trees in Urban Environments
Institute of Australian Consulting Arboriculturists (IACA) 2009.

Vigour

Vigour Ability of a tree to sustain its life processes. This is independent of the *condition* of a tree but may impact upon it. Vigour can appear to alter rapidly with change of seasons (seasonality) e.g. dormant, deciduous or semi-deciduous trees. Vigour can be categorized as *Normal Vigour, High Vigour*, *Low Vigour* and *Dormant Tree Vigour*.

Normal Vigour Ability of a tree to maintain and sustain its life processes. This may be evident by the *typical* growth of leaves, *crown cover* and *crown density*, branches, roots and trunk and *resistance* to *predation*. This is independent of the *condition* of a tree but may impact upon it, and especially the ability of a tree to sustain itself against predation.

High Vigour *Accelerated growth* of a tree due to incidental or deliberate artificial changes to its growing *environment* that are seemingly beneficial, but may result in *premature aging* or failure if the favourable conditions cease, or promote *prolonged senescence* if the favourable conditions remain, e.g. water from a leaking pipe; water and nutrients from a leaking or disrupted sewer pipe; nutrients from animal waste, a tree growing next to a chicken coop, or a stock feed lot, or a regularly used stockyard; a tree subject to a stringent watering and fertilising program; or some trees may achieve an extended lifespan from continuous *pollarding* practices over the life of the tree.

Low Vigour Reduced ability of a tree to sustain its life processes. This may be evident by the *atypical* growth of leaves, reduced *crown cover* and reduced *crown density*, branches, roots and trunk, and a deterioration of their functions with reduced *resistance* to *predation*. This is independent of the *condition* of a tree but may impact upon it, and especially the ability of a tree to sustain itself against predation.

Dormant Tree Vigour Determined by existing turgidity in lowest order branches in the outer extremity of the crown, with good bud set and formation, and where the last *extension growth* is distinct from those most recently preceding it, evident by bud scale scars. Normal vigour during dormancy is achieved when such growth is evident on a majority of branches throughout the crown.

Age of Trees

Age Most trees have a stable biomass for the major proportion of their life. The estimation of the age of a tree is based on the knowledge of the expected lifespan of the taxa in situ divided into three distinct stages of measurable biomass, when the exact age of the tree from its date of cultivation or planting is unknown and can be categorized as *Young*, *Mature* and *Over-mature* (British Standards 1991, p. 13, Harris *et al*, 2004, p. 262).

Young Tree aged less than <20% of life expectancy, *in situ*.

Mature Tree aged 20-80% of life expectancy, *in situ*.

Over-mature Tree aged greater than >80% of life expectancy, *in situ,* or *senescent* with or without reduced *vigour*, and declining gradually or rapidly but irreversibly to death.

Periods of Time

Periods of Time The life span of a tree in the urban environment may often be reduced by the influences of encroachment and the dynamics of the environment and can be categorized as *Immediate*, *Short Term*, *Medium Term* and *Long Term*.

Immediate An *episode* or occurrence, likely to happen within a twenty-four (24) hour period.
Short Term A period of time less than <1 – 15 years.

Medium Term A period of time 15 – 40 years.

Long Term A period of time greater than >40 years.

Trunk

Trunk A single stem extending from the *root crown* to support or elevate the *crown*, terminating where it divides into separate *stems* forming *first order branches*. A trunk may be evident at or near ground or be absent in *acaulescent* trees of *deliquescent* habit, or may be continuous in trees of *excurrent* habit. The trunk of any *caulescent* tree can be divided vertically into three (3) sections and can be categorized as *Lower Trunk*, *Mid Trunk* and *Upper Trunk*. For a *leaning* tree these may be divided evenly into sections of one third along the trunk.

Acaulescent A *trunkless* tree or tree growth forming a very short *trunk*.

Caulescent Tree grows to form a *trunk*. See also *Acaulescent*.

Condition of Trees

Condition A tree's *crown form* and growth habit, as modified by its *environment* (aspect, suppression by other trees, soils), the *stability* and *viability* of the *root plate*, trunk and structural branches (first (1^{st}) and possibly second (2^{nd}) order branches), including structural defects such as wounds, cavities or hollows, *crooked* trunk or weak trunk/branch junctions and the effects of predation by pests and diseases. These may not be directly connected with *vigour* and it is possible for a tree to be of *normal vigour* but in *poor condition*. Condition can be categorized as *Good Condition*, *Fair Condition*, *Poor Condition* and *Dead*.

Good Condition Tree is of good habit, with *crown form* not severely restricted for space and light, physically free from the adverse effects of *predation* by pests and diseases, obvious instability or structural weaknesses, fungal, bacterial or insect infestation and is expected to continue to live in

much the same condition as at the time of inspection provided conditions around it for its basic survival do not alter greatly. This may be independent from, or contributed to by vigour.

Fair Condition Tree is of good habit or *misshapen*, a form not severely restricted for space and light, has some physical indication of *decline* due to the early effects of *predation* by pests and diseases, fungal, bacterial, or insect infestation, or has suffered physical injury to itself that may be contributing to instability or structural weaknesses, or is faltering due to the modification of the *environment* essential for its basic survival. Such a tree may recover with remedial works where appropriate, or without intervention may stabilise or improve over time, or in response to the implementation of beneficial changes to its local environment. This may be independent from, or contributed to by vigour.

Poor Condition Tree is of good habit or *misshapen*, a form that may be severely restricted for space and light, exhibits symptoms of advanced and *irreversible decline* such as fungal, or bacterial infestation, major die-back in the branch and *foliage crown*, *structural deterioration* from insect damage e.g. termite infestation, or storm damage or lightning strike, ring barking from borer activity in the trunk, root damage or instability of the tree, or damage from physical wounding impacts or abrasion, or from altered local environmental conditions and has been unable to adapt to such changes and may decline further to death regardless of remedial works or other modifications to the local *environment* that would normally be sufficient to provide for its basic survival if in *good* to *fair* condition. Deterioration physically, often characterised by a gradual and continuous reduction in vigour but may be independent of a change in vigour, but characterised by a proportionate increase in susceptibility to, and *predation* by pests and diseases against which the tree cannot be sustained. Such conditions may also be evident in trees of advanced senescence due to normal phenological processes, without modifications to the growing environment or physical damage having been inflicted upon the tree. This may be independent from, or contributed to by vigour.

Dead Tree is no longer capable of performing any of the following processes or is exhibiting any of the following symptoms;

Processes

Photosynthesis via its foliage crown (as indicated by the presence of moist, green or other coloured leaves);
Osmosis (the ability of the root system to take up water);

Turgidity (the ability of the plant to sustain moisture pressure in its cells);

Epicormic shoots or *epicormic strands* in Eucalypts (the production of new shoots as a response to stress, generated from latent or adventitious buds or from a *lignotuber*);

Symptoms

Permanent leaf loss;

Permanent wilting (the loss of turgidity which is marked by desiccation of stems leaves and roots);

Abscission of the *epidermis* (bark desiccates and peels off to the beginning of the sapwood).

Removed No longer present, or tree not able to be located or having been cut down and retained on a site or having been taken away from a site prior to site inspection.

Leaning Trees

Leaning A tree where the *trunk* grows or moves away from upright. A lean may occur anywhere along the *trunk* influenced by a number of contributing factors e.g. genetically predetermined characteristics, competition for space or light, prevailing winds, aspect, slope, or other factors. A *leaning* tree may maintain a *static lean* or display an increasingly *progressive lean* over time and may be hazardous and prone to *failure* and *collapse*. The degrees of leaning can be categorized as *Slightly Leaning*, *Moderately Leaning*, *Severely Leaning* and *Critically Leaning*.

Slightly Leaning A leaning tree where the trunk is growing at an angle within 0^{O}-15^{O} from upright.

Moderately Leaning A leaning tree where the trunk is growing at an angle within 15^{O}-30^{O} from upright.

