Transport for NSW

Bridge Road Cycleway

Addendum Review of Environmental Factors

April 2024





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Acknowledgement of Country

Transport for NSW acknowledges the Gadigal people of the Eora Nation, the traditional custodians of the land on which this project is located. We pay our respects to Elders past and present and celebrate the diversity of Aboriginal people and their ongoing cultures and connections to the lands and waters of NSW.

Many of the transport routes we use today – from rail lines, to roads, to water crossings – follow the traditional Songlines, trade routes and ceremonial paths in Country that our nation's First Peoples followed for tens of thousands of years.

Transport for NSW is committed to honouring Aboriginal peoples' cultural and spiritual connections to the land, waters and seas and their rich contribution to society.



Prepared by AECOM and Transport for NSW.

Executive summary

Transport for NSW (Transport) previously prepared a Review of Environmental Factors (REF) for the Bridge Road Cycleway project (referred to as the project REF), which was determined on 14 March 2022. The project comprises converting the existing temporary cycleway on Bridge Road/Pyrmont Bridge Road into a permanent cycleway. The cycleway was initially installed as a pop-up temporary cycleway for the community during COVID-19. The existing cycleway starts at Pyrmont Bridge Road near Lyons Road in Camperdown and continues onto Bridge Road until Taylor Street in Glebe.

The proposed modification

Since the determination of the project REF, it was subsequently identified during detailed design that several new design features are required to address safety issues, meet design standards, and respond to feedback received as part of community consultation. Transport is therefore proposing to update the project by including the following key features (referred to as the proposed modification):

- Changes to cycleway widths to vary from 1.2 to 3.7 metres (rather than 1.4 to 1.5 metres as described in the project REF)
- Inclusion of nine concrete pram ramps on both sides of the road to provide access between the cycleway and the footpath. The pram ramps would be located at the end of the raised separator for the cycleway. The locations would depend on the adopted length of the right turn bays (see further details below). Once the length of the right turn bays has been confirmed, the pram ramps would be installed at the end of the turn lane
- Conversion of the existing pedestrian refuge near Cross Street into a raised pedestrian crossing
- Conversion of the existing pedestrian crossing near Woolley Street into a raised pedestrian crossing
- Permanent restoration of existing underground utility trenches along Bridge Road/Pyrmont Bridge Road and affected side streets (Lyons Road, Darling Street, Railway Street and Bridge Road between Taylor Street and Bellevue Street)
- Full road width (kerb to kerb) asphalt milling and re-sheeting (up to 50 millimetres deep) along Bridge Road/Pyrmont Bridge Road between Lyons Road and Taylor Street (around 1.6 kilometres), including re-marking lines
- Demolition and re-construction (with slight realignment) of the concrete centre median beginning near the intersection with Lyndhurst Street
- Installation of street lighting for the raised pedestrian crossing near Cross Street
- Other minor repair or upgrade works along Bridge Road and side streets, comprising:
 - Installation of stop signs in several side streets at the entrance to Bridge Road to replace give-way
 intersections, including Barr Street, Cross Street, Woolley Street, Rosebank Street, Talfourd Lane (both
 sides of Bridge Road), Gottenham Street (both sides of Bridge Road), Brougham Lane (both sides of
 Bridge Road), Railway Street, Foss Street and Clare Street
 - New signage on new or existing posts (e.g. cycleway and road safety signage) along the cycleway and road corridor
 - Reconstruction of raised concrete platform in front of the existing bus stop (about 20 metres north of the intersection of Barr Street and Bridge Road)
- Right turn bays at Ross Street and Glebe Point Road intersections:
 - The design assessed in this Addendum REF includes a reduction in the length of the right turn bay on the eastern approach to the intersection of Ross Street and Bridge Road (from 80 metres to 42 metres), consisting of line marking changes only. The design assessed in this Addendum REF does not include changes to the lengths of any other right turn bays. However, City of Sydney Council has requested a reduction in the lengths of the right turn bays at the Ross Street and Glebe Point Road intersections and Transport has agreed to implement a trial
 - As requested by City of Sydney Council, Transport will implement a trial of shorter right turn bays at the Ross Street and Glebe Point Road intersections, including:

- Reduction in the length of the right turn bay on the eastern approach to the intersection of Ross Street and Bridge Road (from the existing 80 metres to 21 metres)
- No change to the right turn bay on the western approach to the intersection of Ross Street and Bridge Road is proposed, as this is used by buses that currently occupy the full length of the right turn bay
- Reduction in the length of the right turn bay on the eastern approach to the intersection of Glebe Point Road and Bridge Road (from the existing 30 metres to 14 metres)
- Reduction in the length of the right turn bay on the western approach to the intersection of Glebe Point Road and Bridge Road (from the existing 50 metres to 21 metres).
- The trial of shorter right turn bays would be implemented via line-marking changes and temporary Klemmfix barriers to extend the length of the separated cycleway during the trial period
- Once implemented, the reduced right turn bays would be evaluated to determine if there are any safety or traffic congestion issues. An initial evaluation would be undertaken for up to four weeks after the changes have been implemented. Depending on the outcome of the initial evaluation, the changes would be further assessed for six to twelve months
- o If the reduced right turn bays cause safety issues or unacceptable impacts to the road corridor, the temporary materials would be removed and the length of the right turn bays would be adjusted to be consistent with the Addendum REF design. That is, a 42 metre right turn bay on the eastern approach to Ross Street would be implemented via line-marking changes, and the right turn bays on the eastern and western approaches to Glebe Point Road would be returned to existing lengths of 30 metres and 50 metres, respectively. Pram ramps would then be installed as per the Addendum REF design
- o If the evaluation determines that the trial of reduced right turn bays is successful, the temporary Klemmfix barrier would be removed and replaced with a permanent arrangement (concrete separator) and pram ramps would be installed at the end of the turn lanes
- Inclusion of temporary construction parking areas for vehicle and machinery parking and potentially other ancillary facilities such as a mobile toilet
- Minor trimming of street trees (i.e. less than 10% of the canopy) in some locations along Bridge Road and Pyrmont Bridge Road
- Extension of the total construction duration from a total of up to three weeks as per the determined project REF
 to a total of approximately eight months (weather permitting).

Need for the proposed modification

The proposed modification, as described and assessed in this addendum REF, is in line with the strategic need for the project described in Section 2 of the project REF. The need for the features that comprise the proposed modification was identified through the continued design development of the project. This included the identification of the following issues:

- Cycleway widths: There are several physical constraints to the previously proposed cycleway width that are unavoidable and require changes to the cycleway width in various locations
- Pedestrian crossings: The existing pedestrian crossing near Woolley Street and pedestrian refuge near Cross Street require upgrading to improve the safety of pedestrians crossing Bridge Road
- Road pavement: The pavement surface of Bridge Road is in poor condition and requires re-sheeting
- Cycleway ramps: The safety of people on bikes is potentially compromised along sections where the cycle lane
 merges with the general traffic lane (i.e. through signalised intersections); a kerb ramp is also required on Bridge
 Road to join to the existing cycleway along Junction Street
- Traffic median and turning lane: Adjustments to traffic lanes and a traffic median are required to achieve suitable cycle lane and traffic lane widths
- Signage: Stop signs are required at several current 'give-way' intersections of side streets with Bridge Road to improve the safety of people on bikes (and other road users). New signage is also required at places along the cycleway and road corridor for safety and information (e.g. 'watch for pedestrians' signs and cycleway signs)
- Ancillary parking: Construction would require temporary parking areas for the parking of machinery and vehicles

- Tree pruning: Minor trimming of a small number of planted street trees would be required along Bridge Road and Pyrmont Bridge Road to accommodate construction clearance
- Permanent trench restoration: Recent utility installation works related to Infrastructure NSW's new Sydney Fish
 Market project included temporary restoration of the utility trenches. Permanent restoration of the existing
 underground utility trenches along Bridge Road and affected side streets is required to meet Transport standards.

The proposed modification has therefore been developed to address these issues and incorporate new and changed features, which would be incorporated into the project.

Proposal objectives

The objectives and development criteria of the project are described in Section 2.3 of the project REF. The proposed modification has considered these objectives and development criteria and has expanded them to include an overall objective to improve the connectivity and safety of active transport through the road corridor. Specifically, the proposed modification is expected to:

- Maximise network and active transport efficiency of the corridor
- Improve pedestrian/cyclist safety
- Maintain public transport functionality of the corridor.

Options considered

Selection of the features of the proposed modification was based on addressing safety issues and meeting applicable design standards or avoiding existing constraints, and as such, the options analysis was limited to the following considerations:

- Option 1 'Do nothing' in regard to each issue identified
- Option 2 Selection of each feature of the proposed modification.

Option 1 ('do nothing') was eliminated as all issues identified are required to be addressed under current standards and requirements or are otherwise unavoidable (e.g. in the case of physical constraints along the cycleway). Applicable design standards and requirements are described in Section 3.2. Option 2 (the proposed modification) is the preferred option as it would address the issues identified and increase road safety and efficiency for all road users.

Statutory and planning framework

The statutory and planning framework for the project, inclusive of the proposed modification, would remain consistent with that described for the project (refer to Section 4 of the project REF).

Community and stakeholder consultation

Community and stakeholder consultation was undertaken for the project and is described in section 5 of the project REF. The feedback received through the consultation activities undertaken was summarised in a consultation report, along with confirmation of the decision to proceed with the project, and presented in a community notification in 2022. The additional features of the proposed modification address issues raised in the community consultation undertaken, including road surface condition and bike rider and pedestrian safety.

The project design is close to finalisation and has limited scope for further community input. If the proposed modification is approved, future communication is likely to be generally limited to notification of the commencement and progress of construction of the project (inclusive of the proposed modification).

Additional consultation with City of Sydney Council has been undertaken for the proposed modification, as described in Section 5.3 of this Addendum REF. A trial of shorter right turn bays at two intersections within the proposal area would be implemented to address issues raised by City of Sydney Council.

Environmental impacts

Traffic, transport and access

The proposed increase in the construction period to about eight months would increase the duration of the traffic and transport impacts described in the project REF. Construction would be undertaken during night time hours between 8:00 pm to 5:00 am Sunday to Thursday, which would limit impacts to traffic and transport. Lane closures would result in minor impacts to traffic travel times, including for buses and other public transport, and also active transport. Detour routes are not expected to be required for traffic, people on bikes or pedestrians. However, the construction contractor would install appropriate delineation measures to keep the road and cycleway functional between construction shifts. There would also be a temporary loss of parking spaces to facilitate ancillary parking areas.

As requested by City of Sydney Council, Transport will implement a trial of shorter right turn bays at the Ross Street and Glebe Point Road intersections. The shorter right turn bays would be implemented using temporary materials and would be evaluated to determine if there are any safety or traffic congestion issues. If the reduced right turn bays cause safety issues or unacceptable impacts to the road corridor, the temporary materials would be removed, and the length of the right turn bays would be adjusted to be consistent with the Addendum REF design. If the evaluation determines that the trial of reduced right turn bays is successful, the arrangement would be made permanent.

Operation of the features of the proposed modification would affect all users of Pyrmont Bridge Road and Bridge Road (including pedestrians, people on bikes, motorists, and public transport customers) and are expected to result in mostly positive changes to the existing environment. All features are designed to improve the safety and efficiency of travel for all users of the road and cycleway. Existing street parking would not be impacted.

Visual impacts

Construction activities under the proposed modification would involve similar visual elements to those described in the project REF (e.g. construction machinery, vehicles, barriers and work sites along Bridge Road). However, the additional construction activities required (e.g. construction of raised crossing and road re-sheeting) would slightly increase the magnitude of impacts, and the increased construction duration would increase the duration that impacts could be experienced. Visual impacts during construction are expected to remain minor as they are temporary and mobile along the road corridor.

Visual impacts during operation are anticipated to be neutral or even positive since the re-sheeted road surface of Bridge Road would be of new and uniform quality, which is expected to have a positive impact on the visual amenity of the established road corridor. The pram ramps may also have a negligible to minor positive impact as new features in the corridor connecting the new cycleway and re-sheeted road.

Noise and vibration

During construction, the noisiest construction stage of the proposed modification was determined to be asphalt milling and re-sheeting. During this stage, exceedances of applicable noise management levels would be experienced in the noise catchment areas identified. Noise impacts would be temporary as works move along the road corridor. However, mitigation measures have been recommended in line with the *Construction Noise and Vibration Guidelines* (Transport for NSW, 2016). The majority of sensitive commercial receivers would not be affected due to the works being completed outside of standard construction hours. However, there are some commercial receivers that operate during night time hours (e.g. restaurants and accommodation) that may experience impacts. The use of heavy plant and machinery (such as vibratory rollers) has the potential to generate vibration impacts to nearby structures, and minimum working distances have been recommended to avoid impacts. Additional safeguards and mitigation measures would be undertaken before and during construction to address potential noise and vibration impacts, including notifications for residents and implementation of respite periods.

Operation of the proposed modification is not expected to result in any substantial change to the existing noise environment along the road corridor,

Non-Aboriginal Heritage

The proposed modification includes asphalt re-sheeting and milling works, which would pass directly beneath the overbridge associated with the State heritage-listed Pyrmont and Glebe Railway Tunnel. The heritage assessment concluded that the implementation of the recommended mitigation measures during construction would result in a low potential for the asphalt milling and re-sheeting works to damage the heritage fabric associated with the brick pier or diminish the heritage significance associated with the Pyrmont and Glebe Railway Tunnel. As no other heritage items are located within

the proposal area, there is little likelihood of a significant direct impact on other nearby heritage items or heritage conservation areas.

Vibration from the use of this machinery has the potential to cause structural or cosmetic damage to buildings if not carefully managed. Minimum working distances for vibration plant and machinery have been recommended and need to be complied with when working near heritage-listed items. Safeguards have been recommended to address impacts caused by vibration in addition to those proposed in the project REF.

No significant impacts to heritage-listed items are anticipated from the operation of the proposed modification.

Socio-economic

Given the proposed extended duration of construction (from up to four weeks to a total of about eight months) and the changes in the physical scope of the overall project, the socio-economic impacts of the proposed modification would be of a similar nature but experienced for a greater duration than those described in the project REF.

As most businesses would likely be closed during the proposed out-of-hours construction work, they would not experience impacts. Access to private properties would be maintained at all times during construction; however, may be temporarily impacted for short periods. This would be done with prior notification and in advance agreement with the property owner or resident, wherever practicable. Transport would work with any local residents who need out-of-hours access. Appropriate delineation measures would also be installed to keep the cycleway and road functional between construction shifts.

Construction would have amenity impacts on local residences through the generation of noise, vibration and light emissions and impacts to visual amenity (due to the presence of construction activities and machinery and vehicles). Amenity impacts would be temporary, short-term, and mobile as construction moves along the road corridor.

During operation, the proposed modification would contribute to the project in supporting a longer-term modal shift away from the use of private motor vehicles towards active transport (walking and bike riding) and would also promote a safer use of Bridge Road for all road users.

Biodiversity

The proposed modification would involve minor trimming of a limited number of planted street trees only to accommodate construction activities. Trimming required would be limited to 10% of the overall tree canopy by volume, which is within Transport for NSW's tree maintenance limit and is not expected to affect the viability of the tree. Tree trimming would be carried out by a qualified arborist and in accordance with *Australian Standard AS:4373 Pruning of Amenity Trees*.

No impacts on threatened ecological communities, threatened fauna or flora species are expected. However, construction would take place during nighttime hours, which may cause indirect impacts on bird and bat species and other nocturnal fauna species (e.g. possums) due to light and noise emissions. These impacts would be temporary and limited to the local area surrounding the work front as it moves along the road corridor.

The construction of pram ramps would require excavation near street trees, which may impact tree roots and affect the viability of the tree. Tree protection zones would be implemented to avoid impacting tree roots. If excavation is required within a tree protection zone, a suitably qualified arborist would be required to supervise and document the works and identify if the location of a pram ramp needs to be adjusted to avoid impacting the tree.

The proposed modification would not cause any impacts to biodiversity during operation.

Cumulative impacts

The proposed modification would increase some of the impacts of the project assessed in the project REF (in both intensity and/or duration), such as those associated with traffic and transport, noise and vibration and visual amenity, which increases the potential to contribute to cumulative impacts with other projects in the surrounding area. This is particularly the case for construction-related impacts.

New online searches have been undertaken for other nearby projects that may contribute to cumulative impacts with the project (including the proposed modification). Other projects identified include the New Sydney Fish Market project and Western Distributor Road Network Improvements. There is potential for construction fatigue for some nearby receivers from the ongoing works that have been progressing for the Sydney Fish Market redevelopment (e.g. utilities works) followed by construction of the proposed modification. This would expand the total duration that some receivers are exposed to construction impacts, particularly noise impacts. Otherwise, cumulative impacts are not expected with these projects or would be minimal.

From an operational perspective, the upgraded cycleway would contribute to positive active transport impacts in the area in combination with other active transport upgrades in the region. There is not expected to be any other cumulative impacts not already assessed in the project REF.

A safeguard was included in the project REF to account for potential cumulative impacts with other projects. No additional safeguards or management measures have been proposed to that provided in the project REF.

Justification and conclusion

This addendum REF assesses the potential, biophysical and social impacts of the proposed modification. Construction of the proposed modification would increase the intensity and duration of impacts compared to the original project. However, these impacts are not expected to be significant and would be appropriately managed with the safeguards proposed.

The addition of a wider variety of cycle path widths, raised crossings, pram ramps and re-sheeting of the full length of the project as part of the proposed modification would improve the design and safety of the project, which would be beneficial for all road users along Pyrmont Bridge Road/Bridge Road.

Table of contents

Executive summary4			
1.	Introduction	13	
1.1	Background	13	
1.2	Proposed modification overview	13	
1.3	Purpose of the report	16	
2.	Need and options considered	17	
2.1	Strategic need for the proposed modification	17	
2.2	Proposal objectives and development criteria	17	
2.3	Alternatives and options considered	18	
3.	Description of the proposed modification	19	
3.1	The proposed modification	19	
3.2	Design	24	
3.3	Construction activities	25	
3.4	Ancillary facilities	27	
3.5	Public utility adjustment	29	
3.6	Property acquisition	29	
4.	Statutory and planning framework	30	
5.	Consultation	31	
5.1	Previous community consultation	31	
5.2	Ongoing community engagement	31	
5.3	Government agency consultation	33	
6.	Environmental assessment	36	
6.1	Traffic, transport and access	36	
6.2	Visual impacts	40	
6.3	Noise and vibration	41	
6.4	Non-Aboriginal heritage	48	
6.5	Socio-economic	52	
6.6	Biodiversity	53	
6.7	Cumulative impacts	55	
6.8	Other impacts	56	
7.	Environmental management	59	
7.1	Environmental management plans	59	
7.2	Summary of environmental safeguards and management measures		
7.3	Licensing and approvals	70	

3.	Conclusion	71
3.1	Justification	71
3.2	Objects of the EP&A Act	71
3.3	Ecologically sustainable development	72
3.4	Conclusion	72
9.	Certification	7 3
10.	EP&A Regulation publication requirement	74
11.	Terms and acronyms used in this addendum REF	75
12.	References	76
Арре	endix A	78
Арре	endix B	82
Арре	endix C	87
Арре	endix D	88
Арре	endix E	89
Арре	endix F	. 90
Арре	endix G	91
Tak	oles	
Table !	5-1: Summary of issues raised by the community	31
Table !	5-2: Summary of issues raised by City of Sydney Council	33
	6-1: Existing intersection performance and surveyed queue lengths for Bridge Road and Glebe F intersection	
	6-2: Existing intersection performance and surveyed queue lengths for Bridge Road and Ross Streetion	
Table (6-3: Predicted noise levels during construction hours	45
	6-4: Minimum working distances for vibration-intensive plant and machinery (developed from ruction Noise and Vibration Guidelines, Transport for NSW, 2016)	46
Table :	7-1: Summary of safeguards and management measures	60

Appendices

- A EP&A Regulation Checklist, and EPBC Act Matters of National Environmental Significance and Commonwealth land
- B Statutory consultation checklists
- C Noise and vibration Construction Impact Assessment
- D Non-Aboriginal Heritage Assessment
- E Exemption from approval under s57(2) of the Heritage Act 1977
- F Bridge Road Traffic Analysis
- G Detailed Design Drawings

1. Introduction

1.1 Background

Transport for NSW (Transport) previously prepared a Review of Environmental Factors (REF) for the Bridge Road Cycleway project (referred to as the project REF), which was determined on 14 March 2022. The project comprises converting the existing temporary cycleway on Bridge Road/Pyrmont Bridge Road into a permanent cycleway. The cycleway was initially installed as a pop-up temporary cycleway for the community during the COVID-19 pandemic. The existing cycleway starts at Pyrmont Bridge Road near Lyons Road in Camperdown and continues onto Bridge Road until Taylor Street in Glebe.

1.2 Proposed modification overview

Since the determination of the project REF, it was subsequently identified during detailed design that several new design features are required to address safety issues, meet design standards, and respond to feedback received as part of community consultation.

Transport is therefore proposing to update the project described in section 3 of the project REF. Key features of the proposed modification would include:

- Changes to cycleway widths to vary from 1.2 to 3.7 metres throughout the alignment (rather than between 1.4 and 1.5 metres as described in the project REF)
- Inclusion of nine concrete pram ramps on both sides of the road to provide access between the cycleway and the
 footpath. The pram ramps would be located at the end of the raised separator for the cycleway. The locations
 would depend on the adopted length of the right turn bays (see further details below). Once the length of the right
 turn bays has been confirmed, the pram ramps would be installed at the end of the turn lane
- Conversion of the existing pedestrian refuge near Cross Street into a raised pedestrian crossing
- Conversion of the existing pedestrian crossing near Woolley Street into a raised pedestrian crossing
- Permanent restoration of existing underground utility trenches along Bridge Road/Pyrmont Bridge Road and affected side streets (Lyons Road, Darling Street, Railway Street and Bridge Road between Taylor Street and Bellevue Street)
- Full road width (kerb to kerb) asphalt milling and re-sheeting (up to 50 millimetres deep) along Bridge Road/Pyrmont Bridge Road between Lyons Road and Taylor Street (around 1.6 kilometres), including re-marking lines.
- Demolition and re-construction (with slight realignment) of the concrete centre median beginning near the intersection with Lyndhurst Street
- Installation of street lighting for the raised pedestrian crossing near Cross Street
- Other minor repair or upgrade works along Bridge Road and side streets, comprising:
 - Installation of stop signs in several side streets at the entrance to Bridge Road to replace give-way
 intersections, including Barr Street, Cross Street, Woolley Street, Rosebank Street, Talfourd Lane (both
 sides of Bridge Road), Gottenham Street (both sides of Bridge Road), Brougham Lane (both sides of Bridge
 Road), Railway Street, Foss Street and Clare Street
 - New signage on new or existing posts (e.g. cycleway and road safety signage) along the cycleway and road corridor
 - Reconstruction of raised concrete platform in front of the existing bus stop (about 20 metres north of the intersection of Barr Street and Bridge Road)
- Right turn bays at Ross Street and Glebe Point Road intersections:
 - The design assessed in this Addendum REF includes a reduction in the length of the right turn bay on the eastern approach to the intersection of Ross Street and Bridge Road (from 80 metres to 42 metres), consisting of line marking changes only. The design does not include changes to the lengths of any other

- right turn bays. However, City of Sydney Council has requested a reduction in the lengths of the right turn bays at the Ross Street and Glebe Point Road intersections and Transport has agreed to implement a trial
- As requested by City of Sydney Council, Transport will implement a trial of shorter right turn bays at the Ross Street and Glebe Point Road intersections, including:
 - Reduction in the length of the right turn bay on the eastern approach to the intersection of Ross
 Street and Bridge Road (from the existing 80 metres to 21 metres)
 - No change to the right turn bay on the western approach to the intersection of Ross Street and Bridge Road is proposed, as this is used by buses that currently occupy the full length of the right turn bay
 - Reduction in the length of the right turn bay on the eastern approach to the intersection of Glebe Point Road and Bridge Road (from the existing 30 metres to 14 metres)
 - Reduction in the length of the right turn bay on the western approach to the intersection of Glebe Point Road and Bridge Road (from the existing 50 metres to 21 metres)
- The trial of shorter right turn bays would be implemented via line-marking changes and temporary
 Klemmfix barriers to extend the length of the separated cycleway during the trial period
- Once implemented, the reduced right turn bays would be evaluated to determine if there are any safety
 or traffic congestion issues. An initial evaluation would be undertaken for up to four weeks after the
 changes have been implemented. Depending on the outcome of the initial evaluation, the changes would
 be further assessed for six to twelve months
- o If the reduced right turn bays cause safety issues or unacceptable impacts to the road corridor, the temporary materials would be removed and the length of the right turn bays would be adjusted to be consistent with the Addendum REF design. That is, a 42 metre right turn bay on the eastern approach to Ross Street would be implemented via line-marking changes, and the right turn bays on the eastern and western approaches to Glebe Point Road would be returned to existing lengths of 30 metres and 50 metres, respectively. Pram ramps would then be installed as per the Addendum REF design
- o If the evaluation determines that the trial of reduced right turn bays is successful, the temporary Klemmfix barrier would be removed and replaced with a permanent arrangement (concrete separator) and pram ramps would be installed at the end of the turn lanes
- Inclusion of temporary construction parking areas for vehicle and machinery parking and potentially other ancillary facilities such as a mobile toilet
- Minor trimming of street trees (i.e. less than 10% of the canopy) in some locations along Bridge Road and Pyrmont Bridge Road
- Extension of the total construction duration from a total of up to three weeks to a total of approximately eight months (weather permitting).

The location of the proposed modification is the same as that described in the project REF, with additional side streets where trench restoration is required. The amended proposal area is shown in Figure 1-1. Full details of the proposed modification are provided in Section 3.

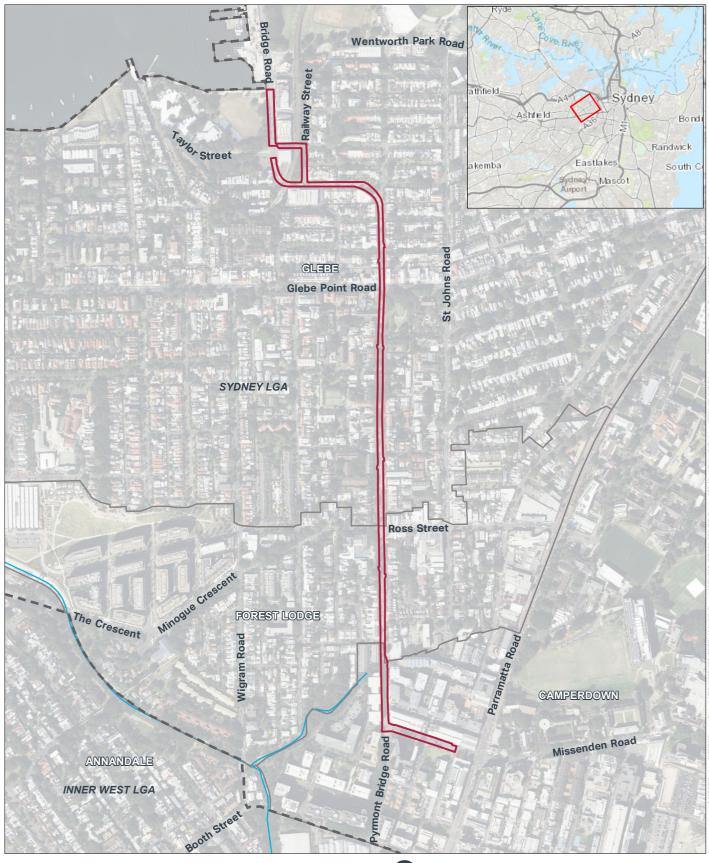


FIGURE 1-1: PROPOSAL LOCATION





Legend

Amended Proposal Area

LGA boundary

Suburb boundary

- Watercourse

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1.3 Purpose of the report

This addendum REF has been prepared by AECOM on behalf of Transport for NSW. For the purposes of these works, Transport for NSW is the proponent and the determining authority under Division 5.1 of the *Environmental Planning and Assessment Act* 1979 (EP&A Act).

This addendum REF is to be read in conjunction with the project REF. The purpose of this addendum REF is to describe the proposed modification, to document and assess the likely impacts of the proposed modification on the environment, and to detail mitigation and management measures to be implemented.

The description of the proposed work and assessment of associated environmental impacts has been undertaken in context of section 171 of the *Environmental Planning and Assessment Regulation 2021, Guidelines for Division 5.1 Assessments* (DEP (NSW Government Department of Planning and Environment, 2022), *Roads and Road Related Facilities EIS Guideline* (NSW Department of Urban Affairs and Planning, 1996), the *Biodiversity Conservation Act 2016* (BC Act), the *Fisheries Management Act 1994* (FM Act), and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The addendum REF helps to fulfil the requirements of:

• Section 5.5 of the EP&A Act including that Transport for NSW examine and take into account, to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity

The findings of the addendum REF would be considered when assessing:

- Whether the proposed modification is likely to result in a significant impact on the environment and, therefore, the
 necessity for an environmental impact statement to be prepared and approval to be sought from the Minister for
 Planning under Division 5.2 of the EP&A Act
- The significance of any impact on threatened species as defined by the BC Act and/or FM Act in section 1.7 of the EP&A Act and, therefore, the requirement for a Species Impact Statement or a Biodiversity Development Assessment Report
- The significance of any impact on nationally listed biodiversity matters under the EPBC Act, including whether there
 is a real possibility that the activity may threaten the long-term survival of these matters and whether offsets are
 required and able to be secured
- The potential for the proposed modification to result in a significant impact upon any other matters of national environmental significance or Commonwealth land, and therefore, the need to make a referral to the Australian Department of Climate Change, Energy, the Environment and Water for a decision on whether assessment and approval is required under the EPBC Act.

2. Need and options considered

2.1 Strategic need for the proposed modification

The strategic need for the project is described in Section 2 of the project REF. The proposed modification, as described and assessed in this addendum REF, is in line with the strategic need for the project.

The key features of the proposed modification are described in Section 3. The need for the features of the proposed modification was identified through continued design development of the project. This included the following issues:

- Cycleway widths: There are several constraints to the previously proposed cycleway width (e.g. required traffic lane widths, telegraph poles, telephone booth, large street trees, built structures) that are unavoidable and required design changes to the cycleway width in various locations
- Pedestrian crossings: The existing pedestrian crossing near Woolley Street and pedestrian refuge near Cross Street were identified as requiring upgrading to improve the safety of pedestrians crossing Bridge Road
- Road pavement: The pavement surface of Bridge Road is in poor condition and requires re-sheeting
- Cycleway ramps: The safety of people on bikes is potentially compromised along sections where the cycle lane
 merges with the general traffic lane (i.e. through signalised intersections), requiring people on bikes to lift their bike
 up the kerb onto the footpath if they wish to avoid riding amongst general traffic. A kerb ramp is also required on
 Bridge Road to connect with the existing cycleway along Junction Street
- Traffic median and turning lane: To achieve suitable cycle lane widths and allow adequate design widths for traffic
 lanes, the traffic median beginning near the intersection of Bridge Road and Lyndhurst Street was identified as
 requiring a slight realignment. The right turn lane at the eastern approach to the intersection with Ross Street would
 also need to be reduced in length from 80 metres to 42 metres, although may be further reduced to 21 metres
 depending on the outcome of the trial of reduced right turn bays at Ross Street and Glebe Point Road
- Signage: Several 'give-way' intersections on side streets entering Bridge Road were identified as requiring
 replacement with stop signs to improve the safety of people using the cycleway by slowing traffic and encouraging
 motorists to notice approaching people on bikes. New signage is also required at places along Bridge Road for safety
 and information (e.g. 'watch for pedestrians' signs and cycleway signs)
- Ancillary parking: It was identified that the construction stage would require temporary parking areas for the parking of machinery and vehicles
- Tree pruning: Minor trimming of a small number of planted street trees would be required along Bridge Road and Pyrmont Bridge Road to accommodate construction clearance
- Permanent trench restoration: Recent utility works related to Infrastructure NSW's new Sydney Fish Market project included temporary restoration of the utility trenches. Permanent restoration of the existing underground utility trenches along Bridge Road and affected side streets is required to meet Transport standards.

The proposed modification has been developed to address these issues and would amend and update the original project described in the project REF.

2.2 Proposal objectives and development criteria

The objectives and development criteria of the project are described in Section 2.3 of the project REF. The proposed modification has considered these objectives and development criteria and has expanded them to include an overall objective to improve the connectivity and safety of active transport through the road corridor.

The proposed modification is expected to:

- Maximise network and active transport efficiency of the corridor
- Improve pedestrian/cyclist safety
- Maintain public transport functionality of the corridor.

2.3 Alternatives and options considered

2.3.1 Identified options

Selection of the features of the proposed modification was based on addressing safety issues and meeting applicable design standards or avoiding existing constraints, and as such, the options analysis was limited to the following considerations:

- Option 1 'Do nothing' in regard to each issue identified in Section 2.1
- Option 2 Selection of each feature of the proposed modification based on design constraints and/or applicable safety and design standards.

2.3.2 Analysis of options and the preferred option

Option 1 ('do nothing') involves not addressing the issues identified in Section 2.1 and, therefore, not making any changes to the project described in the project REF. This option would not meet or contribute to the proposal objectives (described in Section 2.2), and was eliminated as all issues identified are required to be addressed under current standards and requirements or are otherwise unavoidable (e.g. in the case of physical constraints along the cycleway). Applicable design standards and requirements are described in Section 3.2.

Option 2 (selection of the features of the proposed modification) was therefore chosen as the preferred option, as it would address the issues identified and meet the proposal objectives, including improving the connectivity and safety of active transport through the road corridor. For example, the addition of pram ramps would allow people on bikes to avoid riding alongside vehicular traffic where the cycleway merges with the traffic lane, which would be a safer option for all road users. The raised crossings would provide a safer crossing point, and the re-sheeting of the road would provide a safer driving surface. The installation of stop signs to replace give-way intersections would improve safety for people on bikes (and other road users) on Bridge Road. The permanent trench restoration of existing underground utility trenches would ensure the road design is in accordance with Transport standards. The majority of the key features proposed would contribute to the overall function of the cycleway as an active transport corridor through the area.

3. Description of the proposed modification

This chapter describes the proposed modification, including the key features, design criteria and constraints, construction methodology and other relevant construction information.

3.1 The proposed modification

Transport for NSW proposes to modify the project described in the project REF, as outlined below.

Key features of the proposed modification would include:

- Changes to cycleway widths to vary from 1.2 to 3.7 metres (rather than 1.4 to 1.5 metres as described in the project REF)
- Inclusion of nine concrete pram ramps on both sides of the road to provide access between the cycleway and the footpath. The pram ramps would be located at the end of the raised separator for the cycleway. The locations would depend on the adopted length of the right turn bays (see further details below). Once the length of the right turn bays has been confirmed, the pram ramps would be installed at the end of the turn lane
- Conversion of the existing pedestrian refuge near Cross Street into a raised pedestrian crossing
- Conversion of the existing pedestrian crossing near Woolley Street into a raised pedestrian crossing
- Permanent restoration of existing underground utility trenches along Bridge Road/Pyrmont Bridge Road and affected side streets (Lyons Road, Darling Street, Railway Street and Bridge Road between Taylor Street and Bellevue Street)
- Full road width (kerb to kerb) asphalt milling and re-sheeting (up to 50 millimetres deep) along Bridge Road/Pyrmont Bridge Road between Lyons Road and Taylor Street (around 1.6 kilometres), including re-marking lines.
- Demolition and re-construction (with slight realignment) of the concrete centre median beginning near the intersection with Lyndhurst Street
- Installation of street lighting for the raised pedestrian crossing near Cross Street
- Other minor repair or upgrade works along Bridge Road and side streets, comprising:
 - Installation of stop signs in several side streets at the entrance to Bridge Road to replace give-way
 intersections, including Barr Street, Cross Street, Woolley Street, Rosebank Street, Talfourd Lane (both
 sides of Bridge Road), Gottenham Street (both sides of Bridge Road), Brougham Lane (both sides of Bridge
 Road), Railway Street, Foss Street and Clare Street
 - New signage on new or existing posts (e.g. cycleway and road safety signage) along the cycleway and road corridor
 - Reconstruction of raised concrete platform in front of the existing bus stop (about 20 metres north of the intersection of Barr Street and Bridge Road)
- Right turn bays at Ross Street and Glebe Point Road intersections:
 - The design assessed in this Addendum REF includes a reduction in the length of the right turn bay on the eastern approach to the intersection of Ross Street and Bridge Road (from 80 metres to 42 metres), consisting of line marking changes only. The design does not include changes to the lengths of any other right turn bays. However, City of Sydney Council has requested a reduction in the lengths of the right turn bays at the Ross Street and Glebe Point Road intersections and Transport has agreed to implement a trial
 - As requested by City of Sydney Council, Transport will implement a trial of shorter right turn bays at the Ross Street and Glebe Point Road intersections, including:
 - Reduction in the length of the right turn bay on the eastern approach to the intersection of Ross
 Street and Bridge Road (from the existing 80 metres to 21 metres)

- No change to the right turn bay on the western approach to the intersection of Ross Street and Bridge Road is proposed, as this is used by buses that currently occupy the full length of the right turn bay
- Reduction in the length of the right turn bay on the eastern approach to the intersection of Glebe Point Road and Bridge Road (from the existing 30 metres to 14 metres)
- Reduction in the length of the right turn bay on the western approach to the intersection of Glebe Point Road and Bridge Road (from the existing 50 metres to 21 metres)
- The trial of shorter right turn bays would be implemented via line-marking changes and temporary Klemmfix barriers to extend the length of the separated cycleway during the trial period
- Once implemented, the reduced right turn bays would be evaluated to determine if there are any safety
 or traffic congestion issues. An initial evaluation would be undertaken for up to four weeks after the
 changes have been implemented. Depending on the outcome of the initial evaluation, the changes would
 be further assessed for six to twelve months
- o If the reduced right turn bays cause safety issues or unacceptable impacts to the road corridor, the temporary materials would be removed and the length of the right turn bays would be adjusted to be consistent with the Addendum REF design. That is, a 42 metre right turn bay on the eastern approach to Ross Street would be implemented via line-marking changes, and the right turn bays on the eastern and western approaches to Glebe Point Road would be returned to existing lengths of 30 metres and 50 metres, respectively. Pram ramps would then be installed as per the Addendum REF design
- o If the evaluation determines that the trial of reduced right turn bays is successful, the temporary Klemmfix barrier would be removed and replaced with a permanent arrangement (concrete separator) and pram ramps would be installed at the end of the turn lanes
- Inclusion of temporary construction parking areas for vehicle and machinery parking and potentially other ancillary facilities such as a mobile toilet
- Minor trimming of street trees (i.e. less than 10% of the canopy) in some locations along Bridge Road and Pyrmont Bridge Road
- Extension of the total construction duration from a total of up to three weeks to a total of approximately eight months (weather permitting).

The proposed modification is shown in Figure 1-1, and key features of the proposed modification are shown in Figure 3-1, Figure 3-2, and Figure 3-3. The construction ancillary parking areas are described further in section 3.4. Detailed design drawings are provided in Appendix G.



FIGURE 3-1:

KEY FEATURES SHEET 1 OF 3

Legend

Permanent trench restoration, asphalt milling and resheeting

Permanent trench restoration

Pram ramp

Indicative potential alternate pram ramp location





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FIGURE 3-2:

KEY FEATURES SHEET 2 OF 3

Legend

Permanent trench restoration, asphalt milling and resheeting

Raised pedestrian crossing

Pram ramp

Indicative potential alternate pram ramp location





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FIGURE 3-3:

KEY FEATURES SHEET 3 OF 3

Legend

Permanent trench restoration, asphalt milling and resheeting

Permanent trench restoration

Raised pedestrian crossing

Pram ramp

Indicative potential alternate pram ramp location





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3.2 Design

3.2.1 Design criteria and engineering constraints

The design criteria and considerations for the proposed modification are described below. Features of the proposed modification have been developed with reference to *Beyond the Pavement 2020* (Transport for NSW, 2020), *Cycleway Toolbox* (Transport for NSW, 2020), City of Sydney Standard Drawings and applicable Austroads Guidelines.

Cycleway width and traffic lane widths

As described in the project REF, the desirable minimum width for a separated one-way cycleway path is 1.4 metres, as per *Guide to Road Design Part 6a: Paths for Walking and Cycling* (Ausroads, 2015) and the *Summary of Principles for Good Bike Infrastructure* (Bicycle NSW, 2020). Despite this, the City of Sydney's *Sydney Streets Code 2013* (City of Sydney Council, 2013) outlines a preferred minimum width of 1.5 metres. The existing Bridge Road cycleway, as constructed in 2020, generally has a lane width of 1.5 metres, while some areas are slightly narrower at a width of 1.4 metres.

The desirable cycleway lane design width of 1.5 metres was not possible to implement throughout the entire alignment. This was due to existing constraints such as telegraph poles, a telephone booth, street trees and traffic lane widths along Bridge Road. The width of the cycleway under the proposed modification would vary from 1.2 metres to 3.7 metres.

Proposed changes to the widths of traffic lanes have been developed in accordance with criteria set out in the *Guide to Road Design Part 3: Geometric Design* (Ausroads, 2021) and *Part 4A Unsignalised and Signalised intersections* (Ausroads, 2021). Both documents state that the desirable standard traffic lane width is 3.2 metres, with 3.0 metres as a minimum.

The current road space is limited, and several constraints have been identified throughout design development. Constraints have been avoided where possible. Other constraints include working near sandstone kerb and the heritage-listed bridge structure (Pyrmont and Glebe Railway Tunnel), existing utilities, right-turn bay lengths and requirement to minimise gaps in the cycleway at signalised intersections.

Raised pedestrian/cyclist crossings and pram ramps

The designs for the two raised crossings and nine pram ramps proposed have been developed in accordance with the *Guide to Road Design Part 4: Intersections and Crossings* (Ausroads, 2021), *Part 6 – Roadside Design, Safety and Barriers,* and *Part 6A – Paths for Walking and Cycling* (Austroads, 2021).

Road asphalt milling and re-sheeting

A survey of the road surface condition identified its condition as poor. As such, the surface of the road was determined to require re-sheeting. This re-sheeting has been designed in accordance with the *Guide to Pavement Technology Part 2:*Pavement Structural Design (Ausroads, 2019) and Transport for NSW standards, including R101 Cold Milling of Road Pavement Materials (Transport for NSW, 2022) and R116 Heavy Duty Dense Graded Asphalt (Transport for NSW, 2021).

Asphalt trench restoration

Permanent restoration is required for existing underground utility trenches installed during recent utility works for Infrastructure NSW's new Sydney Fish Market project. The permanent trench restoration has been designed in accordance with Transport for NSW standards, including M209 Road Openings and Restoration (Transport for NSW, 2021). The trench would be restored according to M209 Figure E.1- Restoration in flexible pavement (typical cross-section), with some amendments as follows:

- Minimum width of AC20 compaction 1.2 metres.
- Asphalt layers will require 150 millimetres of stepping. However, where the trench location is close to the kerb, there will be no or reduced stepping on the kerb side to suit the available space and avoid damage to the stone kerb.

3.3 Construction activities

The likely construction methodology, work hours and duration, plant and equipment and other construction information relevant to the proposed modification are described in this section.

The actual construction methodology may vary from the description provided due to construction planning in consultation with the construction contractor. The locations of the pram ramps may change slightly (i.e. within 1-2 metres of their planned location) to avoid tree roots.

3.3.1 Work methodology

The construction methodology for the project, including the proposed modification, would include the following stages:

- Stage 1: Asphalt restoration of existing underground 11-kilovolt utility trench:
 - Permanent restoration of existing underground utility trenches would include saw-cutting the concrete and excavating the utility trench to about 450 millimetres depth, removing the existing road pavement and replacing it with layers of asphalt. A final wearing surface will be applied for trench restoration works in the additional side streets and Bridge Road (between Taylor Street and Bellevue Street). A temporary wearing surface will be applied for trench restoration works along Bridge Road/Pyrmont Bridge Road, where milling and re-sheeting will subsequently be undertaken for the full road width. Works would move progressively along the corridor, completing about 40m of trenching restoration per shift, where feasible. Temporary traffic delineation would be put in place as the trench restoration is undertaken
- Stage 2: Asphalt milling and re-sheeting, construction of the raised crossings and median island:
 - Mill 50 millimetres of asphalt from the road pavement using a profiler machine. The milling operation
 would be undertaken across the full width of the road carriageway and is expected to progress from one
 end of the site to the other (direction to be determined by the contractor). Milling spoil would be
 removed from site and appropriately recycled. Temporary traffic delineation would be put in place as the
 milling activity is undertaken
 - Demolition of the median island would include saw cutting, jack hammering and disposal of the existing median concrete. Construction of the new median island would include drilling pavement surface and concreting the new island into place
 - o Construction of raised crossings by placement of correction and intermediate layers of asphalt
 - o 50mm asphalt re-sheeting would follow the milling operation. This would entail delivery of asphalt using asphalt trucks, placement of asphalt using a transfer vehicle and asphalting machine and compaction of asphalt using rollers. Similar to the milling operation, the asphalting scope is expected to be undertaken progressively from one end of the site to the other (direction to be determined by the contractor). Temporary traffic delineation would be in place following the application of the asphalt layer
- Stage 3: The remainder of the cycleway upgrade would be constructed (including three of the pram ramps):
 - Construction of the cycleway separators (refer to the project REF)
 - Three of the pram ramps would be constructed during this stage, as these pram ramps would not be impacted by the trial of shorter right turn bays. This includes the three pram ramps east of Ross Street (refer to Figure 3-3). At these locations, the existing kerb would be cut and removed and minor earthworks undertaken for the new ramps. Waste material/spoil would be removed offsite for disposal or recycling. Concreting would then be undertaken to form the new pram ramps
- Stage 4: Sign posting, line marking, installation of temporary Klemmfix barriers and coloured surface coating for cycleway and lighting for the raised pedestrian crossing near Cross Street:
 - Pavement markings would be applied, including green cycleway marking, 40 km/h pavement patches, longitudinal line marking and intersection line marking
 - New signage would be installed along with the replacement of some existing sign postings
- Stage 5: Evaluation of reduced right turn bays, removal of temporary Klemmfix barriers and adjustment of linemarking and concrete barrier to suit the adopted lengths of the right turn bays:

- Initial evaluation of reduced right turn bays for up to four weeks after changes implemented, with further evaluation over six to twelve months if the initial evaluation determines the changes to be successful
- Once the evaluation of the reduced right turn bays is completed and the length of the turning bays is confirmed, the remaining six pram ramps would be installed and adjusted to the adopted length
- At the locations where pram ramps are to be installed, the existing kerb would be cut and removed and minor earthworks undertaken for the new ramps. Waste material/spoil would be removed offsite for disposal or recycling. Concreting would then be undertaken to form the new pram ramps
- o Removal of temporary Klemmfix barriers
- o Adjust length of the concrete separator to suit the adopted right turn bay length
- Adjust line-marking to suit the adopted right turn bay length.

Minor trimming of street trees (i.e. less than 10% of the canopy) would be required in some locations along Bridge Road and Pyrmont Bridge Road to accommodate construction clearance. No tree removal is proposed as part of the proposed modification.

3.3.2 Construction hours and duration

The total duration of construction (for the original project and proposed modification) would be increased to about eight months (weather permitting). This increase in the total construction duration has been identified during detailed design and construction planning and is mostly driven by the permanent restoration of existing underground utility trenches along Bridge Road / Pyrmont Bridge Road and affected side streets. Night works would be limited to no more than five night shifts within a single week.

No changes to the daily hours of construction are proposed.

As outlined in the project REF, the proposed working hours are subject to a Road Occupancy Licence (ROL), and include the following proposed out of hours works schedule:

- Night work hours: 8:00pm to 5:00am, Sunday to Thursday
- No work on public holidays.

3.3.3 Plant and equipment

Plant, equipment and machinery that is likely to be needed for the project inclusive of the proposed modification includes:

- Profiler
- Excavators
- Asphalt paver and milling machine
- Vibratory roller/s (2 to 4 tonne), static rollers (12 tonne) and wacker packer
- Water cart
- Concrete truck, concrete agitator and concrete vibrator
- Concrete saws
- Bobcat
- Graders
- Forklift
- Hammer drills and impact drivers
- Hand tools
- Line marking machine (temporary and permanent line marking) trucks and equipment
- Lighting towers
- Generator and compressor

 Trucks and light vehicles (about 10 to 15 heavy vehicles and 15 to 20 light vehicles would be required during peak construction).

3.3.4 Source and quantity of materials

The source and quantity of materials that would be needed for the proposed modification were determined during detailed design and construction planning. The sourcing of materials would consider the requirements of the *Sustainable Design Guidelines – Version 4.0* (Transport for NSW, 2017) and utilise local suppliers were practicable. The use of recycled materials would be undertaken where practicable.

3.3.5 Traffic management and access

Construction is proposed to occur at night time to reduce impacts on traffic flow and to minimise safety risks for workers and road users. However, all construction stages would require traffic management, including a temporary traffic lane closure and management of a temporary contraflow lane. Detour routes are not expected to be required for traffic, people on bikes or pedestrians. The construction contractor would install appropriate delineation measures to keep the road and cycleway functional between construction shifts.

Traffic management and access procedures required for the proposed modification will be incorporated into a traffic management plan (TMP), which will be developed in accordance with *Traffic Control at Worksites Manual* (Transport for NSW, 2020) and Transport for NSW's *QA Specification G10 – Traffic Management* (Transport for NSW, 2020). The TMP will provide details of traffic management to be implemented during construction and include detailed cyclist, pedestrian and traffic control plans.

3.4 Ancillary facilities

Three temporary construction ancillary parking areas are proposed to be used, which would require temporary parking removal. These areas would be used for parking machinery, plant and vehicles, and potentially other facilities such as a mobile toilet. The ancillary parking areas are shown in Figure 3-4. No tree trimming is proposed at these locations.

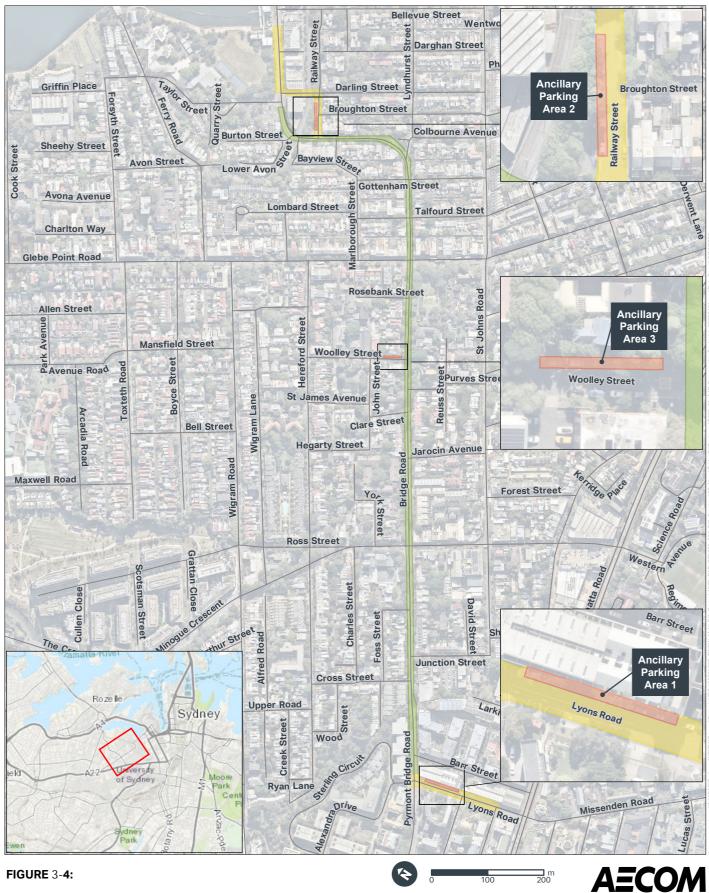


FIGURE 3-4:

CONSTRUCTION ANCILLARY PARKING AREAS

Legend

Permanent trench restoration, asphalt milling and resheeting

Permanent trench restoration

Ancillary parking area

3.5 Public utility adjustment

The proposed modification would not require significant public utility adjustments. Utility works were undertaken recently during Infrastructure NSW's new Sydney Fish Market project, which included a temporary restoration of the utility trench. The proposed modification includes permanent restoration of the existing utility trench along Bridge Road/Pyrmont Bridge Road and within the additional side streets, as listed below:

- Lyons Road between Pyrmont Bridge Road and Purkis Street, Camperdown (150 metres)
- Railway Street between Bridge Road and Darling Street, Glebe (75 metres)
- Darling Street between Railway Street and Bridge Road, Glebe (65 metres)
- Bridge Road between Taylor Street and Bellevue Street, Glebe (210 metres).

The locations of existing utilities would be checked prior to the commencement of construction, with appropriate adjustments being made as necessary. Any such modifications to utilities would be undertaken in consultation with the relevant provider.

3.6 Property acquisition

Property acquisition is not required as part of the proposed modification.

4. Statutory and planning framework

The statutory and planning framework for the project, inclusive of the proposed modification, would remain as per that described in Section 4 of the project REF, noting the following clarifications below.

State Environmental Planning Policy (Transport and Infrastructure) 2021

Since the preparation of the project REF, the former *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) has been consolidated into the *State Environmental Planning Policy (Transport and Infrastructure) 2021* (TI SEPP). Clause 2.109 of the TI SEPP applies to the project (inclusive of the proposed modification), which replaces clause 94 of the ISEPP, and permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

Part 2.2 of the TI SEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. Consultation for the proposed modification, including consultation as required by TI SEPP (where applicable), is discussed in chapter 5 of this REF.

Heritage Act 1977

A brick pier associated with an overbridge across Bridge Road is part of the State heritage listed item *Pyrmont and Glebe Railway Tunnel* (State Heritage Register (SHR) Item 01225)). The brick pier abuts Bridge Road on the eastern side of the road. Asphalt milling and re-sheeting works along Bridge Road would pass directly beneath the overbridge and past the brick pier. A Heritage assessment undertaken for the proposed modification (refer Section 6.4 and Appendix D) found that there is a low risk of impact to this heritage item from asphalt milling and re-sheeting, and that a number of safeguards will be implemented to protect this item (and other heritage items in the surrounding area). As a permit under Section 60 (s60) of the *Heritage Act 1977* is only required for potentially moderate impacts to items of State heritage significance, a section 60 permit would not be required.

Upon review of the heritage assessment, an exemption from approval under s57(2) of the *Heritage Act 1977* has been issued by Transport, and is provided in Appendix E.

5. Consultation

5.1 Previous community consultation

Initial engagement to inform the local community about the cycleway's installation as a pop-up took place in 2020. Since then, the project team has continued to keep the local community informed with proactive progress updates and it also responded to enquiries and feedback received about the project, including by phone and through the project email address.

Extensive community consultation for the project took place in March 2021. A description of this consultation, and Transport's responses to the feedback received through it, is presented in the 36-page March 2022 Bridge Road Pop-up Cycleway Community Consultation Report, which is available on the dedicated project webpage: Bridge Road Cycleway, Glebe | Transport for NSW

Steps taken to raise awareness about the consultation and encourage feedback included:

- Distribution of approximately 10,700 four-page 'Have Your Say' community updates, including information about how to give feedback
- Sponsored and locally targeted Facebook posts which reached over 30,000 users
- 12 eye-catching 'Have Your Say' signs placed along the project route, on both sides of the road.

These steps were successful and 1,083 online surveys were completed through the project webpage. All of the feedback received, which includes 2,915 open-ended responses to the final three survey questions, was carefully considered. A wide range of matters were raised and the majority of feedback about them was positive, neutral or mixed.

In March 2022 a community update was published with the Consultation Report, which announced the cycleway will be kept on Bridge Road permanently, with upgrades to be made.

The additional features of the proposed modification also address other issues raised in the community consultation, including about the safety of people who walk and ride bikes, and the need to improve the condition of the road surface.

5.2 Ongoing community engagement

Further engagement was carried out during the preparation of this Addendum REF, including to provide details of the proposed modification and update the community about how the project will continue to be delivered. An October 2023 Community Update ,was distributed to approximately 10,700 addresses closest to the cycleway and emailed to community members who subscribed to project updates, including during previous consultation. A new project webpage was launched (per the above) where project information and documents can be accessed.

Since publication of the latest Community Update on 10 October 2023, approximately 30 people made contact (as of 12 April 2024) to express their support or opposition to the cycleway, provide feedback or raise specific issues. A summary of the issues raised and a response to each issue is provided in Table 5-1.

Table 5-1: Summary of issues raised by the community

Issue raised	Transport for NSW Response
General feedback about the upgrades to pedestrian crossing, including: Improved lighting Camera installation Potential to add speed bumps Whether bike riders can cross the road using the pedestrian crossings.	Matters raised were considered out-of-scope for the project, including in light of the other upgrades and safety improvements that are being delivered with the permanent cycleway infrastructure, and the relevant guidance. The project team clarified that bike riders need to dismount when using the crossings to travel from one side of the road to the other.
Concerns about having a separated barrier.	The separated cycleway will improve safety for bike riders and feedback from bike riders strongly supports this, as outlined in

	Transport's Bridge Road Pop-up Cycleway Community Consultation Report (March 2022).
Various matters raised focusing particularly on safety (and the Road Safety Audit process), legal matters and transport planning /design.	Transport provided detailed responses to each of these respondents, addressing the legality of the cycleway and Transport's approach, as well as the technical questions raised regarding transport planning and design.
The need for regular street cleaning to remove litter from the cycleway, particularly between a bus stop and the apartment building on 10 Pyrmont Bridge Road (on the cycleway), where a damaged grate on the drain is causing litter to accumulate.	This feedback has been provided to City of Sydney Council, which is responsible for these activities. In relation to the damaged grate, this was repaired the week of 15 January 2023 and debris was removed at the same time. Also, Transport repaired the uneven road surface, close to the footpath, on the westbound side of the road, between Barr Street and Lyons Road.
Request to clarify what will happen to the bus stops on Bridge Road.	Bus stops will not be moving. Information was also provided about the location of bus stops in relation to the cycleway.
Query about whether the road is being re-sheeted and whether a noise-reducing asphalt can be used.	The re-sheet should reduce noise. The intention is currently to complete the re-sheet with a wearing course of 50mm AC14 aggregate and A15E binder.
Information requested about Transport's consultation process.	Transport's consultation process is outlined in the <i>Bridge Road Popup Cycleway Community Consultation Report</i> (March 2022).
Query about the suitability of the alternative route on St Johns Road.	Transport investigated alternative routes, including St Johns Road. The investigation demonstrated that Bridge Road was the most suitable and direct route for bike riders.
Concern about the visibility when crossing the cycleway from side streets.	The Road Safety Audit carried out before opening did not identify the creation of unsafe restrictions to visibility. The Road Safety Audit process and the safety upgrades that have been made give Transport confidence the cycleway improves safety.
Query about the dimensions of the cycleway and the barrier.	Typical cross section widths vary but are approximately 1.5m for the cycleway and 3m for the traffic lanes. The concrete separator (i.e. the barrier) is 0.4m in width.
The temporary cycleway barrier has been damaged and need to be repaired.	Transport's contractor carries out regular inspections and carries out work to rectify damage to the barrier (such as from 18 January 2024). As well as this, team members and other colleagues are bike riders who use the cycleway regularly, and they provide relevant information about repairs that may be needed, on top of these inspections. Repairs take place as quickly as possible but they are scheduled in line with other network priorities.
Feedback about the safety of the cycleway and claims the cycleway makes the road less safe.	This is not the case. Previously people who rode on Bridge Road had to contend with vehicles passing them, often far too close, at 60 km/h without the protection of a barrier. The reduced speed limit of 40 km/h is proven to reduce deaths and serious injuries, and the barrier provides separation from vehicles. As mentioned in the Bridge Road Pop-up Cycleway Community Consultation Report (2022), 92% of people questioned previously, who used the cycleway, felt safer than they did riding in the previous road conditions. All cycleways have a Road Safety Audit carried out before opening.
What was the outcome of Transport's 2023 tender for a contractor to install the cycleway?	Transport has not engaged any of the tenderers, due to delays to the works and scope changes. Transport plans to retender as soon as possible.
Multiple questions regarding a fault in the public bike rider count date and Transport's bike rider count processes.	A bike counter was incorrectly configured for November and December 2023. This has been rectified and historical data has also been fixed.

Transport previously said, in October 2023, that it plans to start work in early 2024 to upgrade the cycleway. Why hasn't work started and when will it?

Transport apologises for the delay and a further update about next steps will be issued by the project team when more information is available. Transport plans to start work as soon as possible and will provide the community with regular updates about the work from before it starts until construction is complete.

The design has limited scope for further community input, and as such, future engagement is likely to be generally limited to communication about installation work. This would include the following:

- Distribution of written and electronic updates to the local community, including those who were originally notified
 and who subscribed to project updates. Information provided will include upcoming construction activities, work
 dates and hours, impacts and mitigation measures and contact information. Updates would be provided at least
 seven days prior to the start of works and be supported by a range of proactive communication outputs and
 activites including, but not limited to:
- Stakeholder meetings (if required)
- VMS signage and posters (corflutes)
- Use of the dedicated project webpage
- Publishing of the construction contractor's contact details, including a 1800 phone number.

5.3 Government agency consultation

In addition to the consultation undertaken with government agencies and stakeholders in section 5.4 of the project REF, City of Sydney Council has been notified of the proposed modification in accordance with Part 2.2, Division 1, Section 2.10 of State Environmental Planning Policy (Transport and Infrastructure) 2021 (refer Appendix B for further information). Briefings and discussions with the City of Sydney Council have been ongoing throughout the planning process. A summary of the main issues raised, and Transport's response, is provided in Table 5-2. Transport will continue to liaise with the Council throughout the design and construction phases of the proposal.

Table 5-2: Summary of issues raised by City of Sydney Council

Matter	Issue raised	Transport for NSW Response
Overall comments on the design	Use a minimum bike lane width of 1.5m and separator width of 0.4m (except in exceptional circumstances where it could be 1.4m and 0.3m, respectively)	Across the majority of the design, the bicycle lane is wider than the desired 1.5m width. For the full extent of the design the separator is 0.4m wide. An absolute minimum bicycle lane width of 1.2m has been adopted. The locations where the desirable 1.5m bicycle lane is not achieved are where there are site constraints that prevent the cycle lane being wider.
	Investigate options (e.g. give way markings) to make the existing zipper merge safer	The design includes a green pavement marker and bicycle symbol across the width of the pavement at each merge between a general traffic lane and bicycle lane. There is also a 'watch for cyclist' sign. Together with the current slow speed of 40km/h, these signs and markings will help to create awareness of people on bikes.
	Use taper merges of 15m or less	The right turn bay taper lengths have been designed as per Austroads guidelines for a 40km/h design speed, based on the required lateral shift to move into the right turn lane.
	Reduce the gaps in cycleway separators at driveways to the absolute minimum	The gaps in the cycleway have been determined by the required turn path to enter and exit the driveway. Reducing the driveway gap would substantially increase the frequency of vehicles hitting the separator, causing damage to the separator and vehicles. The length of the openings at driveways is short and not possible for

		vehicles to use to overtake. Additionally, these gaps are
		painted green and clearly marked as bicycle lane.
Specific comments on the design made within a marked-up version of the current design	Rolltop kerb for school bus access and raised bus stop opposite the school	The length of the eastbound right turn bay at Ross Street will not be shortened due to the need for bus storage. As a result, the separator cannot be extended to the extent proposed in Council's mark-up. Additionally, the use of a rolltop kerb and having the bus parked in the bicycle lane for up to 15 minutes is not acceptable. Build-out of the southern bus stop is not practical without the separator being able to be extended substantially in approach to the bus stop.
	Amendments to the intersection of Bridge Road and Ross Street	The kerb-to-kerb width will not allow for the lane widths being proposed by Council. If this type of narrowed design was adopted there would be issues with turn paths at the intersection.
	Adjustment to the cycle lane at the horizontal curve	The turn paths of the design and check vehicles have determined the required median and separator kerb alignments. Transport has undertaken the design with the objective to maximise the width of the cycle lanes wherever possible. The separator alignment proposed by Council does not work with the turn path that Council has provided or the required check vehicles.
Heritage	While the proposed modification is likely to have some heritage impact, Council can still support the changes to the design from a heritage perspective, provided the mitigation measures recommended in the Heritage Assessment (refer to Section 6.4.4) are carried out. Council reproduced the mitigation measures with some additional commentary.	These comments are noted. The safeguards proposed in Section 6.4.4 are consistent with the Heritage Assessment and the Council's comments.
Tree pruning	There is insufficient information to determine potential impacts of the proposal overall or if the tree pruning is acceptable. Council has canopy targets to ensure it is expanding, not reducing, the overall canopy of its trees. Council's Tree Management and Donations policy specifically states that pruning is not permitted or "non-essential infrastructure" (e.g. work zones).	No tree removal would be undertaken. Transport would need to carry out minor tree trimming of a small number of planted street trees along Bridge Road and Pyrmont Bridge Road. Tree trimming would not exceed 10% of the overall canopy volume. Transport has revisited the need to undertake minor trimming on side streets (i.e. Railway Street, Woolley Street and Lyons Road) to allow for the parking of machinery and vehicles, as initially planned. Transport has decided not to progress with any trimming at these locations. Parking of machinery and vehicles would be accommodated to avoid trimming of planted street trees. Safeguards to be implemented to minimise potential
Right turn bays	Council requested that right turn bay lengths be amended as follows: • Ross Street: 15 metre right turn bay for eastern approach and western approach (bus only) • Glebe Point Road: 25 metre right turn bay for western approach and 20 metre right	impacts of tree pruning are provided in Section 6.6.4. Transport has agreed to undertake a trial of reduced right turn bays, as described in Section 3.1. The lengths of right turn bays proposed as part of the trial corresponds to the average (50%) queue lengths that were recorded during traffic surveys in February 2023.

turn bay for eastern approach

No change to the right turn bay on the western approach to the Bridge Road / Ross Street intersection is proposed, as this is used by buses that currently occupy the full length of the bay. The school bus stop outside Forest Lodge Public School also prevents the cycleway from being extended closer to Ross Street.

Clarification requested regarding trial details, including:

- duration
- interface between the trial and construction of permanent cycleway
- terms of reference of trial, e.g. safety of people riding (and other road users), impacts to convenience of drivers on corridor.

Confirmation requested that cycleways would be protected by a barrier in locations where right turn bays are shortened

Transport intends to assess the impact of the reduced right turn bays, including in relation to safety and traffic congestion, between two and four weeks after the line marking changes have been made to the bays. This would provide time to allow for road user behaviour to change. If this assessment concludes the changes have been unsuccessful, the changes would be removed. However, should the assessment conclude the changes have been successful, the changes would be further assessed, and the permanent arrangement would be implemented progressively after six months.

During the trial of reduced right turn bays, the length of the separate cycleway would be extended using Klemmfix as a temporary separator. Depending on the outcome of the trial, the Klemmfix barrier would be removed, and the concrete separator would be extended to match the final length of the right turn

6. Environmental assessment

This section of the addendum REF provides a description of the potential environmental impacts associated with the construction and operation of the proposed modification. All relevant aspects of the environment potentially affected by the proposed modification are considered. This includes consideration of the guidelines *Roads and Related Facilities EIS Guideline* (DUAP, 1996) and *Guidelines for Division 5.1 assessments* (NSW Government Department of Environment and Planning, 2022), and the factors specified in section 171 of the *Environmental Planning and Assessment Regulation 2021* (refer Appendix A).

Site-specific safeguards and management measures are provided to address the identified potential impacts (see section 7.2).

6.1 Traffic, transport and access

6.1.1 Methodology

A qualitative assessment of potential traffic, transport and access impacts was undertaken based on the proposed construction activities and operational configuration of the proposed modification. The traffic and transport assessment in the project REF is referred to and relied on where relevant.

A traffic and transport analysis, provided in Appendix F, was undertaken to assess the right turn capacity requirements at two intersections along Bridge Road, including Ross Street and Glebe Point Road. The analysis was completed using SIDRA V9 traffic modelling software for the 2023 existing base year. No future year modelling was developed. Traffic surveys were undertaken for one week over a 15 hour period from 7 am to 10 pm, between 6 February 2023 and 12 February 2023. Surveys were not undertaken during the Saturday peak times.

6.1.2 Existing environment

A description of the existing traffic and transport environment in the area is provided in Section 6.1.1 of the project REF.

The proposed temporary ancillary parking areas would be located at Lyons Road, Woolley Street, and Railway Street, as described in section 3.4. All three roads are single-lane, two-way roads with public street parking on both sides. Parking is restricted in these areas as follows:

- Lyons Road: 2-hour parking limit Between 8:30 am and 6:00 pm, Monday to Friday and between 8:30 am and 12:30 pm, Saturday
- Railway Street: 2-hour parking limit between 8:30 am to 6:00 pm, Monday to Friday; permit holders excepted
- Woolley Street: 1-hour parking limit from 8:00 am to 10:00 pm, Monday to Friday, permit holders excepted.

Bridge Road and Glebe Point Road

The Bridge Road and Glebe Point Road intersection currently operates as a 4-way signalised intersection with a pedestrian crossing on all approaches (Figure 6-1). There are large volumes of cyclists that use this intersection and currently there is a temporary path along Bridge Road for cyclists to utilise. The intersection currently operates with an average cycle time of 130 seconds.

A summary of the existing intersection performance and surveyed queue lengths for the Bridge Road and Glebe Point Road intersection is provided in Table 6-1. The results indicate that the overall intersection performance operates at a Level of Service (LoS) C. Right turn bays along Bridge Road only queue for a length of up to 22 metres. The survey of queue lengths identified the following:

- For the AM peak, the average queue length (50th percentile) was around two vehicles per cycle but ranged up to five vehicles per cycle time (95th percentile)
- For the PM peak, the average queue length (50th percentile) was around three vehicles per cycle but ranged up to seven vehicles per cycle time (95th percentile).

Therefore, survey results suggest that the western approach turn bay can accommodate the right turn traffic. However, the eastern approach right turn bay can accommodate the right turn traffic on average but can on occasion overflow into the through traffic.

Table 6-1: Existing intersection performance and surveyed queue lengths for Bridge Road and Glebe Point Road intersection

Parameter	Degree of	Average	Level of	Queue	Length
	Saturation	Delay (s)	Service	Bridge Road Right Turn: western approach queue	Bridge Road Right Turn: eastern approach queue
2023 AM Peak	0.851	28.9	С	21.7 m (3 vehicles)	16.3m (2 vehicles)
Survey (95%)				(~35 m) 5 vehicles	(~35 m) 5 vehicles
Survey (50%)				(~14 m) 2 vehicles	(~7m) 1 vehicle
2023 PM Peak	0.858	29.4	С	21.6 m (3 vehicles)	20 m (3 vehicles)
Survey (95%)				(~49m) 7 vehicles	(~21 m) 3 vehicles
Survey (50%)				(~21 m) 3 vehicles	(~14 m) 2 vehicles
2023 Saturday Peak	0.721	25.4	В	25.3 m	15.9 m

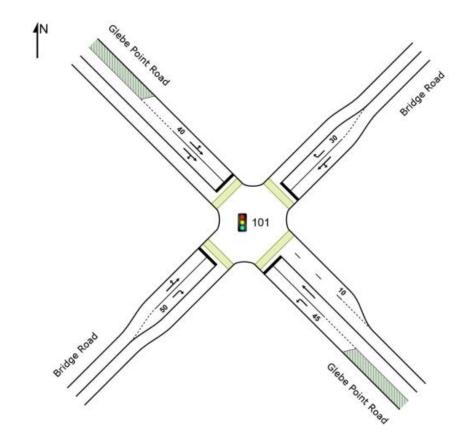


Figure 6-1: Existing layout of the Bridge Road and Glebe Point Road intersection

Bridge Road and Ross Street intersection

The Bridge Road and Ross Street intersection currently operates as a 4-way signalised intersection with a pedestrian crossing on all approaches (Figure 6-2). There are large volumes of cyclists that use this intersection and currently there is a temporary path along Bridge Road for cyclists to utilise. The intersection currently operates with an average cycle time of 130 seconds.

A summary of the existing intersection performance and surveyed queue lengths for the Bridge Road and Ross Street intersection is provided in Table 6-2. The results indicate the overall intersection performance operates at a LoS B in the AM peak and a LoS C in the PM peak and Saturday peaks. The survey of queue lengths identified the following:

- For the AM peak, average queue length (50th percentile) was around two vehicles per cycle but ranged up to four vehicles per cycle time (95th percentile)
- For the PM peak, average queue length (50th percentile) was around three vehicles per cycle but ranged up to six vehicles per cycle time (95th percentile).

The survey results suggest that both right turn bays can accommodate the right turn traffic.

Table 6-2: Existing intersection performance and surveyed queue lengths for Bridge Road and Ross Street intersection

Parameter	Degree of	Average	Level of	Queue	Length
	Saturation	Delay (s)	Service	Bridge Road Right Turn: western approach queue	Bridge Road Right Turn: eastern approach queue
2023 AM Peak	0.745	26.3	В	4.4 m	16.6 m
Survey (95%)				(~21 m) 3 vehicles	(~28 m) 4 vehicles
Survey (50%)				(~14 m) 2 vehicles	(~7 m) 1 vehicle
2023 PM Peak	0.888	40.3	С	5.2 m	63.9 m
Survey (95%)				(~21 m) 3 vehicles	(~42 m) 6 vehicles
Survey (50%)				(~14 m) 2 vehicles	(~21 m) 3 vehicles
2023 Saturday Peak	0.731	28.7	С	2.1 m	30 m

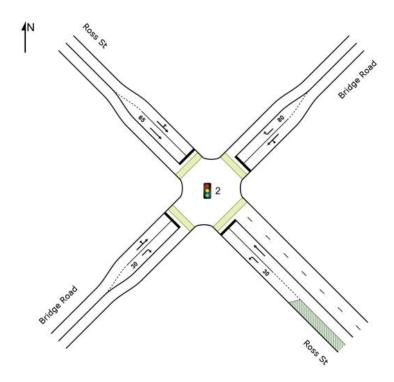


Figure 6-2: Existing layout of the Bridge Road and Ross Street intersection

6.1.3 Potential impacts

Construction

This modification includes the increase in the construction period to eight months (weather permitting), which will increase the duration of the traffic and transport impacts described in the project REF.

Construction activities for the project (including the proposed modification) would be undertaken between 8:00 pm to 5:00 am, Sunday to Thursday, which would limit impacts to traffic and transport. No more than five nights of construction would be undertaken in a single week.

Construction would require a temporary traffic lane closure and management of a contraflow lane. A ROL would be sought for this purpose. Lane closures would result in minor impacts on traffic travel times, including for public and active transport users. Detour routes are not expected to be required for vehicle traffic, people on bikes or pedestrians. However, the construction contractor would install appropriate delineation measures to keep the road and cycleway functional between construction shifts, i.e. during the day.

Temporary bus stop relocations would be required as the works progress along Bridge Road. Bus stop relocations would be organised in accordance with the relevant bus service provider and be included in notifications to the community. Temporary street signage would also be implemented to indicate any changes, including signage at the temporary stop.

Property access for residents and businesses would generally be maintained throughout construction. Should any temporary interruptions occur, this would be done with prior notification and in advance agreement with the property owner or resident, wherever practicable.

On-street parking would be temporarily suspended during construction to allow for the three temporary construction parking areas as follows:

- Construction parking area 1 Lyons Road: Nine parking spaces temporarily suspended
- Construction parking area 2 Woolley Street: Five parking spaces temporarily suspended
- Construction parking area 3 Railway Street: Six parking spaces temporarily suspended.

The temporary suspension of these parking spaces would reduce the amount of on-street parking available to local residents and businesses during construction. This would be short-term, with other nearby street parking likely to be available. Construction parking areas 1 and 3 have also previously been used as ancillary parking areas for trucks and machinery by Council. The local community may have adapted to the absence of parking in these locations, which may limit the impact of the proposed modification.

Standard mitigation measures to mitigate the construction impacts on traffic and transport are summarised in section 6.1.4.

Operation

Operation of the modified project would affect all users of Pyrmont Bridge Road and Bridge Road (including pedestrians, people on bikes, motorists, and public transport customers). Impacts on these users are expected to be mostly positive.

As requested by City of Sydney Council, a trial of shorter right turn bays at the Ross Street and Glebe Point Road intersections would be implemented, as described in Section 3.1. The right turn bay lengths proposed within the Addendum REF design are generally consistent with the 95th percentile queue lengths recorded during the traffic surveys (as described in Section 6.1.2). However, the lengths proposed for the trial of reduced right turn bays are generally consistent with the 50th percentile queue lengths recorded during the traffic surveys. Therefore, there may be times when the right turn traffic cannot be accommodated within the reduced right turn bays and may overflow into the through lane, which could result in delays and congestion along road corridor. It is noted that modelling of the proposed right turn bays has not been undertaken to assess the intersection performance. However, the potential impacts of the reduced right turn bays would be evaluated through traffic monitoring once the changes have been implemented.

Transport will evaluate the impact of the reduced right turn bays over an initial four-week period to determine whether there are any safety or traffic congestion issues. During the trial period, the reduced right turn bays would be implemented using temporary materials and line-marking changes and could be easily removed if required. If it is determined that the reduced right turn bays cause safety issues or unacceptable impacts to the road corridor, the temporary materials would be removed and the length of the right turn bays would be adjusted to be consistent with the Addendum REF design. If the trial of reduced right turn bays is determined to be successful, the temporary materials would be removed and the concrete separator would be extended in line with the adopted right turn bay lengths.

The addition of pram ramps would allow people on bikes to enter the footpath at points where the cycleway merges with the traffic lane. This would allow people on bikes to avoid riding alongside vehicular traffic and provide a safer option for all road users. The raised crossings would provide a safer crossing point for pedestrians and people on bikes, resulting in a safer environment. The re-sheeting of the road would provide a safer driving surface by improving the tyre contact of vehicles (and braking reliability) and would also improve ride comfort.

The modification includes the narrowing of the cycleway in certain locations based on local constraints. These would be well sign-posted and line-marked, as necessary. Whilst this will compromise the strict adherence to the design principles, the impact on cyclists is not considered substantial. Overall, the changes in width would not substantially affect the functionality of the cycleway, though they may require users to reduce their speed through these narrower sections.

Other minor changes to the project proposed as part of this modification would generally result in a positive outcome during operation. For example, the replacement of give-way signs/intersections with stop signs at the entrance to Bridge Road from several side streets would improve safety for road users and people on bikes. Similarly, new and replacement signage (e.g. 'watch for bicyclists', 'pedestrian crossing' signs) would be installed in line with road safety specifications to advise the public of the changed conditions.

The proposed modification would not affect any additional on-street parking.

6.1.4 Safeguards and management measures

Safeguards for addressing traffic and transport impacts are provided in Section 6.1 (traffic and transport) of the project REF. These would also apply to the proposed modification. Other safeguards and management measures that would address traffic and transport are addressed in sections 6.3 (noise and vibration), section 6.5 (socio-economic) and 6.6 (cumulative) of the project REF, and also in section 6.3 (noise and vibration) and section 6.5 (socio-economic impacts) of this addendum REF. A consolidated list of safeguards and mitigation measures is provided in Section 7.2.

6.2 Visual impacts

6.2.1 Methodology

The visual impact assessment in the project REF examined the views seen from a number of representative viewpoints along the cycleway (termed 'visual catchments'). These visual catchments were often bounded by landmarks, including intersections, cross streets and bends in the road. They were identified and defined using desktop analysis.

The project REF provided a high-level assessment of visual impacts during construction, in line with the short-term, temporary nature of the works. The assessment of the potential visual impacts of the project during operation used an analysis of the sensitivity of the view of either the landscape itself or the receptor, seeing the view subject to change. This included an assessment of the magnitude of change in that zone or view as recommended by the – *Guideline for Landscape Character and Visual Impact Assessment, Environmental Impact Assessment Practice Note* EIA-N04 (Transport for NSW, 2020). These assessments have been reviewed and updated where necessary to account for the proposed modification.

6.2.2 Existing environment

The proposal area is located within an urbanised, inner-city area. The dominant land uses in the surrounding area are a mixture of infrastructure (local and state roads, rail corridor), residential, recreational, commercial, and educational facilities. Residential properties and a number of commercial buildings front Bridge Road. The properties along the corridor are generally one or two-storey terrace houses, with the exception of low-rise apartment blocks near the intersection with Lyons Road. Street trees line Pyrmont Bridge Road and Bridge Road.

Seven viewpoints were assessed in the project REF, which represent viewpoints of motorists, pedestrians, people on bikes, residents and other community members along the cycleway. These viewpoints are described in section 6.2.2 of the project REF and remain appropriate as the existing environment for the proposed modification.

6.2.3 Potential Impacts

Construction

Construction activities under the proposed modification would involve similar visual elements (e.g. construction machinery, vehicles, barriers and work sites along Bridge Road) as noted in the project REF. Works under the modified proposal would also be undertaken out of standard hours. However, due to the proposed increase in the overall construction period to eight months, these impacts would be experienced for a longer duration. The trench restoration, re-sheeting of the road, construction of raised crossings and introduction of ancillary parking areas would also slightly increase the magnitude of the visual impact of the project. Construction would progress along the road corridor, however, and only be seen in any one location for a short period of time.

The construction visual assessment in the project REF found that the project would result in a minor, negative impact on visual receivers. Despite the increased duration of construction, this impact assessment is still considered to be valid for the modified project.

Operation

The introduction of the raised crossings would be visible by local receptors along Bridge Road (refer also to viewpoint 4 and viewpoint 6 in the project REF) and would increase the magnitude of change experienced at these locations. The introduction of raised crossings and new signage may interrupt the linear nature of the streetscape and contribute to slightly more

cluttered views. However, these may also entail greater appeal for pedestrians and people on bikes looking for ease of access and safe pathways travelling down Bridge Road. Receptors close to the crossing may notice the addition of street lighting for the raised crossing near Cross Street. However, there are existing street lighting and street trees at this location, which would limit this effect, and in the context of an established streetscape, this change is not expected to be significant. Overall, the visual impacts of these crossings are expected to be low. The re-sheeted road surface of Bridge Road would be visible from all viewpoints. Due to its new and uniform quality, it is expected to positively impact the visual amenity of the established road corridor. The pram ramps may also have a negligible to minor positive impact as new features connecting the new cycleway and re-sheeted road.

