

Last week RMS received an application to approve construction over a live road (White Hart Drive) from Sydney Metro's main contractor which was declined.

Approximately 48hrs later RMS received a draft version of the assurance statement letter that Sydney Metro had proposed in their Lee St meeting with RMS (Approximately 3 months previously that included their Deputy Project Director and the RMS COO).

This was followed less than 12 hours later by a phone call from Sydney Metro stating that the signed version of the draft statement was about to be issued with an expectation that RMS should then approve the commencement of construction for the White Hart Drive works.

The following day at the monthly RMS/Sydney Metro PCG RMS attempted to suggest the assurance statement be re-worded to produce a stronger commitment from Sydney Metro to meet the WAD Quality Assurance obligations.

Sydney Metro stated that in their opinion the assurance statement was adequate.

Regardless of the assurance letter RMS can categorically state that the WAD requirements and obligations have not been met, the Independent Certifier is of exactly the same opinion and the supporting information that has been presented by Sydney Metro would verify this position.

LPP

As Sydney Metro will struggle to resolve all the outstanding WAD issues to the satisfaction of the Independent Certifier without serious delay to their project programme it may be prudent for RMS to insist that Sydney Metro concentrate on meeting the WAD obligations relevant to the structural integrity of the specific section of viaduct they are currently proposing to construct and work with RMS to resolve the remaining outstanding issues in a timely manner.

CAMPBELL Clarinda

From: RAVINDRA Rajanthi
Sent: Tuesday, 19 January 2016 11:20 AM
To: ASSI Salah; CHONG Yew C; DOAN Trung V; HUANG Da; CHEUNG Harry C; Colyn Jones; DEY Ashis K; SIDDIQUE Mohammad S; GNANASOTHY Anusuya
Cc: PONNAMPALAM Vachchiravetkumaran; PRASAD Lakshman; SHAH Parvez; SEDRA Samia; DESHPANDE Sanjivan
Subject: FW: SMH - Jan 15 - Cracks emerge in Skytrain section of \$8.3 billion Sydney rail line

FYI

Two of 24 concrete spans erected for the "Skytrain" section of the new rail line to Sydney's north-west suburbs may need to be pulled down after cracking.

Read more: <http://www.smh.com.au/nsw/cracks-emerge-in-skytrain-section-of-83-billion-sydney-rail-line-20160115-gm6nes.html#ixzz3xZaGLNEk>

In an emailed statement, Sydney Metro acting program director Tom Gellibrand said none of the 24 spans erected so far had been disassembled but, "following close inspections, there are two spans where some cracking has occurred".

"The rectification of the cracking may result in these two spans being replaced," he said. "This is a straightforward construction process.

"It is not uncommon for cracking to occur within reinforced concrete and there is a comprehensive inspection program in place for the Skytrain construction, with any required repairs undertaken in accordance with quality assurance procedures and processes." Mr Gellibrand, who said safety was the top issue for the project, said it would be finished in line with the program. That would mean finishing the section in 2017 to hand over to the next major contractor, in charge of both running the trains and fitting the line with track and signalling systems.

The construction timing will be crucial, partly because the overall project involves shutting down the existing Epping to Chatswood rail line for about seven months from late 2018, to link it in with the extension to Rouse Hill.

The Greens transport spokeswoman, Mehreen Faruqi, who has a doctorate in engineering, said problems in the project were "hallmarks of an infrastructure program where the public sector has been hollowed out of engineering expertise, and is unable to effectively oversee and supervise project delivery".

One source who has worked on the Skytrain section project said morale was low following the latest issue. "Most of the people that are there are completely disillusioned," he said.

Read more: <http://www.smh.com.au/nsw/cracks-emerge-in-skytrain-section-of-83-billion-sydney-rail-line-20160115-gm6nes.html#ixzz3xZav3rg5>

Regards

Rajanthi Ravindra

Senior Bridge Engineer, New Design

Engineering Technology | Asset Maintenance

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Every journey matters

Roads and Maritime Services

Level 5, Pod G, 110 George Street, Parramatta NSW 2150.

CAMPBELL Clarinda

From: DOAN Trung V
Sent: Wednesday, 16 December 2015 10:16 AM
To: DAVE Gopang
Cc: McMahon, Anthony; KROLL Ian
Subject: RE: Sydney Metro Northwest - : DL85.21 - Temporary Works - Launching Gantry Steel Tower Temporary Support for Piers 92 to 94 in Southern Bus Layover (FDD) - Responses to comments

Gopang,

I have reviewed the responses and updated documents to address my comments No 30 to 34 and confirmed that all of these comments can be closed.

Regards,

TRUNG DOAN

Bridge Engineer, Review & External New Design
Bridge Engineering | Engineering Services | Asset Maintenance
T 02 8837 0809 | M 043 763 2238
Roads and Maritime Services
Level 5, 110 George Street Parramatta NSW 2150

From: DAVE Gopang
Sent: Tuesday, 8 December 2015 11:27 AM
To: DOAN Trung V; KROLL Ian
Cc: McMahon, Anthony
Subject: Sydney Metro Northwest - : DL85.21 - Temporary Works - Launching Gantry Steel Tower Temporary Support for Piers 92 to 94 in Southern Bus Layover (FDD) - Responses to comments
Importance: High

Ian & Trung

Enclosed are responses to your comments #30 to #36 raised further to the review of ISJV temporary design works DL85.21 at FDD: please provide updated response statuses using the attached Comment register. Links to drawings series 255300 are embedded in this transmittal (click on the link provided in email below), in response to RMS comment #35.

Your response by 14 Dec 2015 or earlier would be appreciated.

Please do not hesitate to contact me if you have any queries.

Regards,

Gopang Dave
Project/Contract Manager (Sydney Metro Northwest)
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Out of Scope

CAMPBELL Clarinda

From: McMahon, Anthony
Sent: Friday, 10 June 2016 3:23 PM
To: HEAD Steven
Cc: BOCK Sally E
Subject: CEO Brief Draft
Attachments: Sydney Metro Viaduct Construction Approval CEO Brief.docx

Steven,

Apologies for this taking so long, Sydney Metro Rodd Staples may contact our CEO directly on this subject, if this occurs it may be prudent for RMS to not commit to accepting any progression of viaduct works over live roads until this brief and the implications within have been fully considered.

Regards

Anthony McMahon
[Integration Manager](#)
Roads and Maritime Services
Sydney Metro Project
Transport for NSW

M 0400 619329
Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

LPP

LPP

From: HEAD Steven
Sent: Thursday, 1 September 2016 6:52 AM
To: MCMAHON Anthony J
Subject: FW: 20160826_Roads and Maritime Services_Rev 2_Tracked Changes (5) Aug 31.docx
Attachments: 20160826_Roads and Maritime Services_Rev 2_Tracked Changes (5) Aug 31.pdf

I think this is the letter I sent which is not the original. Could you check and follow up this morning including negotiations to bring this to a conclusion. If it needs to be stronger and you want to add in more then that's okay, just needs to be in a way that gets the process moving forward

Regards
Steven

Out of Scope

CAMPBELL Clarinda

From: McMahon, Anthony
Sent: Tuesday, 6 September 2016 2:25 PM
To: 'GRANT Katie'
Subject: FW: Sydney Metro Assurance Letter Tuesday Modified Rev
Attachments: CE16_1077 - Sydney Metro Viaduct Construction Approval.docx; ATT00001.htm

Katie,

I don't have any such letter, can you give me a call I don't have your number.

T.

From: MCMAHON Anthony J [mailto:Anthony.MCMAHON@rms.nsw.gov.au]
Sent: Tuesday, 6 September 2016 2:24 PM
To: McMahon, Anthony
Subject: Fwd: Sydney Metro Assurance Letter Tuesday Modified Rev

Sent from my iPhone

Begin forwarded message:

From: GRANT Katie <Katie.GRANT@rms.nsw.gov.au>
Date: 6 September 2016 at 2:23:29 PM AEST
To: MCMAHON Anthony J <Anthony.MCMAHON@rms.nsw.gov.au>
Subject: **FW: Sydney Metro Assurance Letter Tuesday Modified Rev**

Hi Anthony,

And can you send me the letter for the CE to sign too please- I didn't realise one had already been drafted.

Kind regards,
Katie

From: GRANT Katie
Sent: Tuesday, 6 September 2016 2:21 PM
To: 'McMahon, Anthony'
Subject: RE: Sydney Metro Assurance Letter Tuesday Modified Rev

Hi Anthony,

They are- sorry I should have called you to confirm which of us was updating it. I have removed that statement, and added in some of the wording from your version. Does this look okay to you?

Kind regards,
Katie

From: McMahon, Anthony [mailto:Anthony.McMahon@transport.nsw.gov.au]
Sent: Tuesday, 6 September 2016 2:10 PM

To: GRANT Katie
Subject: FW: Sydney Metro Assurance Letter Tuesday Modified Rev

Katie,

You were just a bit faster than me though my version is strangely similar to yours. Can you have a look and see if there is anything in your version you would like to amend.
I would like you to remove your statement about the Proof Engineer and IC approving changes in design etc as this is not accurate.

Regards

Anthony McMahon
Integration Manager
Roads and Maritime Services
Sydney Metro Project
Transport for NSW

M 0400 619329
Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

From: MCMAHON Anthony J [<mailto:Anthony.MCMAHON@rms.nsw.gov.au>]
Sent: Tuesday, 6 September 2016 2:02 PM
To: McMahon, Anthony
Subject: Fwd: Sydney Metro Assurance Letter Tuesday Modified Rev

Sent from my iPhone

Begin forwarded message:

From: "GRANT Katie" <Katie.GRANT@rms.nsw.gov.au>
To: "HEAD Steven" <Steven.HEAD@rms.nsw.gov.au>, "MCMAHON Anthony J" <Anthony.MCMAHON@rms.nsw.gov.au>
Cc: "THURSTON Claire F2" <Claire.THURSTON@rms.nsw.gov.au>
Subject: RE: Sydney Metro Assurance Letter Tuesday Modified Rev

Hi Steven

How about this? I'm not sure if this is what you are envisaging for the letter, or if it needs more detail.

Anthony, in relation to Steven's comments about remaining risks, can you please advise if anything needs to be added?

Kind regards,
Katie

From: HEAD Steven
Sent: Tuesday, 6 September 2016 1:03 PM
To: GRANT Katie; MCMAHON Anthony J; THURSTON Claire F2
Subject: RE: Sydney Metro Assurance Letter Tuesday Modified Rev

Okay

I just read it

Should the brief not broadly say

There was a previous issue with a viaduct over one of our assets

We were given assurances to its safety and allowed works to continue.
There was another issues following

They have conducted a significant investigation which has identified a number of changes to their design, construction and installation process which has been ticked off by proof engineer and IC

Project has applied to again work over our assets to install additional viaducts

There has been lengthy deliberation with the project

Reached agreement with this letter

We support it under those conditions. Any remaining risks as best we can identify.
Ask CE to sign letter

The existing brief doesn't really give any direction.

This needs to get to CE today

From: GRANT Katie
Sent: Tuesday, 6 September 2016 10:35 AM
To: HEAD Steven
Subject: FW: Sydney Metro Assurance Letter Tuesday Modified Rev

Hi Steven,

Anthony has confirmed he's happy with this version.

Kind regards,
Katie

From: McMahon, Anthony [<mailto:Anthony.McMahon@transport.nsw.gov.au>]
Sent: Tuesday, 6 September 2016 10:16 AM
To: GRANT Katie
Subject: RE: Sydney Metro Assurance Letter Tuesday Modified Rev

Katie,

Great editing, I'm happy with your version.
For completeness you should also add the attached to the 'For Information' documents.

Regards

Anthony McMahon
Integration Manager
Roads and Maritime Services
Sydney Metro Project
Transport for NSW

M 0400 619329

Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

From: GRANT Katie [<mailto:Katie.GRANT@rms.nsw.gov.au>]
Sent: Tuesday, 6 September 2016 10:09 AM
To: McMahon, Anthony
Subject: RE: Sydney Metro Assurance Letter Tuesday Modified Rev

Hi Anthony,

I think Steven sent that email just before I sent through your latest version with a few minor edits. Steven has just asked that you confirm you're happy with the changes I've made.

Best,
Katie

From: McMahon, Anthony [<mailto:Anthony.McMahon@transport.nsw.gov.au>]
Sent: Tuesday, 6 September 2016 9:53 AM
To: GRANT Katie
Subject: RE: Sydney Metro Assurance Letter Tuesday Modified Rev

Katie,

I cannot add any more to the brief.

Regards

Anthony McMahon
Integration Manager
Roads and Maritime Services
Sydney Metro Project
Transport for NSW

M 0400 619329

Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

From: HEAD Steven [<mailto:Steven.HEAD@rms.nsw.gov.au>]
Sent: Tuesday, 6 September 2016 9:45 AM
To: McMahon, Anthony; GRANT Katie
Subject: RE: Sydney Metro Assurance Letter Tuesday Modified Rev

Katie

I have not read, could you and Anthony work together to get this finalised. It is urgent for today.

Regards
Steven

From: McMahon, Anthony [<mailto:Anthony.McMahon@transport.nsw.gov.au>]
Sent: Tuesday, 6 September 2016 9:01 AM
To: GRANT Katie; HEAD Steven
Subject: Sydney Metro Assurance Letter Tuesday Modified Rev

Katie, Steven,

Revised edit to promote consideration of the Sydney Metro request.

Regards

Anthony McMahon
Integration Manager
Roads and Maritime Services
Sydney Metro Project
Transport for NSW

M 0400 619329

Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

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Please visit us at <http://www.transport.nsw.gov.au> or <http://www.transportnsw.info>

LPP

LPP

LPP

CAMPBELL Clarinda

From: HEAD Steven
Sent: Tuesday, 6 September 2016 8:16 AM
To: GRANT Katie; MCMAHON Anthony J; THURSTON Claire F2
Subject: FW: Sydney Metro Viaduct Assurance Letter

This needs to get signed by Acting CE today to meet our obligations under the WAD.

Katie
Can you please prioritise working on this with Anthony so I can quickly review and get to A/COO.

Regards
Steven

Out of Scope

Out of Scope

Out of Scope

CAMPBELL Clarinda

From: DOAN Trung V
Sent: Thursday, 12 November 2015 10:59 AM
To: DAVE Gopang
Cc: CHIM Kevin; McMahon, Anthony; KROLL Ian
Subject: RE: Sydney Metro Northwest -DL85.21 - Temporary Works - Launching Gantry Steel Tower Temporary Support for Piers 92 to 94 in Southern Bus Layover (FDD)
Attachments: NWRLSVC-HYD-SVC-DN-CRR-852100.A.FR - RMS Bridge Comment.xlsx

Gopang,

Please find attached our comments on the subject package.

Regards,

TRUNG DOAN

Bridge Engineer, Review & External New Design
Bridge Engineering | Engineering Services | Asset Maintenance
T 02 8837 0809 | M 043 763 2238
Roads and Maritime Services
Level 5, Pod G 110 George Street Parramatta NSW 2150

From: DAVE Gopang
Sent: Tuesday, 27 October 2015 1:34 PM
To: KROLL Ian; DOAN Trung V
Cc: CHIM Kevin; McMahon, Anthony
Subject: Sydney Metro Northwest -DL85.21 - Temporary Works - Launching Gantry Steel Tower Temporary Support for Piers 92 to 94 in Southern Bus Layover (FDD)
Importance: High

Ian & Trung

Please click on link below to download the design document for temporary works required to be carried out to support launching gantry steel tower. The design about the design & purpose is provided within the report. Please use attached comment register to provide your comments.

Your response is requested by 13/11/2015.

Item	Document Number	Description	Rev	Status	Type	Design Lots
1.	NWRLSVC-ISM-BVR-CS-DRT-852100	SOUTHERN BUS LAYOVER PIER 92 TO 94 LAUNCHING GANTRY STEEL TOWER TEMPORARY SUPPORT DESIGN REPORT	A	FDD	DRT	DL85
2.	NWRLSVC-ISM-SVC-CS-DRG-852100	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET DRAWING INDEX	B	FDD	DRG	DL85
3.	NWRLSVC-ISM-SVC-CS-DRG-852102	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PIER 92 STEEL TOWER TEMPORARY SUPPORT	B	FDD	DRG	DL85
4.	NWRLSVC-ISM-SVC-CS-DRG-852103	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PIER 93 STEEL TOWER TEMPORARY SUPPORT	B	FDD	DRG	DL85
5.	NWRLSVC-ISM-SVC-CS-DRG-	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PIER 94 STEEL TOWER TEMPORARY SUPPORT	B	FDD	DRG	DL85

	852104					
6.	NWRLSVC-ISM-SVC-CS-DRG-852105	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET TYPICAL PRECAST PEDESTAL DETAILS	B	FDD	DRG	DL85
7.	NWRLSVC-ISM-SVC-CS-DRG-852106	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PAVEMENT CONFIGURATION STAGE 1 ARRANGEMENT AT PIER 93 AND 94	B	FDD	DRG	DL85
8.	NWRLSVC-ISM-SVC-CS-DRG-852107	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PAVEMENT CONFIGURATION STAGE 2 ARRANGEMENT AT PIER 93 AND 94	B	FDD	DRG	DL85
9.	NWRLSVC-ISM-SVC-CS-DRG-852110	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PAVEMENT CONFIGURATION AT PIER 93	B	FDD	DRG	DL85
10.	NWRLSVC-ISM-SVC-CS-DRG-852115	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PAVEMENT CONFIGURATION AT PIER 94	B	FDD	DRG	DL85

Regards,

Gopang Dave
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Out of Scope

DESIGN PACKAGE No. **DL85.21**
 TEAMBINDER DOC REF. **NWRLSVC-HYD-SVC-DN-CRR-852100**

Date/Time/Rev	Monday, 26 October 2015		
Date/Time/No. of Drgs			
Date/Time/No. of Drgs			
Date/Time/No. of Drgs			

RESPONSE STATUS
 O Open
 C Closed
 CS Closed SUBJECT TO additional action / information
 L Certification Limitation

Rev	IC USE ONLY: CRR Status	Date	By

DESIGN PACKAGE TITLE
TEMPORARY WORKS
DL85.21 Southern Bus Layover Piers 92 to 94 Launching Gantry Steel Tower Temporary Support
 Report: **NWRLSVC-ISJ-SVC-TW-DRT-852100**

COMPLIANCE STATUS
 O Observation / Comment
 D From info currently provided not able to determine whether design / proposal is compliant.
 N Non-Compliant
 M Minor non-compliance for immediate action but subsequently documented in next version.

No.	Stage	PACKAGE	Rev	Reviewer	Initial Comment Date	Discipline	Organisation	Document Reference	Reviewer Initial Comment	Project Deed ref	Compliance Status	ISJV Response	Initial Response Date	Response Status	Reviewer Comment on Response	Date Comment Closed	Incorporation Status / Date
1	FDD	DL85.21	A	TD	12-Nov-2015	Bridge	RMS	Report	Section 4.2: it is noted the temporary structure is not designed for any horizontal loadings which seems unconservative. At least wind loads and accidental impact loads should be considered. It is also stated that all horizontal loads are resisted by the Pier but it appears the permanent columns will not be constructed until the temporary work finishes. Please clarify.		D						
2	FDD	DL85.21	A	TD	12-Nov-2015	Bridge	RMS	Report	Section 4.2.1: please summarise the results from Strand7 and compared with results from the permanent case (in service). How's the soil bearing pressure under the temporary loads compared to the permanent case?		D						
3	FDD	DL85.21	A	TD	12-Nov-2015	Bridge	RMS	Report	Section 6: there are numerous notes about the piles, pile caps and breakdown of piles but these elements are not shown on the drawings. Please clarify		O						
4	FDD	DL85.21	A	TD	12-Nov-2015	Bridge	RMS	Drawings	Sheet 2 -5: the cast in dowels appear to be cut-off and left in place. Therefore they should be stainless steel.		M						
5	FDD	DL85.21	A	TD	12-Nov-2015	Bridge	RMS	Drawings	Sheet 8: Stage 2 - it should be noted on this drawings that the footing / pile cap to be thoroughly inspected after the completion of the temporary works for any cracking or defect before backfilling. It may be useful to carry out a survey of the footing / pile cap to ascertain it has not moved or settled during the temporary works.		M						
6	FDD	DL85.21	A														
7	FDD	DL85.21	A														
8	FDD	DL85.21	A														
9	FDD	DL85.21	A														
10	FDD	DL85.21	A														
11	FDD	DL85.21	A														
12	FDD	DL85.21	A														
13	FDD	DL85.21	A														
14	FDD	DL85.21	A														
15	FDD	DL85.21	A														
16	FDD	DL85.21	A														
17	FDD	DL85.21	A														

From: [GRANT Katie](#)
To: [MCMAHON Anthony J](#)
Cc: [HEAD Steven](#)
Subject: FW: Viaduct Decision
Date: Monday, 5 September 2016 2:37:07 PM
Attachments: [CE16_1077 - Sydney Metro Viaduct Construction Approval.docx](#)

Hi Anthony,

Just to let you know, I will be out of the office for most of this afternoon. (I will be logging on again a bit later but not until 5.30 or so). If you and Steven wish to progress this for COO approval in the meantime once you have updated it, please forward it to Dora Moga, who should be able to assist.