Severely Leaning A leaning tree where the trunk is growing at an angle within 30^{O}-45^{O} from upright.

Critically Leaning A leaning tree where the trunk is growing at an angle greater than $>45^{O}$ from upright.

Progressively Leaning A tree where the degree of *leaning* appears to be increasing over time.

Static Leaning A leaning tree whose lean appears to have stabilized over time.

Form of Trees

Crown Form The shape of the crown of a tree as influenced by the availability or restriction of space and light, or other contributing factors within its growing environment. Crown Form may be determined for tree shape and habit generally as *Dominant*, *Codominant*, *Intermediate*, *Emergent*, *Forest* and *Suppressed*. The habit and shape of a *crown* may also be considered qualitatively and can be categorized as *Good Form* or *Poor Form*.

Good Form Tree of *typical* crown shape and habit with proportions representative of the taxa considering constraints such as origin e.g. indigenous or exotic, but does not appear to have been adversely influenced in its development by environmental factors in situ such as *soil water* availability, prevailing wind, or cultural practices such as lopping and competition for space and light.

Poor Form Tree of *atypical* crown shape and habit with proportions not representative of the species considering constraints and appears to have been adversely influenced in its development by environmental factors in situ such as *soil water* availability, prevailing wind, cultural practices such as lopping and competition for space and light; causing it to be *misshapen* or disfigured by disease or vandalism.

Crown Form Codominant Crowns of trees restricted for space and light on one or more sides and receiving light primarily from above e.g. constrained by another tree/s or a building.

Crown Form Dominant Crowns of trees generally not restricted for space and light receiving light from above and all sides.

Crown Form Emergent Crowns of trees restricted for space on most sides receiving most light from above until the *upper crown* grows to protrude above the canopy in a stand or forest environment. Such trees may be *crown form dominant* or transitional from *crown form intermediate* to *crown form forest* asserting both *apical dominance* and *axillary dominance* once free of constraints for space and light.

Crown Form Forest Crowns of trees restricted for space and light except from above forming tall trees with narrow spreading crowns with foliage restricted generally to the top of the tree. The trunk is usually erect, straight and continuous, tapering gradually, crown often excurrent, with first order branches becoming structural, supporting the live crown concentrated towards the top of the tree, and below this point other first order branches arising radially with each *inferior* and usually temporary, divergent and ranging from horizontal to ascending, often with internodes exaggerated due to competition for space and light in the *lower crown*.

Crown Form Intermediate Crowns of trees restricted for space on most sides with light primarily from above and on some sides only.

Crown Form Suppressed Crowns of trees generally not restricted for space but restricted for light by being *overtopped* by other trees and occupying an understorey position in the canopy and growing slowly.

Symmetry

Symmetry Balance within a *crown,* or *root plate,* above or below the *axis* of the trunk of branch and foliage, and root distribution respectively and can be categorized as *Asymmetrical* and *Symmetrical*.

Asymmetrical Imbalance within a crown, where there is an uneven distribution of branches and the foliage *crown* or *root plate* around the vertical *axis* of the trunk. This may be due to *Crown Form Codominant* or *Crown From* S*uppressed* as a result of natural restrictions e.g. from buildings, or from competition for space and light with other trees, or from exposure to wind, or artificially caused by pruning for clearance of roads, buildings or power lines.

Symmetrical Balance within a crown, where there is an even distribution of branches and the *foliage crown* around the vertical *axis* of the trunk. This usually applies to trees of *Crown Form Dominant* or *Crown Form Forest*. An example of an expression of this may be crown symmetrical.

Crown Spread Orientation Direction of the *axis* of *crown spread* which can be categorized as *Orientation Radial* and *Orientation Non-radial*.

Crown Spread Orientation Non-radial Where the crown extent is longer than it is wide, e.g. east/west or E/W. Further examples, north/south or N/S, and may be *Crown Form Codominant*, e.g. **A** or **B**, *Crown Form Intermediate* e.g. **A**, or *Crown Form Suppressed* e.g. **B***, and* crown symmetry is *symmetrical* e.g. **A**, or *asymmetrical* e.g. **B**.

Crown Spread Orientation Radial Where the *crown spread* is generally an even distance in all directions from the trunk and often where a tree has *Crown Form Dominant* and is *symmetrical.*

Significant Important, weighty or more than ordinary.

Significant Tree A tree considered important, weighty or more than ordinary. Example: due to prominence of location, or *in situ*, or contribution as a component of the overall landscape for *amenity* or aesthetic qualities, or *curtilage* to structures, or importance due to uniqueness of taxa for species, subspecies, variety, *crown form*, or as an historical or cultural planting, or for age, or substantial dimensions, or habit, or as *remnant vegetation*, or habitat potential, or a rare or threatened species, or uncommon in cultivation, or of aboriginal cultural importance, or is a commemorative planting.

Substantial A tree with large dimensions or proportions in relation to its place in the landscape.

Diameter at Breast Height (DBH) - Measurement of trunk width calculated at a given distance above ground from the base of the tree often measured at 1.4 m. The trunk of a tree is usually not a circle when viewed in cross section, due to the presence of *reaction wood* or *adaptive wood*, therefore an average diameter is determined with a *diameter tape* or by recording the trunk along its narrowest and widest axes, adding the two dimensions together and dividing them by 2 to record an average and allowing the orientation of the longest axis of the trunk to also be recorded. Where a tree is growing on a lean the distance along the top of the trunk is measured to 1.4m and the diameter then recorded from that point perpendicular to the edge of the trunk. Where a *leaning* trunk is *crooked* a vertical distance of 1.4m is measured from the ground. Where a tree branches from a trunk that is less than 1.4m above ground, the trunk diameter is recorded perpendicular to the length of the *trunk* from the

point immediately below the base of the flange of the *branch collar* extending the furthest down the trunk, and the distance of this point above ground recorded as *trunk* length. Where a tree is located on sloping ground the DBH should be measured at half way along the side of the tree to average out the angle of slope. Where a tree is *acaulescent* or *trunkless* branching at or near ground an average diameter is determined by recording the radial extent of the trunk at or near ground and noting where the measurement was recorded e.g. at ground.

Crown Projection (CP) Area within the *dripline* or beneath the lateral extent of the *crown* (Geiger 2004, p. 2). See also *Crown spread* and *Dripline*.

Dripline A line formed around the edge of a tree by the lateral extent of the *crown*. Such a line may be evident on the ground with some trees when exposed soil is displaced by rain shed from the crown. See also *Crown Projection*.

Deadwood

Deadwood Dead branches within a tree's crown and considered quantitatively as separate to *crown cover* and can be categorised as *Small Deadwood* and *Large Deadwood* according to diameter, length and subsequent *risk* potential. The amount of dead branches on a tree can be categorized as *Low Volume Deadwood*, *Medium Volume Deadwood* and *High Volume Deadwood*. See also *Dieback.*

Deadwooding Removing of dead branches by *pruning*. Such pruning may assist in the prevention of the spread of *decay* from *dieback* or for reasons of safety near an identifiable target.

Small Deadwood A dead branch up to 10mm diameter and usually <2 metres long, generally considered of low *risk* potential.

Large Deadwood A dead branch >10mm diameter and usually >2 metres long, generally considered of high *risk* potential.

Low Volume Deadwood Where <5 dead branches occur that may require *removal*.

Medium Volume Deadwood Where 5-10 dead branches occur that may require *removal*.

High Volume Deadwood High Volume Deadwood Where >10 dead branches occur that may require *removal*.

Dieback

Dieback The death of some areas of the *crown*. Symptoms are leaf drop, bare twigs, dead branches and tree death, respectively. This can be caused by root damage, root disease, bacterial or fungal canker, severe bark damage, intensive grazing by insects, *abrupt changes* in growth conditions, drought, water-logging or over-maturity. Dieback often implies reduced *resistance, stress* or *decline* which may be temporary. Dieback can be categorized as *Low Volume Dieback*, *Medium Volume Dieback* and *High Volume Dieback*.