The results of the visual impact assessment in the project REF are likely to remain consistent when considering the incorporation of the proposed modification features. In general, the proposed modification is expected to further contribute to the transport-orientated nature of the road corridor and overall would have a positive effect.

6.2.4 Safeguards and management measures

Safeguards relating to visual impacts were proposed in the project REF and are replicated in Section 7.2. This includes a safeguard for Non-Aboriginal heritage, which would also assist in mitigating visual impacts. The following additional safeguards are also recommended:

Impact	Environmental safeguards	Responsibility	Timing
Visual amenity	Works to be carried out in accordance with Transport for NSW <i>EIA-N04 Guideline</i> for Landscape Character and visual impact assessment.	Transport for NSW and construction contractor	Pre-construction and construction
Visual amenity	Artificial lighting will be directed down, and light spill into neighbouring properties minimised where possible.	Construction contractor	Construction

6.3 Noise and vibration

6.3.1 Methodology

An assessment of construction noise was undertaken using Transport for NSW's "Construction Noise Estimator" tool (refer to Appendix C). The assessment was undertaken for the noisiest construction stage of the project (inclusive of the proposed modification), which was determined to be Stage2: asphalt milling and re-sheeting (i.e. the 'Profiling' scenario in the Construction Noise Estimator Tool). The assessment identified nearby sensitive receivers, characterised background noise conditions, quantitatively assessed potential noise impacts and recommended suitable management measures to minimise impacts during construction. An operational noise assessment was not undertaken as the proposed modification is not expected to result in notable changes to the existing noise environment. A high-level, qualitative consideration of this is provided below.

6.3.2 Existing environment

The surrounding land use activities around the proposal area are described in section 6.3 and shown in figure 4-1 of the project REF. The proposal area is located within a mixed-use development area. The major noise sources in the proposal area are road traffic noise from Bridge Road and Parramatta Road, as well as rail noise from the Dulwich Hill light rail line.

The following sensitive receivers have been identified in close proximity to the work and, therefore, would have the highest potential to be affected (approximate distance to the receiver in brackets):

- Residential receivers along Bridge Road and Pyrmont Bridge Road adjacent to the proposal area and other nearby residential receivers to the proposal area
- Commercial receivers operating during night time hours (e.g. restaurants, hotels/accommodation) along Bridge Road and Pyrmont Bridge Road and near the proposal area
- Forest Lodge Child and Family Health Centre, 300 Bridge Road, Forest Lodge (1 metre)

- Glebe Montessori Academy Childcare Centre, 158 Bridge Road, Glebe (1 metre)
- Only About Children Glebe, 163/165 Bridge Road, Glebe (1 metre)
- Forest Lodge Public School, 231-233 Bridge Road, Forest Lodge (8 metres)
- Medical Foundation Building, 92 Parramatta Road, Camperdown (39 metres)
- Broughton Street Kindergarten, 80 Broughton Street, Glebe (40 metres)
- St John's Anglican Church, 138A Glebe Point Road, Glebe (55 metres)
- St James' Catholic Church and Primary School, 2 Woolley Street, Glebe (66 metres)
- Sydney Secondary College Blackwattle Bay Campus, Taylor Street, Glebe (97 metres)
- Sydney Presbytery, 37 St Johns Road, Glebe (100 metres)
- St Joseph's Catholic Church, 2 Missenden Road, Camperdown (134 metres)
- GBI Miracle Service Sydney, 9 Missenden Road, Camperdown (144 metres)
- Sancta Sophia College, 8 Missenden Road, Camperdown (182 metres)
- Glebe Library, 186 Glebe Point Road, Glebe (240 metres).

Representative existing background noise levels (also referred to as Rating Background Level (RBL)) were determined using the Construction Noise Estimator Tool (using noise environment category 'R4' in the noise tool, which represents a high-density urban environment). The following RBLs were identified for residential receivers:

Daytime RBL: 55dB(A)

Evening: 50dB(A)

• Night time: 45dB(A).

Noise Management Levels (NMLs) were defined using the method specified in the *Interim Construction Noise Guideline* (NSW Department of Environment and Climate Change, 2009) and are based on the estimated RBL. The NML during the night time is estimated to be 50 dB(A) for the proposal area and its surrounds for residential receivers and 70dB(A) for commercial receivers.

6.3.3 Potential Impacts

Construction noise and vibration

Three noise catchment areas (NCAs) were identified to differentiate residential receivers into groups that would be affected by similar noise levels from construction activities. They are shown in Figure 6-3. Two NCAs were identified for commercial receivers, which are shown in Figure 6-4.

Figure 6-4 provides the noise levels estimated for Stage 2 (asphalt milling and re-sheeting) in each NCA, along with the distances up to which noise levels are expected to exceed the applicable NML for each NCA and the recommended mitigation measures. NMLs would be met or exceeded in all NCAs during the noisiest construction stage. Noise impacts would be temporary as works move along the road corridor. However, mitigation measures have been recommended in line with the *Construction Noise and Vibration Guidelines* (Transport for NSW, 2016). The additional mitigation measures were reviewed (refer to Section 4.1 of Appendix C) to determine which measures are feasible and reasonable to apply. The recommended mitigation measures are outlined in Section 6.3.4.

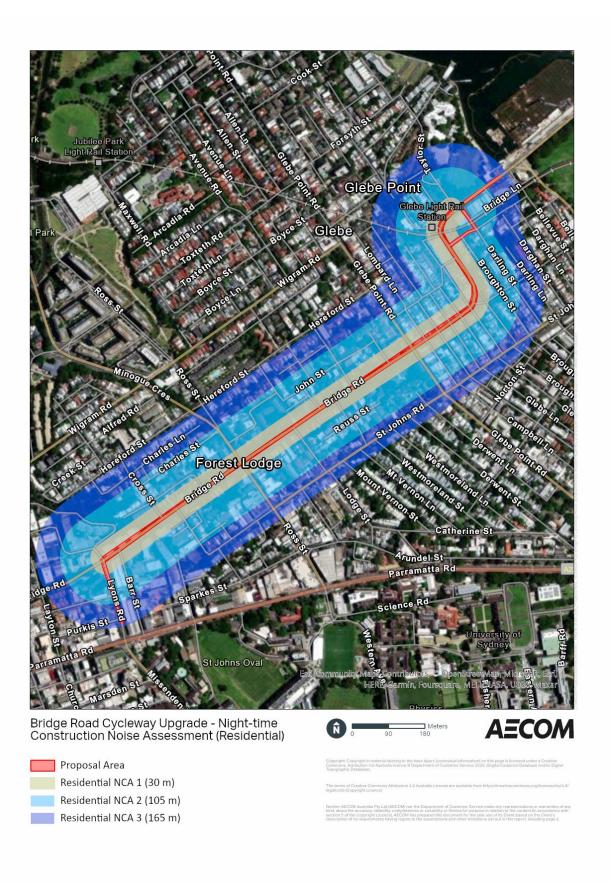


Figure 6-3: Noise Catchment Areas (NCA) for residential receivers

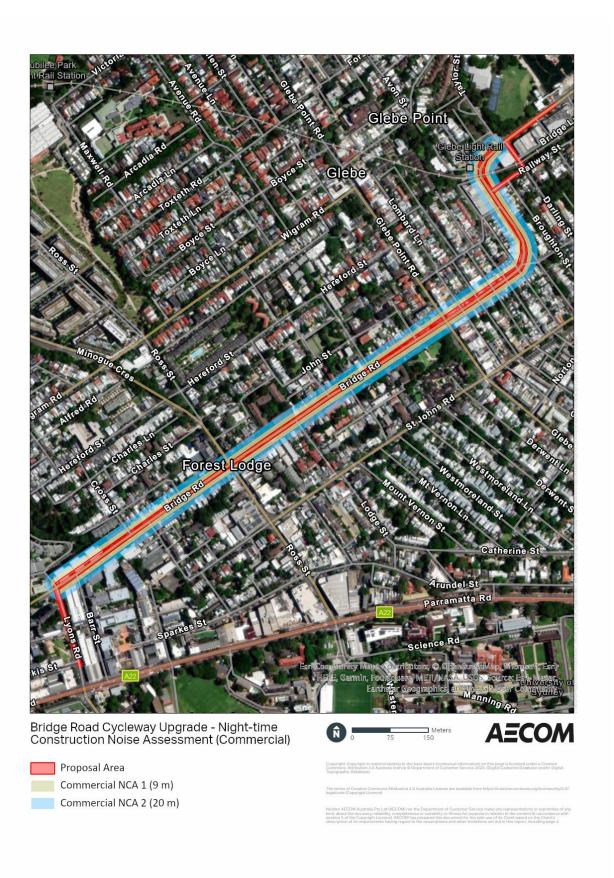


Figure 6-4: Noise Catchment Areas (NCA) for commercial receivers

Table 6-3: Predicted noise levels during construction hours

	Night time				
Catchment distances	NML, dB(A)	Predicted noise levels from the proposed modification, dB(A)	Recommended additional mitigation measures*		
Residential NCA 1 – for					
receivers in line of sight, at a	50	75	N, R2, DR, AA, PC, SN		
distance of up to 30 metres					
Residential NCA 2 – for receivers with no line of sight at a distance of up to 105 metres	50	55	N, R2, DR		
Residential NCA 3 – for receivers with no line of sight at a distance of up to 165 metres	50	50	N		
Commercial NCA 1 – for commercial receivers operating during night time hours in line of sight at a distance of up to 9 metres	70	85	N, PC, SN, R2, DR		
Commercial NCA 2 – for receivers operating during night time hours with no line of sight at a distance of up to 20 metres	70	70	N		

^{*}N = notification, AA = Alternative Accommodation, PC = Phone calls, SN = specific notification, R2 = Respite period 2, DR = Duration Respite. A review of these recommended measures is provided in Section 4.1 of Appendix C to determine which are feasible and reasonable to apply

The use of heavy plant and machinery (such as vibratory rollers) has the potential to generate vibration impacts on nearby structures. Recommended minimum working distances from sensitive receivers for vibration-intensive plant/machinery would need to be observed, which are provided in Table 6-4. The minimum working distances have been developed by Transport in accordance with the *Construction Noise and Vibration Guidelines* (Transport for NSW, 2016). Minimum working distances have also been updated to incorporate minimum distances for heritage structures and distances for light frame structures as per British Standard (BS) 7385 and for heritage and other sensitive structures as per standard DIN 4150. The minimum working distances are indicative and will vary depending on the particular item of plant, local geotechnical conditions and the dominant frequency of the construction vibration levels. They apply to cosmetic damage of typical light-framed residential buildings and heritage/fragile buildings and assume that construction vibration could include low-frequency content with an associated increased risk of cosmetic damage. Vibration monitoring is recommended to confirm the minimum working distances at specific sites.

Table 6-4: Minimum working distances for vibration-intensive plant and machinery (developed from *Construction Noise and Vibration Guidelines*, Transport for NSW, 2016)

			Minimum working distance	
Plant item	Rating / description	Cosmetic damage (BS 7385) Light-framed structures	Cosmetic damage (DIN 4150) Heritage and other sensitive structures	Human response (EPA's Vibration Guideline)
Vibratory Roller	< 50 kN (Typically 1-2 tonnes)	5 m	14 m	15 m to 20 m
	< 100 kN (Typically 2-4 tonnes)	6 m	16 m	20 m
	< 200 kN (Typically 4-6 tonnes)	12 m	33 m	40 m
	< 300 kN (Typically 7-13 tonnes)	15 m	41 m	100 m
	> 300 kN (Typically 13- 18 tonnes)	20 m	54 m	100 m
	> 300 kN (> 18 tonnes)	25 m	68 m	100 m
Small Hydraulic Hammer	(300 kg - 5 to 12t excavator)	2 m	5 m	7 m
Medium Hydraulic Hammer	(900 kg – 12 to 18t excavator)	7 m	19 m	23 m
Large Hydraulic Hammer	(1600 kg – 18 to 34t excavator)	22 m	60 m	73 m
Vibratory Pile Driver	Sheet piles	20 m	50 m	100 m
Pile Boring	≤ 800 mm	2 m (nominal)	5 m	7 m
Jackhammer	Hand held	1 m (nominal)	2 m	3 m

Safeguards to address the impacts identified above are provided in Section 6.3.4. Safeguards have also been recommended in regard to vibration impacts on non-Aboriginal heritage (refer to Section 6.4).

Operational noise

A detailed operational noise assessment was not undertaken as the proposed modification is not anticipated to contribute any substantial operational noise impacts to the project. There may be slight changes to the existing noise environment in the immediate vicinity of the raised crossing near Cross Street, which is currently a crossing point consisting of an island refuge. The introduction of a raised crossing would change the number of vehicles slowing down and speeding up on approach and departure at this location, as well as the degree to which they slow down and speed up. However, as the existing speed limit is 40 kilometres per hour, any noise from an increase in the number of vehicles or braking and accelerating behaviour is expected to be minimal.

The existing crossing near Woolley Street is a zebra crossing. The introduction of a raised crossing at this location is not expected to result in notable changes to the noise environment.

The proposed modification would not result in any significant operational noise impacts.

6.3.4 Safeguards and management measures

Safeguards for noise and vibration were proposed on the project REF. The following additional and updated safeguards are also recommended. A consolidated list of safeguards is provided in Section 7.2.

Impact	Environmental safeguards	Responsibility	Timing
Noise and vibration	All sensitive receivers (local residents) likely to be affected will be notified at least seven (7) days prior to commencement of any works associated with the activity that may have an adverse noise impact. The following mitigation measures will be in place: • Notification (N) - Letterbox drops for receivers within 165 m radius of the proposal area during standard hours work. Notifications should detail work activities, dates and hours, impacts and mitigation measures, indication of work schedule over the night period (if any), any operational noise benefits from the works (where applicable) and contact telephone number. Notification will be sent a minimum of seven calendar days prior to the start of works.	Transport for NSW, Contractor	Pre-construction, Construction
	 Alternative Accommodation (AA) Alternative accommodation may be considered and offered to residents in close proximity in relation to highly intrusive noise levels during construction works. 		
Noise and Vibration	A Construction Noise and a Vibration Management Plan will be prepared and implemented as part of the CEMP. The Noise and Vibration Management Plan will generally follow the approach in the Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009) and identify: • All potential noise and vibration generating activities associated with the activity	Construction Contractor	Pre-construction, construction
	Feasible and reasonable mitigation measures to be implemented. A monitoring program to access performance.		
	 A monitoring program to assess performance against relevant noise and vibration criteria 		
	 Arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures. 		
	 Contingency measures to be implemented in the event of noncompliance with noise and vibration criteria. 		
Noise and vibration	The following management measures will be implemented: • The noisiest activities (jackhammering and sawcutting) cannot be carried out past midnight	Transport for NSW, contractor	Pre-construction, construction
	 Noise curtains are to be used for noisiest activities (jackhammering and sawcutting) during OOHW. 		
	 An out of hours work assessment (OOHWA) is to be prepared prior the start of any out of hours works. 		
	 No more than five night shifts per week will be permitted during construction. 		
	 Additional measures will be investigated during construction stages to further minimize out of hours noise impacts. 		

Noise and vibration	The minimum working distances in Table 6-4 must be complied with for vibration-intensive plant and machinery (e.g. vibratory roller).	Transport for NSW, contractor	Pre-construction, construction	
	Plant/machinery must be used in static mode (so that it doesn't generate vibration) when applicable minimum distances are unable to be complied with.			
	Where this is not possible, pre-construction vibration monitoring tests will be undertaken to confirm vibration will be below a certain threshold to prevent cosmetic or structural damage.			
	If, after applying the above safeguards, the activity doesn't comply with the applicable vibration threshold, then the construction methodology will be changed to reach compliance.			

6.4 Non-Aboriginal heritage

6.4.1 Methodology

A specialist non-Aboriginal heritage assessment was undertaken to account for the proposed modification, which is provided in Appendix D. The assessment included new searches of relevant heritage databases including:

- Australian Heritage Places Inventory
- Commonwealth EPBC Heritage List
- NSW State Heritage Register (SHR)
- Section 170 Heritage and Conservation Registers
- Sydney Local Environment Plan 2012 (Sydney LEP).

The search areas covered the proposal area and bordering properties. Photos from a site inspection undertaken were also utilised in the heritage assessment.

6.4.2 Existing environment

The existing environment is described in section 6.4 of the project REF. The updated database search results identified additional local heritage items and heritage conservation areas within the amended proposal area (shown in Figure 6-5):

- I727: Shop and residence 'Swiss cottages' including interiors, located at 144 Glebe Point Road, Glebe (adjacent to the proposal area)
- 192: Former Royal Alexandra Hospital for Children "Venables House" including interior and courtyard, located at 20 Pyrmont Bridge Road, Camperdown (adjacent to the proposal area)
- I657: Kauri Foreshore Hotel, including interior, located at 2 Bridge Road, Glebe (adjacent to the proposal area)
- C27: Bishopthorpe Heritage Conservation Area (about 100 metres east of the proposal area)
- C32: St Phillips Heritage Conservation Area (about 100 metres east of the proposal area).

6.4.3 Potential Impacts

The addition of the features included in the proposed modification has the potential to introduce new impacts to nearby heritage-listed items in addition to those described in the project REF. These potential impacts are summarised below.

Construction

The project REF found that construction of the project is not expected to have direct or indirect impacts on heritage-listed items.

Potential direct impacts

The proposed modification includes trench restoration, asphalt milling, and re-sheeting works along Bridge Road, which would pass directly beneath the overbridge associated with the State heritage-listed Pyrmont and Glebe Railway Tunnel (SHR item 01225). On its western side, Bridge Road is separated from the brick pier of the overbridge by a footpath and kerb. However, on the eastern side, the brick pier of the overbridge is adjacent to and directly abuts the road surface of Bridge Road. The trench restoration, asphalt milling and re-sheeting works would, therefore, be conducted adjacent to the significant fabric of the item and have the potential to impact this item. There is a risk of accidental damage by machinery to this pier. However, safeguards such as protective fencing and the use of hand tools in the vicinity of the pier should be implemented to protect the pier. Additional safeguards have been recommended to avoid and mitigate impacts to this item, which are provided below in 6.4.4.

As no other heritage items are located within the proposal area, further direct impacts to other heritage items or heritage conservation areas are unlikely.

The construction of pram ramps would require the removal of existing kerb and guttering, some of which is sandstone and/or trachyte. While sandstone/trachyte kerbing is not heritage listed or noted as significant elements of any of the relevant Heritage Conservation Areas, the City of Sydney Council has design specifications for their management. This includes leaving the trachyte and sandstone kerb and gutter in its original position unless otherwise specified by Council and requirements for handling and treatment following any removal. It is noted that even after removal, trachyte kerbing remains the property of Council. Transport is consulting with Council to discuss mitigation and options for the kerb and gutter sections requiring removal (e.g., reinstatement of kerbing where practicable or reuse of the material), particularly as trachyte remains the property of Council.

Potential indirect impacts

Construction of several elements of the proposed modification can potentially cause indirect impacts (e.g., vibration and visual impacts) to nearby heritage items during construction. Indirect impacts may arise from the use of vibration-intensive machinery (e.g. vibratory roller, hammer drills, milling machine, etc.), which would be used in the vicinity of heritage-listed items. Vibration from the use of this machinery has the potential to cause structural or cosmetic damage to buildings if not carefully managed. Mitigation measures would be employed to avoid and minimise impacts caused by vibration, such as having rollers on static mode near heritage items, selection of machinery with lower vibration levels and avoiding the edges of the road by a minimum of 150 millimetres. Additionally, minimum working distances for vibration plant and machinery (refer to Table 6-4) will be complied with when working near heritage-listed items to avoid impacts.

Potential visual impacts associated with the presence of construction sites and the use of the construction ancillary parking areas would be temporary and would not result in reducing the heritage significance of any items or heritage conservation areas.

Operation

Operation of the proposed modification would replace and introduce elements consistent with the existing road corridor (e.g. pram ramps, upgraded pedestrian/cyclist crossings, road signs) and is not expected to contribute to impacts to non-Aboriginal heritage.

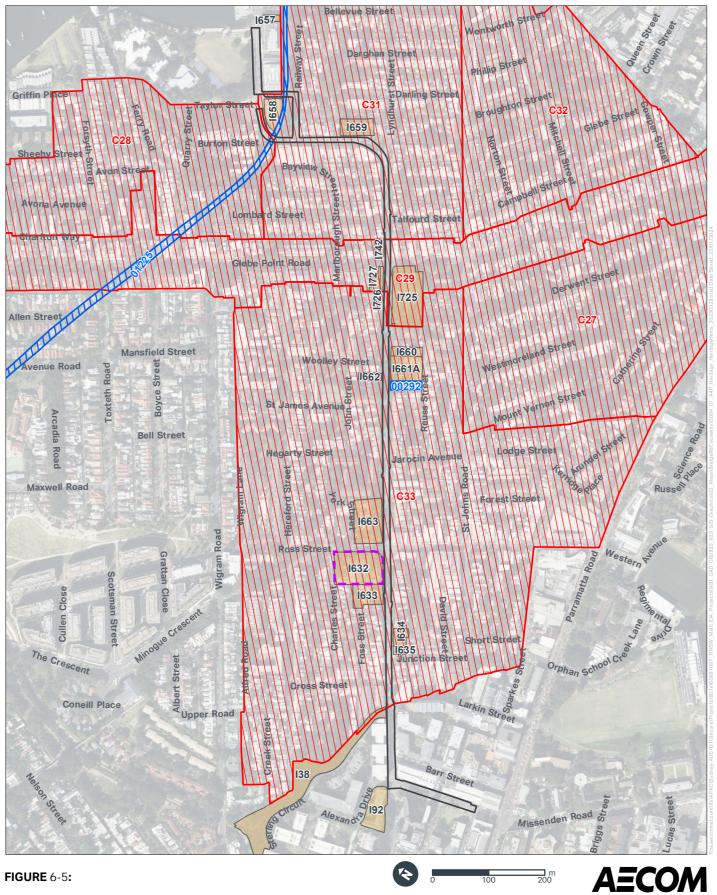


FIGURE 6-5:

HERITAGE ITEMS

Legend

Study area

State Heritage Register item Section 170 Heritage item

Heritage Conservation Area

Local herritage item

6.4.4 Safeguards and management measures

Safeguards for addressing potential non-Aboriginal heritage impacts were proposed on the project REF. The following additional safeguards are also recommended. Other safeguards and management measures that have been proposed as part of the visual amenity and noise and vibration assessments would also assist in addressing potential non-Aboriginal heritage impacts. A consolidated list of safeguards is provided in Section 7.2.

Impact	Environmental safeguards	Responsibility	Timing
Impacts on sandstone/ trachyte kerb and guttering	Consultation with City of Sydney will be undertaken to discuss options for impacting sections of sandstone/trachyte kerb and guttering (e.g. reinstatement of kerbing where practicable or reuse of the material).	Transport for NSW	Pre-construction
Non-Aboriginal heritage impacts	To safeguard indirect impact through vibration, mitigation measures will include having rollers on static mode (i.e. emitting no vibration) near heritage items, selection of machinery with lower vibration levels, avoiding the edges of the road by a minimum of 150 millimetres, and compliance with minimum working distances described in Table 6-4 for vibration intensive plant and machinery. In the event that the minimum working distances are unable to be complied with, further mitigation measures should then include pre-construction vibration monitoring. If readings are below vibration thresholds, then work can continue with caution. If readings exceed vibration thresholds, then a change of construction method/process will be implemented to reduce vibration to the necessary levels. In the event that the minimum working distances and safe vibration thresholds cannot be met, specialist advice should be sought from a structural engineer to advise on appropriate mitigation and management measures.	Construction contractor	Pre-construction and construction
Non-Aboriginal heritage impacts	Impacts to the State significant Pyrmont and Glebe Railway Tunnel (including brick piers and overbridge across Bridge Road) must be avoided by appropriate mitigation and management measures such as: • the use of hand-held tools only within one metre of the pier • expert supervision and the application of protective installation/s (e.g. protective foam).	Transport for NSW and construction contractor	Pre-construction and construction
Non-Aboriginal heritage impacts	All workers will be made aware of their responsibilities in avoiding impacts to heritage through a toolbox presentation that includes the findings of the heritage assessment (provided in Appendix D).	Construction contractor	Pre-construction, construction
Non-Aboriginal heritage impacts	Tree trimming will not occur within the heritage curtilage of any heritage-listed item.	Transport for NSW and construction contractor	Pre-construction, construction

Non-Aboriginal heritage impacts	If the level of impact or methodology for these works changes and there is a risk that the proposed works will impact the brick pier that forms part of the significant fabric of the State heritage listing (SHR item 01225), further assessment would be required, and a section 60 permit under the <i>Heritage Act 1977</i> may need to be sought.	Transport for NSW and construction contractor	All stages
Non-Aboriginal heritage impacts	New signage proposed for new locations must be constrained within the road corridor, kept away from identified heritage items and not affixed to adjacent buildings or structures, with further investigation required if impacts beyond that are proposed.	Transport for NSW and construction contractor	All stages
Non-Aboriginal heritage impacts	The proposal must be carried out in accordance with the conditions attached to the Exemption from approval under s57(2) of the Heritage Act 1977 (refer to Appendix E).	Transport for NSW and construction contractor	All stages

6.5 Socio-economic

6.5.1 Existing environment

The existing environment of population and growth, social infrastructure and economic infrastructure are addressed in section 6.5 (socio-economic impacts) of the project REF.

6.5.2 Potential impacts

Construction

Given the proposed extended duration of construction (from up to four weeks to a total of about eight months), and the changes in the physical scope of the overall project, the socio-economic impacts are considered likely to be of a similar nature, though over a longer duration than described in the project REF.

With the exception of the trench restoration and re-sheeting, all other new construction activities would be undertaken alongside those already considered by the project REF. The trench restoration and re-sheeting would comprise two additional stages of construction and require temporary lane closures and temporary traffic flow management. This would occur outside standard working hours, reducing the magnitude of impacts to traffic, transport and access for the local community. Most businesses are likely to be closed during construction hours and should not experience any substantial adverse impacts on trade or deliveries. Access to private properties would be maintained at all times during construction; however, they may be temporarily impacted for short periods, which would only be done with prior notification to residents and in advance agreement with the property owner or resident, wherever practicable. Transport for NSW would also consult with any local residents who may require out-of-hours access during construction. The existing road and cycleway would be maintained as open and operational between shifts, i.e. during the day. Traffic and transport impacts are assessed in section 6.1, with mitigation measures recommended to address the impacts identified. Socio-economic impacts related to traffic, transport and access impacts are expected to be minor and short-term in line with the construction duration.

Construction of the proposed modification would also have amenity impacts on local residences through the generation of noise, vibration and light emissions, as well as impacts to visual amenity (due to the presence of construction activities and machinery and vehicles). Visual, and noise and vibration impacts have been assessed in sections 6.2 and 6.3, respectively, and mitigation measures have been proposed, with a complete list of measures provided in Section 7.2.

Other amenity impacts, such as light spill, would be temporary and short-term and progress along the alignment as construction progresses.

Operation

The proposed modification would contribute to the objective of the project in supporting and encouraging a longer-term modal shift towards active transport. The modification would also promote a safer road environment along the alignment for all road users. Further to the socio-economic impacts described in section 6.5 of the project REF, the addition of the proposed modification would result in:

- Improved safety: The addition of raised crossings and pram ramps would enhance safety for pedestrians, especially children, elderly people, and people with disabilities, as well as people on bikes. This has the potential to reduce near misses, crashes and injuries. Likewise, the replacement of give-way signs/intersections with stop signs at the entrance to Bridge Road from several side streets would improve safety for motorists and people on bikes using the cycleway
- Better transport efficiency: The re-sheeting of a road would provide a more comfortable ride, reduce travel times and reduce fuel consumption and emissions
- Support the local economy: Improved transport infrastructure may be beneficial to the local economy, including for businesses and property values
- Enhance community cohesion: The addition of raised crossings and pram ramps has the potential to encourage
 walking and cycling, which may help foster an improved sense of community and improve social cohesion. This may
 also improve public health by encouraging physical activity and reducing air pollution.

6.5.3 Safeguards and management measures

Safeguards for addressing socio-economic impacts are provided in Section 6.5 of the project REF. These would also apply to the proposed modification. Safeguards and management measures identified for other environmental issues that would also address socio-economic impacts are included in the consolidated list of safeguards in Section 7.2.

6.6 Biodiversity

6.6.1 Methodology

A high-level, qualitative assessment of biodiversity impacts was undertaken. Desktop searches of the following relevant databases were undertaken in March 2023 to determine the presence of listed threatened flora and fauna species and ecological communities:

- The NSW BioNet Wildlife Atlas and Threatened Biodiversity data collection (DPIE, 2020)
- The Protected Matters Search Tool (DCCEW, 2020).

6.6.2 Existing environment

Bridge Road is located in the inner-Sydney suburb of Glebe, which is a high-density urban environment. There are limited vegetated areas in the vicinity of the proposal area, with most vegetation restricted to planted street trees and gardens in residential properties. Other areas of vegetation include 'Dr HJ Foley Rest Park' near the intersection with Glebe Point Road, a public park/sports grounds near the intersection with Taylor Street, and a vegetated corridor along the railway line crossing north of Railway Street.

Database searches did not identify and threatened ecological communities within the proposal area. No threatened flora species have been recorded in the proposal area. However, the Large-eared Pied Bat (*Chalinolobus dwyeri*) (listed as vulnerable under the EPBC Act (DCCEW, 2020) has been previously recorded adjacent to the proposal area.

6.6.3 Potential impacts

The proposed modification would involve minor trimming of a small number of planted street trees along Bridge and Pyrmont Bridge Road, to accommodate construction activities. Trimming required would be limited to 10% of the overall tree canopy by volume, which is within Transport for NSW's tree maintenance limit and is not expected to affect the viability of the tree. Tree trimming would be carried out by a qualified arborist and in accordance with *Australian Standard AS:4373 Pruning of Amenity Trees*.

Threatened ecological communities would not be affected by the proposed modification. Direct impacts on fauna species are also not expected. However, fauna spotting would be undertaken prior to tree trimming to check for any fauna present.

The construction of pram ramps would require excavation near street trees, which may affect tree roots and the subsequent viability of the tree. Tree protection zones (TPZ) would be implemented to manage this impact. If construction is identified as needing to occur within a TPZ, a qualified arborist would be consulted to advise how the design may be revised to avoid impact. Should this not be possible, and construction within the TPZ be required, an arborist would be required to supervise and document the works.

Construction would occur during night hours, which may affect birds, bats and other nocturnal fauna (e.g. possums) due to light and noise emissions. These impacts would be temporary and limited to the local area surrounding the work front as it moves along the alignment. Noise and light emissions would also be managed by mitigation measures (refer to Section 7.2).

The proposed modification would not result in any additional direct impacts on biodiversity during operation. The addition of street lighting at the crossing near Cross Street may slightly increase the indirect lighting impacts at this location. However, in the context of the established road corridor, which includes existing street lighting, this is expected to be minor. The reduction in the overall traffic speed may result in a beneficial outcome for potential vehicle strikes.

The modification is not likely to result in a significant impact on threatened species, populations, ecological communities or their habitats within the meaning of the BC Act or FM Act. As such, a Species Impact Statement or BDAR is not required.

The modification is not likely to result in a significant impact on threatened species, populations, ecological communities, or migratory species within the meaning of the EPBC Act.

6.6.4 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing
Biodiversity	Standard tree protection zones will be implemented as described in <i>AS 4970-2009</i> (Australian Standard, 2010).	Construction contractor	Pre-construction, construction
Biodiversity	Tree trimming must be limited to no more than 10% of the overall tree canopy volume. All tree trimming work is to be carried out by an arborist with a minimum AQF Level 3 qualification in Arboriculture, in accordance with AS4373 Pruning of Amenity Trees, and the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998). Pruning of mature trees is to be in accordance with Part 5 of the Australian Standard 4373-2007 Pruning of amenity trees.	Construction contractor	Pre-construction, construction
Biodiversity	If it is identified that construction is required to occur within a TPZ a qualified arborist will be consulted to advise how the design may be revised to avoid impact to the tree. Should this not be possible, and construction within a TPZ is still required, an arborist will be required to supervise and document the works.	Transport for NSW and construction contractor	Pre-construction, construction
Biodiversity	Prior to tree trimming, fauna spotting shall be undertaken by a qualified person to check that fauna species are not present. Fauna handling must be carried out in accordance with the requirements the Transport for NSW <i>Biodiversity Guidelines</i> - <i>Guide 9</i> (Fauna Handling).	Construction contractor	Pre-construction, construction

6.7 Cumulative impacts

6.7.1 Methodology

The methodology used to assess potential cumulative impacts was the same as that used in the project REF. New searches of the following sources were undertaken since the preparation of the project REF to identify any new, nearby projects which may contribute to cumulative impacts:

- NSW major projects planning portal (NSW Government, 2023)
- Transport for NSW's major projects page (Transport for NSW, 2023)
- City of Sydney Council's project page (City of Sydney, 2023).

6.7.2 Other projects and developments

Other projects that are expected to take place at the same time as the proposed modification are:

- The New Sydney Fish Market redevelopment, which is currently under construction (expected to open in late 2024)
- The Western Distributor Road Network Improvements, for which construction is proposed to start in quarter 2 of 2023.

Future plans for the area include the:

- Blackwattle Bay renewal project, a State Significant Precinct project for which a draft Voluntary Planning Agreement is due to be exhibited and finalised in the first half of 2023
- Bank Street Park, a State Significant Development project at 1A-19 Bank Street, Pyrmont (currently in the application stage; construction dates or details not available).

6.7.3 Potential impacts

The proposed modification would increase some of the impacts of the project assessed in the project REF (in both intensity and/or duration), such as those associated with traffic and transport, noise and vibration and visual amenity. As such, there is the potential for these to further contribute to cumulative impacts with other projects in the surrounding area. This is particularly the case for construction-related impacts.

The Sydney Fish Market redevelopment is currently under construction. However, this project is generally restricted to standard hours on weekdays, which would not clash with the work hours for the project (including the proposed modification). Therefore, the potential for cumulative impacts between these two projects is expected to be minimal. However, there is potential for construction fatigue for some nearby receivers from the ongoing works that have been progressing for the Sydney Fish Market redevelopment (e.g. utilities works) followed by construction of the proposed modification. This would expand the total duration that some receivers are exposed to construction impacts, particularly noise impacts. Transport and the contractor would review the potential for cumulative impacts and mitigation measures in place in accordance with the cumulative impacts safeguard specified previously in the Project REF.

Construction of the Western Distributor Road Network Improvements is expected to be undertaken at the same time as the proposed modification; however, the REF for the Western Distributor Road Network Improvements shows the proposed modification's proposal area is outside the range of expected noise impact overlap, and Bridge Road was also not assessed as a potentially impacted road for traffic and transport impacts. Due to the distance between the two projects, the potential for cumulative impacts is expected to be minimal.

From an operational perspective, the upgraded cycleway would contribute to positive active transport impacts in the area in combination with other active transport upgrades in the region. There are not expected to be any other cumulative impacts not already assessed in the project REF.

A safeguard was included in the project REF to account for potential cumulative impacts with other projects. No additional safeguards or management measures have been proposed in addition to those provided in the project REF.

Addendum review of environmental factors

6.8 Other impacts

The proposed modification may have other environmental impacts which are expected to be negligible to minor. These are described in the table below.

6.8.1 Existing environment and potential impacts

Environmental factor	Existing environment	Potential impacts
Waste and resource use	As described in section 6 (environmental assessment) of the project REF.	Resources required to construct the proposed modification would be sourced as described in Section 3.3.4. Waste would be generated during construction of the proposed modification, including asphalt waste, cement waste, concrete, green waste and general waste from construction crews. If not appropriately managed, waste generated has the potential to impact the immediate environment (e.g. release of waste material into the surrounding area) or receiving environment elsewhere (e.g. incorrect disposal of a waste type). All waste would be captured on site, re-used where possible or otherwise removed and disposed of according to waste type at appropriately licensed waste disposal facilities. Safeguards for waste management were included in the project REF and would also apply to the proposed modification. The proposed operation would not generate waste during operation.
Air quality	As described in section 6 (environmental assessment) of the project REF.	Construction of the proposed modification has the potential to generate localised dust emissions from construction activities, and would generate exhaust emissions from the combustion of fossil fuels by construction machinery, vehicles and equipment. These air emissions have the potential to impact the air quality of the local environment, particularly for adjacent receivers immediately adjacent the proposal area. Safeguards have been recommended to address these potential construction impacts. Operation of the proposed modification is not expected to directly impact air quality, however there may be a positive impact over time as active transport is increased along Bridge Road, leading to a reduction in vehicle exhaust emissions in the area.
Water quality and flooding	As described in section 6 (environmental assessment) of the project REF.	During construction there is potential for minor impacts to water quality in the receiving environment from rainfall runoff from the proposal area being contaminated with exposed or excavated sediment, or accidental spills of fuel, oils or fluids from construction machinery and vehicles. Road asphalting would avoid periods of wet weather and is not expected to pose a risk to water quality. Standard safeguards related to water quality and flooding were included in the project REF for construction. The design of the proposed modification would not affect drainage infrastructure in the proposal area, and is not expected to affect water quality or result in any local or regional changes to flood behaviour during operation.
Soil and contamination	As described in section 6 (environmental assessment) of the project REF.	Construction is not expected to interact with the existing recorded contaminated land at 21 Bridge Road, Glebe (Glebe Auto Repairs). There is limited scope for construction activities to contaminate soils in the area due to the presence of paved surfaces, however minor excavation work (e.g. for pram ramps and new street signs) would expose surfaces and introduce a temporary risk of contamination from accidental spills and leaks from construction vehicles and machinery. Construction activities in general also introduce the risk of soils and contaminants been washed into stormwater drains in the area. Safeguards were proposed in the project REF to address these risks. No operational impacts to soil or contamination are anticipated from the cycleway.

Aboriginal heritage	As described in section 6 (environmental assessment) of the project REF.	A new search for National Native Title on the National Native Title Tribunal Register was undertaken for this addendum REF. The search results did not identify any Native Title claims within the Sydney LGA. A new AHIMS search was undertaken on 14 April 2023. The search identified no Aboriginal items in or adjacent to the Proposal corridor. These search results remain consistent with those in the Project REF. As there are no previously recorded Aboriginal sites within the proposal area, and due to the works being contained within the existing highly disturbed road corridor, it remains unlikely that construction or operation of the proposal would have any impacts on
		Aboriginal heritage. A mitigation measure for unexpected finds was included in the Project REF and remains applicable.

Addendum review of environmental factors

6.8.2 Safeguards and management measures

The following safeguards are recommended in addition to those found in the project REF. A consolidated list of safeguards is provided in Section 7.2.

Impact	Environmental safeguards	Responsibility	Timing
Waste and resource use	Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day.	Construction contractor	Construction
Waste and resource use	If vegetation is to be mulched and transported off site for beneficial reuse, it is to be assessed for the presence of weeds, pest, and other disease and a Mulch Management Plan prepared in accordance with the Roads and Maritime Technical Procedure: Mulch Management.	Construction contractor	Construction
Waste and resource use	If coal tar asphalt is identified and is to be removed, it is to be disposed of to landfill in accordance with Roads and Maritime Environmental Direction No.21 – Coal Tar Asphalt Handling and Disposal.	Construction contractor	Construction
Air quality	 The management measures would include but not limited to the following: vehicles transporting waste or other materials that have a potential to produce odours or dust are to be covered during transportation. dust would be suppressed on stockpiles and unsealed or exposed areas using methods such as water trucks, temporary stabilisation methods, soil binders or other appropriate practices. plant, vehicles and equipment would be maintained in good condition and in accordance with manufacturer's specifications. plant and machinery would be turned off when not in use. using mains electricity or battery powered equipment instead of diesel- or petrol-powered generators where practicable. using lower emissions plant and equipment where feasible and reasonable. 	Construction contractor	Construction
Soil and contamination	If an incident (e.g. spill) occurs, the Transport for NSW Environmental Incident Classification and Reporting Procedure is to be followed and the Project Manager notified as soon as practicable.	Construction contractor	Detailed design / Pre- construction
Water quality	Water quality control measures are to be used to prevent any waste materials / litter entering drain inlets or waterways.	Construction contractor	Detailed design

7. Environmental management

This chapter describes how the proposed modification will be managed to reduce potential environmental impacts throughout detailed design, construction and operation. A framework for managing the potential impacts is provided. A summary of site-specific environmental safeguards is provided, and the licence and/or approval requirements required prior to construction are also listed in section 7 of the project REF.

7.1 Environmental management plans

A number of safeguards and management measures have been identified to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposed modification. Should the proposed modification proceed, these management measures would be applied during construction and operation as relevant.

A Construction Environmental Management Plan (CEMP) will be prepared to describe the safeguards and management measures identified. The CEMP will provide a framework for establishing how these measures will be implemented and who would be responsible for their implementation.

The CEMP will be prepared prior to construction of the project and must be reviewed and certified by a Transport for NSW Environment Officer prior to the commencement of any on-site works. The CEMP will be a working document, subject to ongoing change and updated as necessary to respond to specific requirements.

7.2 Summary of environmental safeguards and management measures

A consolidated list of environmental safeguards and management measures for the project (including the proposed modification) are summarised in Table 7-1. Additional safeguards and management measures identified in this addendum REF are included in bold and italicised font, and strikethrough text where measures have been amended. The safeguards and management measures will be incorporated into the detailed design/construction planning, the CEMP and the PEMP where relevant, and implemented during construction and operation of the project (inclusive of the proposed modification), should it proceed. These safeguards and management measures will minimise any potential adverse impacts arising from the proposed works on the surrounding environment.

Table 7-1: Summary of safeguards and management measures

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
GEN1	General - minimise environmental impacts during construction	A CEMP will be prepared and submitted for review and endorsement of the Transport for NSW Environment Manager prior to commencement of the activity. As a minimum, the CEMP will address the following: • Any requirements associated with statutory approvals • Details of how the project will implement the identified safeguards outlined in the REF • Issue-specific environmental management plans • Roles and responsibilities • Communication requirements • Induction and training requirements • Procedures for monitoring and evaluating environmental performance, and for corrective action • Reporting requirements and record-keeping • Procedures for emergency and incident management • Procedures for audit and review. The endorsed CEMP will be implemented during the undertaking of the activity.	Contractor / Transport for NSW project manager	Pre-construction / detailed design
GEN2	General - notification	All businesses, residential properties and other key stakeholders (e.g. schools, local councils) affected by the activity will be notified at least <i>five seven</i> days prior to commencement of the activity.	Contractor /Transport for NSW project manager	Pre-construction
GEN3	General – environmental awareness	All personnel working on site will receive training to ensure awareness of environment protection requirements to be implemented during the project. This will include up-front site induction and regular "toolbox" style briefings. Site-specific training will be provided to	Contractor / Transport for NSW project manager	Pre-construction / detailed design

		personnel engaged in activities or areas of higher risk. These include identification of sensitive receivers.		
TSP1	Traffic and transport	According to Section 4.8 of <i>QA G36 Environment Protection</i> , a Traffic Management Plan (TMP) will be prepared and implemented as part of the CEMP for construction works. The TMP will be prepared in accordance with the Transport for NSW <i>Traffic Control at Work Sites Manual</i> (RTA, 2010) and <i>QA Specification G10 Control of Traffic</i> (Transport for NSW, 2008). The TMP will include: • Measures to maintain access to local roads and properties • Site specific traffic control measures (including signage) to manage and regulate traffic movement • Measures to maintain pedestrian and bike rider access • Requirements and methods to consult and inform the local community of impacts on the local road network • Access to construction sites, including entry and exit locations and measures to prevent construction vehicles queuing on public roads • A response plan for any construction traffic incident • Consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic monitoring review and amendment mechanisms.	Contractor	Detailed design/Pre- construction
TSP2	Traffic and transport	Consultation with emergency service authorities, including NSW Rural Fire Service and Fire Rescue would be undertaken during development of the detailed design of the replacement safety barrier.	Transport for NSW	Detailed Design
TSP3	Traffic and transport	 Vehicular property access would be maintained, including access to residential properties, pre-schools, places of worship and all commercial premises during construction works. Where property access would have to be temporarily closed during construction: Property owners would be notified at least seven calendar days prior to the access closure Alternative access would be provided if available Access closure would be minimised, and access would be returned to the property owners as soon as possible. 	Contractor	Construction
TSP4	Traffic and transport	Pedestrian and bike rider access is to be maintained throughout construction. Provision of signposted outlining the pedestrians and bike rider diversion routes would be displayed during construction. There would be advance notification of any construction works that affect pedestrians and bike riders.	Contractor	Construction

TSP5	Traffic and transport	Access to appropriate bus stop locations would be maintained during construction in consultation with bus operators. Ongoing updates on locations and access to bus stops would be provided to the community during construction period to ensure that disruption is minimised.	Contractor	Construction
TSP6	Traffic and transport	Monitoring of roadway and cycleway traffic would be undertaken to track possible congestion impacts and cycleway usage.	Transport for NSW	Operation
VIS1	Visual impacts	Visual coherence with heritage conservation areas aesthetics are to be incorporated into the final design of the safety barriers.	Transport for NSW	Detailed design/Pre- construction
VIS2	Visual impacts	A high level of housekeeping will be maintained by ensuring that the work site is kept in a clean and tidy condition. Waste materials, from construction, will be removed from site.	Contractor	Construction
VIS3	Visual impacts	Klemmfix barriers to be adequately secured to the roadway, until Klemmfix barriers replaced with a more permanent structure, to maintain cycleway visual cleanliness.	Transport for NSW	Operation
VIS4	Visual impacts	Works to be carried out in accordance with Transport for NSW EIA-N04 Guideline for Landscape Character and visual impact assessment.	Transport for NSW and contractor	Pre-construction and construction
VIS5	Visual impacts	Artificial lighting will be directed down and light spill into neighbouring properties minimised where possible.	Contractor	Construction
NSV1	Noise and vibration	As per Section 4.6 of <i>QA G36 Environment Protection</i> , noise impacts are to be minimised in accordance with Transport for NSW's <i>Construction Noise and Vibration Guideline</i> (CNVG).	Contractor	Construction
NSV2	Noise and vibration	 All sensitive receivers (local residents) likely to be affected will be notified at least seven (7) days prior to commencement of any works associated with the activity that may have an adverse noise impact. The following mitigation measures will be in place: Notification (N) - Letterbox drops for receivers within a 95 m 165 metre radius. Notifications should detail work activities, dates, and hours, impacts and mitigation measures, indication of work schedule over the night-time period (if any), any operational noise benefits from the works (where applicable) and contact telephone number. Notification will be sent a minimum of seven calendar days prior to the start of works. Respite Period 2 (R2) — Night time construction noise should be limited to two-consecutive nights except for where there is a Duration Respite. For night-time work these periods of work should be separated, by not less than one week, and no more than six evenings per month. Alternative Accommodation (AA) Alternative accommodation may be considered and offered to residents in close proximity in relation to highly intrusive noise levels during construction works. 	Contractor	Pre-construction

62

NSV3	Noise and vibration	A Construction Noise and a Vibration Management Plan will be prepared and implemented as part of the CEMP. The Noise and Vibration Management Plan will generally follow the approach in the Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009) and identify: • All potential noise and vibration generating activities associated with the activity • Feasible and reasonable mitigation measures to be implemented. • A monitoring program to assess performance against relevant noise and vibration criteria • Arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures. • Contingency measures to be implemented in the event of noncompliance with noise and vibration criteria.	Construction Contractor	Pre-construction, construction
NSV4	Noise and vibration	 The following management measures will be implemented: The noisiest activities (jackhammering and sawcutting) cannot be carried out past midnight Noise curtains are to be used for noisiest activities (jackhammering and sawcutting) during OOHW. An out of hours work assessment (OOHWA) is to be prepared prior the start of any out of hours works. No more than five night shifts per week will be permitted during construction. Additional measures will be investigated during construction stages to further minimize out of hours noise impacts. 	Transport for NSW, contractor	Pre-construction, construction
NCV5	Noise and vibration	The minimum working distances in Table 6-4 must be complied with for vibration intensive plant and machinery (e.g. vibratory roller). Plant/machinery must be used in static mode (so that it doesn't generate vibration) when applicable minimum distances are unable to be complied with. Where this is not possible, pre-construction vibration monitoring tests will be undertaken to confirm vibration will be below a certain threshold to prevent cosmetic or structural damage. If after applying the above safeguards, the activity doesn't comply with the applicable vibration threshold then the construction methodology will be changed to reach compliance.	Transport for NSW, contractor	Pre-construction, construction
HRG1	Non-Aboriginal heritage	For the replacement of the current Klemmfix barrier, according to <i>In accordance with</i> Section 4.10 of <i>QA G36 Environment Protection</i> , a Non-Aboriginal Heritage Management Plan (NAHMP) will be prepared and implemented as part of the CEMP. It will provide specific	Contractor	Detailed design/Pre- construction

		guidance on measures and controls to be implemented to avoid and mitigate impacts to Non-Aboriginal heritage.		
HRG2	Non-Aboriginal heritage	 For the replacement of the current Klemmfix barrier, In accordance with Section 4.10 of QA G36 Environment Protection The Standard Management Procedure - Unexpected Heritage Items (Transport for NSW, 2015) will be followed in the event that any unexpected heritage items, archaeological remains or potential relics of non-Aboriginal origin are encountered. Work will only re-commence once the requirements of that Procedure have been satisfied. 	Contractor	Construction
HRG3	Non-Aboriginal heritage	For the replacement of the current Klemmfix barrier Safeguards and management measures for visual impacts will take into account the surrounding heritage landscapes. Further safeguards and management measures related to this effect can be found in Section 6.4.3 of the project REF.	Transport for NSW	Detailed design/Pre- construction
HRG4	Non-Aboriginal heritage	Continued monitoring of community feedback would be undertaken regarding visual impacts on non-Indigenous heritage items	Transport for NSW	Operation
HRG5	Non-Aboriginal heritage	Consultation with City of Sydney will be undertaken to discuss options for impacting sections of sandstone/trachyte kerb and guttering (e.g. reinstatement of kerbing where practicable or reuse of the material).	Transport for NSW	Pre-construction
HRG6	Non-Aboriginal heritage	To safeguard indirect impact through vibration, mitigation measures will include having rollers on static mode (i.e. emitting no vibration) near heritage items, selection of machinery with lower vibration levels, avoiding the edges of the road by a minimum of 150 millimetres, and compliance with minimum working distances described in Table 6-4 for vibration intensive plant and machinery. In the event that the minimum working distances are unable to be complied with, further mitigation measures should then include pre-construction vibration monitoring. If readings are below vibration thresholds, then work can continue with caution. If readings exceed vibration thresholds, then a change of construction method/process will be implemented to reduce vibration to the necessary levels. In the event that the minimum working distances and safe vibration thresholds cannot be met, specialist advice should be sought from a structural engineer to advise on appropriate mitigation and management measures.	Contractor	Pre-construction and construction
HRG7	Non-Aboriginal heritage	Impacts to the State significant Pyrmont and Glebe Railway Tunnel (including brick piers and overbridge across Bridge Road) must be avoided by appropriate mitigation and management measures such as: • The use of hand-held tools only within one metre of the pier	Transport for NSW and contractor	Pre-construction and construction

		 Expert supervision and the application of protective installation/s (e.g. protective foam). 		
HRG8	Non-Aboriginal heritage	All workers will be made aware of their responsibilities in avoiding impacts on heritage through a toolbox presentation that includes the findings of the heritage assessment (refer Appendix D).	Contractor	Pre-construction, construction
HRG9	Non-Aboriginal heritage	Tree trimming will not occur within the heritage curtilage of any heritage-listed item.	Transport for NSW and contractor tor	Pre-construction, construction
HRG10	Non-Aboriginal heritage	If the level of impact or methodology for these works changes and there is a risk that the proposed works will impact upon the brick pier that forms part of the significant fabric of the State heritage listing (SHR item 01225), further assessment would be required and a section 60 permit under the Heritage Act 1977 may need to be sought.	Transport for NSW and construction contractor	All stages
HRG11	Non-Aboriginal heritage	New signage proposed for new locations must be constrained within the road corridor, kept away from identified heritage items and not affixed to adjacent buildings or structures, with further investigation required if impacts beyond that are proposed.	Transport for NSW and construction contractor	All stages
HRG12	Non-Aboriginal heritage impacts	The proposal must be carried out in accordance with the conditions attached to the Exemption from approval under s57(2) of the Heritage Act 1977 (refer to Appendix E).	Transport for NSW and construction contractor	All stages
SOE1	Socio-economic	For the replacement of the current Klemmfix barrier A Communication Plan (CP) will be prepared and implemented as part of the CEMP to help provide timely and accurate information to the community during construction. The CP will include (as a minimum): • Mechanisms to provide details and timing of proposed activities to affected residents, including changed traffic and access conditions	Contractor	Detailed design / pre- construction and construction
		Contact name and number for complaints.		
		The CP will be prepared in accordance with the <i>Community Involvement and Communications Resource Manual (RTA, 2008).</i>		
SOE2	Socio-economic	For the replacement of the current Klemmfix barrier, All businesses, and residences likely to be affected by the proposed works must be notified in writing at least five seven working days prior to the commencement of the proposed construction activities. The Notification letter would include (as a minimum): • Contact name and phone number	Transport for NSW	Pre-construction and construction
		Working hours and proposed construction periodComplaints process.		
SOE3	Socio-economic	For the replacement of the current Klemmfix barrier Road users, pedestrians and bike riders would be informed of changed conditions, including likely disruptions to access during construction.	Contractor	Pre-construction and construction

SOE4	Socio-economic	For the replacement of the current Klemmfix barrier Fencing with material attached (e.g. shade cloth) would be provided around the construction compounds and other areas to screen views from adjoining properties.	Contractor	Construction
SOE5	Socio-economic	Continued monitoring of community feedback would be undertaken relating to the ongoing operation of the pop up cycleway.	Transport for NSW	Operation
SOE6	Socio-economic	Existing access for nearby and adjoining properties is to be maintained at all times during the works unless otherwise agreed to by the affected property owner.	Contractor	Detailed design / pre- construction and construction
CMT1	Cumulative impacts	The CEMP would be revised to consider potential cumulative impacts from surrounding development activities as they become known. This would include a process to review and update mitigation measures as new works begin or if complaints are received. If required, the project manager would prepare a Community Liaison Management Plan which would include consultation with proponents other nearby projects to: Increase awareness of construction timeframes and impacts Coordinate impact mitigation and management (e.g. respite periods).	Transport for NSW	Pre-construction, construction
AHER1	Aboriginal heritage	If Aboriginal heritage items are uncovered during the works, all works in the vicinity of the find must cease and the Transport for NSW Aboriginal cultural heritage officer and regional environment manager contacted immediately. Steps in the Transport for NSW Standard Management Procedure: Unexpected Heritage Items must be followed.	Contractor	Construction
BIO1	Biodiversity	If unexpected threatened fauna or flora species are discovered, stop works immediately and follow the Transport for NSW Services <i>Unexpected Threatened Species Find Procedure</i> in the <i>Biodiversity Guidelines 2011 — Guide 1 (Pre-clearing process</i>).	Contractor	Pre-construction, construction
BIO2	Trees	 Any tree trimming will not be more than minor (no more than 10% of the canopy). All pruning and trimming of trees is to be in accordance with the Australian—Standard 4373-2007 Pruning of amenity trees. Pruning of mature trees is to be undertaken by a qualified arborist. 	Contractor	Detailed design / construction
BIO2	Biodiversity	Standard tree protection zones will be implemented as described in AS 4970-2009 (Australian Standard, 2010).	Contractor	Pre-construction, construction
BIO3	Biodiversity	Tree trimming must be limited to no more than 10% of the overall tree canopy volume. All tree trimming work is to be carried out by an arborist with a minimum AQF Level 3 qualification in Arboriculture, in accordance with AS4373 Pruning of Amenity Trees, and the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998).	Contractor	Pre-construction, construction

		Pruning of mature trees is to be in accordance with Part 5 of the Australian Standard 4373-2007 Pruning of amenity trees.		
BIO4	Biodiversity	If it is identified that construction is required to occur within a TPZ a qualified arborist will be consulted to advise how the design may be revised to avoid impact to the tree. Should this not be possible, and construction within a TPZ is still required, an arborist will be required to supervise and document the works.	Transport for NSW and contractor	Pre-construction, construction
BIO5	Biodiversity	Prior to tree trimming, fauna spotting shall be undertaken by a qualified person to check that fauna species are not present. Fauna handling must be carried out in accordance with the requirements the Transport for NSW Biodiversity Guidelines - Guide 9 (Fauna Handling).	Contractor	Pre-construction, construction
AIR1	Air quality	 The management measures would include but not limited to the following: Vehicles transporting waste or other materials that have a potential to produce odours or dust are to be covered during transportation. 	Contractor	Construction
		 Dust would be suppressed on stockpiles and unsealed or exposed areas using methods such as water trucks, temporary stabilisation methods, soil binders or other appropriate practices. 		
		 Plant, vehicles and equipment would be maintained in good condition and in accordance with manufacturer's specifications. 		
		Plant and machinery would be turned off when not in use		
		 Using mains electricity or battery powered equipment instead of diesel- or petrol- powered generators where practicable 		
		 Using lower emissions plant and equipment where feasible and reasonable. 		
SOL1	Soil and Contamination	Any material transported onto pavements would be swept and removed at the end of each working shift and prior to rainfall.	Contractor	Construction
SOL2	Soil and Contamination	The Soil and Water Management Plan would include a contingency plan for any acid sulfate soils or salinity identified during the construction phase.	Contractor	Construction
SOL3	Soil and Contamination	In the event that indications of contamination are encountered (known and unexpected, such as odorous or visually contaminated materials), work in the area would cease until an contamination assessment can be prepared to advise on the need for remediation or other action, as deemed appropriate.	Contractor	Construction
SOL4	Soil and contamination	If an incident (e.g. spill) occurs, the Transport for NSW Environmental Incident Classification and Reporting Procedure is to be followed and the Project Manager notified as soon as practicable.	Contractor	Detailed design / Pre- construction

WAT1	Water and flooding	A contingency plan would be prepared in preparation for a potential flood event during construction and would outline evacuation procedures. The plan would include: • Evaluation of what flood event would trigger the plan • Evacuation procedures • A map indicating the area that is flood prone and the locations where to evacuate.	Contractor	Pre-construction
WAT2	Water and flooding	Temporary drainage or drainage diversions will be installed so that stormwater function is not impeded during construction. An Erosion and Sedimentation Control Plan (ESCP) will be prepared in accordance with the Landcom Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book) prior to construction. Water quality control measures are to be used to prevent any waste materials / litter entering drain inlets or waterways.	Contractor	Pre-construction
WST1	Waste	 With regard to possible replacement of the Klemmfix cycleway barrier: A Waste Management Plan (WMP) will be prepared and implemented as part of the CEMP. The WMP will include but not be limited to: Measures to avoid and minimise waste associated with the project Classification of wastes and management options (re-use, recycle, stockpile, disposal) Statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions Procedures for storage, transport, and disposal Monitoring, record keeping and reporting. The WMP will be prepared taking into account the Environmental Procedure - Management of Wastes on Roads and Maritime Services Land (Roads and Maritime, 2014) and relevant Roads and Maritime Waste Fact Sheets. 	Contractor	Detailed design / Pre- construction
WST2	Waste	With regard to the stockpiled general solid waste material: Where practicable, recyclable fractions of the construction and demolition waste (e.g. concrete and asphalt) would be separated for off-site disposal to an appropriately licensed recycling facility.	Contractor	Construction
WST3	Waste	A far as practicable, construction materials would be sourced within the Sydney region so as to reduce transport costs, including fuel usage.	Contractor	Pre-construction / Construction
WST4	Waste	Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day.	Contractor	Construction
WST5	Waste	If vegetation is to be mulched and transported off site for beneficial reuse, it is to be assessed for the presence of weeds, pest, and other disease and a Mulch Management Plan	Contractor	Construction

		prepared in accordance with the Roads and Maritime Technical Procedure: Mulch Management.		
WST6	Waste	If coal tar asphalt is identified and is to be removed, it is to be disposed of to landfill in accordance with Roads and Maritime Environmental Direction No.21 – Coal Tar Asphalt Handling and Disposal.	Contractor	Construction
WAT1	Water	The future design of the replacement barrier in flood prone areas would allow flood waters to pass underneath the installed structure.	Transport for NSW	Detailed design / pre- construction

7.3 Licensing and approvals

The proposed modification would require a ROL (under the *Roads Act 1993*) in order to temporarily close the road and cycleway. The ROL would need to be acquired prior to the start of construction.

An exemption for approval under s57(2) of the Heritage Act 1977 has been issued for the proposal (refer Appendix E), which contains conditions that must be complied with.

No additional licenses and approvals need to be acquired, noting that if there is any change in the proposal scope of works or expected change in the assessed impacts to State heritage-listed items after implementation of safeguards, a Section 60 permit may be required under the *Heritage Act 1977*.

8. Conclusion

8.1 Justification

The proposed modification, including the addition of a wider variety of cycle path widths, raised crossings, pram ramps, trench restoration and re-sheeting of the full length of the cycleway would improve the design and safety of the project, which would be beneficial for all road users along Pyrmont Bridge Road/Bridge Road.

The proposed modification would increase the intensity and duration of impacts during construction, however these impacts are not expected to be significant and would be appropriately managed with the safeguards proposed. Operationally, the proposed modification would provide local benefits for active transport, road safety and the broader social environment.

This addendum REF has assessed the potential, biophysical and social - impacts of the preferred option chosen which make up the proposed modification. The proposed modifications would result in:

- Disruptions to traffic and transport during out-of-hours periods during the construction period, which would include temporary lane closures and temporary contraflow lane
- Temporary visual impacts due to the presence of construction machinery and vehicles
- Temporary construction noise and vibration impacts
- Temporary social impacts during construction works, such as the effect of construction noise and lighting on surrounding businesses
- Positive benefits to the safety of people on bikes, pedestrians and other road users during operation.

Safeguards have been proposed as part of this addendum REF to minimise and manage adverse impacts identified.

8.1.1 Social factors and public interest

Refer section 8.1.1 (Social factors) and section 8.1.2 (Public interest) of the project REF for an assessment of the project in the context of social factors and the public interest, which also apply to the proposed modification.

8.2 Objects of the EP&A Act

Object	Comment
1.3(a) To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources.	The proposed modification would promote the social and economic welfare of the community and a better environment by supporting the range of transport modes for people. The proposed modification, in conjunction with the project, may encourage a reduction in motorised transport, which would contribute to the conservation of natural resources through a reduction in greenhouse gas emissions.
1.3(b) To facilitate ecologically sustainable development (ESD) by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.	The proposed modification would facilitate ESD by facilitating a mode of transport that is environmentally beneficial, socially accessible and affordable to most people in an area where previous cycling infrastructure was lacking and people on bikes were not provided a safe and efficient environment to ride.
1.3(c) To promote the orderly and economic use and development of land.	Not relevant to the proposed modification which would occur within an established road corridor.
1.3(d) To promote the delivery and maintenance of affordable housing.	Not relevant to the proposed modification.
1.3(e) To protect the environment, including the conservation of threatened and other species of native	The proposed modification would have minor impacts to street trees and generate temporary, indirect biodiversity impacts (noise, light) during construction. These impacts would be

animals and plants, ecological communities and their habitats.	managed by safeguards and would not have adverse impacts on the overall conservation of native animals and plants, ecological communities and their habitats.
1.3(f) To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	Potential direct and indirect impacts to non-Aboriginal heritage listed items would be managed by safeguards and would promote the sustainable management of these items.
1.3(g) To promote good design and amenity of the built environment.	The proposed modification may allow for a visually more organised road, though it is not expected to substantially change the overall visual environment.
1.3(h) To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants.	The proposed modification would facilitate a positive impact on the health and safety of the users of Pyrmont Bridge Road and Bridge Road.
1.3(i) To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State.	Not relevant to the proposed modification.
1.3(j) To provide increased opportunity for community participation in environmental planning and assessment.	Not relevant to the proposed modification.

8.3 Ecologically sustainable development

The assessment against the principals of ecologically sustainable development in the project REF (refer to section 8.2.1 (ecologically sustainable development)) remains applicable when incorporating the proposed modification.

8.4 Conclusion

This addendum REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

This has included consideration, where relevant, of conservation agreements and plans of management under the NPW Act, biodiversity stewardship sites under the BC Act, wilderness areas, areas of outstanding value, impacts on threatened species, populations and ecological communities and their habitats and other protected fauna and native plants. It has also considered potential impacts on matters of national environmental significance listed under the EPBC Act.

A number of potential environmental impacts from the proposed modification have been avoided or reduced during the design development and options assessment. The proposed modification, as described in this addendum REF, best meets the project objectives but would result in minor impacts, particularly during construction (e.g. traffic and transport, noise and vibration and visual amenity impacts). Safeguards and management measures, as detailed in this addendum REF, would ameliorate or avoid these impacts. During operation, the proposed modification would improve safety and accessibility in this area. On balance, the proposed modification is considered justified, and the following conclusions are made.

8.4.1 Significance of impact under NSW legislation

The proposed modification would not result in a change to the findings of the project REF in that it would be unlikely to cause a significant impact on the environment. Therefore, it is not necessary for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning under Division 5.2 of the EP&A Act. A Biodiversity Development Assessment Report or Species Impact Statement is not required. The proposed modification is subject to assessment under Division 5.1 of the EP&A Act. Consent from Council is not required.

8.4.2 Significance of impact under Australian legislation

The proposed modification would not likely result in a significant impact on matters of national environmental significance or the environment of Commonwealth land within the meaning of the EPBC Act. A referral to the Australian Government Minister for the Environment is not required.

9. Certification

This addendum review of environmental factors provides a true and fair review of the proposed modification in relation to its potential effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposed modification.

Neil Standen

Team Lead – Impact Assessment

AECOM Australia Pty Ltd

Date: 16 April 2024

I have examined this addendum review of environmental factors and accept it on behalf of Transport for NSW.

Daniel Farrugia

Senior Project Manager

Infrastructure and Place, Transport for NSW

Date: 24/04/2024

10. EP&A Regulation publication requirement

Respondent	Yes/No
Does this REF need to be published under section 171(4) of the EP&A Regulation?	Yes

11. Terms and acronyms used in this addendum REF

Term /acronym	Description
BC Act	Biodiversity Conservation Act 2016 (NSW).
CEMP	Construction / Contractor's environmental management plan
EIA	Environmental impact assessment
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW). Provides the legislative framework for land use planning and development assessment in NSW
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth). Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
ESD	Ecologically sustainable development. Development which uses, conserves and enhances the resources of the community so that ecological processes on which life depends, are maintained and the total quality of life, now and in the future, can be increased
FM Act	Fisheries Management Act 1994 (NSW)
Heritage Act	Heritage Act 1977 (NSW)
LEP	Local Environmental Plan. A type of planning instrument made under Part 3 of the EP&A Act.
NPW Act	National Parks and Wildlife Act 1974 (NSW)
Pier	The pier extends the full width of the bridge, supporting all beam members. In this case the walls of the tunnel are the piers.
Pram ramps	Ramps that come off the cycleway for people on bikes and others to use.
Roads and Maritime	NSW Roads and Maritime was dissolved by the Transport Administration Amendment Bill in August 2019, all function are now managed by Transport for NSW
SEPP	State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act.
SEPP (Precincts – Central River City)	State Environmental Planning Policy (Precincts – Central River City) 2021
SEPP (Precincts – Western Parkland City)	State Environmental Planning Policy (Precincts – Western Parkland City) 2021
SEPP (Transport and Infrastructure)	State Environmental Planning Policy (Transport and Infrastructure) 2021
VMS	Variable Message Signs

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Appendix A

Consideration of EP&A Regulation section 171(2) factors and EPBC Act Matters of National Environmental Significance and Commonwealth land

EP&A Regulation Section 171(2) checklist

In addition to the requirements of the *Guidelines for Division 5.1 Assessments* (DPE, 2022) and the *Roads and Related Facilities EIS Guideline* (DUAP, 1996) as detailed in the addendum REF, the following factors, listed in section 171(2) of the *Environmental Planning and Assessment Regulation 2021*, have also been considered to assess the likely impacts of the proposed modification on the natural and built environment.

Factor	Impact
Any environmental impact on a community? There would be some impacts on the community during construction, including traffic and transport, noise and vibration, visual amenity and socio-economic impacts. These are described in the respective sections of this addendum REF. Safeguards have been proposed to manage and mitigate these impacts, and the community would be notified of construction activities planned prior to and during construction. The impacts on the community during operation are expected to be mostly positive.	Refer Section 6
Any transformation of a locality? There would be no transformation of the locality under the proposed modification	Negligible
Any environmental impact on the ecosystems of the locality? The proposal area is located in a highly modified urban area with limited natural environmental areas or values. There are no identified threatened species or habitats within the proposal area. Ecosystems of the locality would experience minor, short-term, and mostly indirect impacts during construction (e.g. from noise and light emissions), and increased light emissions at the raised crossing near Cross Street during operation.	Mostly short-term, minor, negative impacts
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? Short-term impacts would be experienced during construction however there would be no reduction in these qualities of the environment during operation.	Negligible
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? Non-Aboriginal (historical) heritage is assessed in Section 6.4. With the implementation of safeguards there are not expected to be impacts to listed heritage items in the vicinity. The proposed modification would contribute to a positive impact on Bridge Road/Pyrmont Bridge Road and the adjoining areas serviced by the interconnected cycleway for future generations through the provision of needed active transport infrastructure.	Long-term, positive impacts
Any impact on the habitat of protected fauna (within the meaning of the <i>National Parks and Wildlife Act 1974</i>)? With the implementation of safeguards the impact to any potential habitat of threatened fauna would be negligible.	Negligible
Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air? The proposed modification would not endanger any species.	Nil
Any long-term effects on the environment? The proposed modification is part of a proposed transport solution to improve the active transport network in the area. The proposed modification is aimed at facilitating a modal shift of transport to active transport, and reducing the volume of vehicles within the City, thereby reducing vehicle emissions.	Minor, positive impacts

Factor	Impact
Any degradation of the quality of the environment? The quality of the environment would experience short-term degradation during construction (e.g. noise, visual impacts), however the quality of the environment is expected to be increased during operation with the provision of active transport for the community.	Minor, short-term negative impacts during construction (e.g. through traffic and transport, noise and visual amenity impacts); and long-term, positive impacts during operation.
Any risk to the safety of the environment? The proposed modification does not pose a risk to the safety of the environment. This addendum REF has proposed a number of additional mitigation measures aimed at reducing any risks to the environment during construction.	Negligible
Any reduction in the range of beneficial uses of the environment? The proposed modification is within an established road corridor, and would facilitate a potential increase in active transport in the area. The proposed modification is not expected to reduce the range of beneficial uses of the environment in which it is located.	Negligible
Any pollution of the environment? During constructions there would be temporary noise and light pollution. Mitigation measures are listed in section 7.2. Additional street lighting at the raised crossing near Cross Street would increase light in the immediate vicinity during operation.	Short-term, minor, negative during construction, and minor during operation.
Any environmental problems associated with the disposal of waste? There are no environmental problems associated with the disposal of waste. Waste generated during construction would be categorised according to waste type and disposed of accordingly at suitable licensed waste facilities.	Negligible
Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? The proposed modification would not result in an increase in demand of resources that are, or likely to become, in short supply.	Negligible
Any cumulative environmental effect with other existing or likely future activities? • The proposed modification is unlikely to contribute to cumulative impacts with other projects in the surrounding area. This would be reviewed prior to and during construction.	Negligible
Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? The proposed modification is not in a coastal area.	Negligible
Applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1. N/A	N/A

EPBC Act Matters of National Environmental Significance and Commonwealth land

Under the environmental assessment provisions of the EPBC Act, the following matters of national environmental significance and impacts on Commonwealth land are required to be considered to assist in determining whether the proposed modification should be referred to the Australian Government Department of Climate Change, Energy, the Environment and Water.

Under the EPBC Act strategic assessment approval a referral is not required for proposed road actions that may affect nationally listed threatened species, populations, endangered ecological communities and migratory species. Impacts on these matters are assessed in detail as part of this addendum REF in accordance with Australian Government significant impact criteria and taking into account relevant guidelines and policies.

Factor	Impact
Any impact on a World Heritage property?	nil
N/A	
Any impact on a National Heritage place?	nil
N/A	
Any impact on a wetland of international importance?	nil
N/A	
Any impact on a listed threatened species or communities?	nil
N/A	
Any impacts on listed migratory species?	nil
N/A	
Any impact on a Commonwealth marine area?	nil
N/A	
Does the proposed modification involve a nuclear action (including uranium mining)?	nil
N/A	
Additionally, any impact (direct or indirect) on Commonwealth land?	nil
N/A	

Appendix B

Statutory consultation checklists

State Environmental Planning Policy (Transport and Infrastructure) 2021

Certain development types

Development type	Description	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) section
Car park	Does the project include a car park intended for the use by commuters using regular bus services?	No	City of Sydney Council	Section 2.111
Bus depots	Does the project propose a bus depot?	No	City of Sydney Council	Section 2.111
Permanent road maintenance depot and associated infrastructure	Does the project propose a permanent road maintenance depot or associated infrastructure such as garages, sheds, tool houses, storage yards, training facilities and workers' amenities?	No	City of Sydney Council	Section 2.111

Development within the Coastal Zone

Issue	Description	Yes / No / N/A	If 'yes' consult with	SEPP (Transport and Infrastructure) section
Development with impacts on certain land within the coastal zone	Is the project within a coastal vulnerability area and is inconsistent with a certified coastal management program applying to that land?	N/A	City of Sydney Council	Section 2.14

Note: See interactive map Coastal management - (nsw.gov.au). Note the coastal vulnerability area has not yet been mapped.

Note: a certified coastal zone management plan is taken to be a certified coastal management program.

Council related infrastructure or services

Development type	Potential impact	Yes / No / Response	If 'yes' consult with the relevant local council(s).	SEPP (Transport and Infrastructure) section
Stormwater	Are the works likely to have a substantial impact on the stormwater management services which are provided by council?	No	City of Sydney Council	Section 2.10
Traffic	Are the works likely to generate traffic to an extent that will strain the capacity of the existing road system in a local government area?	No	City of Sydney Council	Section 2.10
Sewerage system	Will the works involve connection to a council owned sewerage system? If so, will this connection have a substantial impact on the capacity of any part of the system?	No	City of Sydney Council	Section 2.10
Water usage	Will the works involve connection to a council owned water supply system? If so, will this require the use of a substantial volume of water?	No	City of Sydney Council	Section 2.10
Temporary structures	Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause more than a minor or inconsequential disruption to pedestrian or vehicular flow?	The proposal would involve the use of local roads under Council management for temporary parking areas during construction. This is not expected to cause more than a minor disruption to pedestrian or vehicular flow, however Council has been consulted under this SEPP provision regardless.	City of Sydney Council	Section 2.10
Road and footpath excavation	Will the works involve more than minor or inconsequential excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	The proposal would involve minor excavation of footpaths adjacent to Council roads (e.g. for signage changes), however Council has been notified under this SEPP provision regardless.	City of Sydney Council	Section 2.10

Local heritage items

Development type	Potential impact	Yes / No / Response	If 'yes' consult with the relevant local council(s).	SEPP (Transport and Infrastructure) section
Local heritage	Is there is a local heritage item (that is not also a State heritage item) or a heritage conservation area in the study area for the works?	There are heritage conservation areas within the proposal area, and local heritage items adjacent to the proposal area also. A non-Aboriginal heritage	City of Sydney Council The heritage assessment indicates that potential impacts	Section 2.11

Development type	Potential impact	Yes / No / Response	If 'yes' consult with the relevant local council(s).	SEPP (Transport and Infrastructure) section
	If yes, does a heritage assessment indicate that the potential impacts to the heritage significance of the item/area are more than minor or inconsequential?	assessment is provided in Section 6.4 (and Appendix D). The assessment found that impacts to these areas and items would not be more than minor, however Council has been consulted under this SEPP provision regardless.	would not be more than minor or inconsequential.	

Flood liable land

Development type	Potential impact	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) section
Flood liable land	Are the works located on flood liable land? If so, will the works change flood patterns to more than a minor extent?	No	City of Sydney Council	Section 2.12
Flood liable land	Are the works located on flood liable land? (to any extent). If so, do the works comprise more than minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance	No	State Emergency Services Email: erm@ses.nsw.gov.au	Section 2.13

Note: Flood liable land means land that is susceptible to flooding by the probable maximum flood event, identified in accordance with the principles set out in the manual entitled Floodplain Development Manual: the management of flood liable land published by the New South Wales Government.

Public authorities other than councils

Development type	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	SEPP (Transport and Infrastructure) section
National parks and reserves	Are the works adjacent to land reserved under the <i>National Parks and Wildlife Act 1974</i> , or on land acquired under that Act?	No	DPE	Section 2.15
National parks and reserves	Are the works on land in Zone C1 National Parks and Nature Reserves or in a land use zone equivalent to that zone?	No	DPE	Section 2.15
Navigable waters	Do the works involve a fixed or floating structure in or over navigable waters	No	Transport for NSW	Section 2.15
Artificial light	Would the works increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map? (Note: the dark sky region is within 200 kilometres of the Siding Spring Observatory)	No	Director of the Siding Spring Observatory	Section 2.15

Development type	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	SEPP (Transport and Infrastructure) section
Defence communications buffer land	Are the works on buffer land around the defence communications facility near Morundah? (Note: refer to Defence Communications Facility Buffer Map referred to in section 5.15 of Lockhart LEP 2012, Narrandera LEP 2013 and Urana LEP 2011).	No	Secretary of the Commonwealth Department of Defence	Section 2.15
Mine subsidence land	Are the works on land in a mine subsidence district within the meaning of the <i>Mine Subsidence Compensation Act 1961</i> ?	No	Mine Subsidence Board	Section 2.15
Bush fire prone land	Are the works for the purpose of a health services facility, a correctional centre or residential accommodation in bush fire prone land?	No	Rural Fire Service	Section 2.16

SEPP (Precincts – Central River City) 2021 and SEPP (Precincts – Western Parkland City) 2021

Development type	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	SEPP (Precincts – Central River City) 2021
Clearing native vegetation	Do the works involve clearing native vegetation (as defined in the Local Land Services Act 2013) on land that is not subject land (as defined in cl 17 of schedule 7 of the <i>Threatened Species Conservation Act 1995</i>)?	No	Department of Planning and Environment	Section 3.24

Appendix C

Construction Noise and vibration Assessment

Construction Noise Assessment – Bridge Road Cycleway Upgrade

1. Proposal details

1.1 Proposed scope of works

Transport for NSW (TfNSW) proposes to modify the proposal described in the project REF primarily to vary the widths of the cycleway, incorporate pram ramps and two raised pedestrian/cyclist crossings, and to undertake asphalt milling and re-sheeting of the road along Bridge Road and Pyrmont Bridge Road.

Key features of the proposed modification would include:

- Changes to cycleway widths to vary from 1.2 to 3.7 metres (rather than 1.4 to 1.5 metres as described in the project REF)
- Inclusion of nine concrete pram ramps on both sides of the road to provide access between the
 cycleway and the footpath. The pram ramps would be located at the end of the raised separator for
 the cycleway. The locations would depend on the adopted length of the right turn bays (see further
 details below). Once the length of the right turn bays has been confirmed, the pram ramps would
 be installed at the end of the turn lane
- Conversion of the existing pedestrian refuge near Cross Street into a raised pedestrian crossing
- Conversion of the existing pedestrian crossing near Woolley Street into a raised pedestrian crossing
- Permanent restoration of existing underground utility trenches along Bridge Road/Pyrmont Bridge Road and affected side streets (Lyons Road, Darling Street, Railway Street and Bridge Road between Taylor Street and Bellevue Street)
- Full road width (kerb to kerb) asphalt milling and re-sheeting (up to 50 millimetres deep) along
 Bridge Road/Pyrmont Bridge Road between Lyons Road and Taylor Street (around 1.6 kilometres),
 including re-marking lines
- Demolition and re-construction (with slight realignment) of the concrete centre median beginning near the intersection with Lyndhurst Street
- Installation of street lighting for the raised pedestrian crossing near Cross Street
- Other minor repair or upgrade works along Bridge Road and side streets, comprising:
 - Installation of stop signs in several side streets at the entrance to Bridge Road to replace give-way intersections, including Barr Street, Cross Street, Woolley Street, Rosebank Street, Talfourd Lane (both sides of Bridge Road), Gottenham Street (both sides of Bridge Road), Brougham Lane (both sides of Bridge Road), Railway Street, Foss Street and Clare Street
 - New signage on new or existing posts (e.g. cycleway and road safety signage) along the cycleway and road corridor
 - Reconstruction of raised concrete platform in front of the existing bus stop (about 20 metres north of the intersection of Barr Street and Bridge Road)
- Right turn bays at Ross Street and Glebe Point Road intersections:
 - The design assessed in this Addendum REF includes a reduction in the length of the right turn bay on the eastern approach to the intersection of Ross Street and Bridge Road (from 80 metres to 42 metres), consisting of line marking changes only. The design does not include changes to the lengths of any other right turn bays. However, City of Sydney Council has requested a reduction in the lengths of the right turn bays at the Ross Street and Glebe Point Road intersections and Transport has agreed to implement a trial
 - As requested by City of Sydney Council, Transport will implement a trial of shorter right turn bays at the Ross Street and Glebe Point Road intersections, including:
 - Reduction in the length of the right turn bay on the eastern approach to the intersection of Ross Street and Bridge Road (from the existing 80 metres to 21 metres)

- No change to the right turn bay on the western approach to the intersection of Ross Street and Bridge Road is proposed, as this is used by buses that currently occupy the full length of the right turn bay
- Reduction in the length of the right turn bay on the eastern approach to the intersection of Glebe Point Road and Bridge Road (from the existing 30 metres to 14 metres)
- Reduction in the length of the right turn bay on the western approach to the intersection of Glebe Point Road and Bridge Road (from the existing 50 metres to 21 metres)
- The trial of shorter right turn bays would be implemented via line-marking changes and temporary Klemmfix barriers to extend the length of the separated cycleway during the trial period
- Once implemented, the reduced right turn bays would be evaluated to determine if there are any safety or traffic congestion issues. An initial evaluation would be undertaken for up to four weeks after the changes have been implemented. Depending on the outcome of the initial evaluation, the changes would be further assessed for six to twelve months
- o If the reduced right turn bays cause safety issues or unacceptable impacts to the road corridor, the temporary materials would be removed and the length of the right turn bays would be adjusted to be consistent with the Addendum REF design. That is, a 42 metre right turn bay on the eastern approach to Ross Street would be implemented via linemarking changes, and the right turn bays on the eastern and western approaches to Glebe Point Road would be returned to existing lengths of 30 metres and 50 metres, respectively. Pram ramps would then be installed as per the Addendum REF design
- If the evaluation determines that the trial of reduced right turn bays is successful, the temporary Klemmfix barrier would be removed and replaced with a permanent arrangement (concrete separator) and pram ramps would be installed at the end of the turn lanes
- Inclusion of temporary construction parking areas for vehicle and machinery parking and potentially other ancillary facilities such as a mobile toilet
- Minor trimming of street trees (i.e. less than 10% of the canopy) in some locations along Bridge Road and Pyrmont Bridge Road
- Extension of the total construction duration from a total of up to three weeks to a total of approximately eight months (weather permitting).

