TTW Structural Civil Traffic Façade

6 August 2020 181052 SAAE

Johnstaff Projects
Level 5, 9 Castlereagh Street
Sydney, NSW, 2000

Attention: Shamma Hassan

Liverpool Health and Academic Precinct - Multi Storey Carpark (MSCP)
Consultation with Sydney Trains

Dear Shamma,

We refer to recent correspondence in relation to DPIE comments for the MSCP.

1. Attached are copies of correspondence with Sydney Trains in relation to the construction of the MSCP adjacent to the main Southern Railway Line.

2. The structural information in the attached letter dated 6 June 2019 notes that support elements for the carpark are outside the impact zone for trains. The letter also notes that bored piles or CFA piles will be used for foundations. As they are individual piles located more than 20m from the nearest track, they will not impact on the Sydney Trains assets.

3. Since the previous consultation with Sydney Trains, the layout of the carpark has been modified, with a different entry structure. The modifications effectively reduce the structure adjacent to the railway boundary, but the principles previously identified remain unchanged.

4. The MSCP contractor will need to complete the design, and submit the final drawings to Sydney Trains for their final approval. We recommend this is specifically confirmed with them that they have allowed for this in their scope of works.

5. Attached is a letter from JK Geotechnics relating to the groundworks, confirming there is no substantial excavation proposed, and there will be no impact on the rail structure within the rail corridor.

6. In response to the specific DPIE requirements, please to the following pages with our comments.

Should you require anything further please contact the undersigned.

Yours faithfully,
TAYLOR THOMSON WHITTING (NSW) PTY LTD
in its capacity as trustee for the
TAYLOR THOMSON WHITTING NSW TRUST

ROBERT MACKELLAR
Managing Director

Appendix A
- RTS Issues Table Responses
- Geotechnical Assessment Letter
- Email – Sydney Train and Sydney Trains + TTW Letter

Appendix A

- RTS Issues Table Responses
- Geotechnical Assessment Letter
- Email – Sydney Train and Sydney Trains + TTW Letter

Issue Raised	Proponent's Response	Comment	Action/Status	Risk
Transport for NSW				
Sydney Trains				
Due to the proximity of development being immediately adjacent to and within 25m of the Rail Corridor, RailCorp assets and land, there is a potential impact on the safe and efficient operation of the Sydney Trains services and integrity of the assets. Sydney Trains has considered that the development impacts can be managed by imposing conditions of consent (should the development be approved) as outlined below. NOTE: Where a condition states prior to the issue of Construction Certificate, if there is no CC required for these works, these conditions can be amended to "prior to commencement of works".	Refer attached letter detailing the previous consultation. As part of the preparation of the construction documents, the contractor will need to submit final designs/reports to obtain approval.	Review conditions	TTW	
1. Prior to the issuing of a Construction Certificate or prior to any commencement of works, whichever occurs first, the applicant / Developer shall prepare and provide to Sydney Trains for review, comment and written endorsement the following final version items in compliance with relevant ASA Standards (https://www.transport.nsw.gov.au/industry/asset-standards-authority):		Review conditions	TTW	
2. Geotechnical and Structural report/drawings that meet Sydney Train requirements. The Geotechnical Report must be based on actual borehole testing conducted on the site closest to the rail corridor.	Final drawings and report to be submitted for approval/endorsement.		TTW	
3. Construction methodology with construction details pertaining to structural support during excavation. The Applicant is to be aware that Sydney Trains will not permit any rock anchors/bolts (whether temporary or permanent) within its land or easements.	Contractor to provide methodology. No anchors/rock bolts are required.		TTW	
4. Cross sectional drawings showing the rail corridor, sub soil profile, proposed excavation and structural design of sub ground support adjacent to the rail corridor. All measurements are to be verified by a Registered Surveyor.	Contractor to provide in the final submission.		TTW	
5. Detailed Survey Plan showing the relationship of the proposed development with respect to Sydney Trains easement and rail corridor	Contractor to provide in the final submission		TTW	
6. No work is permitted within the rail corridor (including land and airspace), or any easements which benefit Sydney Trains/RailCorp, at any time, unless the prior approval of, or an Agreement with, Sydney Trains/RailCorp has been obtained by the Applicant/Developer.	Contractor to note/confirm		TTW	
7. No rock anchors, rock bolts, ground anchors or rock ties, piles, foundations, rock pillars, transfer structures, basement walls, slabs, columns, beams, cut rock faces, are to be installed into RailCorp/Sydney Trains property or easements.	No works of this nature are proposed		TTW	

8. The Applicant/Developer shall not at any stage block rail related use and rail corridor access gate, to ensure continuous provision for easy and ongoing 24/7 access by rail vehicles, plant and equipment to support maintenance and emergency activities. Prior to the commencement of works the Applicant/Developer shall consult with Sydney Trains to obtain written endorsement/agreement to ensure access is maintained.	Contractor to confirm in their construction management plan	TTW
9. The Applicant/Developer must submit to Sydney Trains a plan showing all craneage and other aerial operations for the development and must comply with all Sydney Trains requirements. If required by Sydney Trains, the Applicant must amend the plan showing all craneage and other aerial operations to comply with all Sydney Trains requirements.	Contractor to provide	TTW
10. There is a need to ensure that the roots and foliage of trees being planted beside the rail corridor do not have an impact on the rail corridor or rail operations. Prior to the issue of a Construction Certificate, the Applicant/Developer shall provide to Sydney Trains for review, comment and written endorsement a final landscaping and planting plan demonstrating measures to ensure compliance with this condition must be prepared to the satisfaction of Sydney Trains.	Contractor to provide	TTW
11. Sydney Trains advises there is a 33kV High Voltage Aerial Transmission Line in near proximity to the proposed works. All works within 6 metres of the nearest transmission line conductor must comply with: - ISSC 20 – Guideline for the Management of Activities within Electricity Easements and Close to Electricity Infrastructure. - The Safe Approach Distances (SADs) in the Sydney Trains Document titled "SMS-06-GD-0268 – Working Around Electrical Equipment". - "WorkCover Code of Practice – Work near Overhead Power Lines (The Code)" - All Landscaping shall be in accordance with the Sydney Trains High Voltage Powerline Tree Management Plan.	Contractor to confirm compliance	TTW
12. If required, the Applicant/Developer shall undertake a Services Search / Dial Before You Dig search to establish the existence and location of any rail services. Persons performing the Services Search / Dial Before You Dig search shall use equipment that will not have any impact on rail services and signalling. Should rail services be identified within the subject development site, the Applicant/Developer must discuss with Sydney Trains as to whether these services are to be relocated or incorporated within the development site.	Foundations not within the rail corridor. Contractor to submit survey with the final submission.	TTW
13. The Applicant/Developer must ensure that all drainage from the development is adequately disposed of and managed and not allowed to be discharged into the railway corridor unless prior written approval has been obtained from Sydney Trains.	Contractor to confirm in the final submission. Design does not propose discharge into railway corridor.	TTW