Low Volume Dieback Where <10% of the *crown cover* has died.

Medium Volume Dieback Where 10-50% of the *crown cover* has died.

High Volume Dieback Where >50% of the *crown cover* has died.

Epicormic shoots

Epicormic Shoots Juvenile shoots produced at branches or trunk from *epicormic strands* in some Eucalypts (Burrows 2002, pp. 111-131) or sprouts produced from dormant or latent buds concealed beneath the bark in some trees. Production can be triggered by fire, pruning, wounding, or root damage but may also be as a result of *stress* or *decline*. Epicormic shoots can be categorized as *Low Volume Epicormic Shoots*, *Medium Volume Epicormic Shoots* and *High Volume Epicormic Shoots*.

Low Volume Epicormic Shoots Where <10% of the c*rown cover* is comprised of live *epicormic shoots*.

Medium Volume Epicormic Shoots Where 10-50% of the *crown cover* is comprised of live *epicormic shoots*.

High Volume Epicormic Shoots Where >50% of the *crown cover* is comprised of live *epicormic shoot*

Roots

First Order Roots (FOR) Initial woody roots arising from the *root crown* at the base of the *trunk*, or as an *adventitious root mass* for structural support and *stability*. Woody roots may be buttressed and divided as a marked gradation, gradually tapering and continuous or tapering rapidly at a short distance from the root crown. Depending on soil type these roots may descend initially and not be evident at the root crown, or become buried by changes in soil levels. Trees may develop 4-11 (Perry 1982, pp. 197-221), or more first order roots which may radiate from the trunk with a relatively even distribution, or be prominent on a particular aspect, dependent upon physical characteristics e.g. leaning trunk, *asymmetrical* crown; and constraints within the growing *environment* from topography e.g. slope, soil depth, rocky outcrops, exposure to predominant wind, soil moisture, depth of *water table* etc.

Orders of Roots The marked divisions between woody roots, commencing at the initial division from the base of the trunk, at the *root crown* where successive branching is generally characterised by a gradual reduction in root diameters and each gradation from the trunk and can be categorized numerically, e.g. *first order roots*, second order roots, third order roots etc. Roots may not always be evident at the *root crown* and this may be dependent on species, age class and the growing environment. Palms at maturity may form an adventitious root mass.

Root Plate The entire root system of a tree generally occupying the top 300-600mm of soil including roots at or above ground and may extend laterally for distances exceeding twice the height of the tree (Perry 1982, pp. 197-221). Development and extent is dependent on water availability, soil type, *soil depth* and the physical characteristics of the surrounding landscape.

Root Crown Roots arising at the base of a trunk.

Zone of Rapid Taper The area in the *root plate* where the diameter of *structural roots* reduces substantially over a short distance from the *trunk.* Considered to be the minimum radial distance to provide structural support and *root plate* stability. See also *Structural Root Zone (SRZ)*.

Structural Roots Roots supporting the infrastructure of the *root plate* providing strength and *stability* to the tree. Such roots may taper rapidly at short distances from the *root crown* or become large and woody as with gymnosperms and dicotyledonous angiosperms and are usually 1st and 2nd order roots, or form an *adventitious root mass* in monocotyledonous angiosperms (palms).

11 Appendices

11.1 Appendix 1 – Tree Schedule

Tree #	Botanical Name	Age class	Height (m)	Spread (m)	DCH (mm)	DRB (mm)	TPZ (m)	SRZ (m)	Condition	Structure	Description, condition and comments.	SULE	Landscape Significance	Retention Value
1	*Ficus Benjamina*	SM	8	8	520	900	6.24	3.17	G	G	Good condition, far structural form. No evidence of pests or diseases	M	M	M
2	*Grevillea robusta*	J	5	2	180	220	2.16	1.75	G	F	Good condition, supressed from surrounding trees	S	L	L
3	*Norfolk hibiscus*	SM	5	4	350	420	4.2	2.3	G	F	Good condition, supressed from surrounding trees	S	L	L
4	*Casuarina cunninghamiana*	SM	10	8	940	1400	11.3	3.81	G	F	Good condition, fair structural form, multi stemmed at base. No evidence of pests or diseases	M	M	M
5	*Lophostemon confurtus*	SM	10	8	690	750	8.28	2.93	G	G	Good condition, good structural form. No evidence of pests or diseases	M	H	H
6	*Lophostemon confurtus*	SM	8	6	560	640	6.72	2.74	G	G	Good condition, good structural form. No evidence of pests or diseases	M	H	H
7	*Lophostemon confurtus*	SM	9	7	520	540	6.24	2.55	G	G	Good condition, good structural form. No evidence of pests or diseases	M	H	H

8	*Lophostemon confurtus*	M	16	9	940	950	11.3	3.24	G	G	Good condition, good structural form. No evidence of pests or diseases	L	H	H
9	*Jacaranda mimosifolia*	SM	7	7	550	750	6.6	2.93	G	F	Good condition, good structural form. No evidence of pests or diseases	S	M	L
10	*Cupressus sp.*	M	13	5	690	1060	8.28	3.39	G	G	Good condition, good structural form. No evidence of pests or diseases	M	M	M
11	*Acer negundo*	SM	7	5	360	600	4.32	2.67	G	F	Good condition, fair structural form. No evidence of pests or diseases	S	M	M
12	*Callistemon viminalis*	SM	3	2	210	300	2.52	2	F	F	Good condition, good structural form. No evidence of pests or diseases	S	L	L
13	*Ulmus parvifolia*	M	10	7	430	630	5.16	2.73	G	G	Good condition, good structural form. No evidence of pests or diseases	L	M	H
14	*Lophostemon confurtus*	M	14	8	800	1070	9.6	3.4	G	G	Good condition, good structural form. No evidence of pests or diseases	L	H	H

Tree Schedule Table Notes

Genus, Species and Common Name

The botanical and common name of each tree is identified and recorded. Occasionally the exact species name is unknown; sp. is recorded to indicate this.

Height, Spread, Trunk Dia, DBH and DRB

- The tree's height and spread is recorded in metres.
- The tree DBH is recorded in millimetres. DBH is an abbreviation of Diameter (of the trunk) measured at Breast Height (or 1.2m from the base of the trunk). If more than one trunk is present the DCH is calculated in accordance with AS4970-2009 Protection of Trees on Development Sites.

- If the tree has multiple trunks multiple trunks each trunk DCH (Trunk Dia) will be recorded individually.

- The tree DRB is recorded in millimetres. DRB is an abbreviation of Diameter (of the trunk) measured above the Root Buttress. It is required to calculate the

SRZ in accordance with AS4970-2009 Protection of Trees on Development Sites when there is major encroachment within the TPZ, ie. greater than 10% is encroached upon or if there is an encroachment within the SRZ.

Age

The age class of each tree is estimated as either:

J – Juvenile, a young sapling, easily replaced from nursery stock.
SM - Semi Mature, a tree that has not grown to mature size.
M - Mature, a tree that has reached mature size and will slowly increase in size over time.
OM - Over Mature, a tree that has been mature for a long period and is beginning to display signs of decline, e.g. large dead branches.
S - Senescent, an over mature tree that is now in decline.