1.2 Duration of works

The total construction duration (for the original proposal and proposed modification) would be increased to about eight months, with no more than five nights construction works in a row.

1.3 Proposed activities and/or equipment. Identify the noisiest activity/plant

The indicative construction methodology for the proposed modification would likely be undertaken as follows:

- Stage 1: Asphalt restoration of existing underground 11 kV utility trench
- Stage 2: Asphalt milling and re-sheeting, and construction of the raised crossings and median island would be undertaken and completed.
- Stage 3: The remainder of the cycleway upgrade would be constructed including three of the pram ramps.
- Stage 4: Sign posting, line marking, installation of temporary Klemmfix barriers, coloured surface coating for the cycleway and lighting for the raised pedestrian crossing near Cross Street
- Stage 5: Evaluation of the reduced right turn bays, removal of temporary Klemmfix barriers and adjustment of line-marking and concrete barriers to suit the adopted lengths of the right turn bays would be undertaken as the final stage.

Minor trimming of street trees (i.e. less than 10% of the canopy) would be required in places along the proposal area to accommodate construction clearance.

Based on the above listed methodology it was identified that the noisiest activity would be from asphalt milling and re-sheeting ('Profiling' scenario in TfNSW noise estimator tool).

1.4 Proposed schedule

No changes to construction hours are proposed. The proposed working hours are subject to a Road Occupancy Licence (ROL), and include the following proposed out of hours works schedule:

- Night work hours: 8:00pm to 5:00am, Sunday to Thursday
- No work on public holidays.

The works would be carried out during the evening and night-time in order to minimise the level of disruption on traffic and provide safe working conditions along the proposal area.

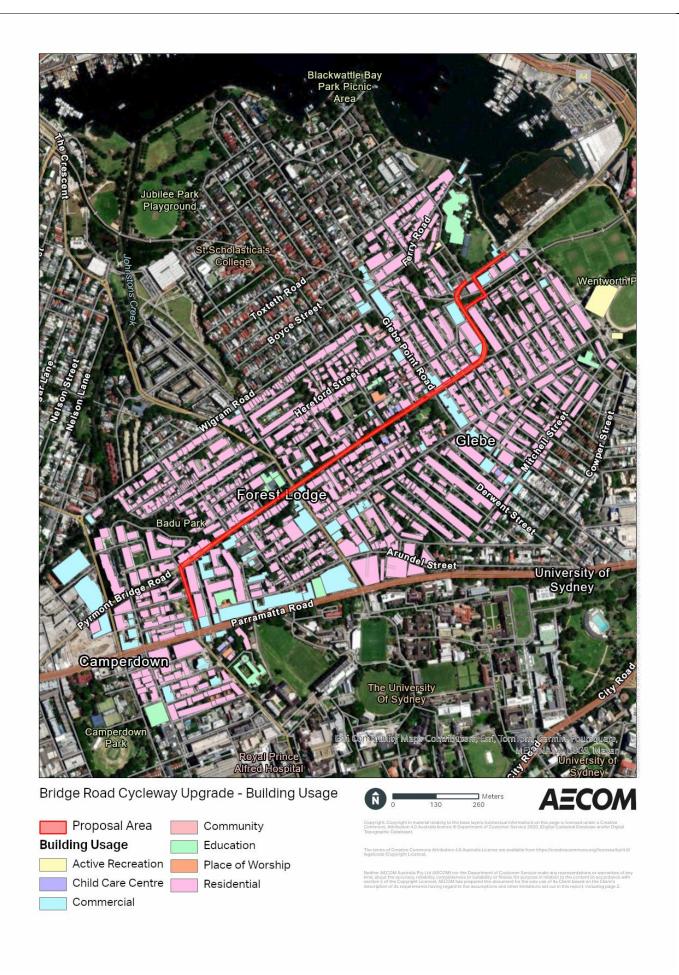
2. Noise and vibration assessment

2.1 Identify the noise sensitive receivers

The proposal area is located within a mixed-use development area. The major noise sources in the proposal area are road traffic noise from Bridge Road and Parramatta Road, as well as rail noise from the Dulwich Hill light rail line. The following sensitive receivers have been identified in close proximity to the work, and therefore would have the highest potential to be affected (approximate distance to the receiver in brackets):

- Residential receivers along Bridge Road and Pyrmont Bridge Road adjacent to the proposal area, and other nearby residential receivers
- Forest Lodge Child & Family Health Centre, 300 Bridge Road, Forest Lodge (1 m)
- Glebe Montessori Academy Childcare Centre, 158 Bridge Road, Glebe (1 m)
- Only About Children Glebe, 163/165 Bridge Road, Glebe (1 m)
- Forest Lodge Public School, 231-233 Bridge Road, Forest Lodge (8 m)
- Commercial receivers operating during night-time hours (e.g. restaurants, hotels/accommodation) along Bridge Road and Pyrmont Bridge Road, and nearby the proposal area (< 9 m)
- Medical Foundation Building, 92 Parramatta Road, Camperdown (39 m)
- Broughton Street Kindergarten, 80 Broughton Street, Glebe (40 m)
- St John's Anglican Church, 138A Glebe Point Road, Glebe (55 m)
- St James' Catholic Church and Primary School, 2 Woolley Street, Glebe (66 m)
- Sydney Secondary College Blackwattle Bay Campus, Taylor Street, Glebe (97 m)
- Sydney Presbytery, 37 St Johns Road, Glebe (100 m)
- St Joseph's Catholic Church, 2 Missenden Road, Camperdown (134 m)
- GBI Miracle Service Sydney, 9 Missenden Road, Camperdown (144 m)
- Sancta Sophia College, 8 Missenden Road, Camperdown (182 m)
- Glebe Library, 186 Glebe Point Road, Glebe (240 m).

The figure below presents the receivers within a 300-metre buffer from the proposal area and their building usages.



2.2 Identify the noise area category (i.e. R0 - R4). Give reasoning.

The TfNSW construction noise estimator tool was used to assess the impacts on the receivers during construction. The noise area category has been selected as **R4** for all areas due to the density of receivers, light rail activities, and the proximity to Bridge Road and Parramatta Road, of which the latter has over approximately 55,000 ADTC (Average Daily Traffic Count). This is in line with previous noise monitoring completed separately by AECOM (not associated with this proposal) at Cardigan Street, Glebe.

2.3 Indicate type of noise assessment selected (ie 'distance based (noisiest plant)' or 'distance based (scenario)'). Give reasoning.

The 'distance-based (scenario)' assessment was selected as it considers a number of plant operating together during multiple construction activities. In this case 'Profiling' was selected as the noisiest activity.

2.4 Identify the background noise levels (RBL or LA90) and the noise management levels (NML or LAeq(15minute))

The table below provides the background noise levels (also referred to as Rating Background Level (RBL)) and noise management levels for the residential receivers in the noise area category mentioned above.

Noise Area	R4	
RBL or LA90 ¹	Day	55
Background level	Evening	50
(dB(A))	Night	45
La va la Maia	Day	65
LAeq(15minute) Noise Management Level ²	Day (OOHW)	60
(dB(A))	Evening	55
(4.2(7.1))	Night	50

Notes: 1 LA90 = Background noise level

The noise management level for commercial receivers in the R4 noise category is presented in the table below.

Noise Area	R4	
LAeq(15minute) Noise		
Management Level	When in Use	70
(dB(A))		

² Noise Management Level for works during <u>standard hours</u> = Background level plus 10 dB(A) Noise Management Level (NML) for <u>out of hours works</u> = Background level plus 5 dB(A).

2.5 Determine if receivers are in line of sight or behind the barrier (noise wall or row of buildings)

As noted earlier, the nosiest activity was defined to be 'Profiling'. For the first row of receivers, there is line of sight to construction activities. For the second row of receivers and all the rows beyond, 'Behind substantial solid barrier' was selected. The outcome of the assessment is recorded in Section 3 below.

For the first row of buildings:

Scenario	Profiling
Is there line of sight to receiver?	Yes

For the second and all further rows of buildings:

Scenario	Profiling		
Is there line of sight to receiver?	No (behind substantial solid barrier)		

3. Noise estimator output data

3.1 Predicted noise levels

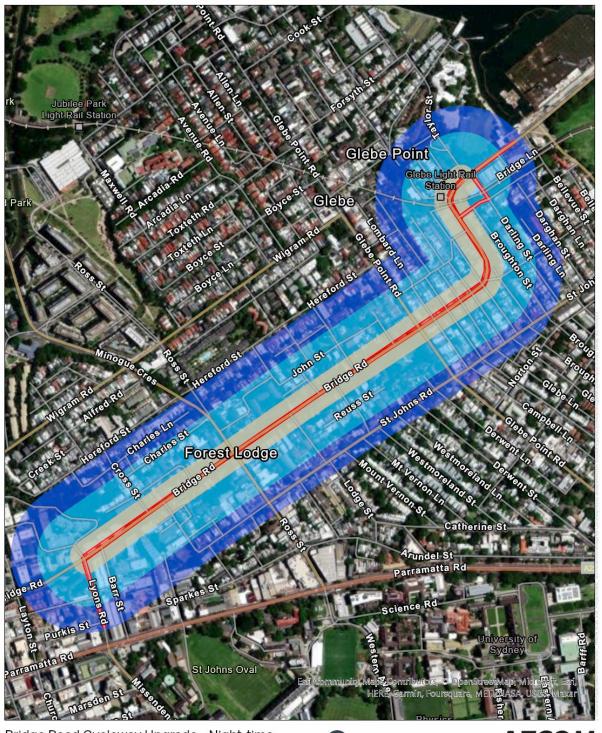
The noise estimator tool was used to predict noise levels and determine appropriate additional mitigation measures for various receivers. To assist with the assessment, receivers were grouped into noise catchment areas (NCAs) for construction noise assessment which are shown in the figure below. For the NCAs, affected distances (or the distances up to which noise levels are expected to exceed the Noise Management Level) are recorded in the table below together with the predicted noise levels. The results of the construction noise assessment are summarised below.

R4 noise area category:

	Night			
Catchment distances	NML, dB(A)	NML, dB(A) Predicted noise levels, dB(A)		
Residential NCA 1 – for				
receivers in line of sight, at a	50	75 ¹	AA, N, PC, SN, R2, DR	
distance of up to 30 m				
Residential NCA 2 – for				
receivers with no line of sight,	50	55	N, R2, DR	
at a distance of up to 105 m				
Residential NCA 3 – for				
receivers with no line of sight,	50	50	N	
at a distance of up to 165 m				
Commercial NCA 1 – for				
receivers in line of sight, at a	70	85	N, PC, SN, R2, DR	
distance of up to 9 m				
Commercial NCA 2 – for				
receivers with no line of sight,	70	70	N	
at a distance of up to 20 m				

Notes:

^{1.} A noise level of 75 dB(A) or greater for residential receivers is considered 'highly intrusive' and triggers the maximum noise controls required to be considered. Therefore 75 dB(A) is the maximum noise level identified for the purposes of identifying mitigation measures.



Bridge Road Cycleway Upgrade - Night-time Construction Noise Assessment (Residential)

Proposal Area
Residential NCA 1 (30 m)
Residential NCA 2 (105 m)

Residential NCA 3 (165 m)

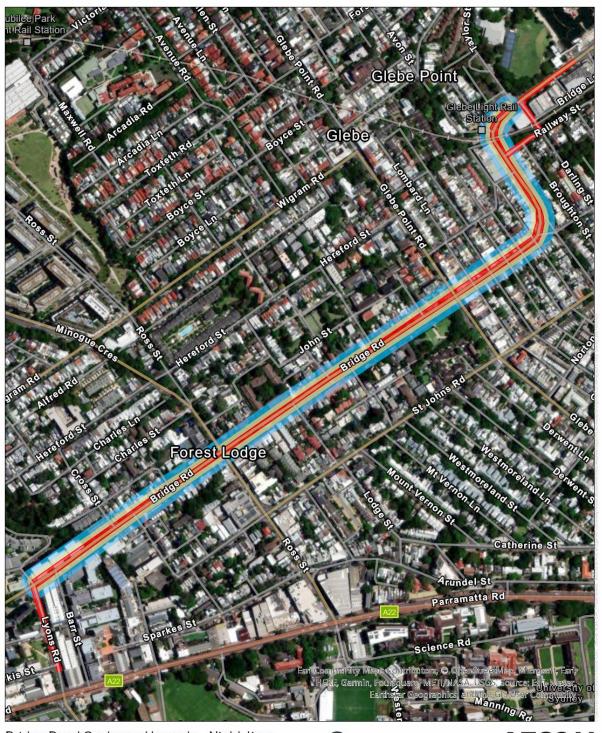
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Bridge Road Cycleway Upgrade - Night-time Construction Noise Assessment (Commercial)

Proposal Area
Commercial NCA 1 (9 m)
Commercial NCA 2 (20 m)



3.2 Vibration Assessment

A 2-4 tonne vibratory roller would be used during the asphalt milling and re-sheeting stage of construction works. This machinery has a minimum working distance of 6 m to prevent cosmetic damage, in accordance with BS 7385: Evaluation and measurement for vibration in buildings. As there are sensitive receivers within 6 m of the proposal area, this minimum working distance must be complied with at all times. Where the minimum working distance cannot be complied with, vibration monitoring should be undertaken to determine site specific minimum working distances and to confirm that appropriate thresholds are not exceeded.

4. Review of additional mitigation measures

4.1 Review of additional mitigation measures to determine which are feasible and reasonable to apply

- Letterbox drop (N = notification) has been recommended for receivers within: 165 m radius of the proposal area during evening and night-time working hours. For night-time works the noise estimator tool indicates that specific notification (SN) should be delivered to the residential and commercial receivers within 30 m of the proposal area. The specific notification provides more highly affected receivers additional information that is more informative than that covered in general letterbox drops. However, it may not be reasonable to undertake separate types of notifications. Instead, a single coordinated message should be delivered to the affected community.
- Phone calls (PC) detailing relevant information made to identified/affected stakeholders within a minimum of 30 m radius may be considered impractical due to the large number of affected receivers within this radius.
- Respite offer (RO) should be considered where there are high noise and vibration generating activities
 near receivers. RO proposes that works should be carried out in continuous blocks that do not exceed
 3 hours each, with a minimum respite period of one hour between each block. The purpose of such offer
 is to provide residents with respite from an ongoing impact. However, this is not applicable to projects
 that are undertaken at night as this would only cause nuisance to the residences. As such this mitigation
 offer is not recommended.
- Respite Period 2 (R2) Night-time construction noise shall be limited to two consecutive nights except
 for where there is a Duration Respite. For night work these periods of work should be separated by no
 less than one week and no more than 6 nights per month. However, this is not recommended for this
 project as this measure would significantly extend the duration of works.
- **Duration Respite (DR)** is offered when works are unable to comply with R2 respite offers. Where it can be strongly justified, it may be beneficial to increase the work duration (number of evenings or nights worked) for longer duration projects so that the project can be completed more quickly.
- Alternative Accommodation (AA) may be offered to residents living in close proximity to construction works that are likely to experience highly intrusive noise levels.

Review of AA recommendation:

- Are works required beyond midnight? If so, has a justification been provided?

 Yes, works would extend beyond midnight to minimise the level of disruption on traffic and provide safe working conditions along the proposal area. Noisiest works would be scheduled prior to midnight as far as possible.
- Does the surrounding area have a high density of receivers?

Yes, the surrounding area comprises of double storey houses and a number of apartment complexes.

- Will the receivers' exposure to the high noise generating activity occur as peak event/s or is it consistent throughout the duration of the project?
 - Construction noise would likely affect receivers as peak events as the works progressively approach and then depart from any individual receiver. The worst affected receivers are located about 5 m from the proposal area and would experience >75 dB(A) (or >30 dB(A) above the background level) at times. However, this is considered a worst-case scenario.
- Could temporary alternative accommodation be consistently applied?
 - No, due to the high number of noise receivers within the noise catchment area it would be impractical and difficult to consistently deliver alternative accommodation arrangements.
- Will receivers receive detailed information on the proposed work activities and mitigation measures to be applied?
 - Yes, the letterbox drop contains information on the proposed works as well as the proposed mitigation measures including the scheduling of works and contact details for more information.

Outcome of the evaluation process:

Alternative accommodation may be considered and offered to residents experiencing highly intrusive noise levels in response to receiving a complaint and in accordance with Transport for NSW procedures.

4.2 Additional mitigation measures that are feasible and reasonable to apply

Based on the review of additional mitigation measures in Section 4.1, the following additional safeguards are considered feasible and reasonable to implement to the proposal:

- 1. **Notification (N)** Letterbox drops for receivers within: 165 m radius of the proposal area during standard hours work. Notifications should detail work activities, dates and hours, impacts and mitigation measures, indication of work schedule over the night period (if any), any operational noise benefits from the works (where applicable) and contact telephone number. Notification will be sent a minimum of 7 calendar days prior to the start of works.
- 2. Duration Respite (DR) Where it can be strongly justified, it may be beneficial to increase the work duration (number of nights worked) through Duration Respite so that the project can be completed more quickly. TfNSW is planning to work no more than five nights in a row.
- **3.** Alternative Accommodation (AA) Alternative accommodation may be considered and offered to residents experiencing highly intrusive noise levels in response to receiving a complaint and in accordance with Transport for NSW procedures.

Appendix D

Non-Aboriginal Heritage Assessment



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ABN 20 093 846 925

10 November 2023

Ms Paula Camarero Senior Environment & Sustainability Officer Transport for NSW 10-14 Smith Street PARRAMATTA NSW 2150

Dear Ms Camarero,

Bridge Road Cycleway - Heritage Assessment

Transport for NSW is proposing to convert the existing pop-up cycleway on Bridge Road/Pyrmont Bridge Road, Glebe, into a permanent cycleway. The proposal was the subject of a Review of Environmental Factors (REF) previously prepared and determined in 2022. Since this time, several additions and modifications have been made to the proposed cycleway design, which has necessitated the need for an addendum to the REF. The purpose of this Heritage Assessment is to consider any heritage constraints associated with the works subject to the addendum (i.e., the 'proposed modification'). This assessment should be read in conjunction with the 2022 REF.

The key features of the proposed modification would include:

- Changes to cycleway widths to vary from 1.2 to 3.7 metres (rather than 1.4 to 1.5 metres as described in the project REF)
- Inclusion of nine concrete pram ramps on both sides of the road to provide access between the
 cycleway and the footpath. The pram ramps would be located at the end of the raised separator
 for the cycleway. The locations would depend on the adopted length of the right turn bays (see
 further details below). Once the length of the right turn bays has been confirmed, the pram ramps
 would be installed at the end of the turn lane
- Conversion of the existing pedestrian refuge near Cross Street into a raised pedestrian crossing
- Conversion of the existing pedestrian crossing near Woolley Street into a raised pedestrian crossing
- Permanent restoration of existing underground utility trenches along Bridge Road/Pyrmont Bridge Road and affected side streets (Lyons Road, Darling Street, Railway Street and Bridge Road between Taylor Street and Bellevue Street)
- Full road width (kerb to kerb) asphalt milling and re-sheeting (up to 50 millimetres deep) along Bridge Road/Pyrmont Bridge Road between Lyons Road and Taylor Street (around 1.6 kilometres), including re-marking lines
- Demolition and re-construction (with slight realignment) of the concrete centre median beginning near the intersection with Lyndhurst Street
- Installation of street lighting for the raised pedestrian crossing near Cross Street
- Other minor repair or upgrade works along Bridge Road and side streets, comprising:
 - Installation of stop signs in several side streets at the entrance to Bridge Road to replace give-way intersections, including Barr Street, Cross Street, Woolley Street, Rosebank Street, Talfourd Lane (both sides of Bridge Road), Gottenham Street (both sides of Bridge Road), Brougham Lane (both sides of Bridge Road), Railway Street, Foss Street and Clare Street
 - New signage on new or existing posts (e.g. cycleway and road safety signage) along the cycleway and road corridor
 - Reconstruction of raised concrete platform in front of the existing bus stop (about 20 metres north of the intersection of Barr Street and Bridge Road)
- Right turn bays at Ross Street and Glebe Point Road intersections:

1 of 19 OFFICIAL

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- The design assessed in this Addendum REF includes a reduction in the length of the right turn bay on the eastern approach to the intersection of Ross Street and Bridge Road (from 80 metres to 42 metres), consisting of line marking changes only. The design does not include changes to the lengths of any other right turn bays. However, City of Sydney Council has requested a reduction in the lengths of the right turn bays at the Ross Street and Glebe Point Road intersections and Transport has agreed to implement a trial
- As requested by City of Sydney Council, Transport will implement a trial of shorter right turn bays at the Ross Street and Glebe Point Road intersections, including:
 - Reduction in the length of the right turn bay on the eastern approach to the intersection of Ross Street and Bridge Road (from the existing 80 metres to 21 metres)
 - No change to the right turn bay on the western approach to the intersection of Ross Street and Bridge Road is proposed, as this is used by buses that currently occupy the full length of the right turn bay
 - Reduction in the length of the right turn bay on the eastern approach to the intersection of Glebe Point Road and Bridge Road (from the existing 30 metres to 14 metres)
 - Reduction in the length of the right turn bay on the western approach to the intersection of Glebe Point Road and Bridge Road (from the existing 50 metres to 21 metres)
- The trial of shorter right turn bays would be implemented via line-marking changes and temporary Klemmfix barriers to extend the length of the separated cycleway during the trial period
- Once implemented, the reduced right turn bays would be evaluated to determine if there are any safety or traffic congestion issues. An initial evaluation would be undertaken for up to four weeks after the changes have been implemented. Depending on the outcome of the initial evaluation, the changes would be further assessed for six to twelve months
- If the reduced right turn bays cause safety issues or unacceptable impacts to the road corridor, the temporary materials would be removed and the length of the right turn bays would be adjusted to be consistent with the Addendum REF design. That is, a 42 metre right turn bay on the eastern approach to Ross Street would be implemented via line-marking changes, and the right turn bays on the eastern and western approaches to Glebe Point Road would be returned to existing lengths of 30 metres and 50 metres, respectively. Pram ramps would then be installed as per the Addendum REF design
- If the evaluation determines that the trial of reduced right turn bays is successful, the temporary Klemmfix barrier would be removed and replaced with a permanent arrangement (concrete separator) and pram ramps would be installed at the end of the turn lanes
- Inclusion of temporary construction parking areas for vehicle and machinery parking and potentially other ancillary facilities such as a mobile toilet
- Minor trimming of street trees (i.e. less than 10% of the canopy) in some locations along Bridge Road and Pyrmont Bridge Road
- Extension of the total construction duration from a total of up to three weeks to a total of approximately eight months (weather permitting).

The key features of the proposed modification are shown in Figures 1 to 3 below. The proposed construction ancillary parking areas are shown in Figure 4.



FIGURE 1:

KEY FEATURES SHEET 1 OF 3

Legend

Permanent trench restoration, asphalt milling and resheeting

Permanent trench restoration

Pram ramp

Indicative potential alternate pram ramp location





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FIGURE 2:

KEY FEATURES SHEET 2 OF 3

Legend

Permanent trench restoration, asphalt milling and resheeting

Raised pedestrian crossing

Pram ramp

Indicative potential alternate pram ramp location





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FIGURE 3:

KEY FEATURES SHEET 3 OF 3

Legend

Permanent trench restoration, asphalt milling and resheeting

Permanent trench restoration

Raised pedestrian crossing

Pram ramp

Indicative potential alternate pram ramp location





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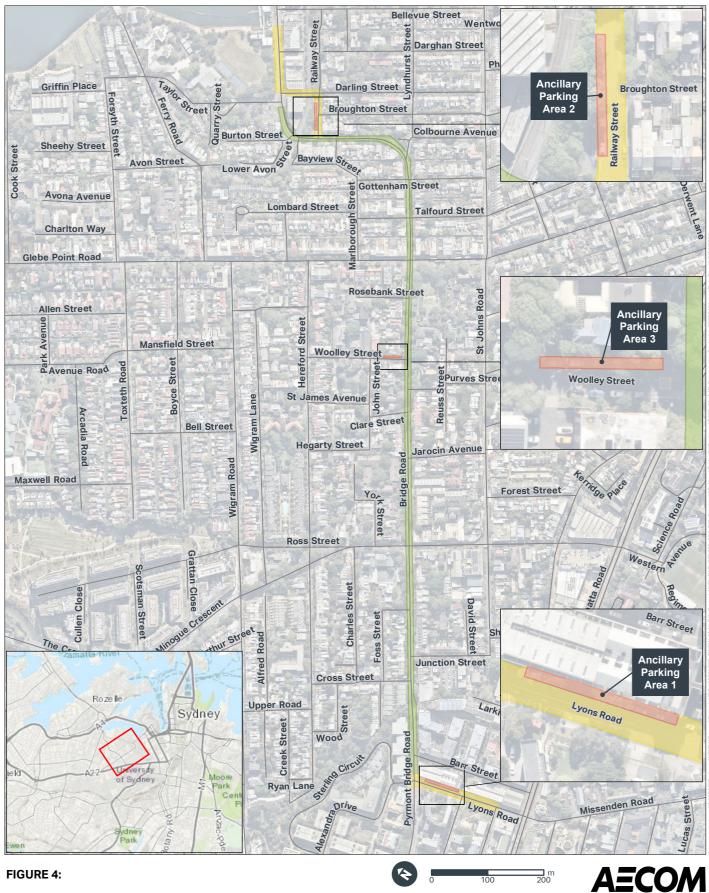


FIGURE 4:

CONSTRUCTION ANCILLARY PARKING AREAS

Legend

Permanent trench restoration, asphalt milling and resheeting

Permanent trench restoration

Ancillary parking area

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1.0 Heritage database searches

Searches of statutory databases indicate that there are a total of 19 heritage items in the vicinity of the proposed modification, including two items of State heritage significance, 18 items of local heritage significance and one item listed on the heritage register of the Department of Education under Section 170 of the *Heritage Act 1977*. The footprint of the proposed modification also occurs within four Heritage Conservation Areas (HCAs). The search area comprised the footprint of the proposed modification (refer Section 3 of the Addendum REF) and the bordering properties. A full list of these heritage items and HCAs is included in Appendix A and shown in Figure 5. A brief historical context is included in Appendix B.

All but one of the heritage items are located outside the road corridor of Bridge Road/Pyrmont Bridge Road, or the pedestrian zones adjacent to the road corridor, and therefore also outside of the proposal footprint. The exception is the Pyrmont and Glebe Railway Tunnel, an item of State heritage significance (SHR #01225). The eastern brick pier of the overbridge on Bridge Road forms a part of this item and abuts the asphalt road surface.

7 of 19 OFFICIAL

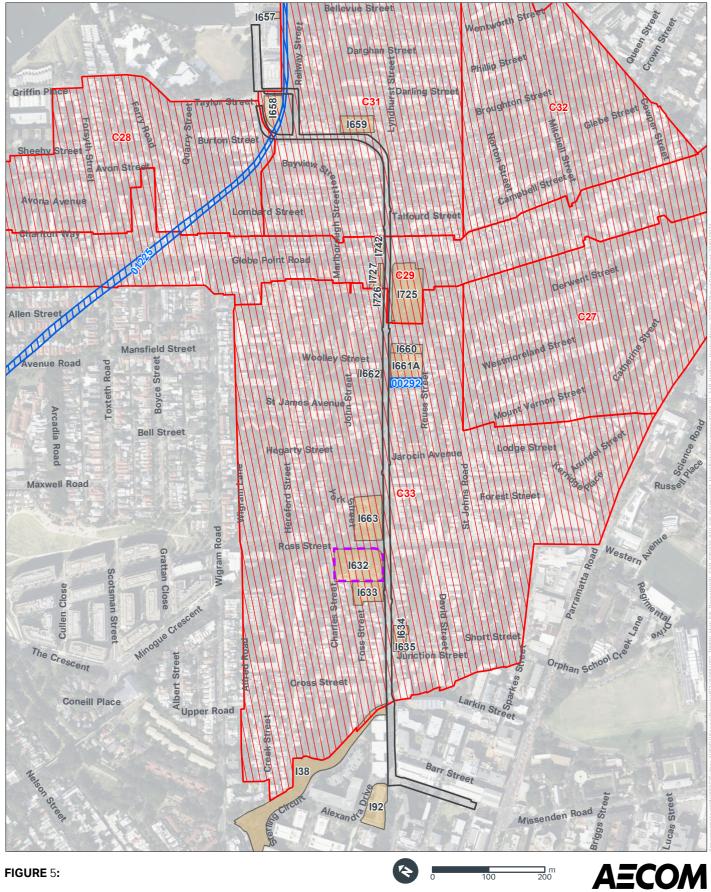


FIGURE 5:

HERITAGE ITEMS

Legend

Study area

State Heritage Register item Section 170 Heritage item

Heritage Conservation Area

Local herritage item



2.0 Site inspection

A site inspection was undertaken by the AECOM REF Project Manager, on 21 March 2023 in company with representatives of Transport for NSW. It was noted during the site visit that there were several types of kerbing along Bridge Road/Pyrmont Bridge Road, including concrete, trachyte and sandstone kerbing. None of the kerbing along Bridge Road/Pyrmont Bridge Road is listed as a heritage item/s under the *Sydney Local Environmental Plan (LEP)* 2012.

3.0 Impact Assessment

As noted above, none of the heritage items are within the proposal footprint. There is therefore little likelihood of significant direct impact to other nearby heritage items or heritage conservation areas within the study area, including from construction of the proposed modification.

There are three temporary construction parking areas proposed as part of the proposal, located on Lyons Road (south of Bridge Road), Railway Street (east of Bridge Road) and Woolley Street (north of Bridge Road). There are no heritage implications for the use of these areas for parking of machinery and vehicles during construction.

However, several elements of the proposed modification have the potential to cause indirect impacts to nearby heritage items. Examples of indirect impact includes vibration and visual impacts.

Vibration impacts

Vibration-intensive machinery would be used in construction of the proposed modification (e.g. vibratory roller, hammer drills, milling machine). These machines may be used during construction of the pram ramps, pedestrian/cyclist crossings, trench restoration and the milling and re-sheeting of the road, and have the potential to cause indirect impacts to nearby heritage items. Mitigation measures can be employed to avoid and minimise impacts caused by vibration, such as having rollers on static mode near heritage items, selection of machinery with lower vibration levels and avoiding the edges of the road by a minimum of 150 millimetres.

9 of 19 OFFICIAL

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Additional measures to avoid vibration impacts to heritage items are described below:

- Minimum working distances must be complied with for vibration intensive plant (refer Table 1)
- If compliance with minimum working distances is not possible, then pre-construction vibration monitoring will be undertaken. If readings are below vibration thresholds, then work can continue with caution
- If readings exceed vibration thresholds, then a change of construction method/process will be implemented to reduce vibration
- If vibration thresholds cannot be complied with, a structural engineer will be engaged to provide advice.

Table 1: Minimum working distances for vibration intensive plant and machinery (developed from *Construction Noise* and *Vibration Guidelines*, TfNSW, 2016)

		Minimum working distance (metres)		
Plant item	Rating / description	Cosmetic damage (BS 7385) Light-framed structures	Cosmetic damage (DIN 4150) Heritage and other sensitive structures	Human response (EPA's Vibration Guideline)
Vibratory Roller	< 50 kN¹ (Typically 1-2 tonnes)	5 m	14 m	15 m to 20 m
	< 100 kN (Typically 2-4 tonnes)	6 m	16 m	20 m
	< 200 kN (Typically 4-6 tonnes)	12 m	33 m	40 m
	< 300 kN (Typically 7-13 tonnes)	15 m	41 m	100 m
	> 300 kN (Typically 13-18 tonnes)	20 m	54 m	100 m
	> 300 kN (> 18 tonnes)	25 m	68 m	100 m
Small Hydraulic Hammer	(300 kg - 5 to 12 tonne excavator)	2 m	5 m	7 m
Medium Hydraulic Hammer	(900 kg – 12 to 18 tonne excavator)	7 m	19 m	23 m
Large Hydraulic Hammer	(1600 kg - 18 to 34 tonne excavator)	22 m	60 m	73 m
Vibratory Pile Driver	Sheet piles	20 m	50 m	100 m
Pile Boring	≤ 800 millimetres	2 m (nominal)	5 m	7 m
Jackhammer	Hand held	1 m (nominal)	2 m	3 m

¹ kilonewton

Visual Impacts

Visual impacts may be caused by construction and the use of the construction ancillary parking areas (and establishment of any temporary compound facilities in these parking areas). It is assessed that these impacts would be temporary and would not result in diminishing the heritage significance of any items or of the heritage conservation areas.

Sandstone/trachyte kerbing

The construction of pram ramps would require the removal of existing kerb and guttering, some of which are sandstone and/or trachyte. It is noted that the existing kerb and guttering along Bridge Road is a mixture of sandstone, trachyte and concrete. While the sandstone and trachyte kerb and guttering are in decline following the removal of several sections as part of previous civil and road works, they are still substantially represented along the road's length.

While sandstone/trachyte kerbing is not heritage listed, or noted as significant elements of any of the relevant HCAs, the Council of the City of Sydney (CoS) have design specifications for their treatment. The publication, *Sydney Streets – Technical Specifications* states:

Trachyte and sandstone kerb and gutter must be left in its original position unless otherwise specified by the City's Representative.

(Council of the City of Sydney, 2019:126)

Requirements also apply to the handling and treatment of trachyte kerb and guttering following any removal. It is noted that even after removal, trachyte kerbing remains the property of CoS (Council of the City of Sydney, 2019:126).

If re-design is not possible to avoid impacts to kerb and guttering, it is recommended that consultation with CoS be undertaken to discuss mitigation options, particularly as trachyte remains the property of CoS. Options could include the reinstatement of kerbing where practicable, or reuse of the material.

Pyrmont and Glebe Railway Tunnel

Asphalt milling and re-sheeting works would pass directly beneath the overbridge associated with the heritage listed Pyrmont and Glebe Railway Tunnel. The boundary description for this heritage item states that:

The listing boundary is formed by the property boundary on either side of the line from the tunnel entrance on the Sydney side <u>including the portals</u>, <u>embankments and cutting</u> and extends to the Wentworth Park Viaduct and <u>includes the whole formation of the line</u> (Heritage NSW, 2022, author's emphasis).

On its western side the road is separated from the brick pier by a footpath and kerb. However, on the eastern side, the brick pier is adjacent to the road corridor and abuts the road surface (Figure 6). As the boundary description includes embankments, cuttings and "the whole formation of the line", the asphalt milling and re-sheeting would therefore be conducted adjacent to significant fabric of the item (refer Figure 6).

11 of 19 OFFICIAL



Figure 6: Underpass of the Pyrmont and Glebe Railway Tunnels, looking south. Note the base of the brick embankment at left (Source: Google Maps)

The risk of impacts to the pier during asphalt milling and re-sheeting would largely be through accidental damage by machinery, however it is assessed that the potential for this impact is low. Protection measures, such as protective fencing and use of hand tools in the vicinity of the pier should be implemented to further reduce the risk of impact.

As a permit under Section 60 (s60) of the *Heritage Act 1977* is only required for potentially moderate impacts to items of State heritage significance (Heritage NSW, 2022b), a s60 permit will not be required for these works.

4.0 Recommendations

The following recommendations are provided in relation to the proposed modification:

- To safeguard indirect impact through vibration, mitigation measures should include having rollers on static mode (i.e. emitting no vibration) near heritage items, selection of machinery with lower vibration levels, avoiding the edges of the road by a minimum of 150 millimetres, and compliance with minimum working distances described in Table 1 for vibration intensive plant and machinery.
- In the event that the minimum working distances are unable to be complied with, further mitigation
 measures should then include pre-construction vibration monitoring. If readings are below
 vibration thresholds, then work can continue with caution. If readings exceed vibration thresholds,
 then a change of construction method/process will be implemented to reduce vibration to the
 necessary levels.
- In the event that the minimum working distances and safe vibration thresholds cannot be met, specialist advice should be sought from a structural engineer to advise on appropriate mitigation and management measures.
- Impacts to the State significant Pyrmont and Glebe Railway Tunnel must be avoided by appropriate mitigation and management measures, such as the use of hand-held tools only within one metre of the pier, expert supervision and the application of protective installation/s (e.g., protective foam).
- Appropriate management and mitigation measures should be defined in the Construction Environmental Management Plan (CEMP) for the proposal (inclusive of the proposed modification).

12 of 19

- All workers should be made aware of their responsibilities in avoiding impacts to heritage through a toolbox presentation that includes the findings of this assessment.
- New signage proposed for new locations must be constructed within the road corridor, kept away
 from identified heritage items and not affixed to adjacent heritage buildings or structures, with
 further investigation required if impacts beyond that are proposed.
- If the level of impact or methodology for these works changes and there is a risk that the proposed works will impact upon the brick pier that forms part of the significant fabric of the State heritage listing, further assessment would be required and a s60 permit may need to be sought.

Yours faithfully

Dr Darran Jordan

Principal Heritage Consultant

13 of 19 OFFICIAL

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- Council of the City of Sydney. (2019). *Sydney Streets Technical Specifications*. https://www.cityofsydney.nsw.gov.au/design-codes-technical-specifications/sydney-streets
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14 of 19 OFFICIAL



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Appendix A – Heritage database search results

The following search results for known heritage items were undertaken on 25 October 2023. There are no World, National or Commonwealth heritage items listed within the study area, with the closest item being a Commonwealth heritage listed item, the Pyrmont Post Office, approximately 200 metres north of Pyrmont Bridge Road on Harris Street, Pyrmont.

In relation to State heritage, there are two items listed on the State Heritage Register (SHR); both are adjacent to the proposal footprint (refer Table 2).

Table 2: State heritage items

Name	Address	SHR ID
Reussdale	160 Bridge Road, Glebe	SHR#00292
Pyrmont and Glebe Railway Tunnels	Metropolitan Goods Railway	SHR#01225

There are 18 local heritage items identified on the Sydney LEP 2012. All of these items are located adjacent to the proposal footprint (refer Table 3).

Table 3: Local heritage items

Name	Address	Sydney LEP 2012 ID		
Orphan Creek Public Reserve	Pyrmont Bridge Road, Camperdown	138		
Former Royal Alexandra Hospital for Children "Venables House" including interior and courtyard	20 Pyrmont Bridge Road, Camperdown	192		
Forest Lodge Public School including buildings and interiors, fencing and grounds	231-233 Bridge Road, Forest Lodge	1632		
Former house "Briarbank" including interior	231-233 Bridge Road, Forest Lodge	1633		
Terrace group "Magnolia Terrace" including interiors and front fencing	272-280 Bridge Road, Forest Lodge	1634		
Bridge Hotel and terrace group including interiors	282-284 Bridge Road, Forest Lodge	1635		
Kauri Foreshore Hotel including interior	2 Bridge Road, Glebe	1657		
Warehouse "Greens Woolstore" including interior	22 Bridge Road, Glebe	I658		
Public Housing development including interior	82-96 Bridge Road, Glebe	1659		
House "The Hermitage" and stables including grounds and interiors of house and stables	154 Bridge Road, Glebe	I660		



House "Reussdale", including interior and grounds	160 Bridge Road, Glebe	I661
Former church "The Abbey" including interior and grounds	156-158 Bridge Road, Glebe	I661A
House including interior	175 Bridge Road, Glebe	1662
House group "Killara", "Morocco", "Hillston" and "Strathmore" including interiors, former stables at No. 229 and front fencing	223A-229 Bridge Road, Glebe	I663
Foley Park including wireless house and interior, sandstone walls, trees and landscaping	Glebe Point Road, Glebe	1725
Commercial building including interior	142 Glebe Point Road, Glebe	1726
Shop and residence 'Swiss cottages' including interiors	144 Glebe Point Road, Glebe	1727
Ancient Briton Hotel including interior	225 Glebe Point Road, Glebe	1742

The following item in Table 4 is listed on State government agencies' heritage registers under Section 170 of the *Heritage Act 1977*.

Table 4: Section 170 heritage items

Name	Address	Agency
Forest Lodge Public School	231-233 Bridge Road, Forest Lodge	Department of Education

In addition, the proposal passes through the Heritage Conservation Areas listed in Table 5.

Table 5: Heritage Conservation Areas

Code	Heritage Conservation Area Name
CA28	Glebe Point Heritage Conservation Area
CA29	Glebe Point Road Heritage Conservation Area
CA31	Lyndhurst Heritage Conservation Area
CA33	Hereford and Forest Lodge Heritage Conservation Area

16 of 19 OFFICIAL



Appendix B – Brief historical context

The land comprising the proposal area was part of a 400-acres grant allocated to the Church of England by Governor Arthur Philip in 1789. Philip had been directed by The Right Hon. W. W. Grenville in orders dated 22 August 1789:

... that a particular spot in or as near each town as possible be set apart for the building of a church, and four hundred acres adjacent thereto allotted for the maintenance of a minister, and two hundred for a school-master.²

Philip had the land then called "the Kangaroo Grounds" surveyed, and divided it into three allotments, being 400 acres along the harbour front for the church and glebe lands, two hundred acres on the south for the schoolmaster and four hundred acres in between reserved for the Crown (see Figure-7).³ This glebe⁴ eventually gave the area its name.

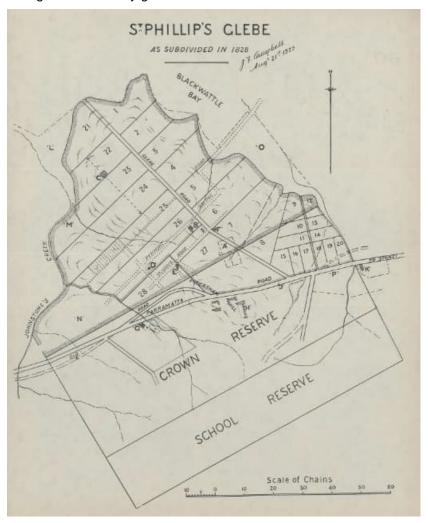


Figure-7: Map showing Philip's grant for church and school lands (Campbell, 1929:306)

The first chaplain appointed to the colony was Richard Johnson, who set out to clear the heavily timbered glebe land, but found that it was unsuitable for cultivation and stated "400 acres... for which I would not give 400 pence". 5 In 1793, Johnson was granted 100 acres of more fertile land at present

17 of 19 OFFICIAL

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² Frederick Watson (ed.), *Historical Records of Australia, Series 1. Governors' Despatches to and from England, Volume 1, 1788-1796*, 1914, Series 1, Volume 1. Sydney, William Applegate Gullick, Government Printer, 127.

³ Campbell, J F, 'Notes on the Early History of the Glebe', *Journal of the Royal Australian Historical Society*, 1929, Vol. 15 Part 5, pp 298-306, p. 298.

⁴ A glebe is defined as "a piece of land serving as part of a clergyman's benefice and providing income", Oxford Languages. ⁵ Cable, K J "Richard Johnson (1753-1827)", *Australian Dictionary of Biography*, 1967, accessed on 25 October 2023 from https://adb.anu.edu.au/biography/johnson-richard-2275.

day Ashbury, which he named "Canterbury Vale". The 400-acres church grant remained unoccupied and unimproved for approximately 30 years, although fishermen utilised the shores of the harbour and small parcels were leased.

In 1806, 240 acres of land, including the triangular piece of land north of Parramatta Road and the western end of present-day Pyrmont Bridge Road between Johnsons Creek and Orphan School Creek, was granted to William Bligh. The triangular piece of land represented approximately 40 acres of the 400-acres church grant. In 1826, the "Trustees of Clergy and School Lands in the Colony of New South Wales" corporation was formed, which had control over all church and school lands, and two years later, the glebe lands were sold at auction.⁸

Most of the people who bought the lands were professionals and merchants, and their families. Elegant dwellings were constructed, largely grouped in two areas: along the ridge from Glebe Road to St Johns Road down to the water, and on either side of Bridge Road between Glebe Road and Ross Street.⁹

The population of Glebe steadily grew between 1841 and 1915, with the most intensive phase occurring in the later decades of the 19th century, and comprised well-defined enclaves of middle-class, lower middle-class and working-class communities. Terrace houses became the dominant type of residence but differed in sizes and styles.¹⁰

From the beginning of the 20th century, the middle-class residents began moving away from the inner city, which had gained a reputation as a breeding ground for disease, poverty, and vice. Industry also rose in the inner-city suburbs; these suburbs, including Glebe, gradually became the home of mainly lower income families living close to their work.

By the middle of the 20th century, Glebe remained industrialised, working-class, and mostly Anglo-Celtic. Post-war immigration saw this change, with the number of overseas-born residents rising from 148 in 1947 to 3,420 in 1971. Although the inner-city suburbs were generally in decline, the late 1960s and early 1970s saw two main examples of activism to prevent development radically changing the character of Glebe. In the first instance, the Department of Main Roads (DMR) had begun buying properties ahead of the planned construction of the North-Western Expressway through parts of Glebe, threatening "Lyndhurst" in Darghan Street:

The Builders' Labourers Federation, led by Jack Mundey, imposed a 'green ban' on construction of the expressway. Green bans represented an alliance between militant trade unions and middle-class conservationists, and the movement took on the classic features of an urban social movement; it was sudden, unexpected, and spontaneous, and its impact was dramatic. Expressway opposition took the form of confrontation at demolition sites and squatting at DMR-affected properties. After several confrontations between the Builders Labourers Federation, anti-expressway groups, police and demolishers in 1972, the DMR withdrew from Glebe.¹¹

In 1974, the Glebe area was listed by the National Trust as a Conservation Area, receiving the highest category of listing. In the same year, the Federal Government acquired Bishopthorpe and St Phillip's Estate from the Church of England for use as family dwellings and commercial buildings.¹²

With the protection from development and greater awareness of the benefits of conservation, Glebe has once again become gentrified.

18 of 19 OFFICIAL

⁶ Solling, M "Glebe", *The Dictionary of Sydney*, 2011, accessed on 25 October 2023 from https://dictionaryofsydney.org/entry/glebe.

⁷ Campbell, 1929, 300.

⁸ Solling, 2011.

⁹ Ibid.

¹⁰ Ibid.

¹¹ Ibid.

¹² Ibid.

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19 of 19 OFFICIAL

Appendix E

Exemption from approval under s57(2) of the Heritage Act 1977

Exemption from Approval under s57(2) Heritage Act 1977

Paula Camarero





Re: Exemption from Approval or Notification under s57(2) of the NSW Heritage Act to undertake works to **Pyrmont and Glebe Railway Tunnel**, SHR 01225

17 May 2023

Dear Paula,

The proposed works have been assessed, and an exemption under Section 57(2) of the *NSW Heritage Act* 1977 has been granted.

NSW State Heritage Register details	Pyrmont and Glebe Railway Tunnel (SHR 01225)
Documentation	The project information has been provided in the following documentation and reviewed in support of this exemption:
	Bridge Road Cycleway Heritage Assessment (AECOM, 3 May 2023).
Scope of Works	It is understood that the proposal includes the following:
	 Replacement of the temporary flexible barrier (Klemmfix) which separates motorists and bike riders with a permanent low profile concrete barrier (as included in the Project REF determined in March 2022)
	 Full road width (kerb to kerb) asphalt milling and re-sheeting (up to 50 millimetres deep) including re-marking lines (as included in an Addendum REF currently under preparation)
Assessment	The proposal is considered consistent with the activities described within the following Standard Exemptions (gazetted 13 November 2020):
	Standard Exemption 2 – Repairs to non-significant fabric
	The proposal has been assessed by a Transport for NSW Heritage Specialist and is considered to have no adverse impacts on the heritage significance of the place.
	The project is not required to obtain external heritage approval from Heritage NSW (the office of the Heritage Council of New South Wales).
Conditions	Please note these works are exempt from approval based on the following conditions.

General conditions:

- Due care must be taken in the vicinity of identified heritage structures and fabric. No construction materials are to be stockpiled or stored against heritage items or trees.
- Any accidental damage caused to heritage items/fabric must be reported immediately through the TFNSW Environmental Incident system. Damage is to be made good in accordance with specialist heritage advice.
- All areas impacted by the work must be cleaned and made good after completion of works.
- Any proposed changes beyond the approved scope of works may require further assessment and approval.
- On completion of work, photos of the works—both before and after, suitably captioned or identified must be submitted to ES_heritage@transport.nsw.gov.au for updating the S170 Register.

Project specific conditions:

 The work must conform to Section 4 - Recommendations of the Bridge Road Cycleway Heritage Assessment (AECOM 3 May 2023).

Site Visit/Post
Completion
Inspection
Required

No

Please do not hesitate to make contact if you have any questions.

Sincerely,

Denis Gojak

Senior Heritage Specialist Environment and Sustainability Safety, Environment and Regulation

Transport for NSW

M 0400 474 405 E denis.gojak@transport.nsw.gov.au

Appendix F

Bridge Road Traffic Analysis

Design Advice Form



Project	On-Road Cycle provision Bridge Road, Glebe			
				Issued for
Description:	Bridge Road Traffic Analysis	Sto	atus:	Information (IFI)
Location:	Glebe			
		_		
Prepared:	Usha Jacome	Da	ite:	28/02/2023
Reviewed:	Adam Hillard	Da	ıte:	07/03/2023

Terms and Definitions

Term	Meaning
SIDRA model	Traffic modelling software developed by SIDRA SOLUTIONS. The software has the
	ability to analyse individual intersections in isolation or in a network, which is suitable for
	a corridor like Wakehurst Parkway (within this tech note).
Priority control	A control type for an intersection, which refers to Give-Way or STOP sign arrangements,
	as opposed to a roundabout or traffic signal controls.
SCATS signal data	SCATS stand for the Sydney Coordinated Adaptive Traffic System, which is a traffic
	signal system developed by Transport for NSW (TfNSW) formerly Roads and Maritime
	Services (RMS). SCATS signal data refers to data collected by traffic signals, including
	signal cycle times, traffic signal phases and traffic counts.
Throughput	Refers to traffic volume through a road mid-block, or intersection. It should be noted that
	throughput is not the same as the demand. It is a portion of the demand that managed to
	arrive at the intersection or mid-block section of the road.
DoS	Degree of Saturation
LoS	Level of Service
Modelling Guidelines	Roads and Maritime Services' (now TfNSW) Traffic Modelling Guideline, Version 1.0,
	February 2013.
NSW	New South Wales.
CCHD	CCHD Pty Ltd
TfNSW	Transport for NSW

Introduction

Background

This technical note has been developed to understand the right turn capacity requirements at two intersections along Bridge Road

- Bridge Road and Ross St
- Bridge Road and Glebe Point Road

And to understand the kerbside lane length of the west approach of Bridge Road and Taylor Street.

The traffic and transport analysis has been completed using SIDRA V9 traffic modelling software with the network modelling function. SIDRA Network was undertaken for the 2023 existing base year.

Figure 0-1 below shows the SIDRA network modelling road sections.

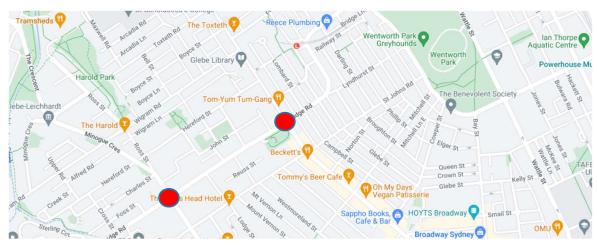


Figure 0-1Map of the Bridge Road SIDRA Modelling Coverage Area

1.2 Purpose of this Technical Note

The key objective of this technical note is to document the process of developing the 2023 base year SIDRA models for the above listed locations. This technical note also summarises the traffic modelling findings of each intersection, and to report on the performance results. The mitigation measures that have been introduced in this technical note have been presented and discussed with TfNSW.

1.3 SIDRA Performance Criteria

An interpretation of the measure of performance provided in from SIDRA outputs are described as follows.

1.3.1 Level of Service Criteria

The performance of an intersection can be measured by the average delay per vehicle which corresponds to a Level of Service (LoS) measure for the intersection.

The performance of an intersection is measured in accordance with the Austroads Guide to Traffic Management-Part 3: Traffic Studies and Analysis (2013). The guidelines recommend that for roundabouts and priority-controlled intersections, the LoS value is determined by the critical movement with the highest delay, whereas for a signalised intersection, LoS criteria are related to the average overall intersection delay, measured in seconds per vehicle.

An intersection's LoS was assessed using the standard TfNSW Level of Service criteria for intersections, which are listed in Table 0-1 below.

Table 0-1 Modelling Guidelines Level of Services for Intersections

Level of Service	Average Delay per Vehicle (sec/vehicle)	Traffic Signal and Roundabout	Give Way and Stop Signs
А	<14	Good operation	Good operation
В	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
С	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity, at signals, incidents will cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode
F	>70	Unsatisfactory with excessive queuing	Unsatisfactory with excessive queuing

1.3.2 Degree of Saturation

In addition to the LoS, the performance of an intersection is measured in terms of Degree of Saturation (DoS) for each movement. The DoS is a measure of total demand in comparison to the total capacity. A DoS above 1.0, for example, represents oversaturated conditions where demand flows exceed capacity. On the contrary, a DoS below 1.0 represents under-saturated conditions where demand flows are below capacity.

Table 0-2 lists the maximum practical DoS for different intersection types. If the traffic analysis results are greater than the corresponding values provided in the table for any movement, then the intersection requires an appropriate treatment to maintain acceptable DoS levels.

Table 0-2 Maximum Practical Degree of Saturation

Intersection type	Maximum practical degree of saturation
Signalised intersections	0.90
Roundabouts	0.85
Priority intersections	0.80

Source: SIDRA Software and the TfNSW Traffic Modelling Guidelines

1.4 Traffic Modelling Process

The SIDRA Intersection modelling software (V9) has been used to meet the objectives of this study.

1.4.1 Traffic Demand Analysis

Traffic surveys were undertaken by Matrix for one week for a 15 hour period from 7am to 10pm from 6th February to 12th February 2023. The survey data was broken down into lights, heavies and cyclists. There was no information provided for buses, so it was assumed that the bus volumes (frequencies) shown in the tables below were considered as part of the heavy vehicles class. Therefore, for the heavy vehicle volumes surveyed the volumes were split accordingly between buses and heavy vehicles. Surveys were undertaken for the intersections:

- Bridge Road and Ross Street
- Bridge Road and Glebe Point Road

Upon review of the data, it was determined that the peak weekday and weekend volumes were:

- Tuesday 7th February, 2023
 - o 8:00am to 9:00am
 - o 5:30pm to 6:30pm

- Saturday 11th February, 2023
 - o 12:00pm to 1:00pm

The surveys undertaken included intersection counts (light and heavy vehicles), pedestrian counts and queue lengths. Surveys were not undertaken for Bridge Road and Taylor Street. Therefore, the traffic volumes used to undertake this analysis has been based on SCATS data provided by TfNSW. SCATS data was collected for 30th August 2022. Both the survey and SCATS volumes have been presented in **Attachment 1**.

Note, there are limitations with SCATS in that the data does not provide information for light and heavy vehicles. Therefore, to determine the percentage heavies at the following intersections TfNSW provided 7-day counts undertaken at the midblock crossing near Cross Street (16th Sept to 22nd Sept, 2022) to be used as an indicator or the number of trucks. The average weekday percentage trucks for the AM and PM were calculated to be:

- AM Peak, Northbound 4.5% HV
- AM Peak, Southbound 3.8% HV
- PM Peak, Northbound 1.4% HV
- PM Peak. Southbound 1.7% HV

For pedestrians, it has been assumed that all four legs would have approximately 5 pedestrians per cycle in the AM Peak and 5 pedestrians every second cycle in the PM Peak. Lanes in SCATS cannot distinguish multiple movements for example a through-left and therefore assumptions have been made for this also. Bridge Road traffic turning left is assumed to be 10% of the detector volume, and on the cross streets it has been assumed to be 20%. Bus volumes were calculated based on timetable information.

Glebe Point Road had the following bus routes and frequency:

	Route	370	Route	e 431	Route	433	TO	TAL
Direction	NB	SB	NB	SB	NB	SB	NB	SB
8:00am to 9:00am	6	6	5	14	3	10	14	30
4:45pm to 5:45pm	6	6	7	4	9	4	22	14

Ross St had the following bus routes and frequency:

	Rout	e 470	Rou	te 469
Direction	WB	EB	NB	SB
8:00am to 9:00am	5	23	-	3
4:45pm to 5:45pm	8	6	-	3

WB = LT from Ross St onto Bridge Rd; EB = RT from Bridge onto Ross St

For Taylor Street and Bridge Road intersection, there appears to be school bus services that operate on Taylor Street as well as a bus stop on the eastbound downstream carriageway, on the northern side of Bridge Road. No data was available for this intersection and therefore for this technical note analysis was undertaken with no buses included at this intersection.

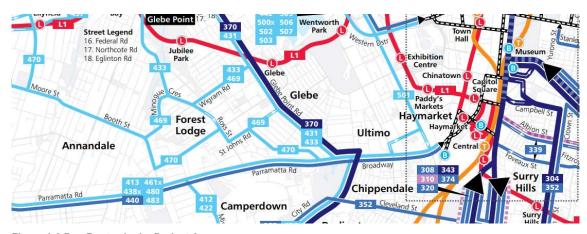


Figure 0-2 Bus Routes in the Project Area.

For Bridge Road and Taylor Street intersection, based on the SCATS data the peak periods were determined as:

- AM Peak 7:45am to 8:45am
- PM Peak 2:45pm to 3:45pm

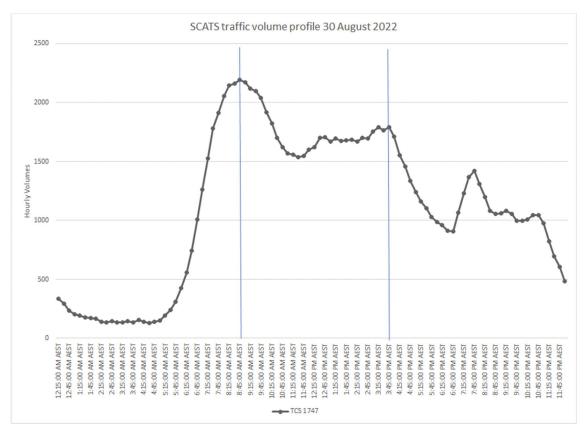


Figure 0-3 SCATS profile for Bridge Road and Taylor Street

Note: For Bridge Road and Taylor Street intersection, the results have been updated due to incorrect demands used in previous memo 'AA0435 - Bridge Road Traffic Technical Note 221104'

1.4.2 SCATS Signal Data

Signal operation data were modelled based upon provided SCATS signal data for Tuesday 30 August 2022 for the three signalised intersections. Signal phases were coded in the models according to the signal phasing plan for the intersections. Additionally, signal phasing was applied based upon 15minute phase time data which was provided by TfNSW. Additional SCATS signal data was not provided at the time the traffic surveys were completed.

1.4.3 Future Year Traffic Demand Estimation No future year modelling has been developed for this project.

Bridge Road Intersections

Bridge Road and Glebe Point Road

Bridge Road and Glebe Point Road intersection has been modelled in SIDRA 9. Figure 0-1 below is an image of the existing conditions.

Bridge Road and Glebe Point Road intersection currently operates as a 4-way signalised intersection with a pedestrian crossing on all approaches. Glebe Point Road on both approaches do not allow vehicles to turn right onto Bridge Road. Buses excepted on the northern approach. Glebe Point Road southern approach is a shared zone of 40km/hr and only has a short southbound downstream lane available due to parking. There are large volumes of cyclists that currently use this intersection. Currently there is a temporary path along Bridge Road for cyclist to utilize and therefore have not been included in the intersection analysis, however cyclist currently along Glebe Point Road have been included. The intersection currently operates with an average cycle time of 130 seconds.

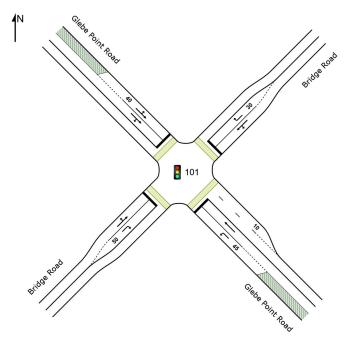


Figure 0-1 Existing Layout of Bridge Road and Glebe Point Road

The main phasing for this intersection currently operates as follows:

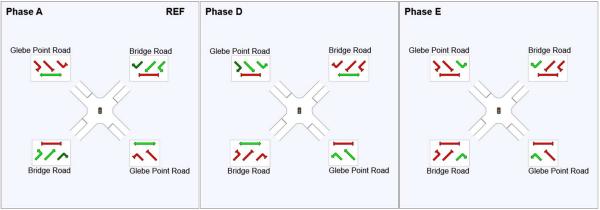


Figure 0-2 Existing phasing for Bridge Road and Glebe Point Rd intersection

The intersection does also include some variable phases. The TCS Plan for this intersection is presented in **Attachment 2**. The model was run, and the following results were output for 2023.

Table 0-1 Bridge Road and Glebe Point Rd 2023 Existing Intersection Performance

				95th Percentile Queue Length (m)				
Year	DoS	Avg Delay (s)	LoS	Bridge Rd Right Turn western approach queue	Bridge Rd Right Turn eastern approach queue			
2023 AM Peak	0.851	28.9	С	21.7m (3 veh)	16.3m (2 veh)			
Survey (95%)				(~35m) 5 veh	(~35m) 5 veh			
Survey (50%)				(~14m) 2 veh	(~7m) 1 veh			
2023 PM Peak	0.858	29.4	С	21.6m (3 veh)	20m (3 veh)			
Survey (95%)				(~49m) 7 veh	(~21m) 3 veh			
Survey (50%)				(~21m) 3 veh	(~14m) 2 veh			
2023 Saturday Peak	0.721	25.4	В	25.3m	15.9m			

The results in Table 0-1 show that the overall intersection performance operates at a LOS C. The results show that the right turn bays along Bridge Road only queue for a length of up to 22m. Queues were also surveyed at the same time as the traffic volumes were undertaken and average queues:

- For the AM Peak was on average around 2 vehicles per cycle, but the queues per cycle ranged from 0 vehicles up to 5 vehicles per cycle time.
- For the PM Peak was on average around 3 vehicles per cycle, but the queues per cycle ranged from 0 vehicles up to 7 vehicles per cycle time.
- Surveys were not undertaken during Saturday peak time.

Therefore, the survey results suggest that the western approach right turn bay can accommodate the right turn traffic, however the eastern approach right turn bay on average can be accommodated but can on occasion overflow into the through traffic.

Bridge Road and Ross St

Figure 0-3 below is an image of the existing conditions.

Bridge Road and Ross St intersection currently operates as a 4-way signalised intersection with a pedestrian crossing on all approaches. Ross St on both approaches do not allow vehicles to turn right onto Bridge Road. Ross St northern approach has a school zone of 40km/hr. There are large volumes of cyclists that currently use this intersection. Currently there is a temporary path along Bridge Road for cyclists to utilize and therefore have not been included in the intersection analysis, however cyclist currently along Ross Street have been included. The intersection currently operates with an average cycle time of 130 seconds.

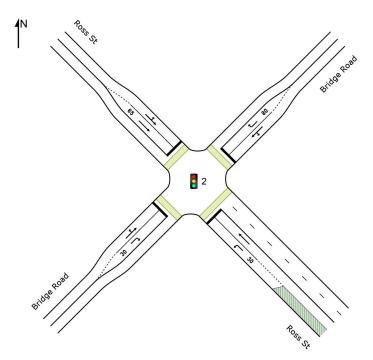
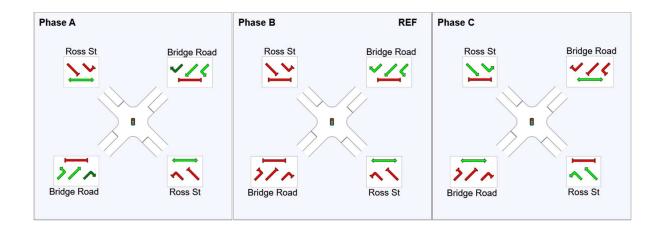


Figure 0-3 Existing Layout of Bridge Road and Ross St

The main phasing for this intersection currently operates as follows:



The intersection does also include some variable phases. The TCS Plan for this intersection is presented in **Attachment 2**. The model was run, and the following results were output for 2021.

Table 0-2 Bridge Road and Ross St 2023 Existing Intersection Performance

		A . D.I.		95th Percentile Qu	eue Length (m)
Year	DoS	Avg Delay (s)	LoS	Right Turn western approach queue	Right Turn eastern approach queue
2023 AM Peak	0.745	26.3	В	4.4m	16.6m
				(~21m) 3 veh	(~28m) 4 veh
				(~14m) 2 veh	(~7m) 1 veh
2023 PM Peak	0.888	40.3	С	5.2m	63.9m
				(~21m) 3 veh	(~42m) 6 veh
				(~14m) 2 veh	(~21m) 3 veh
2023 Saturday Peak	0.731	28.7	С	2.1m	30m

The results in Table 0-1 show that the overall intersection performance operates at a LOS B in the AM Peak and a LOS C in the PM Peak and Saturday Peaks. It has been suggested that the right turn bays along Bridge Road can accommodate the right turn volumes. Queues were also surveyed at the same time as the traffic volumes were undertaken and average queues:

- For the AM Peak was on average around 2 vehicles per cycle, but the queues per cycle ranged from 0 vehicles up to 4 vehicles per cycle time.
- For the PM Peak was on average around 3 vehicles per cycle, but the queues per cycle ranged from 0 vehicles up to 6 vehicles per cycle time.
- Surveys were not undertaken during Saturday peak time.

Therefore, the survey results suggest that both right turn bays can accommodate the right turn traffic.

Bridge Road and Taylor Street

Figure 0-5 below is an image of the existing conditions.

Bridge Road and Taylor St intersection currently operates as a T-signalised intersection with a pedestrian crossing on northern and eastern approaches. Bridge Road on the western approach operates as one lane each way with the eastern approach operating as 2 lanes each way. Taylor St northern approach and Bridge Road eastern approach has a school zone and shared zone of 40km/hr. The intersection currently operates with an average cycle time of 130 seconds for the AM Peak and 110 seconds for the PM Peak.

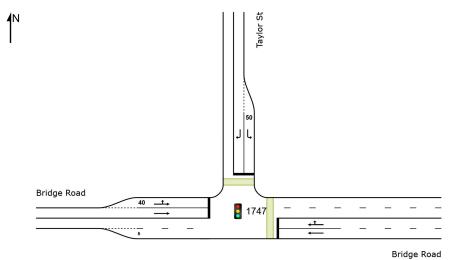


Figure 0-4 Existing AM Peak Layout of Bridge Road and Taylor St

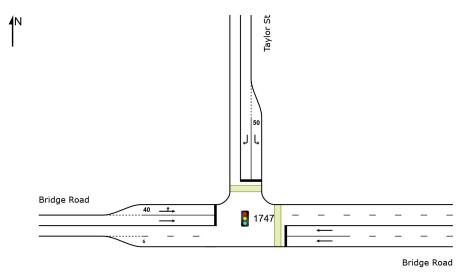


Figure 0-5 Existing PM Peak Layout of Bridge Road and Taylor St

The main phasing for this intersection currently operates as follows for the AM and PM Peaks:

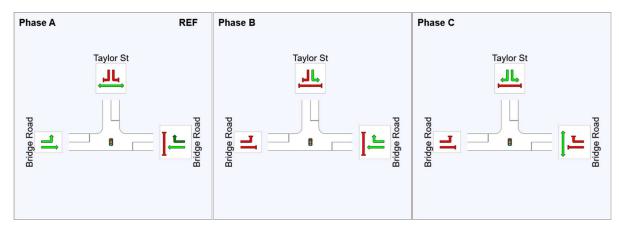


Figure 0-6 AM Peak Phase Splits for Bridge Rd and Taylor St

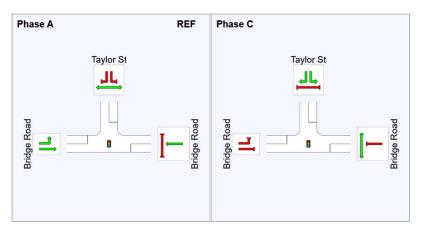


Figure 0-7 PM Peak Phase Splits for Bridge Rd and Taylor St

Table 0-3 Bridge Road and Ross St 2021 Existing Intersection Performance

Year	DoS	Avg Delay (s)	LoS	Left Lane Queue Length of Western Approach
2022 AM Peak	0.769	18.6	В	>40m
2022 PM Peak	0.480	8.3	Α	30m

The results in Table 0-3 show that the overall intersection performance operates at a LOS B in the AM Peak and LOS A in the PM Peak. It has been suggested that the left kerbside lane on the western approach extends queues of more than 40m in the PM Peak. Therefore, it is suggested that the left turn lane be retained.

Note: The results are based on SCATS data and no site observations have been undertaken to determine if these results are accurate. The kerbside lane on the western approach is a through-left and therefore it is difficult to understand from SCATs the proportion that turn left and through. It has been assumed the volume split is 50-50 for the purposes of this analysis.

Conclusion

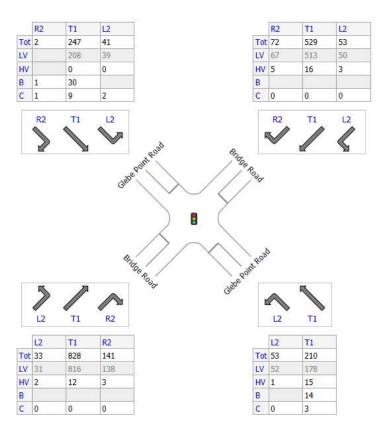
The results show for Bridge Road and Glebe Point Road intersection that the eastern approach along Bridge Road may extend out of the 30m bay provided based on the surveys. Therefore, it is suggested that there may be a need to extend the right turn bay in line with the western approach to 50m.

The results for Bridge Road and Ross Street intersection shows the queues for both the east and west right turn bays on Bridge Road do not extend past the bay lengths provided. Noting the western approach right turn on Bridge Road at Ross Street intersection is a Bus Lane it is suggested to maintain the length of this bay.

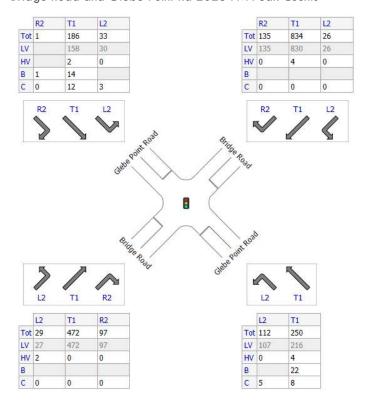
The results show for Bridge Road and Taylor Street the left kerbside lane on the western approach should be maintained at 40m as per existing conditions, which is what the current design is proposing.

Attachment 1 – traffic volumes

Bridge Road and Glebe Point Rd 2023 AM Peak Counts

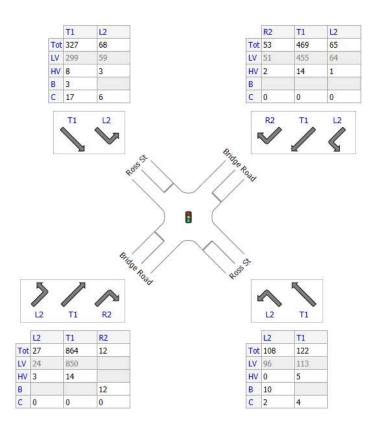


Bridge Road and Glebe Point Rd 2023 PM Peak Counts

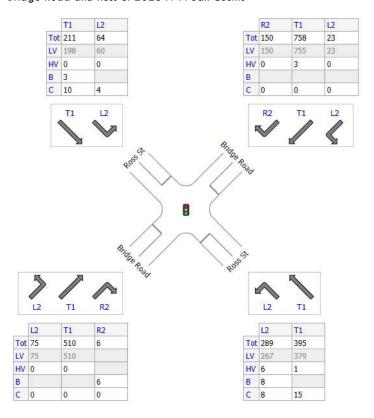


Bridge Road and Glebe Point Rd 2023 Saturday Peak Counts

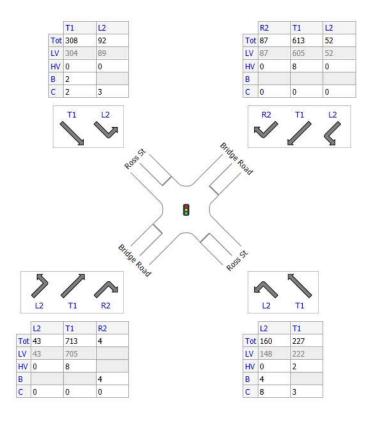
	R2	T1	L2	- 3				R2	T1	L
Tot	1	211	52				Tot	99	641	63
LV		191	49				LV	97	635	60
HV		1	0				HV	2	6	3
В	1	15					В			
С	0	4	3				С	0	0	0
	R2	T1	L2					R2	T1	
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	L2	T1 T1				Chebre Count	Rost	. /	T1 T1	
Tot	L2		R2			,	Ross	L2		
_	L2 50	T1	R2					L2 L2 79	T1	
LV	L2 50 49	T1 635	R2 R2 142				Tot	L2 L2 79 78	T1 169	
Tot LV HV	L2 50 49	T1 635 629	R2 R2 142 142				Tot	L2 L2 79 78	T1 169 148	



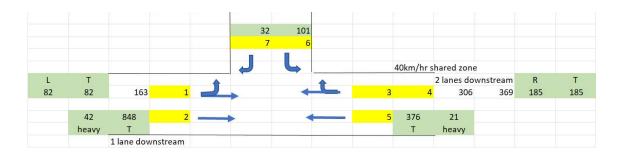
Bridge Road and Ross St 2023 PM Peak Counts



Bridge Road and Ross St 2023 Saturday Peak Counts



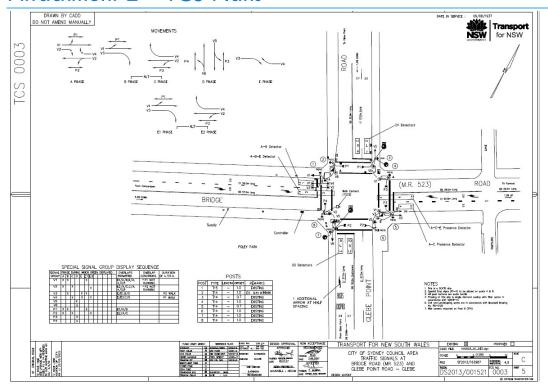
Bridge Road and Taylor Street 2022 AM Peak Counts

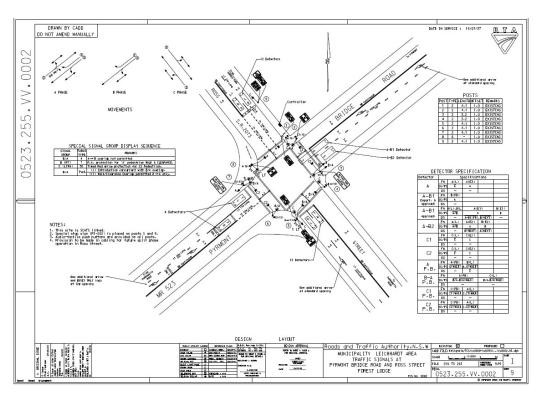


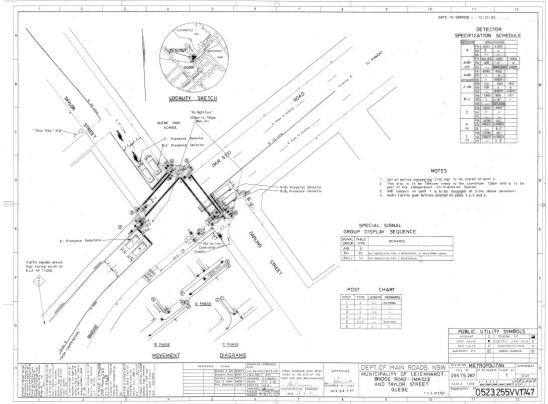




Attachment 2 - TCS Plans







TRAFFIC CONTROL SYSTEM LAYOUT DRIVING SHEET ISSUED FEB 1877

Appendix G

Detailed Design Drawings



THE CITY OF SYDNEY

BRIDGE ROAD

JOSP CYCLEWAY

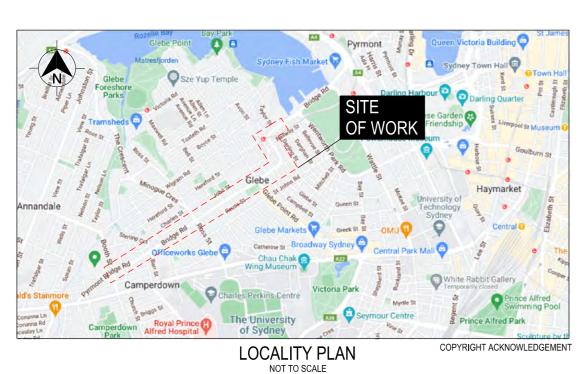
PERMANENT CYCLE PROVISIONS
AT GLEBE
LYONS ROAD TO TAYLOR STREET

CYCLEWAY DESIGN

DETAIL DESIGN - ISSUE FOR CONSTRUCTION

VERIFIED

ADAM HILLARD



PART NUMBER	CHAPTER	NAME
PART 1	A	GENERAL
9-13-	В	ROAD ARRANGEMENT
	С	ROADSIDE FURNITURE AND LINEMARKING
	D	STORMWATER MANAGEMENT
	E	SETOUT
	F	ROAD CROSS SECTIONS

DRAWING FILE LOCATION / NAME
D:Box Sync)PROJECTS - Current(AA0435 - JOSP
PREPARED BY

REVIEWED

SIGNED

NAME ADAM HILLARD

Transport for NSW

THE CITY OF SYDNEY
MR523 BRIDGE ROAD/PYRMONT BRIDGE ROAD
PERMANENT CYCLEWAY BETWEEN LYONS ROAD AND
TAYLOR STREET, GLEBE

PREPARED FOR RMS REGISTRATION No.