14. During all stages of the development the Applicant/Developer must take extreme care to prevent any form of pollution entering the railway corridor. Any form of pollution that arises as a consequence of the development activities shall remain the full responsibility of the Applicant.	Contractor to confirm in Construction Management Plan	TTW
15. Excess soil is not allowed to enter, be spread or stockpiled within the rail corridor (and its easements) and must be adequately managed/disposed of.	Contractor to confirm in Construction Management Plan	TTW
16. The Applicant/Developer is to ensure that the development incorporates appropriate anti-graffiti measures, to the satisfaction of to Sydney Trains.	HI/Architect to confirm	TTW
17. Appropriate fencing must be in place along the rail corridor to prevent unauthorised access to the rail corridor during construction works. Details of the type of fencing and the method of erection are to be to the satisfaction of Sydney Trains prior to the fencing work being undertaken.	Contractor to confirm	TTW
18. The development shall have appropriate fencing fit for the future usage of the development site to prevent unauthorised access to the rail corridor by future occupants of the development. Prior to the issuing of an Occupation Certificate the Applicant shall liaise with Sydney Trains regarding the adequacy of any existing fencing along the rail corridor boundary or design and construction of new fencing. Details of the type of new fencing to be installed and the method of erection are to be to the satisfaction of Sydney Trains prior to the fencing work being undertaken.	Landscape to confirm?	TTW

Date: 30 July 2020
Ref: 32160A2let

Health Infrastructure
C/- Johnstaff Projects Pty Ltd
Level 5, 9 Castlereagh Street
Sydney NSW 2000

Attention: Shamma Hasan
Email: shamma.hasan@johnstaff.com.au

GEOTECHNICAL ASSESSMENT
PROPOSED NEW MULTI-STOREY CAR PARK
LIVERPOOL HEALTH + ACADEMIC PRECINCT, ELIZABETH STREET, LIVERPOOL, NSW

This letter presents our geotechnical opinion on the possible impacts on the adjacent rail corridor (Main Southern Railway) from the construction of the proposed multi-storey car park (MSCP) at the Liverpool Health + Academic Precinct (Liverpool Hospital), and must be read in conjunction with our geotechnical investigation report, Ref. 32160A2rpt dated 27 November 2019.

The proposed MSCP will be set back 23.9m from the centreline of the near track and approximately 12m from the common boundary with the rail corridor. In existing grassed areas, excavation of topsoil and root affected soils to a maximum depth of about 0.2m will be required. The ground floor level of the proposed MSCP will be constructed at RL10.5m and will require filling above existing grade to a maximum height of about 1m to achieve design subgrade level. Retaining walls will be required to support the fill platform. Lifts are proposed towards the western end of the southern side of the MSCP; approximately 95m away from the rail corridor. Localised shallow excavations below design subgrade level will be required for the proposed lift pit.

Based on the nature of the proposed development and the horizontal set-back of the works to the rail corridor, it is our opinion that construction of the proposed MSCP will have no impact on the rail tracks or other structures (e.g. overhead wire structures) within the rail corridor.

Should you require any further information regarding the above, please do not hesitate to contact the undersigned.

Yours faithfully
For and on behalf of
JK GEOTECHNICS

Andrew Jackaman
Principal Geotechnical Engineer

From: Sarah Anderson <Sarah.ANDERSON2@transport.nsw.gov.au>
Sent: 7 June 2019 10:33 AM
To: Robert Mackellar
Cc: Scott Coakes; Thomas Pottie; Shamma Hasan; Brian Cunningham; Stephen Brain; Mark Sherlock; Kenneth Amegor; Lee Cheng
Subject: RE: 181052: 90605 Liverpool Hospital New Carpark on Sydney Trains Assets RM lee

Hi Robert

Can you confirm which planning pathway you were going to use?

Just a few points to be aware of:

- Our concurrence is 25m from the rail corridor boundary, not the track centre, and includes ground penetration not just excavation. Any site plan should have the boundary and the distances clearly defined for ease of review.
    - If concurrence is triggered, a referral under Clause 86 through the DA pathway will be required, including a geotechnical report which is rail specific to identify any potential impacts to the corridor.
    - If it does not trigger concurrence, then the development is still immediately adjacent to the rail corridor and therefore should be referred under Clause 85 through the DA pathway.
- Double check if you need to do a risk assessment for derailment for anything within 10-20m of the centre of the nearest rail track

Any queries please let me know,

Kind Regards

Sarah Anderson
Town Planning Officer
Future Direction, Growth & Performance
Sydney Trains

T 02 8575 0237
Ground Floor East, 36-46 George Street, Burwood NSW 2134
PO Box 459, Burwood NSW 1805
Generic email: DA_sydneytrains@transport.nsw.gov.au
Sydney Trains is a NSW Government agency

From: Kenneth Amegor
Sent: Friday, 7 June 2019 8:27 AM
To: Robert Mackellar
Cc: Scott Coakes; Thomas Pottie; Shamma Hasan; Brian Cunningham; Stephen Brain; Mark Sherlock; Sarah Anderson
Subject: RE: 181052: 90605 Liverpool Hospital New Carpark on Sydney Trains Assets RM lee

Hi Robert,

It looks ok. You will need to go through the DA process to get a formal review and approval.