SRZ (Structural Root Zone)

The SRZ is a radial area extending outwards from the centre of the trunk. This area contains the majority of the structural woody roots. This area is responsible primarily for stability. Root damage or root loss within this zone greatly increases the opportunity for decay fungi to ingress into the heartwood, causing internal decay in addition to destabilising the tree's structural integrity. The SRZ is calculated as follows (This calculation is derived from the Australian Standard 4970 – 2009 Protection of Trees on Development Sites):

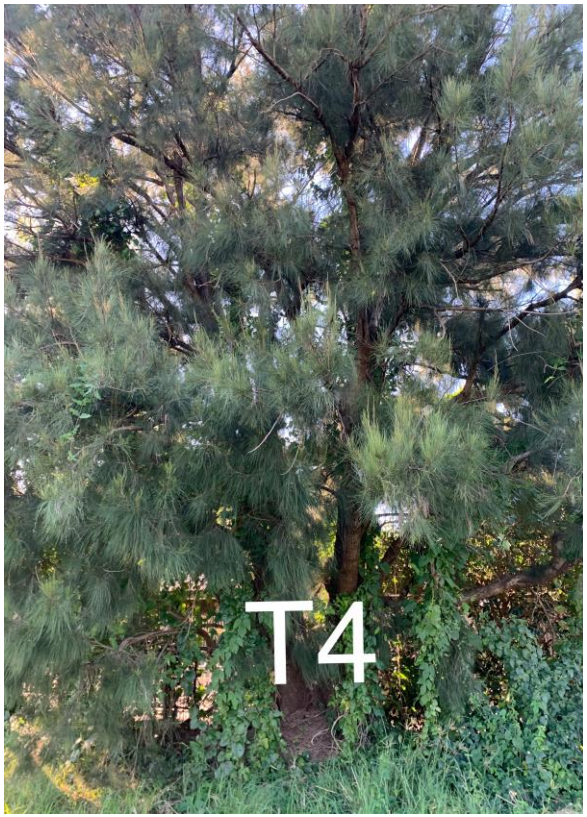
SRZ (Radius) = (DAB x 50)^0.42 x 0.64

TPZ (Tree Protection Zone)

The TPZ is a circular area with a radius measured by multiplying the DCH by twelve (12), or a circular area the size of the tree's drip line whichever is greater. This area contains the majority of the essential structural and feeder roots responsible for stability, gaseous exchange and water and nutrient uptake. Excavation, back filling, compaction or other disturbance should not occur in this area.

The TPZ is used to identify the minimum area required for the safe retention of a given tree. This calculation is derived from the Australian Standard 4970 – 2009 Protection of Trees on Development Sites. An incursion to 10% within the TPZ is potentially acceptable if no other option is available. A major encroachment (in excess of 10%) is required to be clearly justified by the project Arborist and compensated for elsewhere.

11.2 Appendix 2 – Photos of the Trees

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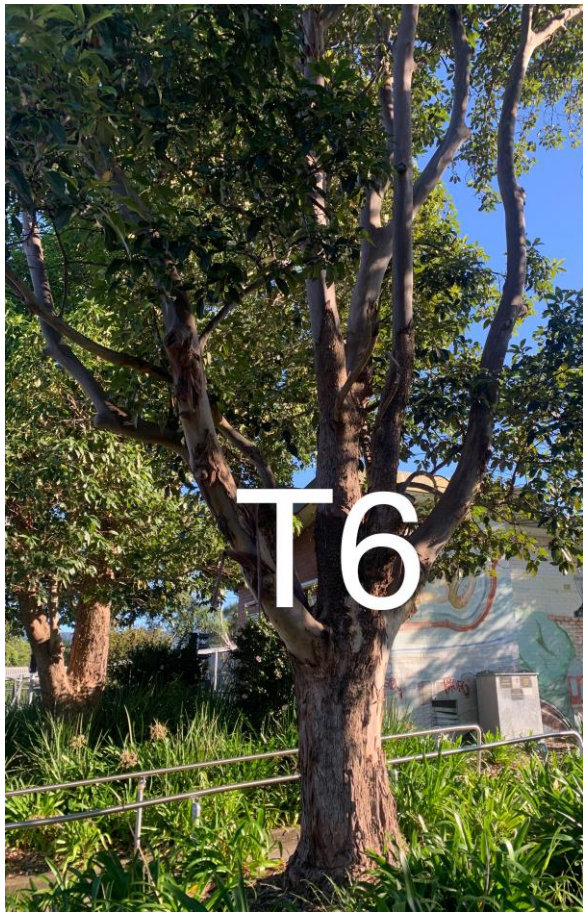
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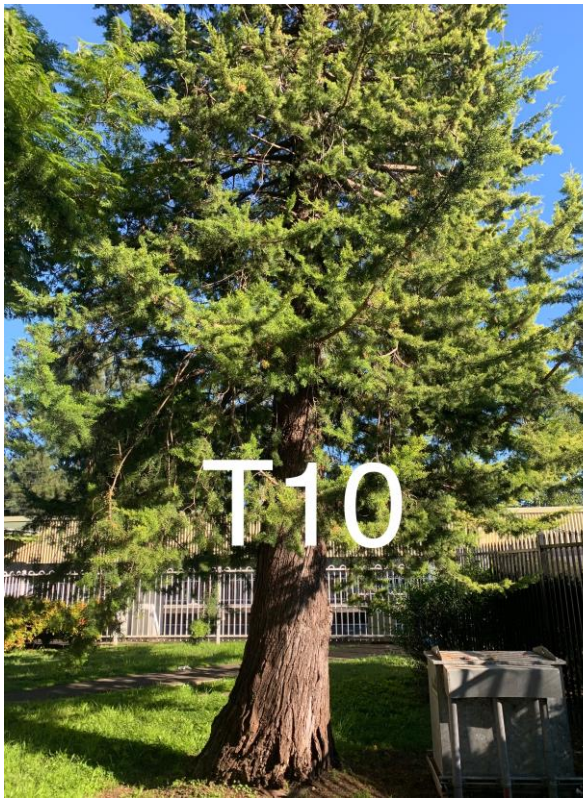
T7