Kind regards,
Katie

From: GRANT Katie
Sent: Monday, 5 September 2016 10:56 AM
To: MCMAHON Anthony J
Subject: FW: Viaduct Decision

Hi Anthony,

The latest version of the brief is attached, as discussed, and my phone number is below.

Kind regards,
Katie

Katie Grant
Senior GIS Officer
Government Information Services | Customer, Engagement and Planning
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www.rms.nsw.gov.au
Every journey matters

Roads and Maritime Services
Level 1 – Ennis Rd | Kirribilli | Sydney NSW
Locked Bag 928 North Sydney 2059

From: McMahon, Anthony [<mailto:Anthony.McMahon@transport.nsw.gov.au>]
Sent: Monday, 5 September 2016 9:15 AM
To: GRANT Katie
Subject: FW: Viaduct Decision

Katie,

Can you give me a call to discuss.

Regards

Anthony McMahon
Integration Manager
Roads and Maritime Services
Sydney Metro Project
Transport for NSW

M 0400 619329
Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

From: HEAD Steven [<mailto:Steven.HEAD@rms.nsw.gov.au>]
Sent: Monday, 5 September 2016 8:34 AM
To: McMahon, Anthony; GRANT Katie
Subject: Re: Viaduct Decision

Anthony
I'd like to amend the brief and get the acting CE to sign today. Could you work with Katie to do that.
Thanks
Steven
Sent from my iPhone

On 5 Sep 2016, at 8:28 am, McMahon, Anthony <Anthony.McMahon@transport.nsw.gov.au> wrote:

Steven,

Should I continue holding off approval until the letter is accepted by our Senior Exec?

Regards

Anthony McMahon
Integration Manager
Roads and Maritime Services
Sydney Metro Project
Transport for NSW

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Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

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Sydney Metro Northwest Viaduct Construction Issues

From: A/Chief Operating Officer

Topic: Roads and Maritime Services' response to Sydney Metro's request to continue constructing an elevated viaduct over White Hart Drive, Rouse Hill.

Analysis: Roads and Maritime should continue to withhold approval for construction of the viaduct over publicly accessible areas of the site until Sydney Metro addresses concerns about the work. These concerns include public safety and the viaduct's structural integrity, as well as a lack of independent certification, and non-compliance with conditions of the Works Authorisation Deed (WAD).

It is recommended that Roads and Maritime continues discussions with Transport for NSW and the Sydney Metro project team before issuing any formal refusal. This will provide the opportunity to identify instances of non-compliance, discuss the public safety risk, and invite the project team to provide further technical assurance (preferably in the form of independent certification) so that Roads and Maritime can issue approval.

Sydney Metro has indicated that they will escalate the matter if approval is not forthcoming given key project delivery risks they face.

Key issues

Roads and Maritime and the independent certifier have concerns about public safety and quality assurance

Sydney Metro wishes to continue constructing an elevated viaduct across White Hart Drive and has applied for consent from Roads and Maritime through the WAD mechanism.

On a prior road crossing of Memorial Avenue, Transport for NSW was able to provide adequate assurance that it had matters in hand and that the safety of road users and assets was protected. However, a subsequent incident of spalling has raised fresh concerns. In addition, there has been no progress certification from an independent certifier for any of the works completed within the past two years.

Roads and Maritime has previously approved continuation of construction over areas of the site that are not publicly accessible. When Transport for NSW last requested approval to proceed, Roads and Maritime asked that Sydney Metro endorse its contractor's plans to construct over live roads, and provide assurance that Roads and Maritime's concerns have been addressed before submitting any further applications to start works over live roads.

Roads and Maritime assessed the current application and accompanying documents (**Attachment A**), and advised that it cannot provide approval for Sydney Metro to start construction due to concerns about compliance with WAD conditions. Roads and Maritime's primary concerns relate to construction, including quality assurance, which in turn raise issues of structural reliability and public safety. Roads and Maritime's project representative considers Sydney Metro has not yet provided adequate assurance that the project meets WAD requirements. The independent certifier has raised similar concerns (**Attachment B**).

Roads and Maritime also considers that that the Prescribed Quality Management Plan, required under the WAD, needs to be updated to incorporate the augmented safeguards and controls (outlined in the letter at **Attachment C**) and the independent certifier should ideally provide comments on the plan. Roads and Maritime may then need to further consider these comments with Transport for NSW.

Once Sydney Metro provides adequate technical assurance, Roads and Maritime can approve construction to proceed

Once Sydney Metro has provided sufficient assurance that issues relating to construction, including quality assurance, have been considered, addressed and mitigated, Roads and Maritime will be in a position to consider approving the commencement of works. A sufficiently qualified person will need to prepare the quality plans, which must include appropriate hold and witness points, as well as mechanisms for ensuring compliance.

Although Transport for NSW has provided Roads and Maritime with broad indemnities in relation to the works, including the viaduct, Roads and Maritime retains responsibility for ensuring public safety as the roads authority with powers to issue the WAD and authorise works. There is also a whole of Government responsibility to manage rail safety requirements, WHS issues, and roads authority responsibilities.

Discussions with Sydney Metro are ongoing to achieve a satisfactory solution.

Supporting analysis

Provisions of the WAD

Roads and Maritime has an existing WAD with Sydney Metro for viaduct construction over public roads, Roads and Maritime owned land, and associated road works.

The WAD requires Transport for NSW to retain a proof engineer for the viaducts over roads and an independent certifier for the works generally, including aspects of the viaducts.

Where Roads and Maritime has concerns about the quality and safety systems it can undertake an audit, and can direct that works cease if there are concerns for public safety.

Financial impact

N/A.

Consultation

Roads and Maritime staff have been in ongoing contact with Transport for NSW and Sydney Metro project staff, and will continue to work with them to establish the minimum commitments required in order for Roads and Maritime to approve access to the road network.

Angus Mitchell, A/Chief Operating Officer	
Chief Executive's comments	Noted
Briefing for Minister or Secretary	

CAMPBELL Clarinda

From: DAVE Gopang
Sent: Tuesday, 8 December 2015 11:27 AM
To: DOAN Trung V; KROLL Ian
Cc: McMahon, Anthony
Subject: Sydney Metro Northwest - : DL85.21 - Temporary Works - Launching Gantry Steel Tower Temporary Support for Piers 92 to 94 in Southern Bus Layover (FDD) - Responses to comments

Attachments: Comment 3 - Section 2.2, Design Report.pdf; Comment 4 - Table 3-1, Design Report.pdf; Comment 5, 15, 20 to 23, 30 - Appendix D.pdf; Comment 6 - Section 4.3.2, Design Report.pdf; Comment 7 - Section 6.1, Design Report.pdf; Comment 8 - Section 6.2.11, Design Report.pdf; Comment 9 - Section 8, Design Report.pdf; Comment 10 - WVR 85-024_Int Rev_PV UPDATED.pdf; Comment 11 - WVR 85-65_FDD_Temp Support_Package Release corrected.pdf; Comment 12 - NWRLSVC-ISM-SVC-CS-DRG-852102[B.1].pdf; Comment 13, 18, 33, 34 - NWRLSVC-ISM-SVC-CS-DRG-852104[B.1].pdf; Comment 16, 17 - NWRLSVC-ISM-SVC-CS-DRG-852105[B.1].pdf; Comment 24 - Figure 4.1 to 4.3, Design Report.pdf; Comment 25, 31 - Section 4.2, Design Report.pdf; Comment 28 - NWRLSVC-ISM-SVC-CS-DRG-852107[B.1].pdf; Comment 32 - Section 6, Design Report.pdf; NWRLSVC-HYD-SVC-DN-CRR-852100.B.FDD_SMEC Response.xlsx

Importance: High

Ian & Trung

Enclosed are responses to your comments #30 to #36 raised further to the review of ISJV temporary design works DL85.21 at FDD: please provide updated response statuses using the attached Comment register. Links to drawings series 255300 are embedded in this transmittal (click on the link provided in email below), in response to RMS comment #35.

Your response by 14 Dec 2015 or earlier would be appreciated.

Please do not hesitate to contact me if you have any queries.

Regards,

Gopang Dave
Project/Contract Manager (Sydney Metro Northwest)
Regional Maintenance Delivery | Asset Maintenance
M 0408-050-763
www.rms.nsw.gov.au
Every journey matters
Roads and Maritime Services
Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

Out of Scope

2. Works Scope for this Package

2.1 Package Description

This package covers the design of temporary supports at piers 92 to 94 as required during the erection of the Bella Vista to Rouse Hill Viaduct and the temporary pavement construction associated with the between kilometrage 44km674 and 44km814.

2.2 Design Scope

The design scope of services in this package includes:

- The structural design and detailing of the three (3no.) concrete temporary works supports (i.e. in-situ concrete ring beams and precast concrete pedestals) required for the erection of the Bella Vista to Rouse Hill Viaduct superstructure; and
- The temporary pavement design and detailing of the pavement jointing between existing pavement and permanent pavement.

3. Design Criteria and Performance Requirements

3.1 Standards, Codes and Guidelines

The documents listed in Table 3-1 below have been applied in the design development of Southern Bus Layover Launching Gantry Steel Tower Temporary Support Design.

Table 3-1 – Australian Standards, Codes and Guidelines

Issuer Ref.	Title	Issue Date
AS 5100.1	Bridge design—Scope and general principles	2004
AS 5100.5	Bridge design—Concrete	2004
	Austrroads Guide to Pavement Technology Part 2	2012
	RMS Rigid Pavement Standard Drawings Volume CP	2014

3.2 Key Design Criteria and Inputs

Design loads are provided by ISJV drawing NWRLSVC-ISJ-SVC-TN-DRG-731723_02

Launching gantry steel tower interfacing dimensions are provided by ISJV drawing NWRLSVC-ISJ-SVC-TN-DRG-731739_03

Launching gantry steel tower base beam details are provided by ISJV drawing NWRLSVC-ISJ-SVC-TW-DRG-731002

The tie down anchors details in Pilecap are provided by ISJV drawing NWRLSVC-ISJ-SVC-TN-DRG-731715

3.2.1 Location

The temporary supports and temporary pavement is located at Piers 92 to 94 along Bella Vista to Rouse Hill Viaduct between kilometrage 44km674 and 44km814

3.2.2 Design Life

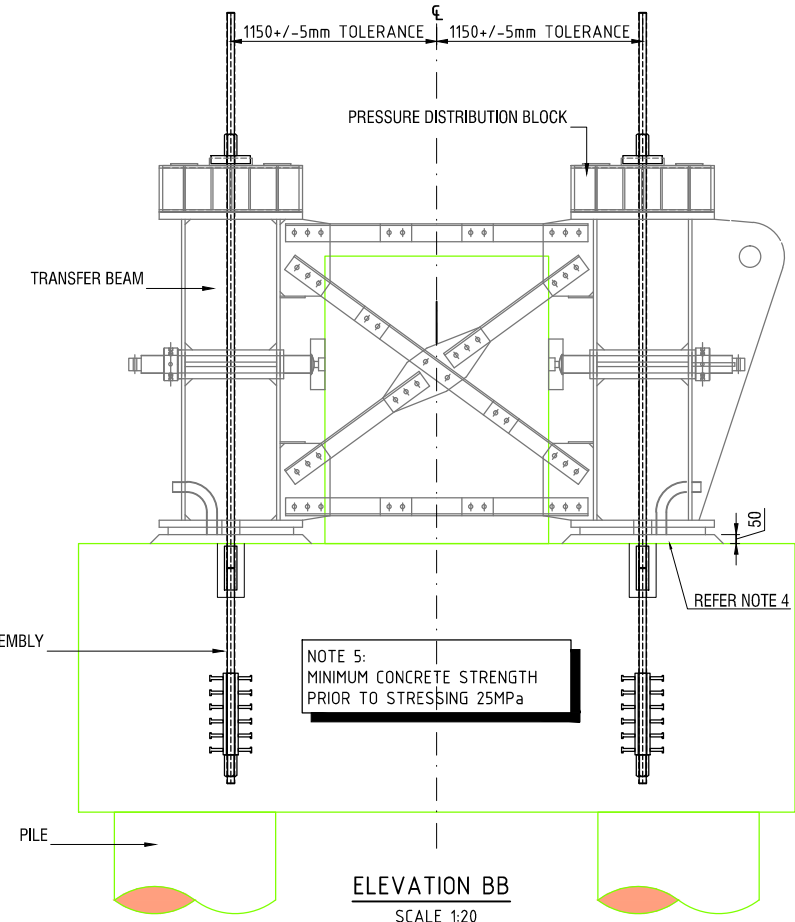
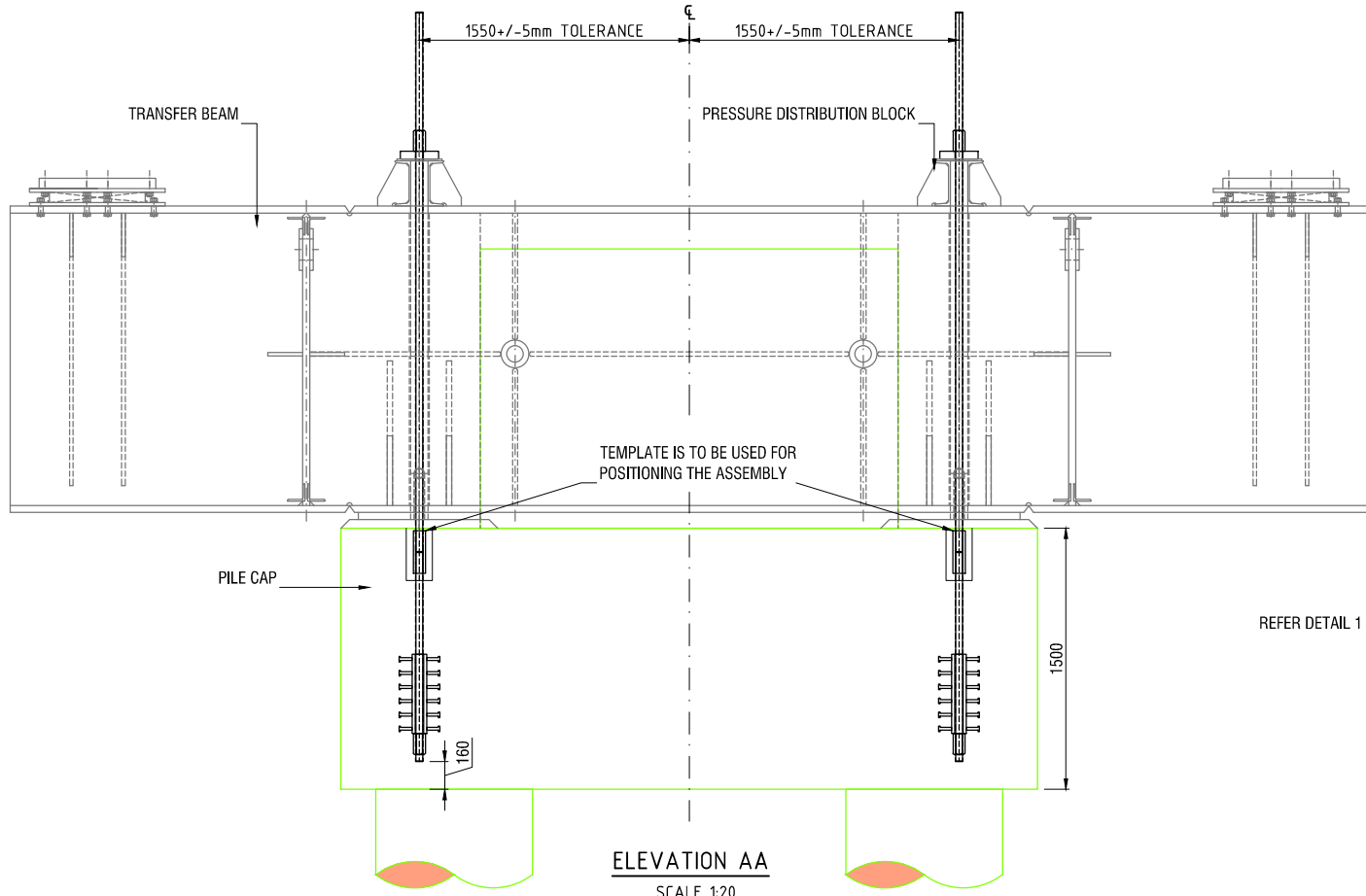
The temporary supports will be required for a period of less than 6 months. Given this relatively short design life, no special provisions are required to ensure their durability. However, as part of the temporary concrete structure will be left in the place permanently, the temporary support durability was designed based on a 100 years design life in accordance with AS5100.5 Section 4.

3.2.3 Loading Requirements

Design loads are provided by ISJV on drawing NWRLSVC-ISJ-SVC-TN-DRG-731723_02, the loading are as followed:

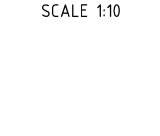
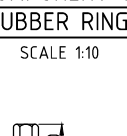
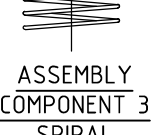
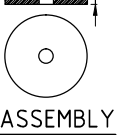
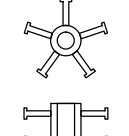
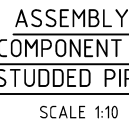
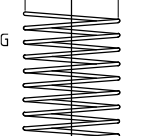
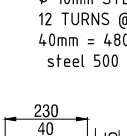
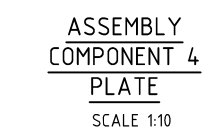
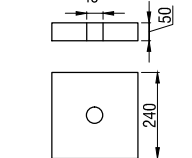
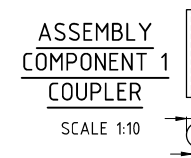
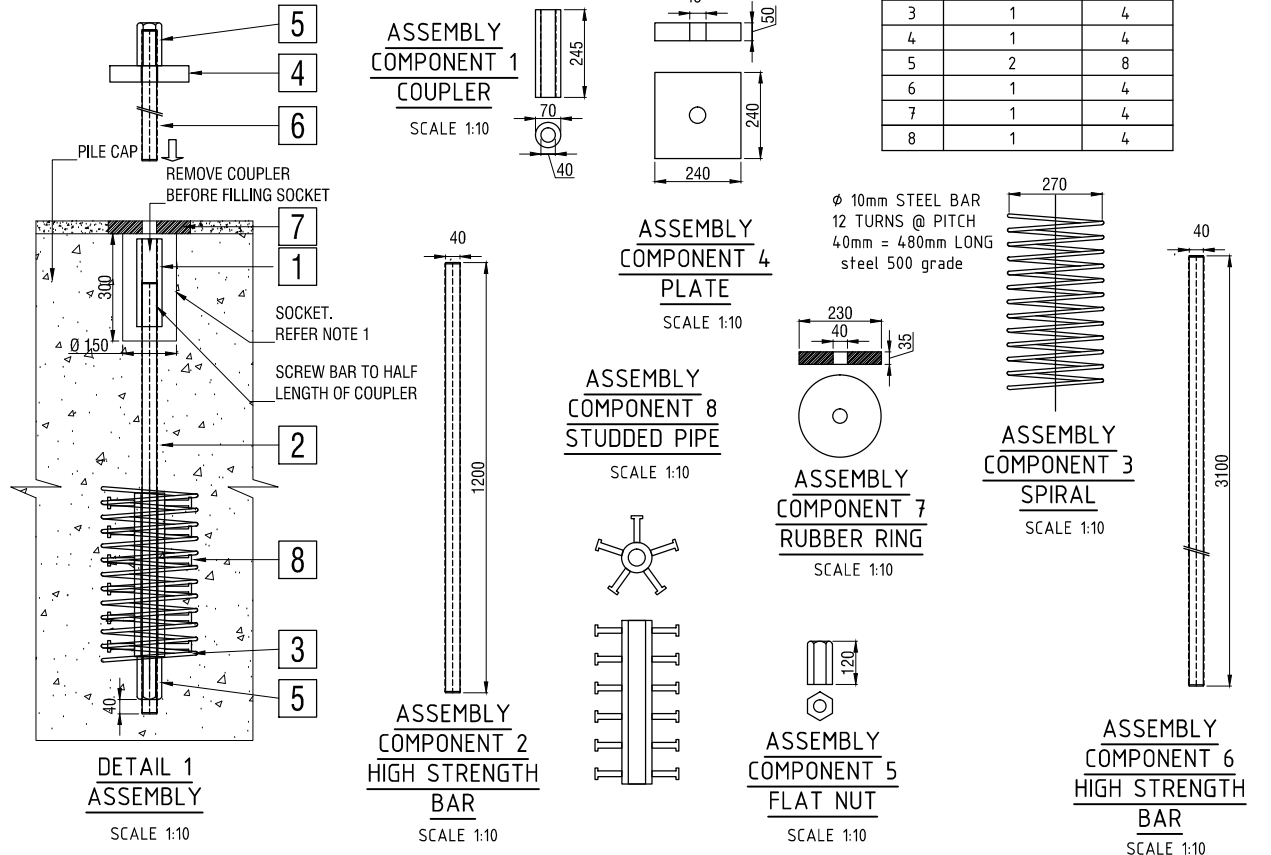
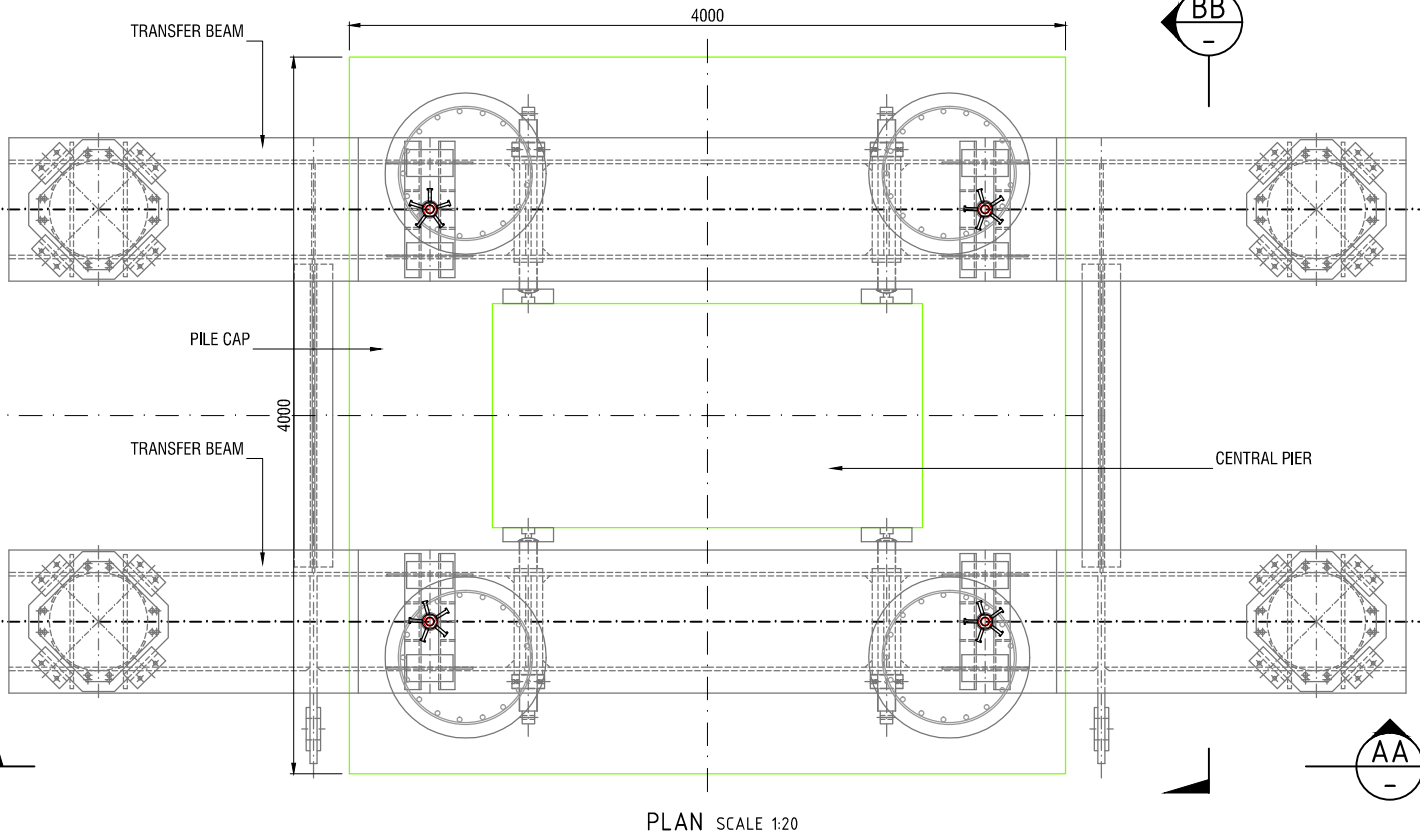
Table 3-2 Tall Pier Loading