RMS REGISTRATION No. DS 2022/000816

ISSUE STATUS EDMS No. SHEET No. ISSUE FOR CONSTRUCTION

SHEET NAME	SHEET DESCRIPTION	ISSUE										
SHEET WANE		Α	В	С	D	E	F	G	Н	ı	J	К
A-01	COVER SHEET											
A-02	SHEET REGISTER 1 of 3	√	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$				
A-03	SHEET REGISTER 2 of 3	$\sqrt{}$										
A-04	SHEET REGISTER 3 of 3	V	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$				
A-05	KEY PLAN	$\sqrt{}$										
A-06	DETAILS AND SECTIONS 1 of 5	$\sqrt{}$										
A-07	DETAILS AND SECTIONS 2 of 5			$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$				
A-08	DETAILS AND SECTIONS 3 of 5			$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$				
A-09	DETAILS AND SECTIONS 4 of 5				$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$				
A-10	DETAILS AND SECTIONS 5 of 5				$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$				
A-11	GENERAL NOTES				$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$				
B-01	GENERAL ARRANGEMENT 1 of 25				$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$				
B-02	GENERAL ARRANGEMENT 2 of 25	$\sqrt{}$										
B-03	GENERAL ARRANGEMENT 3 of 25	$\sqrt{}$										
B-04	GENERAL ARRANGEMENT 4 of 25	V	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$				
B-05	GENERAL ARRANGEMENT 5 of 25	V	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$				
B-06	GENERAL ARRANGEMENT 6 of 25	$\sqrt{}$										
B-07	GENERAL ARRANGEMENT 7 of 25	$\sqrt{}$										
B-08	GENERAL ARRANGEMENT 8 of 25	$\sqrt{}$										
B-09	GENERAL ARRANGEMENT 9 of 25	$\sqrt{}$										
B-10	GENERAL ARRANGEMENT 10 of 25	$\sqrt{}$										
B-11	GENERAL ARRANGEMENT 11 of 25	$\sqrt{}$										
B-12	GENERAL ARRANGEMENT 12 of 25	$\sqrt{}$										
B-13	GENERAL ARRANGEMENT 13 of 25	$\sqrt{}$										
B-14	GENERAL ARRANGEMENT 14 of 25	$\sqrt{}$										
B-15	GENERAL ARRANGEMENT 15 of 25	$\sqrt{}$										
B-16	GENERAL ARRANGEMENT 16 of 25	$\sqrt{}$										
B-17	GENERAL ARRANGEMENT 17 of 25	$\sqrt{}$										
B-18	GENERAL ARRANGEMENT 18 of 25	$\sqrt{}$										
B-19	GENERAL ARRANGEMENT 19 of 25	$\sqrt{}$										
B-20	GENERAL ARRANGEMENT 20 of 25	V	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$				
B-21	GENERAL ARRANGEMENT 21 of 25	$\sqrt{}$										
B-22	GENERAL ARRANGEMENT 22 of 25	$\sqrt{}$										
B-23	GENERAL ARRANGEMENT 23 of 25	$\sqrt{}$										
B-24	GENERAL ARRANGEMENT 24 of 25				√	√						
B-25	GENERAL ARRANGEMENT 25 of 25	V			√	√						
C-01	PAVEMENT MARKING & ROAD FURNITURE 1 of 25				V	V	V	V				
C-02	PAVEMENT MARKING & ROAD FURNITURE 2 of 25	V	V	V		V	V					
C-03	PAVEMENT MARKING & ROAD FURNITURE 3 of 25	V	V	V	V	V	V	√				
C-04	PAVEMENT MARKING & ROAD FURNITURE 4 of 25	√				$\sqrt{}$						
DRAWING FILE LOCATION / NAME	DESIGN LOT CODE DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING			PLOT DATE	/ TIME	PLOT BY	CLIENT		TH	E CITY OF SYDNE		

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F 26/05/2023 ISSUE FOR CONSTRUCTION

E 16/05/2023 ISSUE FOR CONSTRUCTION (CHECKPRINT)

G 21/06/2023 DESIGN UPDATE (ISSUE FOR CONSTRUCTION)

DESIGN MODEL FILE(S) USED D JOSP IFC 230621 WVR No. | APPROVAL | SCALES ON A3 SIZE DRAWING

HEIGHT DATUM AHD

CO-ORDINATE SYSTEM MGA ZONE 56 (GDA2020)

DRAWINGS / DESIGN PREPARED BY

PLOT DATE / TIME 20/06/2023 10	PLOT BY Adam			
TITLE	NAME		DATE	
DRAWN	W KEMP		21/06/23	
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Transport for NSW

THE CITY OF SYDNEY MR523 BRIDGE ROAD/PYRMONT BRIDGE ROAD PERMANENT CYCLEWAY BETWEEN LYONS ROAD AND TAYLOR STREET, GLEBE

SHEET REGISTER 1 of 3 PREPARED FOR Infrastructure and Place Eastern Sydney Project Office

RMS REGISTRATION No. DS 2022/000816 ISSUE STATUS
ISSUE FOR CONSTRUCTION SHEET No. A-02

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CUEET NAME	CHEET DESCRIPTION	ISSUE											
SHEET NAME	SHEET DESCRIPTION	Α	В	С	D	E	F	G	Н	Ī	J	K	
C-05	PAVEMENT MARKING & ROAD FURNITURE 5 of 25	$\sqrt{}$	V	V	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	V					
C-06	PAVEMENT MARKING & ROAD FURNITURE 6 of 25	V	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$					
C-07	PAVEMENT MARKING & ROAD FURNITURE 7 of 25	$\sqrt{}$											
C-08	PAVEMENT MARKING & ROAD FURNITURE 8 of 25	$\sqrt{}$											
C-09	PAVEMENT MARKING & ROAD FURNITURE 9 of 25	$\sqrt{}$											
C-10	PAVEMENT MARKING & ROAD FURNITURE 10 of 25	$\sqrt{}$											
C-11	PAVEMENT MARKING & ROAD FURNITURE 11 of 25	$\sqrt{}$											
C-12	PAVEMENT MARKING & ROAD FURNITURE 12 of 25	$\sqrt{}$											
C-13	PAVEMENT MARKING & ROAD FURNITURE 13 of 25	$\sqrt{}$	$\sqrt{}$	√	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$						
C-14	PAVEMENT MARKING & ROAD FURNITURE 14 of 25	$\sqrt{}$	$\sqrt{}$	√	$\sqrt{}$	$\sqrt{}$	√	$\sqrt{}$					
C-15	PAVEMENT MARKING & ROAD FURNITURE 15 of 25	$\sqrt{}$	$\sqrt{}$	√	$\sqrt{}$	$\sqrt{}$	√	$\sqrt{}$					
C-16	PAVEMENT MARKING & ROAD FURNITURE 16 of 25	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$						
C-17	PAVEMENT MARKING & ROAD FURNITURE 17 of 25	$\sqrt{}$	$\sqrt{}$	√	$\sqrt{}$	$\sqrt{}$	√	$\sqrt{}$					
C-18	PAVEMENT MARKING & ROAD FURNITURE 18 of 25	√	$\sqrt{}$	√	√	$\sqrt{}$	√	√					
C-19	PAVEMENT MARKING & ROAD FURNITURE 19 of 25	$\sqrt{}$	$\sqrt{}$	√	√	$\sqrt{}$	$\sqrt{}$						
C-20	PAVEMENT MARKING & ROAD FURNITURE 20 of 25	$\sqrt{}$	$\sqrt{}$	√	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$						
C-21	PAVEMENT MARKING & ROAD FURNITURE 21 of 25	$\sqrt{}$	$\sqrt{}$	√	$\sqrt{}$	$\sqrt{}$	√	$\sqrt{}$					
C-22	PAVEMENT MARKING & ROAD FURNITURE 22 of 25	$\sqrt{}$	$\sqrt{}$	√	$\sqrt{}$	$\sqrt{}$	√	$\sqrt{}$					
C-23	PAVEMENT MARKING & ROAD FURNITURE 23 of 25	$\sqrt{}$	$\sqrt{}$	√	√	$\sqrt{}$	√	$\sqrt{}$					
C-24	PAVEMENT MARKING & ROAD FURNITURE 24 of 25	$\sqrt{}$											
C-25	PAVEMENT MARKING & ROAD FURNITURE 25 of 25	$\sqrt{}$	$\sqrt{}$	√	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$					
D-01	STORMWATER MANAGEMENT 1 of 25				$\sqrt{}$	$\sqrt{}$	√	$\sqrt{}$					
D-02	STORMWATER MANAGEMENT 2 of 25	$\sqrt{}$	$\sqrt{}$	√	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$					
D-03	STORMWATER MANAGEMENT 3 of 25	$\sqrt{}$	$\sqrt{}$	√	$\sqrt{}$	$\sqrt{}$	√	$\sqrt{}$					
D-04	STORMWATER MANAGEMENT 4 of 25	√	$\sqrt{}$	√	√	$\sqrt{}$	√	√					
D-05	STORMWATER MANAGEMENT 5 of 25	$\sqrt{}$	$\sqrt{}$	√	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	√					
D-06	STORMWATER MANAGEMENT 6 of 25	$\sqrt{}$											
D-07	STORMWATER MANAGEMENT 7 of 25	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$		V					
D-08	STORMWATER MANAGEMENT 8 of 25	$\sqrt{}$											
D-09	STORMWATER MANAGEMENT 9 of 25	$\sqrt{}$	$\sqrt{}$	√	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$					
D-10	STORMWATER MANAGEMENT 10 of 25	$\sqrt{}$											
D-11	STORMWATER MANAGEMENT 11 of 25	$\sqrt{}$	$\sqrt{}$	√	$\sqrt{}$	$\sqrt{}$	√	$\sqrt{}$					
D-12	STORMWATER MANAGEMENT 12 of 25	√	V		√	√	√	√					
D-13	STORMWATER MANAGEMENT 13 of 25	√	V	√	V		√	√					
D-14	STORMWATER MANAGEMENT 14 of 25	V	√	V	V	√	√	√					
D-15	STORMWATER MANAGEMENT 15 of 25	V	V	√	V	V	√	√					
D-16	STORMWATER MANAGEMENT 16 of 25	V	V	V	V	V	√	V					
D-17	STORMWATER MANAGEMENT 17 of 25	· √	√	√ √	√	√ √	√ √	√ √				+	

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_	x_D JOSP IFC 230512	Α	11/11/2022	DETAIL DESIGN (PRELIMINARY) - ISSUED FOR REVIEW				
:		В	16/02/2023	DETAIL DESIGN (PRELIMINARY) - ISSUED FOR REVIEW				
		С	01/01/2023	DETAIL DESIGN (FINAL) - ISSUED FOR REVIEW				
_		D	01/01/2023	DETAIL DESIGN (FINAL) - ISSUED FOR TENDER				
		Е	16/05/2023	ISSUE FOR CONSTRUCTION (CHECKPRINT)				
_		F	26/05/2023	ISSUE FOR CONSTRUCTION			CO-ORDINATE SYSTEM HEIGHT DATUM	
		G	21/06/2023	DESIGN UPDATE (ISSUE FOR CONSTRUCTION)			MGA ZONE 56 (GDA2020) AHD	www

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	DESIGN MNGR	A HILLARD		21/06/		
www.cchd.com.au	PROJECT MNGR	K CHEN				

Transport for NSW 06/23 PREPARED FOR Infrastructure and Place Eastern Sydney Project Office

THE CITY OF SYDNEY
MR523 BRIDGE ROAD/PYRMONT BRIDGE ROAD
PERMANENT CYCLEWAY BETWEEN LYONS ROAD AND
TAYLOR STREET, GLEBE
SHEET REGISTER 2 of 3

RMS REGISTRATION No. DS 2022/000816 ISSUE STATUS
ISSUE FOR CONSTRUCTION SHEET No. ISSUE A-03 G

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D-18	STORMWATER MANAGEMENT 18 of 25	√	V	V	√	√		√					
D-19	STORMWATER MANAGEMENT 19 of 25	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$					
D-20	STORMWATER MANAGEMENT 20 of 25	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$					
D-21	STORMWATER MANAGEMENT 21 of 25	√	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$					
D-22	STORMWATER MANAGEMENT 22 of 25	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$					
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D-24	STORMWATER MANAGEMENT 24 of 25	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$					
D-25	STORMWATER MANAGEMENT 25 of 25	√	√	√	√	√	$\sqrt{}$	√					
E-00	SETOUT COORDINATES 1 of 2	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$					
E-01	SETOUT COORDINATES 2 of 2					√	√	√					
E-02	SETOUT PLAN 1 of 3	√	V	V	V	√	V	V					
E-03	SETOUT PLAN 2 of 3	√	√	√	√	√	√	√					
E-04	SETOUT PLAN 3 of 3	√	√	V	√	√	√	V					
F-01	MC00 CROSS SECTIONS 1 of 26	√	V										
F-02	MC00 CROSS SECTIONS 2 of 26	√	V										
F-03	MC00 CROSS SECTIONS 3 of 26	√	V										
F-04	MC00 CROSS SECTIONS 1 of 26	√	V										
F-05	MC00 CROSS SECTIONS 2 of 26	√	V										
F-06	MC00 CROSS SECTIONS 3 of 26	√	√										
F-07	MC00 CROSS SECTIONS 4 of 26	V	V										
F-08	MC00 CROSS SECTIONS 5 of 26	√	$\sqrt{}$										
F-09	MC00 CROSS SECTIONS 6 of 26	V	V	V	√	√	√	V					
F-10	MC00 CROSS SECTIONS 7 of 26	V	$\sqrt{}$	$\sqrt{}$	V	√	√	V					
F-11	MC00 CROSS SECTIONS 8 of 26	V	√	√	V	√	√	V					
F-12	MC00 CROSS SECTIONS 9 of 26	√	√	√	√	V	√	√					
F-13	MC00 CROSS SECTIONS 10 of 26	V	V	V	√	√	√	V					
F-14	MC00 CROSS SECTIONS 11 of 26	V	V	$\sqrt{}$	V	√	√	V					
F-15	MC00 CROSS SECTIONS 12 of 26	V	V	V	√	√	√	V					
F-16	MC00 CROSS SECTIONS 13 of 26	√	V	$\sqrt{}$	V	√	√	V					
F-17	MC00 CROSS SECTIONS 14 of 26	V	√	√	V	√	√	V					
F-18	MC00 CROSS SECTIONS 15 of 26	√	√	√	√	√	√	√					
F-19	MC00 CROSS SECTIONS 16 of 26	√	√	√	√	√	√	√					
F-20	MC00 CROSS SECTIONS 17 of 26	√	√	√	√	√	√	√					
F-21	MC00 CROSS SECTIONS 18 of 26	√	√	√	√	√	√	√					
F-22	MC00 CROSS SECTIONS 19 of 26	V	√	V	√	√	V	√					
F-23	MC00 CROSS SECTIONS 20 of 26	V	V	V	√	V	√	V					
F-24	MC00 CROSS SECTIONS 21 of 26	1	· √	√ V	√ V	\ \	√ V	√ V					
F-25	MC00 CROSS SECTIONS 22 of 26	· √	√	√	\ \ \	√ √	· √	\ \ \					
F-26	MC00 CROSS SECTIONS 23 of 26	1	· √	· √	\ √	√ √	· √	· √					
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REV DATE AMENDMENT / REVISION DESCRIPTION

C 01/01/2023 DETAIL DESIGN (FINAL) - ISSUED FOR REVIEW

D 01/01/2023 DETAIL DESIGN (FINAL) - ISSUED FOR TENDER

E 16/05/2023 ISSUE FOR CONSTRUCTION (CHECKPRINT)

G 21/06/2023 DESIGN UPDATE (ISSUE FOR CONSTRUCTION)

F 26/05/2023 ISSUE FOR CONSTRUCTION

HEIGHT DATUM AHD

CO-ORDINATE SYSTEM MGA ZONE 56 (GDA2020)

DRAWINGS / DESIGN PREPARED BY

20/06/2023 10:56:09 AM Adam NAME DATE TITLE W KEMP 21/06/23 DRAWN DRG CHECK A HILLARD 21/06/23 DESIGN W KEMP 21/06/23 DESIGN CHECK A HILLARD 21/06/23 21/06/23 Infrastructure and Place Eastern Sydney Project Office DESIGN MNGR A HILLARD PROJECT MNGR K CHEN

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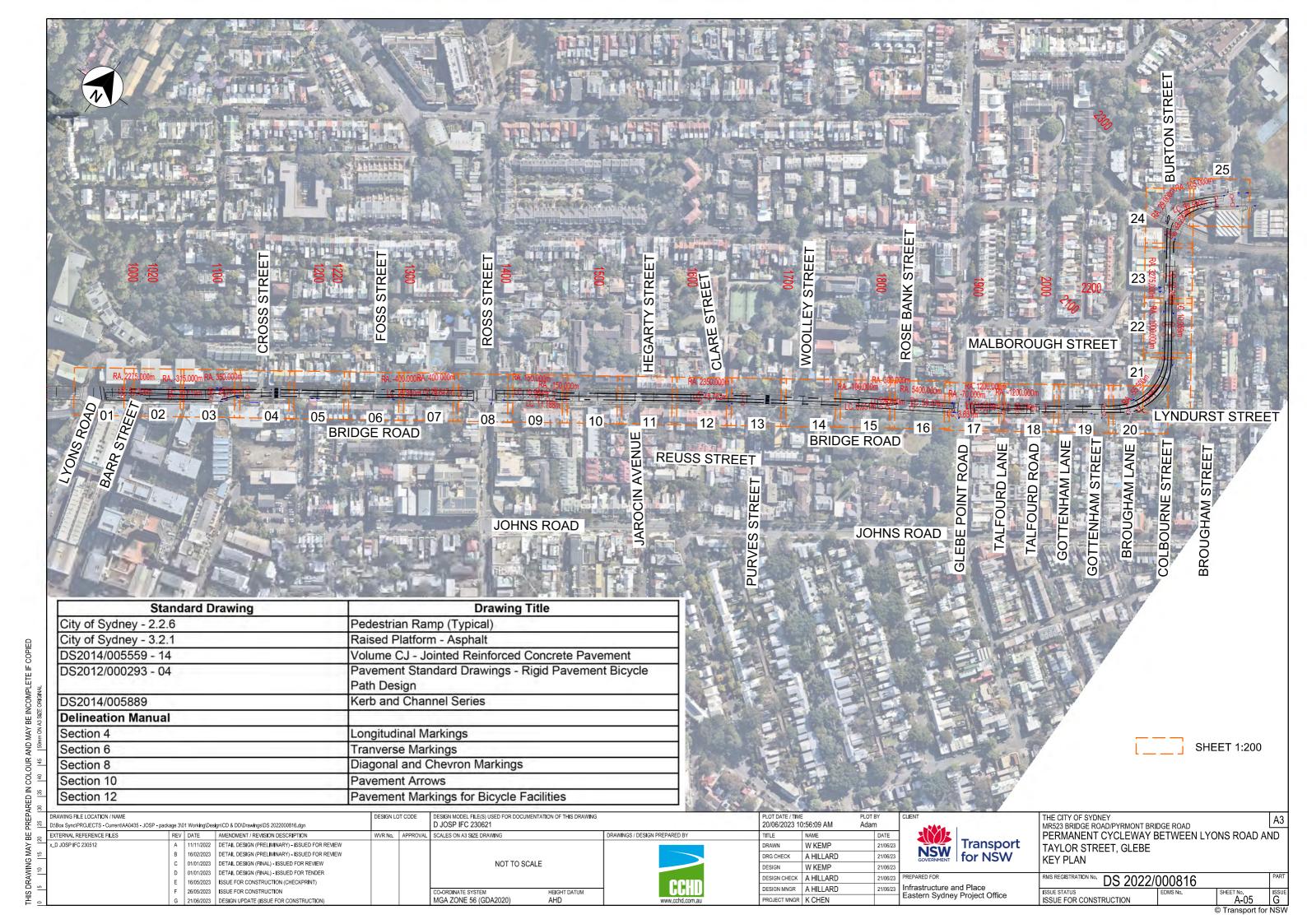
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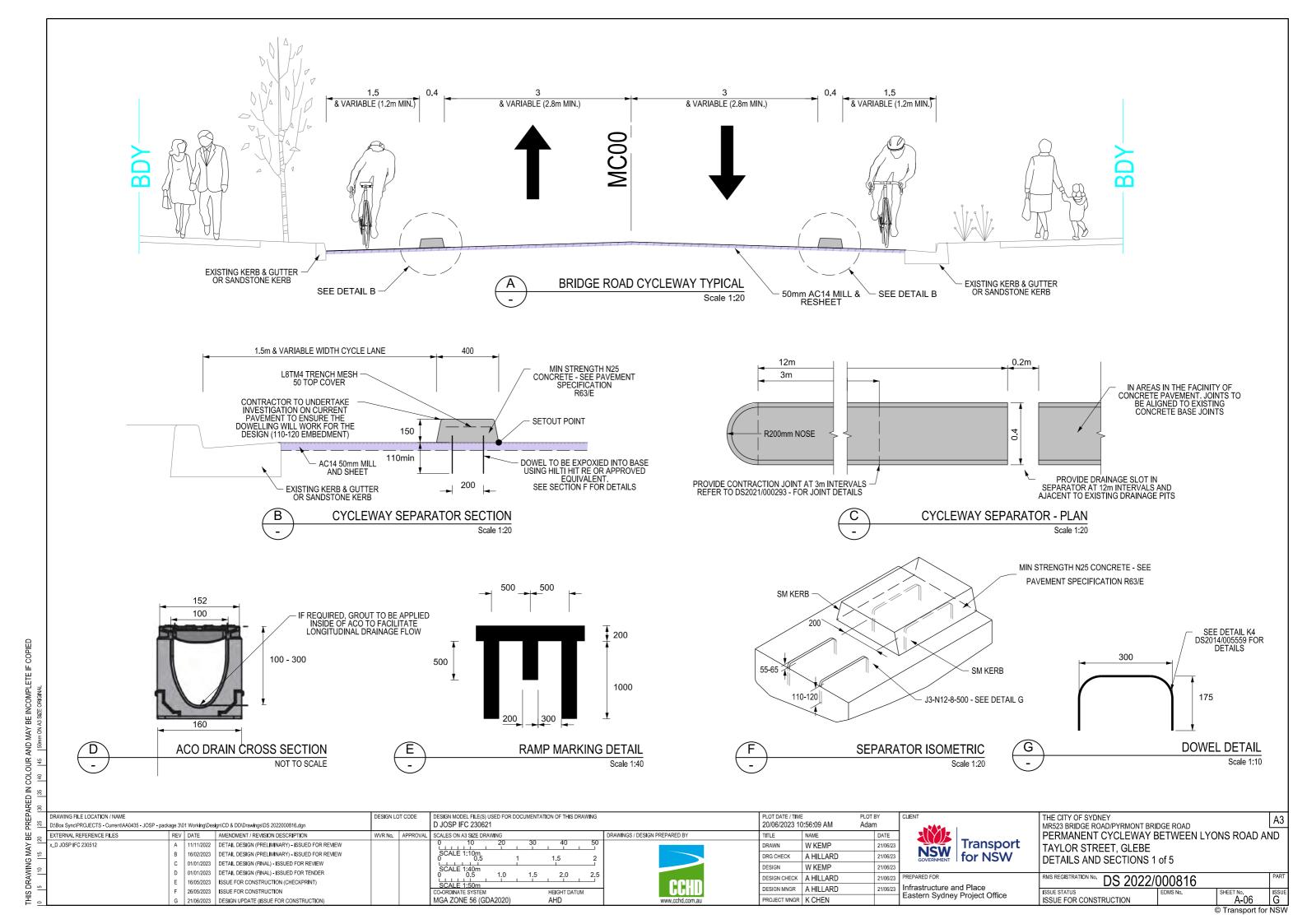
MR523 BRIDGE ROAD/PYRMONT BRIDGE ROAD PERMANENT CYCLEWAY BETWEEN LYONS ROAD AND TAYLOR STREET, GLEBE

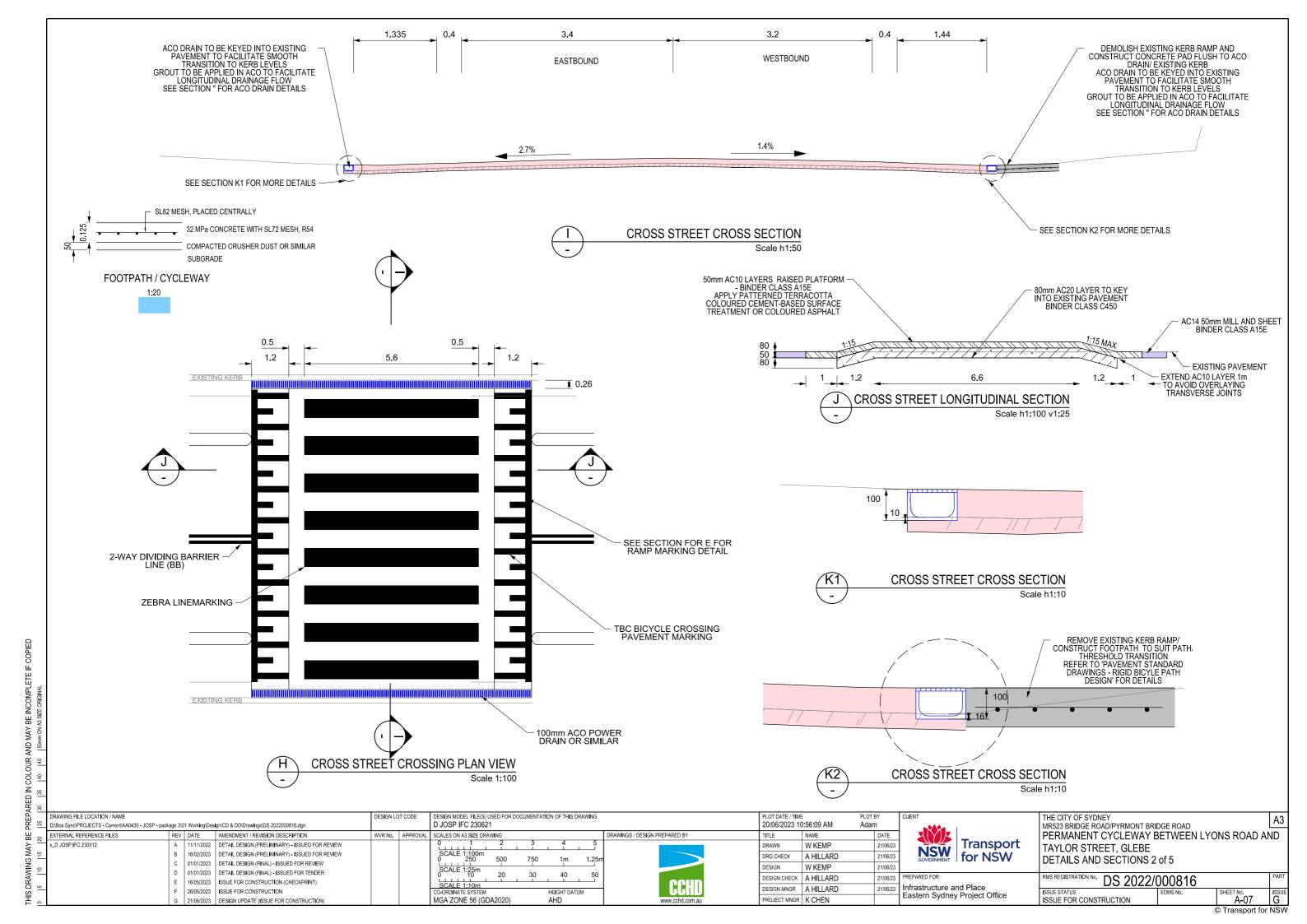
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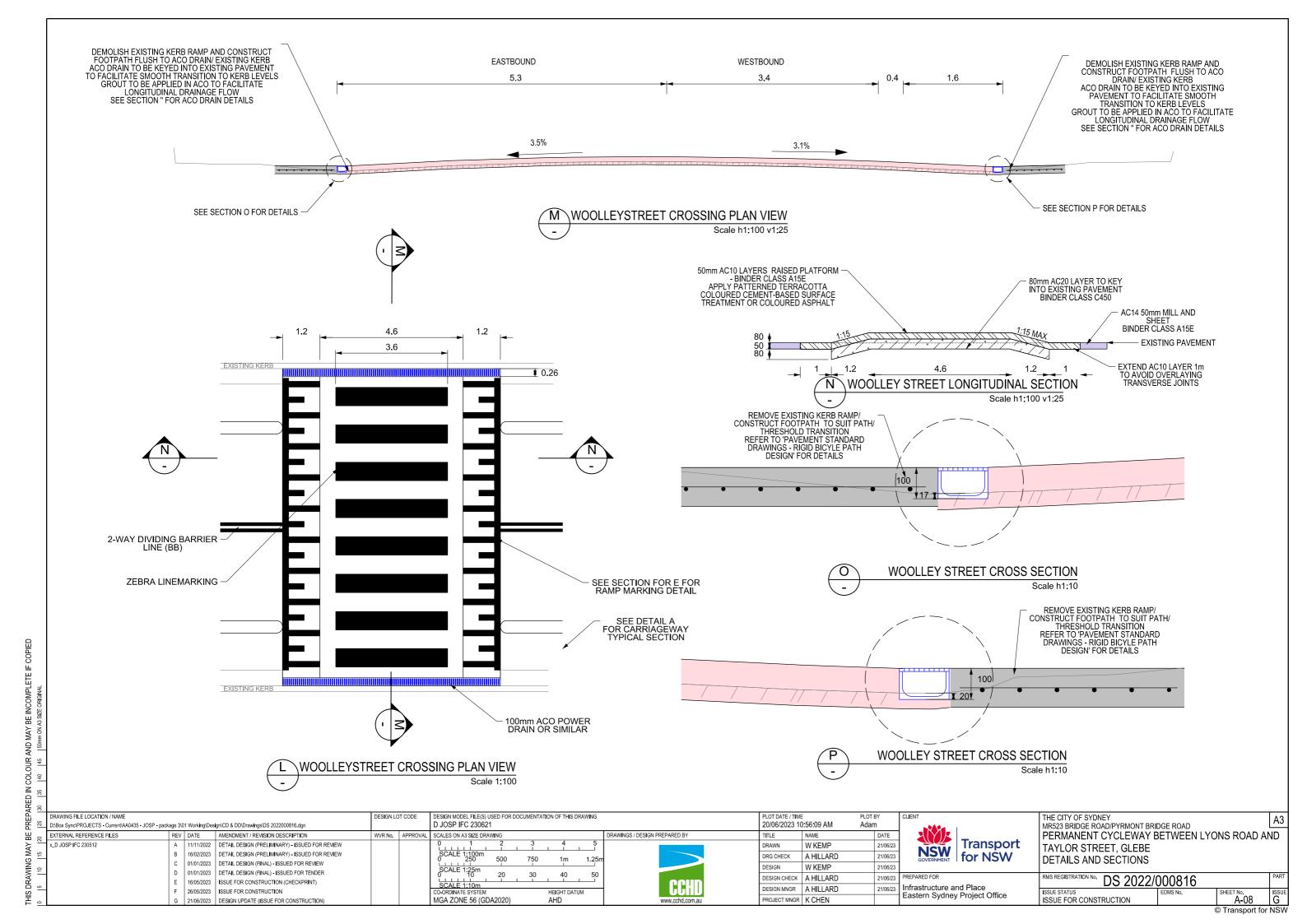
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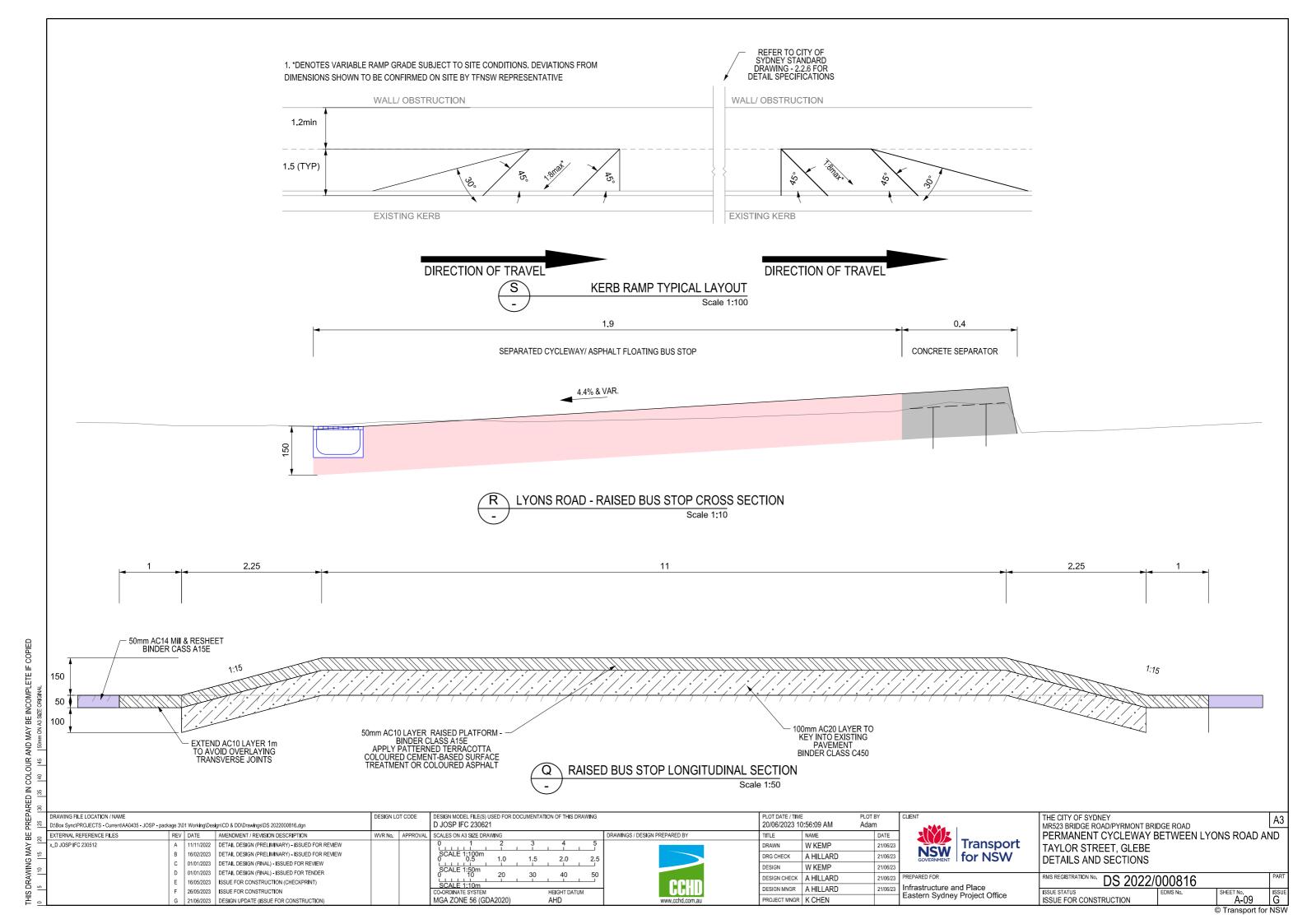
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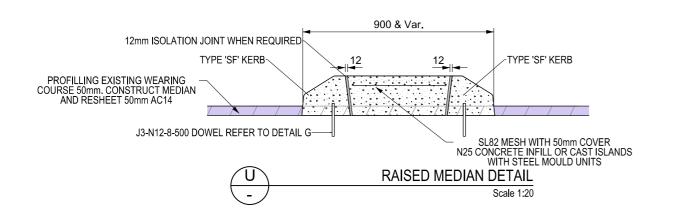


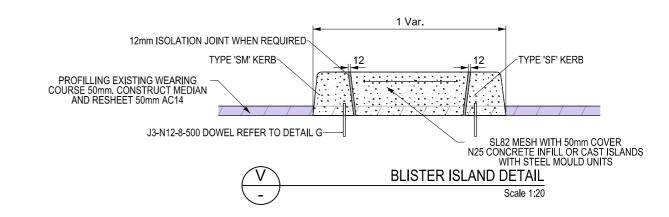


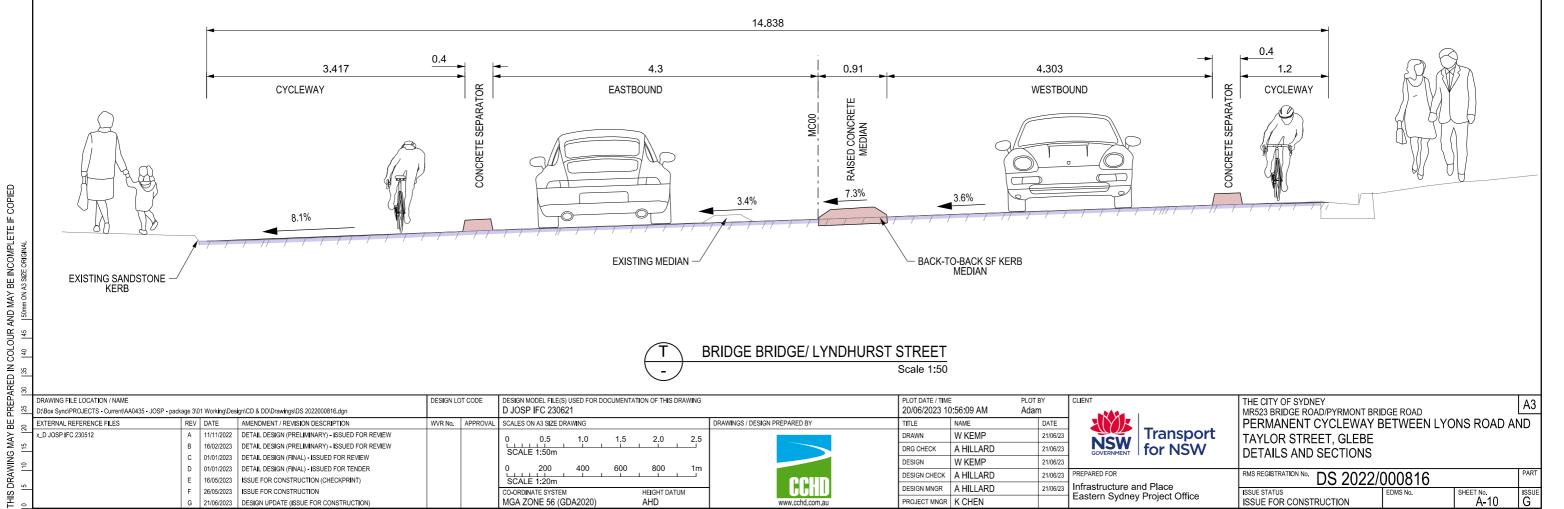


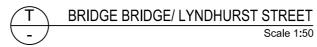












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DESIGN MNGR	A HILLARD		21/06/23	Infrastructure ar	
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THE CITY OF SYDNEY	A3
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DETAILS AND SECTIONS	

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G2. NO SURVEY, CADASTRAL OR BOUNDARY LIMITS SHOULD BE SCALED FROM THESE DRAWINGS.

G3. DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED BY THE PRINCIPAL DURING THE COURSE OF CONSTRUCTION, WHERE THERE IS A DISCREPANCY, THIS SHALL BE RESOLVED BY THE PRINCIPAL, NOTES ON SPECIFIC DOCUMENTS SHALL TAKE PRECEDENCE OVER THE GENERAL NOTES.

G4. ALL DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE DESIGN REPORT

G5. DIMENSIONS SHALL NOT BE OBTAINED BY SCALING DRAWINGS.

G6, ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE SPECIFICATION FOR THE WORKS TOGETHER WITH THE REQUIREMENTS OF ALL RELEVANT CODES OF PRACTICE REFERRED TO THEREIN AND THE REQUIREMENTS OF ALL STATUTORY AUTHORITIES WHERE APPLICABLE.

G7. ACCESS TO PROPERTIES TO BE MADE AVAILABLE BY THE CONTRACTOR AT ALL TIMES DURING CONSTRUCTION.

G8. WHERE REFERENCE IS MADE TO PROPRIETARY COMPONENT NAMES ON THE DRAWINGS THE CONTRACTOR MAY PROPOSE AN ALTERNATIVE PRODUCT PROVIDED THE ALTERNATIVE IS EQUIVALENT AND SATISFIES THE REQUIREMENTS OF THE SPECIFICATION AND IS APPROVED BY THE PRINCIPAL.

G9. ALL NEW WORKS ARE TO BE UNDERTAKEN TO THE REQUIREMENTS OF CURRENT TINSW QA SPECIFICATION, SYDNEY CITY COUNCIL AND AUSTRALIAN STANDARDS UNLESS OTHERWISE STATED.

G10. PROVISION FOR TRAFFIC DURING CONSTRUCTION TO BE IN ACCORDANCE WITH TINSW SPECIFICATION G10.

G11. ALL TRAFFIC MOVEMENTS ARE TO BE MAINTAINED THROUGHOUT COURSE OF CONSTRUCTION.

IN ACCORDANCE WITH TINSW QA SPECIFICATION R44.

PAVEMENT MARKINGS AND SIGNPOSTING

PS1. LINE MARKING AND SIGNPOSTING SHALL BE IN ACCORDANCE WITH THE DESIGN DRAWINGS, THE RELEVANT TRISW GUIDES AND STANDARDS.

PS2. LINE MARKINGS SHALL BE APPLIED IN ACCORDANCE WITH TINSW SPECIFICATION R141, USING WATER BORNE PAINT ON CONCRETE SURFACES AND THERMOPLASTIC LINE MARKING ON ASPHALT OR SPRAY SEALED SURFACES.

PS3. RETROFLECTIVE RAISED PAVEMENT MARKERS (RRPMs) SHALL BE INSTALLED IN ACCORDANCE WITH TINSW SPECIFICATION R142 AND SPACED IN ACCORDANCE WITH TINSW SPECIFICATION R141 FOR EACH LINE TYPE.

PS4. SIGNS SHOWN TO BE REMOVED INCLUDE REMOVAL OF SIGN STRUCTURE, UNLESS SPECIFIED OTHERWISE. ALL REMOVED SIGNS, STRUCTURES AND FOUNDATIONS ARE TO BE DISPOSED OF BY THE CONTRACTOR

PS5. ALL SIGNS SHALL BE CLEAR OF VEGETATION AND OBSTRUCTIONS.

PS6, SIGNS SHALL BE INSTALLED IN ACCORDANCE WITH AS 1742 PART 1 TO 15,

PS7. CONDITION ASSESSMENT TO BE UNDERTAKEN ON ALL EXISTING SIGNS TO BE RELOCATED PRIOR TO BEING REUSED. REFER TO TRINSW INSTALLATION AND MAINTENANCE OF SIGNS FOR GUIDANCE ON CONDITION ASSESSMENT.

PS8, EXISTING PAVEMENT MARKS CONFLICTING WITH PROPOSED LINE MARKING ARE TO BE REMOVED.

PS9. ALL EXISTING LINEMARKING (INCLUDING RRPMs) AFFECTED BY THE NEW WORKS AND NOT OTHERWISE CONFLICTING WITH THE PROPOSED LINE MARKING ARE TO BE REINSTATED.

PAVEMENTS

P1. ALL DIMENSIONS ON PAVEMENT DETAIL DRAWINGS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

P2. ALL ASPHALT WORKS MUST BE IN ACCORDANCE WITH TINSW QA SPECIFICATION R116.

P3. ALL ASPHALT PAVEMENT DIMENSIONS RELATE TO COMPACTED ASPHALT.

P4. HAND PLACEMENT OF ASPHALT IS ONLY PERMITTED FOR MINOR CORRECTIONS OF THE EXISTING SURFACE AND IN AREAS WHERE PLACEMENT WITH A PAVING MACHINE IS IMPRACTICAL.

P5. PAVEMENT CONSTRUCTION MUST BE COMPLETED TO FULL LANE WIDTH OR CENTRE OF LANE SUCH THAT LONGITUDINAL JOINT IS NOT LOCATED UNDER THE WHEEL PATH. MINIMUM PAVING WIDTH MUST BE 1.5m U.N.O. TO ENABLE MACHINE COMPACTION.

P6. THE TACK COAT MUST BE APPLIED AT AN APPLICATION RATE OF BETWEEN 0.15 AND 0.30 Lim'/ OF RESIDUAL BITUMEN. FOR JOINTS, THE APPLICATION RATE MUST BE DOUBLED ON VERTICAL FACES.

P7. BITUMEN EMULSION FOR USE AS A TACK COAT MUST BE CRS/170-60 AND COMPLY WITH AS1160.

P8. ALL SEALS MUST BE APPLIED IN ACCORDANCE WITH TINSW QA SPECIFICATION R106.

P9. LONGITUDINAL ASPHALT JOINTS MUST BE LOCATED WITHIN ±±25mm OF LINE MARKINGS OR AT THE CENTRE OF THE LANE, UNLESS NOTED OTHERWISE ON THE DRAWINGS.

P10. LONGITUDINAL ASPHALT JOINTS MUST BE OFFSET BY 150mm FROM THE JOINT IN THE UNDERLYING LAYER WITHIN 150mm OF THE LINE OF CHANGE IN CROSSFALL.

P11. SEALANTS AND FILLERS MUST BE IN ACCORDANCE WITH TRNSW QA SPECIFICATION M258.

P12. ALL EARTHWORKS MUST BE CONSTRUCTED IN ACCORDANCE WITH TINSW QA SPECIFICATION

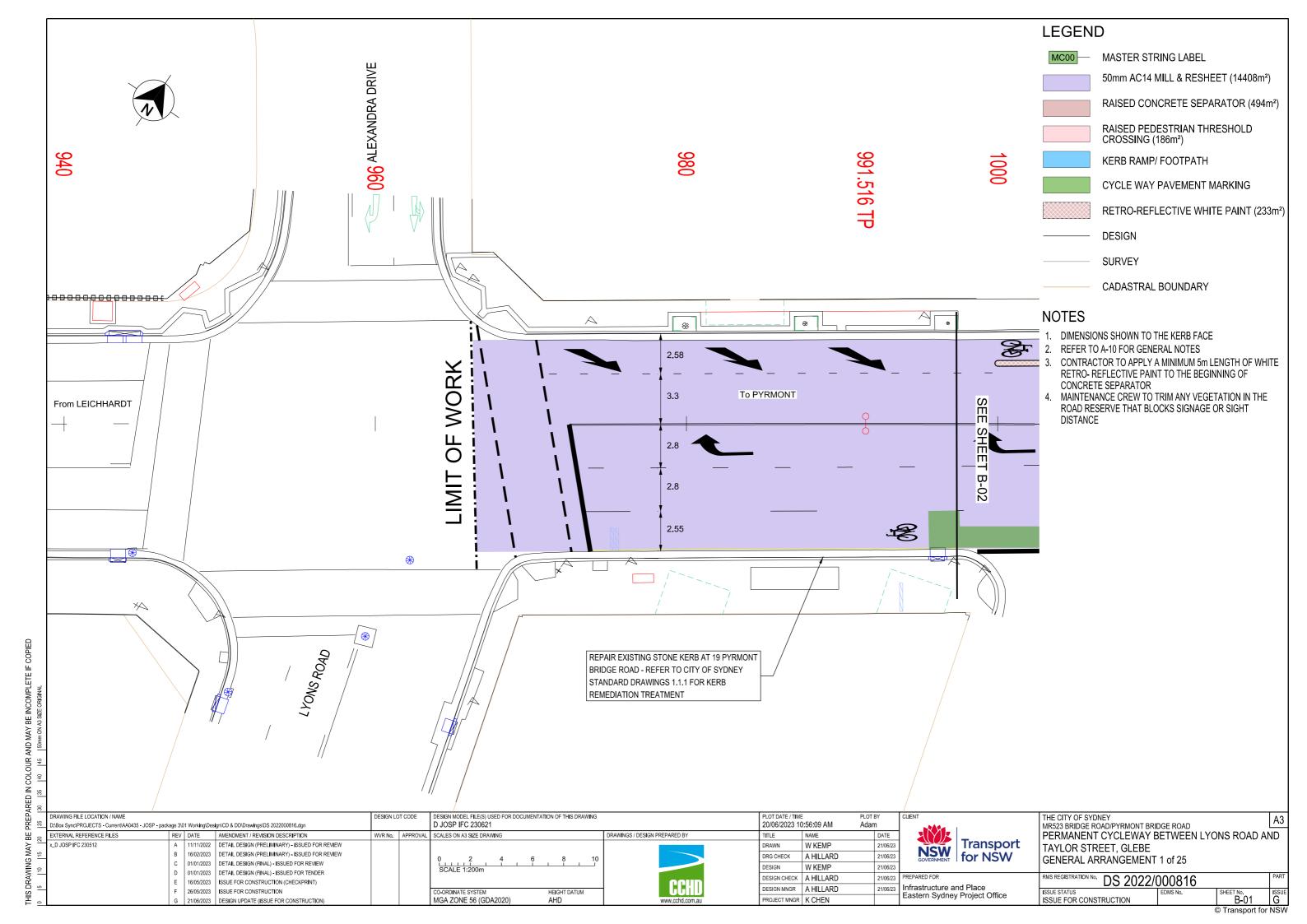
CONCRETE

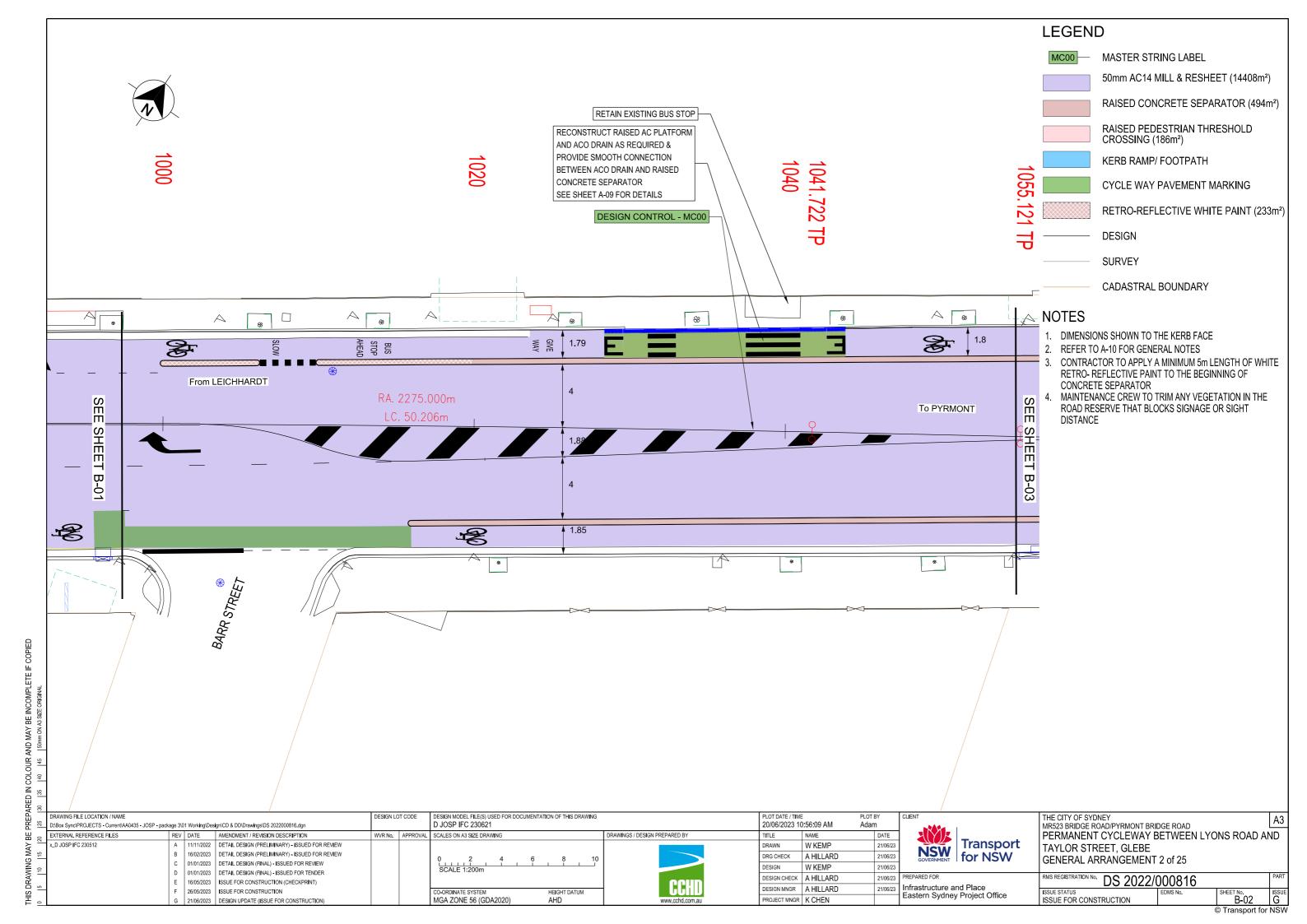
C1. ALL CONCRETE WORKS MUST BE IN ACCORDANCE WITH TFNSW SPECIFICATION R53.

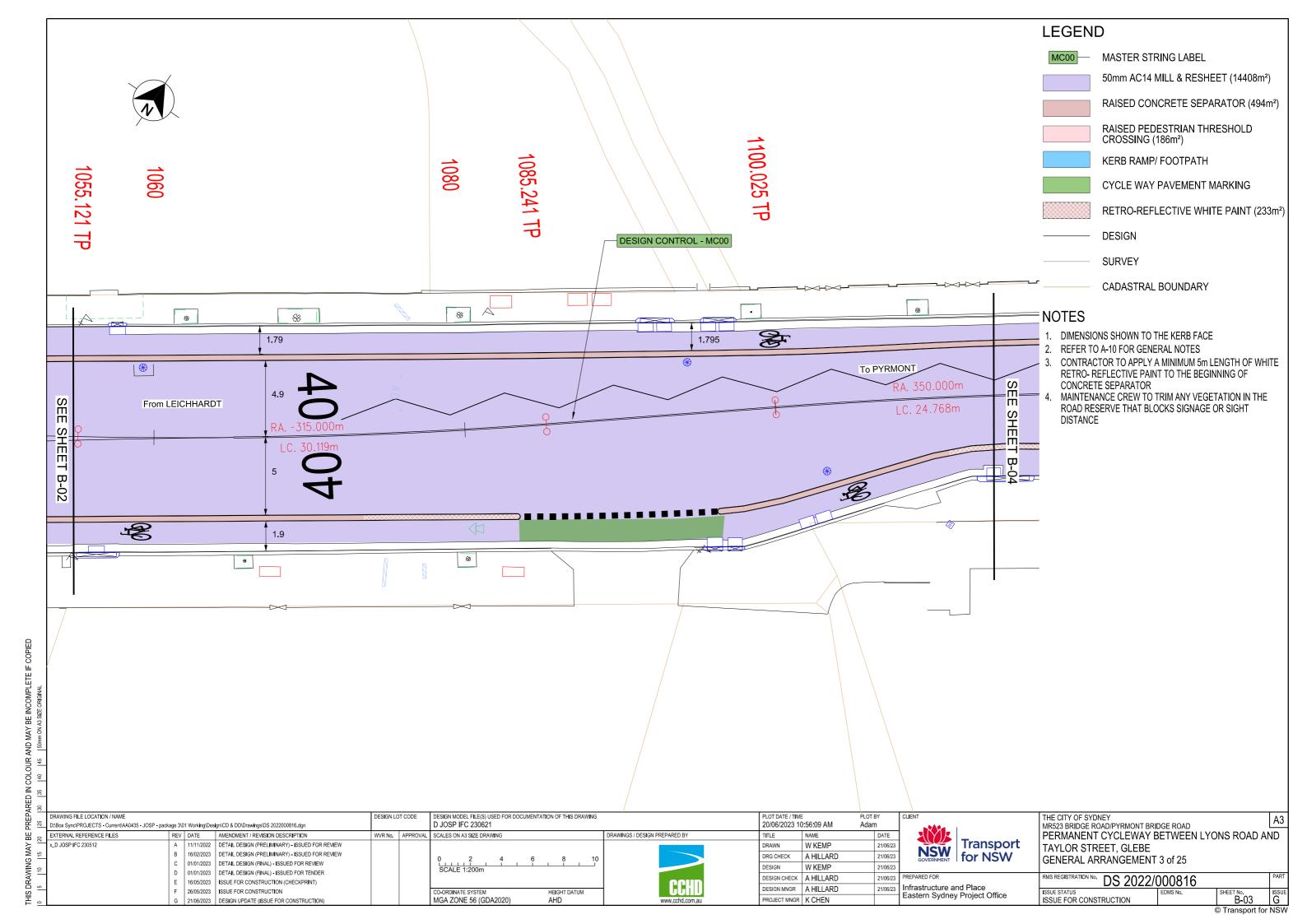
C2, CONCRETE GRADES PROVIDED IN DRAWINGS ARE A MINIUMUM AND SHOULD BE USED AS A GUIDE ONLY.

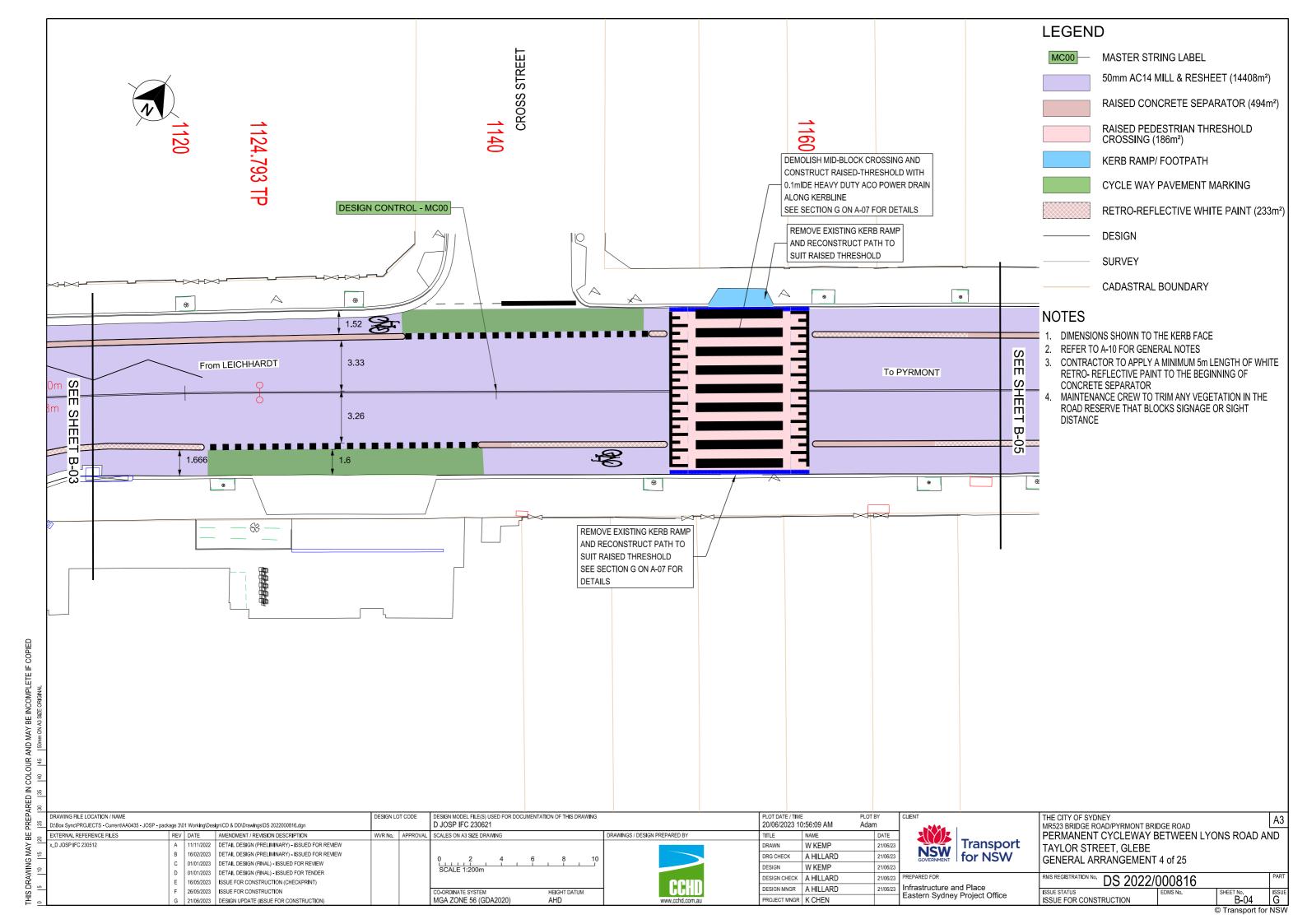
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B 8	EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	L SCALES ON A3 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY	TITLE	NAME	DATE		PERMANENT CYCLEWAY BETWEEN LYC	JNS ROAD AND
≽ ¨	x_D JOSP IFC 230512	A	11/11/2022	DETAIL DESIGN (PRELIMINARY) - ISSUED FOR REVIEW					DRAWN	W KEMP	21/06/23	Transport	TAYLOR STREET, GLEBE	
Σ ₹		В	16/02/2023	DETAIL DESIGN (PRELIMINARY) - ISSUED FOR REVIEW					DRG CHECK	A HILLARD	21/06/23	SOVERNMENT FOR NSW		
<u>S</u>		С	01/01/2023	DETAIL DESIGN (FINAL) - ISSUED FOR REVIEW					DESIGN	W KEMP	21/06/23	GOVERNMENT TOT THOU	DETAILS AND SECTIONS	
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⊉		E	16/05/2023	ISSUE FOR CONSTRUCTION (CHECKPRINT)					DESIGN CHECK		21/00/20		RMS REGISTRATION No. DS 2022/000816	TAKI
S ⊡	-	F	26/05/2023	ISSUE FOR CONSTRUCTION			CO-ORDINATE SYSTEM HEIGHT DATUM	CCHU	DESIGN MNGR	A HILLARD	21/06/23	Infrastructure and Place	ISSUE STATUS EDMS No.	SHEET No. ISSUE
Ë 。		G	21/06/2023	DESIGN UPDATE (ISSUE FOR CONSTRUCTION)			MGA ZONE 56 (GDA2020) AHD		PROJECT MNGR	K CHEN		Eastern Sydney Project Office	ISSUE FOR CONSTRUCTION	A-06 G
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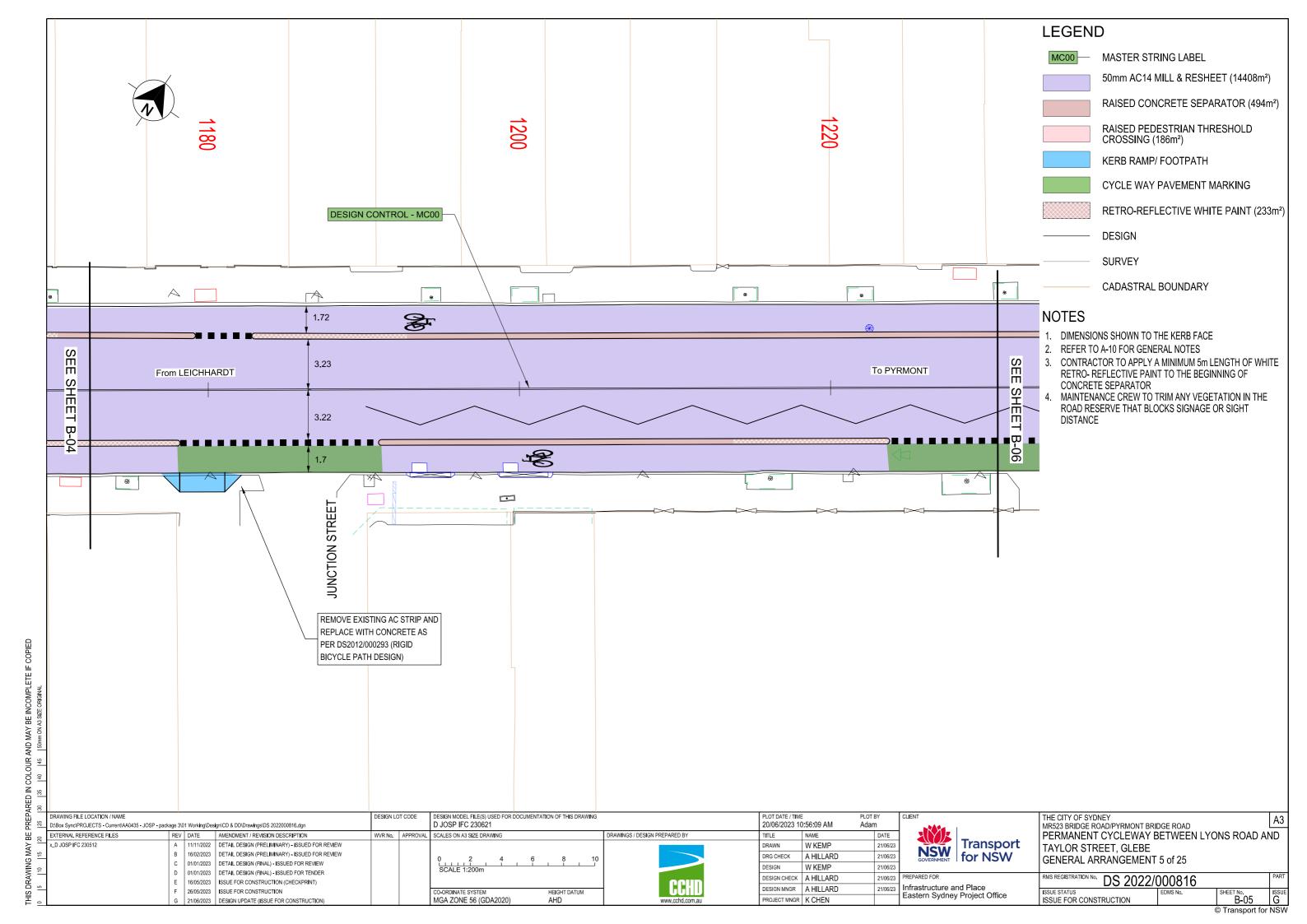
MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED 5 120 125 130 135 140 145 150mm ON A3 SUZE ORIGINAL