T8


T9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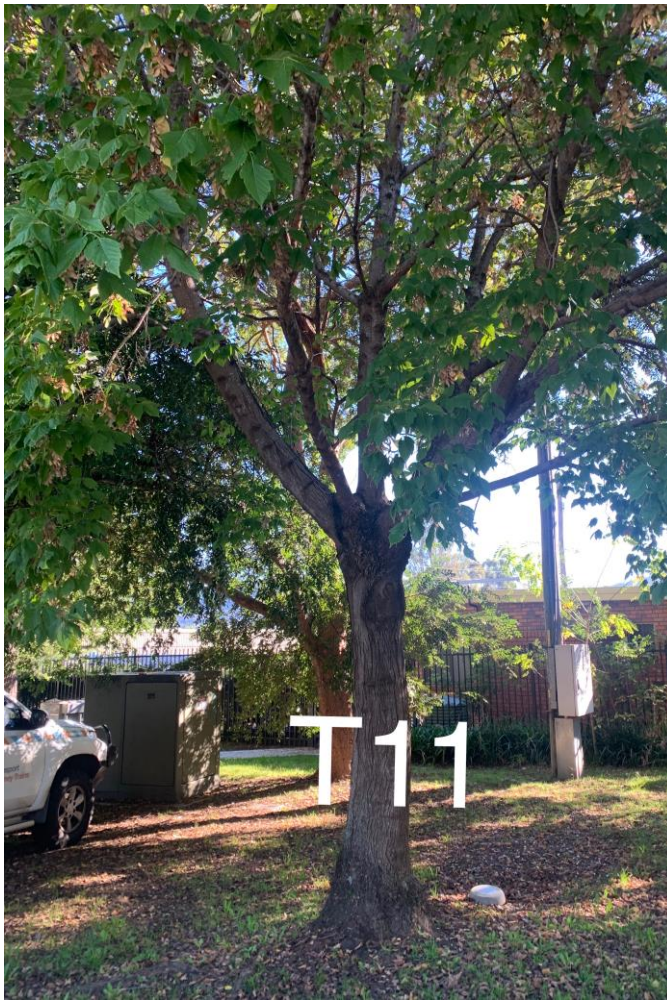
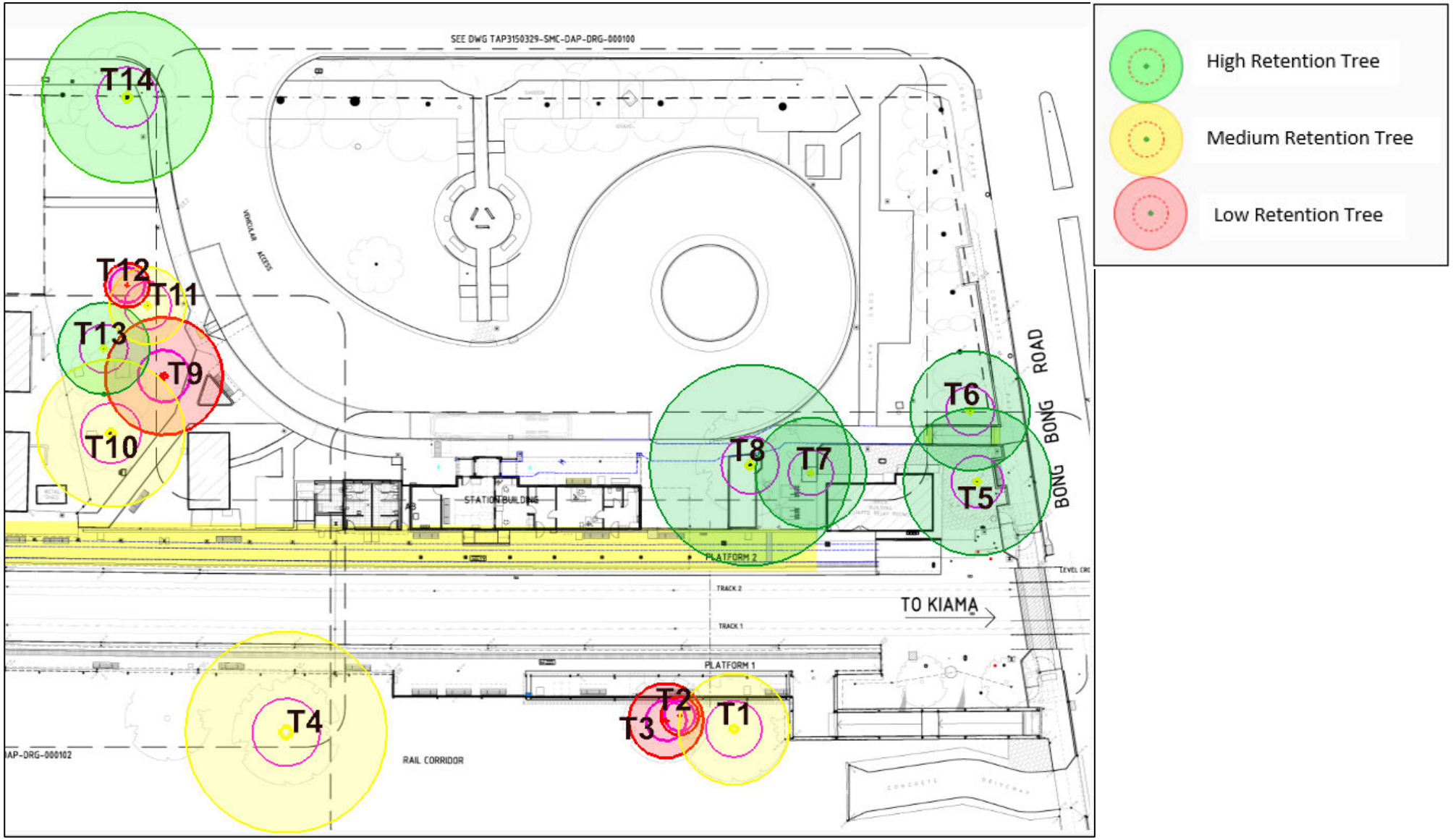