Point	Load condition	Load combination	Axial Load Fz (kN)
A1	Working condition	Erection stages	-3050
		Moving stages	-1800



- NOTE 1: SOCKET FOR COUPLER TO BE FILLED AFTER COMPLETION WITH CEMENTITIOUS NON-SHRINKAGE GROUT, CYLINDRICAL STRENGTH = 40MPa.
- NOTE 2: RUBBER RING TO KEEP SOCKET CLEAN UNTIL THE OPERATION IS COMPLETED. IT WILL BE REMOVED TOGETHER WITH TOP MORTAR UPON SOCKET FILLING.
- NOTE 3: MAXIMUM POST TENSIONING LOAD = 650kN.
- NOTE 4: CEMENTITIOUS NON SHRINKAGE GROUT. CUBIC STRENGTH 35 MPa. MINIMUM STRENGTH PRIOR TO PRESTRESSING 25 MPa.
- NOTE 6: FOR STUDDED PIPE DETAILS REFER TO DRW NWRL-ISJ-SVC-TN-DRG-731717
- NOTE 7: DIWIDAG-SYSTEM INTERNATIONAL HIGH STRENGTH BARS (BREAKING LOAD 1320 kN) ARE OF PRESTRESSING STEEL Y1050H ACCORDING TO prEN10138-4.
- NOTE 8: REFERENCE DOCUMENTS AND DRAWINGS
- NWRLSVC-ISM-SVC-GN-SPC-580314(01) ISJV B240 SUPPLY OF BOLTS, NUTS, SCREWS AND WASHERS
 - NWRLSVC-ISM-SVC-GN-SPC-580315(01) ISJV B241 MANUFACTURE AND SUPPLY OF MINOR STEEL ITEMS
 - NWRLSVC-ISM-SPC-CS-DRG-025006(01) SECOND PONDS CREEK VIADUCT GENERAL NOTES SHEET 1
 - NWRLSVC-ISM-SPC-CS-DRG-025007(01) SECOND PONDS CREEK VIADUCT GENERAL NOTES SHEET 2
- NOTE 9: FOR MAXIMUM DESIGN TENSILE FORCE OF ANCHOR BAR REFER TO DRAWING NWRLSVC-ISJ-SVC-TN-DRG-731723(1)_INTERFACES WITH PIER AND DECK SEGMENTS_XAU21XXXXXCA121_01

COMP.	QTY./ASSEMBLY	QTY./CAP
1	1	4
2	1	4
3	1	4
4	1	4
5	2	8
6	1	4
7	1	4
8	1	4



100mm AT FULL SIZE
Cadd File: P:\S73 Technical Department\73.1 Launching Gantry\73.1.700 TOWERS\NWRLSVC-ISJ-SVC-TN-DRG-731715(1)_TIE DOWN ANCHORS IN PILE CAP.dwg
Plot Date: 07/09/15 - 11:10

REV.	BY	DATE	DESCRIPTION	APPD.
H	PK	07/09/2015	IC CERTIFICATE	PL
G	DN	03/09/2015	IC CERTIFICATE	PL
F	DN	16/04/2015	NOTE 7 MODIFIED	PL
E	DN	03/02/2015	NOTE 7, 8 AND 9	PL
D	DN	28/01/2015	STUDS AND SPIRAL MODIFIED	PL
C	PL	27/01/2015	STUDED PIPE AND SPIRAL	PL

PK	DATE	DESCRIPTION	APPD.
A1	Original	Co-ordinate System: MGA Zone 56 Height Datum: A.H.D.	This sheet may be prepared using colour and may be incomplete if copied

INDEPENDENT CERTIFIER CERTIFICATE:
NWRLSVC-HYD-SVC-DN-CER-732501
TBA

NOTE: Do not scale from this drawing.

CLIENT

Transport for NSW

SERVICE PROVIDERS

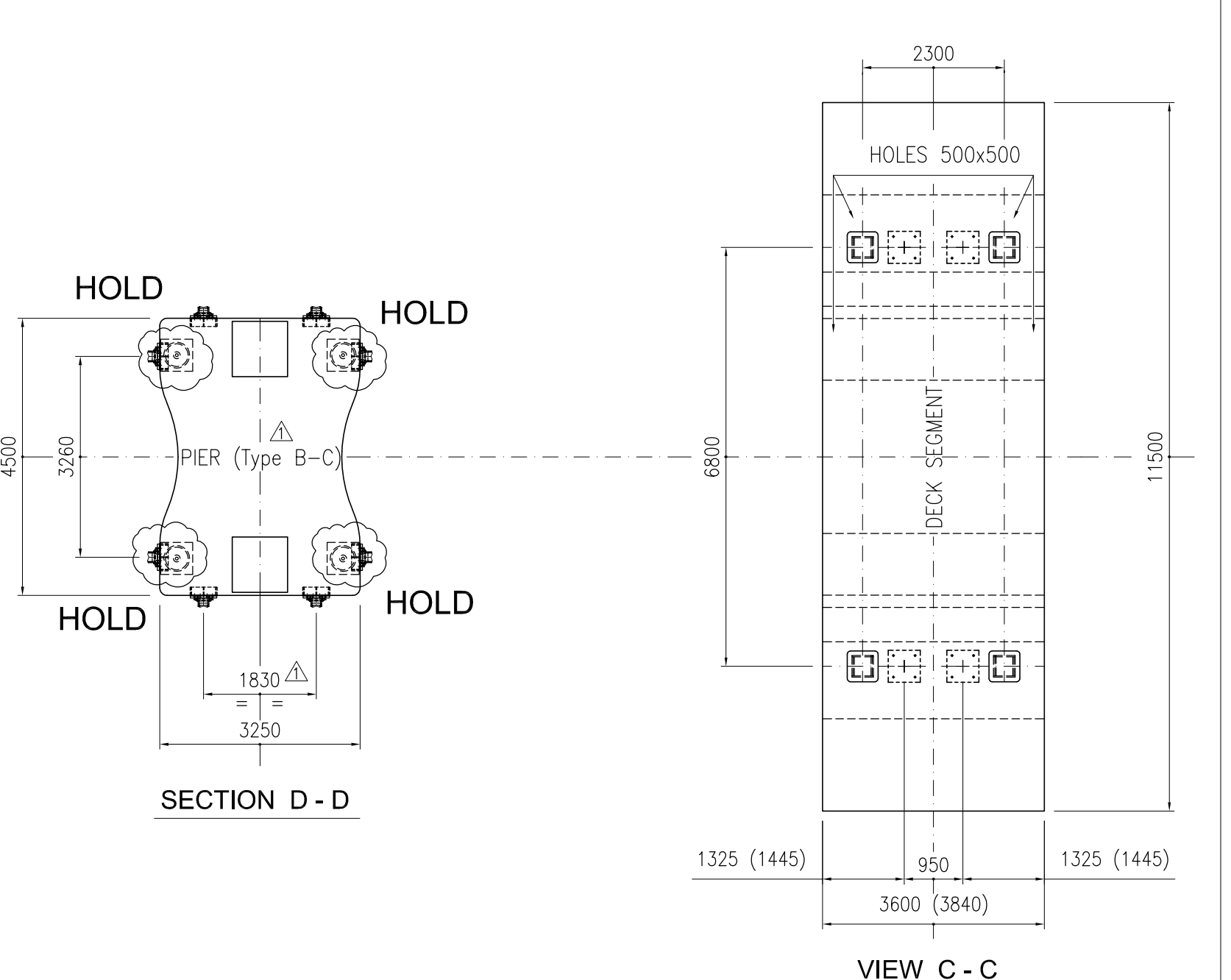
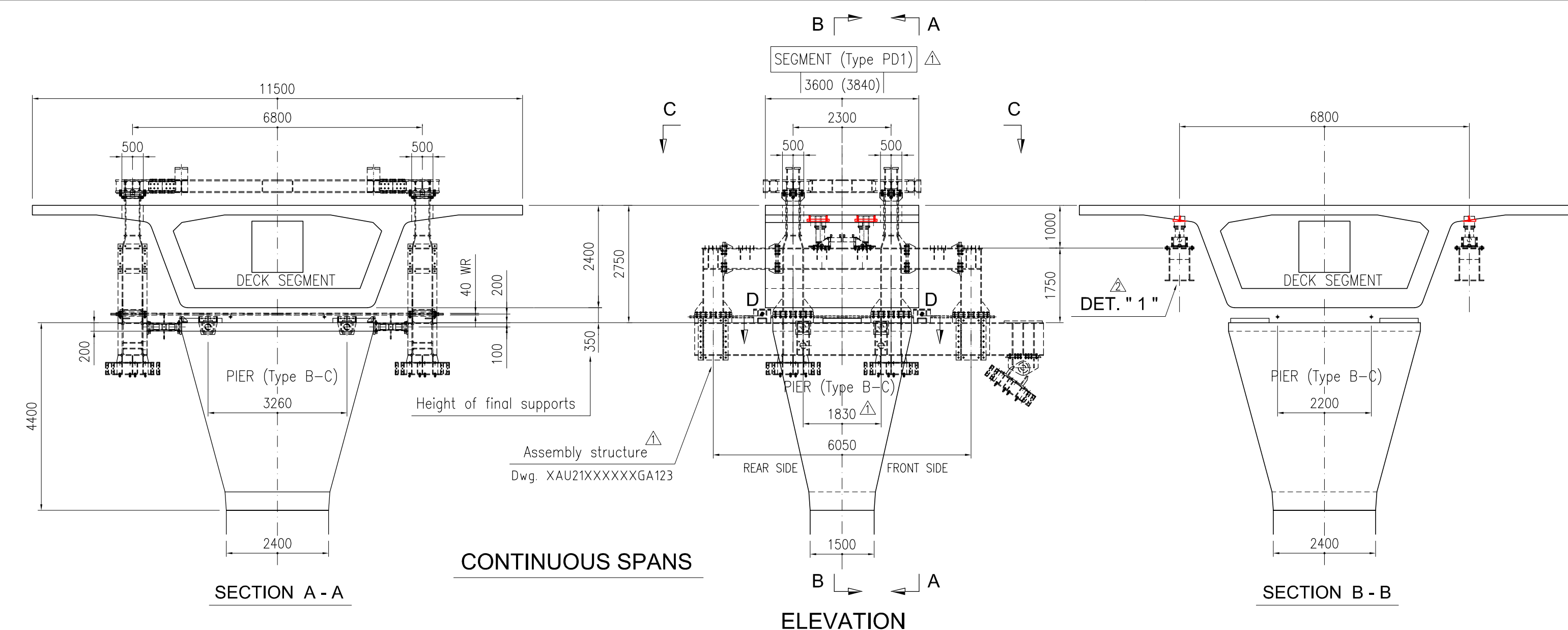
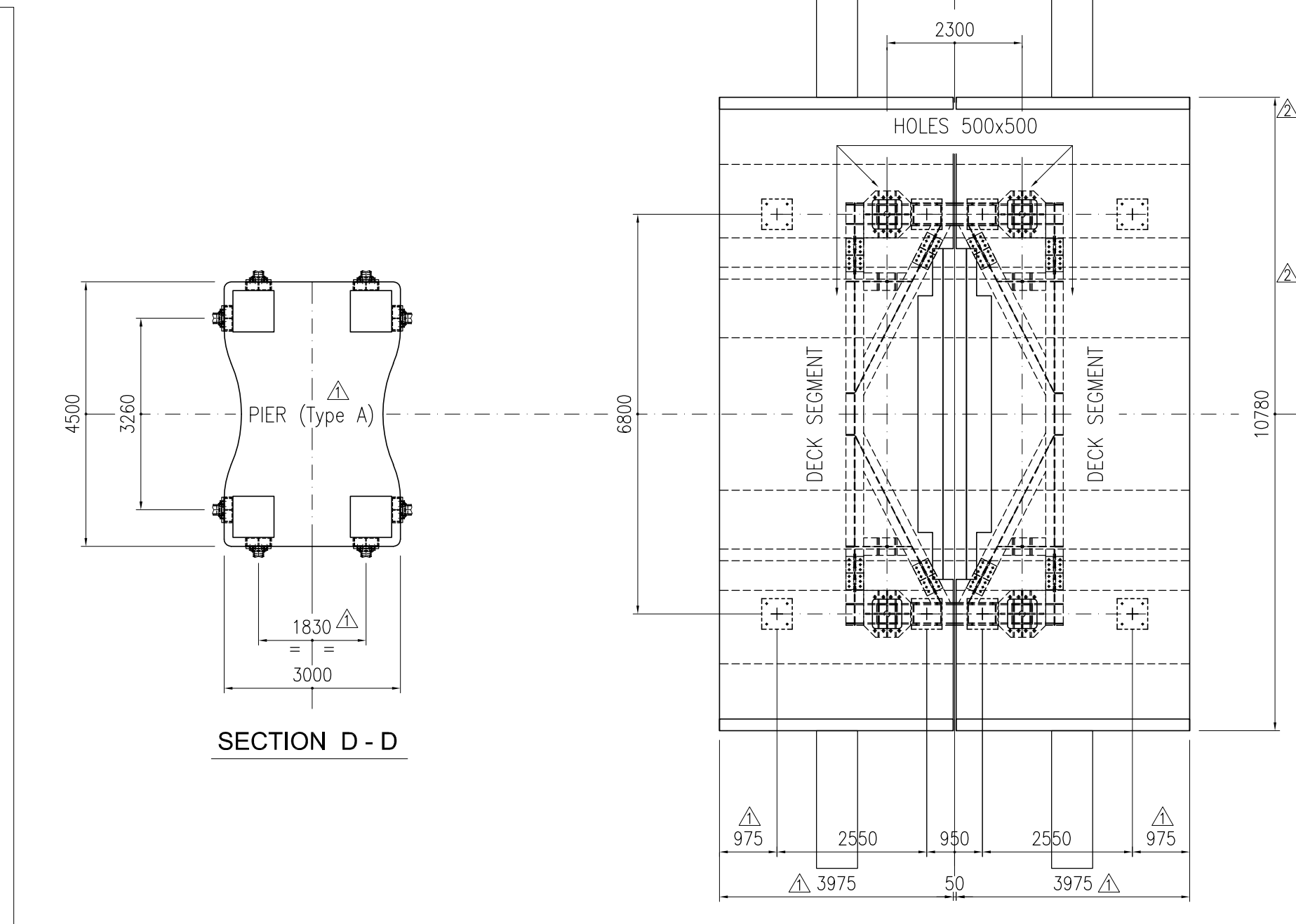
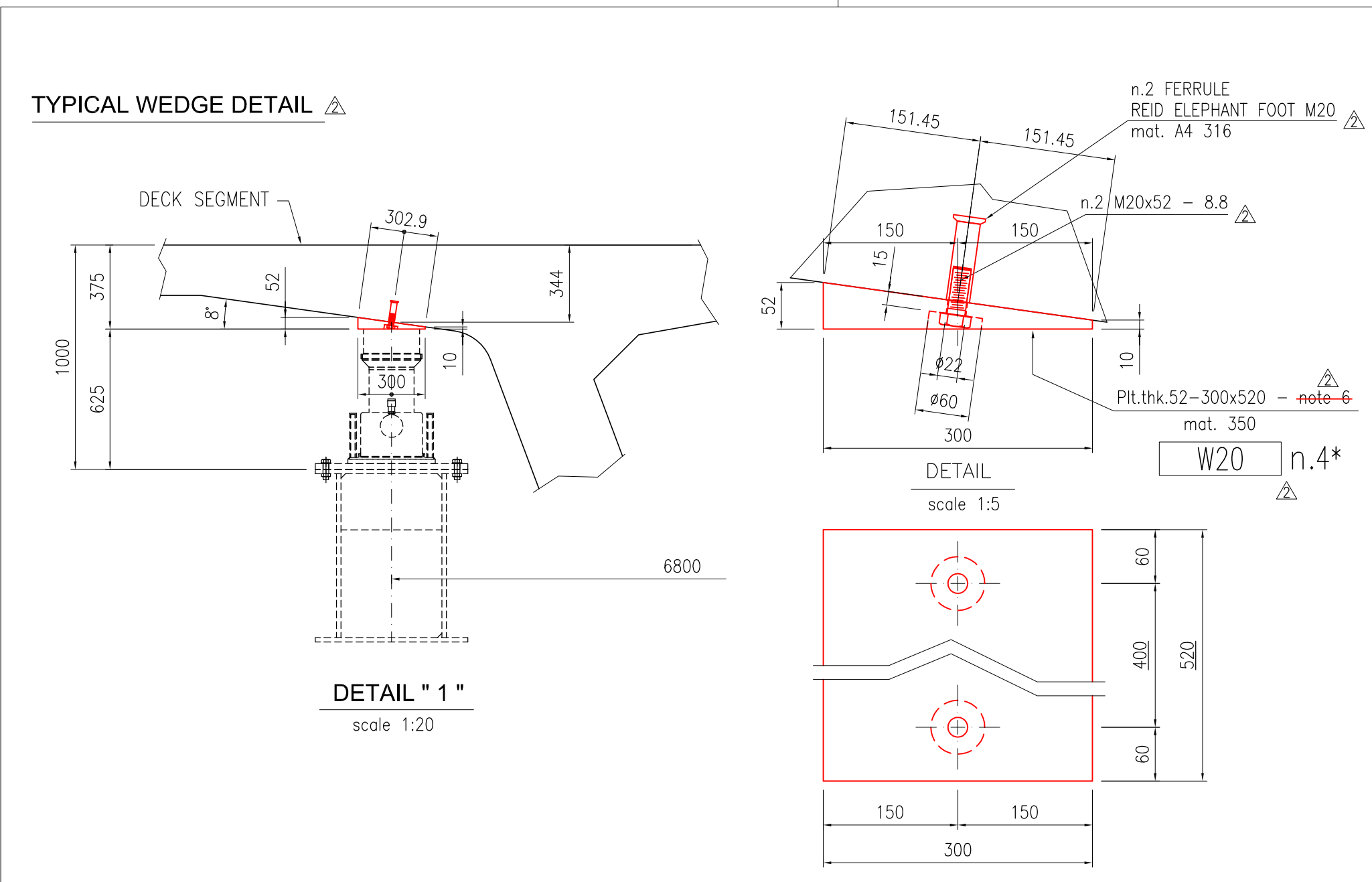
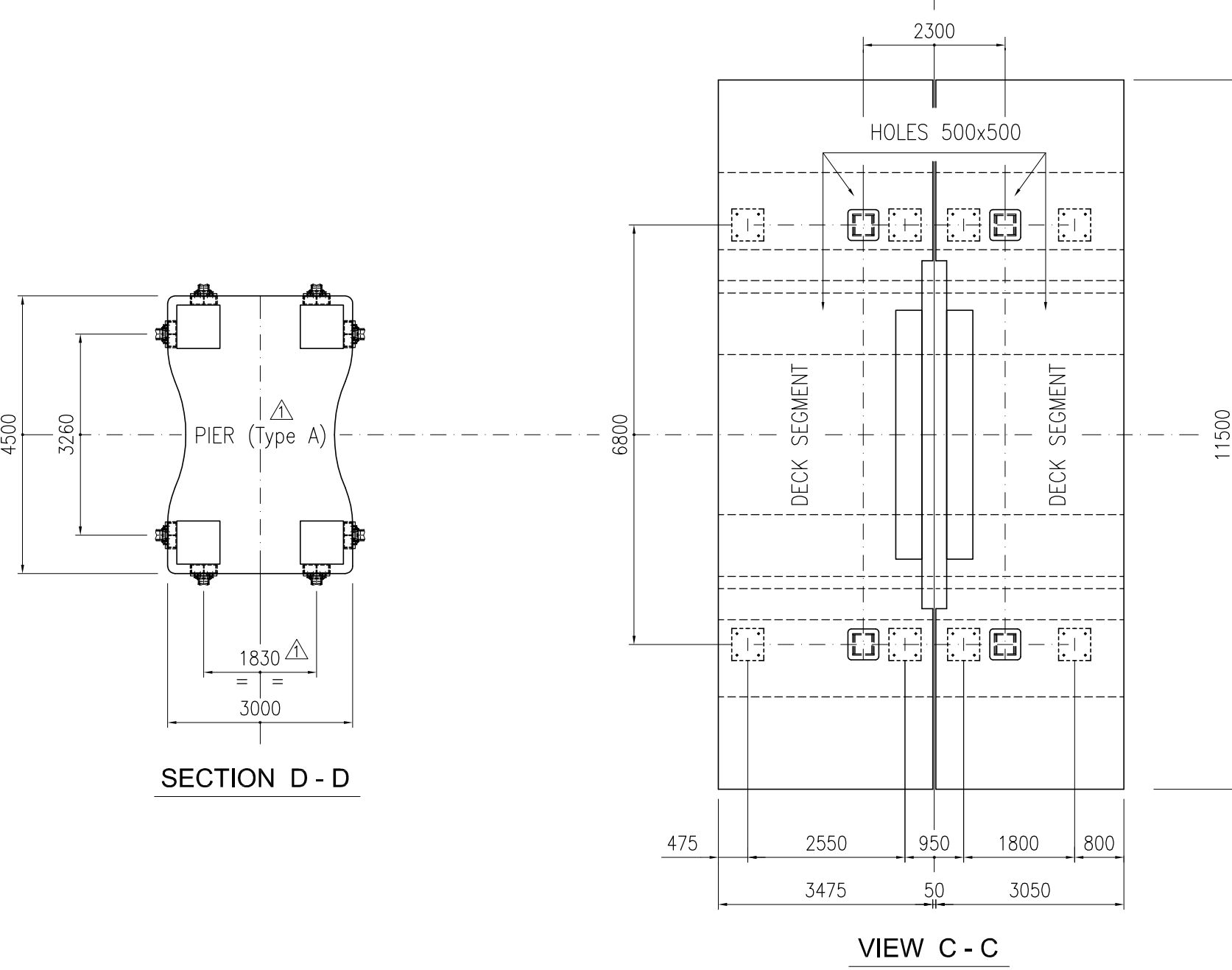
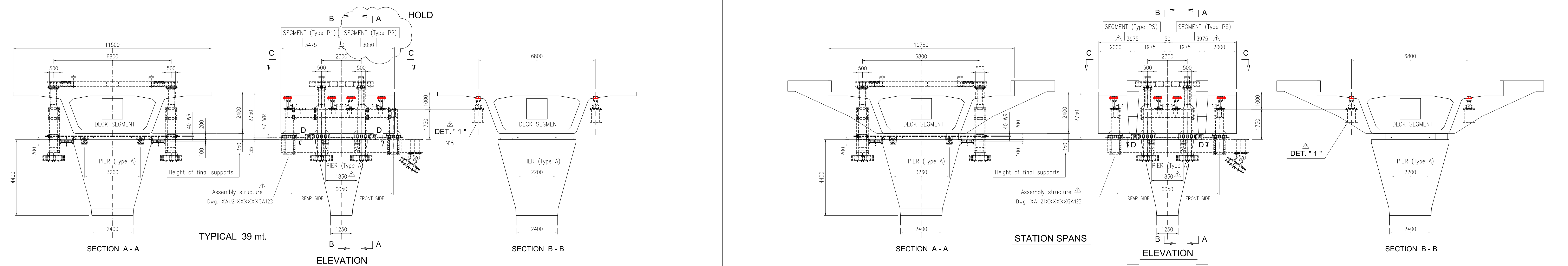
DRAWN: MARCOS PERELMUTER
DESIGNED: PAOLO LOCATELLI
DRG CHECK: PAOLO LOCATELLI
DESIGN CHECK: JOHN DE GRAAF
APPROVED: NICK BAILEY