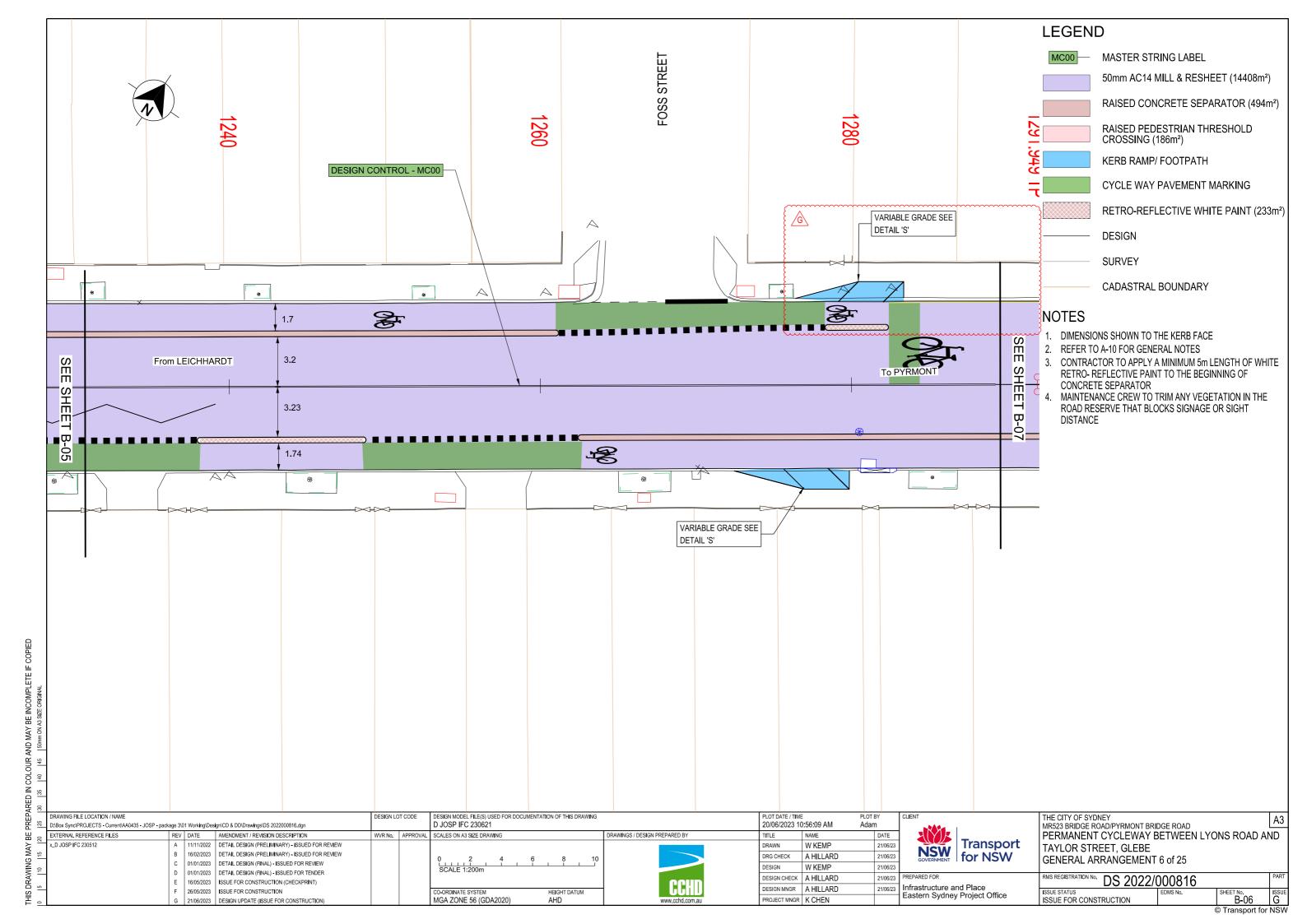


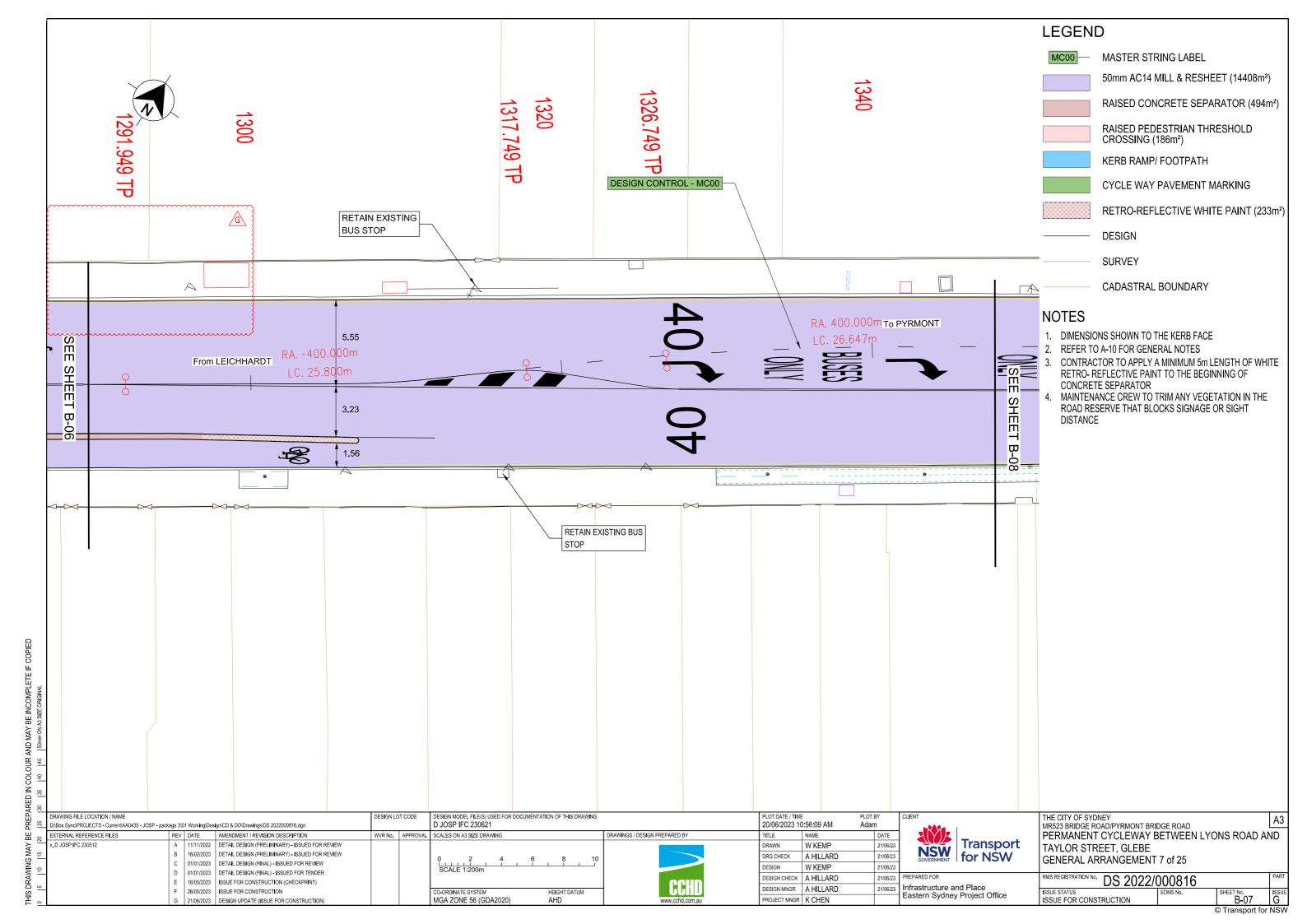


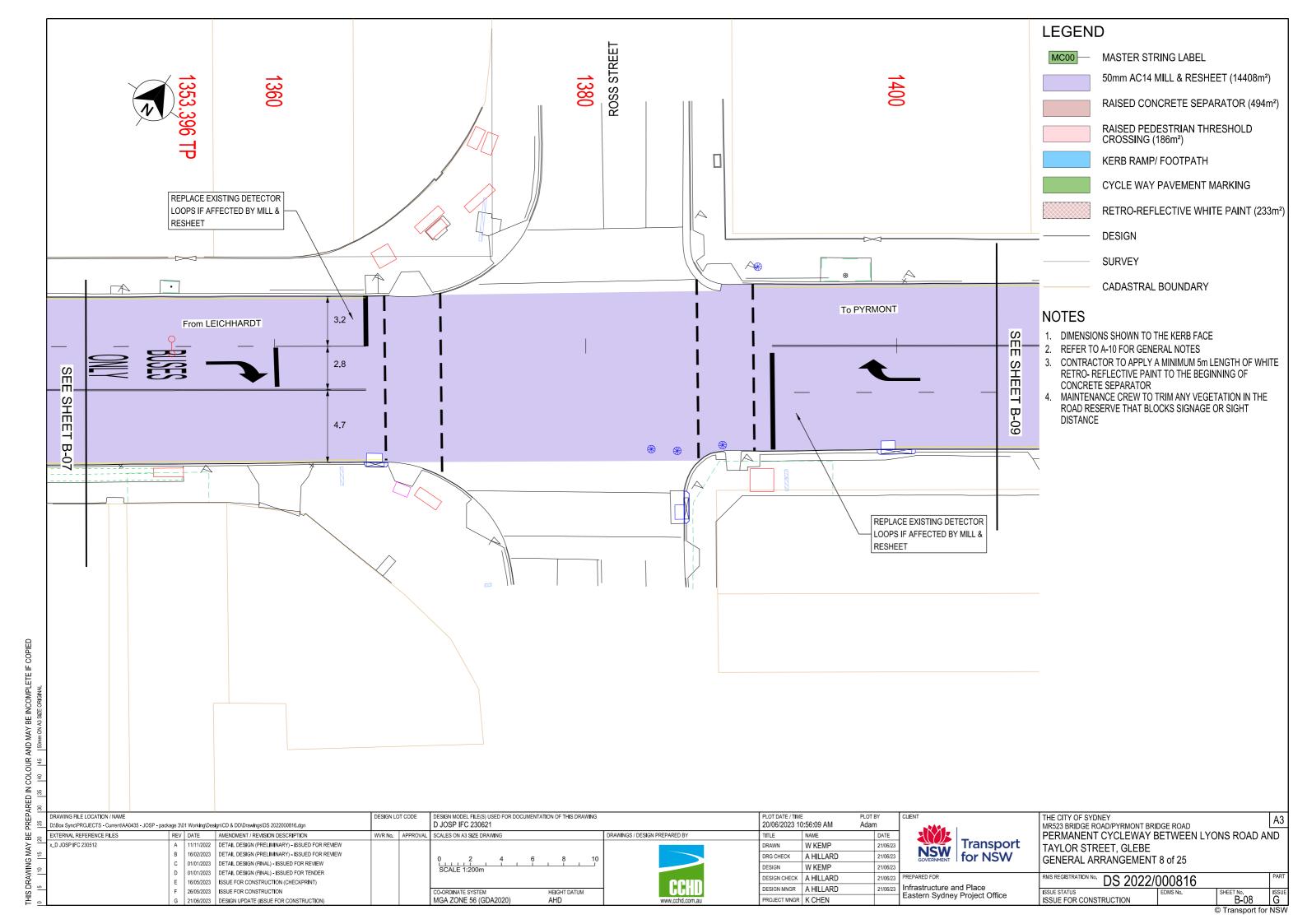


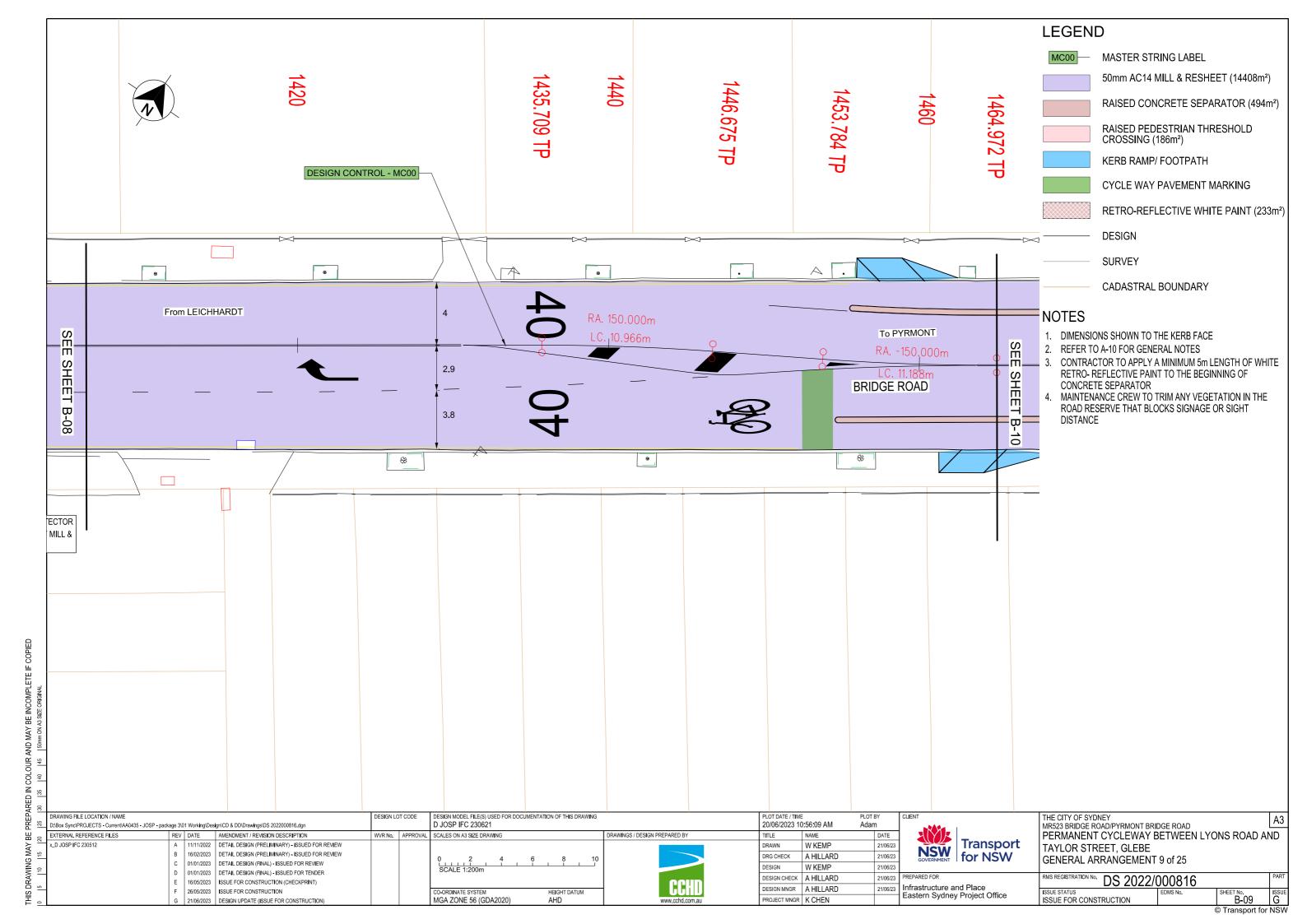


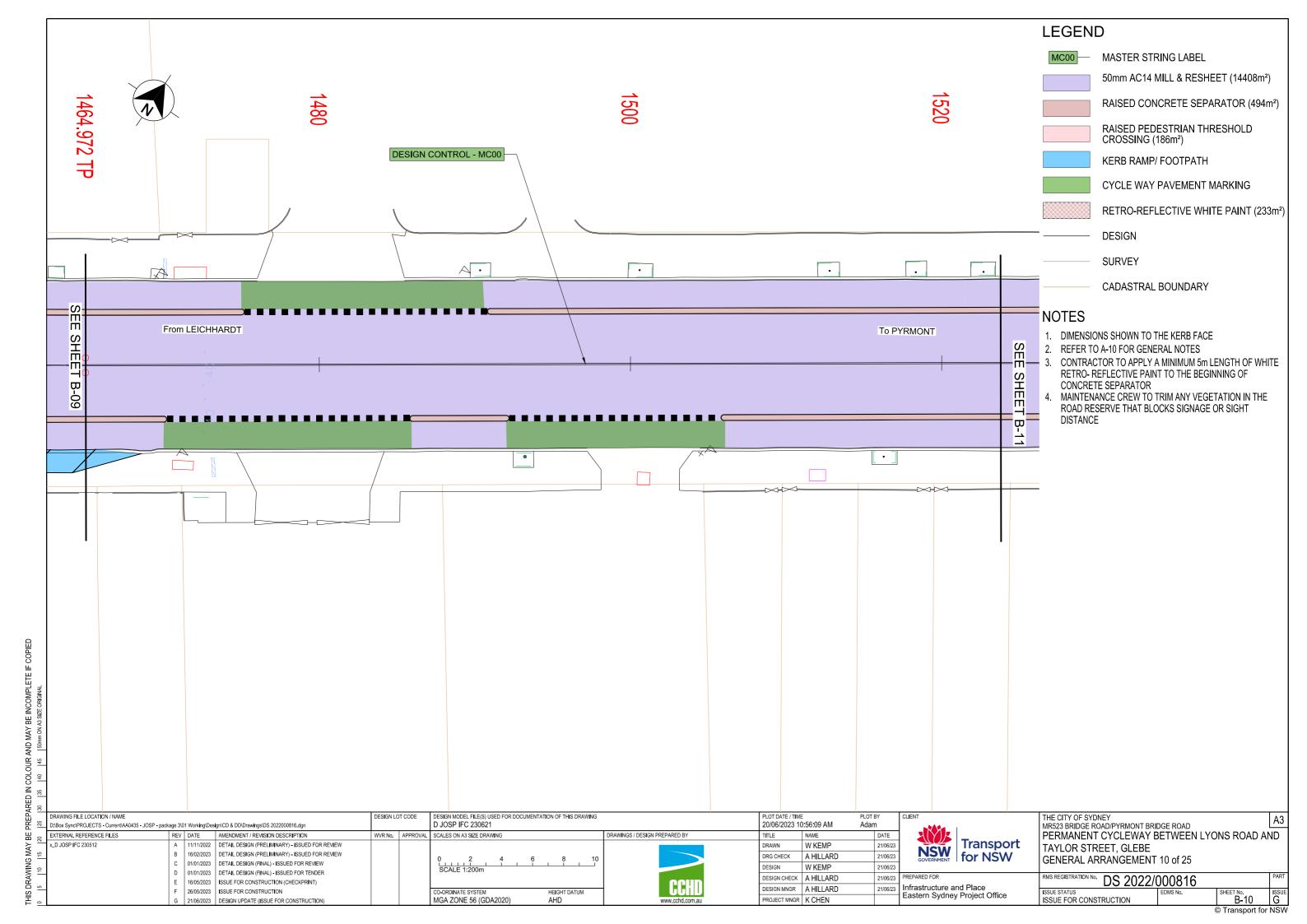


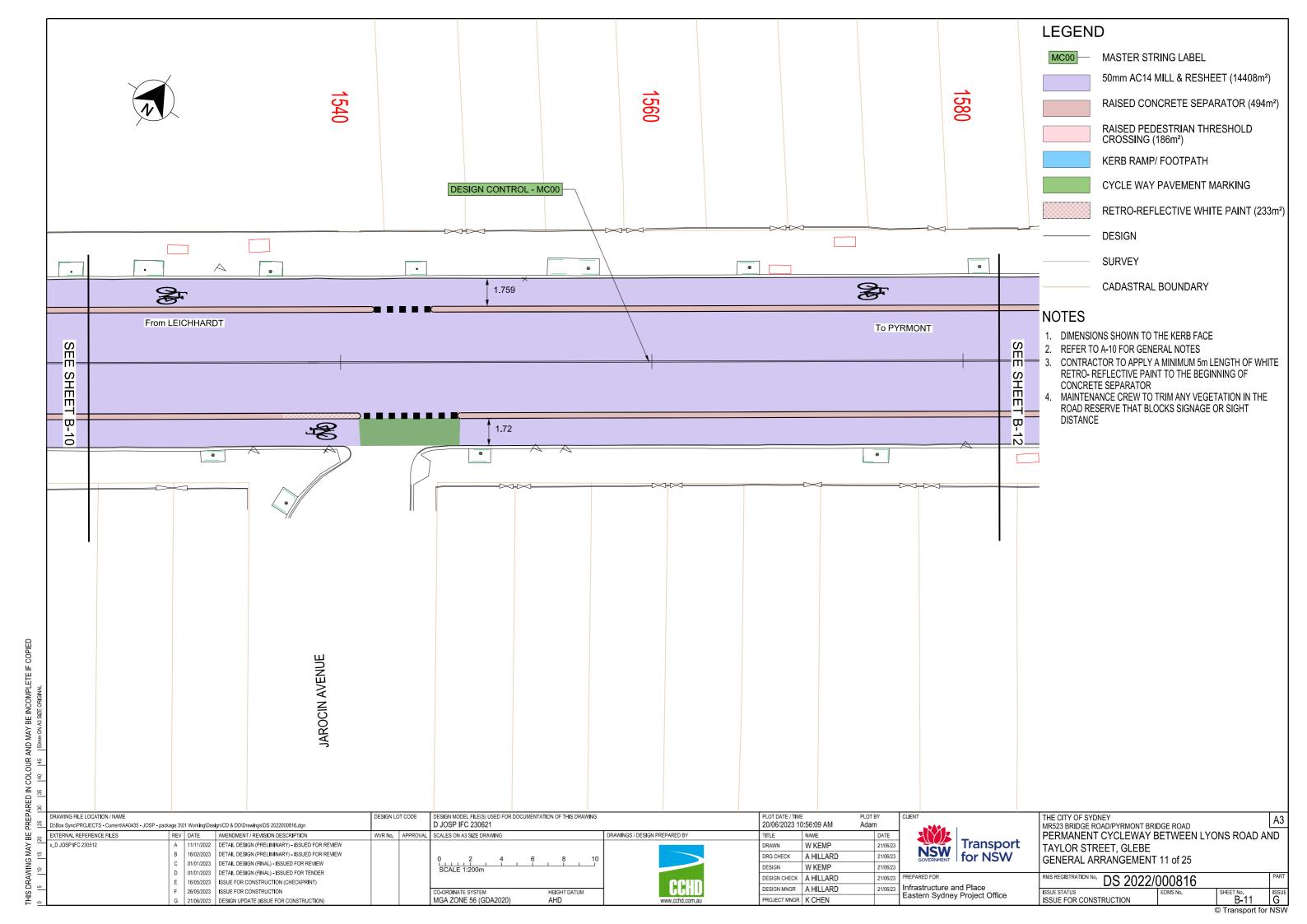


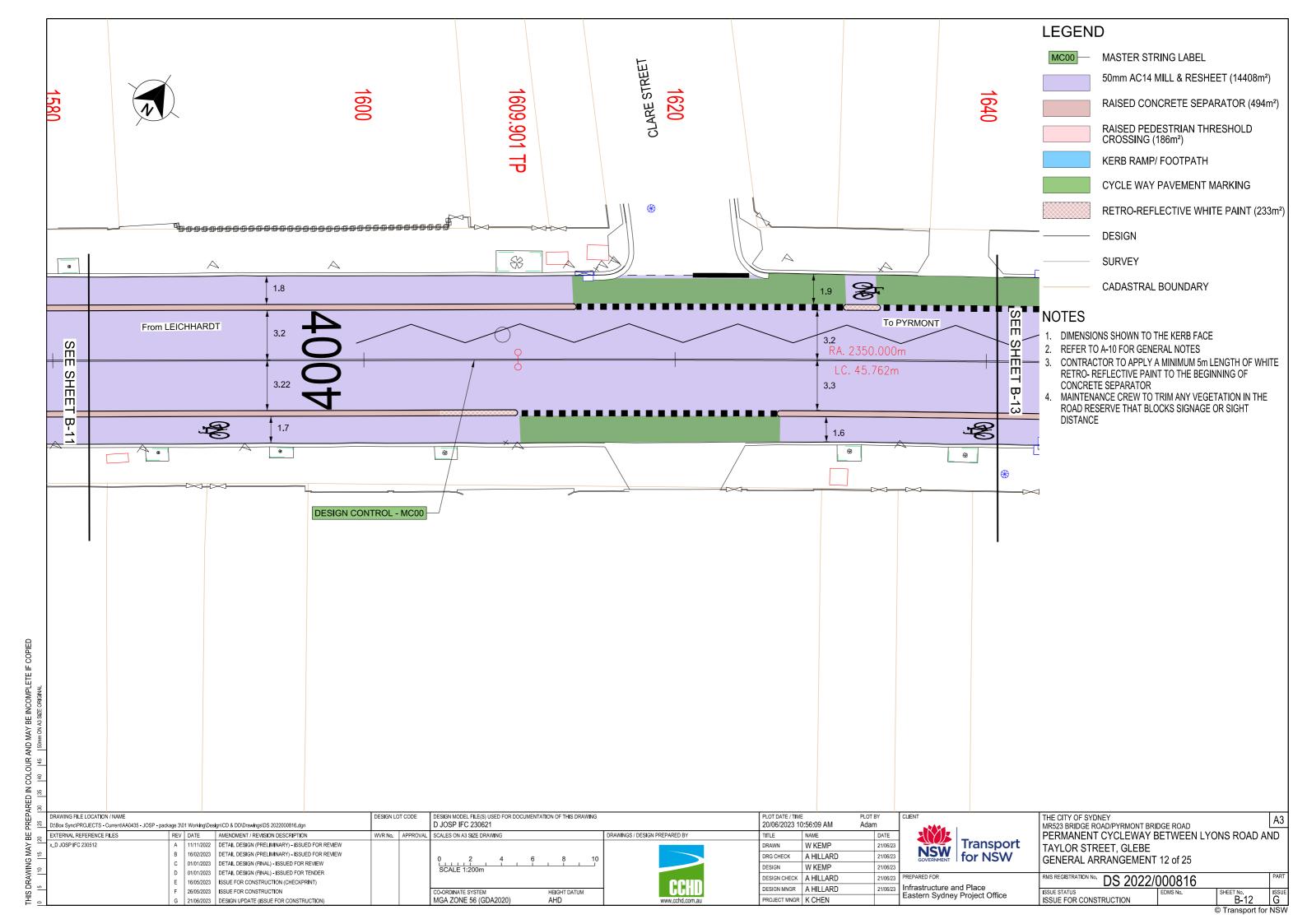


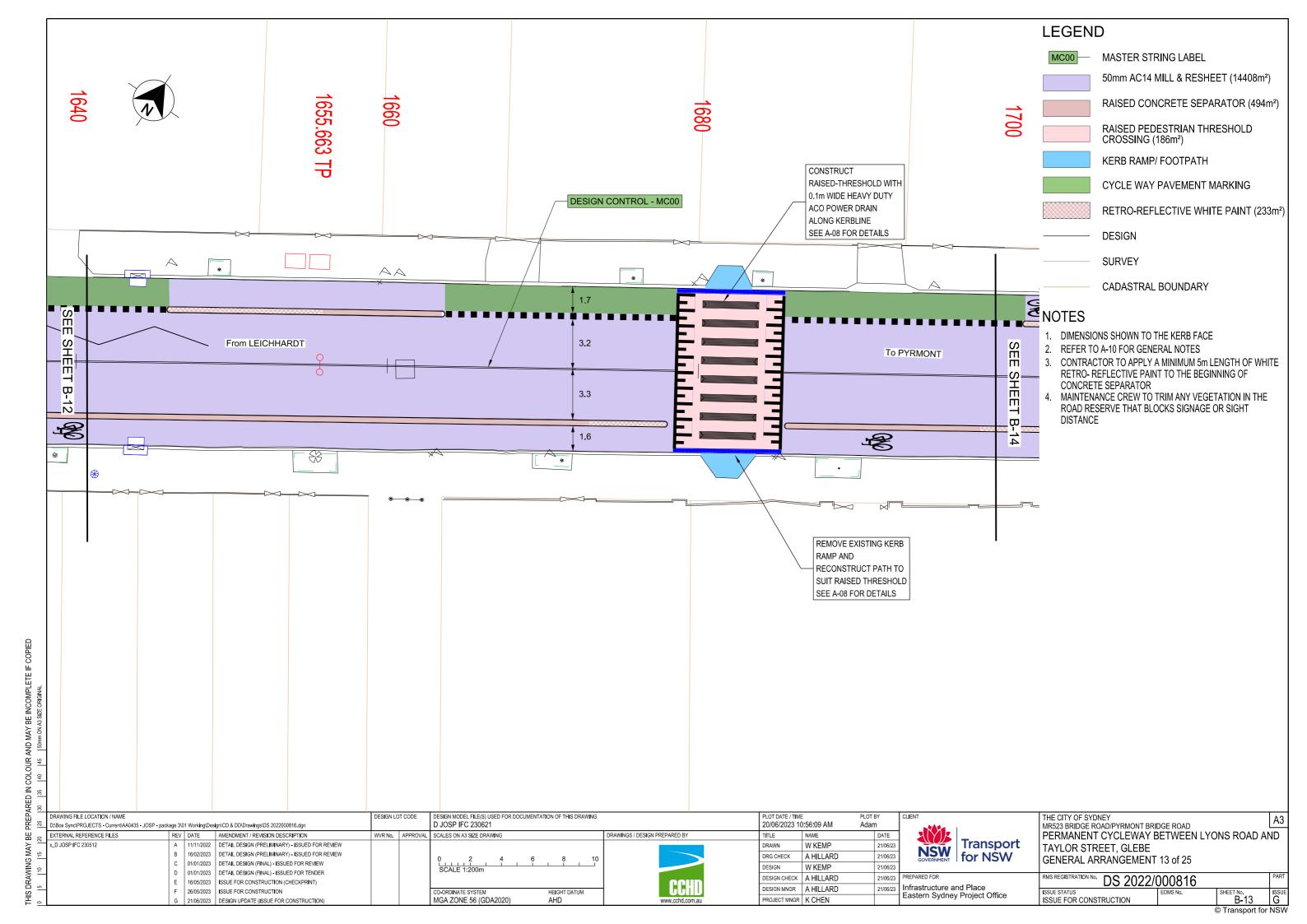


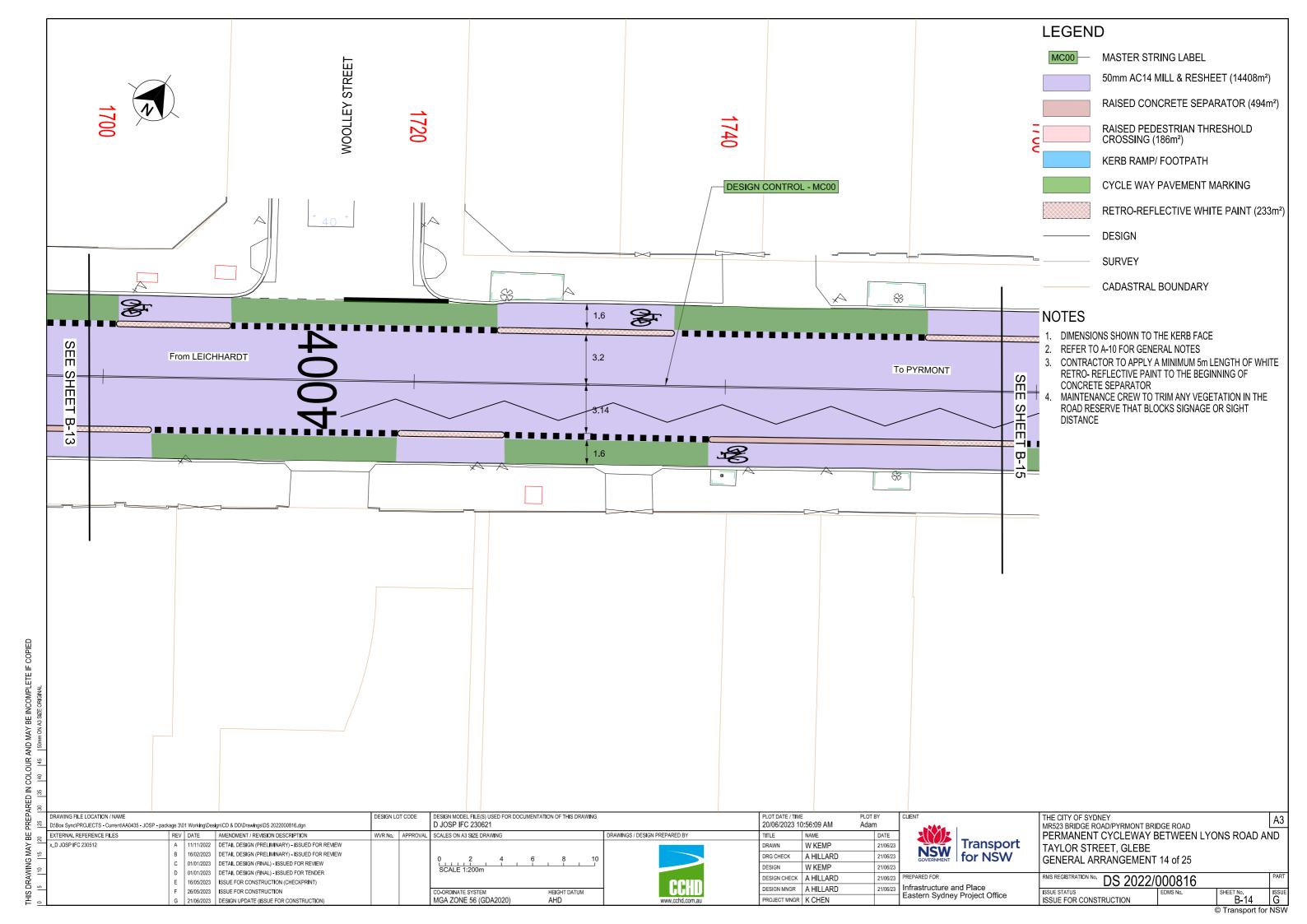


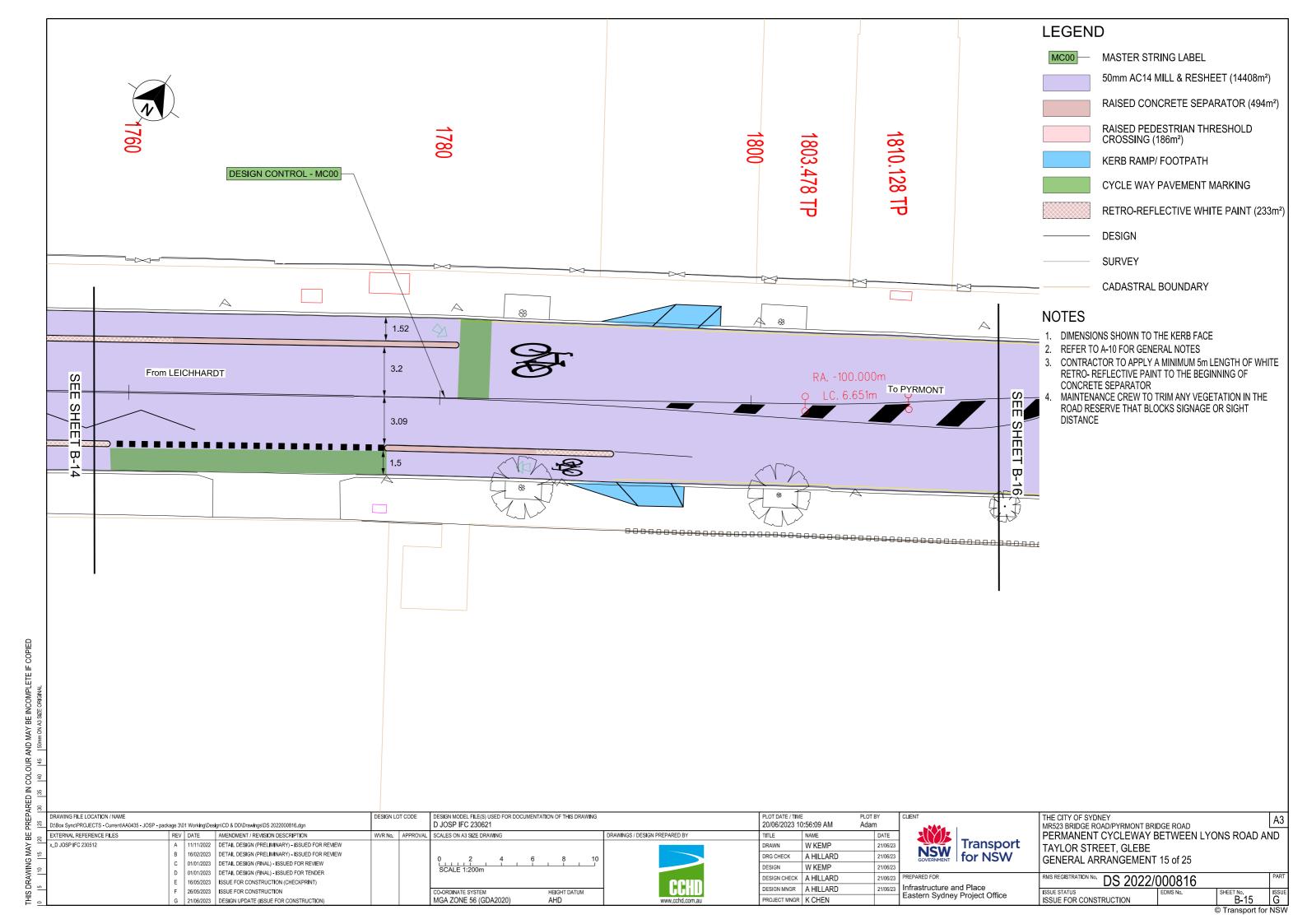


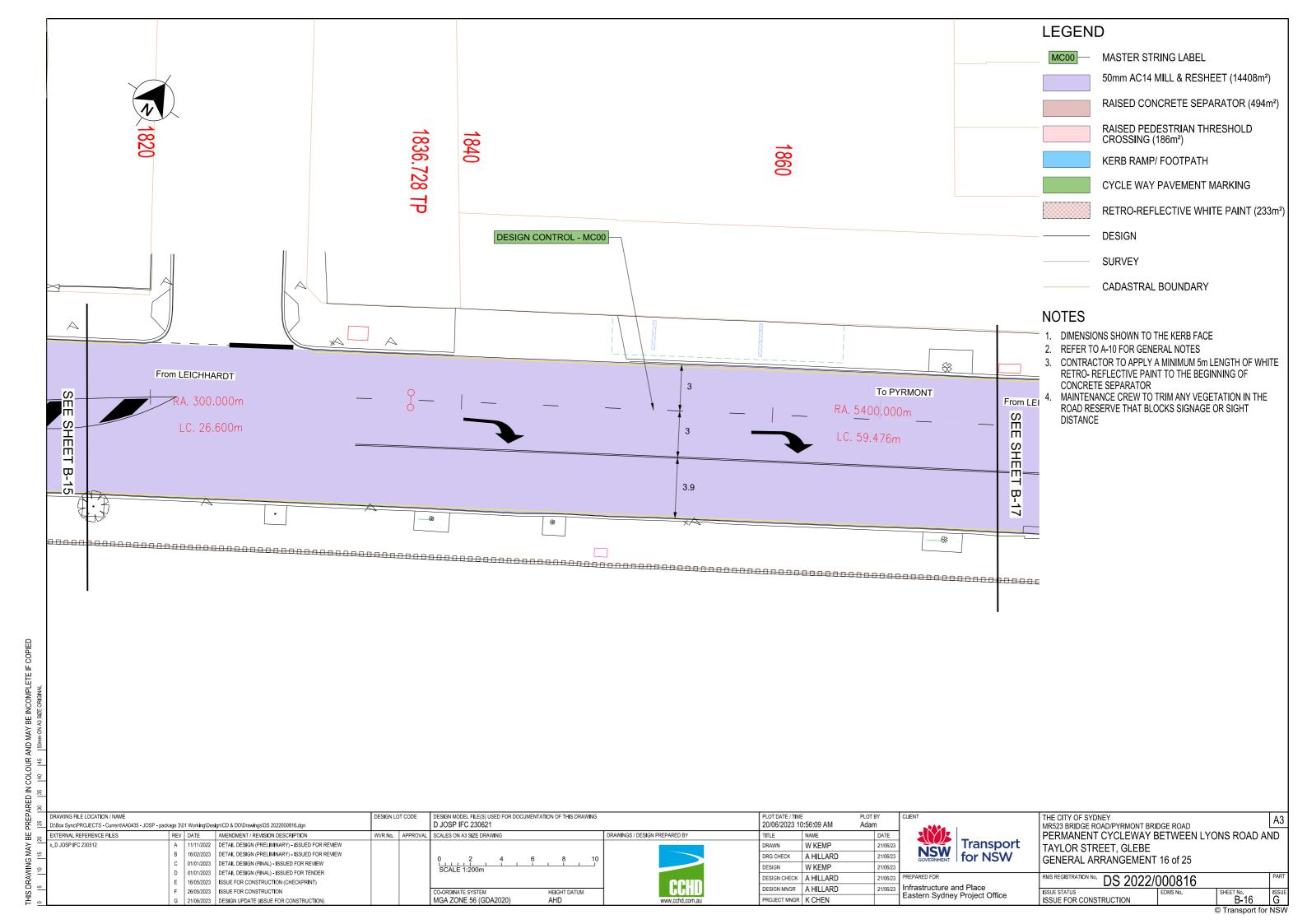


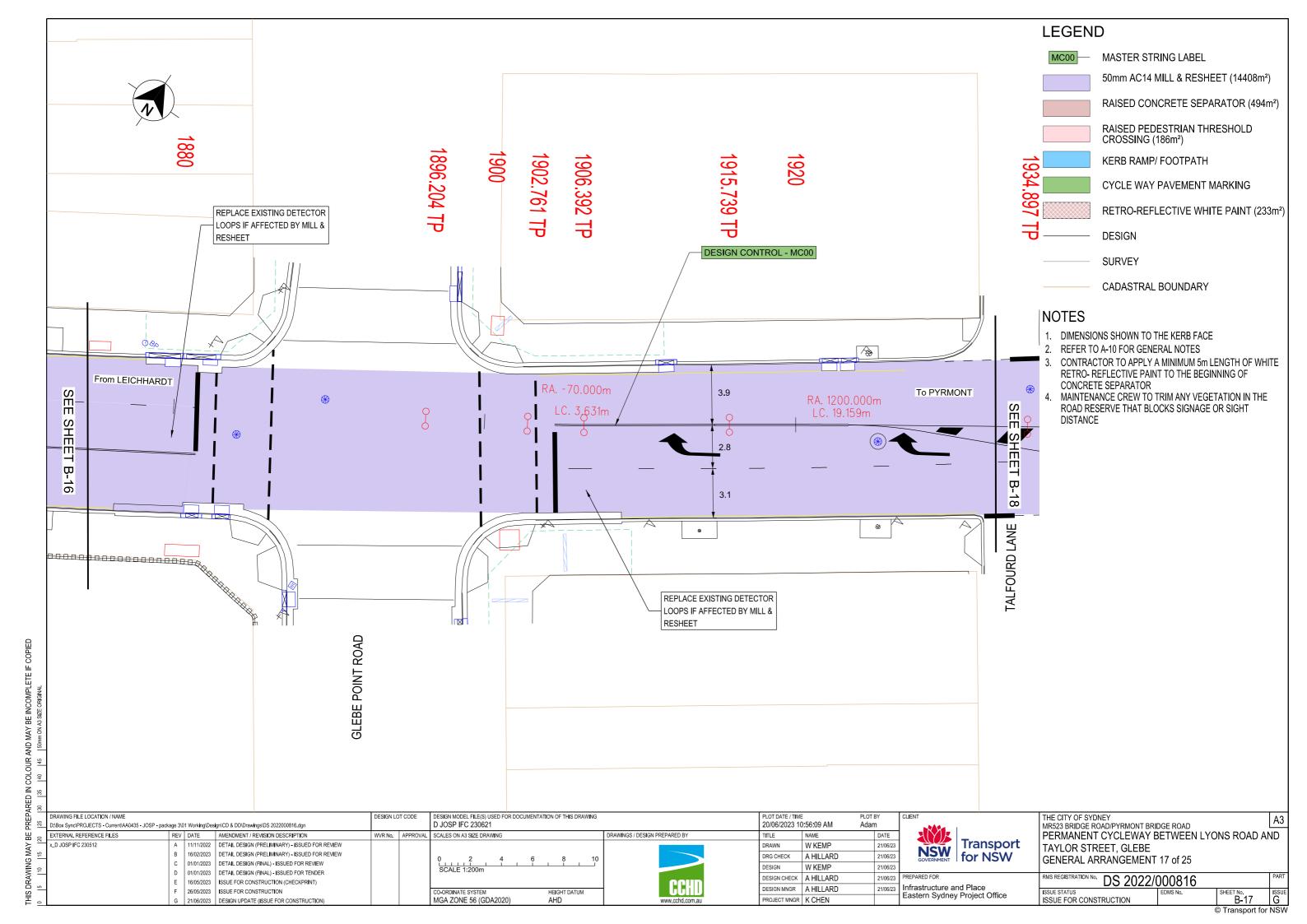


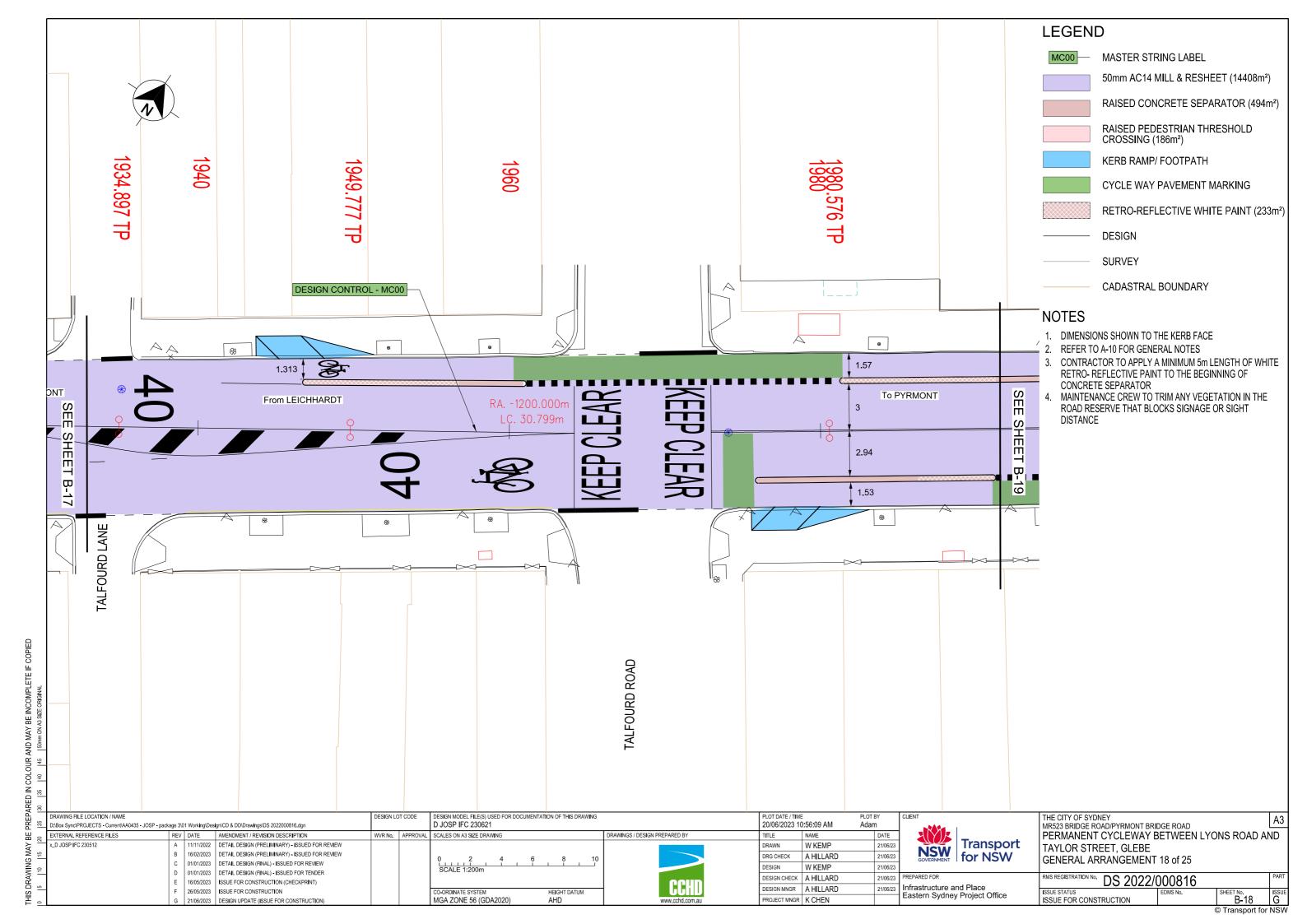


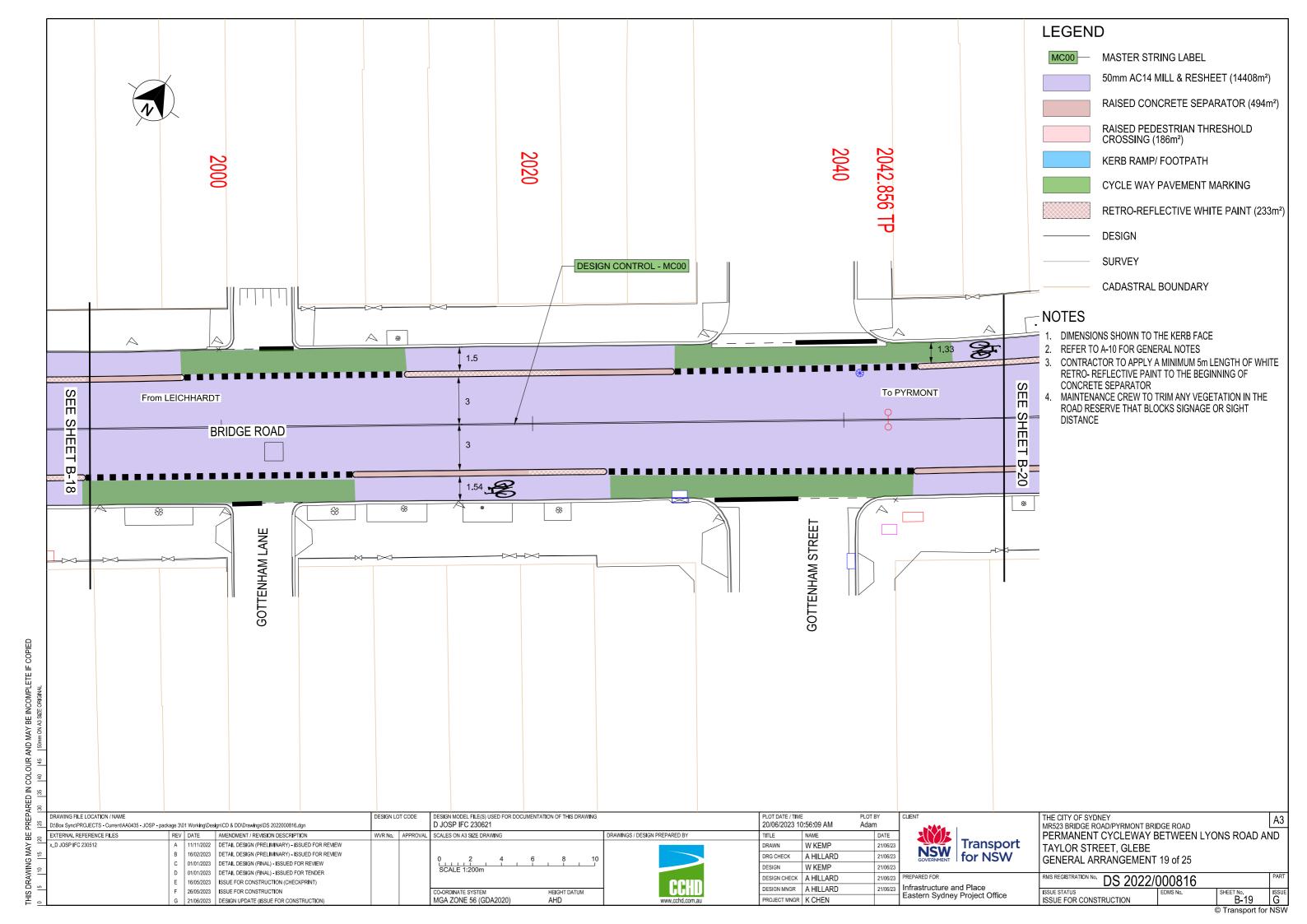


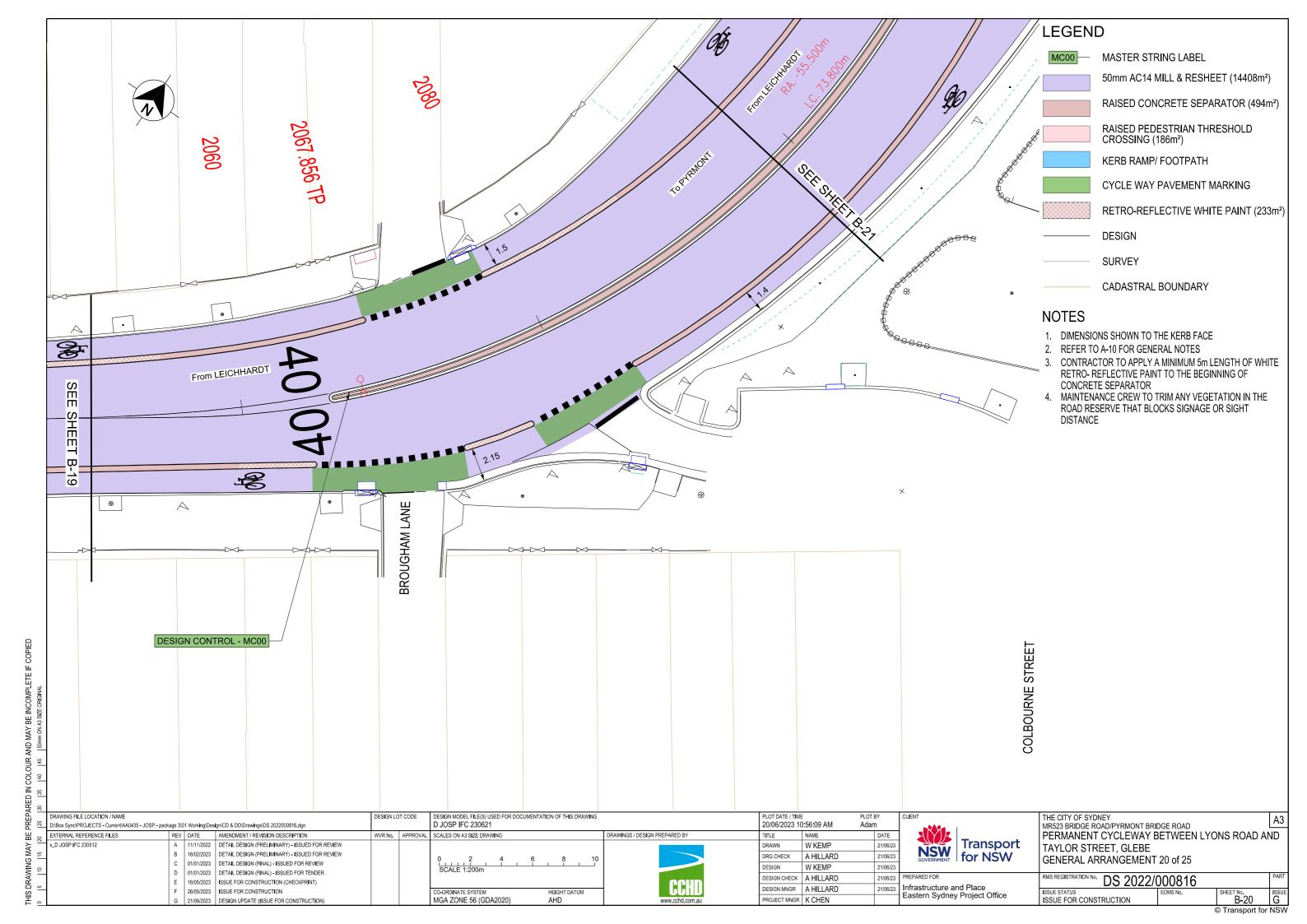


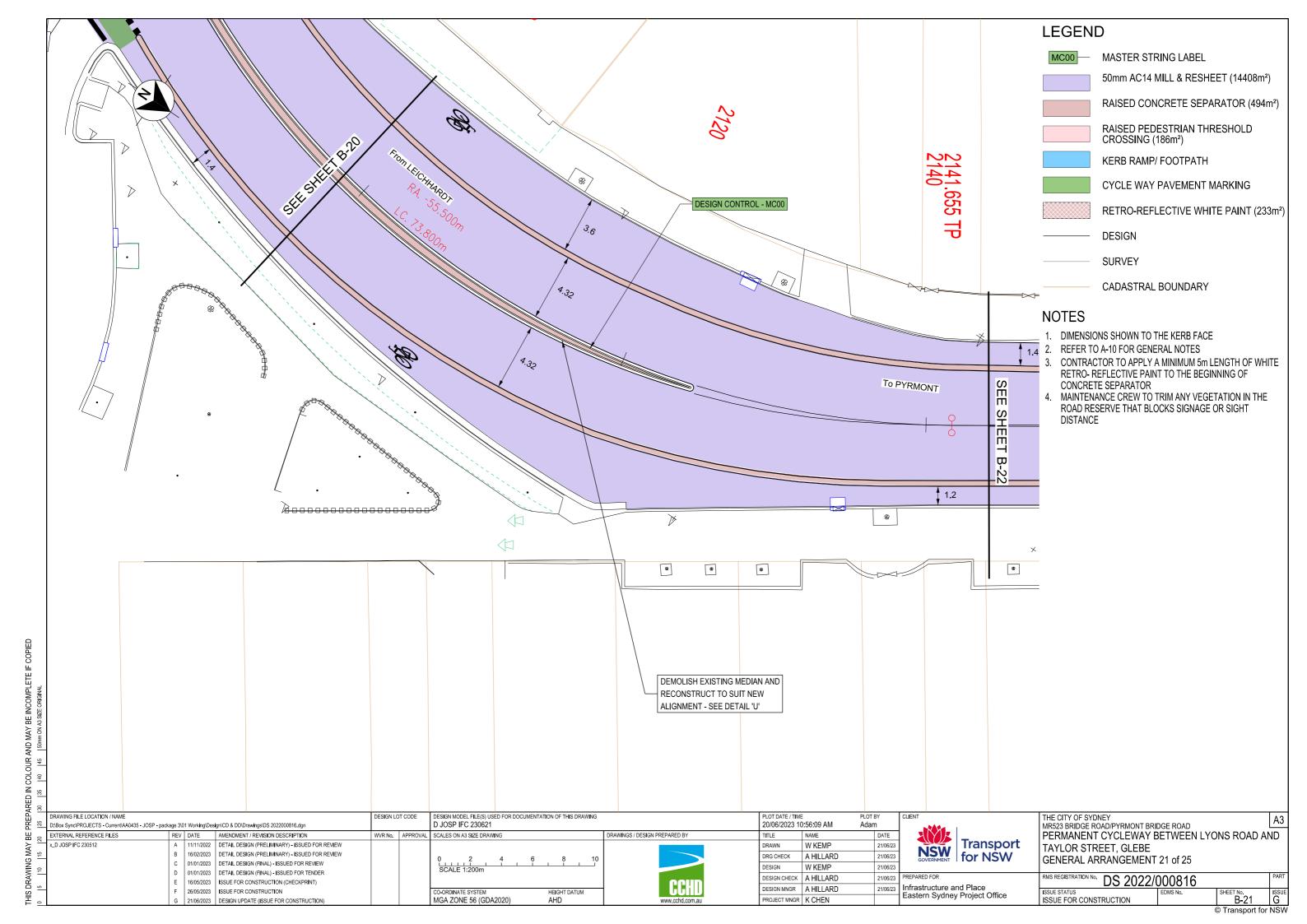


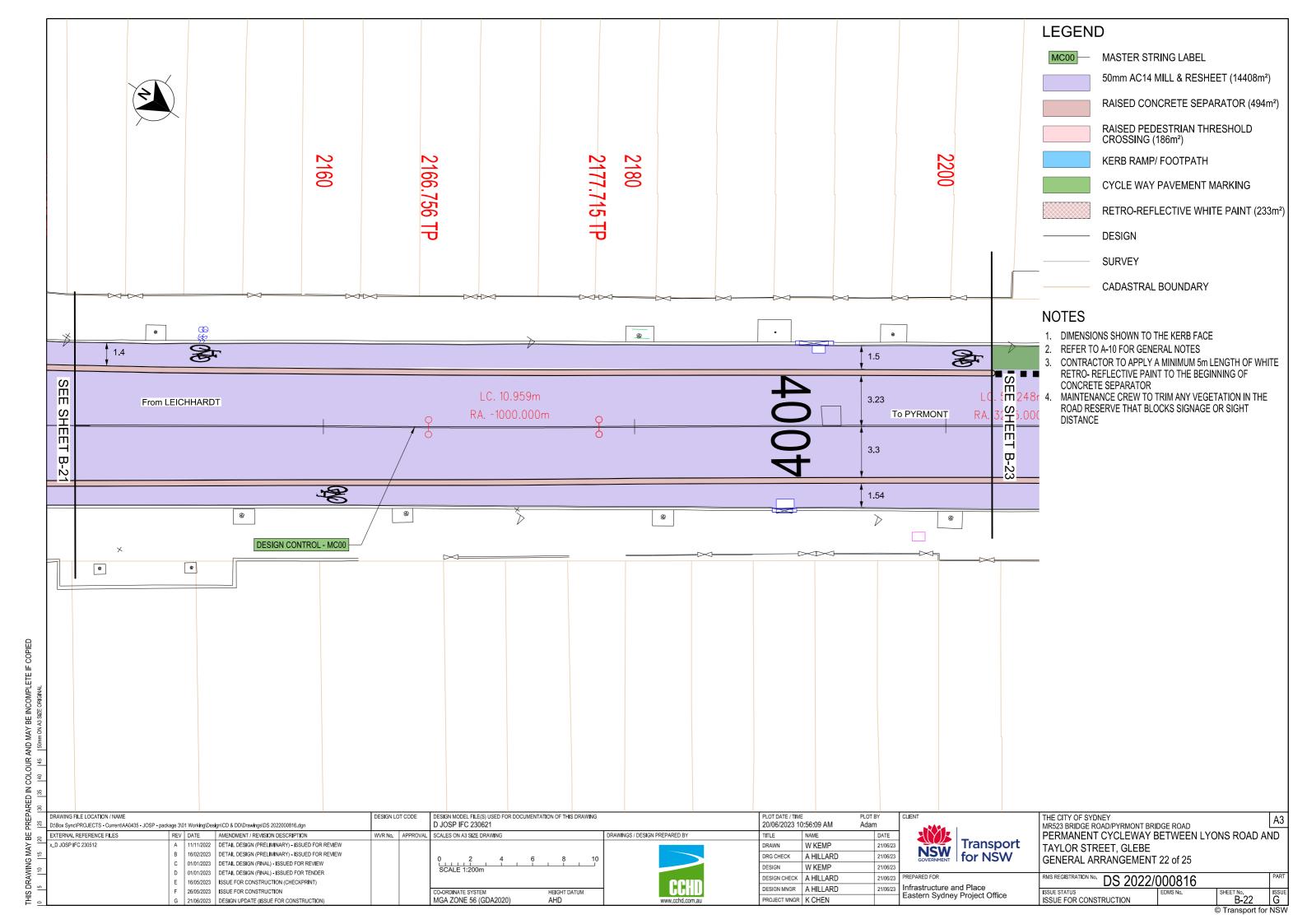


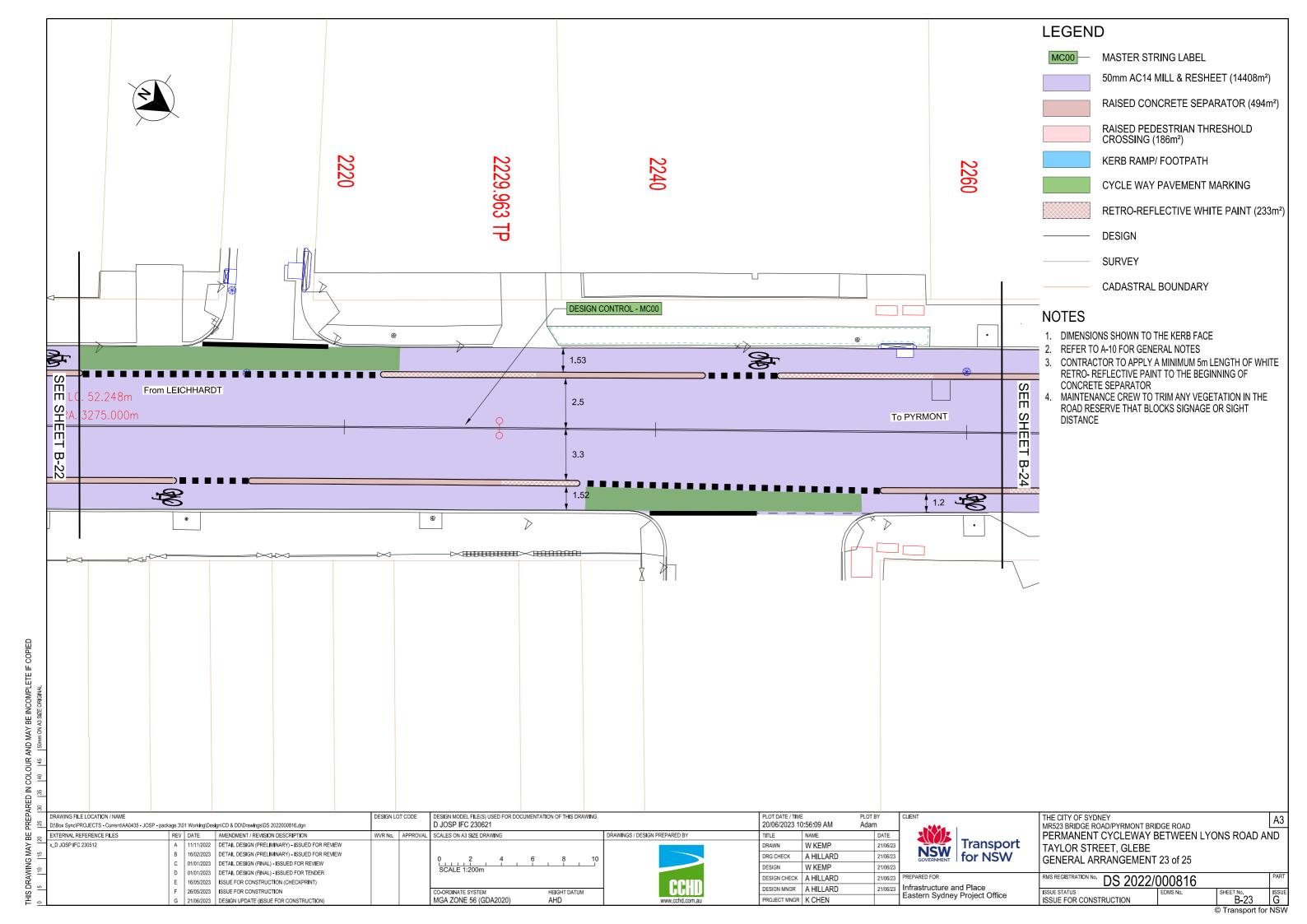


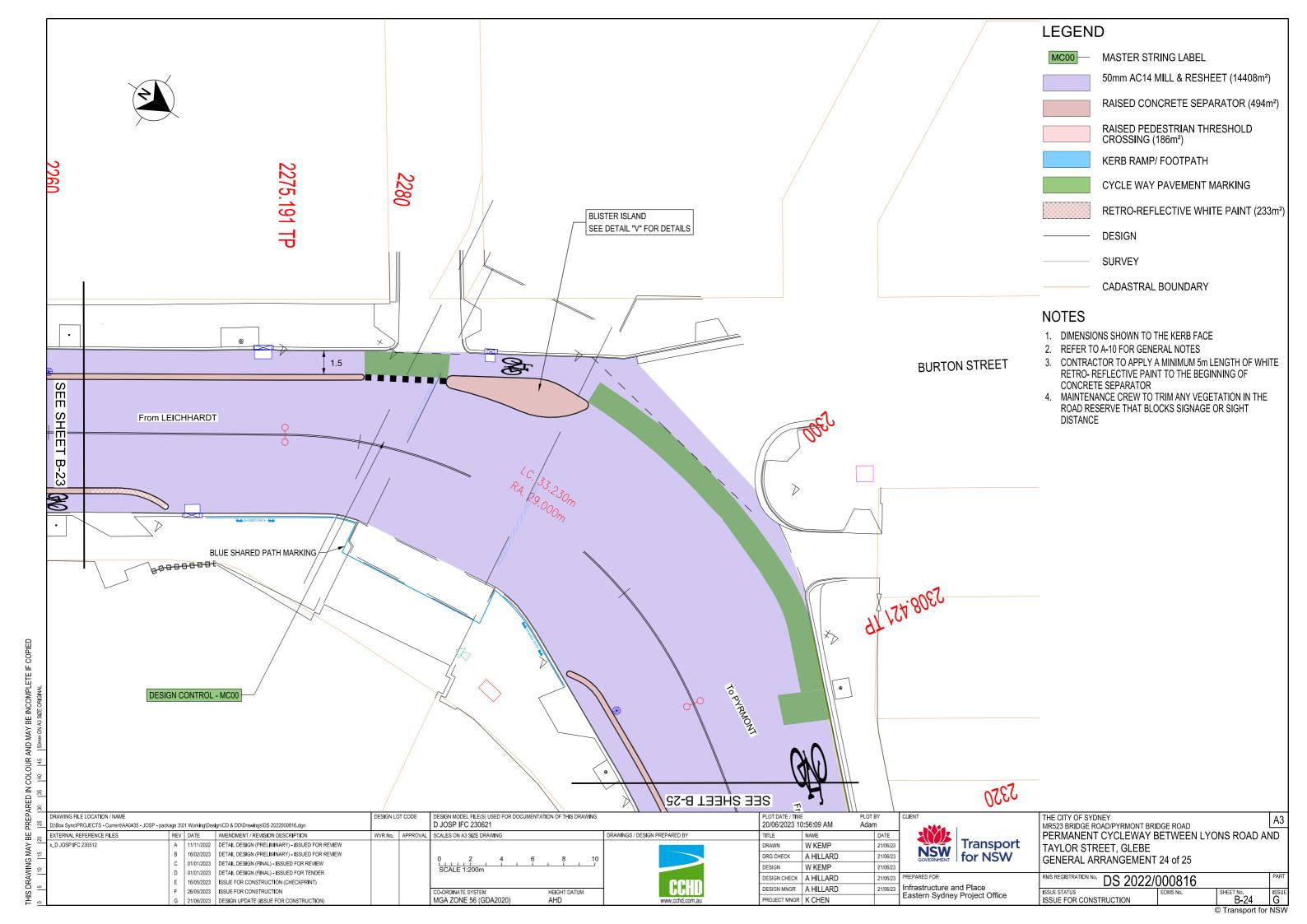


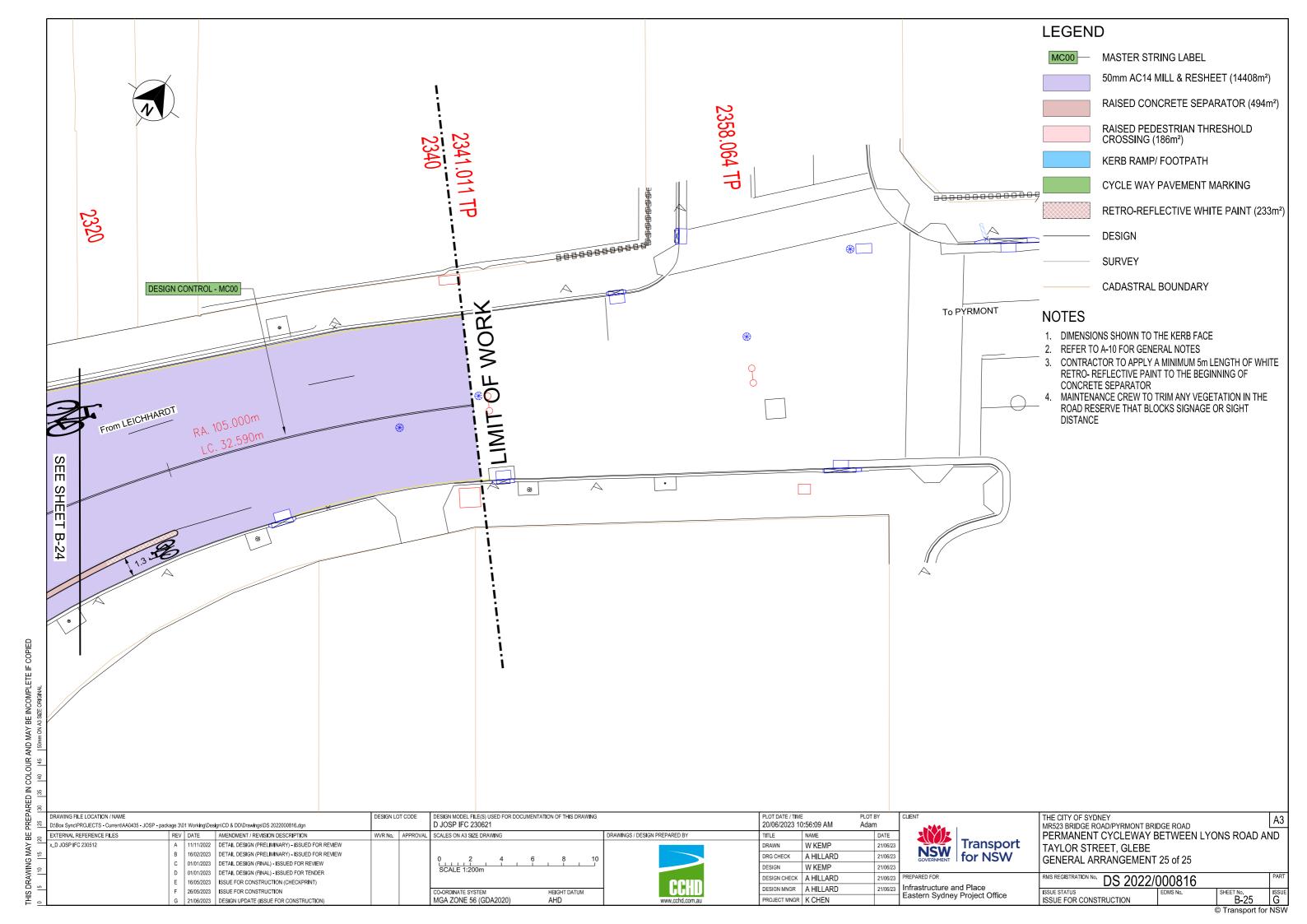


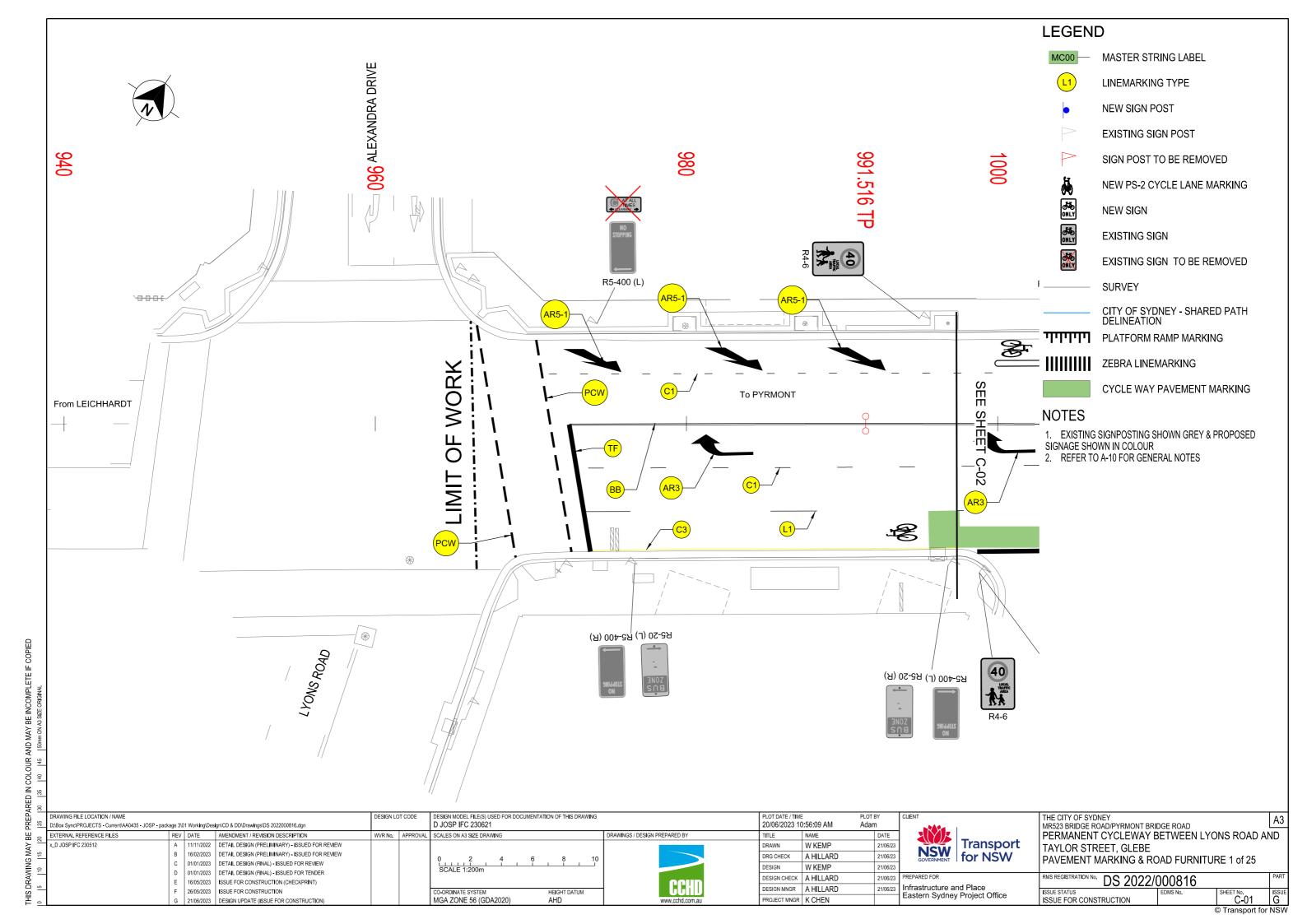


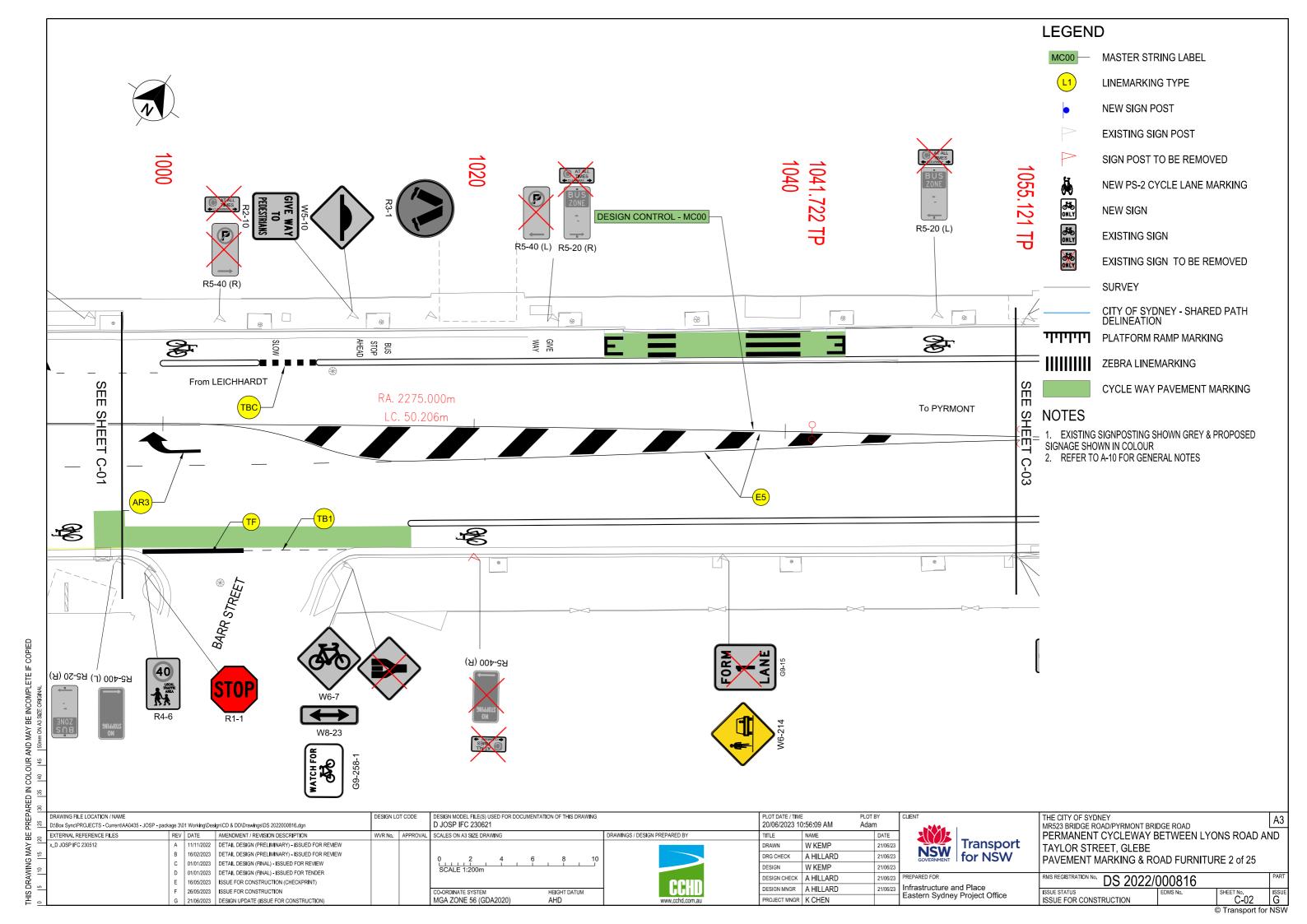


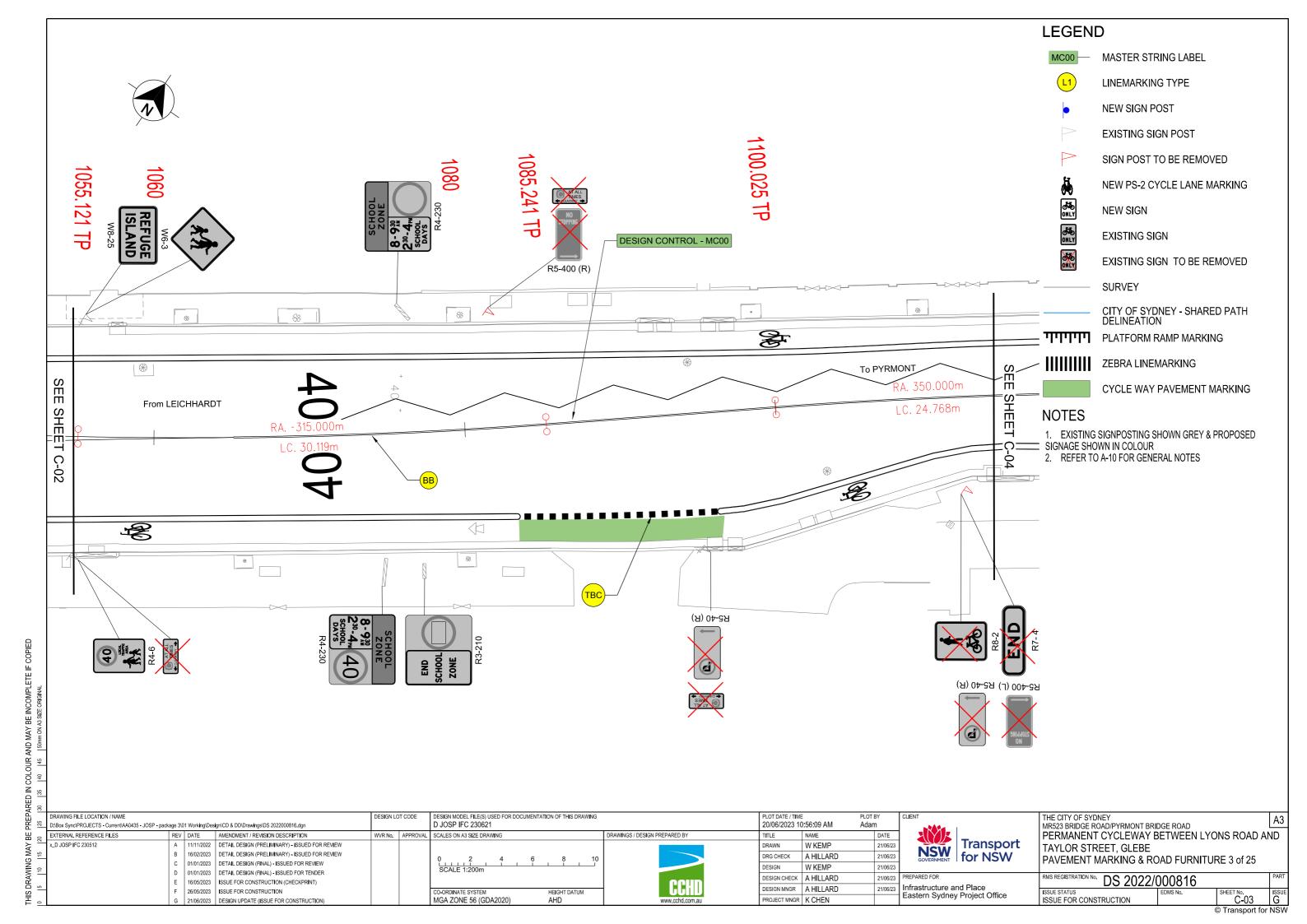


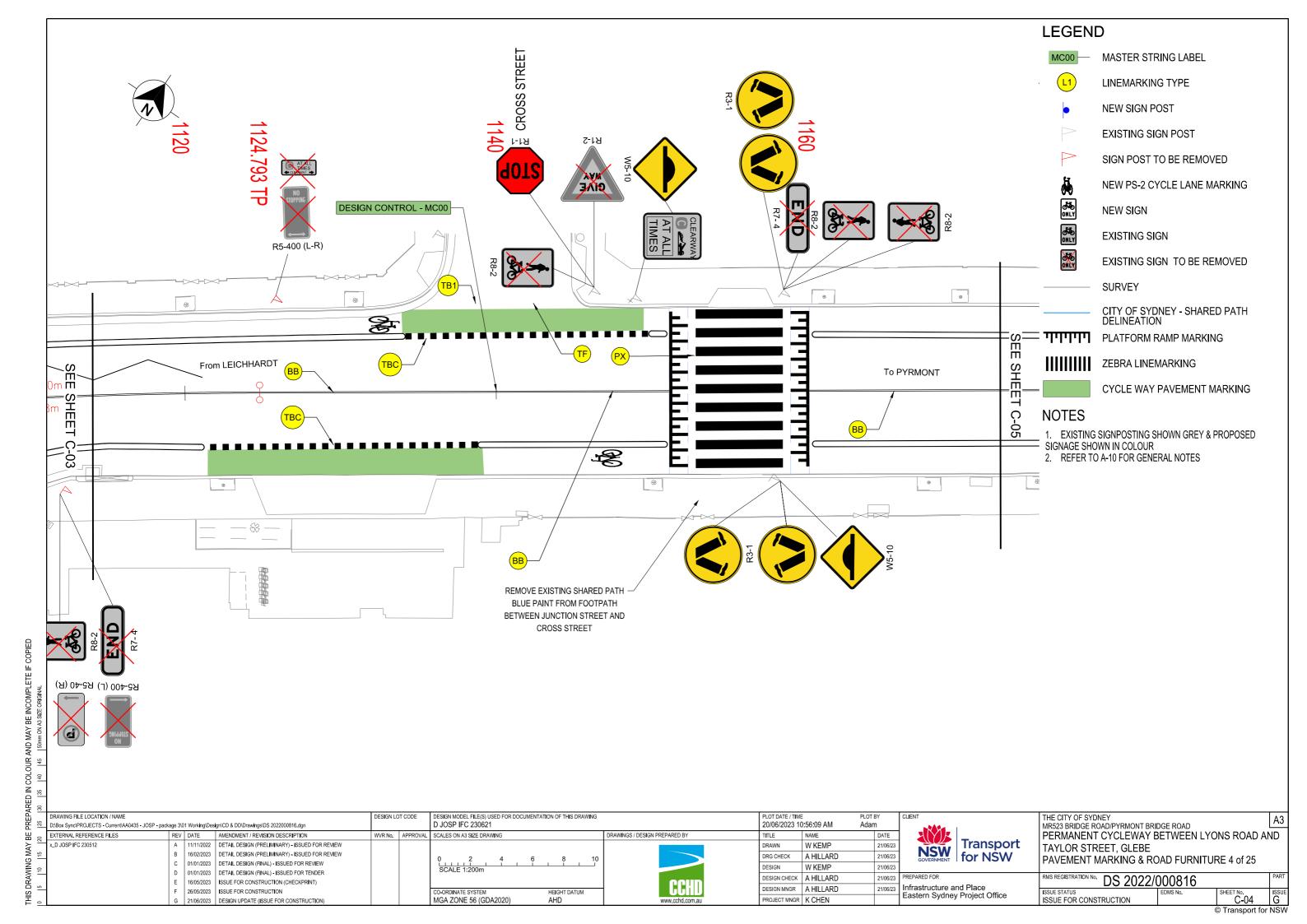