Thanks

Kenneth Amegor
Program Manager - External Interface
Engineering and Maintenance Interface
Engineering and Maintenance
Sydney Trains

T 02 8574 2806 | M 0422 005 865
36-46 George Street, Burwood NSW 2134
Sydney Trains is a NSW Government agency

From: Robert Mackellar [mailto:Robert.Mackellar@ttw.com.au]
Sent: Thursday, 6 June 2019 3:49 PM
To: Kenneth Amegor
Cc: Scott Coakes; Thomas Pottie; Shamma Hasan; Brian Cunningham; Stephen Brain; Mark Sherlock
Subject: 181052: 90605 Liverpool Hospital New Carpark on Sydney Trains Assets RM lee

Hi Kenneth

My colleague Stephen brain touched base with you the other day regarding consultation with Sydney Trains / TfNSW in relation to the proposed new carpark at Liverpool Hospital. There was a meeting held with Sydney Trains a couple of months ago in relation to the development.

I've prepared a letter with associated plans showing the location relative to the railway lines.
In general there is no proposed basement excavation, and the support structures for the carpark development are outside of the required 20m, so I trust that this will be more a notification than needing formal approvals.

Would you be able to pass this on to the relevant person to assess please?

If you would let us know who the person to contact would be that would be appreciated.

If there are any questions please contact me or Stephen Brain in our office.

Regards

Rob

Robert Mackellar | Managing Director
+61 2 9439 7288 | +61 411 873 968 | ttw.com.au |
Level 3, 48 Chandos Street, St Leonards NSW 2065

From: Kenneth Amegor <KENNETH.AMEGOR@transport.nsw.gov.au>
Sent: 7 June 2019 8:27 AM
To: Robert Mackellar
Cc: Scott Coakes; Thomas Pottie; Shamma Hasan; Brian Cunningham; Stephen Brain; Mark Sherlock; Sarah Anderson; Lee Cheng
Subject: RE: 181052: 90605 Liverpool Hospital New Carpark on Sydney Trains Assets RM lee
Attachments: 190605 LHAP New Carpark on Sydney Trains Assets RM lee.pdf

Hi Robert,

It looks ok. You will need to go through the DA process to get a formal review and approval.

Thanks

Kenneth Amegor
Program Manager - External Interface
Engineering and Maintenance Interface
Engineering and Maintenance
Sydney Trains

T 02 8574 2806 | M 0422 005 865
36-46 George Street, Burwood NSW 2134
Sydney Trains is a NSW Government agency

From: Robert Mackellar [mailto:Robert.Mackellar@ttw.com.au]
Sent: Thursday, 6 June 2019 3:49 PM
To: Kenneth Amegor
Cc: Scott Coakes; Thomas Pottie; Shamma Hasan; Brian Cunningham; Stephen Brain; Mark Sherlock
Subject: 181052: 90605 Liverpool Hospital New Carpark on Sydney Trains Assets RM lee

Hi Kenneth

My colleague Stephen brain touched base with you the other day regarding consultation with Sydney Trains / TfNSW in relation to the proposed new carpark at Liverpool Hospital. There was a meeting held with Sydney Trains a couple of months ago in relation to the development.

I've prepared a letter with associated plans showing the location relative to the railway lines.
In general there is no proposed basement excavation, and the support structures for the carpark development are outside of the required 20m, so I trust that this will be more a notification than needing formal approvals.

Would you be able to pass this on to the relevant person to assess please?

If you would let us know who the person to contact would be that would be appreciated.

If there are any questions please contact me or Stephen Brain in our office.

Regards

Rob

Robert Mackellar | Managing Director

+61 2 9439 7288 | +61 411 873 968 | ttw.com.au |

Level 3, 48 Chandos Street, St Leonards NSW 2065

Structural
Civil
Traffic
Façade

6 June 2019 181052 SAAE

Transport for NSW
36-46 George Street
Burwood NSW 2134

Attention: Mr Kenneth Amegor

Liverpool Health and Academic Precinct

Impact of Proposed New Carpark on Sydney Trains Assets

Dear Kenneth,

Further to recent discussions in relation to the proposed Liverpool Hospital Redevelopment, and in particular the Multi Deck Carpark, we provide the following information for submission to Sydney Trains, for their consideration and comment.

1. The information attached as Appendix 1 shows the proposed ground and first floor plans, and a section showing the proposed carpark, relative to the Main Southern Railway Lines, that are adjacent to the Liverpool Hospital site.

2. At our previous meeting with Sydney Trains, it was noted that any excavation within 25m of the railway line would require approval from Sydney Trains.

   No excavation is proposed for the carpark, other than bored pier or CFA piles, and construction of an on-grade area beneath the suspended carpark slabs. The piles and support elements to the overhead suspended carpark are generally located outside of the 25m distance from the centreline of the nearest railway line. In this case, we consider the proposed works do not impact on the Sydney Trains assets.

3. We have attached as Appendix 2 the TfNSW Technical Note: TN043:2017 relating to Development adjacent to Railways. This document notes that structures within 20m are to be designed for impact requirements to AS5100. This is similar to the requirements noted in AS5100.2-2007.