NORTH WEST RAIL LINK

LAUNCHING GANTRY
TOWERS
TIE DOWN ANCHORS IN PILE CAP

STATUS: FINAL DETAIL DESIGN SHEET 1 OF 1 ©

Drw No: NWRLSVC-ISJ-SVC-TN-DRG-731715 NWRL REV. [H]



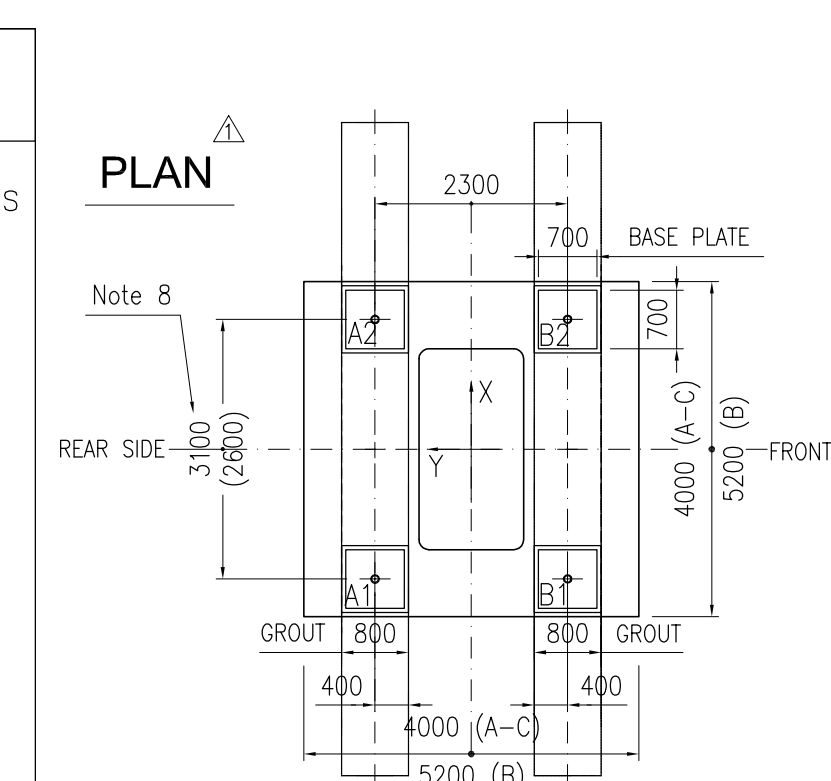
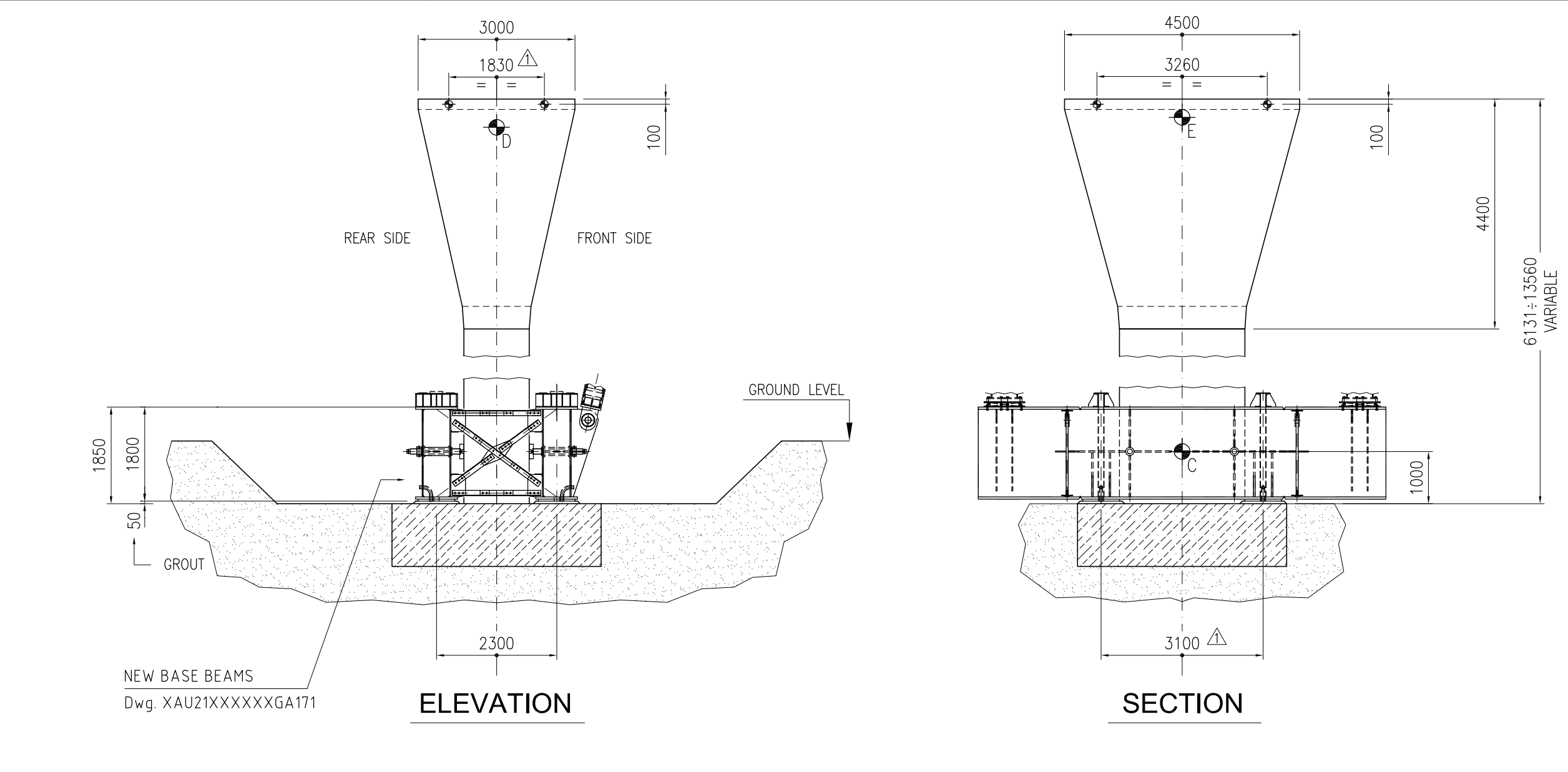
ACTIONS ON PIERS AND FOUNDATIONS

1 - Tables show actions on pier and foundation, due to tower connection. Actions are global nominal values applied on five zones:
A1, A2) grouting area under the rear base distribution beam of tower columns
B1, B2) grouting area under the front base distribution beam of tower columns
C) horizontal global action due to pushing bar at the bottom of the pier
D) horizontal global force along transversal direction due to strut and tie system
E) horizontal global force along longitudinal direction due to strut and tie system

Reference system:
X axis: transversal axis
Y axis: longitudinal axis, from Front Leg to Rear Leg
Z axis: vertical axis according right hand rule
Global moment are about global axis.

2 - Wind and longitudinal forces and eccentricity effects have unpredictable direction. Global actions, listed in tables, have been computed taking into account:
+X : transversal wind direction
+Y : longitudinal force direction
+Z : eccentricity direction

3 - Maximum design compressive force due to pushing bar (zone C): 1450 kN (each)
4 - Maximum design traction force of anchor bar (zone A-B): 500 kN (each)
5 - Maximum design compressive force due to strut system (zone D = 400 kN each - zone E = 1150 kN each)



TALL PIER

Point	Load condition	Load combination	F23(KN)
A1	Working condition	Erection stages	3050
	Working condition	Moving stages	1800
	Out of service	Wind	60
A2	Working condition	Erection stages	4850
	Working condition	Moving stages	1300
	Out of service	Wind	25
B1	Working condition	Erection stages	2350
	Working condition	Moving stages	1850
	Out of service	Wind	1500
B2	Working condition	Erection stages	4950
	Working condition	Moving stages	1250
	Out of service	Wind	2550

SHORT PIER

Point	Load condition	Load combination	F23(KN)
A1	Working condition	Erection stages	3300
	Working condition	Moving stages	1900
	Out of service	Wind	220
A2	Working condition	Erection stages	5250
	Working condition	Moving stages	1400
	Out of service	Wind	200
B1	Working condition	Erection stages	2350
	Working condition	Moving stages	1750
	Out of service	Wind	1450
B2	Working condition	Erection stages	4850
	Working condition	Moving stages	1300
	Out of service	Wind	2550

LIST OF BOLTS

NO. OF PCS	DIMENSION	WIDTH	LENGTH	POS.	SHOP ASSEMBLY	N.POS. FOR MARK	WT. in Kg.	UNIT	TOTAL	REF. SUR.	WT. GRADE	REFERENCE BILL OF GRADE
4(*)	R. S2	300.0	520.0	W20			31.5	151.6	350			

LIST OF BOLTS

SCREW	NUT	WASHER	PIECES	WEIGHT	NOTE
DENOMINAL	UNIF.	GRADE	UNIF.	GRADE	Q
M 20x52	B.8		4*		GALVANIZED

(*) QUANTITIES RELATIVE TO ONE DECK SEGMENTS

DECK SEGMENTS:
Type P1 (3.475m): span 39m
Type PD1 (4.000m): continuous span 36+51+36m
Type P2 (3.050m): continuous span 36+51+36m (HOLD)
Type PS (3.975m): station span 24m

NOTES

- For general notes, materials, welds and symbols see drawing XAU21XXXXXXG100
- For assembly of false segment see drawing XAU21XXXXXXG123
- All dimensions are in millimetres
- Dimensions of deck segments and piers shown in this drawing have to be checked by the Designer of deck segments.
- Allowable error of holes positions and dimensions : 1 cm.
- Dimensions of wedges, as drawn, are nominal values. Final design dimensions have to be checked before the order and supply of wedges, taking into account the final shape of deck segment and their longitudinal and transversal slope along the bridge profile.
- Bent socket bars, forged socket with nailing flange. To be defined by deck segment Designer. Design shear force: 25 kN each.
- Foresee 4 holes for anchor ties. The design of anchor ties, their connection to concrete foundation and the dimensions of holes are in charge to the Designer of pier and foundations. Holes position depends on the base beam, for new base beams spacing are 3100 x 2300 mm, see dwg XAU21XXXXXXG171, for existing base beam (to use only for front support of standard tandem spans) spacing are 2600 x 2300 mm, see dwg XAU21XXXXXXG176.
- For detailed reaction tables see XAU21XXXXXXG100_01 (annex 11)
- For dimensions of piers tops and bearing plinths see dwg XAU21XXXXXXG123

ISSUED FOR CONSTRUCTION

REV.	DESCRIPTION	DATE	DRAWN	CHECKED
02	REVISED WEDGE FOR SLIDING SYSTEM - (13 TIMES)	15/04/2015	BCV	CHECHER
01	REVISED WHERE (S) IS INDICATED (29 TIMES)	14/11/2014	BCV	CHECHER
00	ISSUED FOR CONSTRUCTION	30/04/2014	BCV	CHECHER

EMPLOYER:

Transport for NSW
Level 7, 100 Walker Street
Chippendale NSW 2008 - Australia

NORTH WEST RAIL LINK

CONTRACTOR:

DESIGN CONSULTANT:	DRAWN	DATE
BCV	BCV	30/04/2014
CHECKED	CHECHER	DATE
APPROVED	CHECHER	CHECKEDDATE
APPROVER		APPROVEDDATE

LAUNCHING GANTRY LG1 TOWERS AND FALSE SEGMENT INTERFACES WITH PIERS AND DECK SEGMENTS

SCALE:	DATE:	STATUS:
1:80	30/04/2014	EXISTING

A.	Project	Phase	Area	WBS	Part	Doc. type	Prog.	Rev.
X	AU21	X	X	X	X	X	C	A12102

SCALES

REV.	BY	DATE	DESCRIPTION	APPD.
2	BCV	15/04/2015		
1	BCV	14/11/2014		

REV.	BY	DATE	DESCRIPTION	APPD.
A1	Original	Co-ordinate System: MGA Zone 56	Height Datum: A.H.D.	This sheet may be prepared using colour and may be incomplete if copied

NOTE: Do not scale from this drawing.