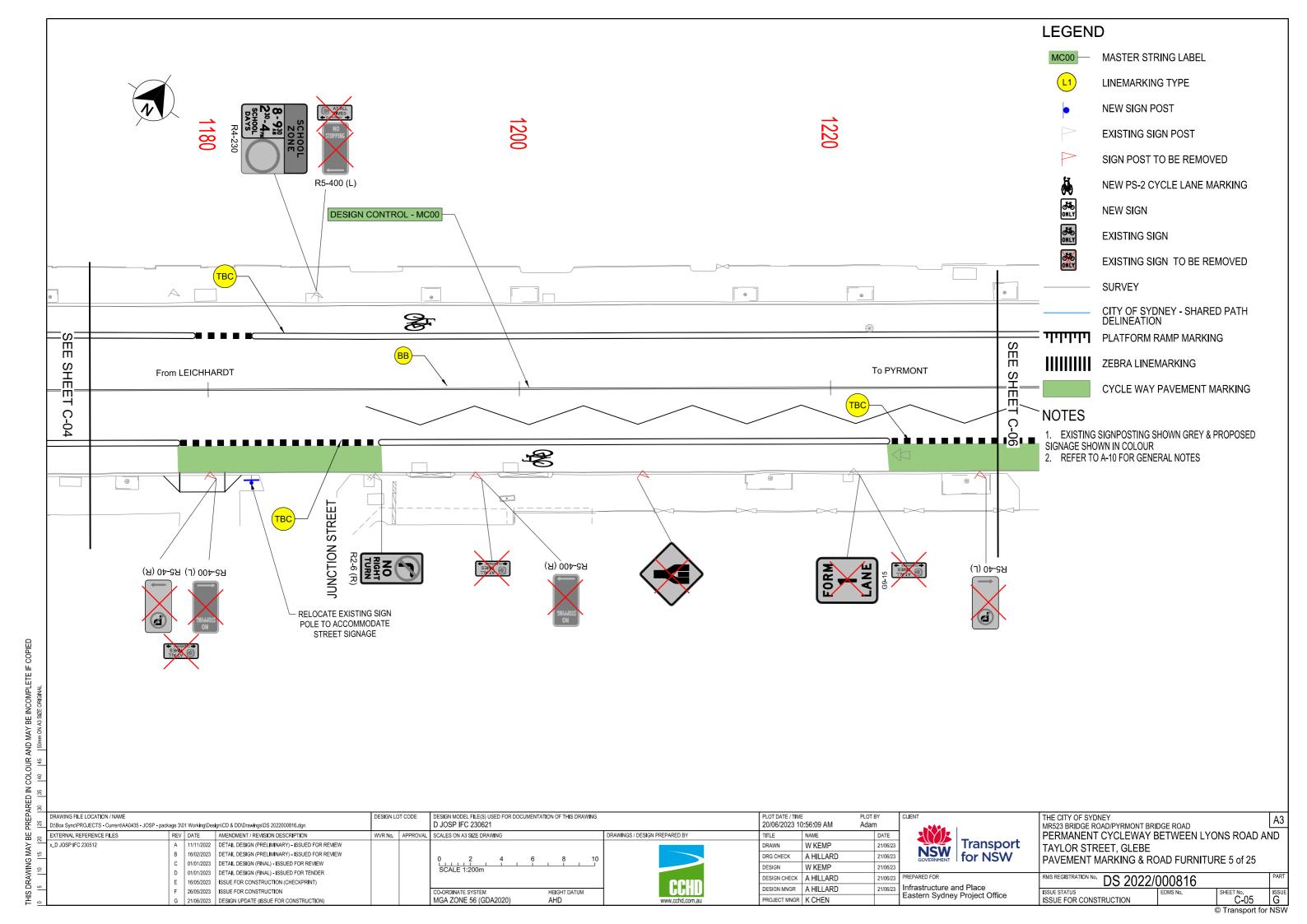


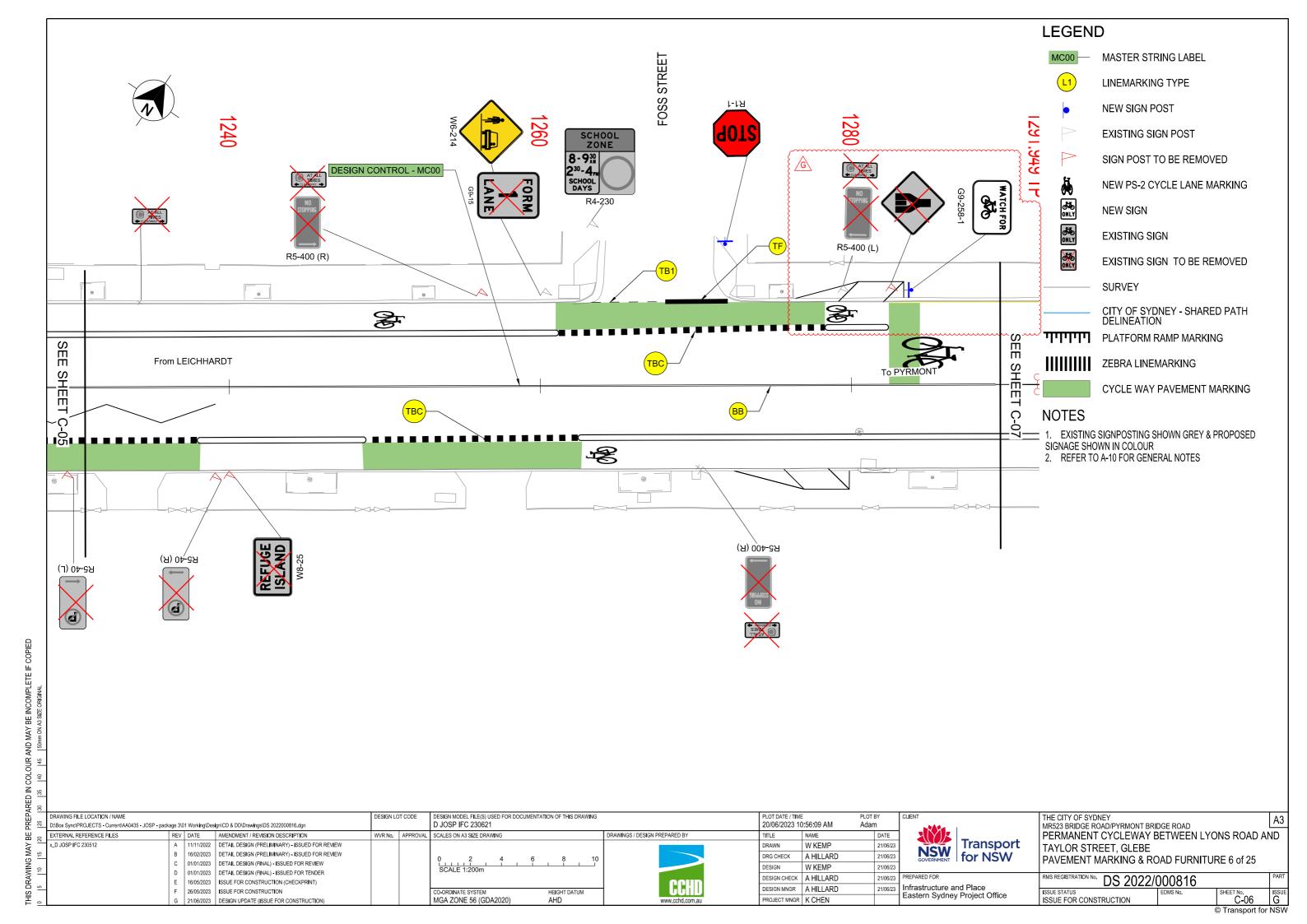


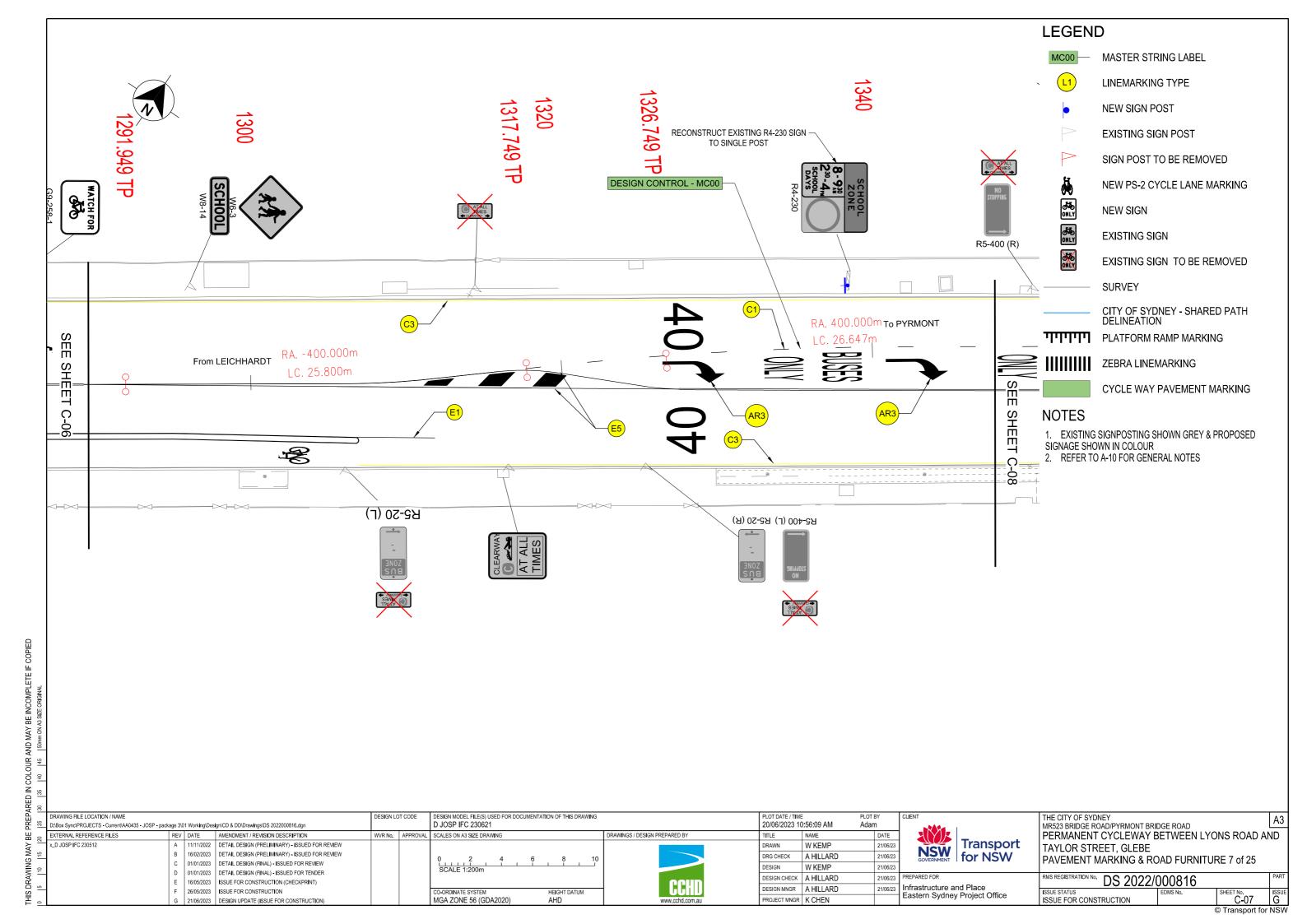


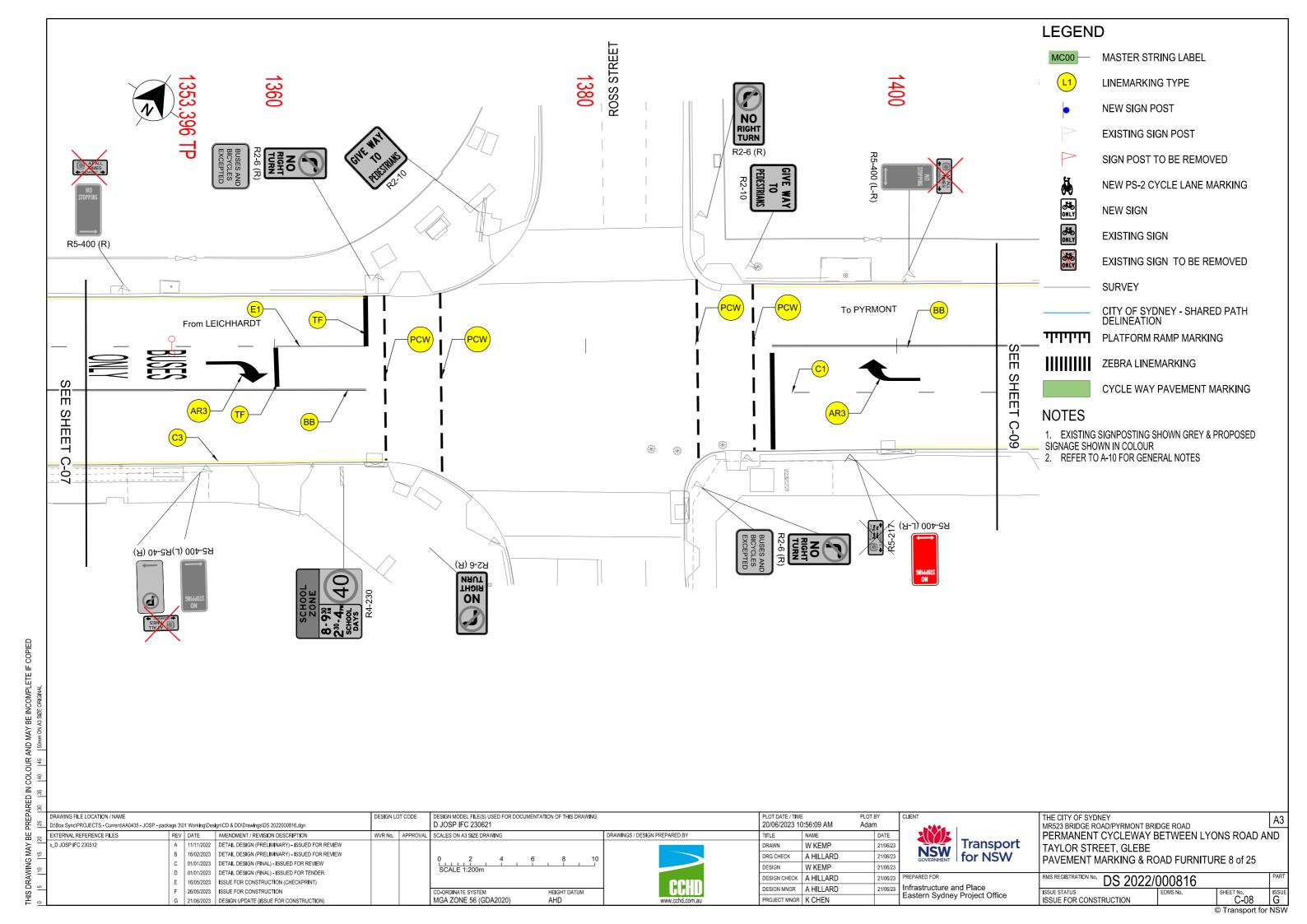


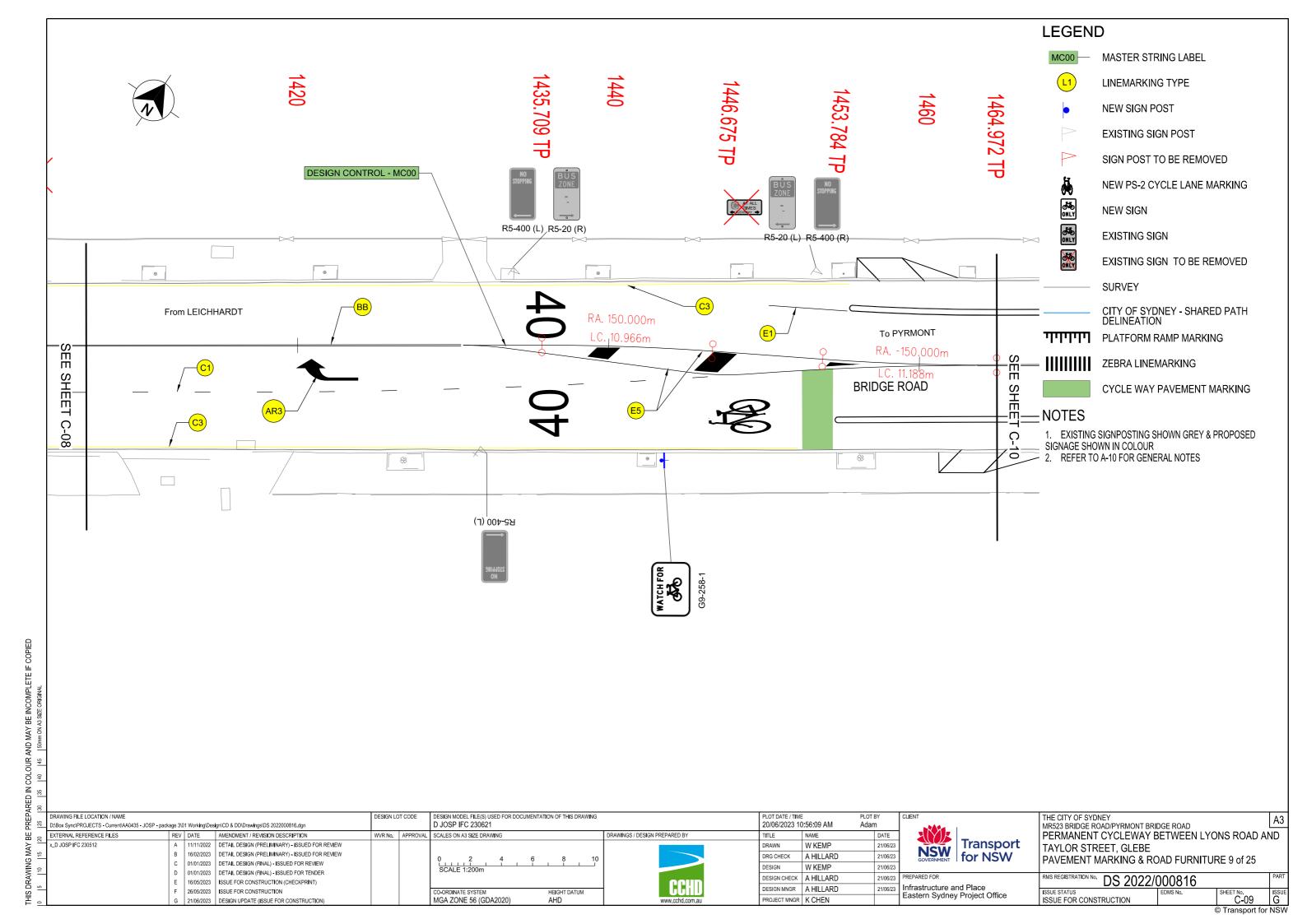


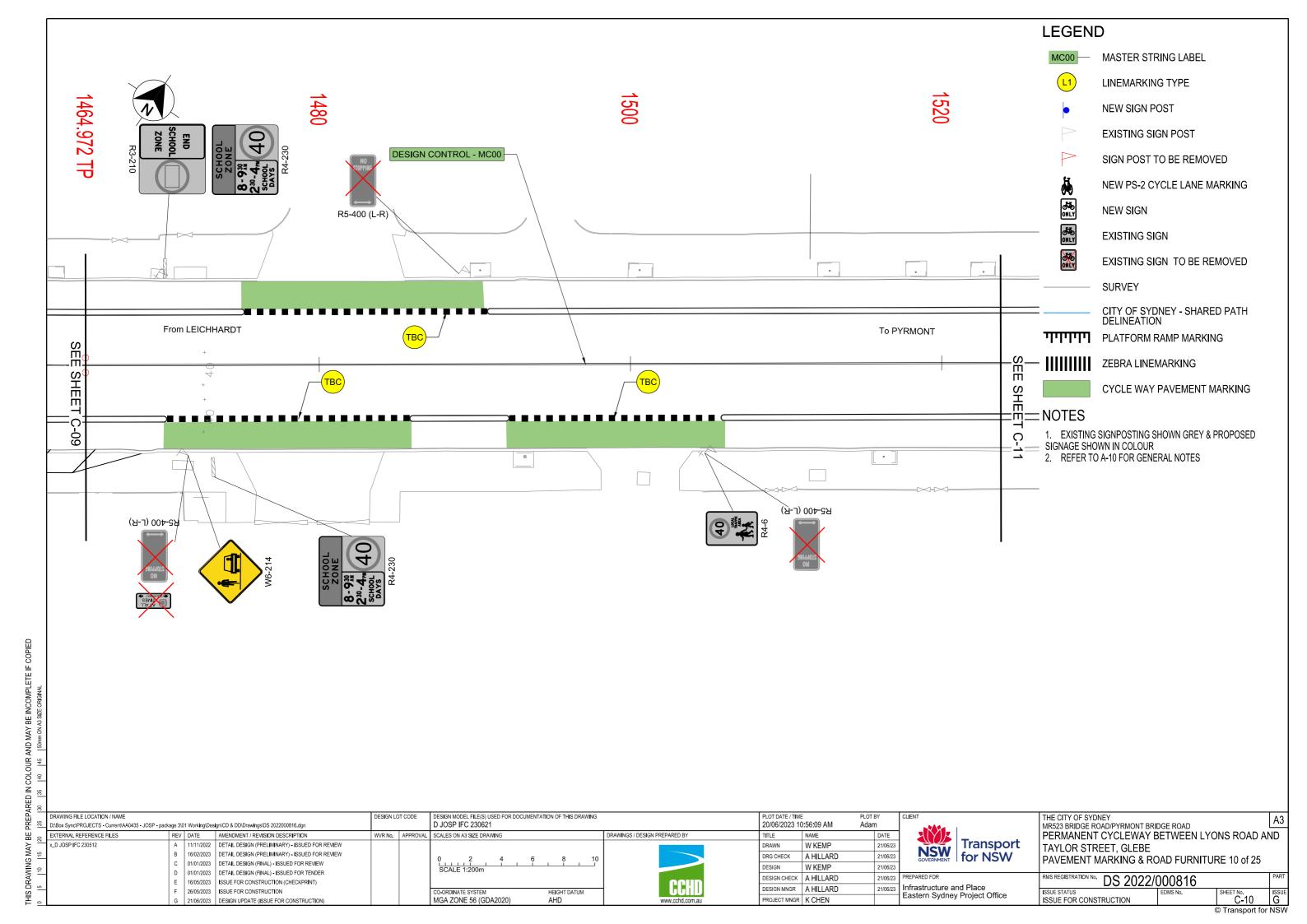


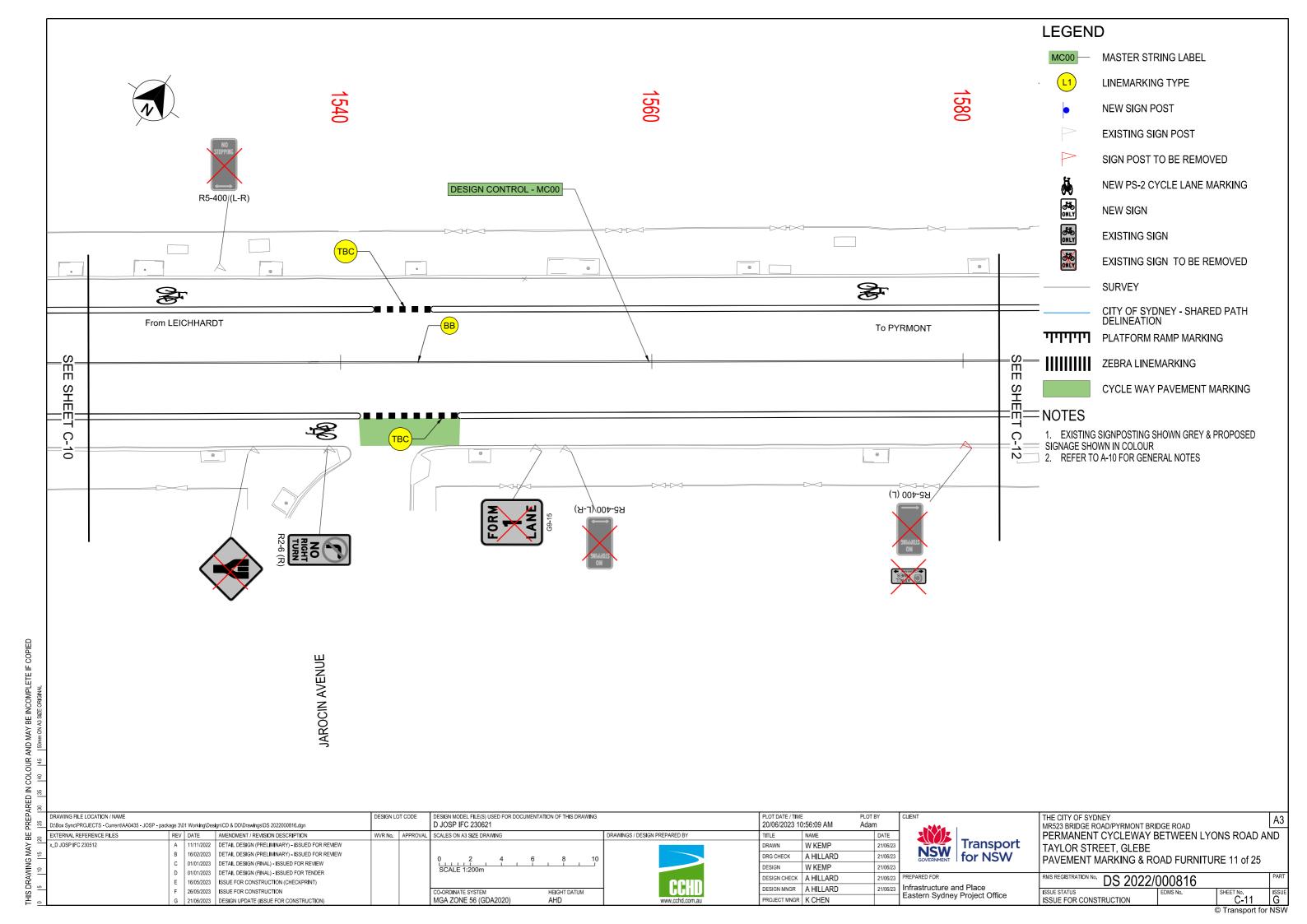


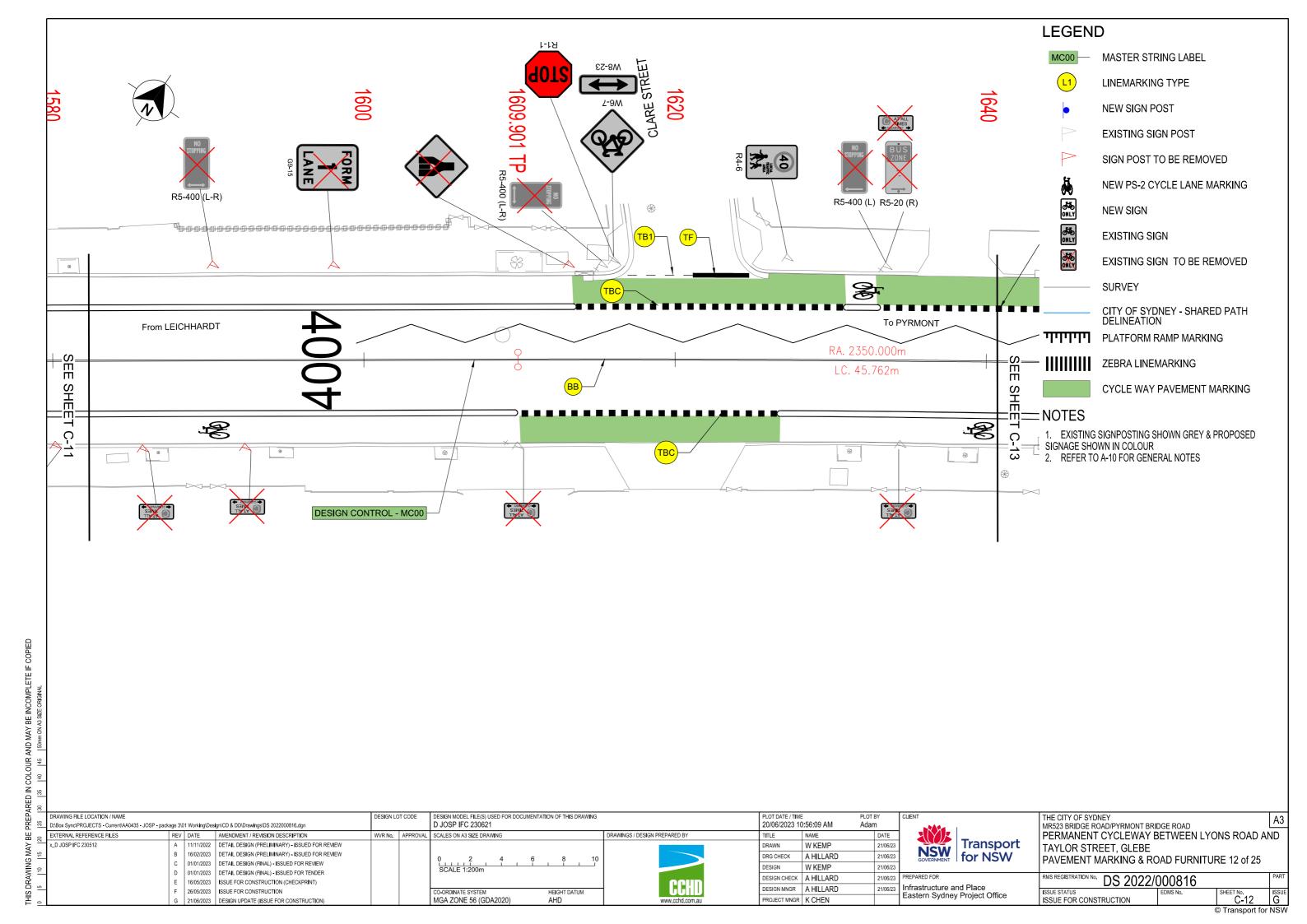


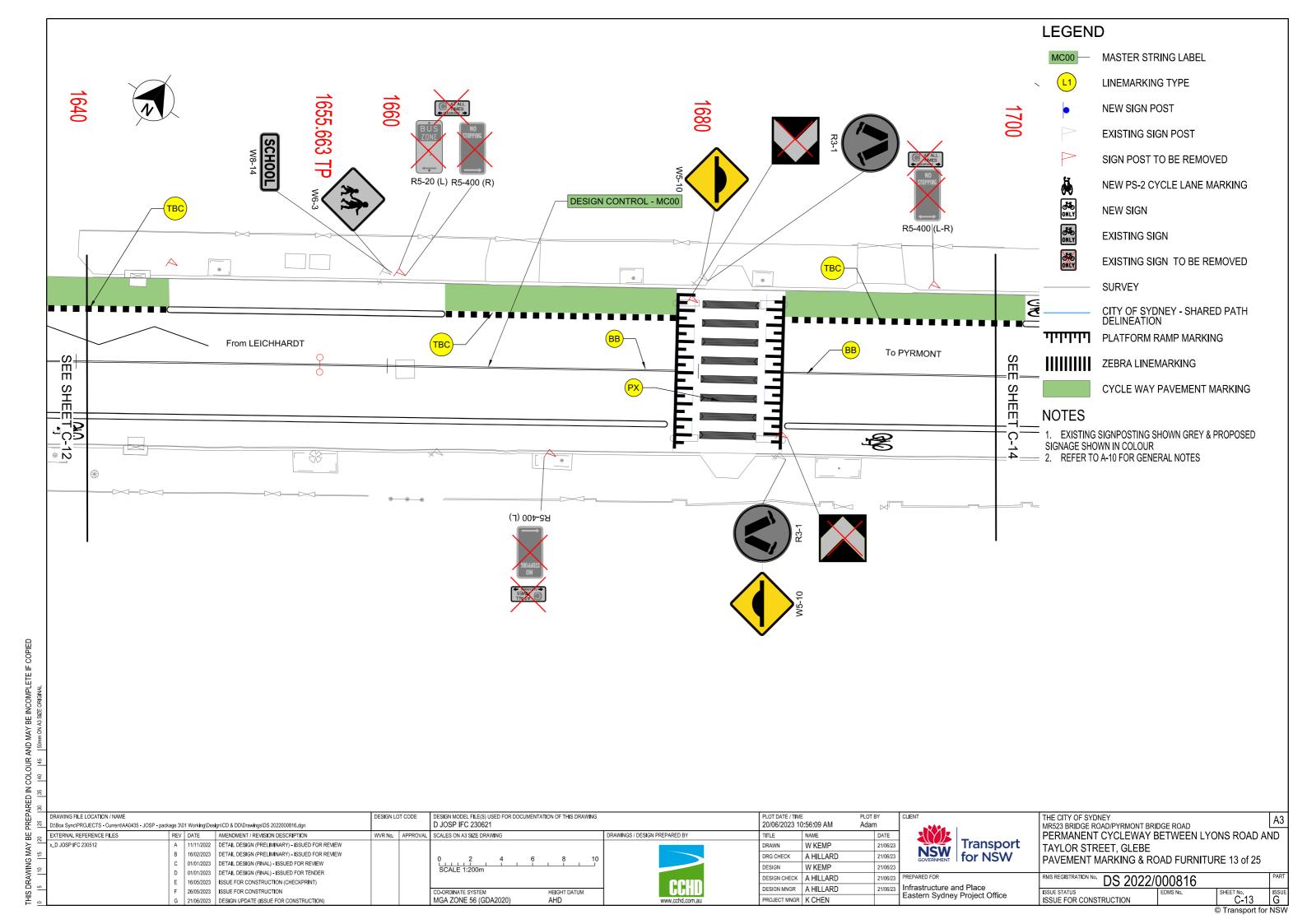


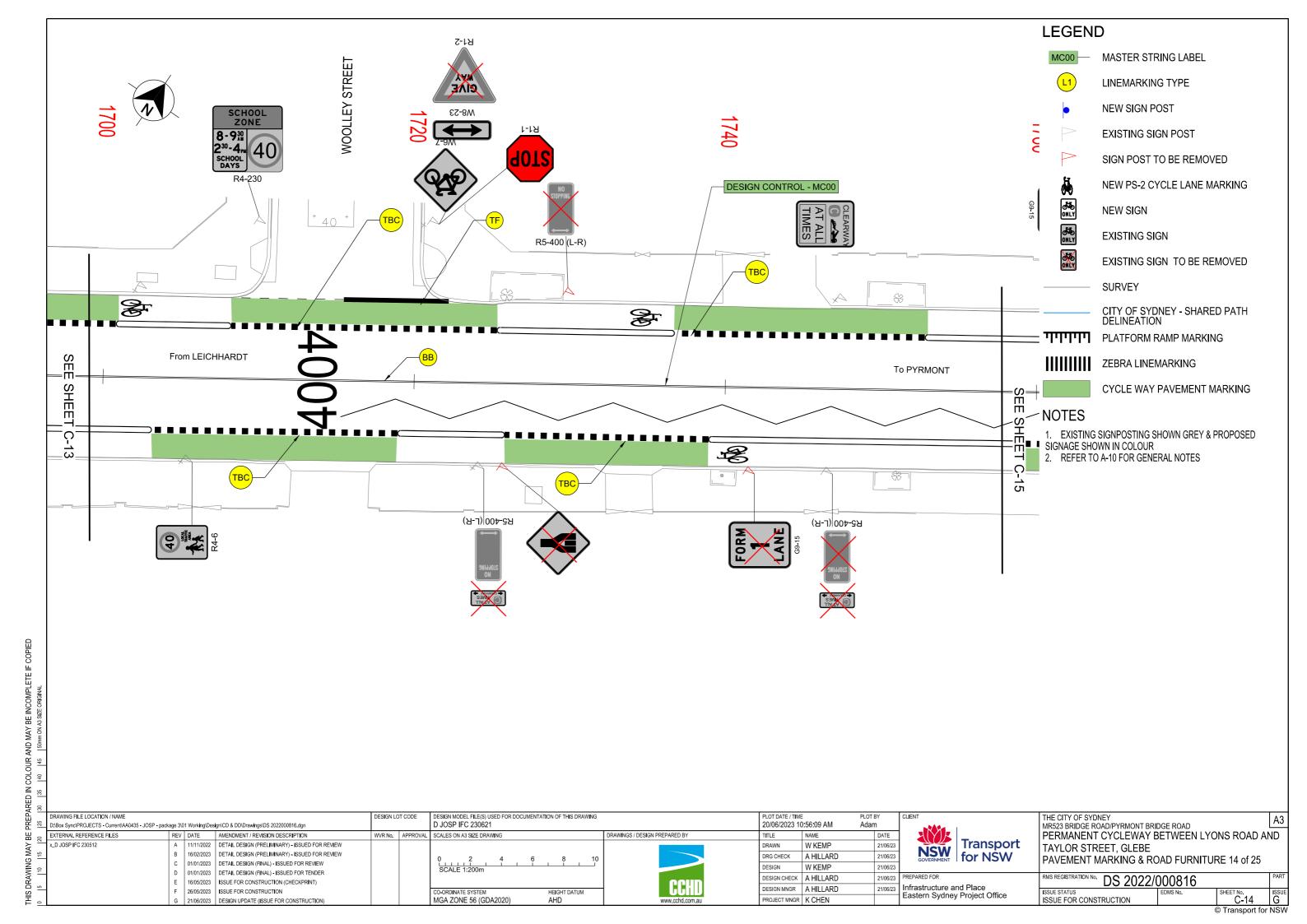


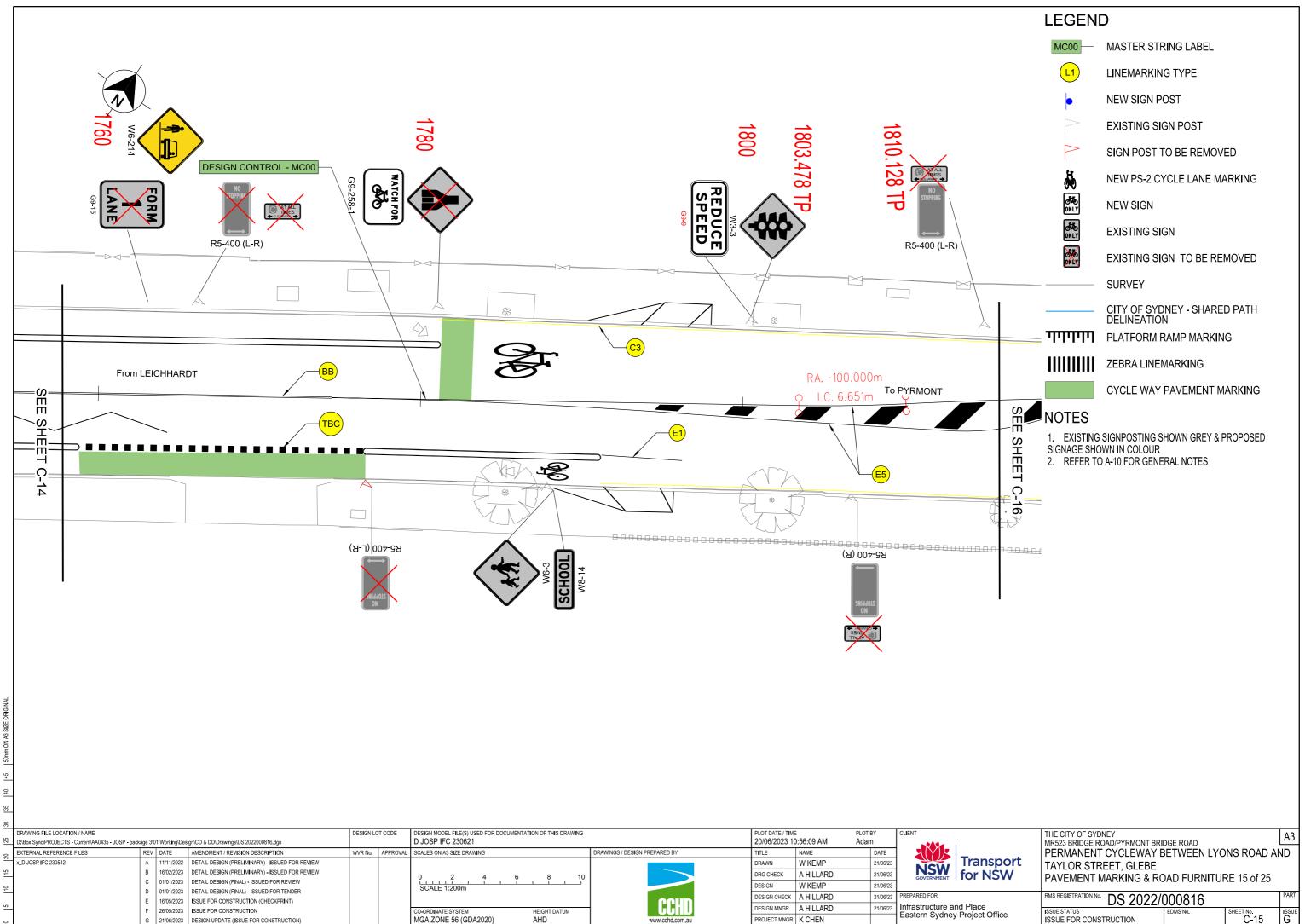




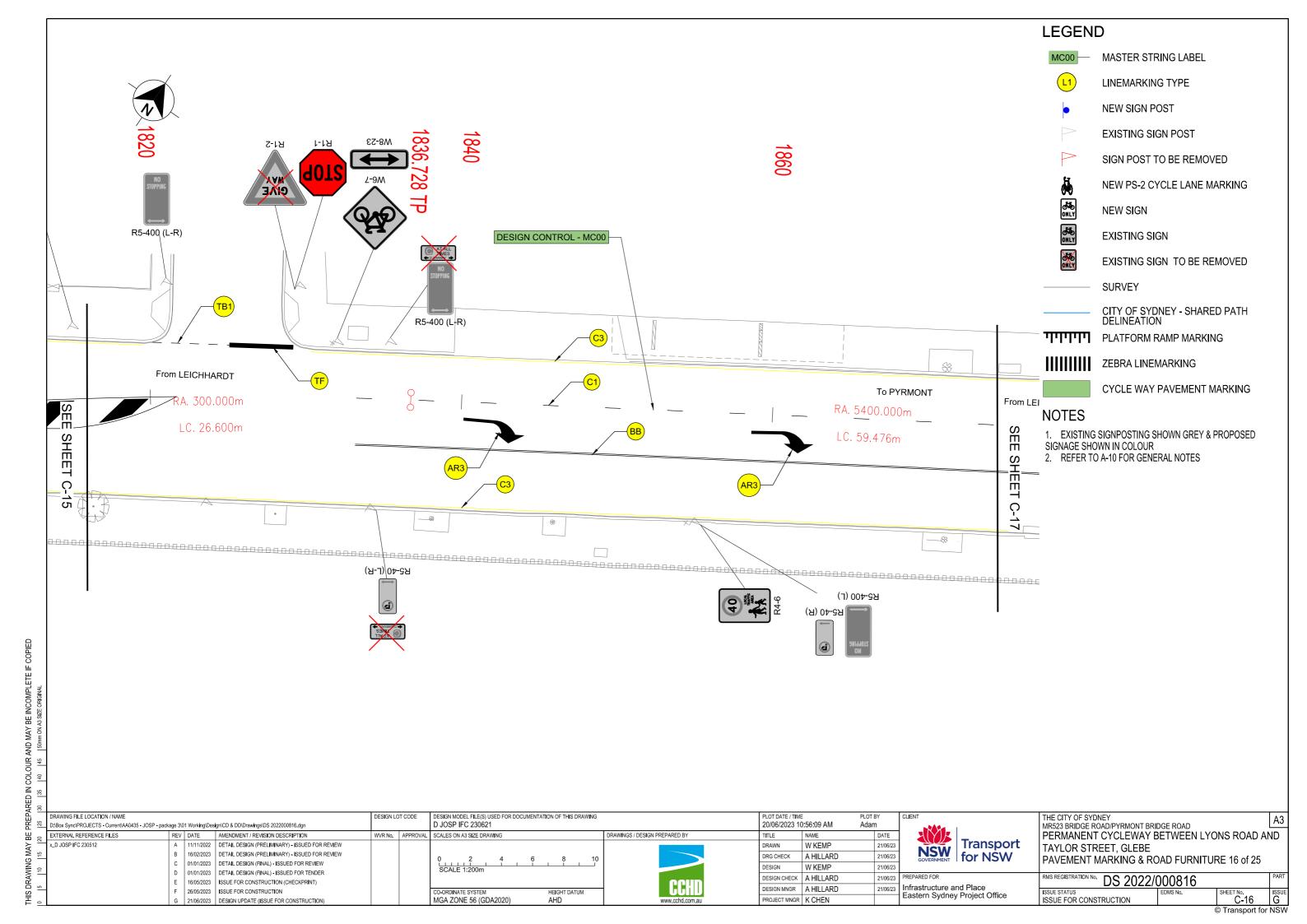


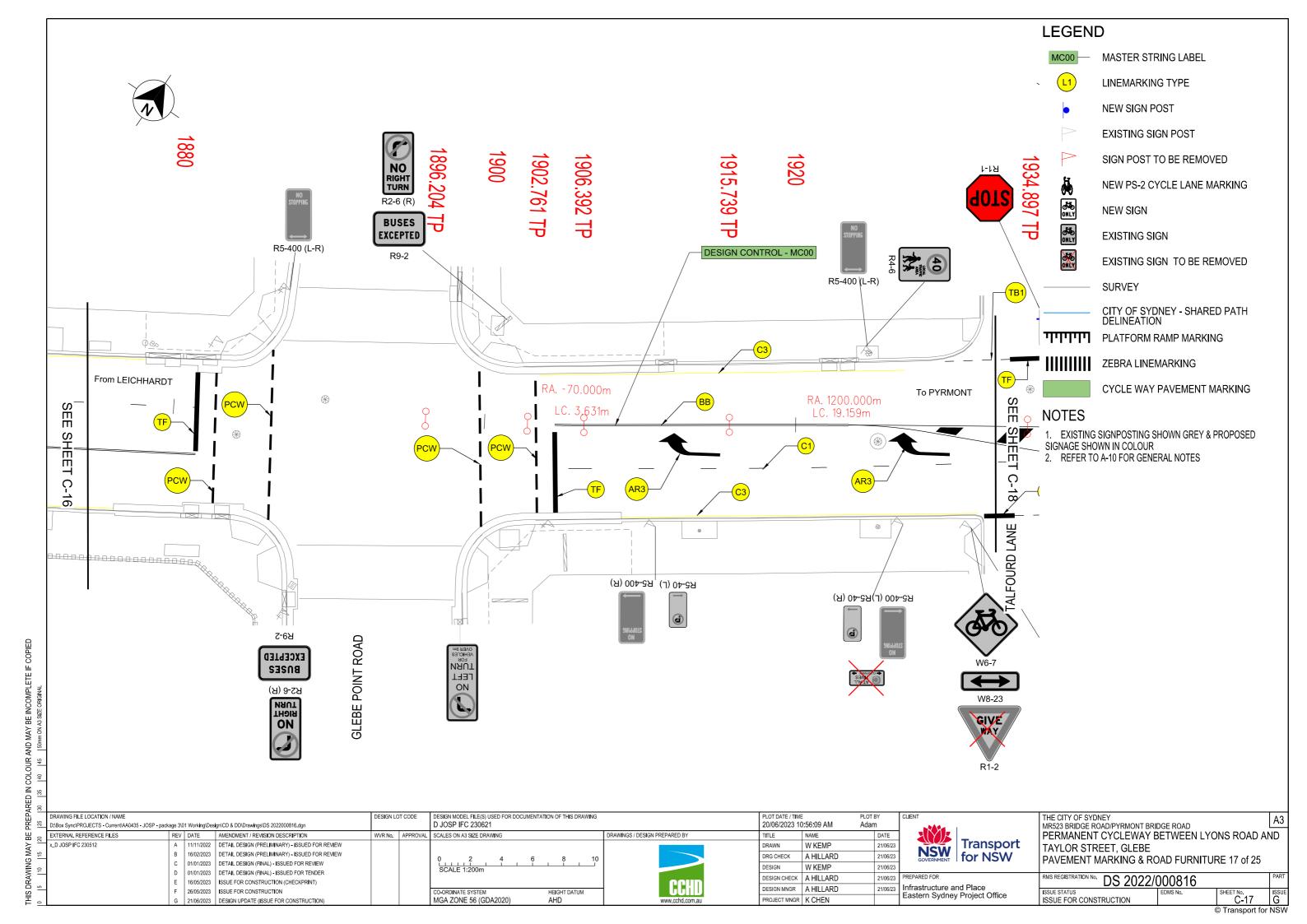


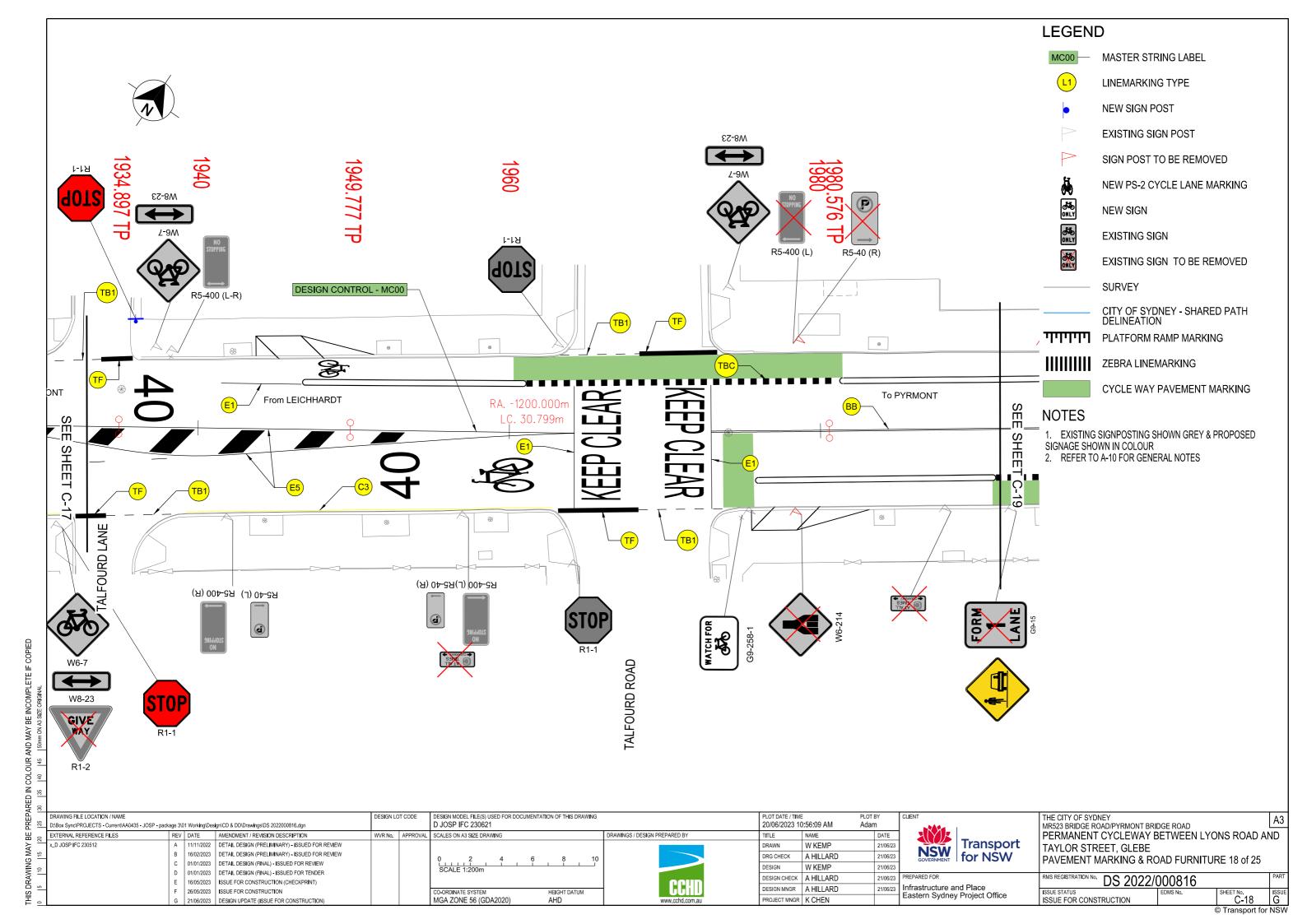


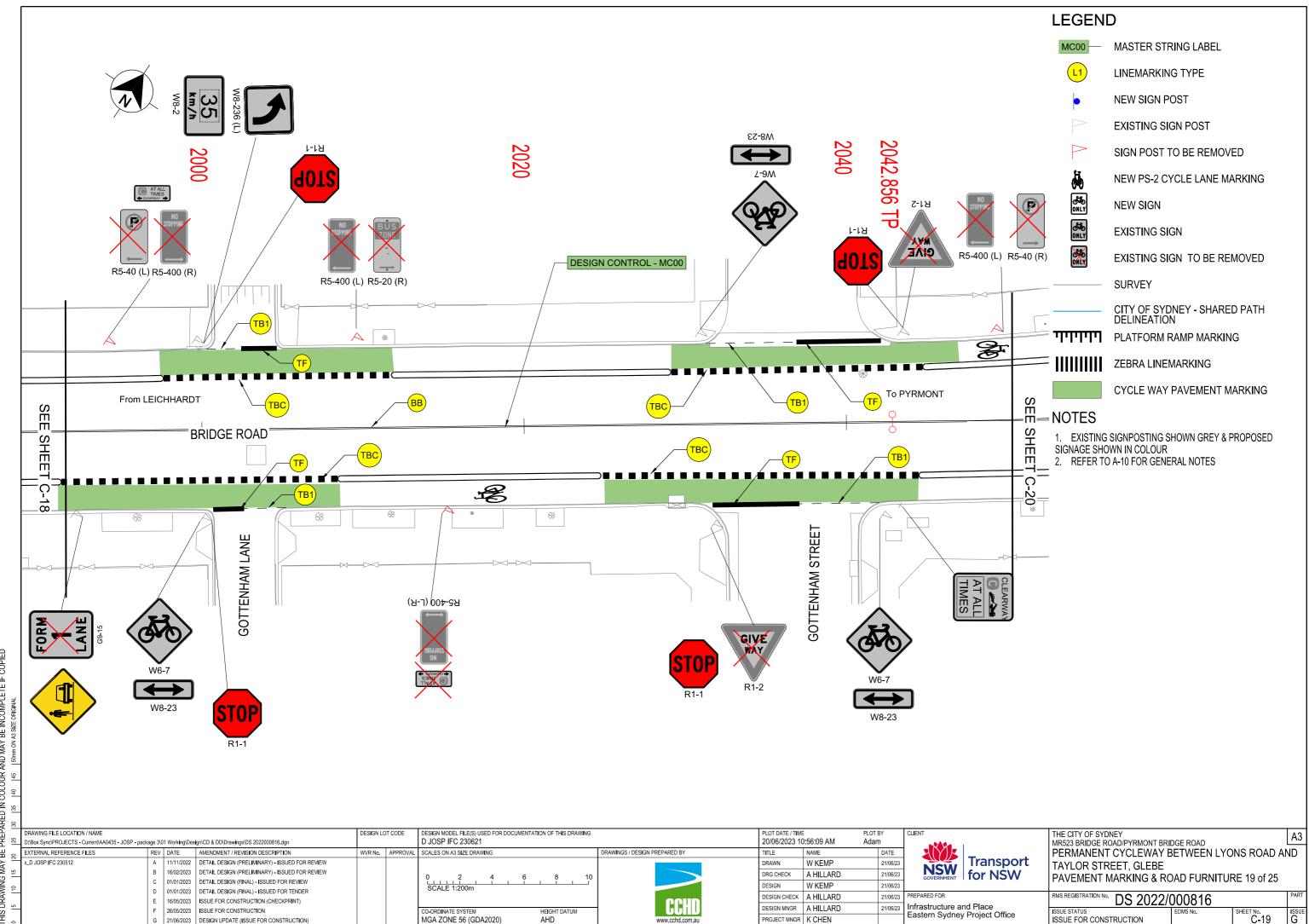


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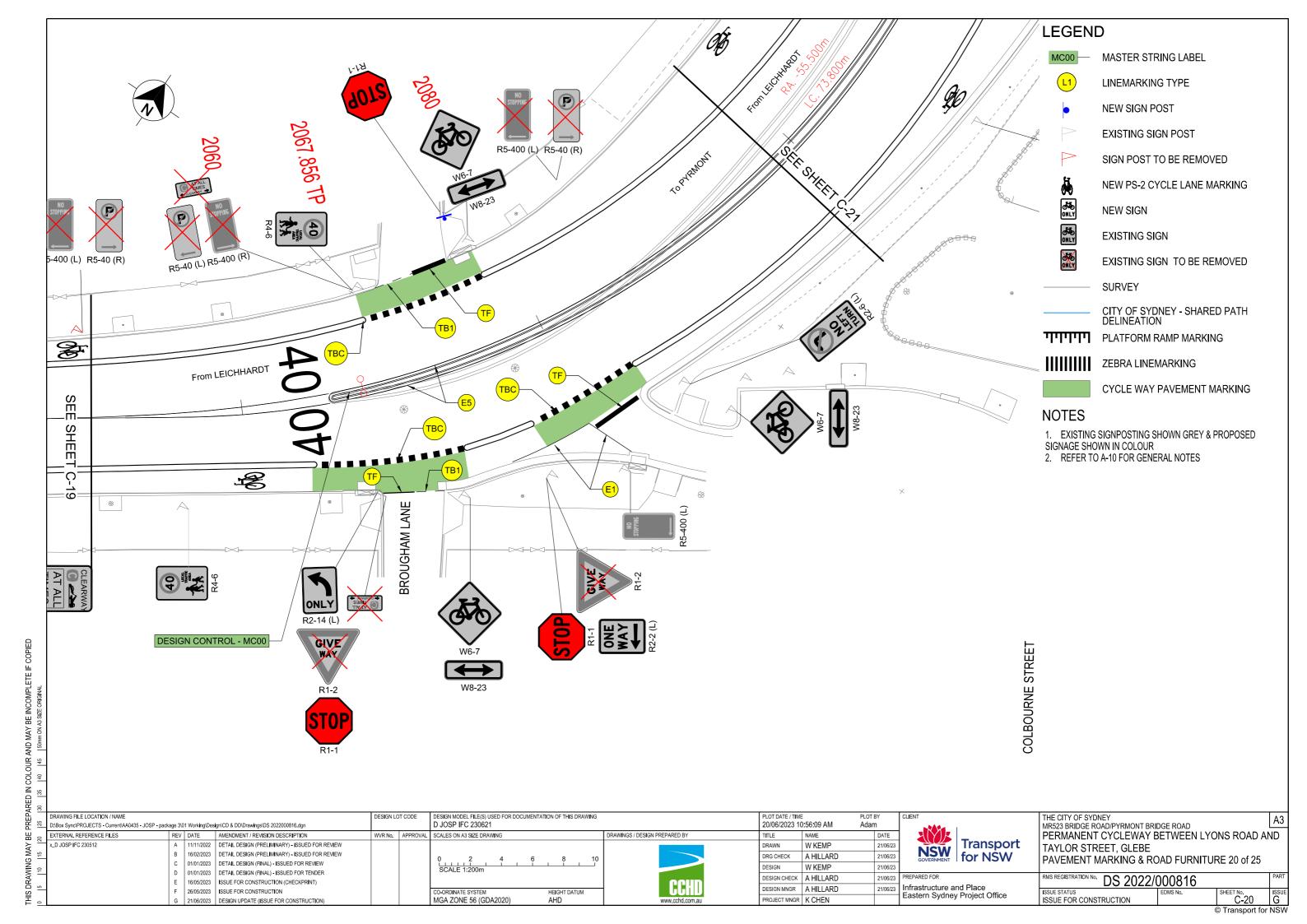


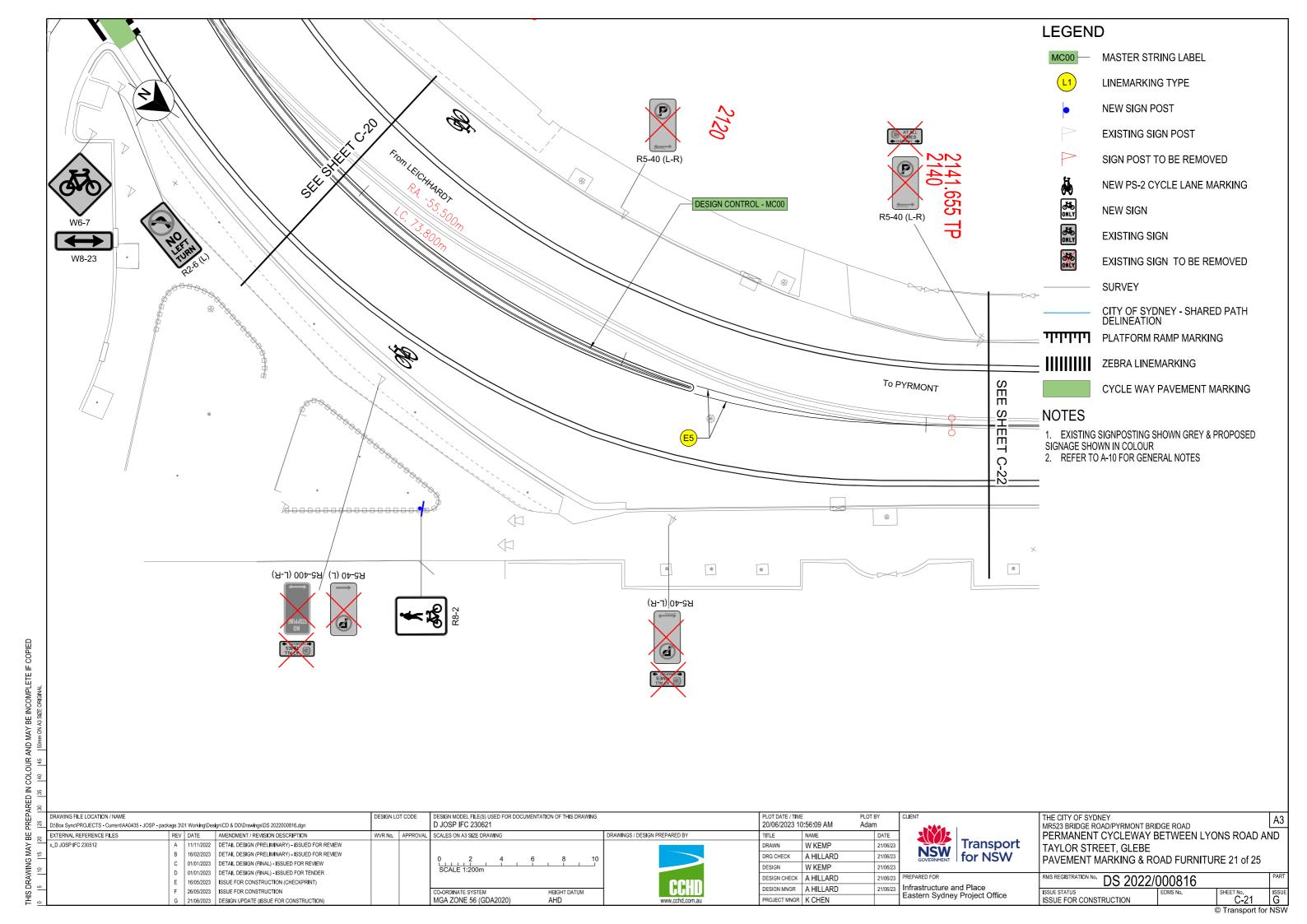


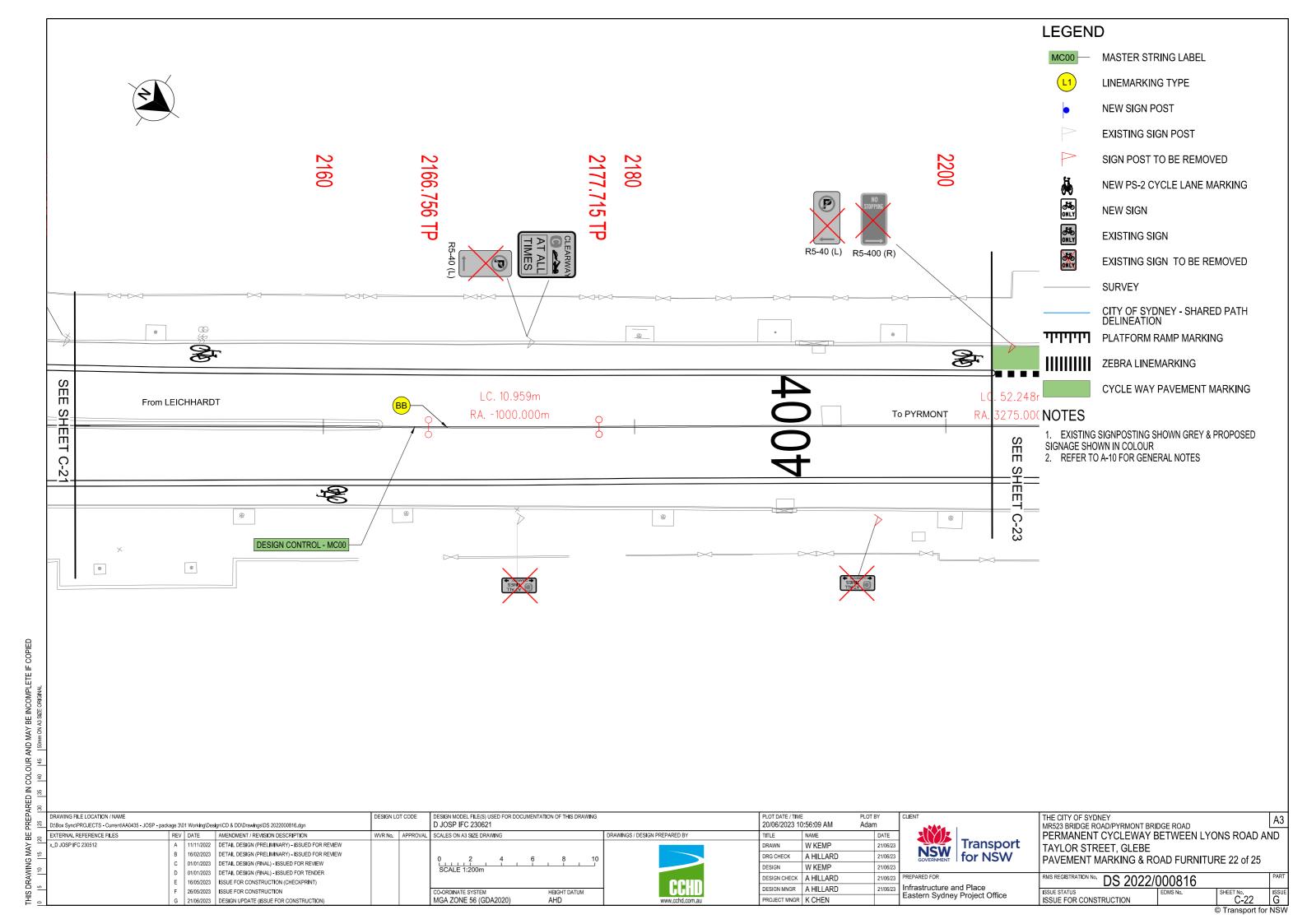


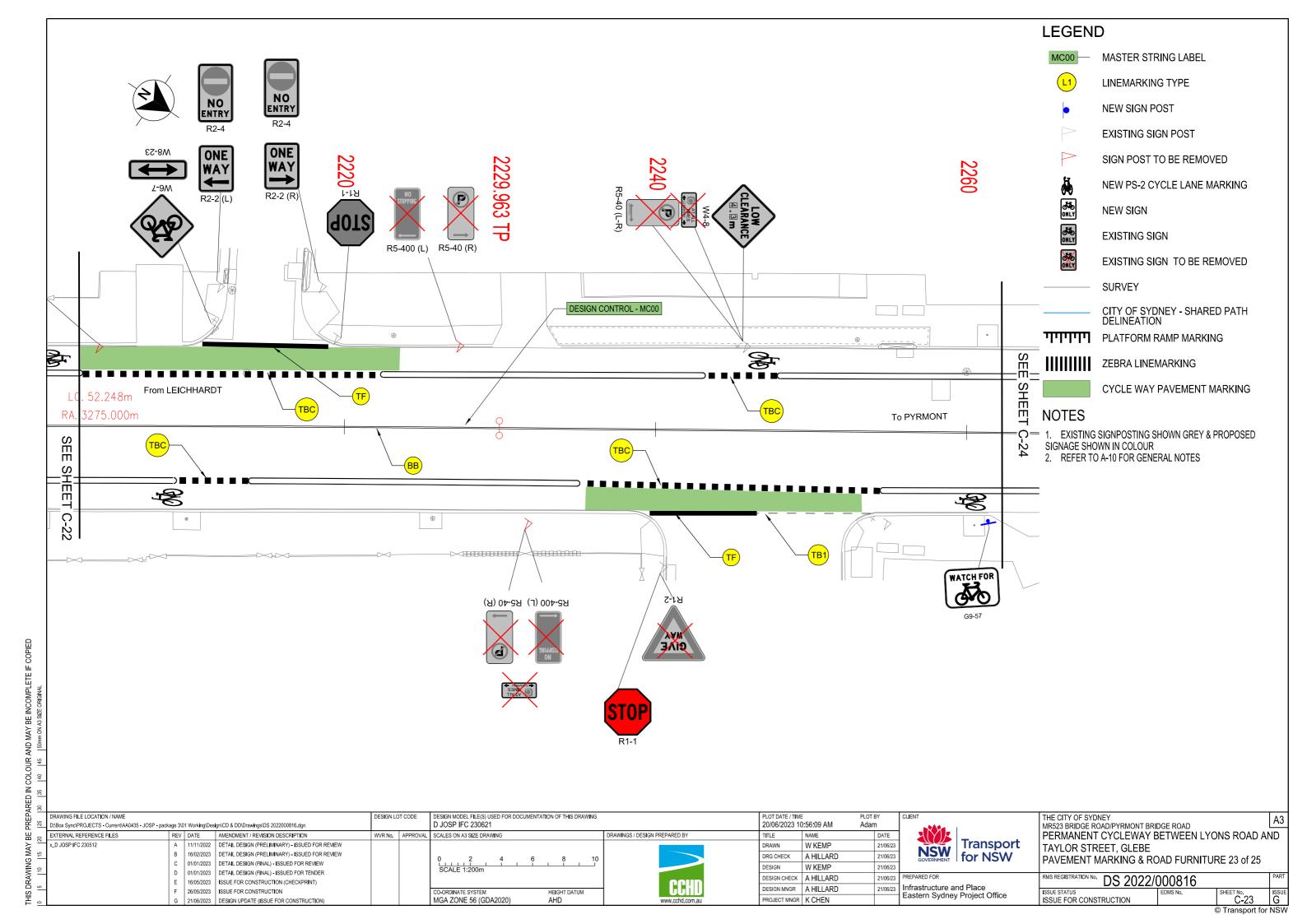


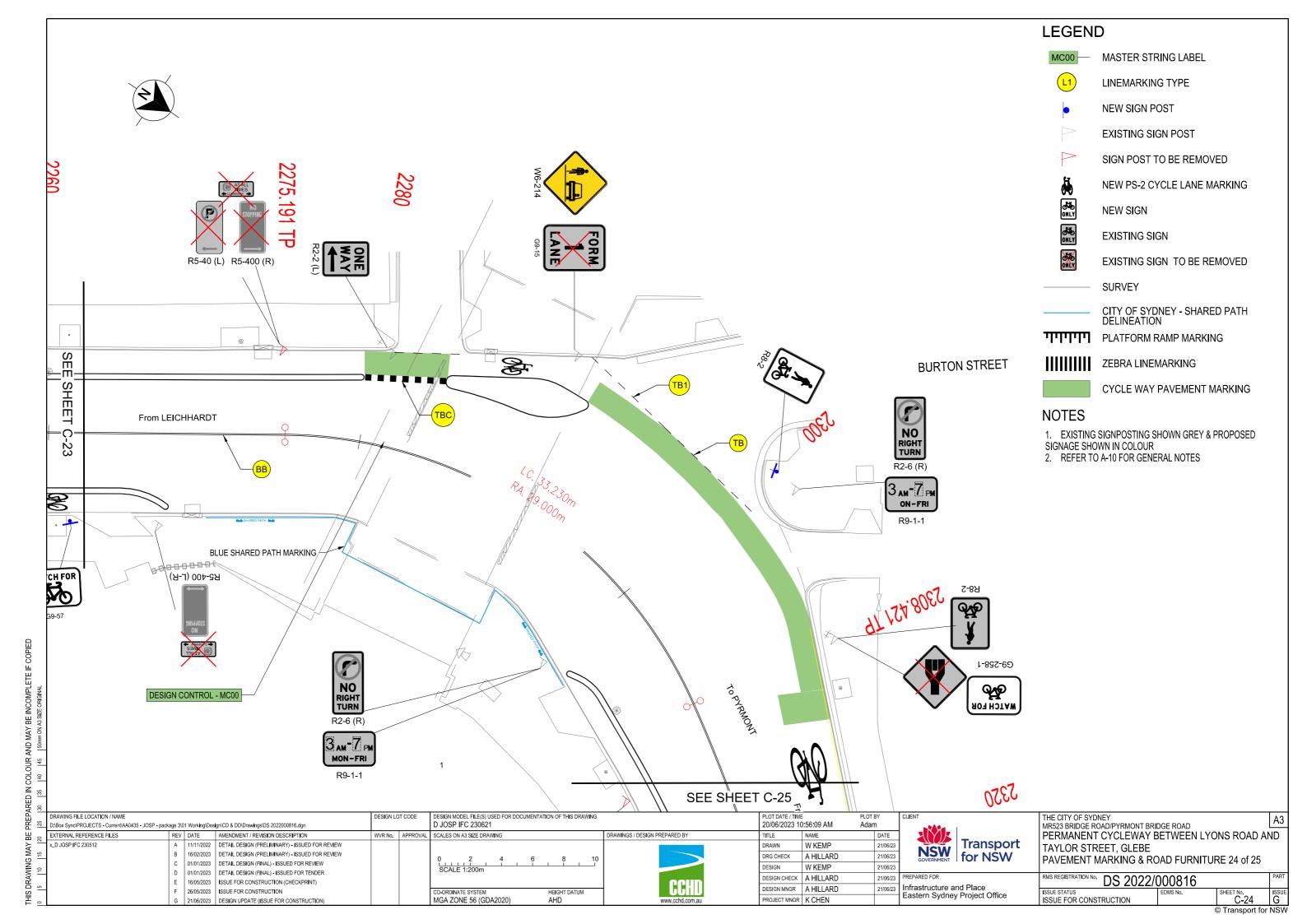
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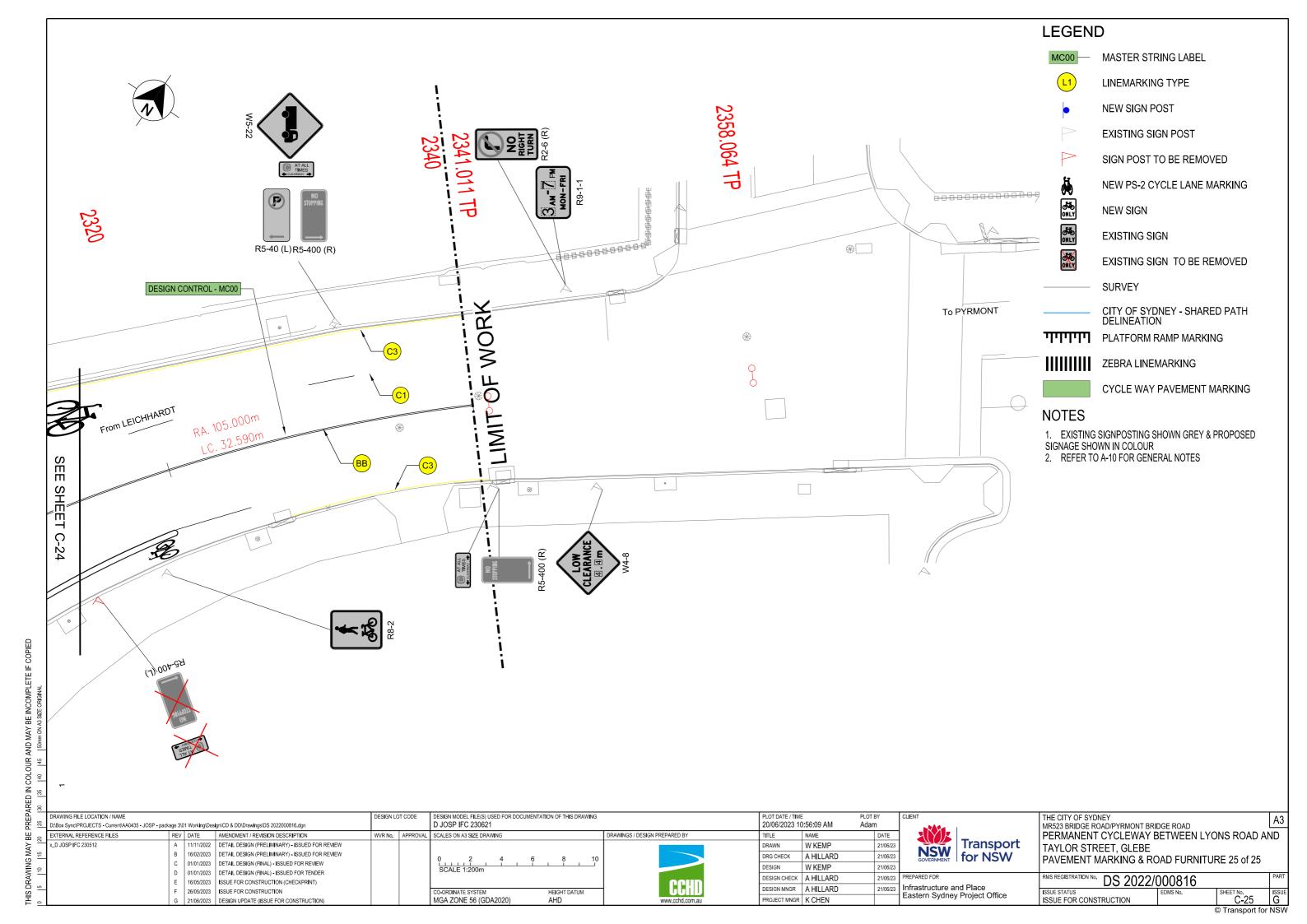