   The attached plans show the support structures for the carpark (columns) are all outside of the 20m impact zone. There is a minor intrusion of approximately 1 m into the 20m zone of the suspended floor slab, more than 4m above the ground level at the north east edge of the carpark.

   Clause 11.4.3 of AS5100.2 only requires a collision lead for the superstructure within 10m horizontally and 5m vertically of the centerline of the nearest track.

   Considering this is a suspended concrete slab, above the level of the railway, we consider the proposed location of the carpark and its support structures do not require a specific design for collision requirements. We request Sydney Trains comment or provide their concurrence with this approach.

Should you require anything further please contact the undersigned.

Taylor Thomson Whitting (NSW) Pty Ltd (ACN 113 578 377)
as trustee for the Taylor Thomson Whitting NSW Trust
(ABN 59 514 956 558) I Consulting Engineers
Level 3, 48 Chandos Street, St Leonards NSW 2065

Yours faithfully,
TAYLOR THOMSON WHITTING (NSW) PTY LTD
in its capacity as trustee for the
TAYLOR THOMSON WHITTING NSW TRUST

ROBERT MACKELLAR
Managing Director

cc.

Scott Coakes, Johnstaff Projects
Thomas Pottie, Johnstaff Projects
Shamma Hasan, Johnstaff Projects

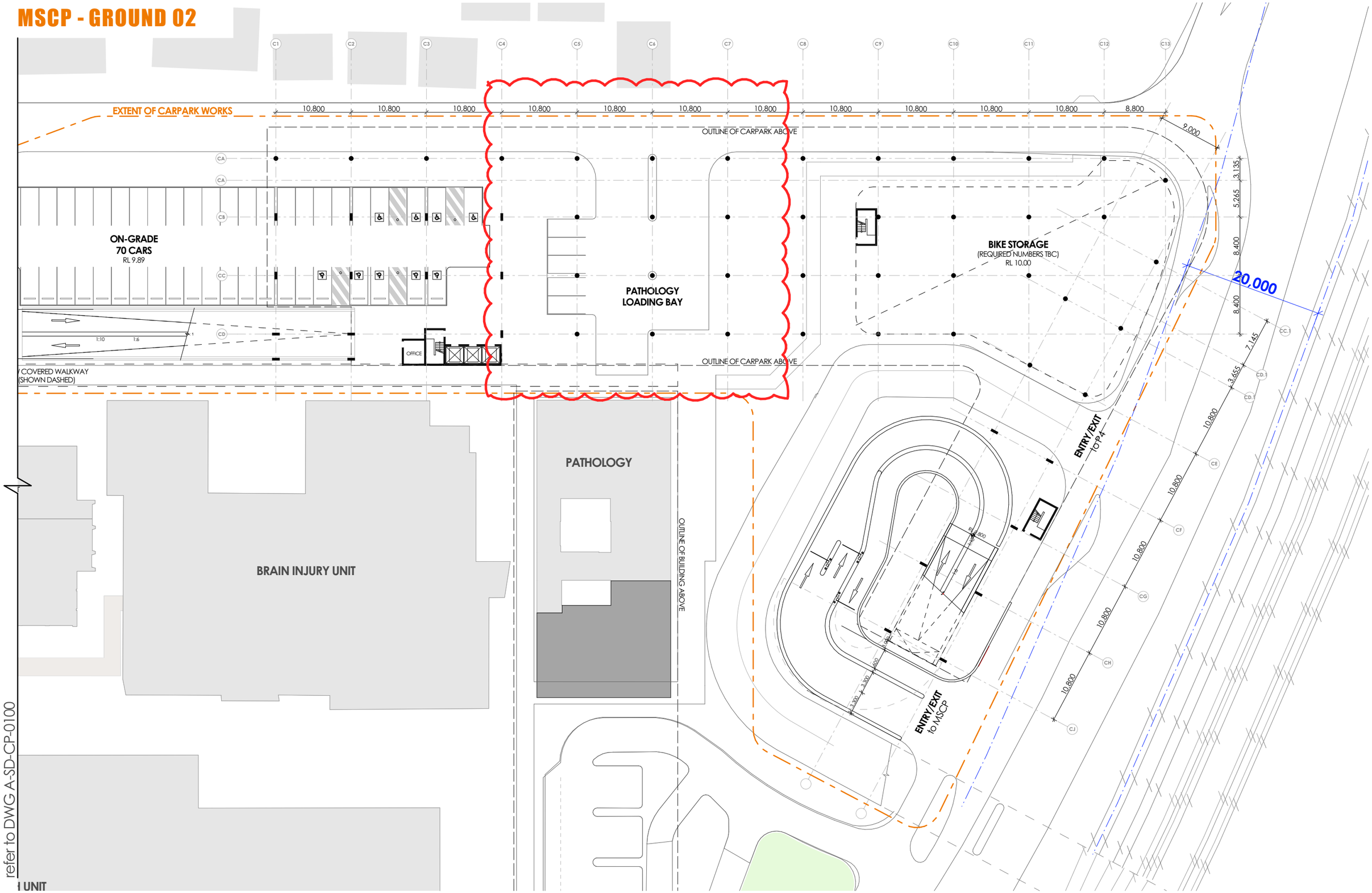
Attachment:

Appendix 1	MSCP Ground Floor, Section Thru Railway Corridor and Level 1 Rail Overlay Drawings
Appendix 2	TFNSW ASA Building Adjacent to Railway Lines

\\192.168.1.186\Jobfiles$\2018\1810\181052\Letters\190605 LHAP New Carpark on Sydney Trains Assets RM lee.docx