CLIENT:

SERVICE PROVIDERS:

DRAWN: BCV PROGETTI
DESIGNED: BCV PROGETTI
DRG CHECK: BCV PROGETTI
DESIGN CHECK: BCV PROGETTI
APPROVED: PITT&SHERRY

NORTH WEST RAIL LINK

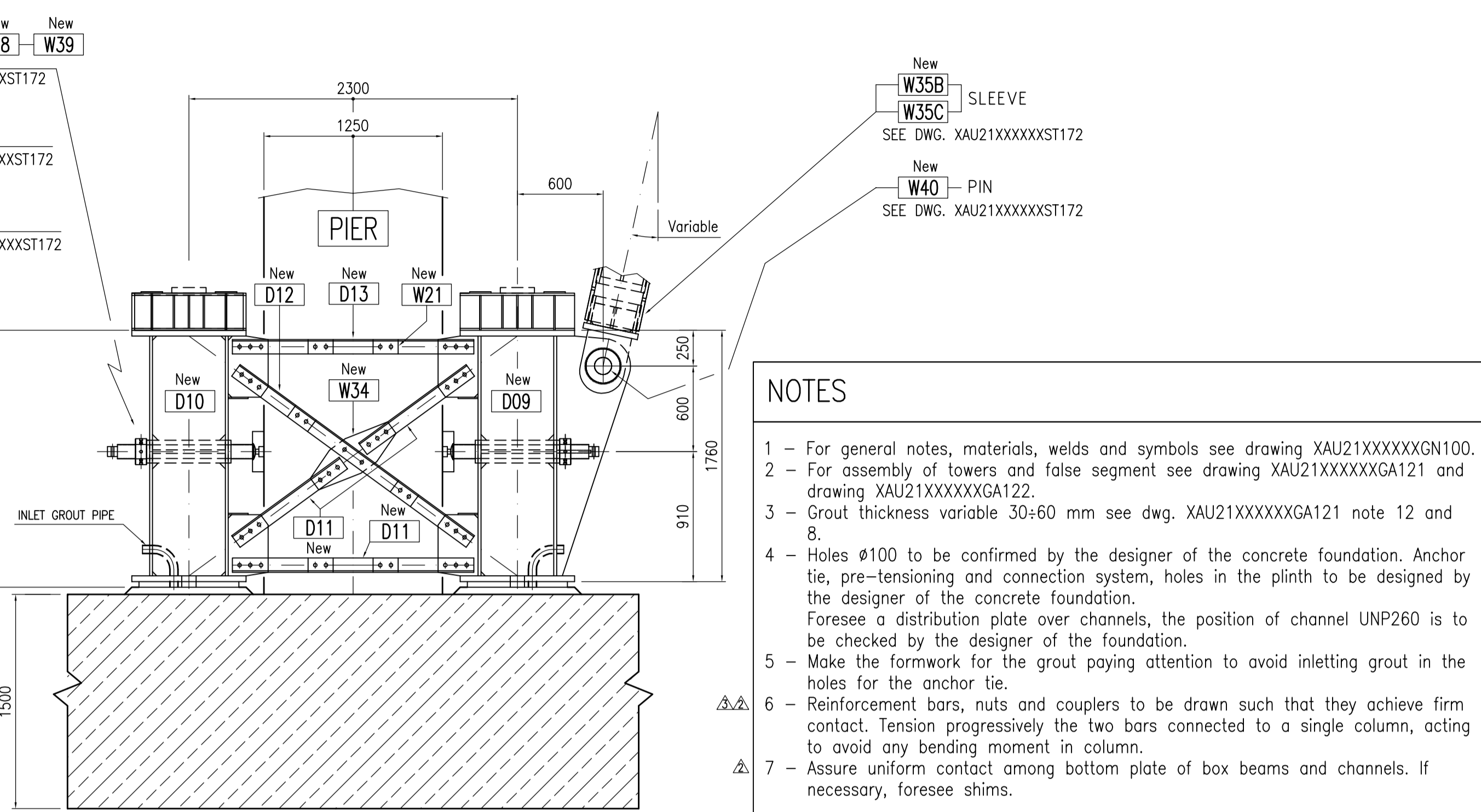
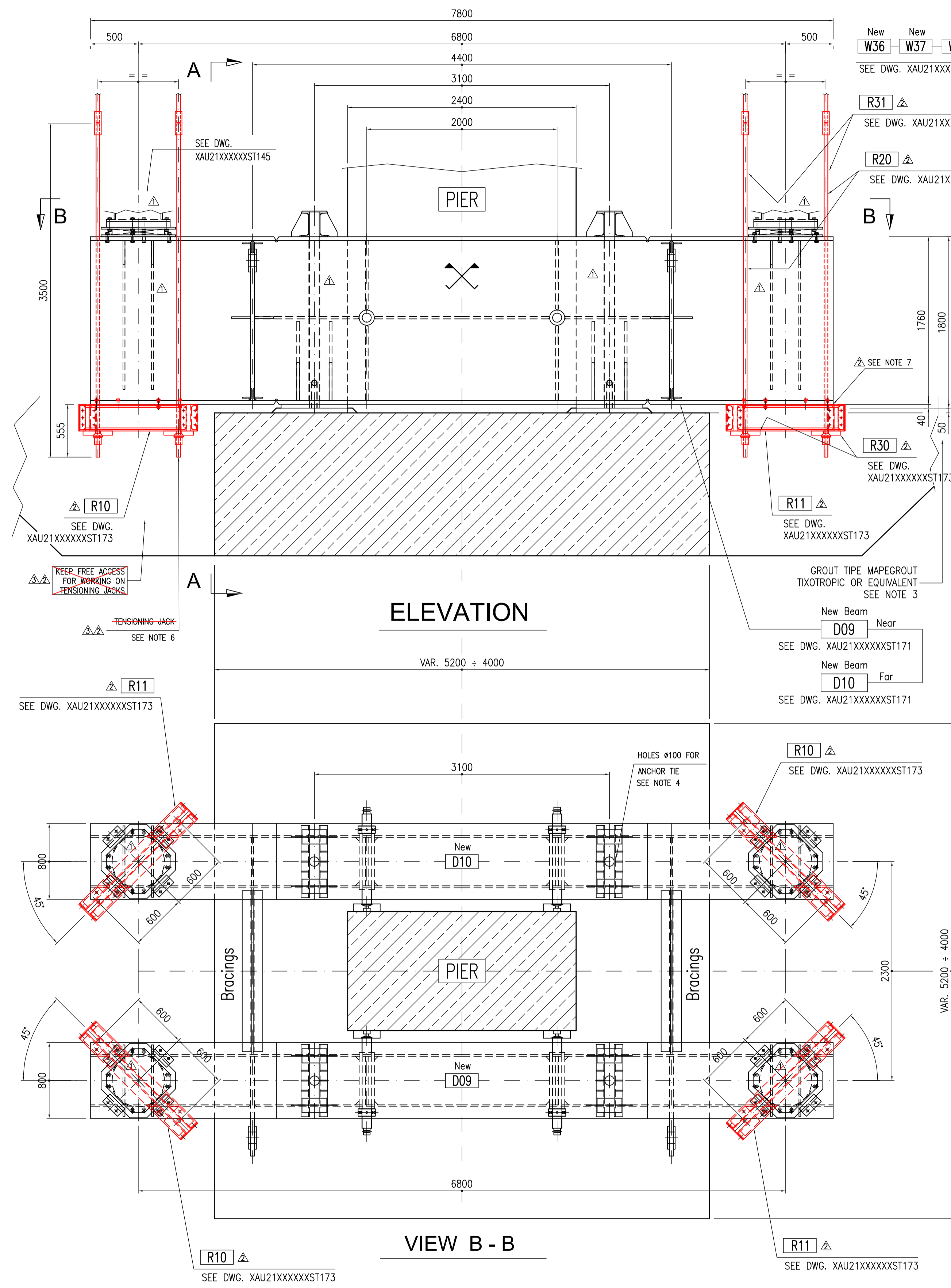
LAUNCHING GANTRY TOWERS INTERFACES WITH PIER AND DECK SEGMENTS

STATUS: EXISTING SHEET 1 OF 1

Dwg No. NWRLSVC-ISJ-SVC-TN-DRG-731723 NWRL REV. [2]

100mm AT FULL SIZE

100mm AT FULL SIZE
 Plot Date: 24/02/15 - 15:28
 Cad File: U:\S\IV Project Files\IS73 Technical Department\73.1 Launching Gantry\73.1.700 TOWERS\NWRLSVC-ISJ-SVC-TN-DRG-731739\3_NEW BASE DISTRIBUTION BEAM-GENERAL ASSEMBLY_XAU21XXXXXXGA171_03.dwg



- NOTES**
- For general notes, materials, welds and symbols see drawing XAU21XXXXXXGN100.
 - For assembly of towers and false segment see drawing XAU21XXXXXXGA121 and drawing XAU21XXXXXXGA122.
 - Grout thickness variable 30±60 mm see dwg. XAU21XXXXXXGA121 note 12 and 8.
 - Holes ø100 to be confirmed by the designer of the concrete foundation. Anchor tie, pre-tensioning and connection system, holes in the plinth to be designed by the designer of the concrete foundation. Foresee a distribution plate over channels, the position of channel UNP260 to be checked by the designer of the foundation.
 - Make the formwork for the grout paying attention to avoid inleting grout in the holes for the anchor tie.
 - Reinforcement bars, nuts and couplers to be drawn such that they achieve firm contact. Tension progressively the two bars connected to a single column, acting to avoid any bending moment in column.
 - Assure uniform contact among bottom plate of box beams and channels. If necessary, foresee shims.

ISSUED FOR CONSTRUCTION

REV.	DESCRIPTION	DATE	DRAWN	CHECKED
03	REMOVED PRELOAD BY JACKS - (3 TIMES)	19/11/2014	BCV	CHECHER
02	REVIEWED WHERE Δ IS INDICATED (15 TIMES)	07/11/2014	BCV	CHECHER
01	REVIEWED WHERE Δ IS INDICATED (10 TIMES)	23/05/2014	BCV	CHECHER
00	ISSUED FOR CONSTRUCTION	15/05/2014	BCV	CHECHER

EMPLOYER:

.Logo T.gif

Transport for NSW
 Level 6 - 18 Lee St
 Chippendale NSW 2008 - Australia

CONTRACTOR:

.Carfiglio\Legosi.GIF

IS Joint Venture
 Suite 1 level 7 - 100 Walker Street
 North Sydney NSW 2060 - Australia

DESIGN CONSULTANT:	DRAWN	DATE
BCV progettati s.r.l. I 20123 Milano, via S.Orsola 1 tel. (+39) 02 8645 2002 fax (+39) 02 8900 103 E-mail bcv@bcv.it	BCV	15/05/2014
	CHECKED	DATE
	CHECKER	CHECKEDDATE
	APPROVED	APPROVEDDATE

TITLE: **LAUNCHING GANTRY LG1
NEW BASE DISTRIBUTION BEAMS
GENERAL ASSEMBLY**

SCALE: 1:25 DATE: 15/05/2014 STATUS:

A.	Project	Phase	Area	WBS	Part	Doc. type	Prog.	Rev.
X	A	U	2	1	X	X	X	X

STATUS: EXISTING SHEET 1 OF 1 ©

REV.	BY	DATE	DESCRIPTION	APPD.
3	BCV	19/11/2014		

SCALE	CLIENT
	 Transport for NSW

NOTE: Do not scale from this drawing.

NORTH WEST RAIL LINK

LAUNCHING GANTRY
TOWERS
NEW BASE DISTRIBUTION BEAM
GENERAL ASSEMBLY

STATUS: EXISTING SHEET 1 OF 1 ©

Org No. NWRLSVC-ISJ-SVC-TN-DRG-731739 NWRL REV. [3]

SERVICE PROVIDERS

DRAWN	BCV PROGETTI
DESIGNED	BCV PROGETTI
DRG CHECK	BCV PROGETTI
DESIGN CHECK	BCV PROGETTI
APPROVED	PITT&SHERRY

- The torsion action of the concrete beam is checked against AS5100.5 Section 8.3 Strength of the beam in torsion. The torsion action is found to be less than $0.25\phi T_{uc}$, therefore torsion reinforcement is not required.
- The vertical upstand of the temporary structure is designed based on AS5100.5 Section 12.3 bearing surfaces

4.3 Pavements

Two stages of pavement construction are proposed where Pier 93 and Pier 94 are to be built. These are shown on the detailed drawings as 'Temporary Configuration' and 'Permanent Configuration'.

4.3.1 Temporary Pavement Configuration

Temporary Configuration – Following the construction of the concrete ring around the pier a geotextile strip will be placed against the face of the concrete base and subbase to separate any granular material making its way into the concrete pavement.

The void left around the concrete ring is to be filled with 100mm to 150mm of compacted layers of Selected Material (SMZ) CBR \geq 15%. The SMZ must be sealed and topped with a 50mm AC14 (AR450) wearing course. This has been changed to mass concrete infill.

4.3.2 Permanent Pavement Configuration

Once the required sections of concrete ring have been removed the permanent pavement is to be built. The pavement composition will be the same as shown in the permanent works set **Design Lot DL25** however both of the piers will have drill-tied longitudinal joints and drill-dowelled contraction joints.

6. Constructability

The design development process includes progressive consultation, reviews and inputs by the ISJV construction team to ensure that the design reflects the anticipated construction practices and can be constructed safely and efficiently incorporating the necessary staging of the works. Constructability review and input is occurring through formal and informal meetings, and assists in preparing the design to minimise construction risks.

6.1 Key Construction Issues

Key construction issues are casting of cast-in-situ ring beam footings with dowels above pilecap/footing and 20 MPa mass concrete infill under drainage pit. Concrete pouring will be staged in such a way to avoid any gaps between the pilecap/footing and ring beam.

6.2 Construction Methodology

The following paragraph describes key features of the construction methodology and how the design has addressed the key constructability issues associated with the Temporary Supports.

6.2.1 Survey Setout of Pile cap Structure

The ISJV Surveyor will be requested to provide a setout of each pilecap/footing structure on the existing ground. At each corner an offset recovery peg will be provided to allow for regular checking of the excavation position along with a benchmark height to determine excavation depth.

6.2.2 Excavation for Pile cap Structure

Excavation Permit will be prepared by ISJV in preparation for excavation works. Prior to excavation the Excavation Permit shall be checked for any services in the vicinity of the excavation works. Surveyor's pegs marking the known services shall be used to reference the service locations with the excavation works.

A delineation fence will be established if there is a chance that other workgroups could encroach the excavation or operating plant hazards. The delineation fence may be replaced with a temporary security fence depending on the risk assessment of Pile cap excavation.

Pile cap will be excavated using a 24-tonne Caterpillar excavator. The excavation will be battered at 45 degrees or benched at a 1:1.5 ratio (1.5m V 2.2m H). A set of stairs will be excavated to provide worker access to completed excavation. All excavations to be inspected by geotechnical engineer for slope stability.

6.2.3 Blinding Concrete

Blinding concrete will be delivered to site in ready-mix agitator. The concrete blinding will either be chute or pump.

The height of the blinding will be controlled using a laser level using the benchmark R.L. established by the surveyor. Blinding concrete will be screed finished only and does not require any curing regime.

The concrete shall generally be 'sealed' cured by formwork for at least 7-days from the date of pour. If the formwork is to be removed during this time two-coats of Aftek Concure A99 will be sprayed to the stripped surface in accordance to manufacturer's recommendations to prevent evaporation.

6.2.11 Placement of precast concrete pedestals

Precast pedestals will be installed to the top of the ring beam with 5mm compressible filler (i.e. elastomeric bearing pad or approved equivalent) in between. The pedestals will be locked into the position once precast pedestals into the correct position.

6.2.12 Backfilling of pilecap & demolition of pedestals

2 days after the pile cap concrete pour; formwork will be stripped and checked for any visible cracking. Any cracking will need to be repaired before backfilling in accordance with approved concrete repair method. Pier construction will commence and after pier construction is completed, pavement layers will be constructed as per design around the ring beam. Prior the pavement layers have been completed; precast pedestals will be saw cut and removed using a small 5 t excavator to avoid any damage to the ring beam.

8. Commissioning and Decommissioning Considerations

Commissioning of the launching gantry steel tower temporary support will be addressed by ISJV through preparation of Work Method Statements. Work Method Statements will identify the sequencing of erection and the associated traffic management procedures required during erection.

A temporary pavement will be constructed at the location of the concrete slab immediately adjacent to the pier. At the completion of the launching gantry operation works the temporary pavement will be excavated and the precast pedestals will be removed. A recess has been provided locally in the ring-beam to allow installation of the drainage pit at the base of the pier.

The rest of the temporary structure will be left in place and buried under the permanent works infill concrete slab directly surrounding the pier.



INTERNAL REVIEW FORM

Project Title: NWRL-SVC Detailed Design
Project No: 3001407
Work Verification Record # 85-24

<p>Design Lot Number: 85.21</p> <p>Design Lot / Package Description: Southern Bus Layover Pier 92 to 94 Launching Gantry Steel Tower Temp Supports PAVEMENTS REVIEW ONLY</p>	<p>Work Package Stage:</p> <p><input type="checkbox"/> DCD – Developed Concept Design</p> <p><input type="checkbox"/> SDD- Substantial Detailed Design</p> <p><input checked="" type="checkbox"/> FDD – Final Design Documentation</p> <p><input type="checkbox"/> IFC – For Construction</p> <p><input type="checkbox"/> OTHER – General Investigations/Management Plans</p>
---	--

Part of Work Package (or all)
 List items to be reviewed (also attach drawings, documents, reports, specifications, etc.)

<input checked="" type="checkbox"/> Drawings (See attached Sheet)	<input type="checkbox"/> Specifications	<input checked="" type="checkbox"/> Reports
<input type="checkbox"/> 3D Model	<input type="checkbox"/> Calculations	<input type="checkbox"/> Other

SELF CHECK (BY DESIGNER)

DESIGN STATEMENT (TICK COMPLETED CHECKS)

<input checked="" type="checkbox"/> All check prints completed	<input type="checkbox"/> Durability requirements satisfied
<input type="checkbox"/> Deed/ SWTC compliance review completed	<input type="checkbox"/> Environmental compliance check completed
<input type="checkbox"/> Outstanding Issues and Risks addressed (eg Holds on drawings/ Conditions or limitations identified)	

Designer's Comments REFER MARKUPS

Designer's Name: Craig Hodder	Designer's Signature <i>C. Hodder</i> Date 23/10/15
---	---

DESIGN REVIEW (TICK COMPLETED CHECKS)

<input checked="" type="checkbox"/> Deed/ SWTC & Design Brief satisfied	<input type="checkbox"/> Major Issues Identified (develop design further – correction mandatory prior to proceeding to next review)
<input checked="" type="checkbox"/> Design Standards satisfied	<input type="checkbox"/> Minor Issues Identified (correct and close out – correction mandatory prior to proceeding to next review)
<input checked="" type="checkbox"/> Safety in Design addressed	<input type="checkbox"/> Observations Identified (observations noted and work should be revised)
<input checked="" type="checkbox"/> Durability requirements satisfied	<input checked="" type="checkbox"/> Reviewer confirms all issues closed out

Design/Team Lead's Comments

Design/ Team Lead's Name Brendan Leader	Design/Team Lead's Signature <i>B. Leader</i> Date 23/10/15
---	---

Document / Drawing Reference #	Rev	Document / Drawing Title
NWRLSVC-ISM-SVC-CS-DRG-852100	B	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET DRAWING INDEX
NWRLSVC-ISM-SVC-CS-DRG-852102	B	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PIER 92 STEEL TOWER TEMPORARY SUPPORT
NWRLSVC-ISM-SVC-CS-DRG-852103	B	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PIER 93 STEEL TOWER TEMPORARY SUPPORT
NWRLSVC-ISM-SVC-CS-DRG-852104	B	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PIER 94 STEEL TOWER TEMPORARY SUPPORT
NWRLSVC-ISM-SVC-CS-DRG-852105	B	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET TYPICAL PRECAST PEDESTAL DETAILS
NWRLSVC-ISM-SVC-CS-DRG-852106	B	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PAVEMENT CONFIGURATION STAGE 1 ARRANGEMENT AT PIER 93 AND 94
NWRLSVC-ISM-SVC-CS-DRG-852107	B	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PAVEMENT CONFIGURATION STAGE 2 ARRANGEMENT AT PIER 93 AND 94
NWRLSVC-ISM-SVC-CS-DRG-852110	B	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PAVEMENT CONFIGURATION AT PIER 93
NWRLSVC-ISM-SVC-CS-DRG-852115	B	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PAVEMENT CONFIGURATION AT PIER 94

WVR FORM 4 (DESIGN PACKAGE RELEASE FORM)
NWRL SVC DETAILED DESIGN
DESIGN PACKAGE DL85.21 Southern Bus Layover - Temp Supports



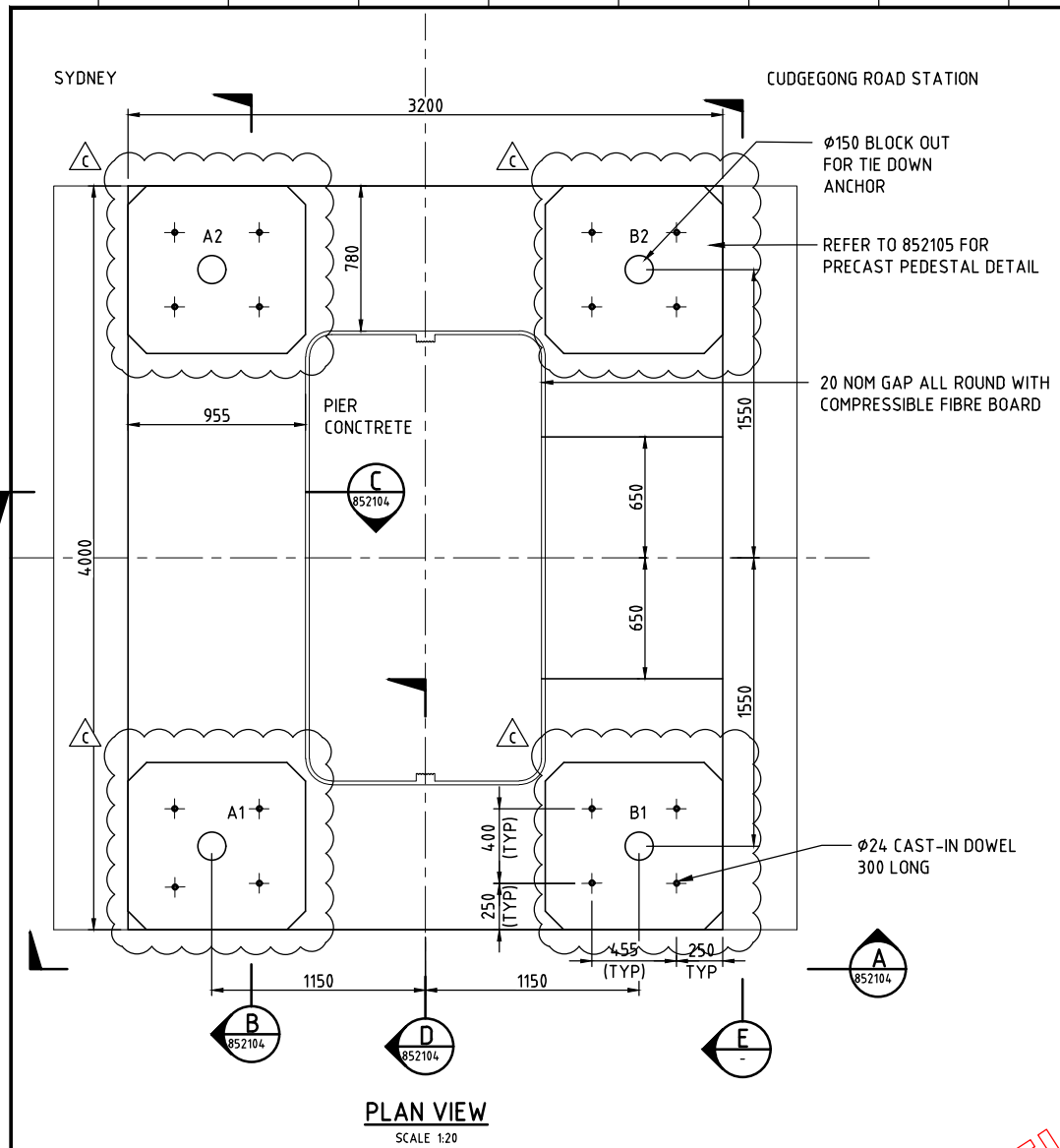
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Design Lot Number:	85.21		
Design Lot / Package Description: 85.21 Southern Bus Layover Launching Gantry Temp Supports			
The following design reviews have been completed: (Stage 1 and Stage 2)			
<input checked="" type="checkbox"/> Design Check Review Completed and signed <input type="checkbox"/> IDC review completed and Certificate Signed Comments:			
Stage 3 - Internal Independent Verification:			
Structures <input checked="" type="checkbox"/> Completed <input type="checkbox"/> Pending <input type="checkbox"/> N/A Comments:		Road Eng <input type="checkbox"/> Completed <input type="checkbox"/> Pending <input type="checkbox"/> N/A Comments:	
Geotech <input type="checkbox"/> Completed <input type="checkbox"/> Pending <input type="checkbox"/> N/A Comments:		Pavement <input checked="" type="checkbox"/> Completed <input type="checkbox"/> Pending <input type="checkbox"/> N/A Comments:	
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Close-out of the following items has been completed:			
<input type="checkbox"/> TfNSW Comments Traceability Updated <input type="checkbox"/> IC Comments Addressed Traceability <input type="checkbox"/> RMS/ Authorities comments addressed		<input type="checkbox"/> Report sections finalized: <input type="checkbox"/> RATMS addressed <input type="checkbox"/> Durability <input type="checkbox"/> Interfaces <input type="checkbox"/> Specifications <input type="checkbox"/> Engineering and drafting check signed on final check prints	
Designer: Oscar Sun	Signature: Date: 23/10/15	Design Team Leader: Chun Ng	Signature: Date: 23/10/2015
Approval to Issue Design Package / Documentation			
Design Manager: David Jefferson		Signature:	Date: 23/10/15
Project Manager: Ray Murphy		Signature:	Date: 23/10/15