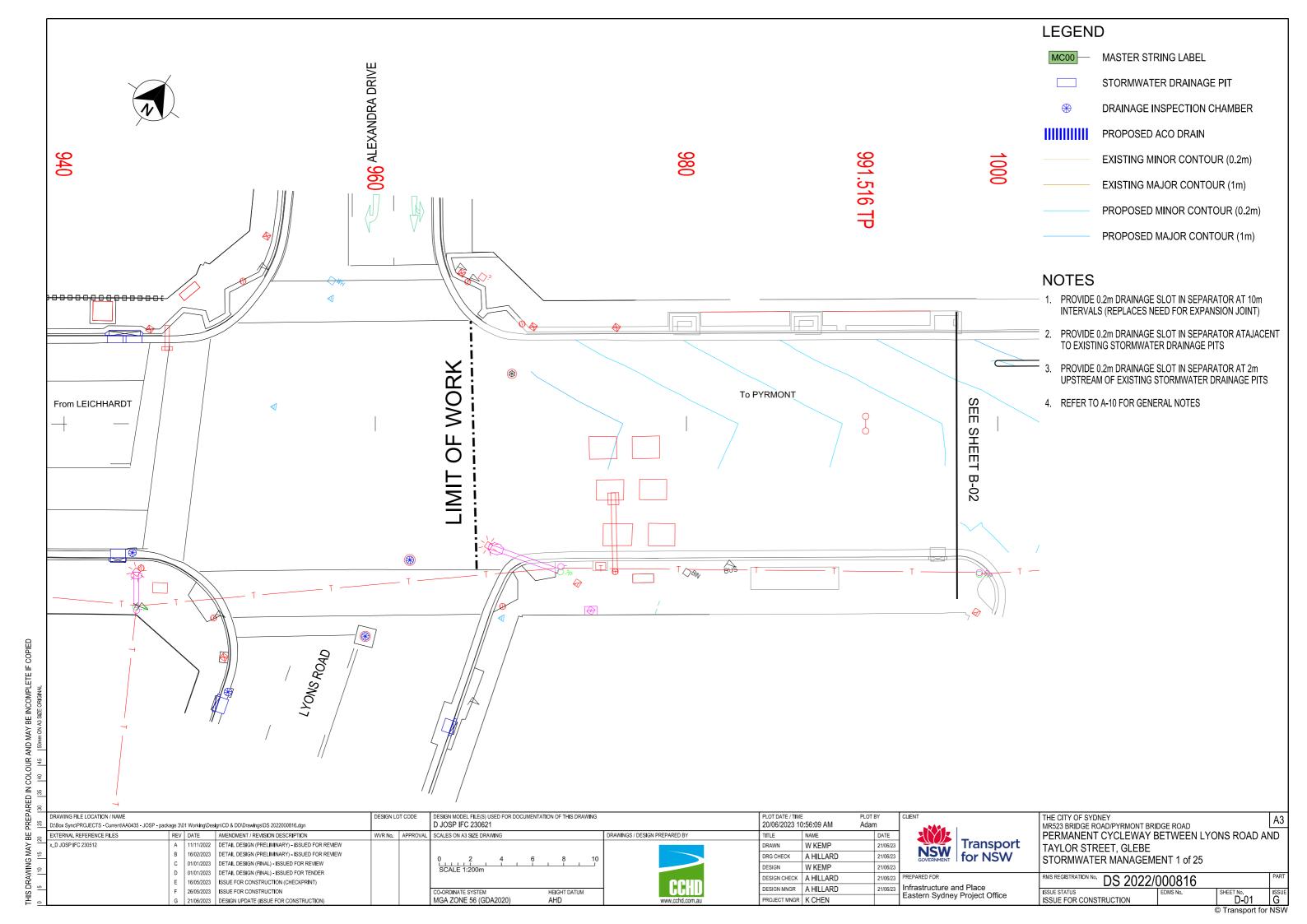


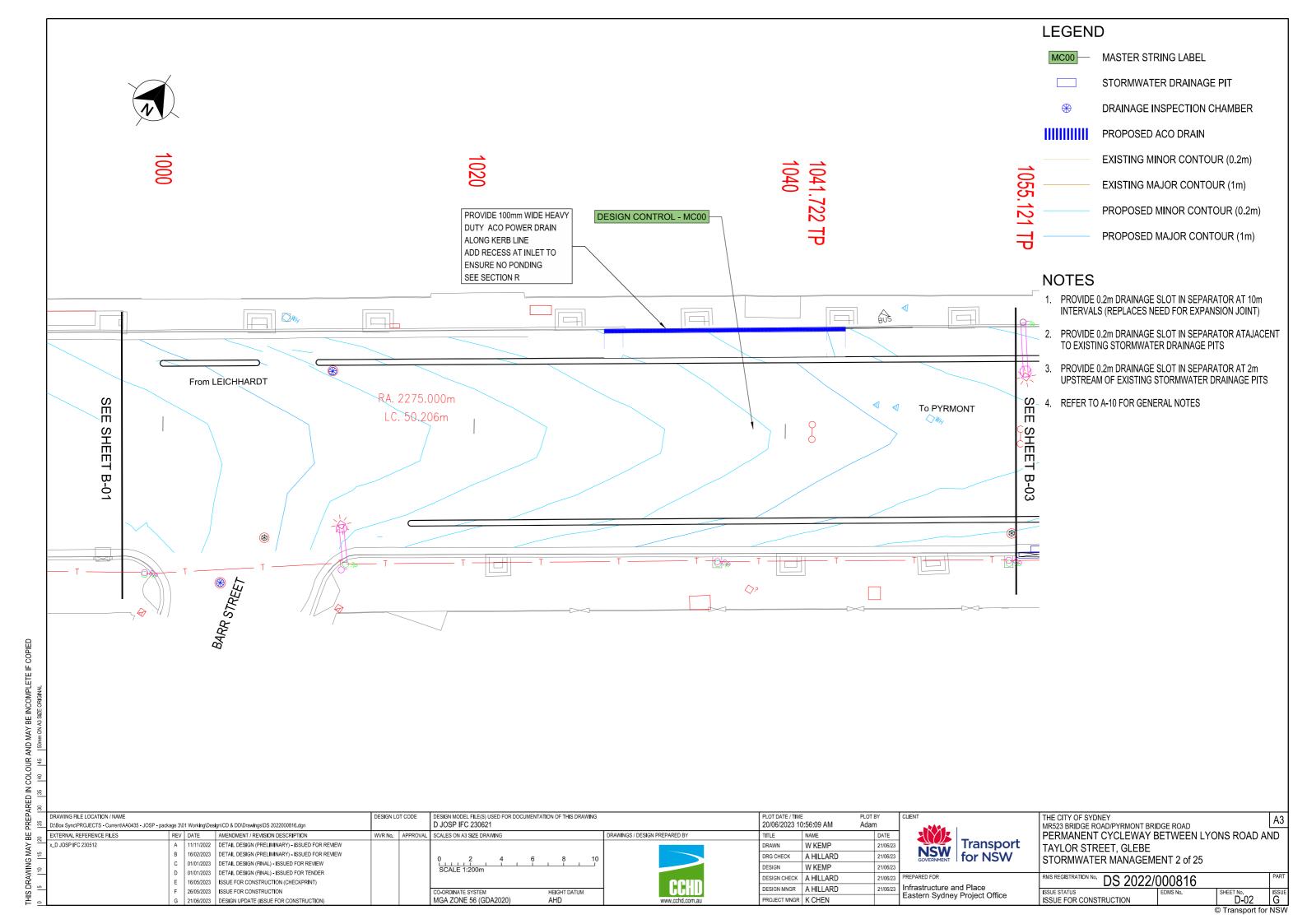


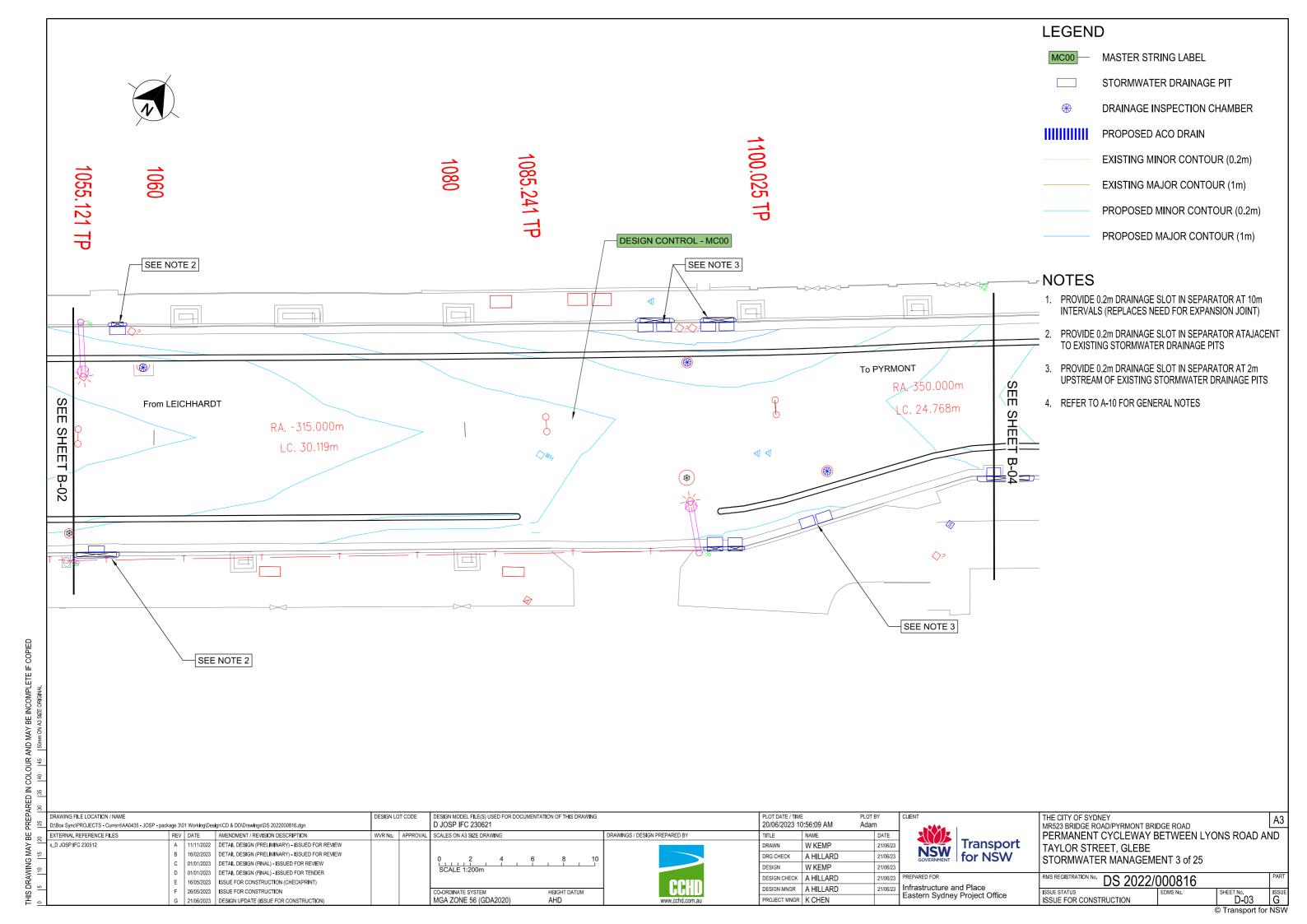


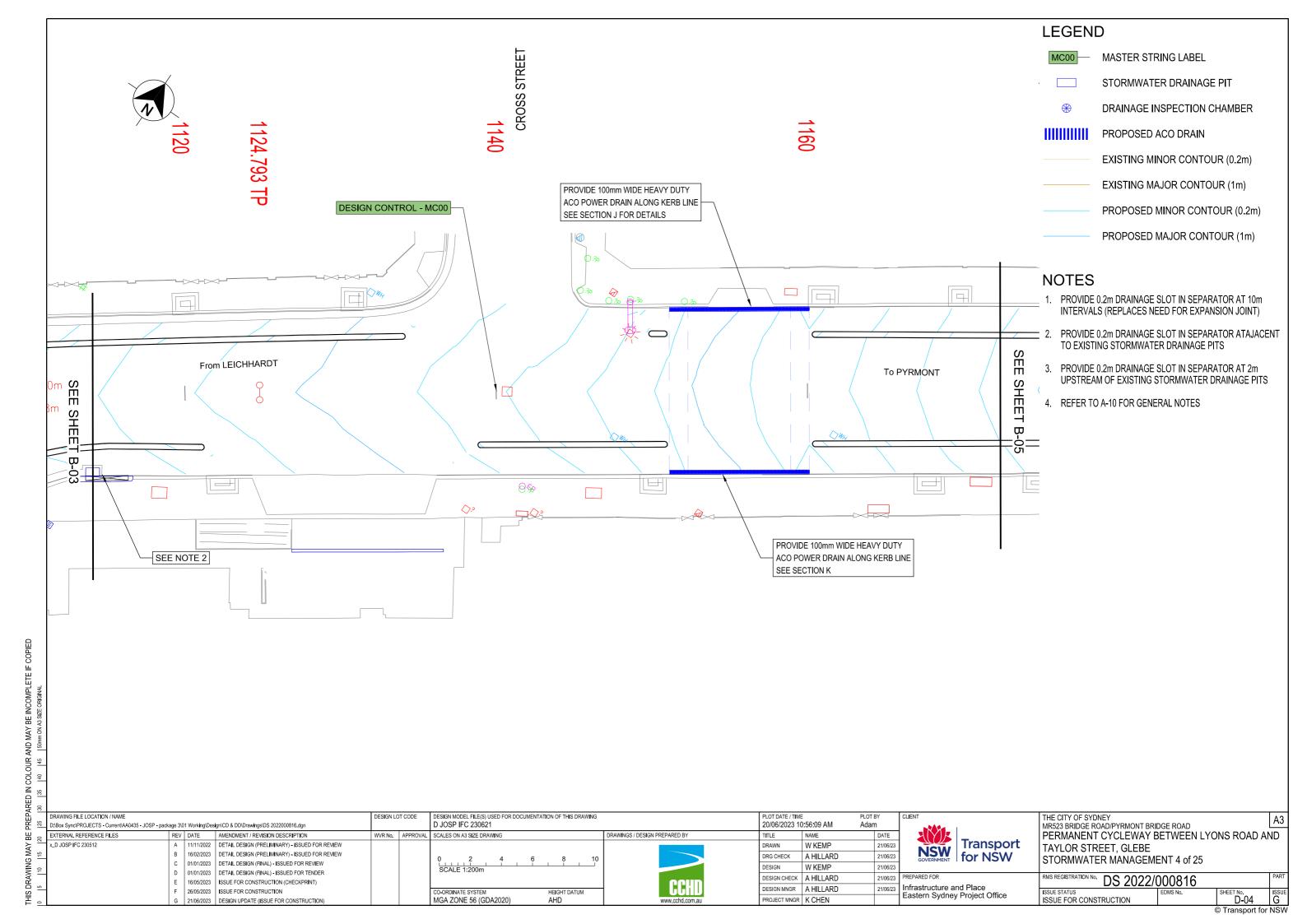


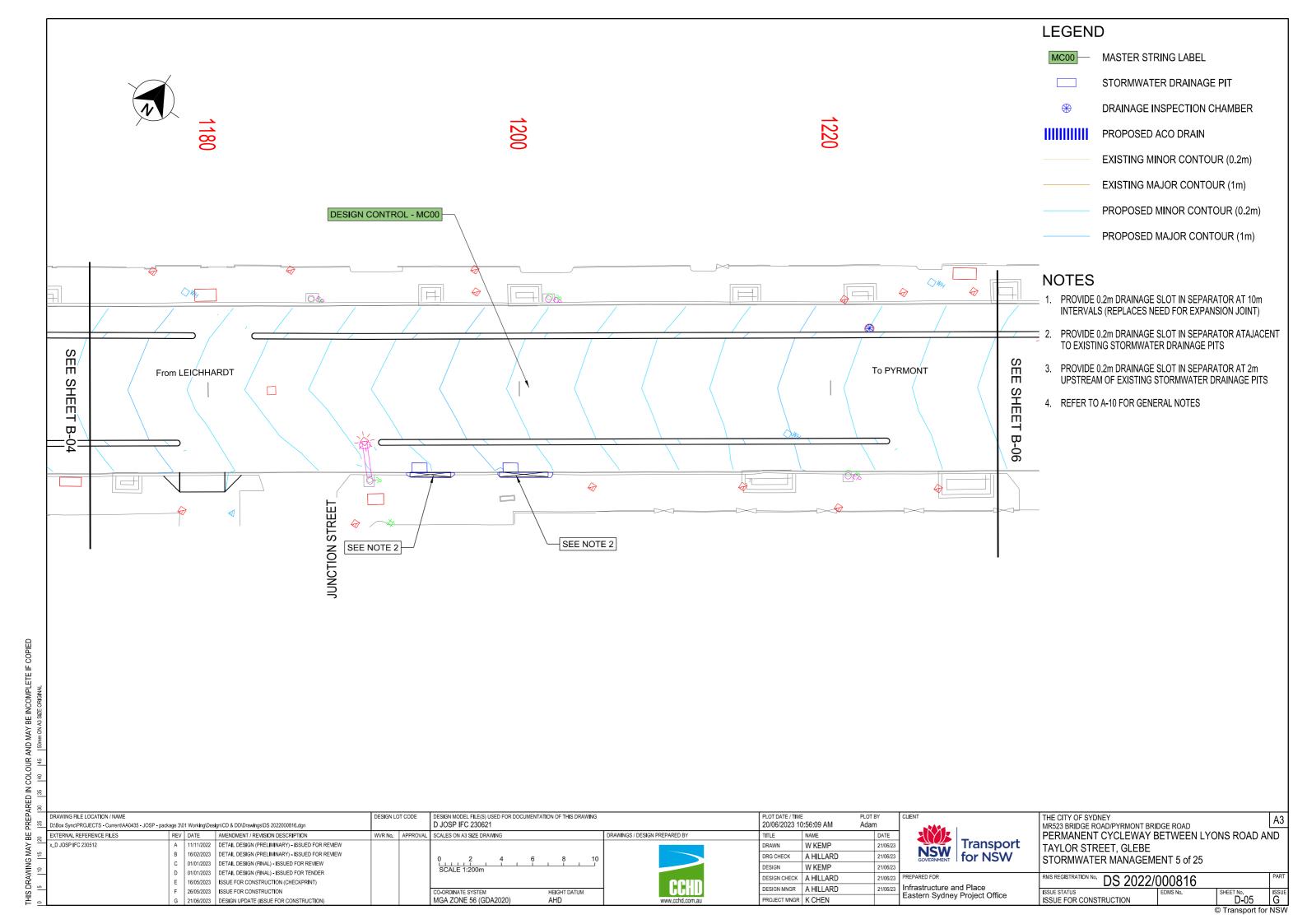


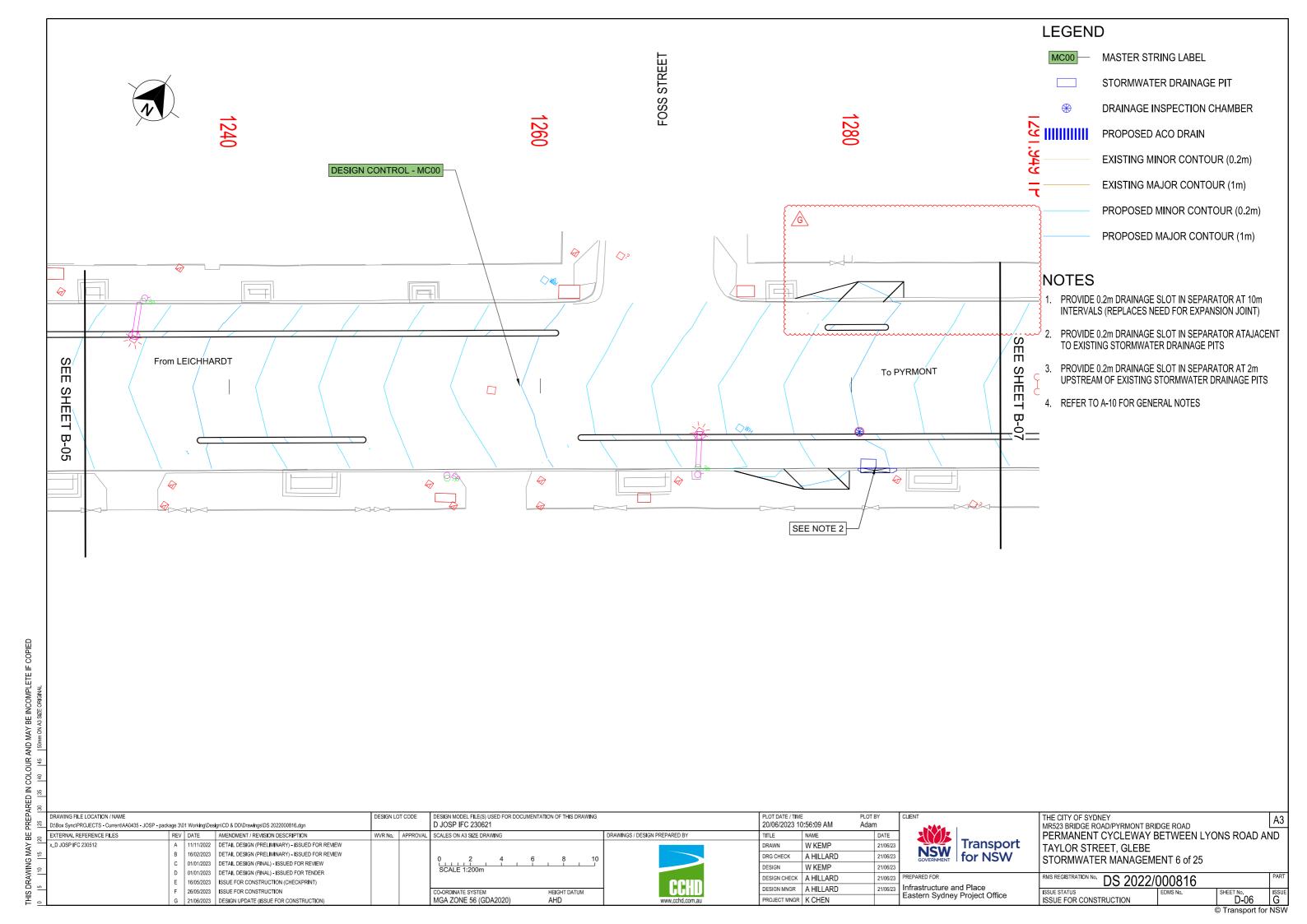


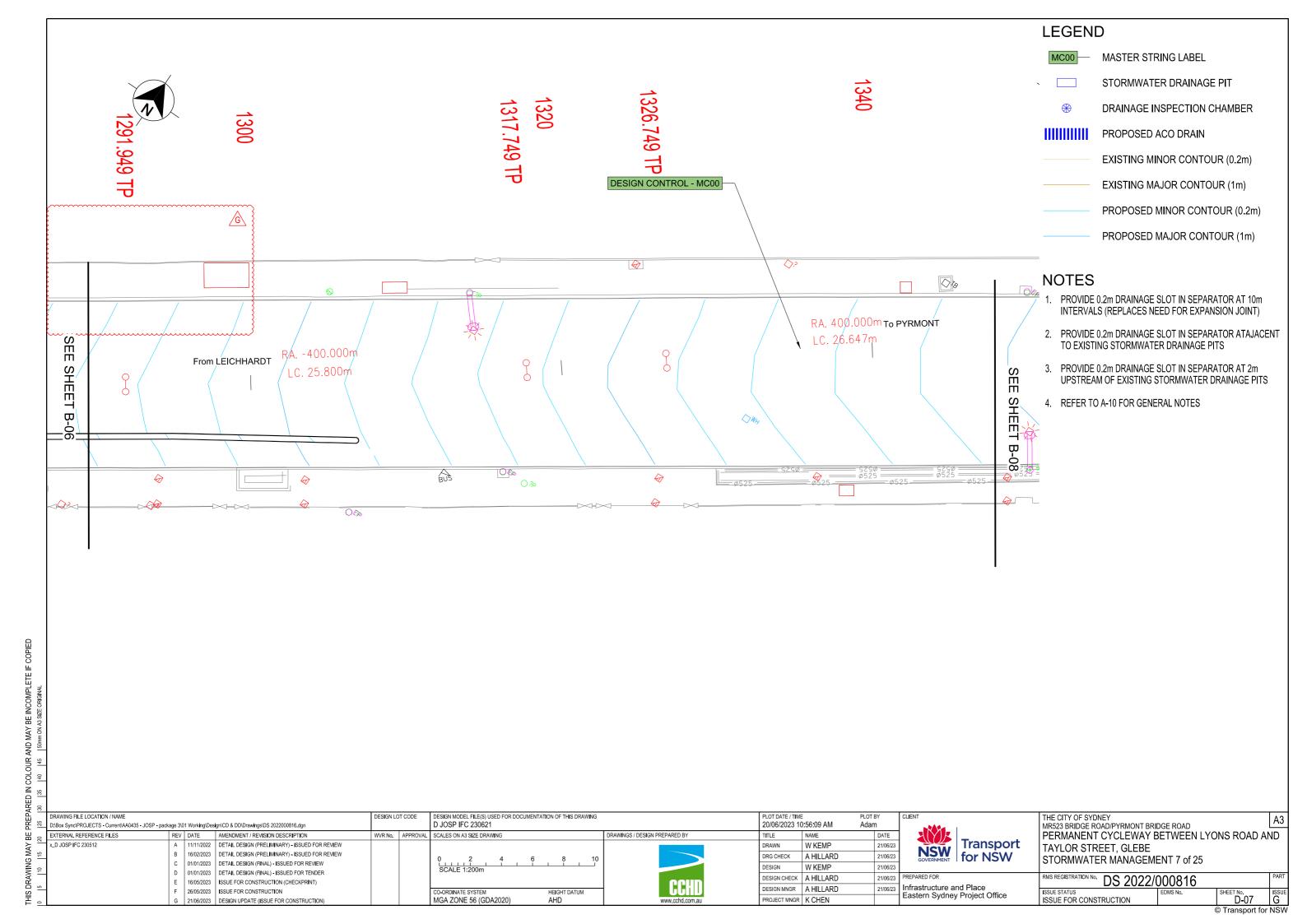


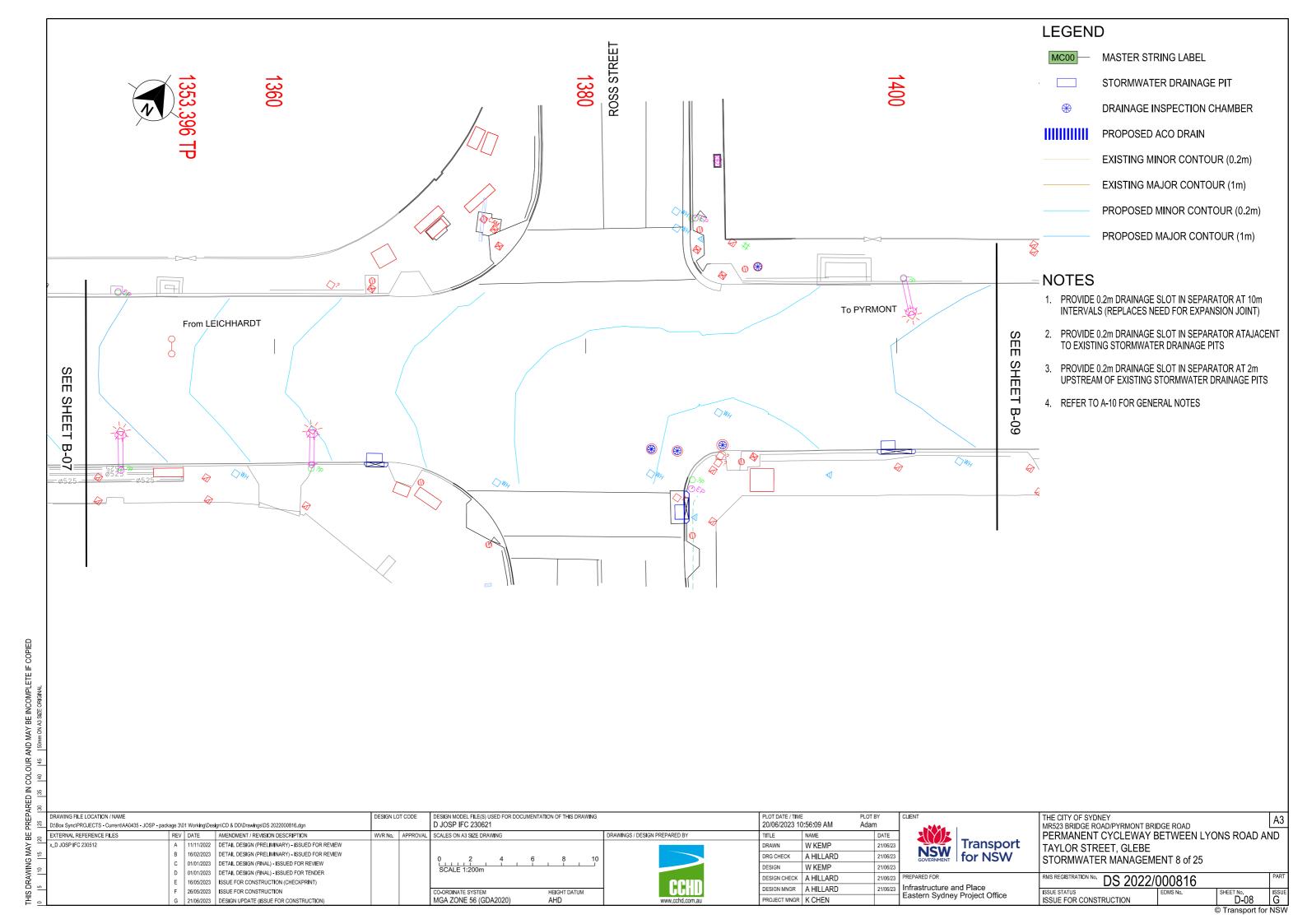


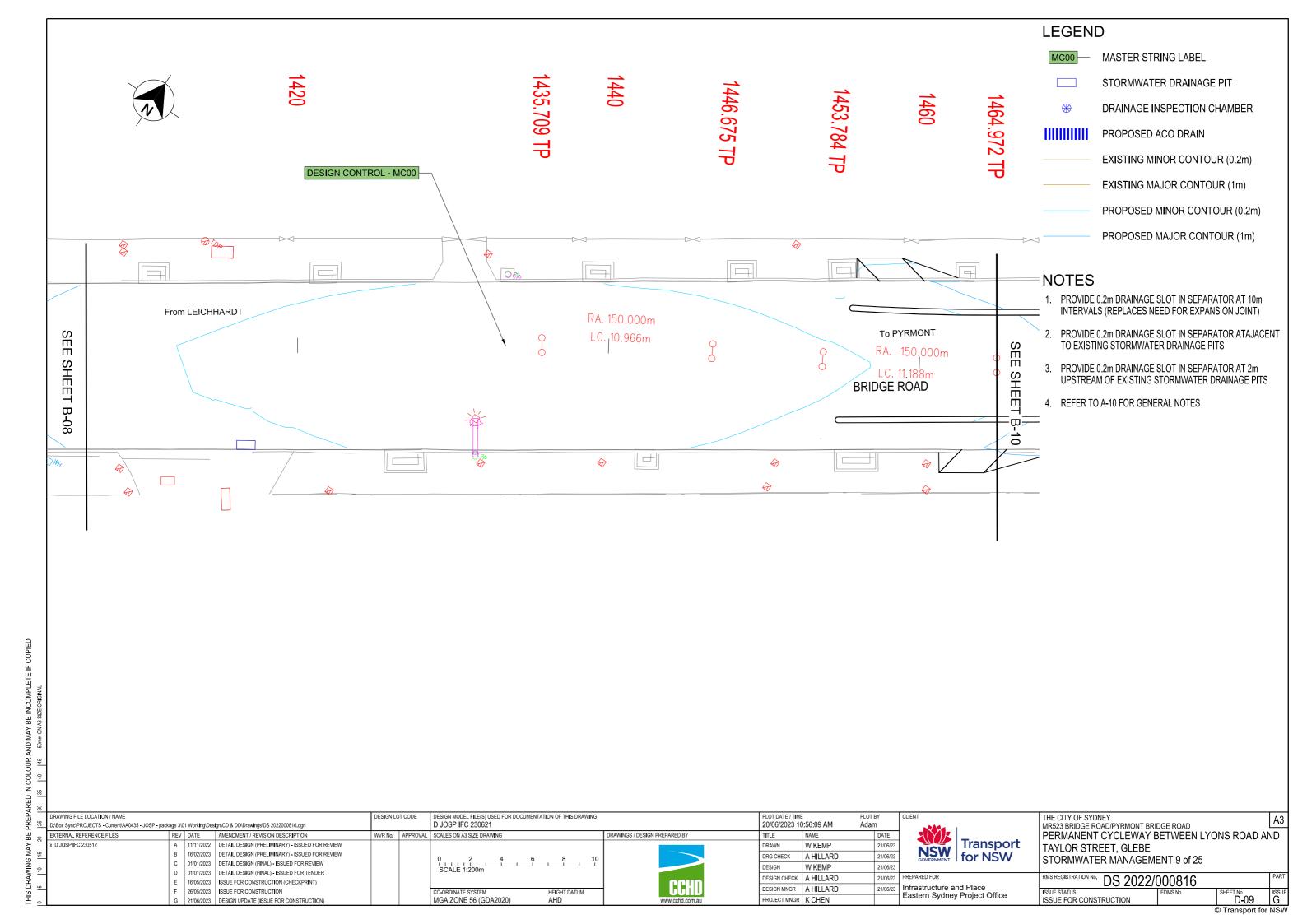


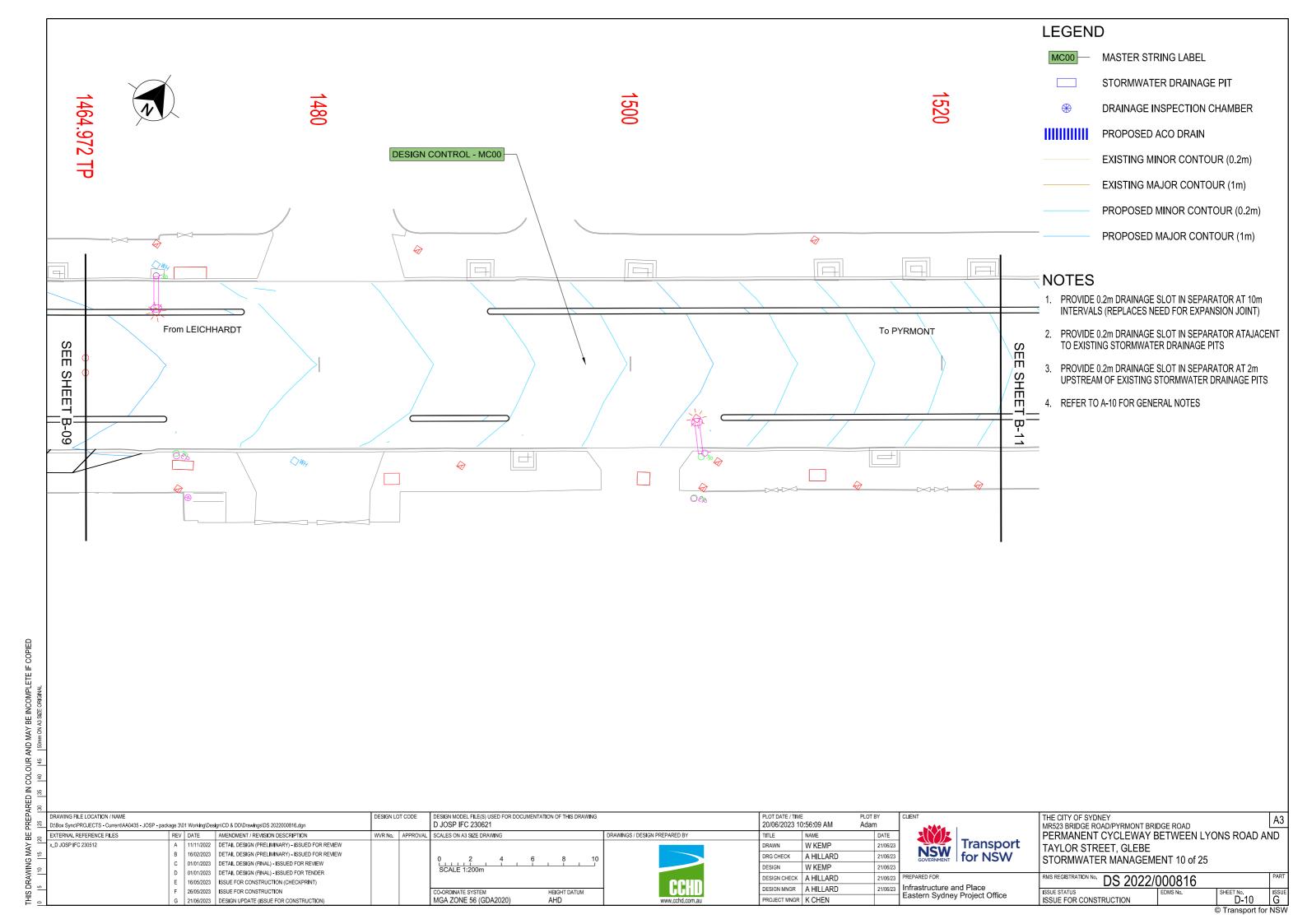


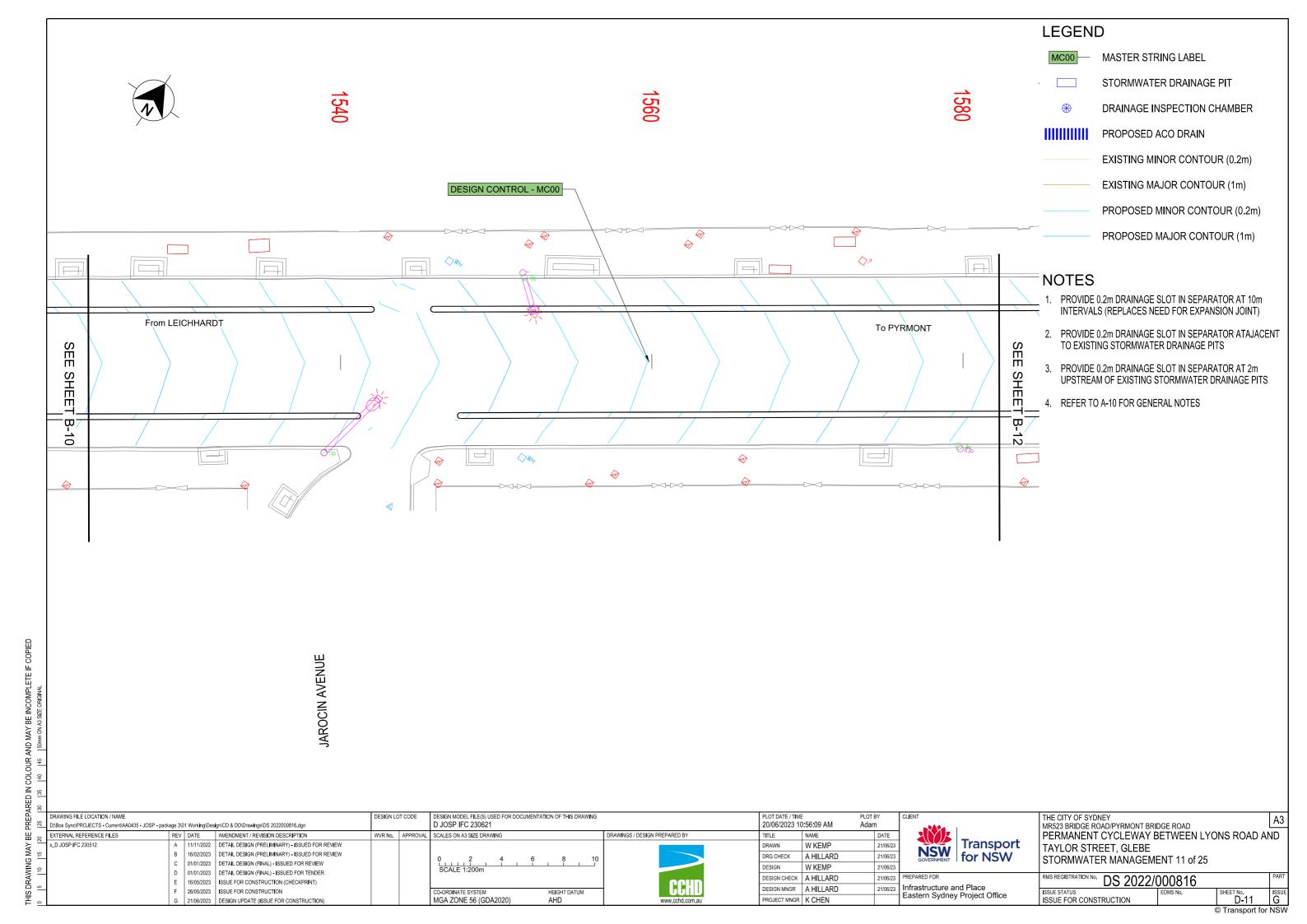


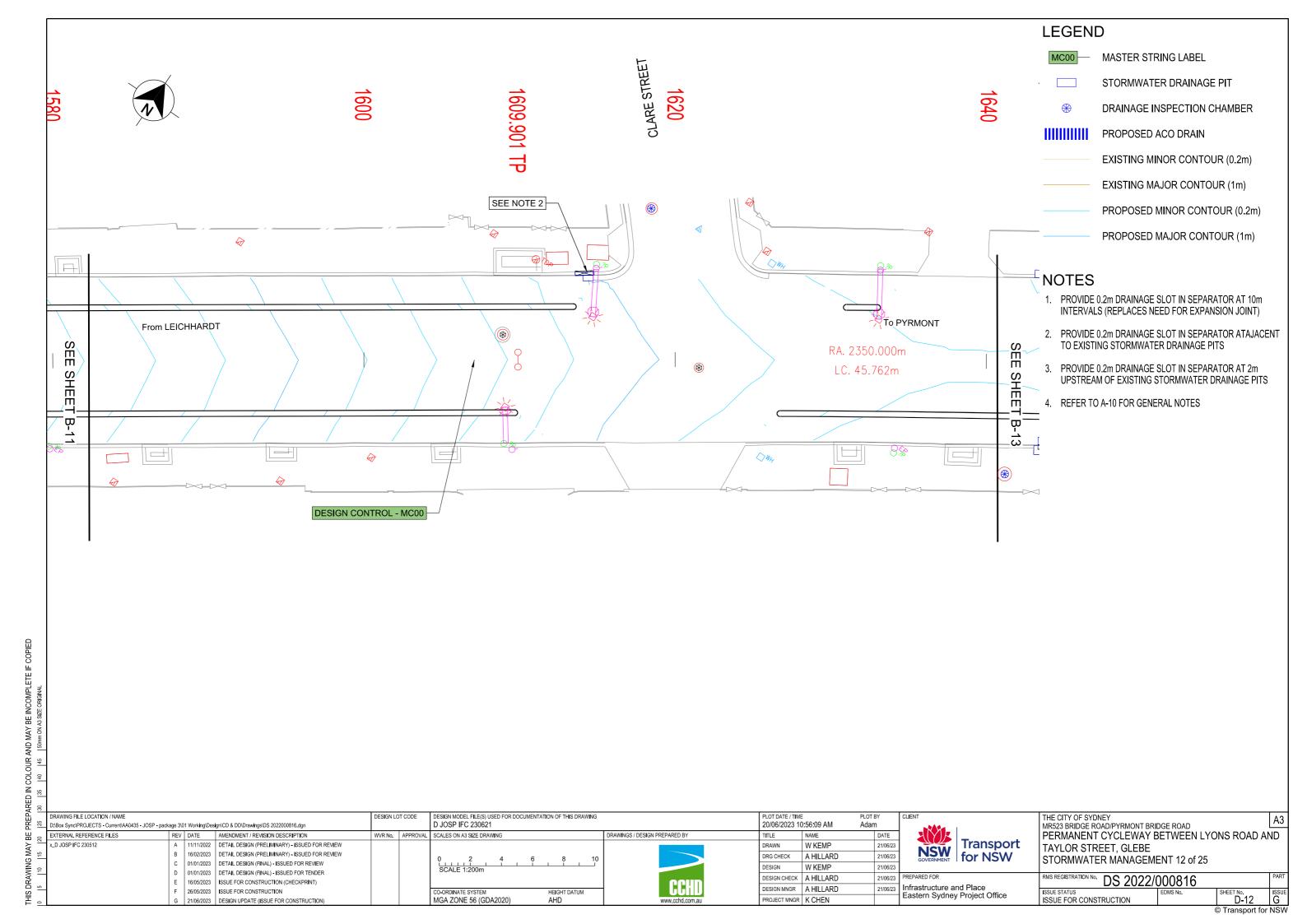


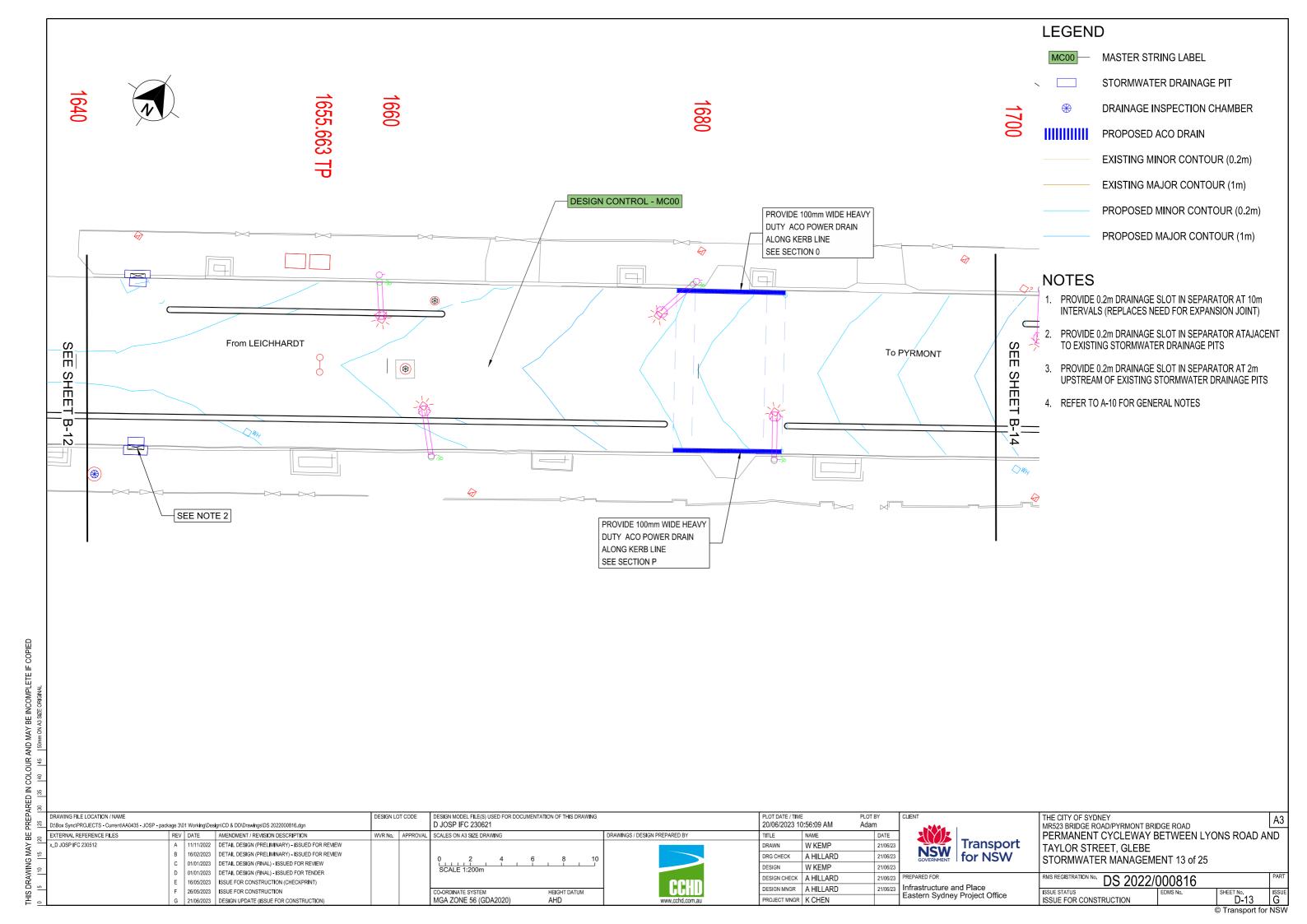


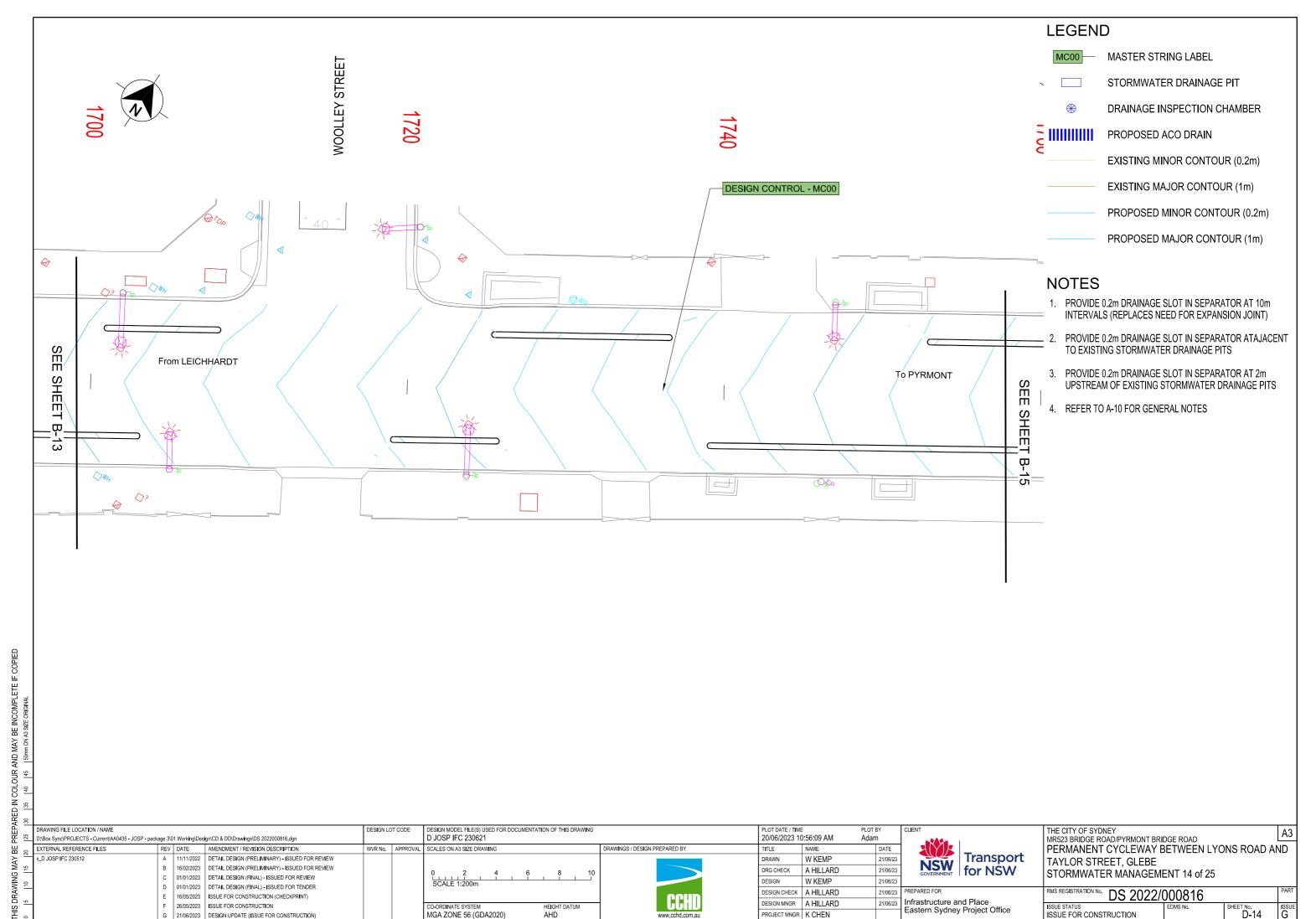




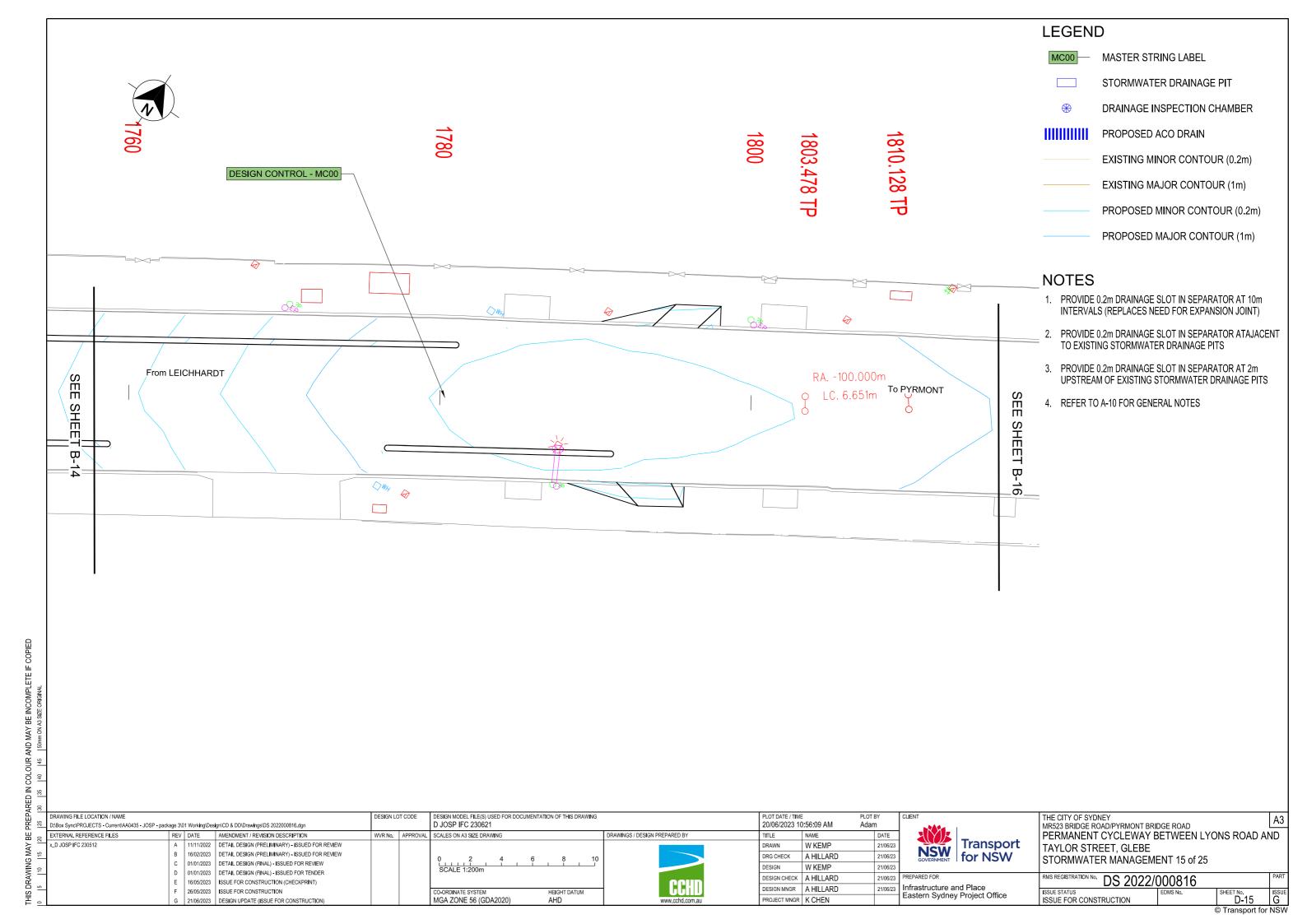


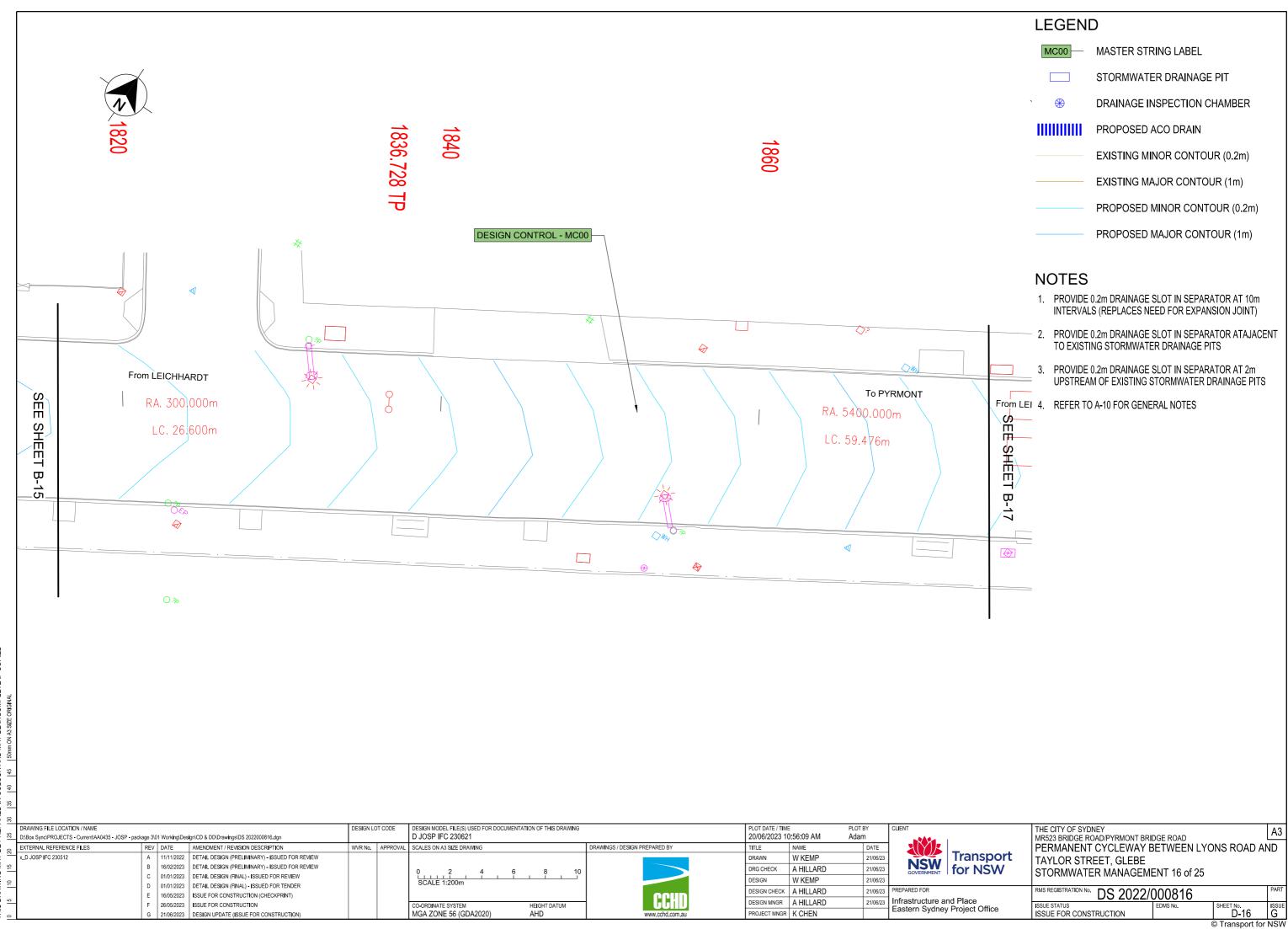


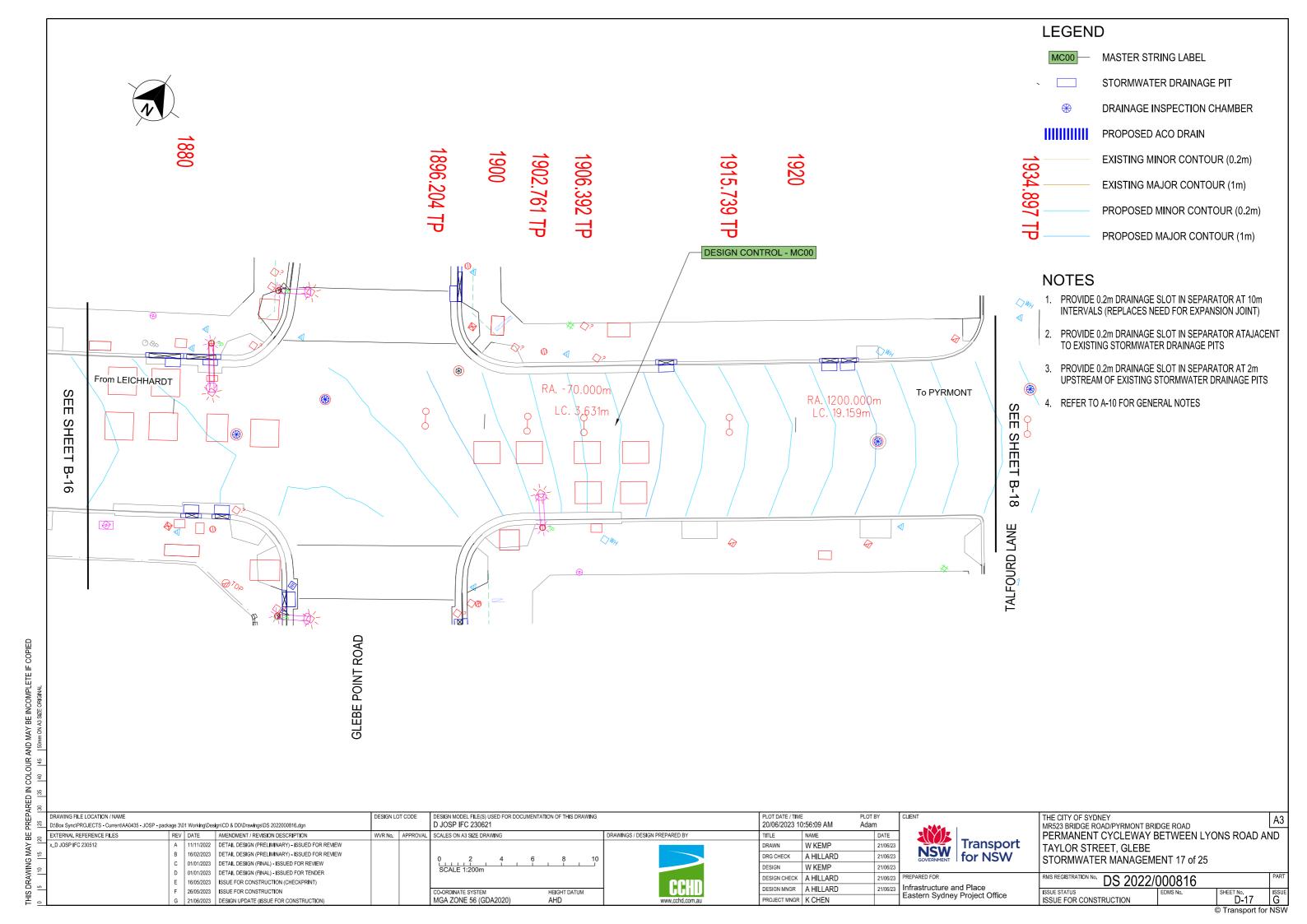


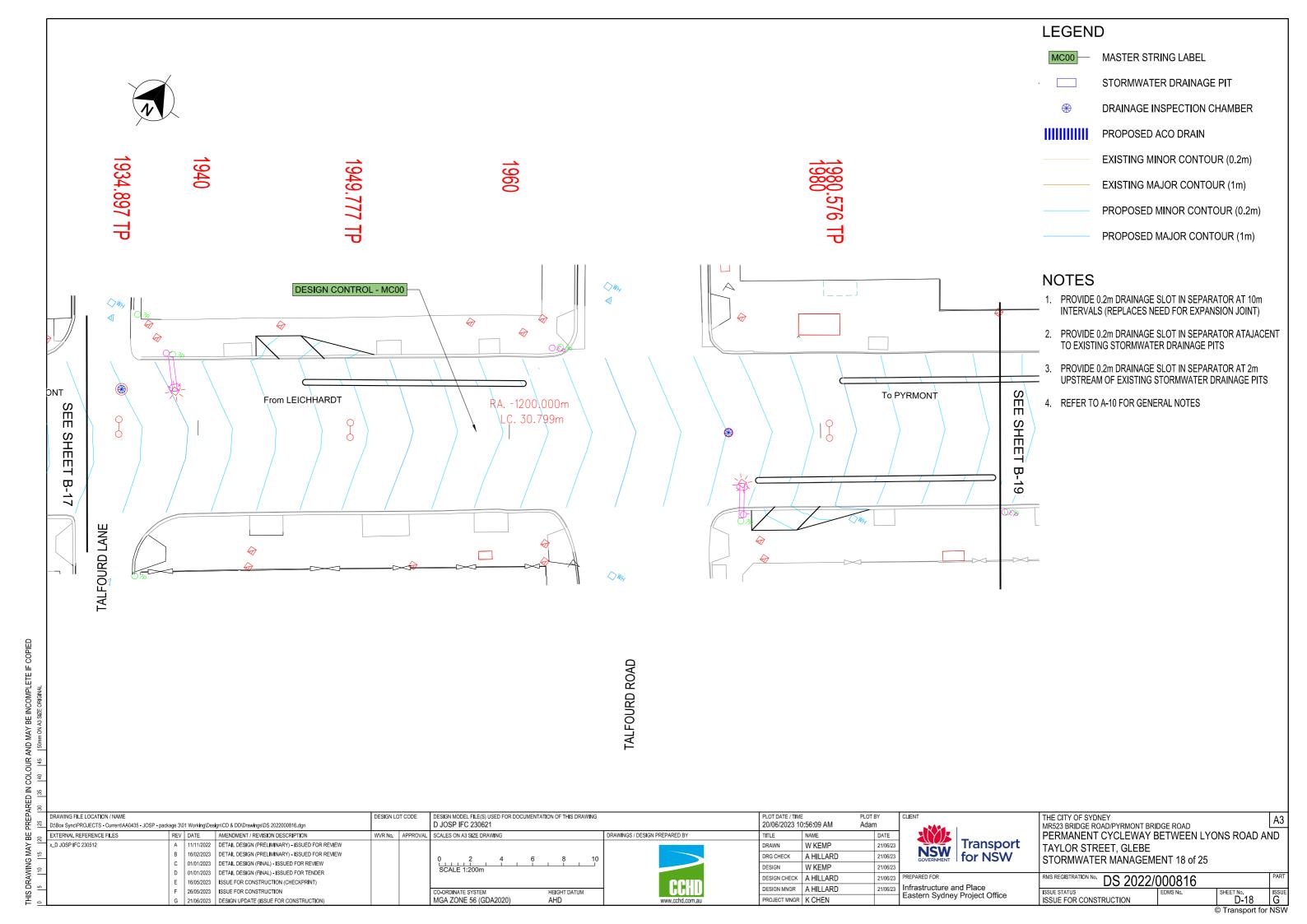


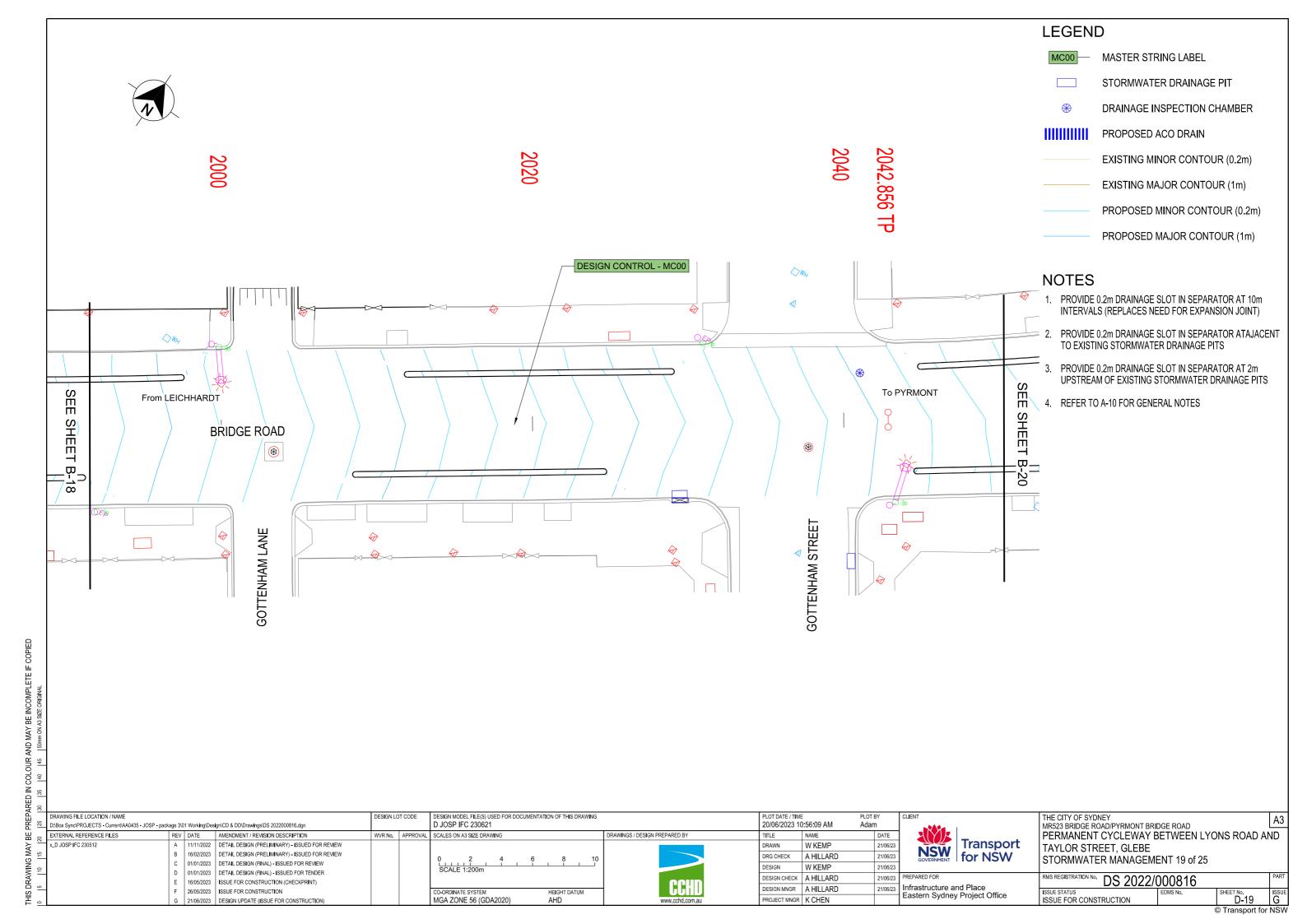
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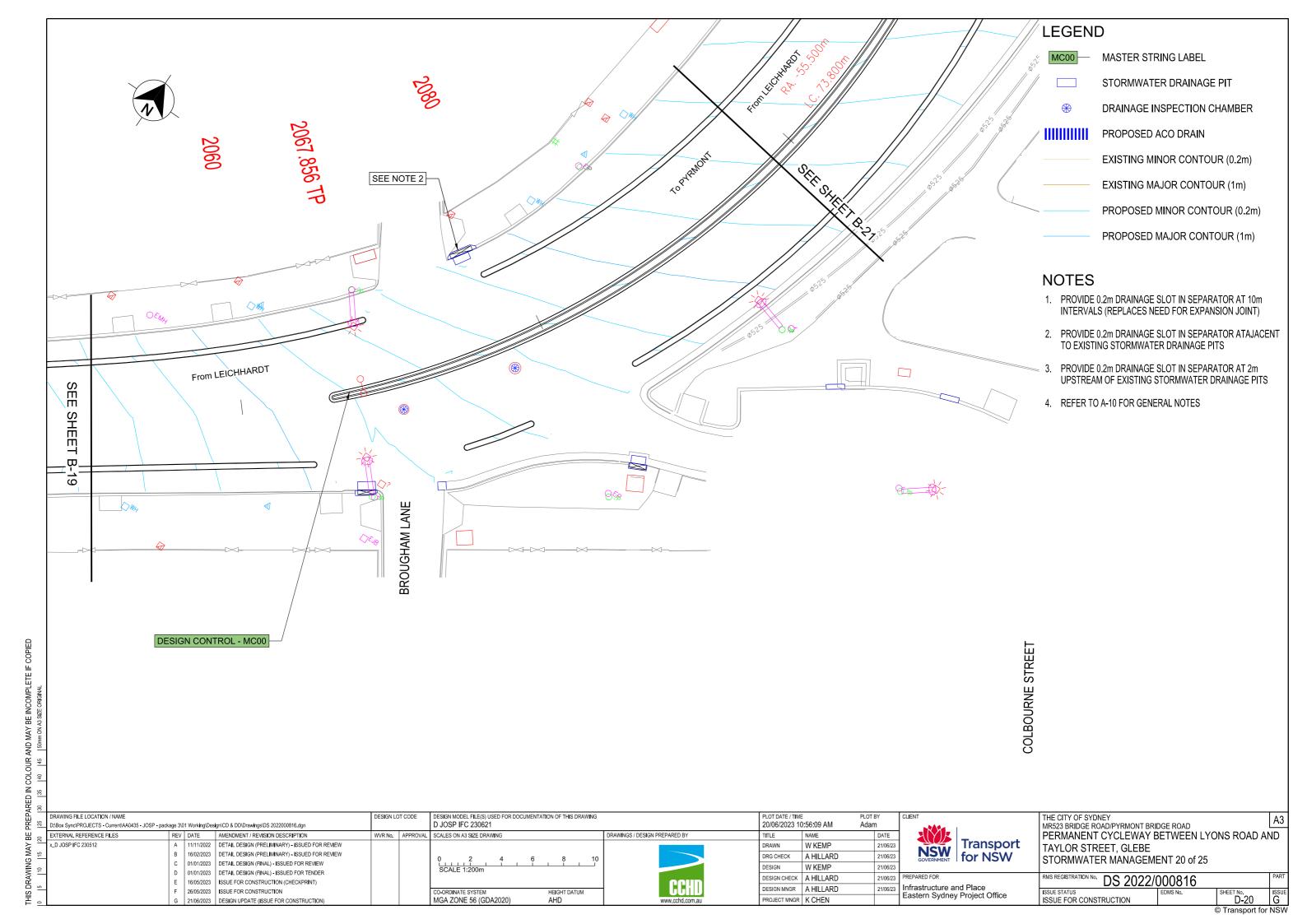


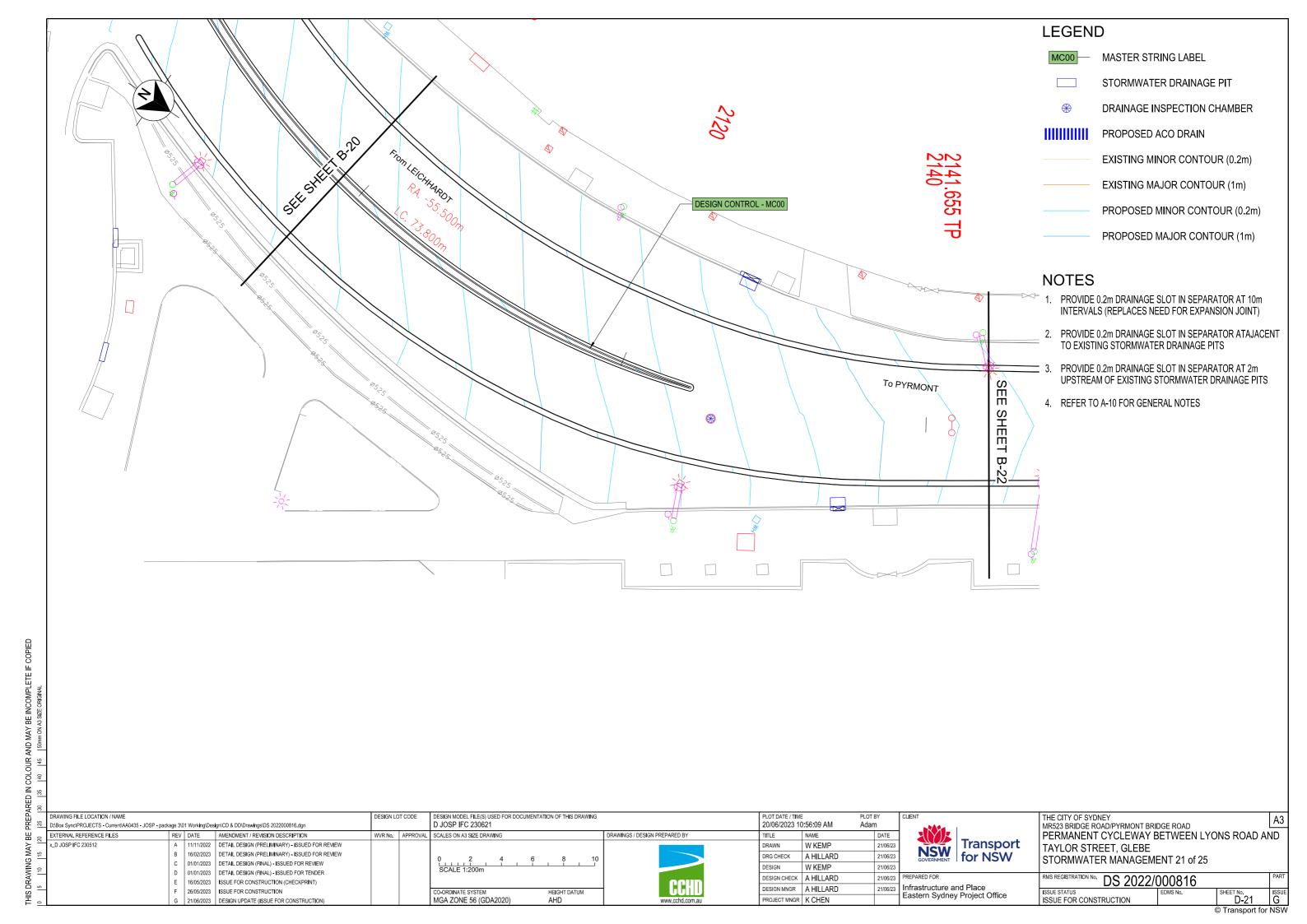


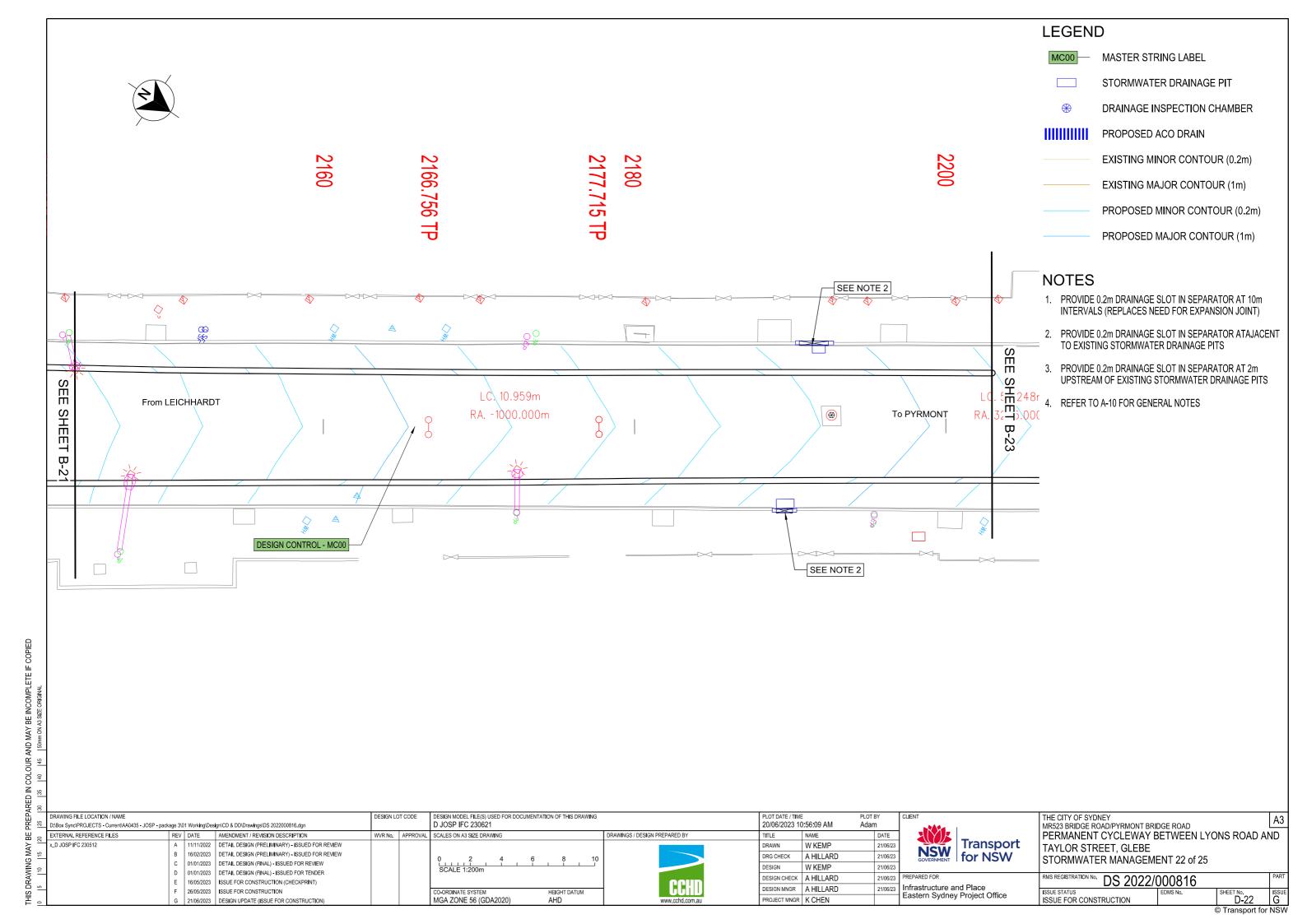


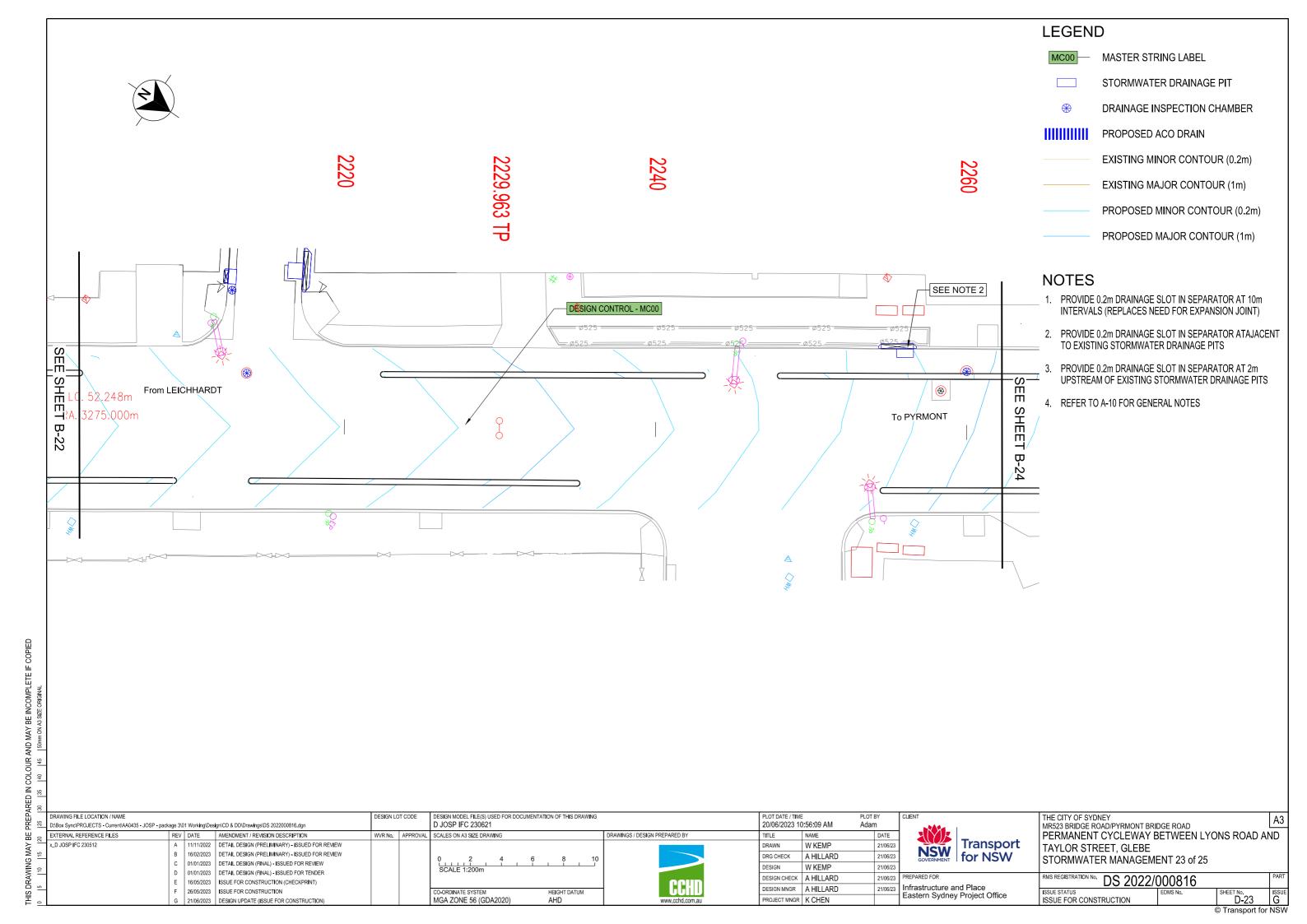


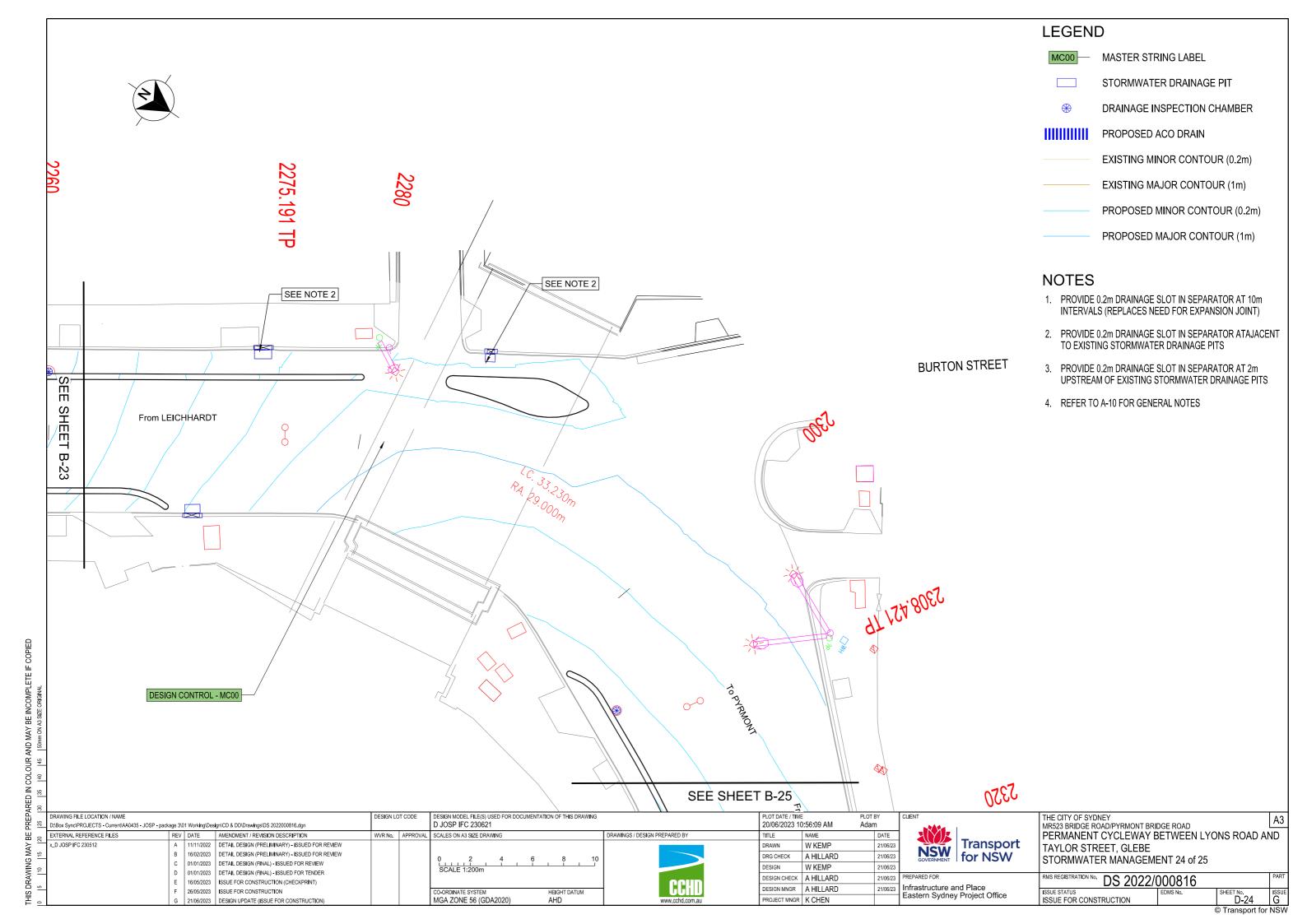


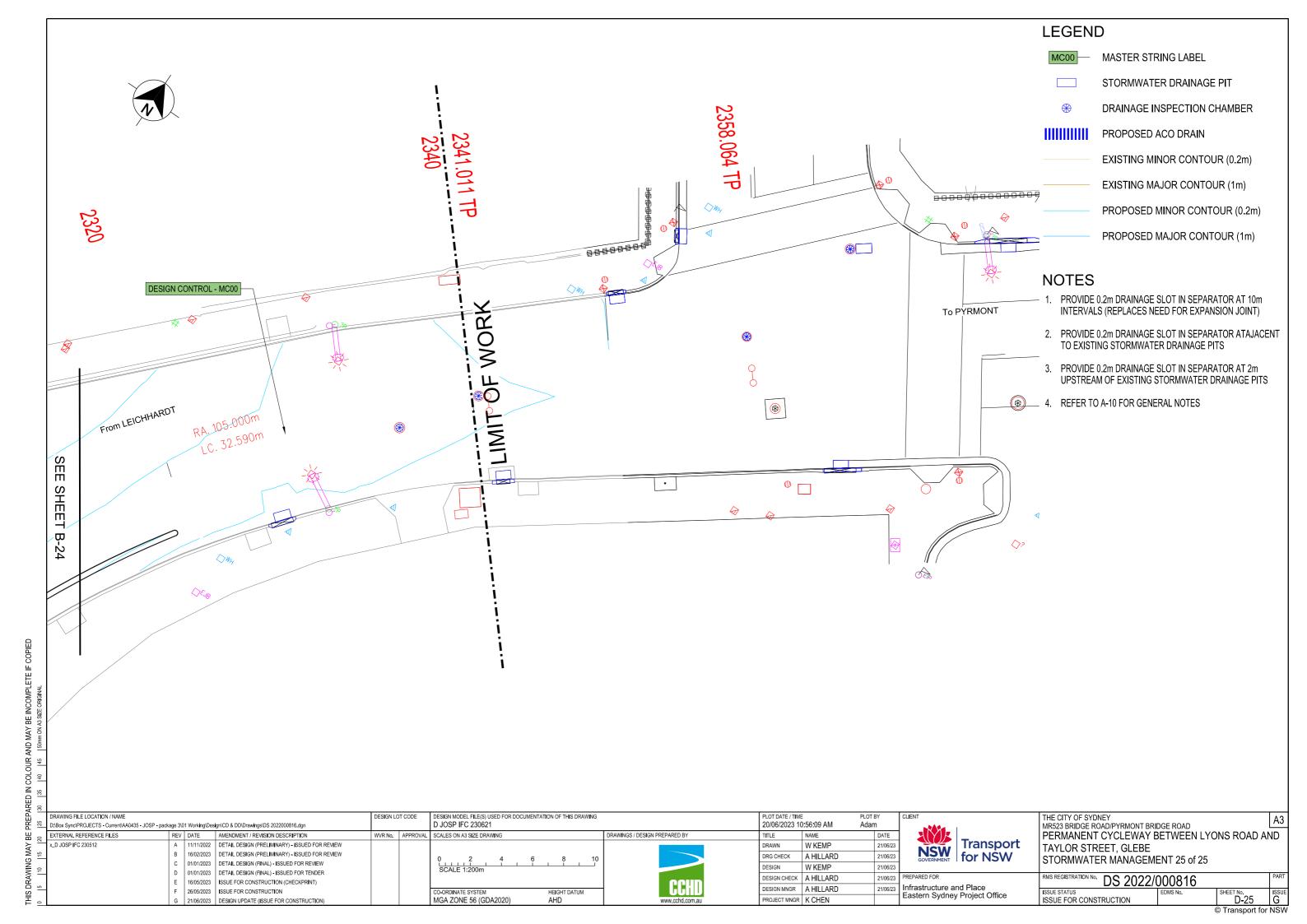












	STATION	EASTING	NORTHING	BEARING	RADIUS
START	0	331312.956	6249036.905	53 25 49.3	
Т.Р.	701.575	331328.557	6249048.478	53 25 49.3	
CENTRE		331668.162	6248590.693		570.000
Г.Р.	729.505	331351.386	6249064.563	56 14 16.0	
Т.Р.	738.762	331359.082	6249069.707	56 14 16.0	
CENTRE		331470.232	6248903.437		200.000
T.P.	795.865	331410.412	6249094.282	72 35 47.8	
T.P.	814.935	331428.610	6249099.985	72 35 47.8	
CENTRE		331334.394	6249400.566		-315.000
T.P.	908.178	331512.192	6249140.541	55 38 11.8	
Г.Р.	991.516	331580.986	6249187.581	55 38 11.8	
CENTRE		332865.086	6247309.626		2275.000
T.P.	1041.722	331622.739	6249215.459	56 54 3.8	
T.P.	1055.121	331633.964	6249222.777	56 54 3.8	
CENTRE		331461.947	6249486.661		-315.000
T.P.	1085.241	331658.372	6249240.405	51 25 21.4	
Г.Р.	1100.025	331669.930	6249249.624	51 25 21.4	
CENTRE		331888.180	6248976.006		350.000
Г.Р.	1124.793	331689.823	6249264.371	55 28 37.8	
Г.Р.	1291.949	331827.543	6249359.104	55 28 37.8	
CENTRE		331600.849	6249688.664		-400.000
Г.Р.	1317.749	331848.313	6249374.401	51 46 53.8	
Т.Р.	1326.749	331855.384	6249379.969	51 46 53.8	
CENTRE		332102.848	6249065.705		400.000
T.P.	1353.396	331876.853	6249395.745	55 35 54.6	
Т.Р.	1435.709	331944.769	6249442.251	55 35 54.6	
CENTRE		332029.517	6249318.486		150.000
Г.Р.	1446.675	331954.035	6249448.110	59 47 13.4	
Г.Р.	1453.784	331960.179	6249451.688	59 47 13.4	
CENTRE		331884.697	6249581.312		-150.000
Т.Р.	1464.972	331969.628	6249457.673	55 30 48.8	
Г.Р.	1609.901	332089.088	6249539.733	55 30 48.8	
CENTRE		333419.685	6247602.722		2350.000
T.P.	1655.663	332127.058	6249565.276	56 37 45.4	
Г.Р.	1803.478	332250.501	6249646.581	56 37 45.4	
CENTRE		332195.496	6249730.094		-100.000
T.P.	1810.128	332255.930	6249650.421	52 49 7.7	1
CENTRE	1	332437.231	6249411.403	1	300.000

CO-ORDINATES - MC00

		CO-ORDINATES -	MC00 CONTINUED		
	STATION	EASTING	NORTHING	BEARING	RADIUS
T.P.	1836.728	332277.807	6249665.537	57 53 56.2	
CENTRE		335147.444	6245091.131		5400.000
T.P.	1896.204	332328.363	6249696.865	58 31 48.0	
T.P.	1902.761	332333.955	6249700.288	58 31 48.0	
CENTRE		332297.412	6249759.992		-70.000
T.P.	1906.392	332337.002	6249702.263	55 33 29.1	
T.P.	1915.739	332344.710	6249707.549	55 33 29.1	
CENTRE		333023.395	6248717.910		1200.000
T.P.	1934.897	332360.596	6249718.258	56 28 22.2	
T.P.	1949.777	332373.001	6249726.477	56 28 22.2	
CENTRE		331710.202	6250726.826		-1200.000
T.P.	1980.576	332398.454	6249743.816	55 0 8.3	
T.P.	2042.856	332449.472	6249779.536		T = 25.000
T.P.	2067.856	332468.775	6249795.334	42 5 52.0	
CENTRE		332427.594	6249832.541		-55.500
T.P.	2141.655	332473.557	6249863.648	325 54 36.7	
T.P.	2166.756	332459.488	6249884.435	325 54 36.7	
CENTRE		331631.328	6249323.944		-1000.000
T.P.	2177.715	332453.296	6249893.477	325 16 56.3	
CENTRE		335145.242	6251758.699		3275.000
T.P.	2229.963	332423.883	6249936.659	326 11 46.9	
T.P.	2275.191	332398.720	6249974.241	326 11 46.9	
CENTRE		332422.818	6249990.375		29.000
T.P.	2308.421	332398.184	6250005.678	31 50 57.4	
CENTRE		332487.375	6249950.271	1	105.000
T.P.	2341.011	332419.368	6250030.272	49 37 57.6	
END	2358.064	332432.362	6250041.317	49 37 57.6	