T11


T12

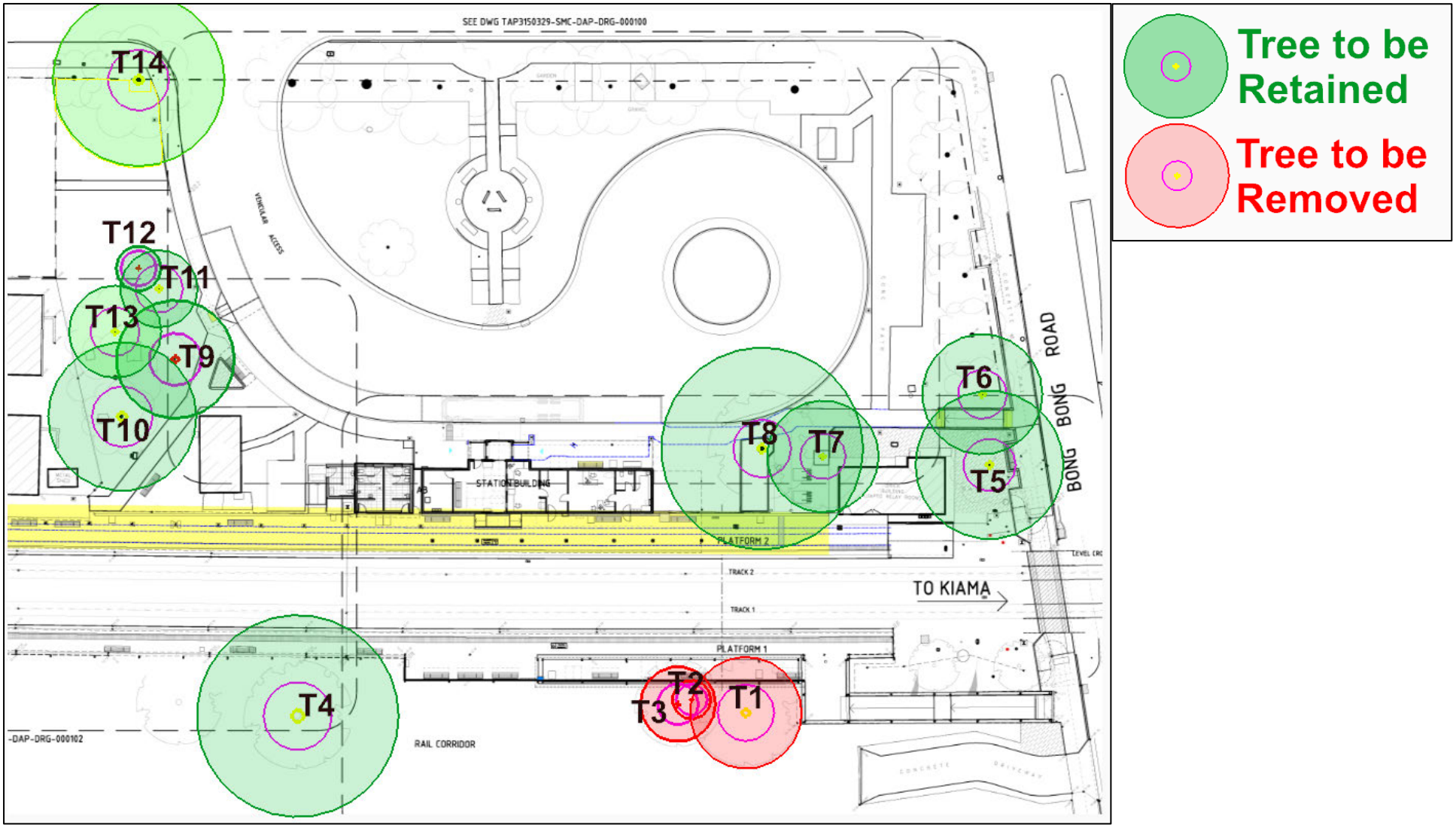

T13


T14

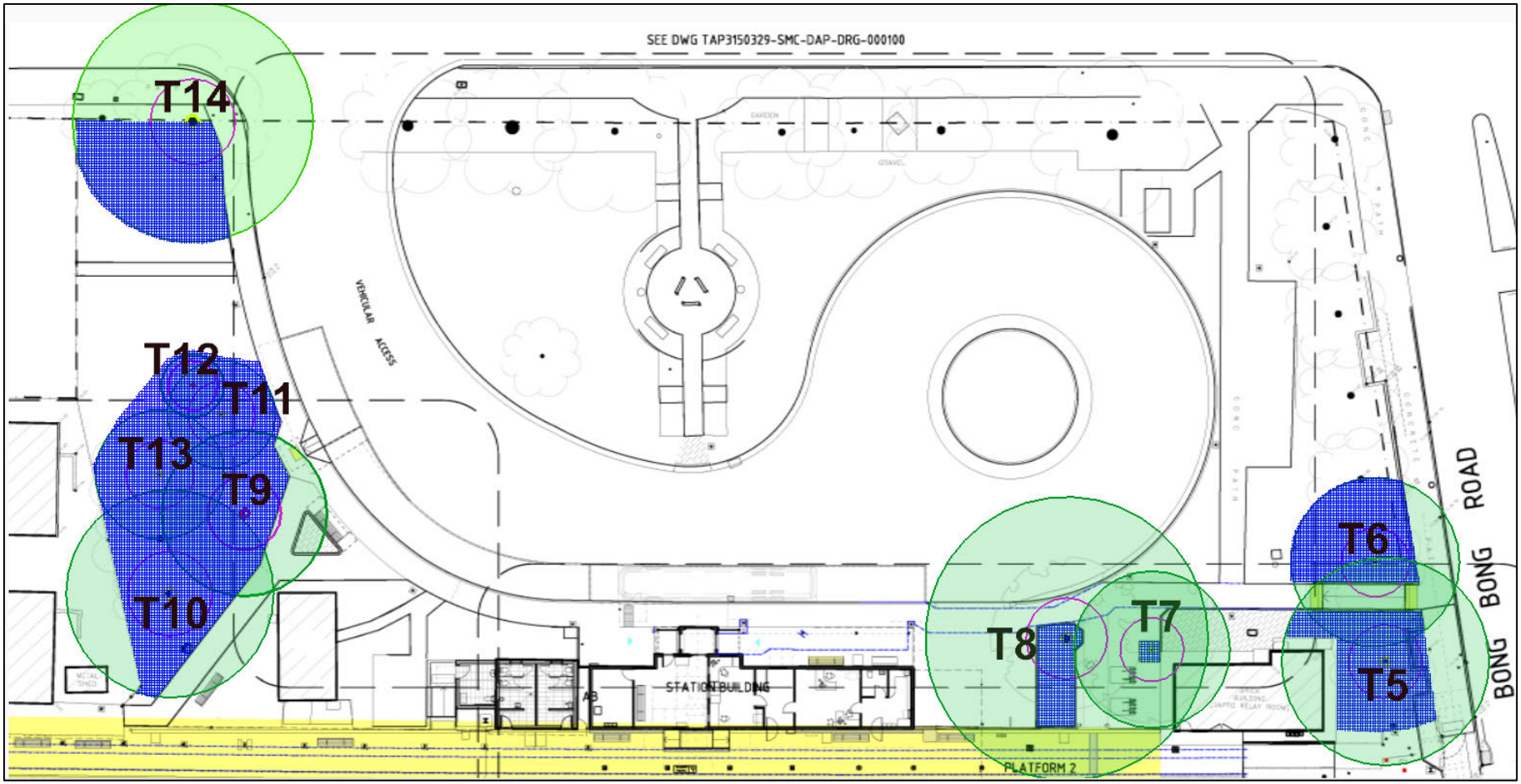
11.3 Appendix 3 – Tree Locations and Retention Values