WVR FORM 4 (DESIGN PACKAGE RELEASE FORM)
NWRL SVC DETAILED DESIGN
DESIGN PACKAGE DL85.21 Southern Bus Layover - Temp Supports

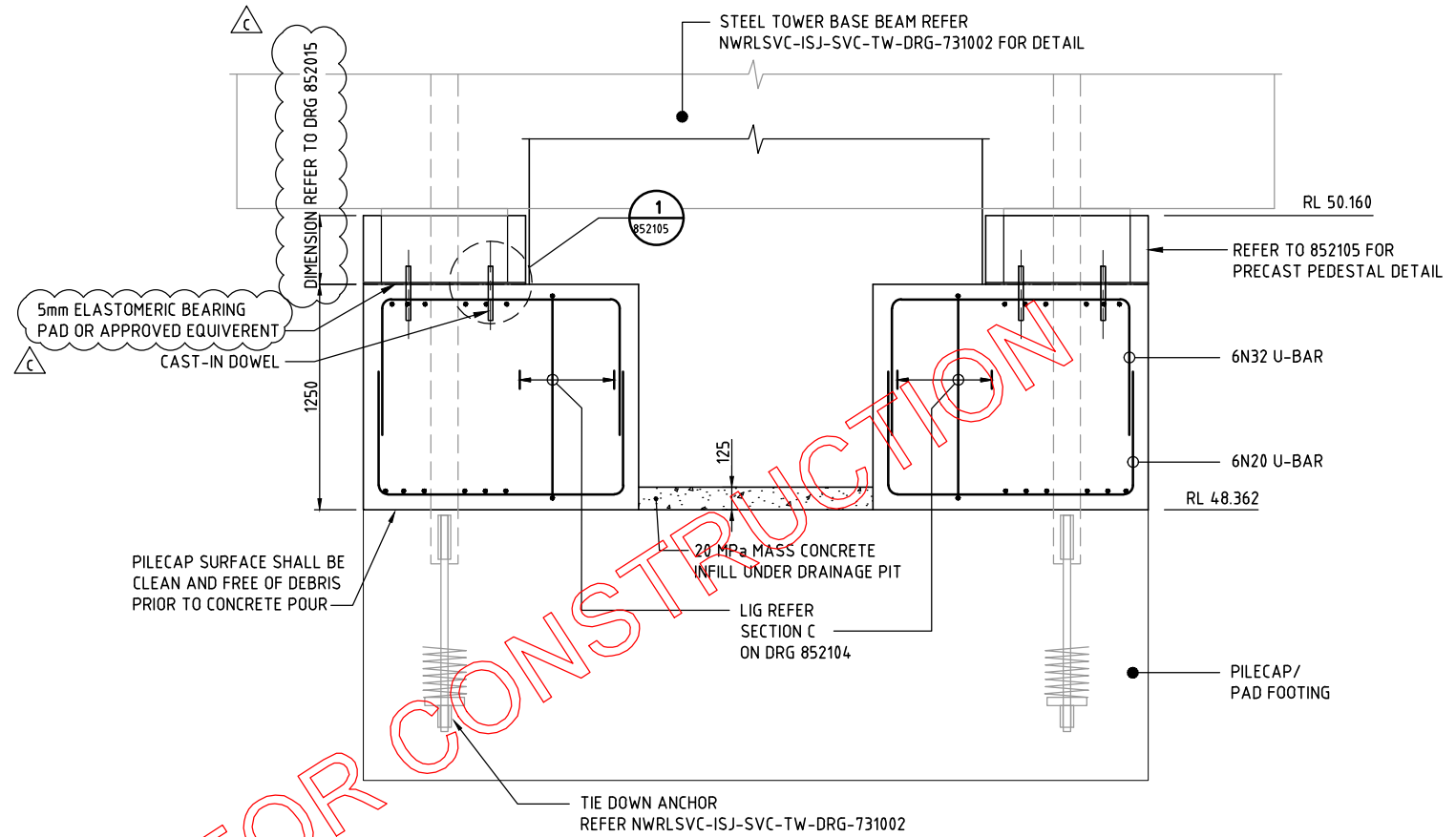


Document Number	Rev	Document Title
NWRLSVC-ISM-BVR-CS-DRT-852100	A	SOUTHERN BUS LAYOVER-PIER 92 TO 94 LAUNCHING GANTRY STEEL TOWER TEMPORARY SUPPORT DESIGN REPORT
NWRLSVC-ISM-SVC-CS-DRG-852100	B	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET DRAWING INDEX
NWRLSVC-ISM-SVC-CS-DRG-852102	B	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PIER 92 STEEL TOWER TEMPORARY SUPPORT
NWRLSVC-ISM-SVC-CS-DRG-852103	B	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PIER 93 STEEL TOWER TEMPORARY SUPPORT
NWRLSVC-ISM-SVC-CS-DRG-852104	B	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PIER 94 STEEL TOWER TEMPORARY SUPPORT
NWRLSVC-ISM-SVC-CS-DRG-852105	B	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET TYPICAL PRECAST PEDESTAL DETAILS
NWRLSVC-ISM-SVC-CS-DRG-852106	B	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PAVEMENT CONFIGURATION STAGE 1 ARRANGEMENT AT PIER 93 AND 94
NWRLSVC-ISM-SVC-CS-DRG-852107	B	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PAVEMENT CONFIGURATION STAGE 2 ARRANGEMENT AT PIER 93 AND 94
NWRLSVC-ISM-SVC-CS-DRG-852110	B	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PAVEMENT CONFIGURATION AT PIER 93
NWRLSVC-ISM-SVC-CS-DRG-852115	B	SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PAVEMENT CONFIGURATION AT PIER 94

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PLAN VIEW
SCALE 1:20



SECTION E
SCALE 1:20
SIDE BARS NOT SHOWN FOR CLARITY

NOT CERTIFIED FOR CONSTRUCTION

NOTES
1. FOR NOTES AND DESIGN LOADS REFER TO DRG 852014.

CHECK PRINT

REV.	BY	DATE	DESCRIPTION	APPD.
B	TF	23.10.2015	ISSUED FOR FINAL DESIGN DOCUMENTATION	DJ
A	TF	16.10.2015	ISSUED FOR FINAL DESIGN DOCUMENTATION	DJ

Co-ordinate System: MGA Zone 56 Height Datum: A.H.D. This sheet may be prepared using colour and may be incomplete if copied

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DISCIPLINE	INITIAL	DATE											

Refer to: Electronic file issue disclaimer on transmittal form

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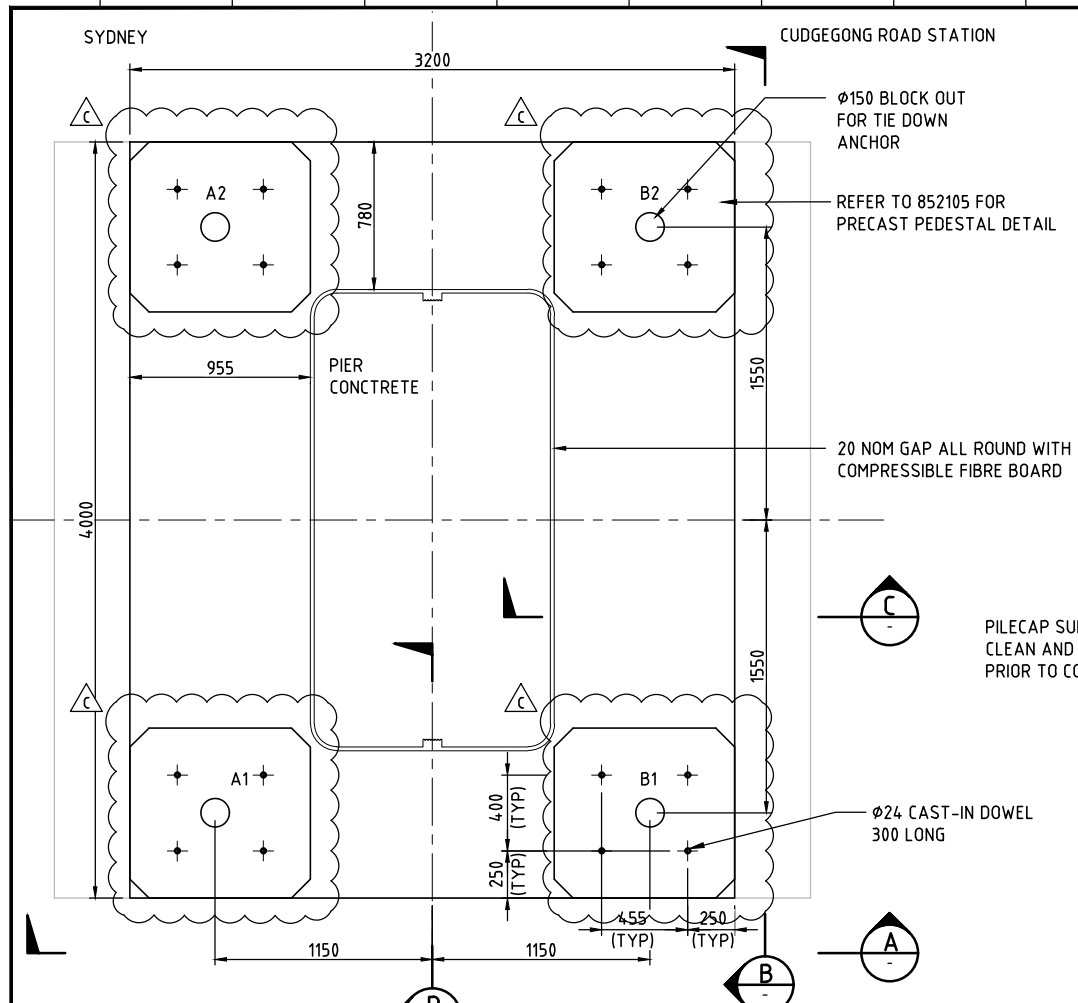


Transport for NSW

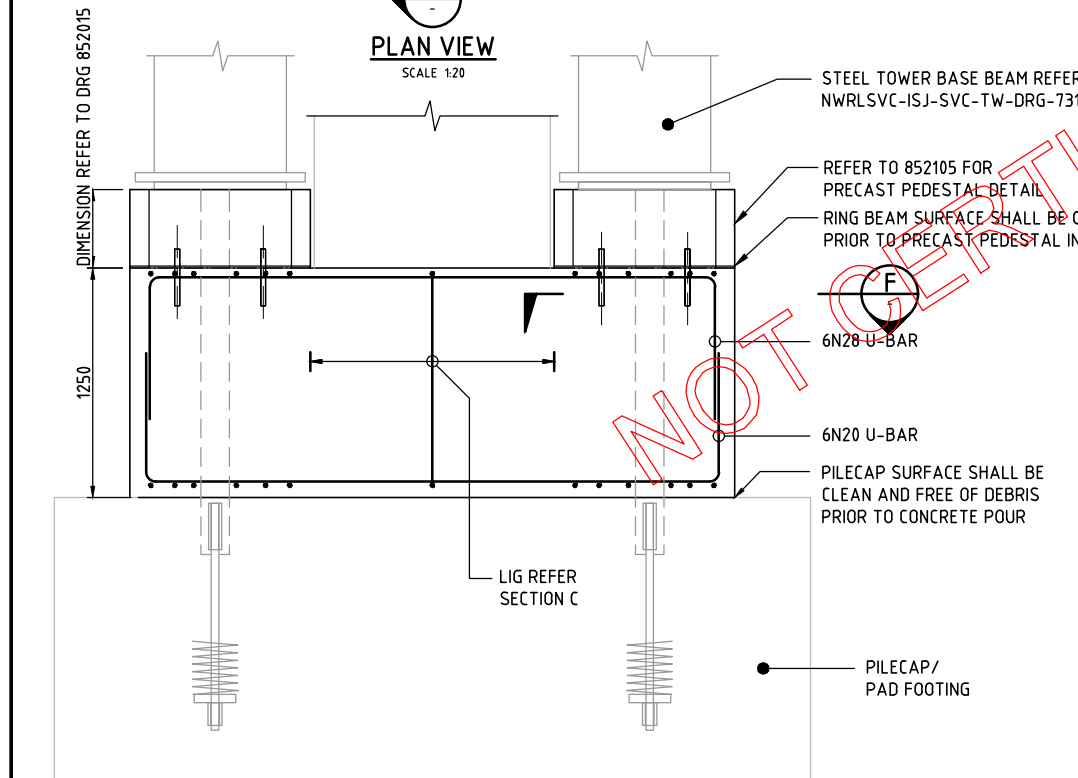
SERVICE PROVIDERS	DRAWN: Mark Erdmanis DESIGNED: Oscar Sun DRG CHECK: Tom Fisher DESIGN CHECK: Chun Ng APPROVED: David Jefferson
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NORTH WEST RAIL LINK	
44km690 TO 44km810	
SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET	
PIER 92 STEEL TOWER TEMPORARY SUPPORT	
STATUS: FINAL DESIGN DOCUMENTATION	SHEET 2 OF 9
NWRL Dwg No. NWRLSVC-ISM-SVC-CS-DRG-852102	NWRL REV. B.1

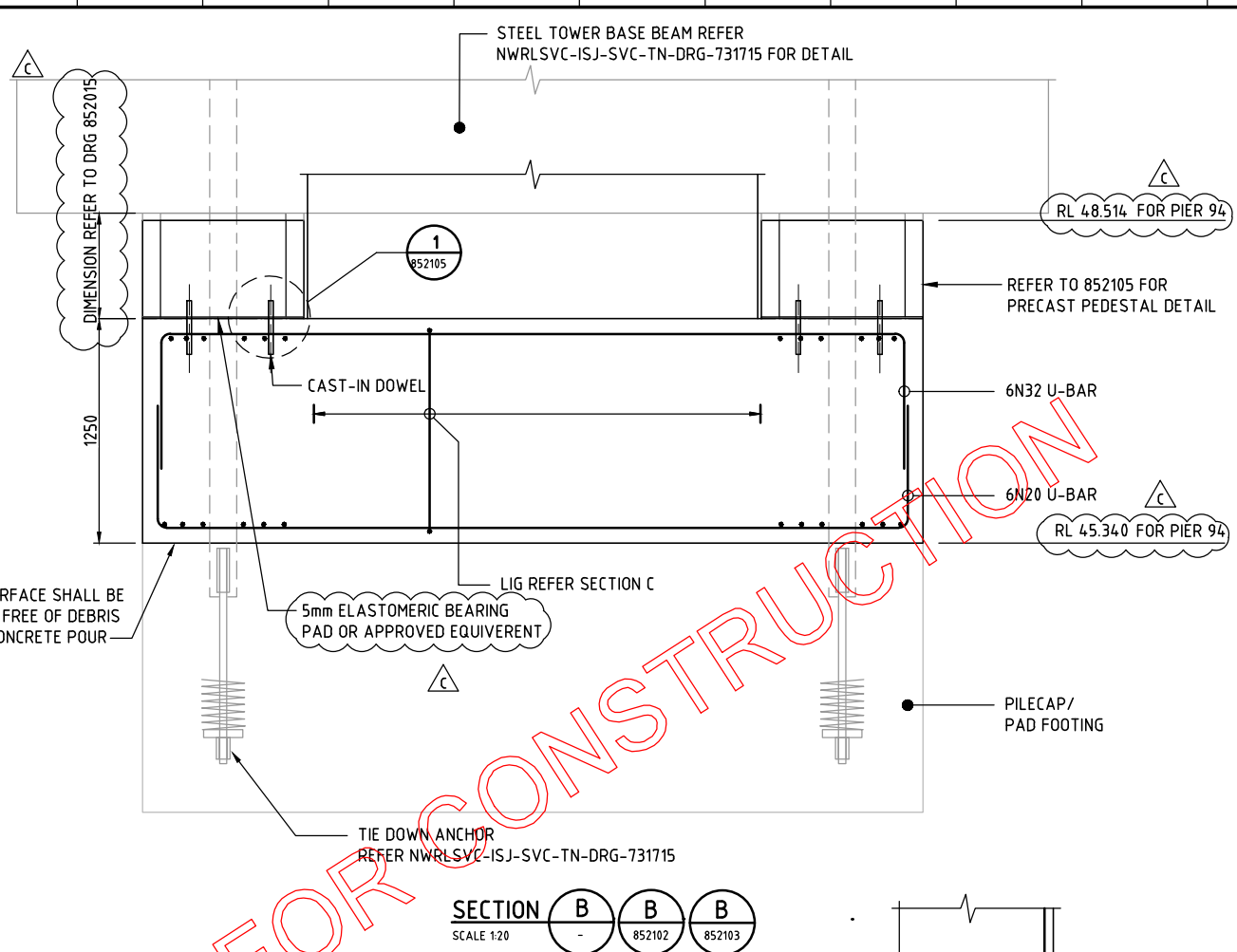
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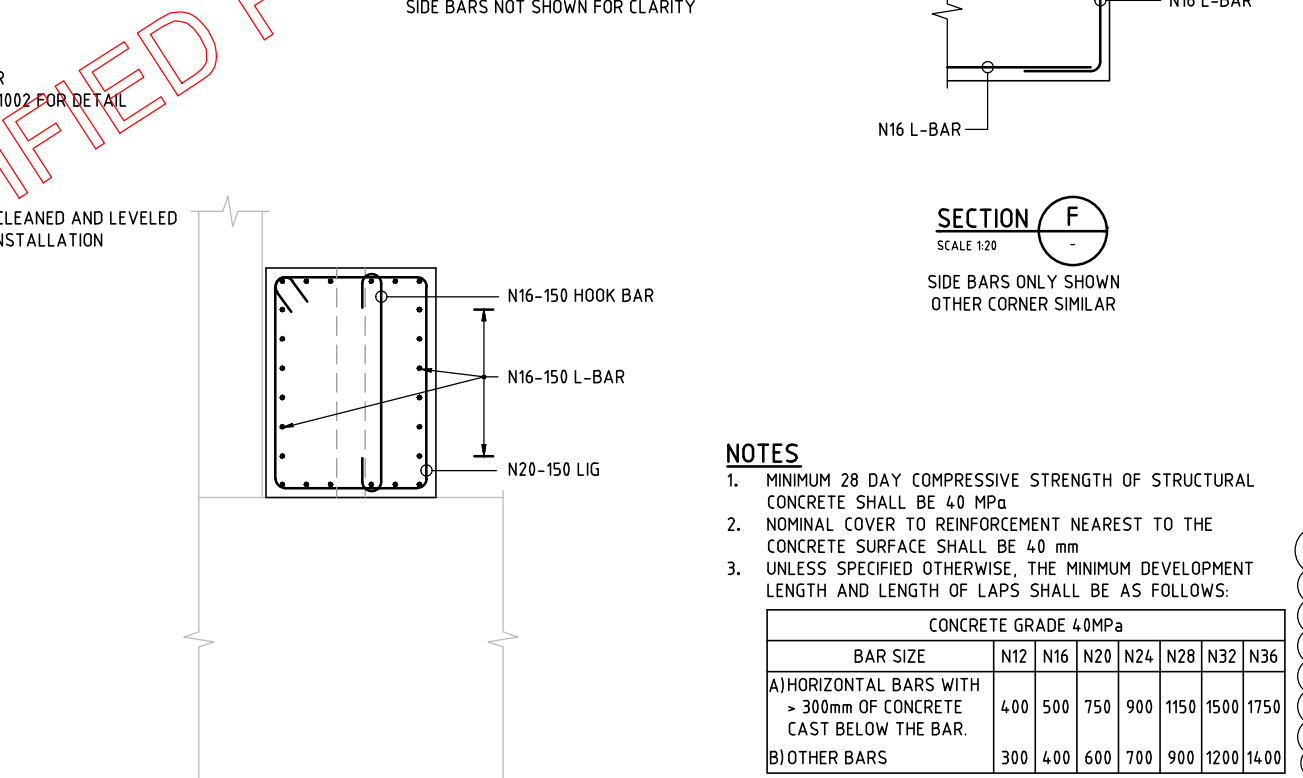
PLAN VIEW
SCALE 1:20