Appendix 1

MSCP - GROUND 02



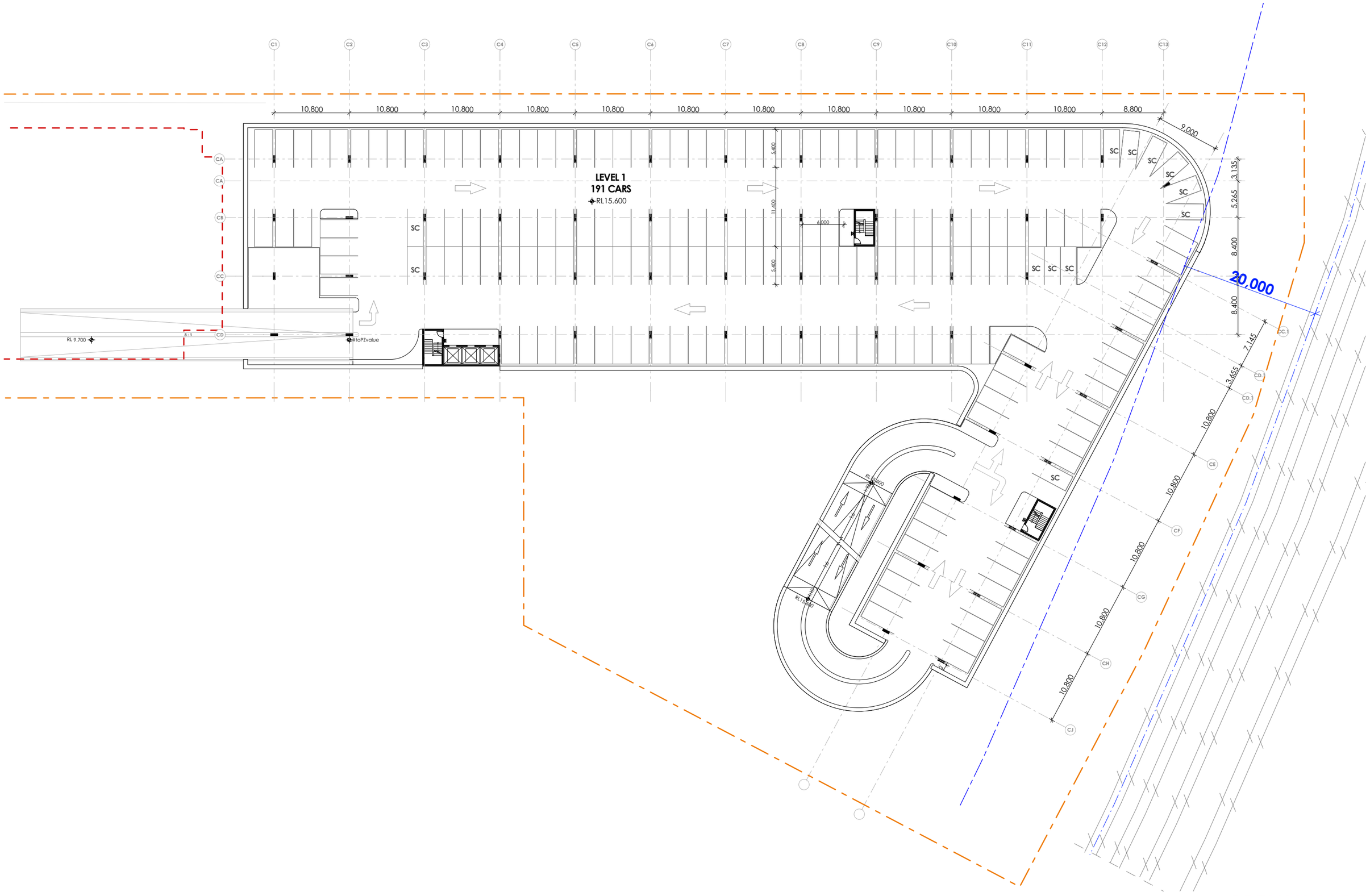
fitzpatrick+partners

SK30/05/2019

SCHEMATIC DESIGN

LIVERPOOL HEALTH + ACADEMIC PRECINCT

ELIZABETH STREET, LIVERPOOL NSW



PRELIMINARY

fitzpatrick+partners

p. +61 (0)2 8274 8200 w. www.fitzpatrickpartners.com
a. LEVEL 6, 156 CLARENCE STREET, SYDNEY 2000, AUSTRALIA