		CO-ORD	INATES MK0H		
	STATION	EASTING	NORTHING	BEARING	RADIUS
START	0.000	332481.263	6249848.460	341 33 54.2	
CENTRE		332481.035	6249848.384		-0.240
T.P.	0.746	332480.805	6249848.316	163 29 13.0	
CENTRE		332427.594	6249832.541		55.500
T.P.	59.430	332467.470	6249793.939	224 6 52.9	
CENTRE		332467.700	6249793.716		-0.320
T.P.	60.430	332467.927	6249793.490	44 56 17.2	
CENTRE		332428.994	6249832.339		-55.000
T.P.	93.340	332483.045	6249822.169	10 39 22.5	
CENTRE		332431.451	6249831.877		-52.500
END	119.965	332481.266	6249848.450		

CO-ORDINATES MK1L									
	STATION	EASTING	NORTHING	BEARING	RADIUS				
START	0.000	332400.898	6249997.976	349 54 27.9					
T.P.	0.599	332400.793	6249998.566	349 54 27.9					
CENTRE		332404.141	6249999.162		3.400				
T.P.	2.697	332401.066	6250000.612	25 15 35.8					
T.P.	6.496	332402.687	6250004.048	25 15 35.8					
CENTRE		332460.205	6249976.908		63.600				
END	15.781	332407.247	6250012.126						

		CO-ORD	INATES MX00		
	STATION	EASTING	NORTHING	BEARING	RADIUS
START	0.000	331566.913	6249174.410	55 55 45.0	
CENTRE		331202.772	6249712.834		-650.000
T.P.	11.703	331576.548	6249181.053	54 53 51.0	
T.P.	33.177	331594.117	6249193.401	54 53 51.0	
CENTRE		331019.076	6250011.526		-1000.000
T.P.	60.736	331616.442	6249209.558	53 19 6.6	
T.P.	71.105	331624.758	6249215.752	53 19 6.6	
CENTRE		332042.914	6248654.374		700.000
END	92.669	331642.247	6249228.365		

		CO-ORD	INATES MK1K		
	STATION	EASTING	NORTHING	BEARING	RADIUS
START	0.000	332413.121	6249959.164	325 47 0.4	
T.P.	9.960	332407.520	6249967.400	325 47 0.4	
CENTRE		332411.655	6249970.212		5.000
END	13.246	332406.664	6249970.511		

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	STATION	EASTING	NORTHING	BEARING	RADI
START	0.000	331827.543	6249359.104	55 28 37.8	
T.P.	12.294	331837.672	6249366.071	55 28 37.8	
CENTRE		332177.713	6248871.731		600.000
T.P.	33.834	331855.634	6249377.957	57 32 2.5	
T.P.	38.858	331859.873	6249380.655	57 32 2.5	
CENTRE		331725.673	6249591.582		-250.000
T.P.	47.304	331866.921	6249385.308	55 35 54.6	
T.P.	128.348	331933.790	6249431.097	55 35 54.6	
CENTRE		331736.044	6249719.881		-350.000
T.P.	151.660	331952.572	6249444.899	51 46 55.8	
T.P.	158.544	331957.980	6249449.157	51 46 55.8	
CENTRE		332081.711	6249292.024		200.000
T.P.	171.569	331968.469	6249456.876	55 30 48.8	
END	187.995	331982.008	6249466.177	55 30 48.8	

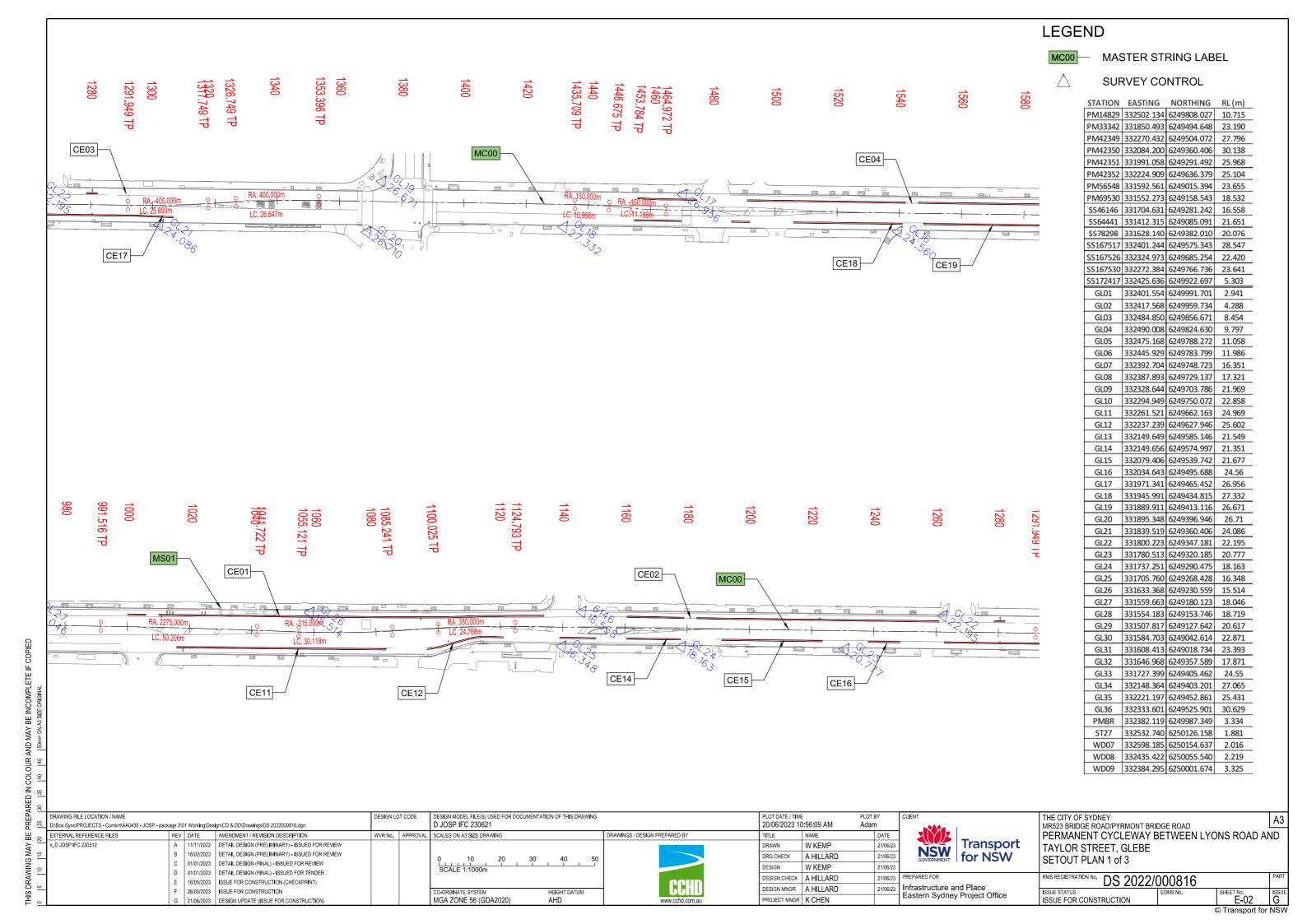
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	STATION	EASTING	NORTHING	BEARING	RADIUS
START	0.000	332226.296	6249630.638	56 37 45.5	
CENTRE		332435.315	6249313.291		379.998
T.P.	20.500	332243.712	6249641.447	59 43 12.9	
T.P.	22.094	332245.088	6249642.251	59 43 12.9	
CENTRE		331640.021	6250678.539		-1200.000
T.P.	55.663	332273.837	6249659.581	58 7 2.7	
T.P.	102.299	332313.437	6249684.212	58 7 2.7	
CENTRE		333005.353	6248571.849		1310.000
T.P.	122.783	332330.914	6249694.895	59 0 49.1	
CENTRE		332284.579	6249772.051		-90.000
T.P.	128.405	332335.641	6249697.939	55 26 2.6	
T.P.	144.279	332348.712	6249706.945	55 26 2.6	
CENTRE		332133.118	6250019.865		-380.000
T.P.	173.694	332372.265	6249724.554	50 59 56.3	
T.P.	178.793	332376.228	6249727.763	50 59 56.3	
CENTRE		332480.068	6249599.536		165.000
T.P.	190.322	332385.434	6249734.700	55 0 8.3	
END	206.216	332398.454	6249743.816	55 0 8.3	

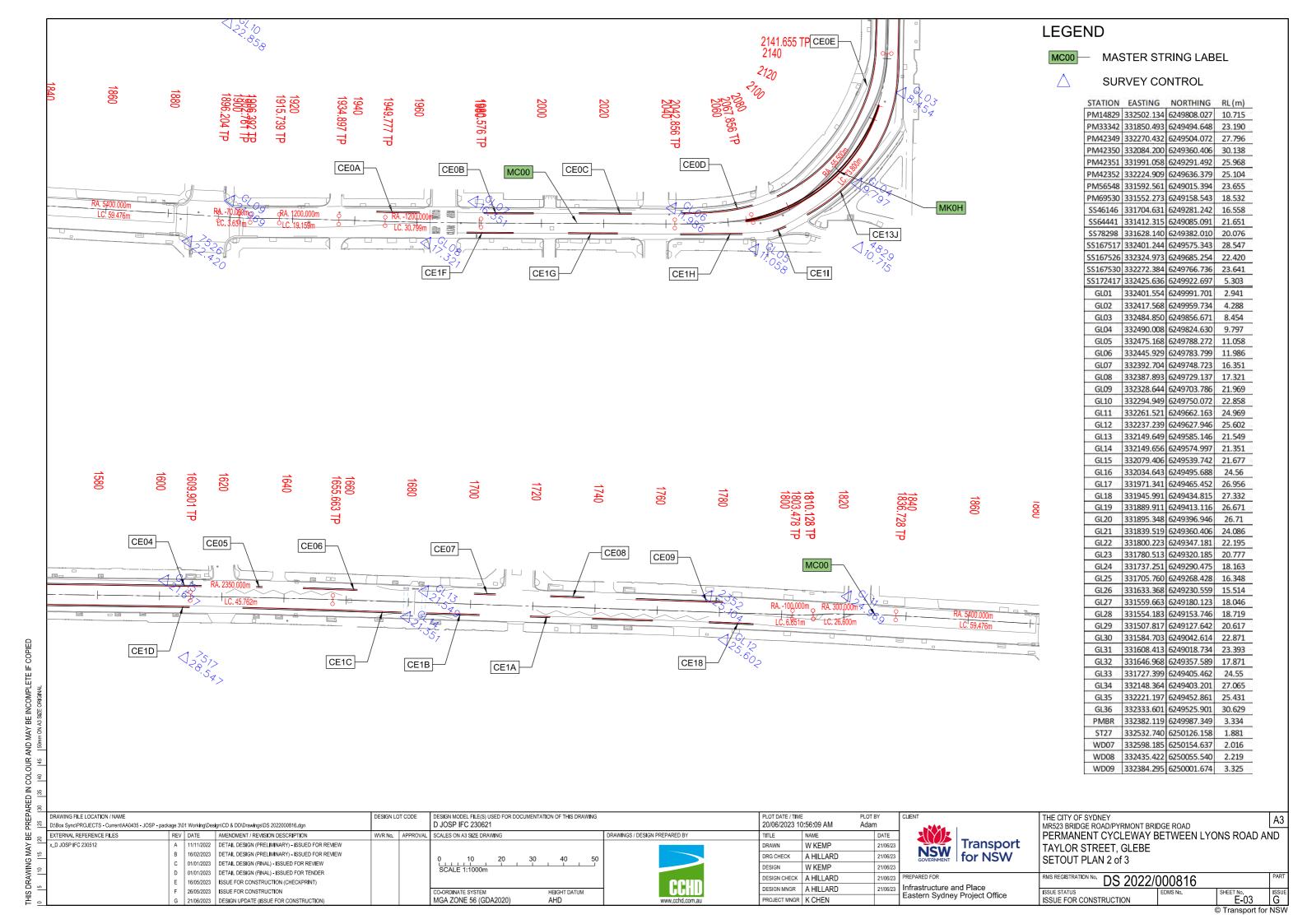
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	STATION	EASTING	NORTHING	BEARING	RADIUS
START	0.000	332447.118	6249777.888	55 0 8.3	
T.P.	16.382	332460.539	6249787.284	55 0 8.3	
CENTRE		332428.994	6249832.339		-55.000
T.P.	62.145	332483.544	6249825.322	7 19 47.4	
CENTRE		332431.473	6249832.020		-52.500
T.P.	95.097	332477.553	6249857.178		T = 10.000
T.P.	105.097	332472.216	6249865.630	325 54 36.7	
END	121.032	332463.284	6249878.826	325 54 36.7	

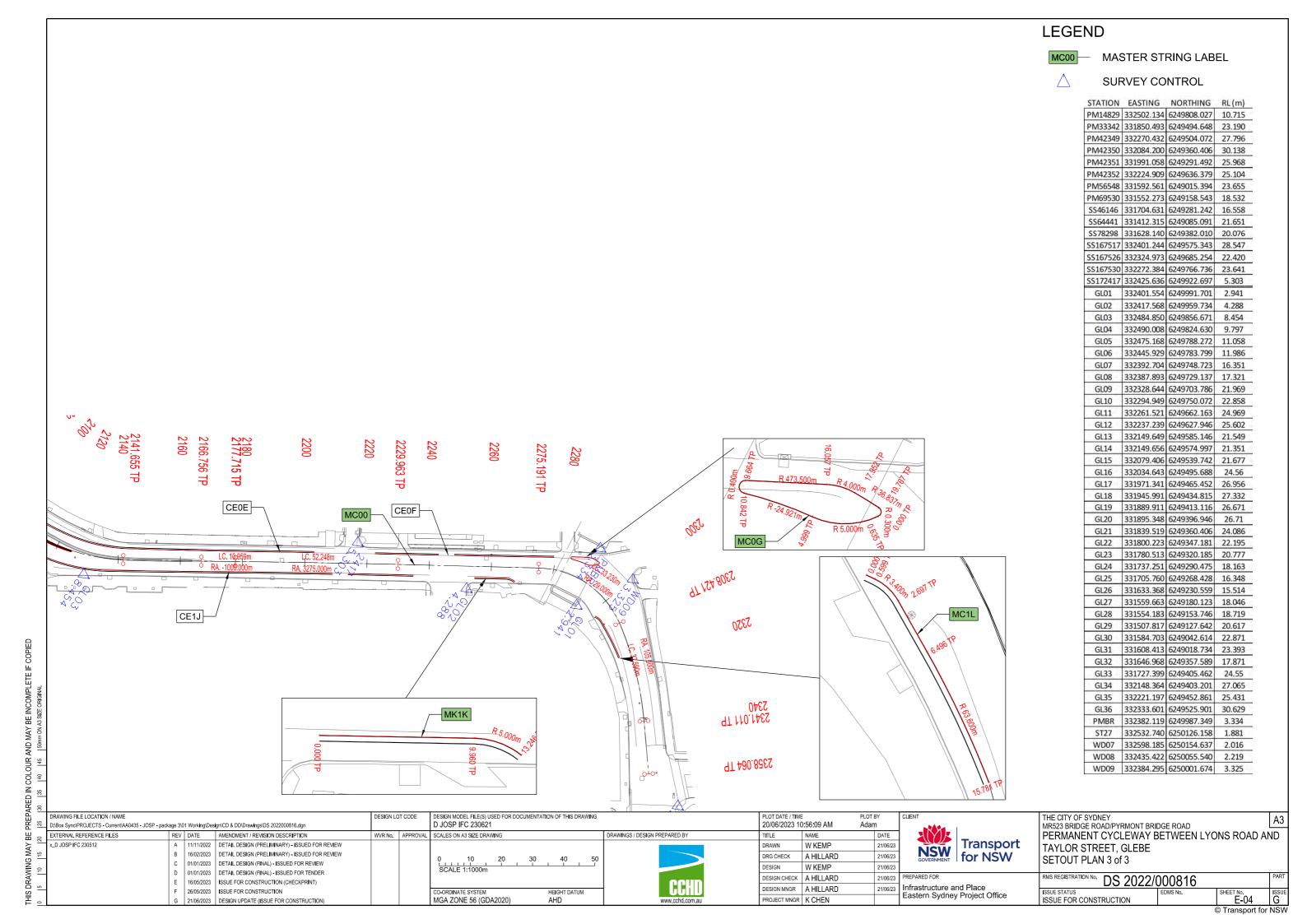
		CO-ORDIN	ATES MKOG		
	STATION	EASTING	NORTHING	BEARING	RADIUS
START	0.000	332386.007	6249988.994	357 54 0.3	
CENTRE		332386.307	6249989.005		0.300
T.P.	0.635	332386.453	6249989.267	119 11 41.4	
CENTRE		332384.014	6249984.902		5.000
T.P.	4.999	332388.926	6249985.839	169 12 14.7	
CENTRE		332413.406	6249990.507		-24.921
T.P.	9.664	332390.222	6249981.365	158 26 16.8	
CENTRE		332389.850	6249981.218		0.400
T.P.	10.842	332389.513	6249981.002	327 15 15.9	
CENTRE		332787.765	6250237.123		473.500
T.P.	16.057	332386.717	6249985.403	327 53 28.9	
CENTRE		332390.105	6249987.529		4.000
T.P.	17.952	332386.120	6249987.183	355 1 44.1	
CENTRE		332422.818	6249990.375		36.837
END	19.767	332386.007	6249988.994		

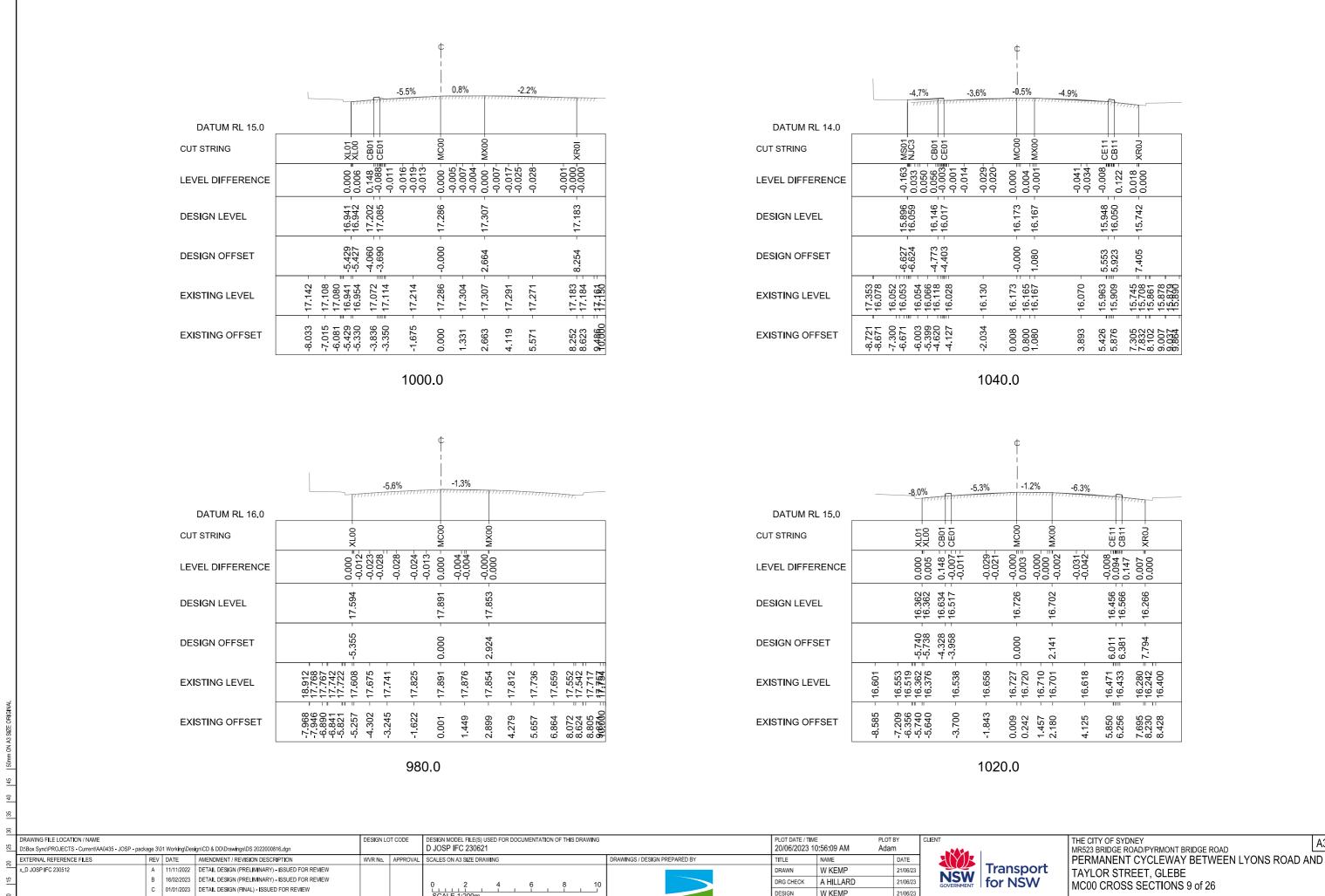
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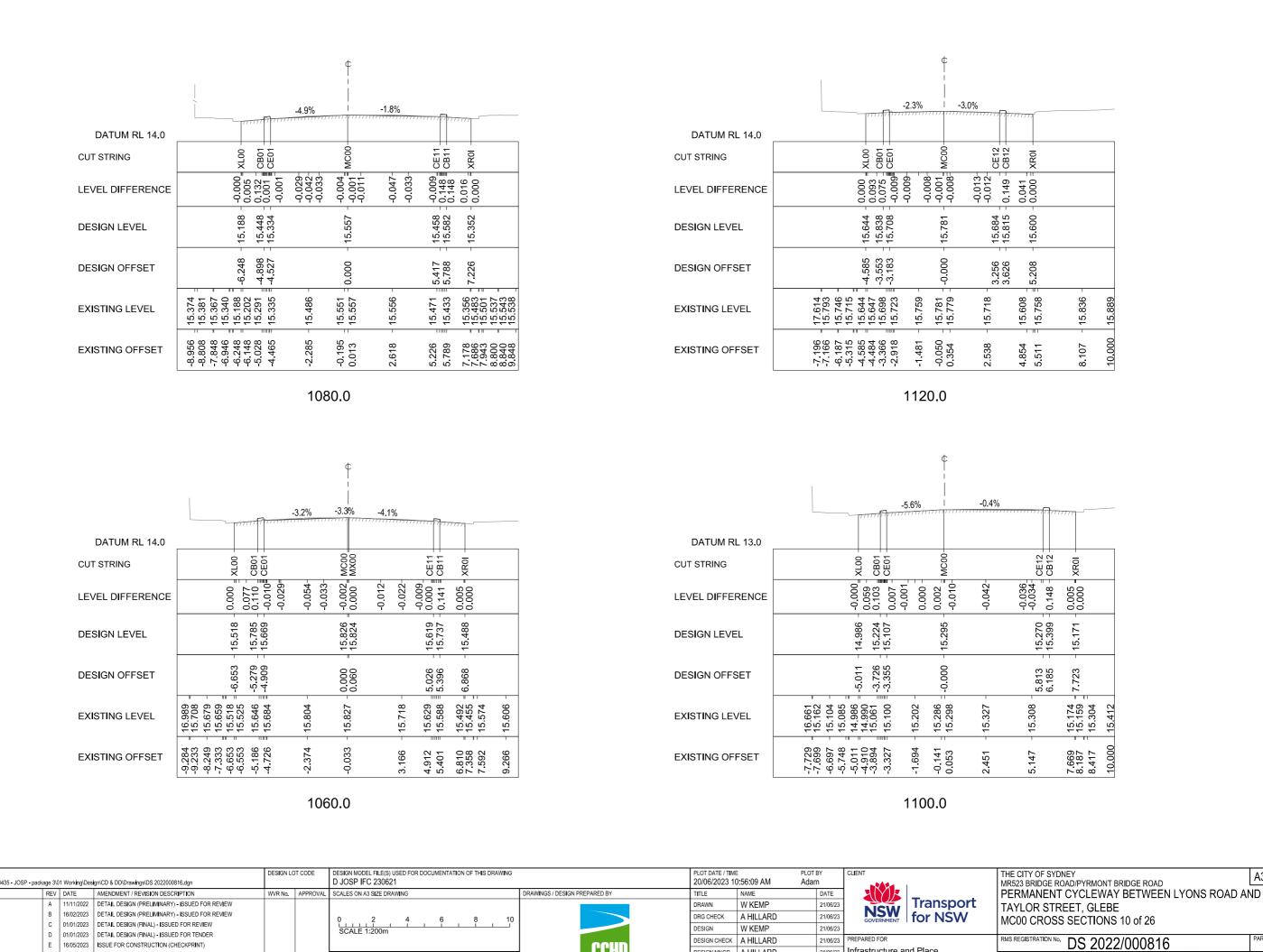
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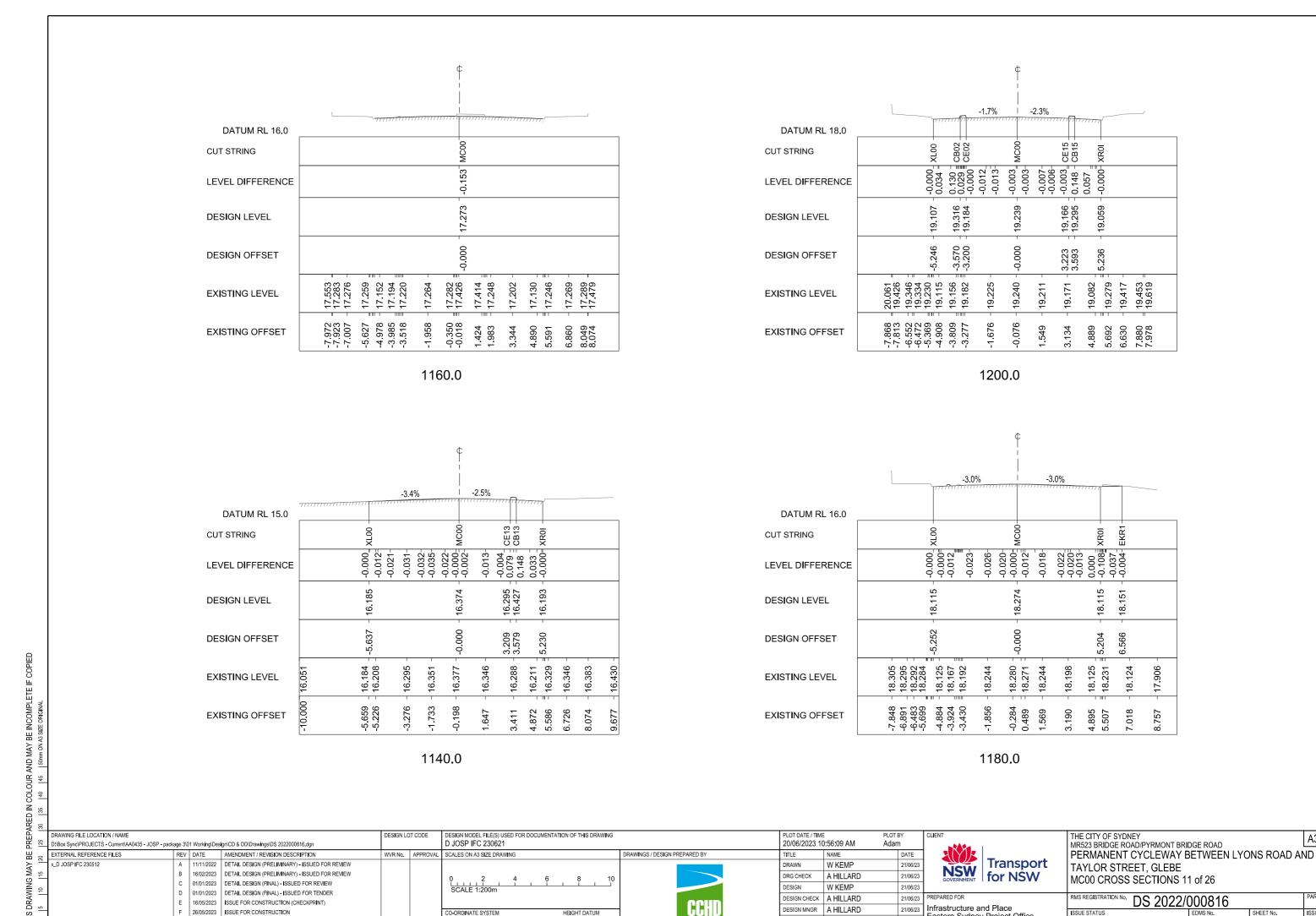
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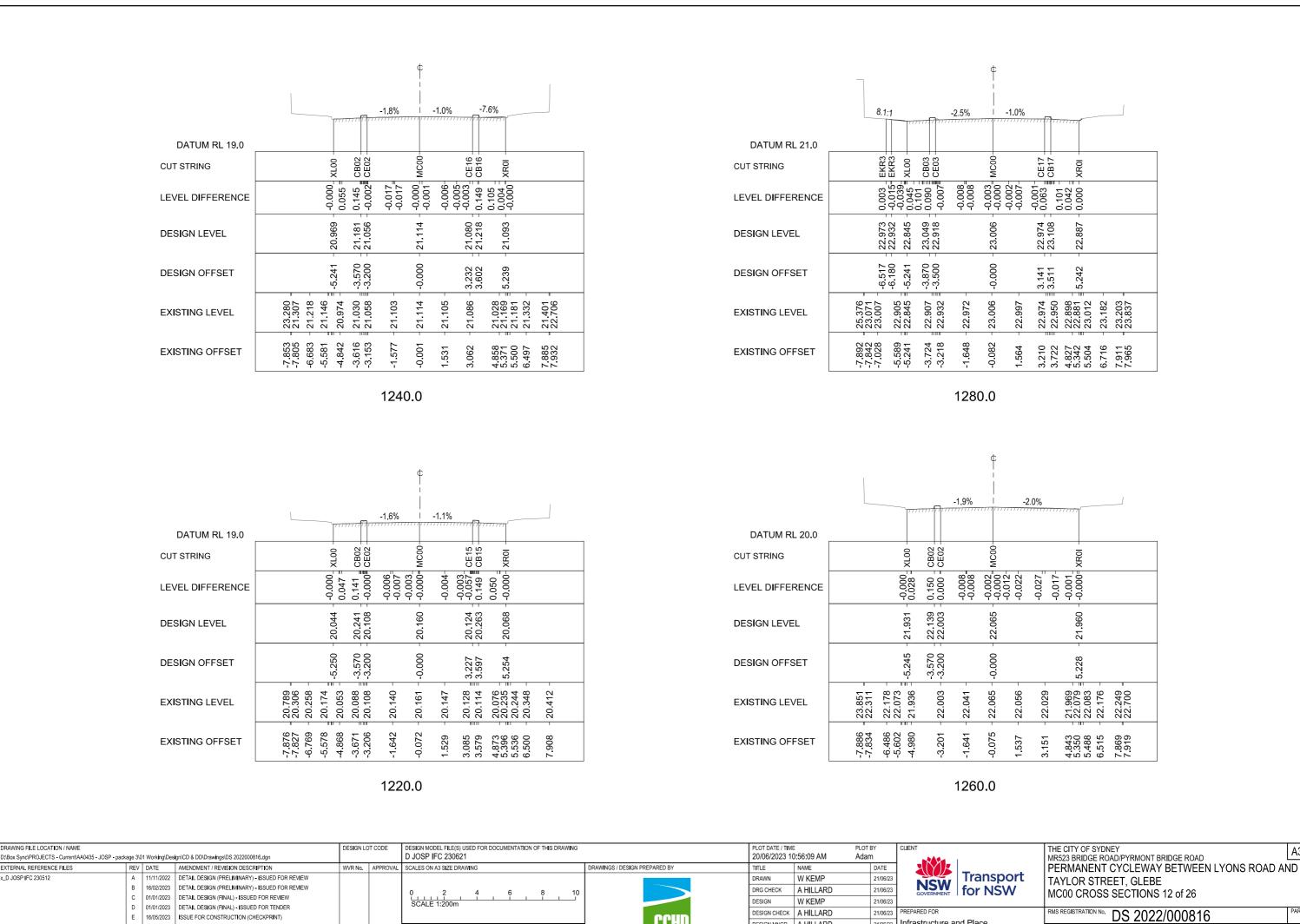
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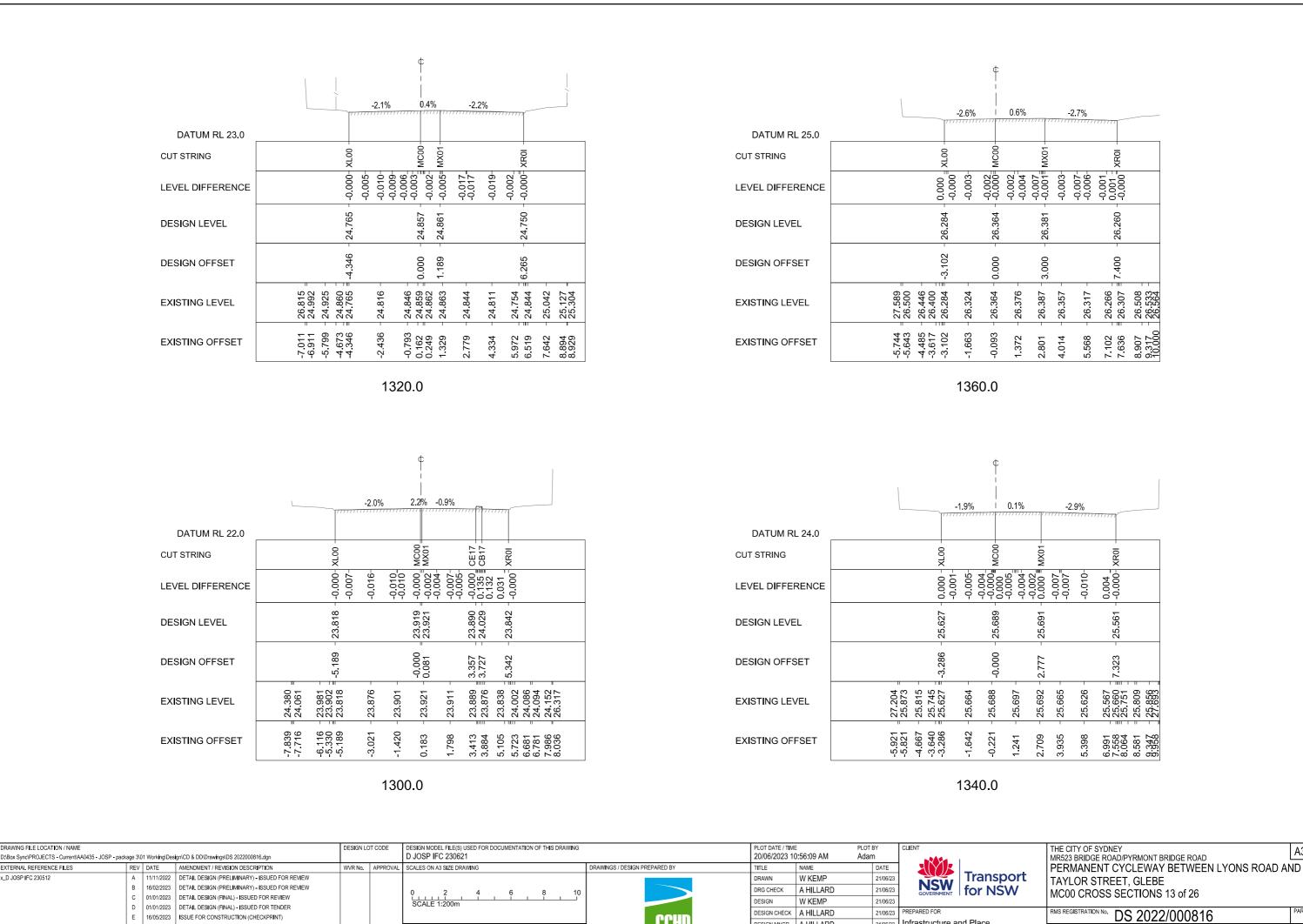
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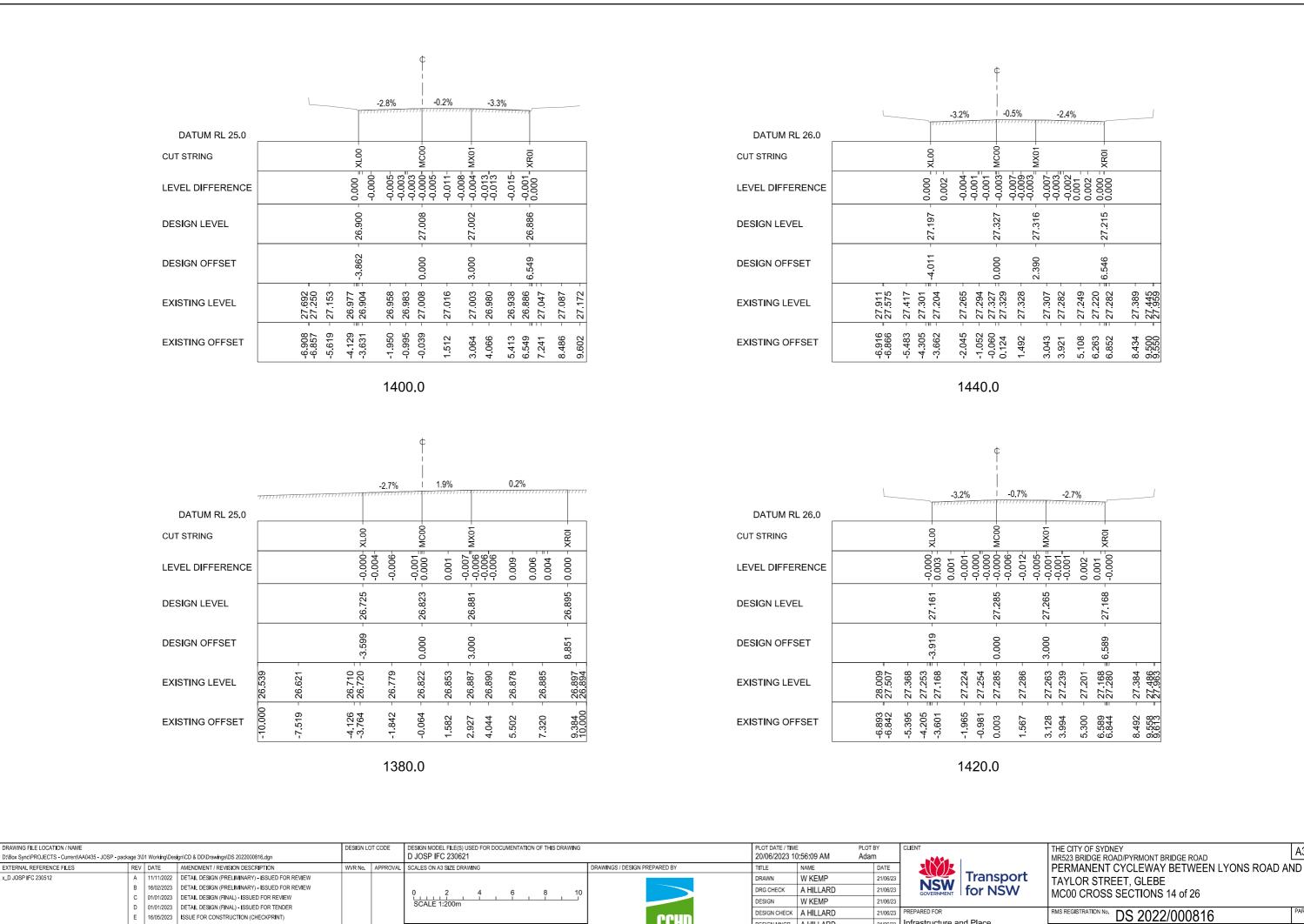
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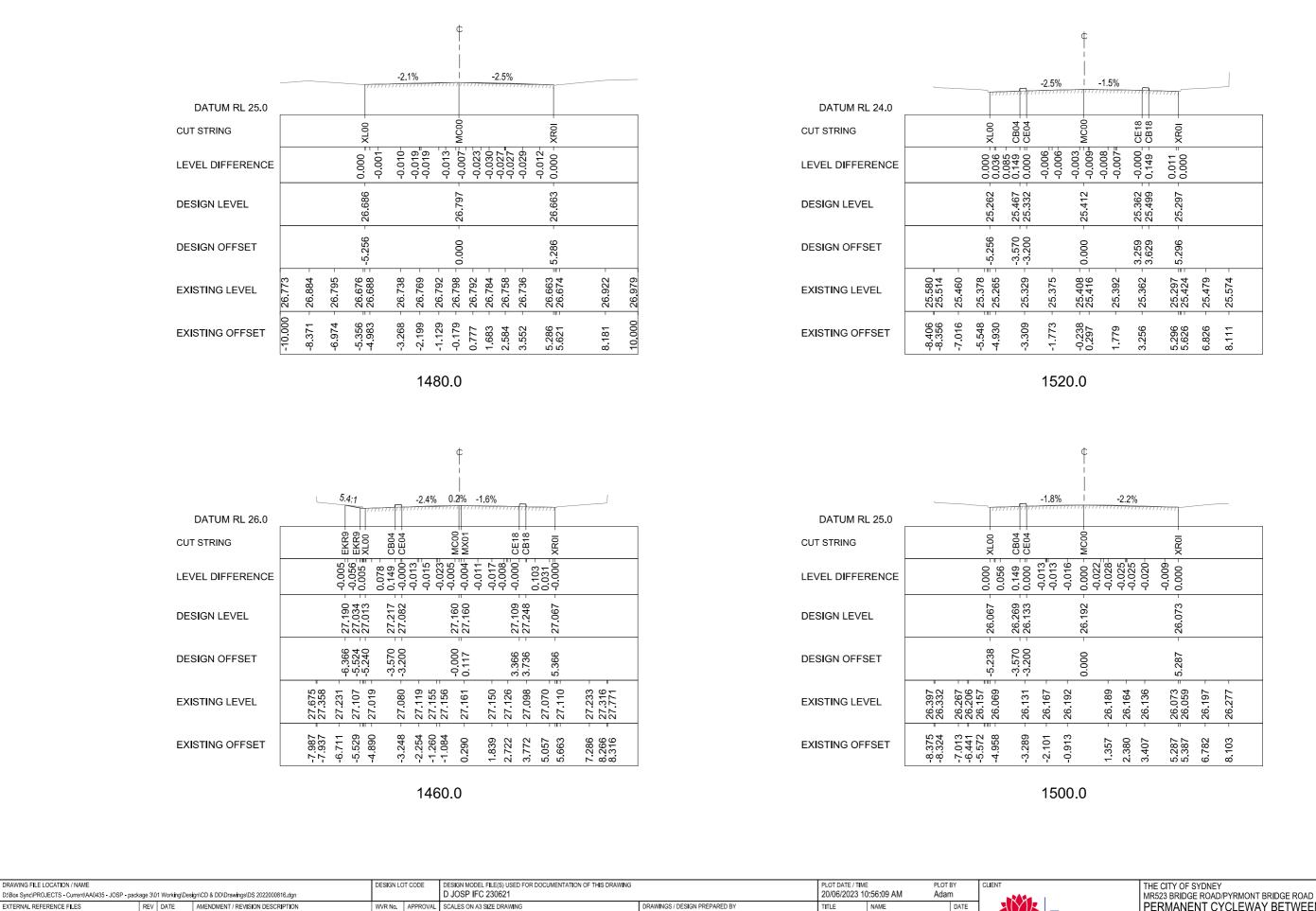
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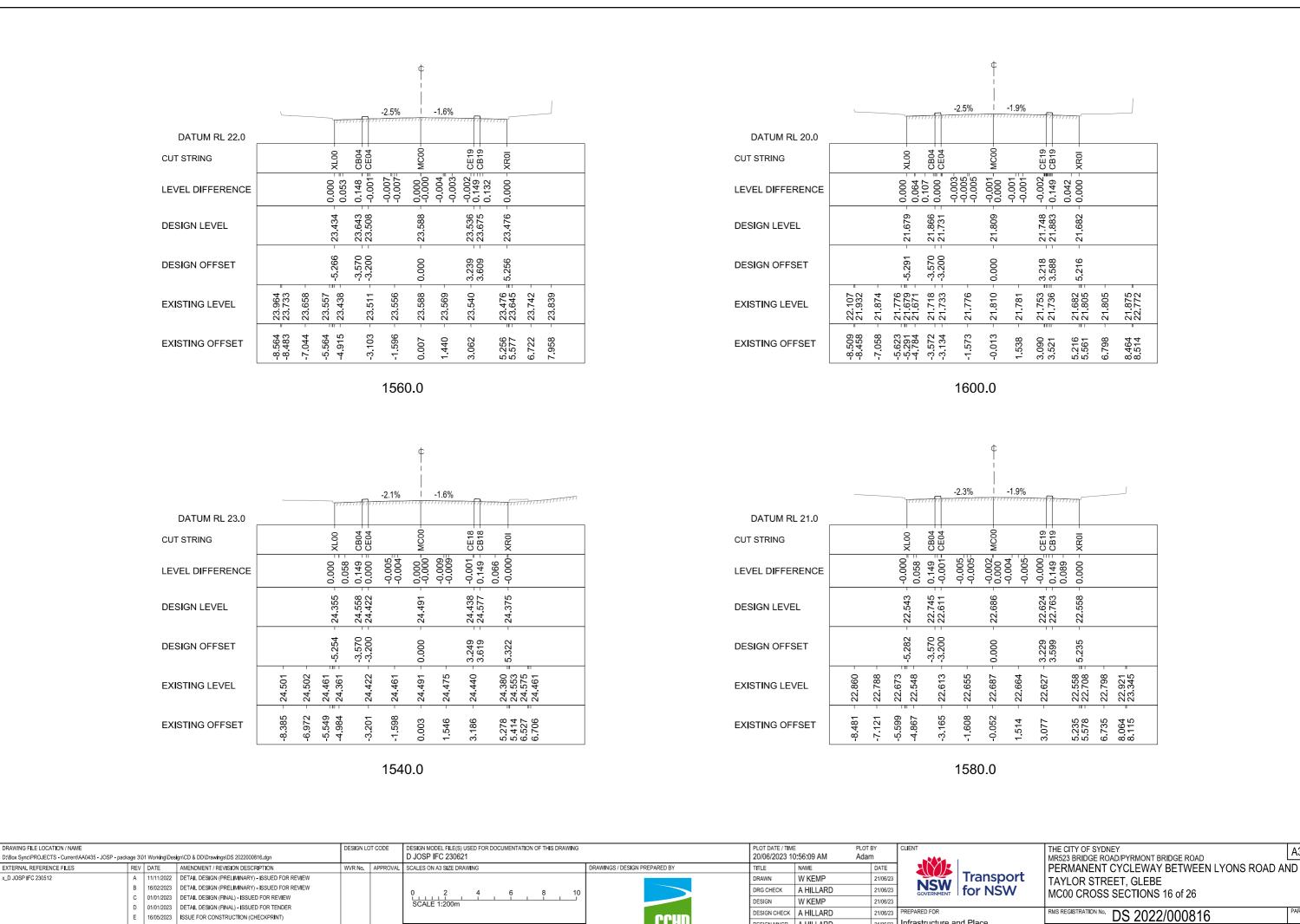
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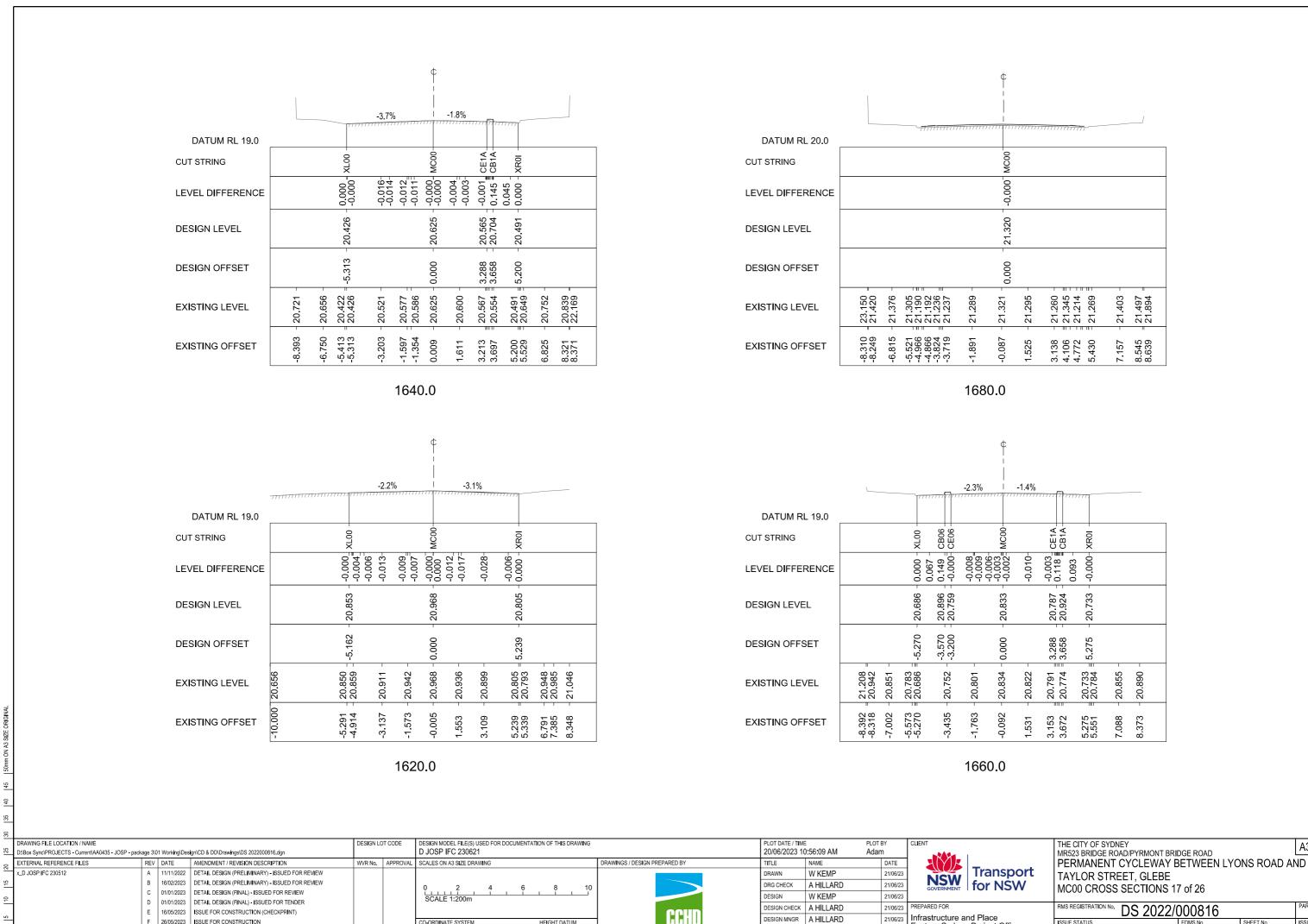
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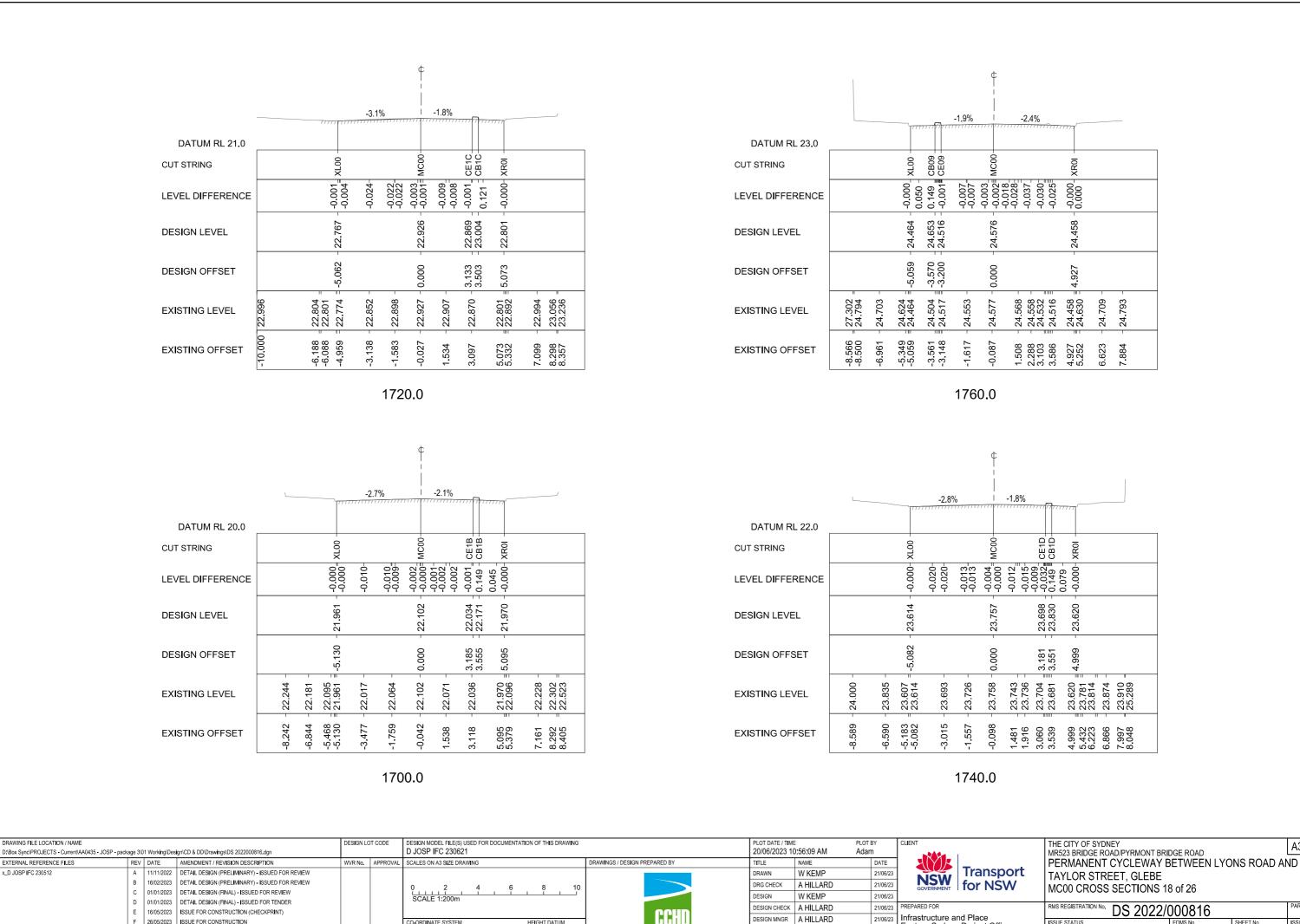
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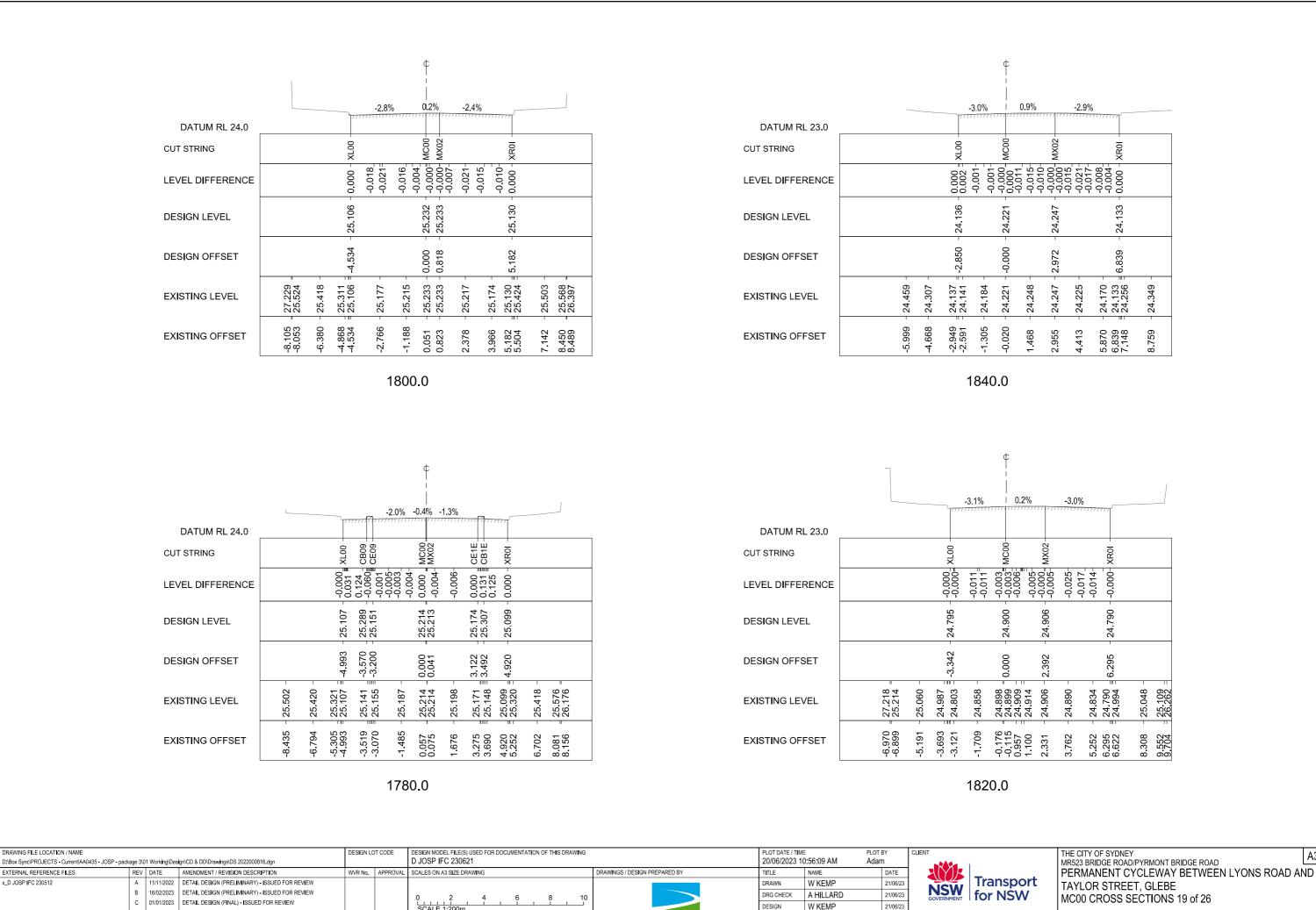
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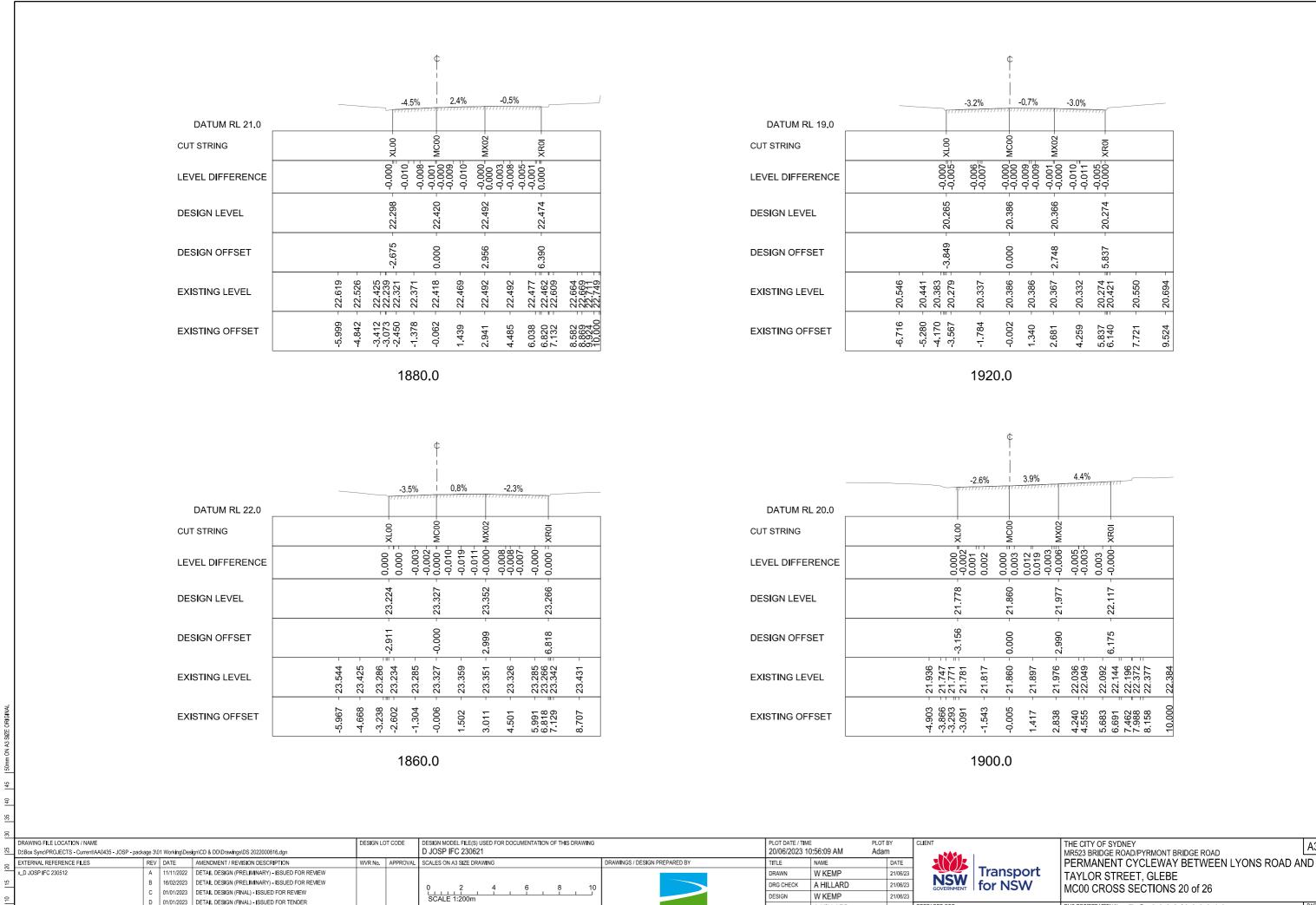
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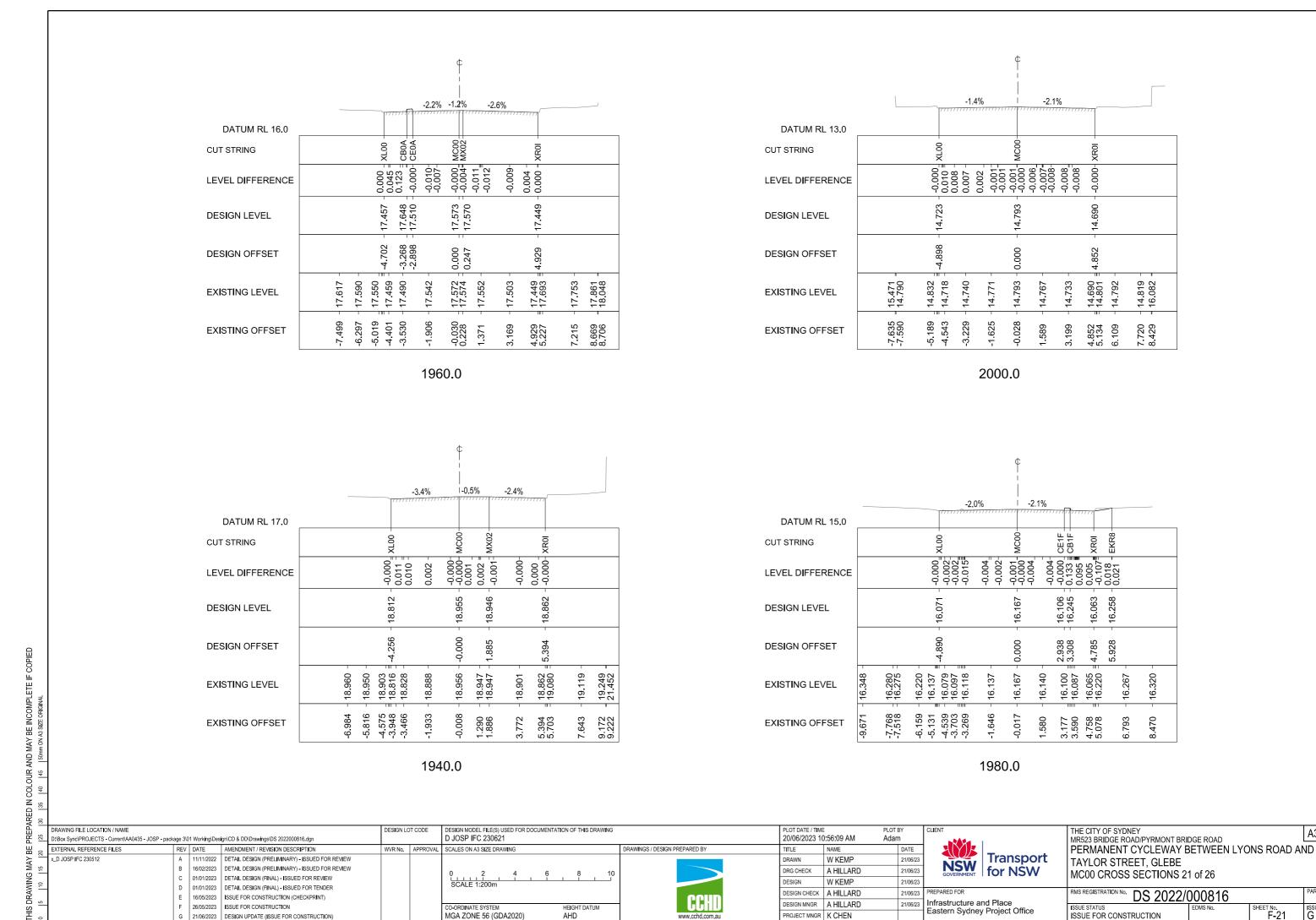
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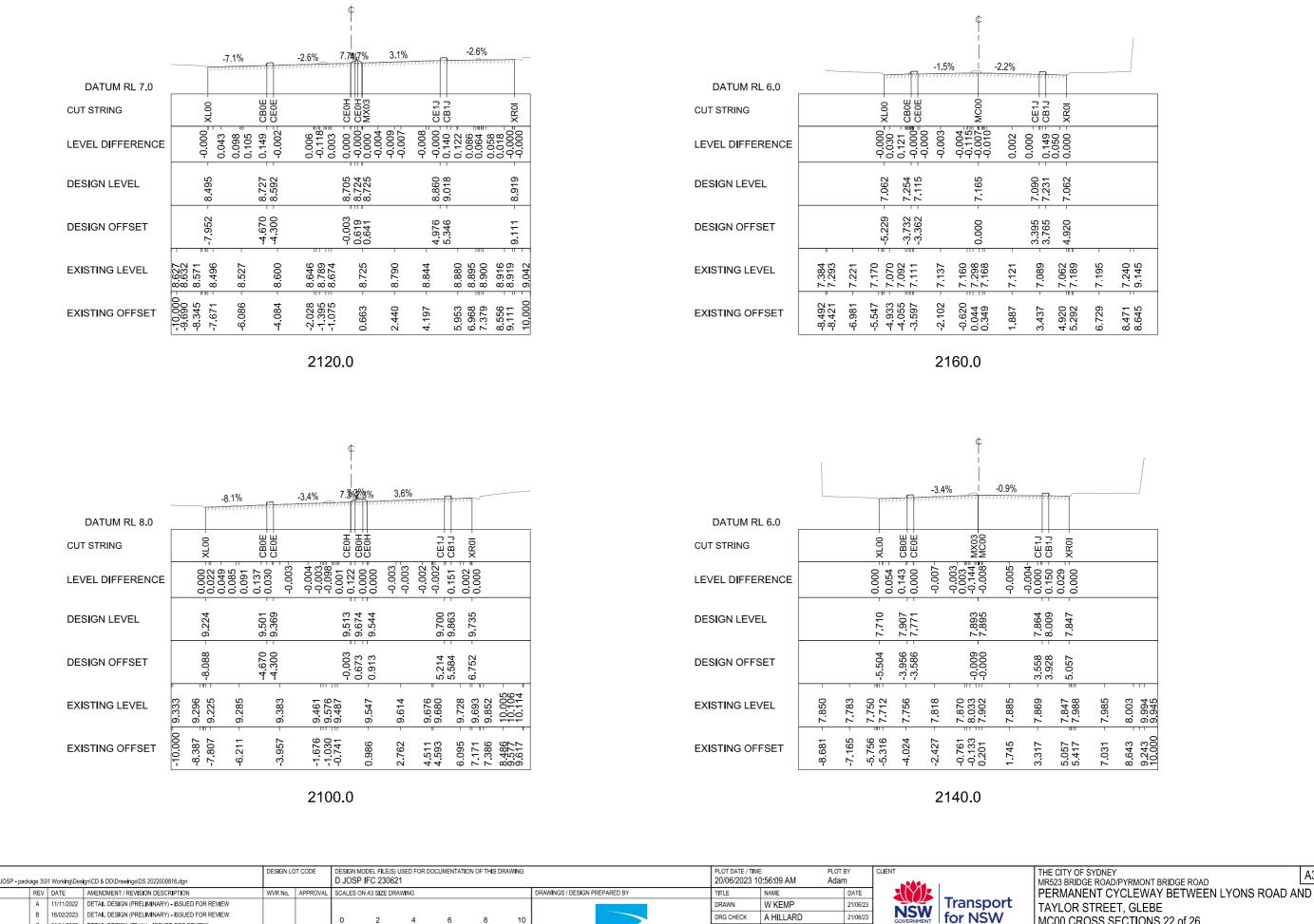
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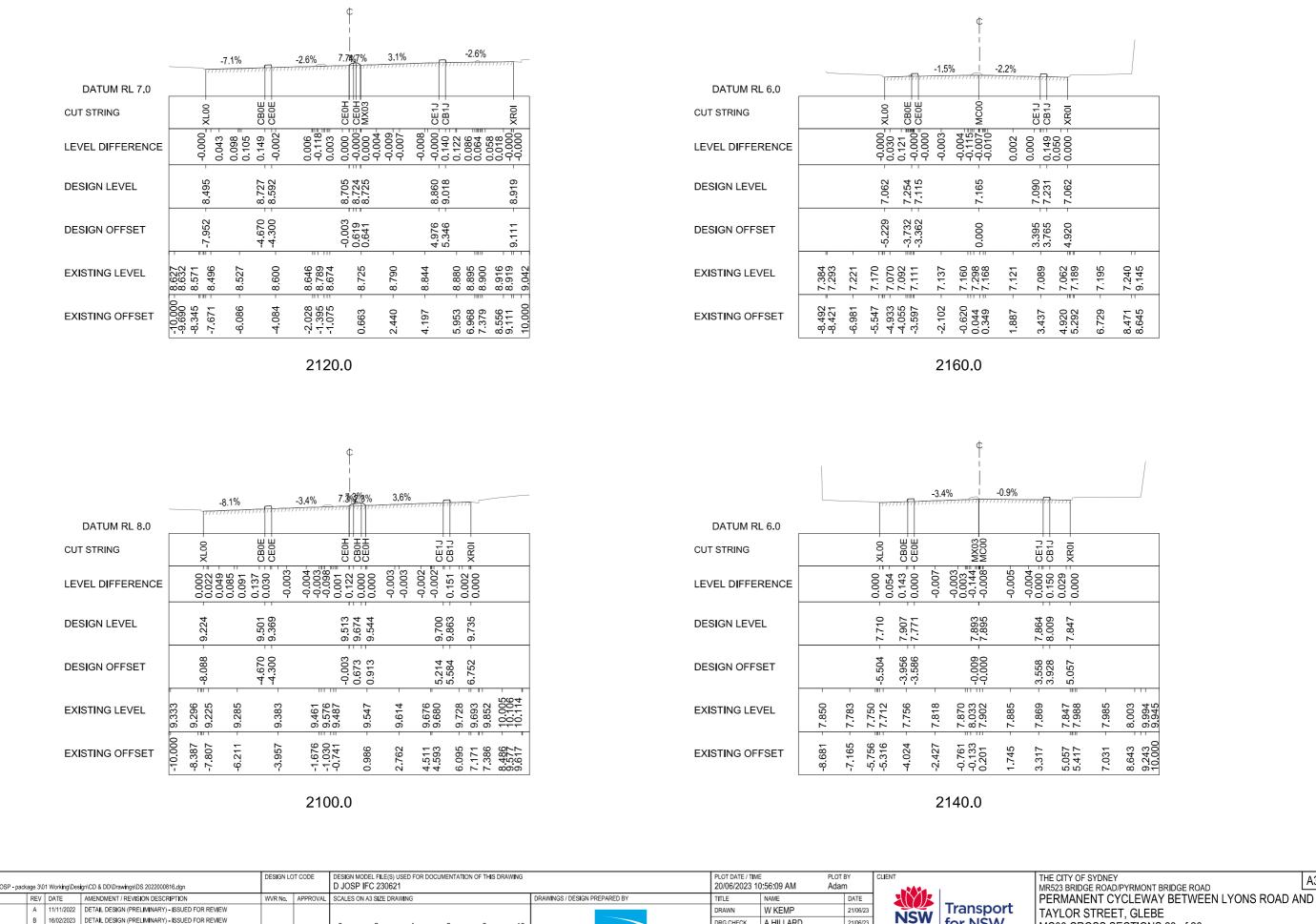
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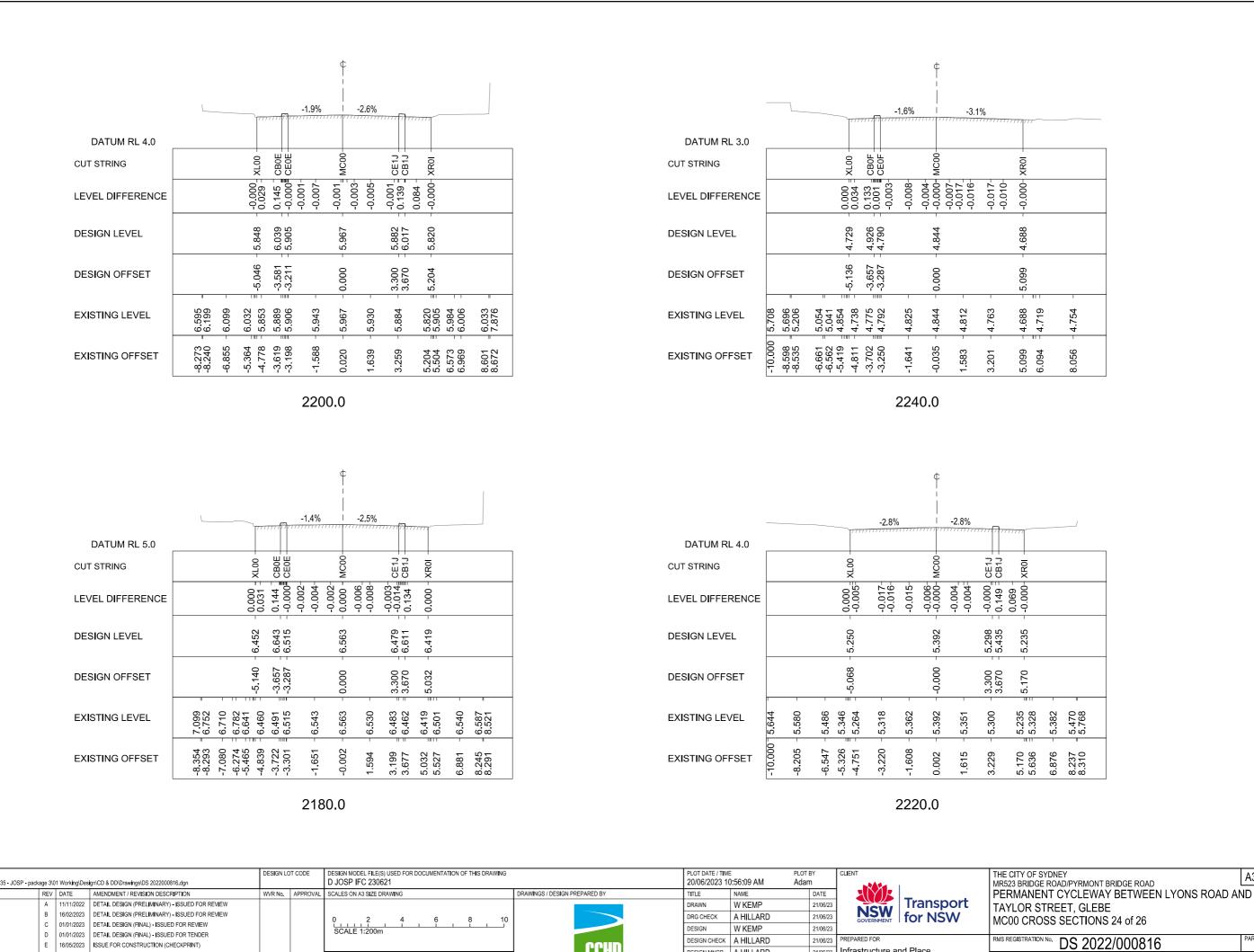
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MGA ZONE 56 (GDA2020)

DESIGN CHECK A HILLARD

DESIGN MNGR A HILLARD

PROJECT MNGR K CHEN

21/06/23

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Infrastructure and Place

Eastern Sydney Project Office

ISSUE FOR CONSTRUCTION

DRAWING FILE LOCATION / NAME

EXTERNAL REFERENCE FILES

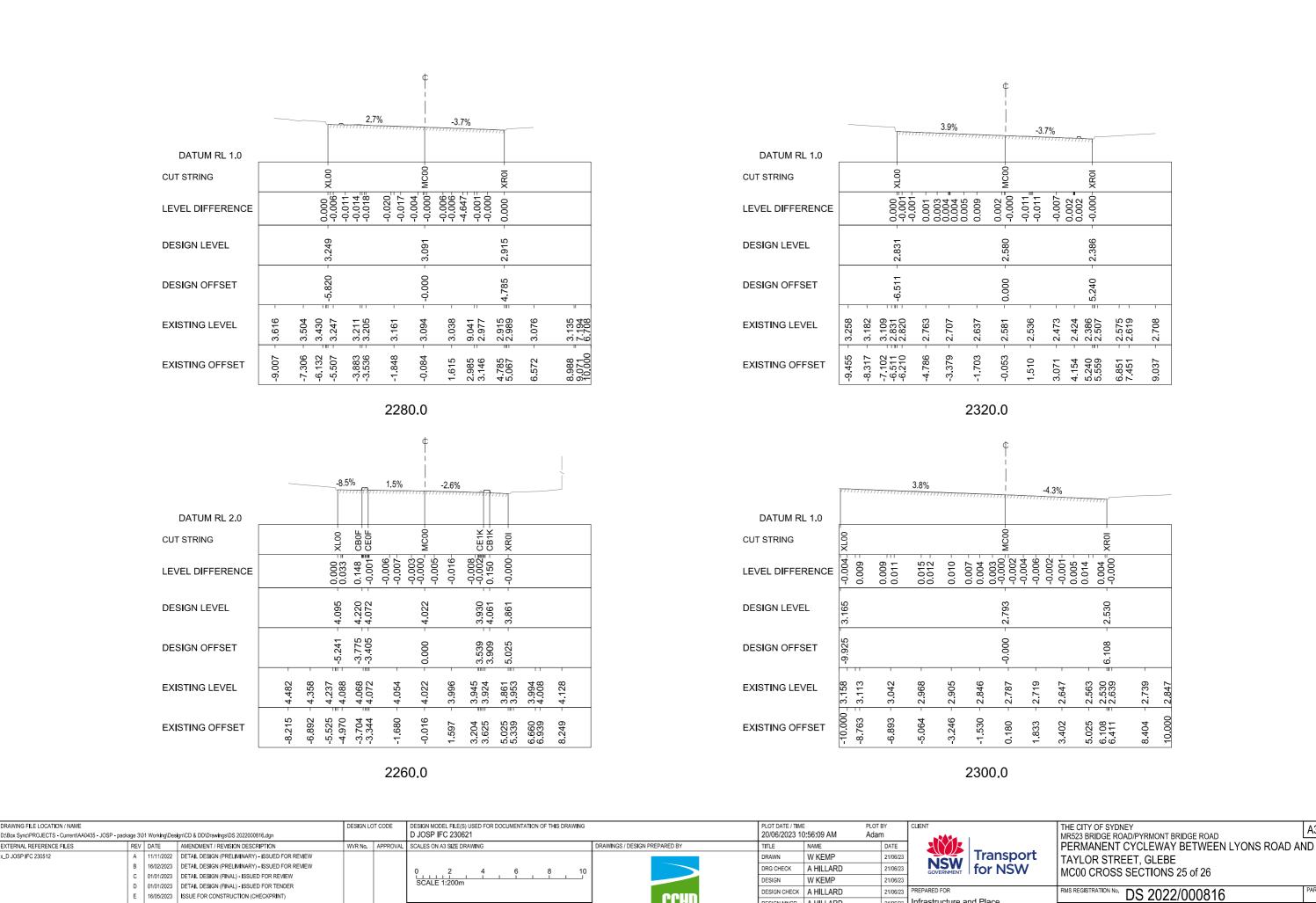
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DRAWINGS / DESIGN PREPARED BY

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THE CITY OF SYDNEY MR523 BRIDGE ROAD/PYRMONT BRIDGE ROAD PERMANENT CYCLEWAY BETWEEN LYONS ROAD AND MC00 CROSS SECTIONS 26 of 26

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LEVEL DIFFERENCE	-0.000 0.001 -0.009 -0.014	-0.019 -0.017 -0.002 -0.007 -0.018	-0.025 -0.025 -0.021 -0.000	
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EXISTING OFFSET	-8.989 -8.444 -7.878 -7.291 -6.070 -5.551 -4.312	- 1.5670.079 - 1.516 -	3.071 - 4.041 - 4.795 = 5.086 = 6.151 -	7.868

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