SECTION A-A
SCALE 1:20
SIDE BARS NOT SHOWN FOR CLARITY



SECTION B-B
SCALE 1:20
SIDE BARS NOT SHOWN FOR CLARITY



SECTION C-C
SCALE 1:20
SECTION D SIMILAR

TALL PIER = 13.56m

POINT	LOAD CONDITION	LOAD COMBINATION	AXIAL LOAD Fz (kN)
A1	WORKING CONDITION	ERECTION STAGES	-3050
		MOVING STAGES	-1800
	OUT OF SERVICE	WIND	110
A2	WORKING CONDITION	ERECTION STAGES	-4850
		MOVING STAGES	-3100
	OUT OF SERVICE	WIND	-2350
B1	WORKING CONDITION	ERECTION STAGES	-2500
		MOVING STAGES	-1650
	OUT OF SERVICE	WIND	250
B2	WORKING CONDITION	ERECTION STAGES	-4950
		MOVING STAGES	-3250
	OUT OF SERVICE	WIND	-2450

SHORT PIER = 6.131m

POINT	LOAD CONDITION	LOAD COMBINATION	AXIAL LOAD Fz (kN)
A1	WORKING CONDITION	ERECTION STAGES	-3300
		MOVING STAGES	-1900
	OUT OF SERVICE	WIND	220
A2	WORKING CONDITION	ERECTION STAGES	-5250
		MOVING STAGES	-3400
	OUT OF SERVICE	WIND	-2400
B1	WORKING CONDITION	ERECTION STAGES	-2350
		MOVING STAGES	-1750
	OUT OF SERVICE	WIND	240
B2	WORKING CONDITION	ERECTION STAGES	-4850
		MOVING STAGES	-3200
	OUT OF SERVICE	WIND	-2400

LOADS IN ABOVE TABLE TAKEN FROM ISJV DRAWING NWRLSVC_ISJ_SVC_TN_DRG_731723_2
NEGATIVE FORCE DENOTE COMPRESSION.
THE TEMPORARY WORK IS NOT DESIGNED TO TAKE HORIZONTAL LOADS.

NOTES

- MINIMUM 28 DAY COMPRESSIVE STRENGTH OF STRUCTURAL CONCRETE SHALL BE 40 MPa
 - NOMINAL COVER TO REINFORCEMENT NEAREST TO THE CONCRETE SURFACE SHALL BE 40 mm
 - UNLESS SPECIFIED OTHERWISE, THE MINIMUM DEVELOPMENT LENGTH AND LENGTH OF LAPS SHALL BE AS FOLLOWS:
- | CONCRETE GRADE 40MPa | | | | | | | |
|---|-----|-----|-----|-----|------|------|------|
| BAR SIZE | N12 | N16 | N20 | N24 | N28 | N32 | N36 |
| A) HORIZONTAL BARS WITH > 300mm OF CONCRETE CAST BELOW THE BAR. | 400 | 500 | 750 | 900 | 1150 | 1500 | 1750 |
| B) OTHER BARS | 300 | 400 | 600 | 700 | 900 | 1200 | 1400 |
- LAPS NOT SHOWN ON THE DRAWING SHALL BE STAGGERED NO LESS THAN LAP LENGTH SO THAT NO MORE THAN 50% OF BARS ARE LAPPED IN ANY ONE CROSS SECTION.

- REINFORCEMENT MAY BE DISPLACED SLIGHTLY WHERE NECESSARY TO CLEAR PROJECTING REINFORCEMENT, FORMED HOLES AND ANCHOR ASSEMBLIES.
- AT THE COMPLETION OF THE TEMPORARY WORK, THE PRECAST PEDESTALS ARE TO BE REMOVED, THE DOWELS ARE TO BE CUT FLUSH TO THE TOP OF RING BEAM AND COATED BY 3mm THICK 'MEGAPOXY' P1 OR APPROVED EQUIVALENT. THE BLOCKOUT FOR ANCHORS ARE TO BE FILLED UP WITH CEMENTITIOUS NON-SHRINKAGE GROUT WITH COMPRESSIVE STRENGTH OF 40 MPa.
- THE PILECAP/FOOTING SHALL BE INSPECTED AFTER THE COMPLETION OF THE TEMPORARY WORKS FOR ANY CRACKING OR DEFECTS AS WELL AS ANY EXCESSIVE MOVEMENT OR SETTLEMENT BEFORE BACKFILLING.

CHECK PRINT

REV.	BY	DATE	DESCRIPTION	APPD.
B	TF	23.10.2015	ISSUED FOR FINAL DESIGN DOCUMENTATION	DJ
A	TF	16.10.2015	ISSUED FOR FINAL DESIGN DOCUMENTATION	DJ

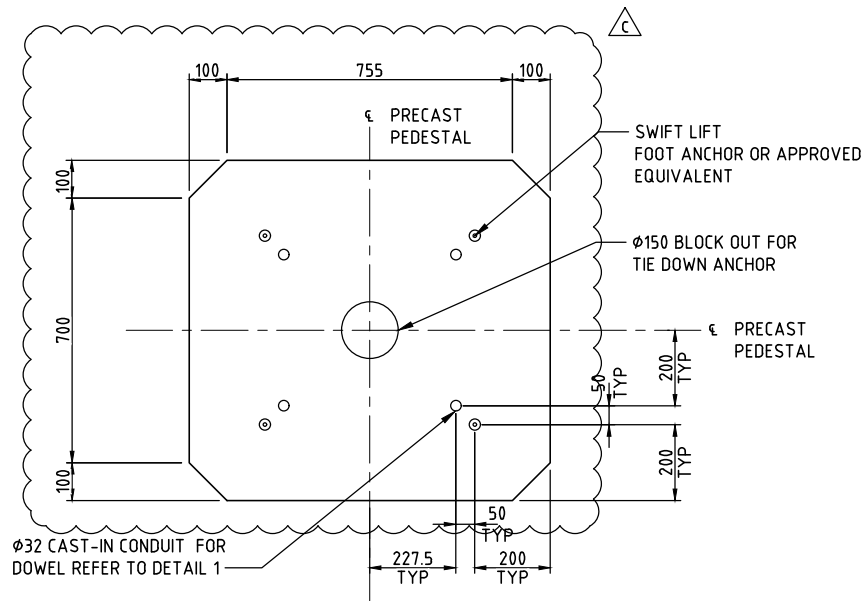
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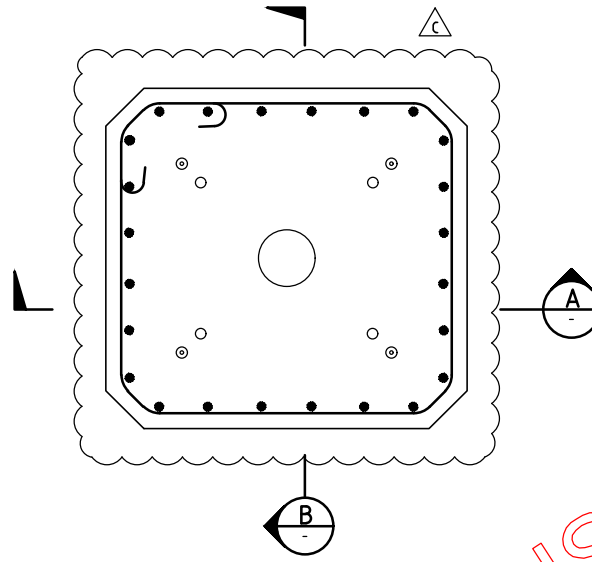
SERVICE PROVIDERS	DRAWN: Mark Erdmanis DESIGNED: Oscar Sun DRG CHECK: Tom Fisher DESIGN CHECK: Chun Ng APPROVED: David Jefferson
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NORTH WEST RAIL LINK	
44km690 TO 44km810 SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET PIER 94 STEEL TOWER TEMPORARY SUPPORT	
STATUS: FINAL DESIGN DOCUMENTATION	SHEET 4 OF 9
NWRL Drg No: NWRLSVC-ISM-SVC-CS-DRG-852104	NWRL REV: B.1

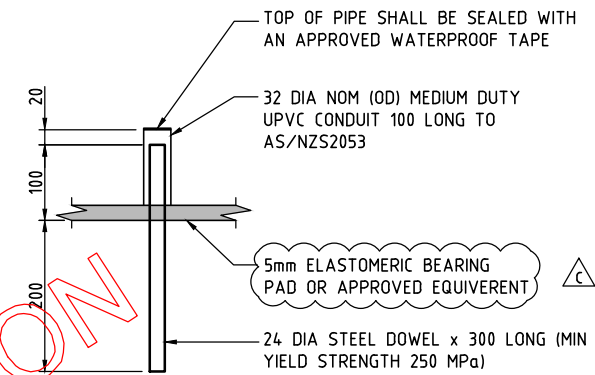
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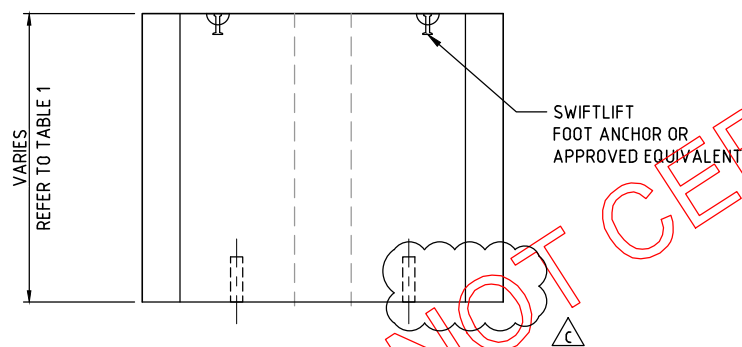
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SCALE 1:10



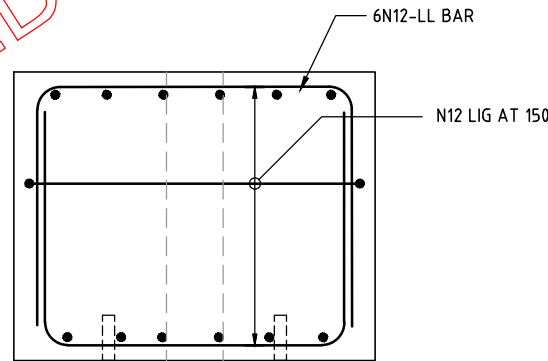
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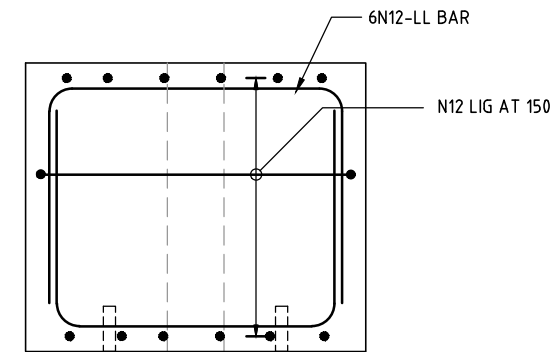
DETAIL 1
SCALE 1:5



ELEVATION
SCALE 1:10



SECTION A
SCALE 1:10



SECTION B
SCALE 1:10

PIER NO.	PEDESTAL HEIGHT(m)	PEDESTAL APPROX. WEIGHT(TON)
PIER 92	0.543	1.3
PIER 93	1.429	3.2
PIER 94	1.919	4.3

NOTES
1. FOR NOTES RELATING TO THIS DRAWING REFER DRAWING NWRLSVC-ISM-SVC-CS-DRG-852104.

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REV.	BY	DATE	DESCRIPTION	APPD.
B	TF	23.10.2015	ISSUED FOR FINAL DESIGN DOCUMENTATION	DJ
A	TF	16.10.2015	ISSUED FOR FINAL DESIGN DOCUMENTATION	DJ

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DISCIPLINE	<input type="checkbox"/>	<input type="checkbox"/>		
DISCIPLINE	<input type="checkbox"/>	<input type="checkbox"/>		

CLIENT
NSW GOVERNMENT
Transport for NSW

SERVICE PROVIDERS
SMC AUSTRALIA PTY LTD

DRAWN: Mark Erdmanis
DESIGNED: Oscar Sun
DRG CHECK: Tom Fisher
DESIGN CHECK: Chun Ng
APPROVED: David Jefferson

NORTH WEST RAIL LINK
44km690 TO 44km810
SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET
TYPICAL PRECAST PEDESTAL DETAILS

STATUS: FINAL DESIGN DOCUMENTATION SHEET 5 OF 9
NWRL Dwg No: NWRLSVC-ISM-SVC-CS-DRG-852105

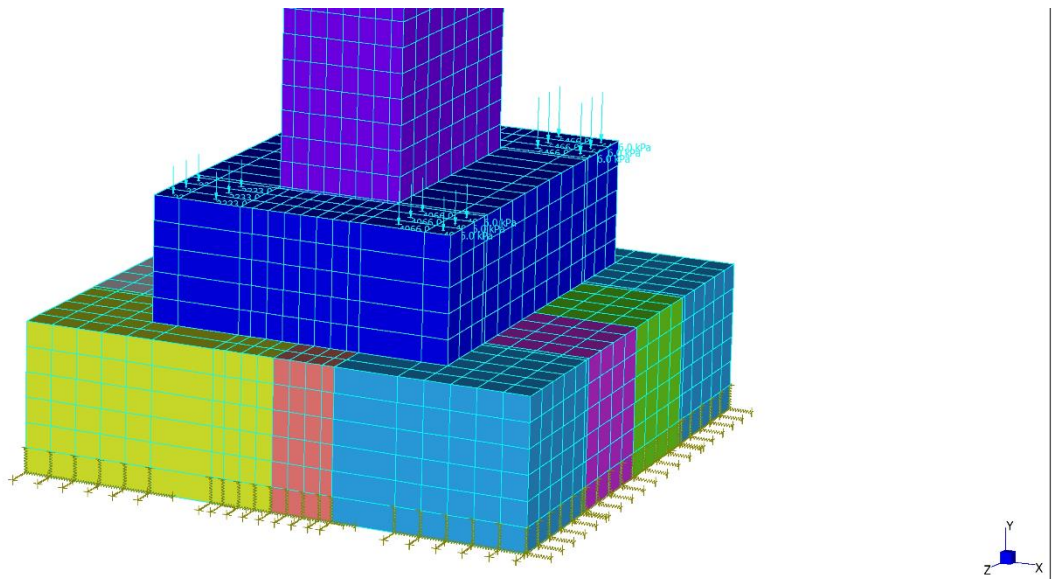


Figure 4-1 Temporary Support on Pad Footing (Pier 94)

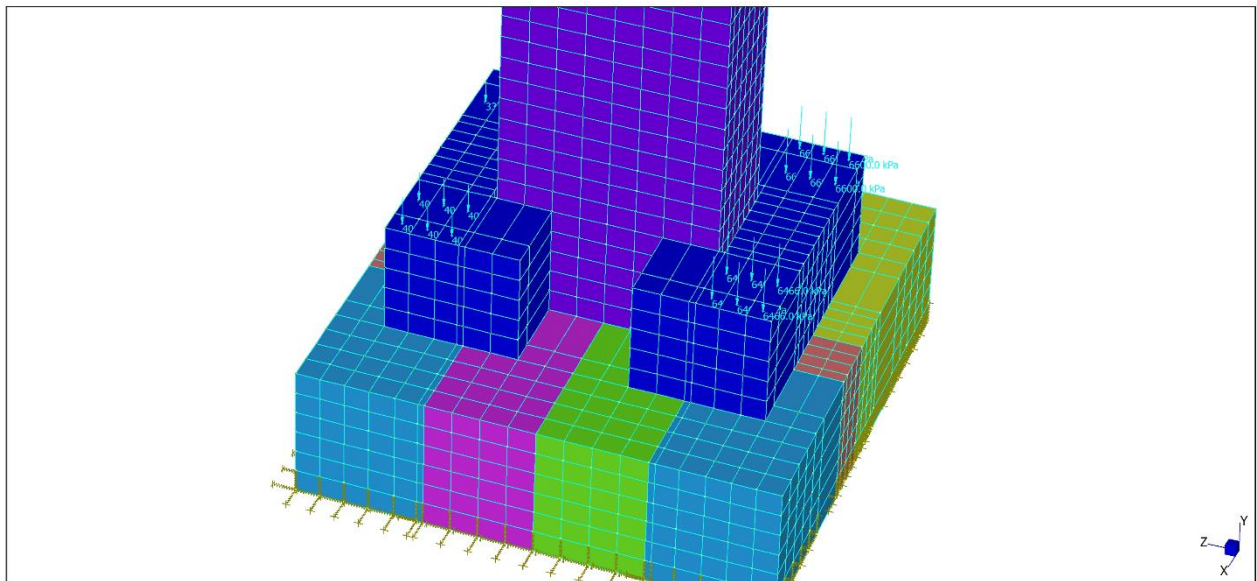


Figure 4-2 Temporary Support With Recess on Pad Footing (Pier 93)

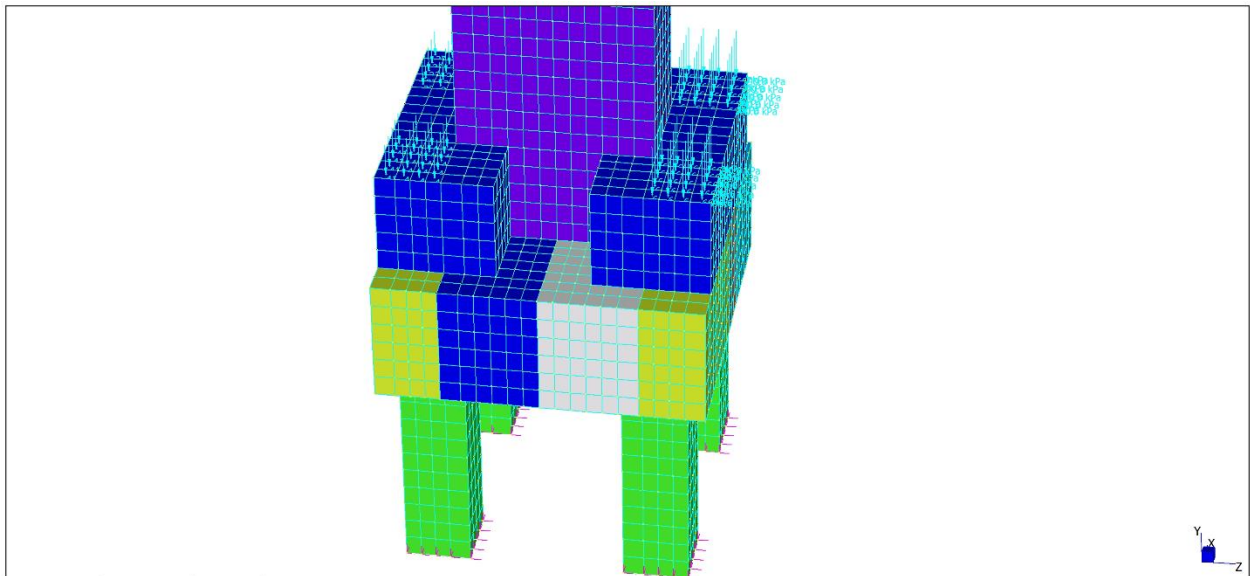


Figure 4-3 Temporary Support With Recess on Pilecap (Pier 92)

- A1 to A2, B1 to B2 has a total length of 4m with a section of 955mm (width) by 1250mm (depth). A1 to B1, A2 to B2 has a total length of 3.2m with a section of 780mm (width) by 1250mm (depth). Concrete strength of 40MPa is adopted for the design
- Force and moment is extracted from the Strand 7 model and the reinforcement is designed accordingly
- The bending action of the concrete beam is designed base on AS5100.5 Section 8.1 Strength of beams in bending
- The shear action of the concrete beam is designed base on AS5100.5 Section 8.2 Strength of the beam in shear
- Strut & Tie method based on the stress distribution from the 3D models has been adopted to verify the design.
- The torsion action of the concrete beam is checked against AS5100.5 Section 8.3 Strength of the beam in torsion. The torsion action is found to be less than $0.25\phi T_{uc}$, therefore torsion reinforcement is not required.
- The vertical upstand of the temporary structure is designed based on AS5100.5 Section 12.3 bearing surfaces
- The temporary loads are significantly less than the design loads (i.e. Dead load + Superimposed dead load + Live load) in permanent condition. Therefore, the permanent structures (Pad footing/Pilecap and piles) are adequate to take the temporary loads.