AMENDMENTS

REV.	DATE	DESCRIPTION	CHK
01	29/05/2019		JZ

PROJECT
LIVERPOOL HEALTH & ACADEMIC PRECINCT
ELIZABETH STREET LIVERPOOL NSW

CLIENT
HEALTH INFRASTRUCTURE
14/77 PACIFIC HWY, NORTH SYDNEY NSW 2060

NORTH
SCALE @ A3
1:500
25mm ON ORIGINAL

DRAWING
LEVEL 01

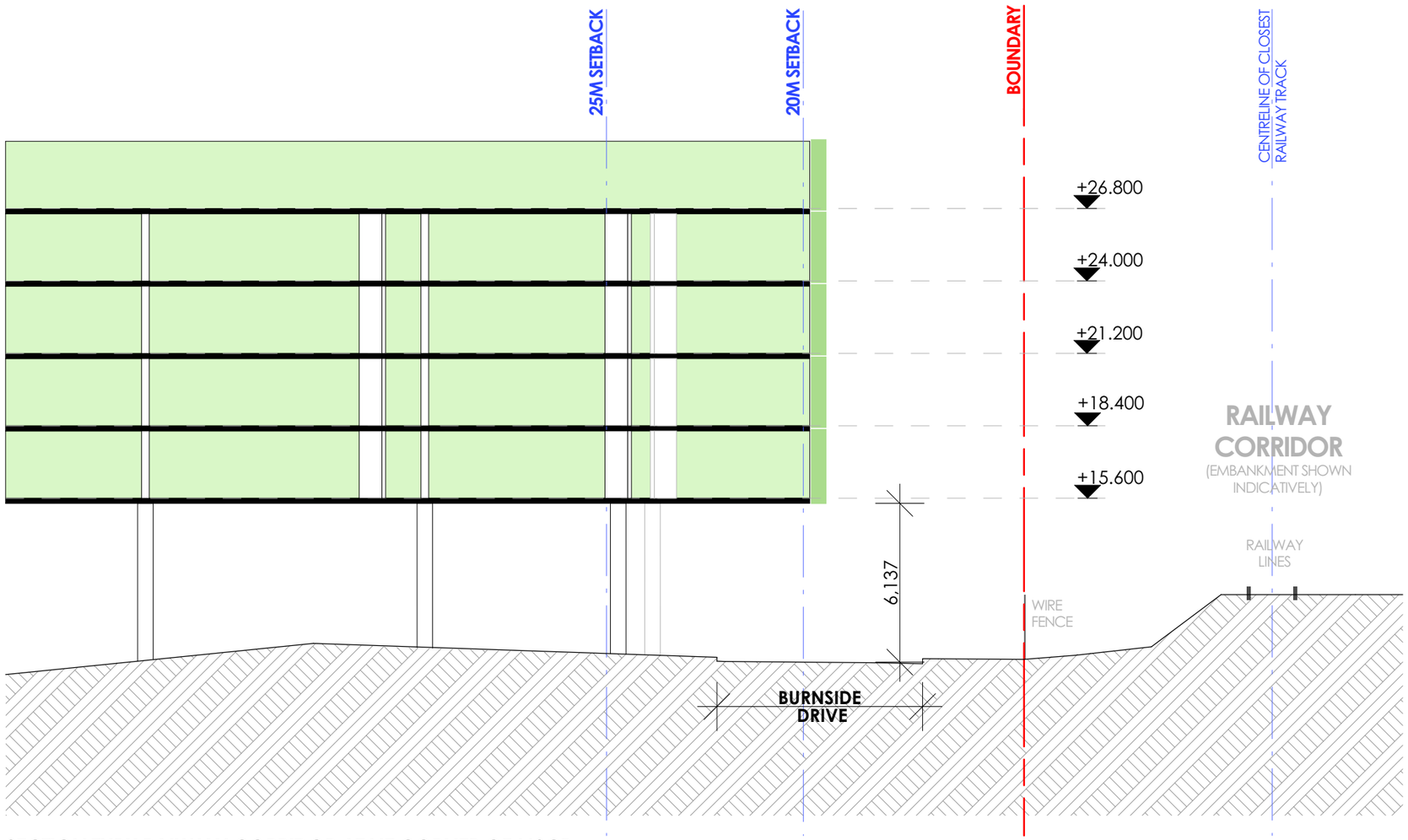
DRAWN	CHECKED	APPROVED
LL	JZ	JZ

PROJECT NO.	DRAWING NO.	ISSUE
21807	A-SD-CP-0102	01

STAGE
SCHEMATIC DESIGN

PRINT DATE
29/05/2019

SECTION THRU RAILWAY CORRIDOR



SECTION THRU RAILWAY CORRIDOR AT NE CORNER OF MSCP
1:200

27/05/2019
fitzpatrick+partners
SK190513 REV:

SCHEMATIC DESIGN
LIVERPOOL HEALTH + ACADEMIC PRECINCT
ELIZABETH STREET, LIVERPOOL NSW

Appendix 2

For queries regarding this document
standards@transport.nsw.gov.au
www.asa.transport.nsw.gov.au

Technical Note - TN 043: 2017

Issued date: 10 November 2017

Effective date: 10 November 2017

Subject: Ground anchor restrictions

This technical note is issued by the Asset Standards Authority (ASA) to update the requirements of T HR CI 12080 ST *External Developments,* version 1.0.

This update relates to the restriction of the use of ground anchors in external developments specified in Section 5.3 of T HR CI 12080 ST.

Section 5.3 of T HR CI 12080 ST shall be replaced in its entirety with the following:

5.3 Ground anchors

Permanent or temporary soil or rock anchors extending into TfNSW property are not acceptable to TfNSW, unless there are demonstrable geotechnical and property development benefits to TfNSW.

Authorisation:

	Technical content prepared by	Checked and approved by	Interdisciplinary coordination checked by	Authorised for release
Signature				
Date				
Name	Richard Hitch	Richard Hitch	Jason R Gordon	Jagath Peiris
Position	Lead Civil Engineer	Lead Civil Engineer	Chief Engineer	Director Network Standards and Services

For queries regarding this document
standards@transport.nsw.gov.au
www.asa.transport.nsw.gov.au

Technical Note - TN 082: 2016

Issued date: 21 December 2016

Subject: Revised reference to risk criteria

This technical note has been issued by the Asset Standards Authority (ASA) to notify the following.

- The risk criteria to be used by the Authorised Engineering Organisations (AEOs) providing engineering services to TfNSW are contained in T MU MD 20002 ST *Risk Criteria for Organisations Providing Engineering Services*, version 1.0.
- 30-ST-164 *TfNSW Enterprise Risk Management (TERM) Standard* provides the risk criteria to be used by TfNSW.
- All references to the TERM standard in this document, where applicable to AEOs, shall read as T MU MD 20002 ST.

Authorisation:

	Technical content prepared by	Checked and approved by	Interdisciplinary coordination checked by	Authorised for release
Signature				
Date				
Name	Richard Adams	Andy Tankard	Andy Tankard	Graham Bradshaw
Position	Manager Safety and Risk Assurance	Principal Manager SQER	Principal Manager SQER	Director Network Standards and Services

T HR CI 12080 ST

Standard

External Developments

Version 1.0

Issued Date: 05 February 2015

Standard governance

Owner: Lead Civil Engineer, Asset Standards Authority

Authoriser: Chief Engineer Rail, Asset Standards Authority

Approver: Director, Asset Standards Authority on behalf of ASA Configuration Control Board

Document history

Version	Summary of change
1.0	First issue

For queries regarding this document,
please email the ASA at
standards@asa.transport.nsw.gov.au
or visit www.asa.transport.nsw.gov.au

Transport
Asset Standards
Authority

Preface

The Asset Standards Authority (ASA) is an independent unit within Transport for NSW (TfNSW) and is the network design and standards authority for defined NSW transport assets.