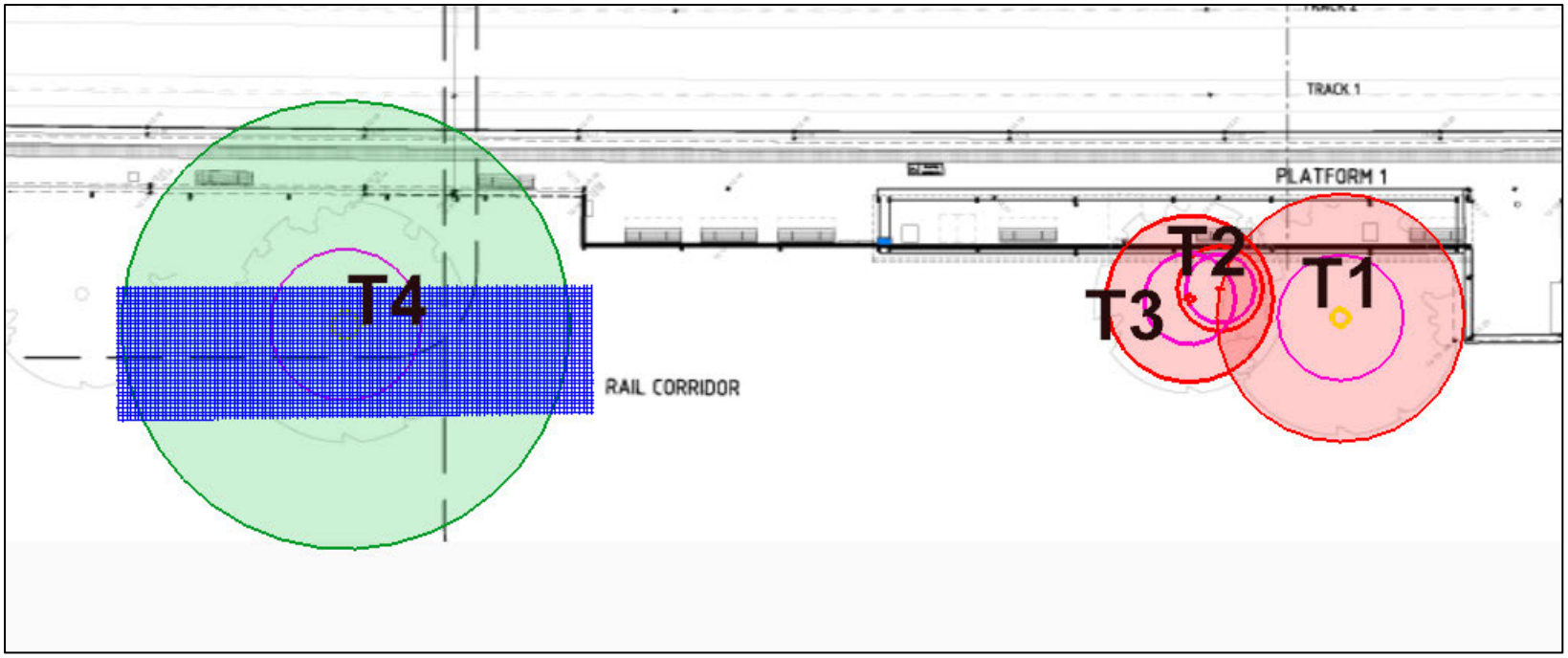


11.4 Appendix 4 – Tree Removal and Tree Retention Locations



11.5 Appendix 5 – Tree Protection Fencing Locations

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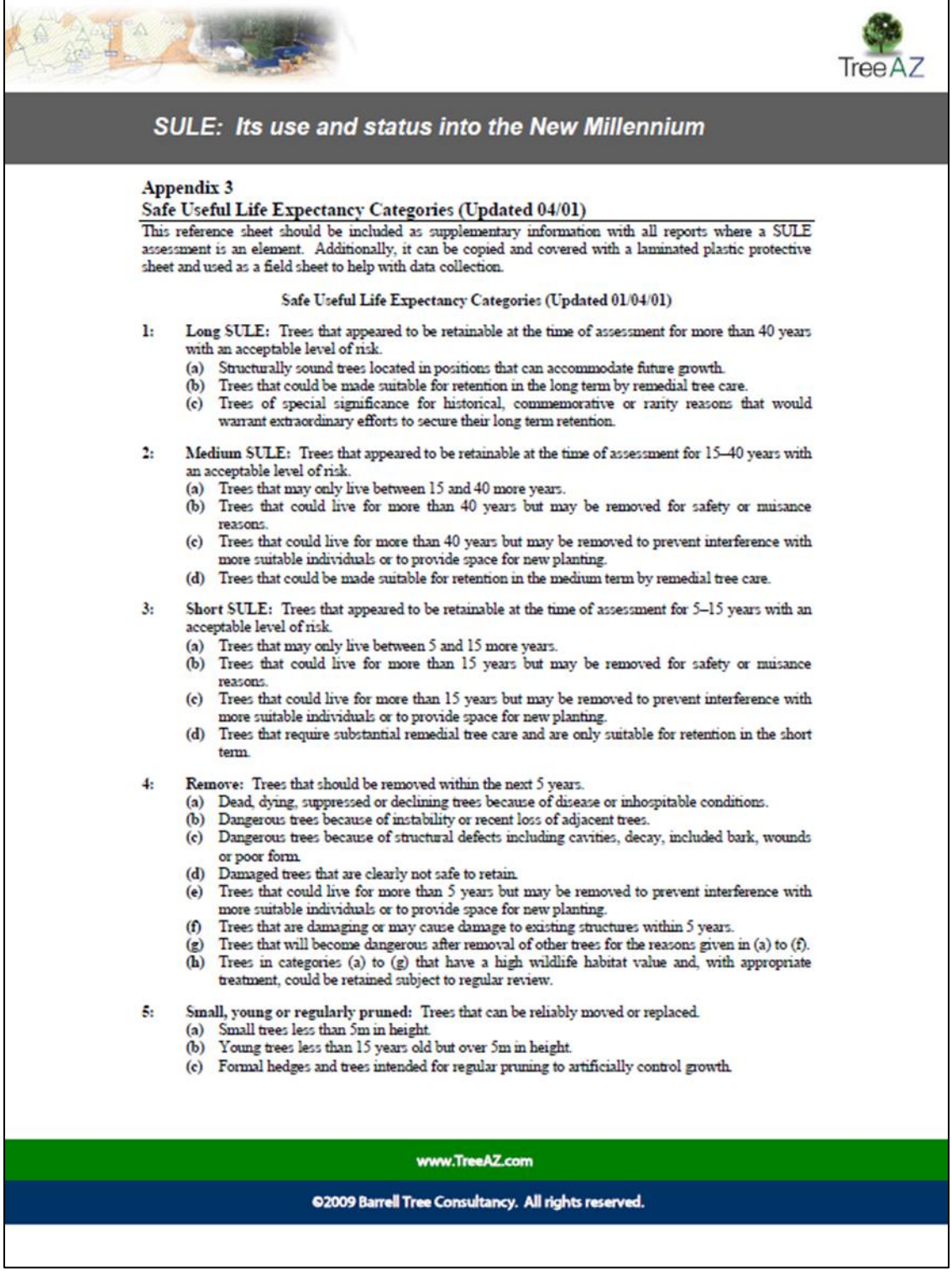
PLATFORM 1
T4
T2
T3
T1
RAIL CORRIDOR

11.6 Appendix 6 – Safe Useful Life Expectancy



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SULE: Its use and status into the New Millennium

Appendix 3
Safe Useful Life Expectancy Categories (Updated 04/01)

This reference sheet should be included as supplementary information with all reports where a SULE assessment is an element. Additionally, it can be copied and covered with a laminated plastic protective sheet and used as a field sheet to help with data collection.

Safe Useful Life Expectancy Categories (Updated 01/04/01)

1: **Long SULE:** Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.
- (a) Structurally sound trees located in positions that can accommodate future growth.
- (b) Trees that could be made suitable for retention in the long term by remedial tree care.
- (c) Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention.

2: **Medium SULE:** Trees that appeared to be retainable at the time of assessment for 15–40 years with an acceptable level of risk.
- (a) Trees that may only live between 15 and 40 more years.
- (b) Trees that could live for more than 40 years but may be removed for safety or nuisance reasons.
- (c) Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
- (d) Trees that could be made suitable for retention in the medium term by remedial tree care.

3: **Short SULE:** Trees that appeared to be retainable at the time of assessment for 5–15 years with an acceptable level of risk.
- (a) Trees that may only live between 5 and 15 more years.
- (b) Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.
- (c) Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
- (d) Trees that require substantial remedial tree care and are only suitable for retention in the short term.

4: **Remove:** Trees that should be removed within the next 5 years.
- (a) Dead, dying, suppressed or declining trees because of disease or inhospitable conditions.
- (b) Dangerous trees because of instability or recent loss of adjacent trees.
- (c) Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form.
- (d) Damaged trees that are clearly not safe to retain.
- (e) Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
- (f) Trees that are damaging or may cause damage to existing structures within 5 years.
- (g) Trees that will become dangerous after removal of other trees for the reasons given in (a) to (f).
- (h) Trees in categories (a) to (g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review.

5: **Small, young or regularly pruned:** Trees that can be reliably moved or replaced.
- (a) Small trees less than 5m in height.
- (b) Young trees less than 15 years old but over 5m in height.
- (c) Formal hedges and trees intended for regular pruning to artificially control growth.

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11.7 Appendix 7 – Retention Value

IACA Significance of a Tree, Assessment Rating System (STARS)© (IACA 2010)©

In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd in June 2001.

The landscape significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree. To assist this process all definitions for terms used in the *Tree Significance - Assessment Criteria* and *Tree Retention Value - Priority Matrix*, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of *High*, *Medium* and *Low* significance in the landscape. Once the landscape significance of an individual tree has been defined, the retention value can be determined. An example of its use in an Arboricultural report is shown as Appendix A.

Tree Significance - Assessment Criteria

1. High Significance in landscape

- The tree is in good condition and good vigour;
- The tree has a form typical for the species;
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age;
- The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on Councils significant Tree Register;
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity;
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values;
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa *in situ* - tree is appropriate to the site conditions.

2. Medium Significance in landscape

- The tree is in fair-good condition and good or low vigour;
- The tree has form typical or atypical of the species;
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street,
- The tree provides a fair contribution to the visual character and amenity of the local area,
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa *in situ*.

3. Low Significance in landscape

- The tree is in fair-poor condition and good or low vigour;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings,
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area,
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen,
- The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa *in situ* - tree is inappropriate to the site conditions,
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms,
- The tree has a wound or defect that has potential to become structurally unsound.

Environmental Pest / Noxious Weed Species

- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties,
- The tree is a declared noxious weed by legislation.