The ASA is responsible for developing engineering governance frameworks to support industry delivery in the assurance of design, safety, integrity, construction, and commissioning of transport assets for the whole asset life cycle. In order to achieve this, the ASA effectively discharges obligations as the authority for various technical, process, and planning matters across the asset life cycle.

The ASA collaborates with industry using stakeholder engagement activities to assist in achieving its mission. These activities help align the ASA to broader government expectations of making it clearer, simpler, and more attractive to do business within the NSW transport industry, allowing the supply chain to deliver safe, efficient, and competent transport services.

The ASA develops, maintains, controls, and publishes a suite of standards and other documentation for transport assets of TfNSW. Further, the ASA ensures that these standards are performance based to create opportunities for innovation and improve access to a broader competitive supply chain.

This standard supersedes RailCorp standard ESC 380 *External Developments*, Version 2.4.

The changes to previous content include the following:

- updates to reflect organisational changes resulting in responsibilities
- minor amendments and clarification to content
- conversion of the standard to ASA numbering, format and style

Table of contents

1. Introduction

External developments are public or private works that take place outside but adjacent to the rail corridor. External developments are to be considered across the full life cycle of the asset including, construction, operation, maintenance, and decommissioning or demolition.

The potential effects of such work upon the rail corridor shall be considered and mitigated to ensure safety so far as is reasonably practicable (SFAIRP) in accordance with the requirements of this document. The affect of rail infrastructure alterations upon existing developments is also to be considered.

2. Purpose

The purpose of this document is to provide the technical requirements for the interface between external developments and the rail corridor.

2.1. Scope

This document specifies the technical requirements for the interface with external developments adjacent to the rail corridor.

External developments can include the demolition, extension or construction of any new public or private infrastructure adjacent to TfNSW rail property.

2.2. Application

The requirements of this document apply to new developments and to upgrades of existing developments.

The requirements also apply when the proximity or arrangement between existing developments and the rail corridor or track changes as a result of rail corridor or track alteration.

An example of this situation is where the distance between a development and track decreases as a result of track duplication.

3. Reference documents

Australian standards

AS 5100 - Bridge design

Transport for NSW standards

ESC 510 Boundary Fences

30-ST-164/3.0 TfNSW Enterprise Risk Management Standard (available on request – contact standards@asa.transport.nsw.gov.au)

Legislation

Heritage Act 1977 (NSW)

Other references

NSW State Heritage Register

SMS-06-GD-0268 Working around Electrical Equipment

TfNSW Section 170 Heritage and Conservation Register

4. Terms and definitions

The following terms and definitions apply in this document:

AEO Authorised Engineering Organisation

external development is the demolition, extension to or construction of any new public or private infrastructure adjacent to TfNSW rail property

rail corridor comprises the full volume, both above and below ground, between the outer face of opposing boundary fences. If no boundary fences are present, the extent of the rail corridor shall be taken as 15 m from the centre-line of the outermost rail.

railway infrastructure facilities other than rolling stock necessary for a railway to operate safely including railway track, associated track structures, over-track or under-track structures, supports (including supports for railway equipment or items associated with the use of a railway), tunnels, bridges, stations, platforms, train control systems, signalling systems, communication systems, electric traction infrastructure, buildings, workshops and associated equipment

SFAIRP so far as is reasonably practicable

TfNSW Transport for New South Wales

5. General requirements

Developments adjacent to the railway corridor shall be planned so that there will be no adverse affects on the railway infrastructure or rail operations across the full life cycle of the asset.

5.1. Specific corridors

Guidelines for assessing the impact of proposed developments on the New Southern Railway (Airport line) and the Epping to Chatswood rail link (ECRL) were prepared during the construction of those lines. These guidelines reside with the operator and maintainer of the rail network.

Developments along those lines shall comply with the specific protection guidelines for each line and any additional requirements specified in this standard.

5.2. Temporary components

Any temporary components of shoring systems that are located such that their stability has the potential to affect the rail corridor shall have a minimum service life of 10 years excluding considerations of any support from the permanent structure.

Shoring systems shall be designed and certified by an approved AEO and verified by an independent approved AEO.

All access to the rail corridor shall be subject to the approval of the operator and maintainer.

5.3. Ground anchors

Temporary or permanent soil or rock anchors which extend into the rail corridor are not permitted.

6. Design requirements

The design of all external developments shall be carried out in accordance with Australian Standards.

6.1. Boundary definition

The location of the proposed development with respect to the railway corridor boundary shall be clearly identified on design, construction and as-built drawings. Boundaries between external developments and the rail corridor shall be considered as side or rear boundaries in terms of Building Code of Australia (BCA) compliance.

6.2. Geotechnical and structural stability and integrity

The design of the development shall not affect the stability and integrity of railway infrastructure through loading from the development and ground deformation.

6.3. Foundations within the rail corridor

Foundations for external developments shall not physically intrude into the rail corridor.

Foundations for external developments shall not rely upon passive earth pressure from rail corridor land.

6.4. Noise and vibration

The effects of noise and vibration from rail operations shall be considered in the design of the development. The noise from construction and rail operation shall be considered against statutory and project noise vibration limit requirements.

6.5. Stray currents and electrolysis from rail operations

The potential effects of stray electrical currents and electrolysis in the electrified area of the rail network shall be the subject of a risk assessment across the full life cycle of the asset. Such effects shall be managed to a safety SFAIRP level across the full life cycle.