Hazardous/Irreversible Decline

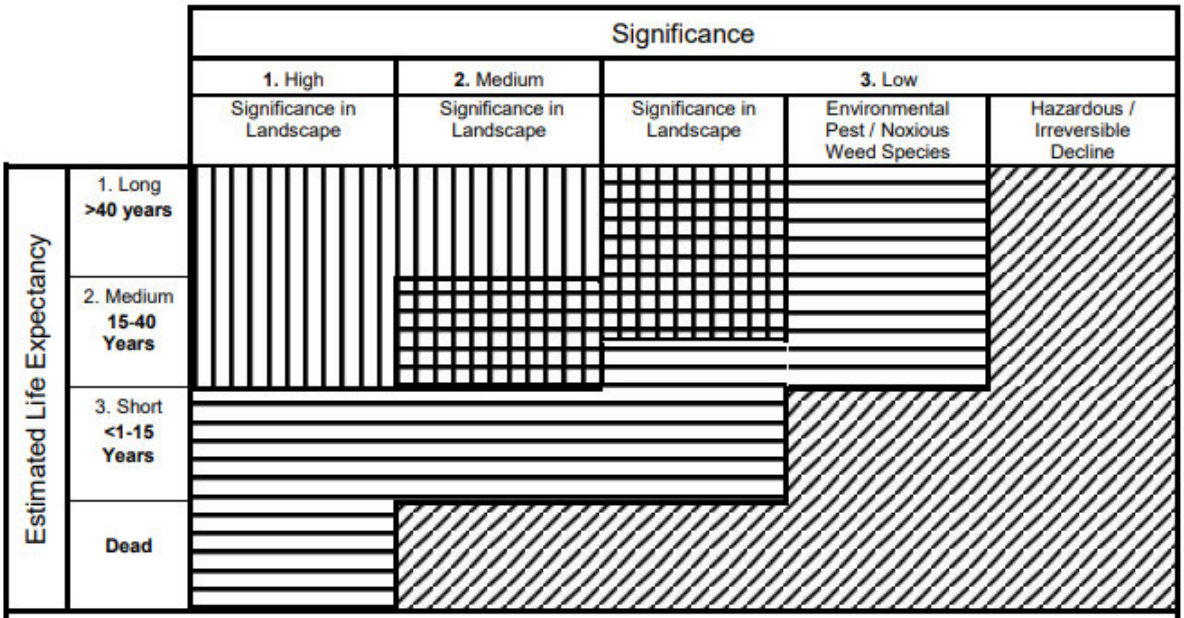
- The tree is structurally unsound and/or unstable and is considered potentially dangerous,
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

The tree is to have a minimum of three (3) criteria in a category to be classified in that group.

Note: The assessment criteria are for individual trees only, however, can be applied to a monocultural stand in its entirety e.g. hedge.

IACA 2010, *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, www.iaca.org.au

Table 1.0 Tree Retention Value - Priority Matrix.



Legend for Matrix Assessment

INSTITUTE OF AUSTRALIAN CONSULTING ARBORICULTURISTS ®

Priority for Retention (High) - These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 *Protection of trees on development sites*. Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone.

Consider for Retention (Medium) - These trees may be retained and protected. These are considered less critical; however their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.

Consider for Removal (Low) - These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.

Priority for Removal - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

USE OF THIS DOCUMENT AND REFERENCING

The IACA Significance of a Tree, Assessment Rating System (STARS) is free to use, but only in its entirety and must be cited as follows:

IACA, 2010, *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au

REFERENCES

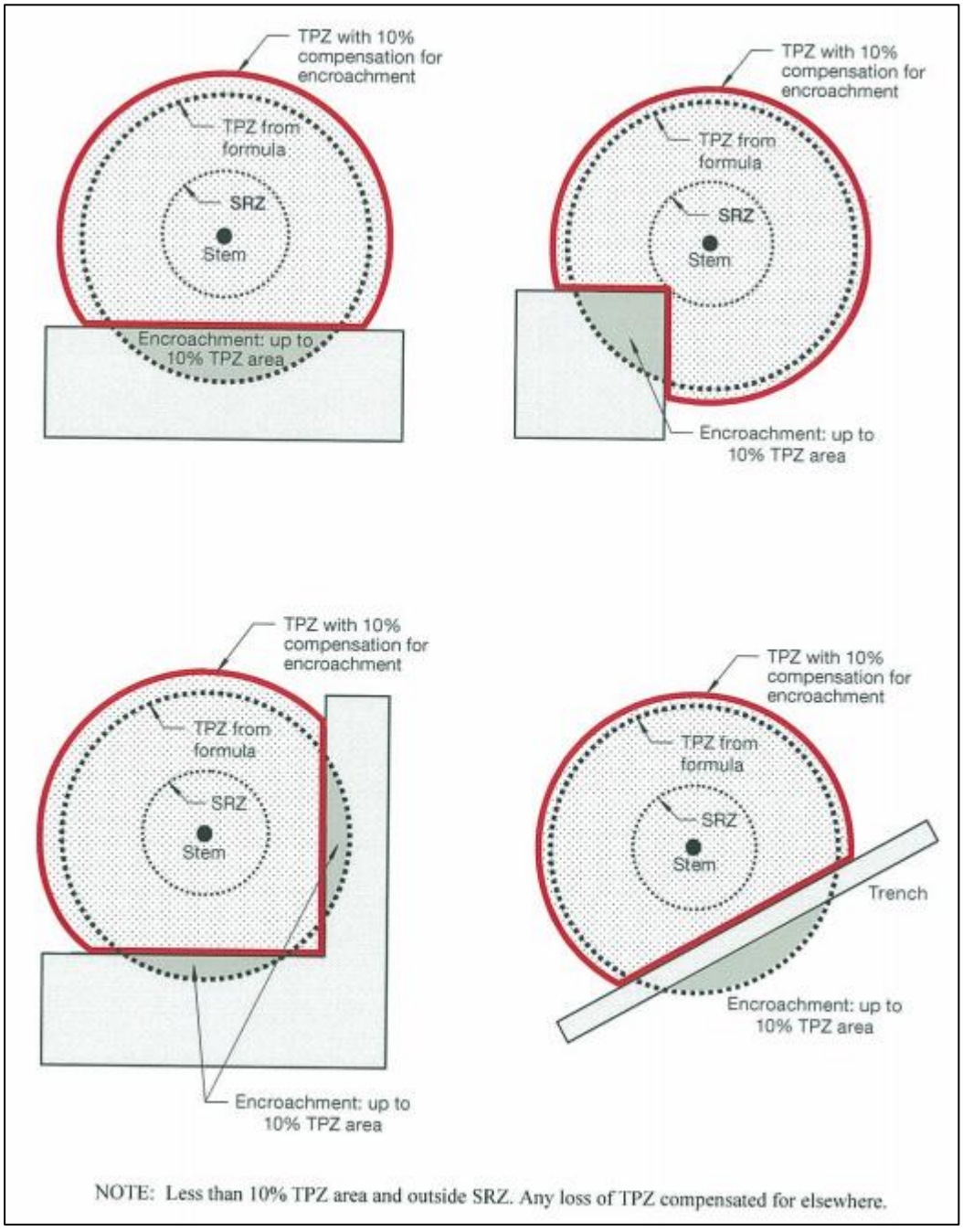
Australia ICOMOS Inc. 1999, *The Burra Charter – The Australian ICOMOS Charter for Places of Cultural Significance*, International Council of Monuments and Sites, www.icomos.org/australia

Draper BD and Richards PA 2009, *Dictionary for Managing Trees in Urban Environments*, Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia.

Footprint Green Pty Ltd 2001, *Footprint Green Tree Significance & Retention Value Matrix*, Avalon, NSW Australia, www.footprintgreen.com.au

IACA 2010, *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, www.iaca.org.au

11.8 Appendix 8 – Acceptable Encroachment



Source - Council of Standards Australia (August 2009) AS 4970 – 2009 – Protection of Trees on Development Sites Standards Australia.

12 DISCLAIMER

Hunter Bruce Consulting Pty Ltd does not assume responsibility for liability associated with the tree on or adjacent to this project site, their future demise and/or any damage, which may result therefrom.

Hunter Bruce Consulting Pty Ltd takes care to obtain all information from reliable sources. All data has been verified insofar as possible; however, the consultant can neither guarantee nor be responsible for the accuracy of information provided by others.

Hunter Bruce Consulting Pty Ltd cannot be held responsible for any consequences as a result of work carried out outside specifications, not in compliance with Australian Standards or by inappropriately qualified staff. Sketches, diagrams, graphs, and photographs in this report, being intended as visual aids, are not necessarily to scale.

12.1 LIMITS OF OBSERVATION

Hunter Bruce Consulting makes every effort to accurately identify current tree health and safety issues. Results may or may not correlate to actual tree structural integrity. There are many factors that may contribute to limb or total tree failure. Not all these symptoms are visible. There can be hidden defects that may result in a failure even though it would seem that other, more obvious defects would be the likely cause of failure. All standing trees have an element of unpredictable risk.

This report and all recommendations within this report are valid for a period of 12 months.