6.6. Stormwater drainage and sewerage

Stormwater run-off from the development shall not discharge onto the rail corridor or into the track drainage system. This requirement exists for both the construction and operational phases of the development.

Sewerage from the development shall not discharge onto the rail corridor or into the track drainage system. This requirement exists for both the construction and operational phases of the development.

6.7. Electrical clearances

Developments shall be designed to ensure that minimum clearances are observed to HV aerial lines, 1500 V dc overhead traction wiring and equipment, and exposed low voltage equipment, as per the requirements of Australian Standards, the regulations of the relevant electrical authorities and TfNSW electrical engineering standards.

6.8. Environmental conditions

The design of the development shall not result in any increased environmental risk, including statutory environmental noncompliance within the rail corridor.

6.9. Lighting and reflective materials

Developments that require illumination at night or special lighting during daylight hours shall be planned and implemented so that there is no effect on the rail operations such as interference with train drivers or fixed signals. Interference with train drivers includes, but is not limited to, restriction of visibility of signals and signage distraction, and glare.

The designer shall seek approval for any such lighting from the rail operator in advance of construction of works.

External developments shall not introduce obstructions or reflections which adversely effect signal sighting. Night time lighting shall not generate colours which can cause signal misinterpretation.

The risk assessment for an external development shall consider the risks associated with lighting and reflective materials. Any such risks identified shall be managed to ensure safety SFAIRP across the life cycle of the asset.

6.10. Boundary fencing

Boundary fences between any external development and the rail corridor shall comply with ESC 510 *Boundary Fences*.

6.11. Building setbacks and design

The ongoing ability to access the rail corridor for maintenance and emergency situations is critical to the safety, integrity and operation of the NSW rail network. Existing and proposed new access points shall be considered when designing the location of new buildings and structures.

The design of balconies and windows shall mitigate the risk of debris being thrown onto railway infrastructure.

The risk of cladding panels becoming detached from external developments shall be mitigated.

6.12. Derailment protection of structures

Supports for structures positioned within 20 metres of the centre-line of the railway track shall comply with the collision protection provisions of AS 5100 *Bridge Design*, whether on rail property or not.

Supporting elements positioned within 10 metres of the centre-line of the railway track shall comply with the redundancy requirements or the minimum collision loads specified in AS 5100, whether on rail property or not.

Where the supporting elements are located between 10 metres and 20 metres of the rail line, an assessment of the risk of a derailed train colliding with the supporting elements of the structure will determine the category of collision loading in AS 5100 that shall be applied to a support. This risk assessment shall be carried out in accordance with 30-ST-164/3.0 *TfNSW Enterprise Risk Management Standard.*

6.13. Maintenance of the development

Future maintenance of the proposed development shall not adversely affect the railway infrastructure or rail operations. Ongoing maintenance of any element of the proposed external development shall not rely upon access from the TfNSW side of the railway boundary.

6.14. Communications and signalling

Potential interference to rail signalling and communications systems shall be assessed at the concept design stage. The design of external developments shall not introduce electro magnetic interference to railway signalling and telecommunications systems.

Potential line of sight disruption to train radio or microwave communication systems shall be assessed for operational risk, and the mitigation required shall be identified at the concept design stage.

7. Construction requirements

The construction and maintenance of all external developments shall be carried out in accordance with Australian Standards.

7.1. Demolition and earthworks

Demolition and earthworks shall not adversely affect railway infrastructure over the full life cycle.

Hydraulic rock breakers shall not be used within five metres of any railway tunnel.

7.2. Drainage and pollution control

During construction, water shall not collect and pond on or near the railway infrastructure. No run-off from the development shall discharge onto the rail corridor or into the track drainage system during construction.

7.3. Electrical restrictions

Minimum safe working clearances to electrical power lines and equipment located within the rail corridor are to be observed in accordance with WorkCover and electrical safety requirements as published on the RailSafe website, particularly SMS-06-GD-0268 *Working around Electrical Equipment*.

7.4. Crane and other aerial operations

When in operation, cranes and other construction equipment such as, concrete pumps and access equipment, shall not intrude into the rail corridor.

When not in operation, cranes are permitted to 'weathervane' into the rail corridor subject to the approval of the maintainer and operator and the Lead Electrical Engineer, ASA.

The requirements of SMS-06-GD-0268, Section 9 *Work above exposed electrical equipment,* shall be observed.

No loads are to pass over any overhead wiring or HV aerial lines located within the rail corridor.

7.5. Geotechnical and structural stability and integrity

The construction and operation of external developments shall not affect the stability and integrity of railway infrastructure through loading from the development and ground deformation.

7.6. Environmental conditions

The construction and operation of external developments shall not to result in any increased environmental risk, including statutory environmental noncompliance within the rail corridor.

7.7. Electrical clearances

External developments shall be constructed to ensure that minimum clearances are observed to HV aerial lines, 1500 V dc overhead traction wiring and equipment, and exposed low voltage equipment, as per the requirements of Australian Standards, the regulations of the relevant electrical authorities and TfNSW electrical engineering standards.

8. Heritage

All environmental factors, including heritage significance, shall be examined at an early project stage and shall be incorporated into the concept design.

Construction activities shall not affect the heritage significance of items or structures that are located within or adjacent to the rail corridor and listed on the *NSW State Heritage Register* or the TfNSW *Section 170 Heritage and Conservation Register*. Refer to the *Heritage Act 1977 (NSW)* for further information.

Consideration in the design stage shall also take into account the effects of construction activities on the following:

- heritage curtilages
- view corridors
- landscape
- overall contextual setting

Further considerations include, but are not limited to, the potential for dilapidation to heritage items as a result of construction activities, and ensuring that access is available for long term maintenance of heritage items.