4.3 Pavements

Two stages of pavement construction are proposed where Pier 93 and Pier 94 are to be built. These are shown on the detailed drawings as 'Temporary Configuration' and 'Permanent Configuration'.

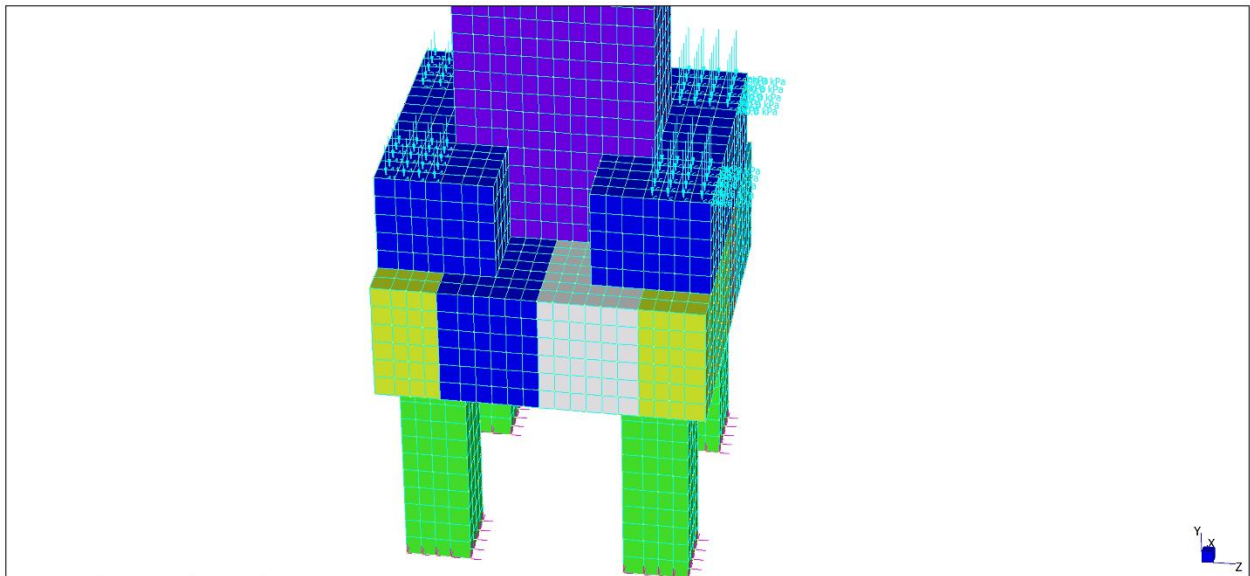


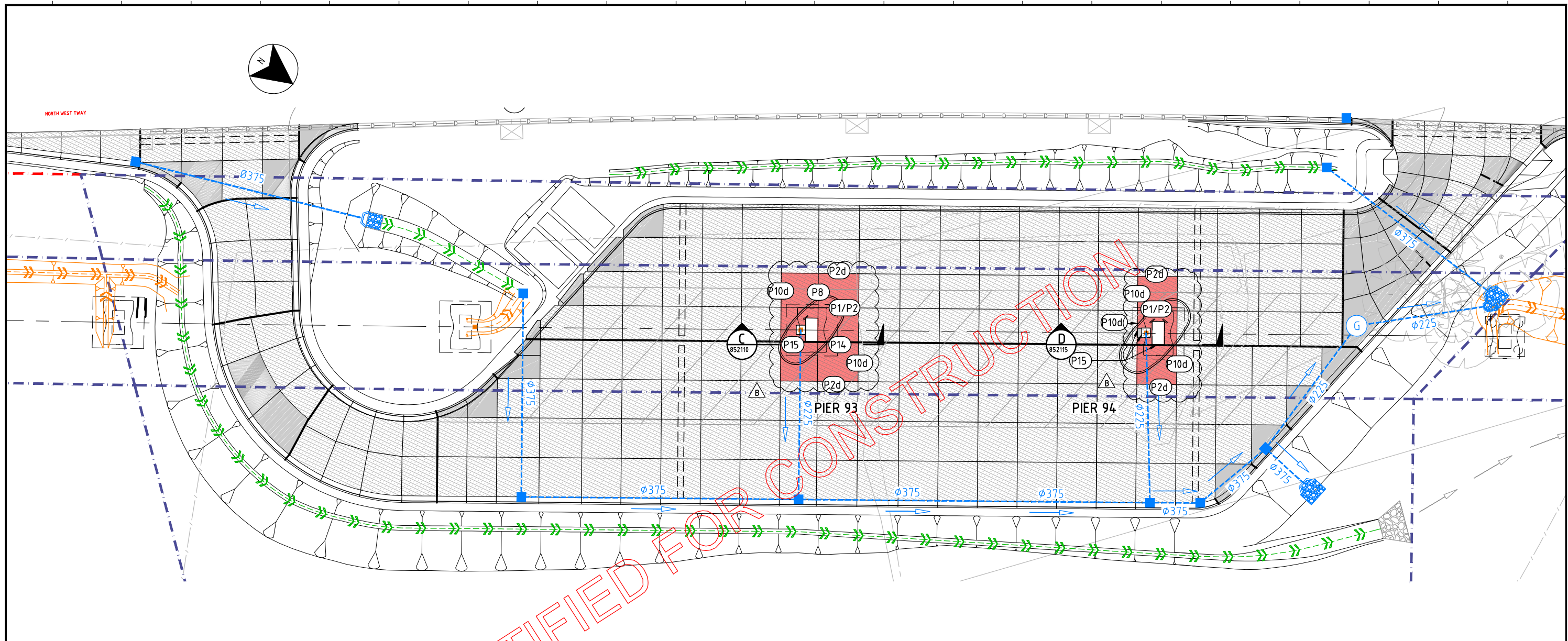
Figure 4-3 Temporary Support With Recess on Pilecap (Pier 92)

- A1 to A2, B1 to B2 has a total length of 4m with a section of 955mm (width) by 1250mm (depth). A1 to B1, A2 to B2 has a total length of 3.2m with a section of 780mm (width) by 1250mm (depth). Concrete strength of 40MPa is adopted for the design
- Force and moment is extracted from the Strand 7 model and the reinforcement is designed accordingly
- The bending action of the concrete beam is designed base on AS5100.5 Section 8.1 Strength of beams in bending
- The shear action of the concrete beam is designed base on AS5100.5 Section 8.2 Strength of the beam in shear
- Strut & Tie method based on the stress distribution from the 3D models has been adopted to verify the design.
- The torsion action of the concrete beam is checked against AS5100.5 Section 8.3 Strength of the beam in torsion. The torsion action is found to be less than $0.25\phi T_{uc}$, therefore torsion reinforcement is not required.
- The vertical upstand of the temporary structure is designed based on AS5100.5 Section 12.3 bearing surfaces
- The temporary loads are significantly less than the design loads (i.e. Dead load + Superimposed dead load + Live load) in permanent condition. Therefore, the permanent structures (Pad footing/Pilecap and piles) are adequate to take the temporary loads.

4.3 Pavements

Two stages of pavement construction are proposed where Pier 93 and Pier 94 are to be built. These are shown on the detailed drawings as 'Temporary Configuration' and 'Permanent Configuration'.

C:\p1\15\15_03\15_03_04\Temp_Support\NWRLSVC-ISM-SVC-CS-DRG-852107.dwg
 Plot Date: 03/12/15 - 10:34
 100mm AT FULL SIZE



**PLAN - PAVEMENT CONFIGURATION STAGE 2
AT PIER 93 AND 94**

SCALE 1:200

LEGEND

- STAGE 2 PERMANENT PAVEMENT CONSTRUCTION
- PCP-R
- SFCP

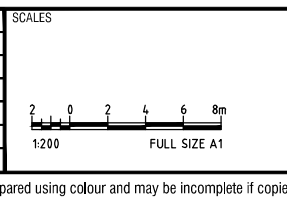
- P1 PCP LONGITUDINAL TIED/SAWN
- P2 PCP LONGITUDINAL TIED/FORMED
- P2d PCP LONGITUDINAL/FORMED/DRILL-TIED JOINT FOR DETAIL REFER TO RMS STD DRAWING MD.R83.CP SHEET No. 08
- P8 PCP TRANSVERSE CONTRACTION/SAWN JOINT FOR DETAIL REFER TO RMS STD DRAWING MD.R83.CP SHEET No. 08
- P10d PCP TRANSVERSE CONTRACTION/FORMED/DRILL-DOWELLED JOINT FOR DETAIL REFER TO RMS STD DRAWING MD.R83.CP SHEET No. 09
- P14 PCP BEAMED ISOLATION JOINT FOR DETAIL REFER TO RMS STD DRAWING MD.R83.CP SHEET No. 09
- P15 PCP ISOLATION JOINT FOR DETAIL REFER TO RMS STD DRAWING MD.R83.CP SHEET No. 09

NOTES

1. FOR PERMANENT PAVEMENT DETAILS REFER TO DRAWING SERIES NWRLSVC-ISM-SRH-RE-DRG-255300.
2. DRILL-TIES IN P2D JOINT MAY BE INCLINED (AT 10° MAX) TO FACILITATE FIXING.
3. IN JOINT TYPES P10, THE SEALANT RESERVOIR MAY BE CREATED BY SAWCUTTING OR BY FIXING A TEMPORARY FILLER TO THE FIRST-PLACED FACE. THE NOMINATED METHOD MUST CONSIDER THE IMPACT OF ANY EXISTING ROUNDING AND/OR SPALLING OF THE EXISTING ARRISSES. WHERE A FILLER IS USED, THE FORMED FACES MUST BE PREPARED IN ACCORDANCE WITH THE SPECIFICATION PRIOR TO SILICONE SEALANT INSTALLATION.

CHECK PRINT

REV.	BY	DATE	DESCRIPTION	APPD.
B	TF	23.10.2015	ISSUED FOR FINAL DESIGN DOCUMENTATION	DJ
A	TF	16.10.2015	ISSUED FOR FINAL DESIGN DOCUMENTATION	DJ



DESIGN MODEL FILE(S) USED FOR DOCUMENTATION

INDEPENDENT CERTIFIER CERTIFICATE

<input type="checkbox"/> BACKDRAFTING REQUIRED	<input checked="" type="checkbox"/> CHECK PRINT
<input type="checkbox"/> READY TO ISSUE	
DISCIPLINE	INITIAL DATE
DISCIPLINE	
BACKDRAFTED/CORRECTED	
CONFIRMED	

Refer to: Electronic file issue disclaimer on transmittal form

CLIENT

Transport for NSW

Service Providers

DRAWN	Mark Erdmanis
DESIGNED	Oscar Sun
DRG CHECK	Tom Fisher
DESIGN CHECK	Chun Ng
APPROVED	David Jefferson

NORTH WEST RAIL LINK

44km690 TO 44km810
SOUTHERN BUS LAYOVER - TEMPORARY WORKS SET
PAVEMENT CONFIGURATION STAGE 2 ARRANGEMENT AT PIER 93 AND 94

STATUS: FINAL DESIGN DOCUMENTATION	SHEET 7 OF 9	©
NWRL Dwg No. NWRLSVC-ISM-SVC-CS-DRG-852107	NWRL REV.	B.1

6. Constructability

The design development process includes progressive consultation, reviews and inputs by the ISJV construction team to ensure that the design reflects the anticipated construction practices and can be constructed safely and efficiently incorporating the necessary staging of the works. Constructability review and input is occurring through formal and informal meetings, and assists in preparing the design to minimise construction risks.

6.1 Key Construction Issues

Key construction issues are casting of cast-in-situ ring beam footings with dowels above pilecap/footing and 20 MPa mass concrete infill under drainage pit. Concrete pouring will be staged in such a way to avoid any gaps between the pilecap/footing and ring beam.

6.2 Construction Methodology

The following paragraph describes key features of the construction methodology and how the design has addressed the key constructability issues associated with the Temporary Supports.

6.2.1 Survey Setout of Pilecap/Footing Structure

The ISJV Surveyor will be requested to provide a setout of each pilecap/footing structure on the existing ground. At each corner an offset recovery peg will be provided to allow for regular checking of the excavation position along with a benchmark height to determine excavation depth.

6.2.2 Excavation for Pilecap/Footing Structure

Excavation Permit will be prepared by ISJV in preparation for excavation works. Prior to excavation the Excavation Permit shall be checked for any services in the vicinity of the excavation works. Surveyor's pegs marking the known services shall be used to reference the service locations with the excavation works.

A delineation fence will be established if there is a chance that other workgroups could encroach the excavation or operating plant hazards. The delineation fence may be replaced with a temporary security fence depending on the risk assessment of Pilecap/footing excavation.

Pilecap/footing will be excavated using a 24-tonne Caterpillar excavator. The excavation will be battered at 45 degrees or benched at a 1:1.5 ratio (1.5m V 2.2m H). A set of stairs will be excavated to provide worker access to completed excavation. All excavations to be inspected by geotechnical engineer for slope stability.

6.2.3 Blinding Concrete

Blinding concrete will be delivered to site in ready-mix agitator. The concrete blinding will either be chute or pump.

The height of the blinding will be controlled using a laser level using the benchmark R.L. established by the surveyor. Blinding concrete will be screed finished only and does not require any curing regime.

6.2.4 As-Built Pile and Blinding Survey and Pilecap/Footing Setout

The ISJV Surveyor will be requested to provide an as-built survey of the Piles (for pier 92 only) to so that measurements can be made for Quality Assurance and Payment Measurement reasons. The height of the blinding will be checked to ensure that the underside of the Pilecap/footing is within Specification tolerances of the design height.

The surveyor will set out the Pilecap/footing on the blinding using concrete nails and flagging tape at each corner.

6.2.5 Placement of Reinforcement for Pilecap/Footing and ring beam

Reinforcement will be supplied by Activesteel and a Production Schedule will be provided to list the Bar Labels and quantities. The Bar Labels will match those on the reinforcement design drawings.

Reinforcement will generally be handled into the footing location using a Dieci telehandler crane in bundles in accordance with Kenny Constructions SWMS. Small, manageable amounts of reinforcement will be manual-handled from bundles and fixed in-situ.

A Hot Works Permit will be established for site cutting of reinforcement (if required) using grinders. Only grinders with wheel diameter smaller than 230mm will be used for safety reasons.

The reinforcement shall be tied strictly in accordance with the order stipulated on the design drawings. The reinforcement will be positioned in accordance with the setout provided on the concrete blinding. Care shall be taken to ensure the design cover to each face is accurately achieved. Reinforcement chairs shall be Aspro concrete block type to ensure that there is no failure of the support during concrete placement. Ring beam dowels will be casted into the pile cap/footing reinforcement.

6.2.6 Placement of Formwork for pilecap/footing and ring beam

Formwork will generally be handled into the pilecap/footing location using a Dieci tele-handler crane in bundles.

Excavation and blinding levels will be checked by the surveyor and concrete nails with flagging will be used to define the design position for the pilecap/footing and ring beam above for formwork positioning.

A combination of standard Peri 'Pan' formwork with infill portions of conventional timber/ply single-sided formwork will be installed in accordance with Australian Standards 3610 and Peri Formwork System Installation Manual. A custom designed plate will then be installed for setting dowels for ring beam. The plate will be fixed with the reinforcement and dowels.

6.2.7 Pre-Pour Certification and Notification

On completion of formwork and reinforcement placement, a pre-pour survey will be undertaken to ensure that the formwork is in the correct position. If necessary, adjustments to the formwork will be made to bring formwork position within specified tolerances.

Concrete will not be placed if the weather forecast is not conducive for a quality product. Kenny Constructions will liaise with ISJV on these matters before concrete is activated for batching.

Consideration will be given when scheduling any concrete pours to completing pour within EPL approved work hours.

6.2.8 Placement of Concrete

Concrete will be placed using boom pump. An access platform will be installed around the top of the Pilecap/footing and ring beam formwork and accessed from a ladder access. The initial slurry and concrete from the boom pump will be discarded. Discarded concrete to be returned to supplier or disposed of in site concrete wash out.

3 No. diameter 50mm needle vibrators will be used to compact the concrete (one active and one standby). These will be shaft-driven, petrol-powered type. As per ISJV B80 Specification:

- 1 No. vibrator (minimum diameter 50mm) per 10m³/hour with 25% on standby (minimum 1 No. standby)
- Vibrators to be used vertically at spacing not more than 350mm.

The concrete pour rates will approximately 20m³/hour.

Concrete will be placed in a manner that ensures that no portion is allowed to develop a cold-joint. Concrete supply will be monitored to ensure the correct mix and slump is being supplied by the batching plant.

Unformed concrete surfaces will be steel-trowelled to produce a compacted surface finish.

After finishing, and just prior to initial set, a coating of SIKA Rugasol will be sprayed onto the fresh concrete finish at the construction joint to in accordance to manufacturer's recommendations. This will allow for green-cutting of the construction joint with a water-blaster to expose the aggregate for the future joint. To unformed areas that are not construction joints, two-coats of Aftek Concure A99 will be sprayed to the top of the Pile cap in accordance to manufacturer's recommendations to prevent evaporation.

6.2.9 Curing and Formwork Stripping of Concrete Elements

In accordance with Specification ISJV B80, vertical faces of the concrete can only be stripped once the concrete has achieved 7MPa. Concrete test cylinders will be used to indicate that the necessary strength has been achieved.

The concrete shall generally be 'sealed' cured by formwork for at least 7-days from the date of pour. If the formwork is to be removed during this time two-coats of Aftek Concure A99 will be sprayed to the stripped surface in accordance to manufacturer's recommendations to prevent evaporation.

6.2.10 Placement of precast concrete pedestals

Precast pedestals will be installed to the top of the ring beam with 5mm compressible filler (i.e. elastomeric bearing pad or approved equivalent) in between. The pedestals will be locked into the position once precast pedestals into the correct position.

6.2.11 Backfilling of pilecap/footing & demolition of pedestals

2 days after the pile cap concrete pour; formwork will be stripped and checked for any visible cracking. Any cracking will need to be repaired before backfilling in accordance with approved concrete repair method. Pier construction will commence and after pier construction is completed, pavement layers will be constructed as per design around the ring beam. Prior the pavement layers have been completed; precast pedestals will be saw cut and removed using a small 5 t excavator to avoid any damage to the ring beam.

DESIGN PACKAGE No.	DL85.21
TEAMBINDER DOC REF.	NWRLSVC-HYD-SVC-DN-CRR-852100
DESIGN PACKAGE TITLE	TEMPORARY WORKS DL85.21 Temp Works - Southern Bus Layover
Report:	NWRLSVC-ISM-BVR-CS-DRT-852100

FDD (Date/Time/Rev)	Monday, 26 October 2015	2:12 PM	A
Date/Time/No. of Drgs			
Date/Time/No. of Drgs			
Date/Time/No. of Drgs			

RESPONSE STATUS

- O Open
- C Closed
- CS Closed SUBJECT TO additional action / information
- L Certification Limitation
- H Drawings or part thereof on HOLD

Rev	IC USE ONLY: CRR Status	Date	By
A	IC & TINSW initial comments on Rev A submission of DL85.21;	29/10 & 9/11/15	MK / AN
B	RMS initial comments	13/11/2015	AN

No.	Stage	PACKAGE	Rev	Reviewer	Initial Comment Date	Discipline	Organisation	Document Reference	Reviewer Initial Comment	Project Deed ref	Compliance Status	ISJV Response	Initial Response Date	Response Status	Reviewer Comment on Response	Date Comment Closed	Incorporation Status / Date	SMEC Status
30	FDD	DL85.21	A	TD	12-Nov-2015	Bridge	RMS	Report	Section 4.2: it is noted the temporary structure is not designed for any horizontal loadings which seems unconservative. At least wind loads and accidental impact loads should be considered. It is also stated that all horizontal loads are resisted by the Pier but it appears the permanent columns will not be constructed until the temporary work finishes. Please clarify.		D	C.Ng: The permanent piers are constructed before the steel tower is fixed to the pier and the temporary concrete structure. Refer to drawing NWRLSVC-ISJ-SVC-TN-DRG-731739 in Appendix D, where it shows that the horizontal loads are taken by the pier at points C, D and E.	19/11/2015					Closeout Check Print provided
31	FDD	DL85.21	A	TD	12-Nov-2015	Bridge	RMS	Report	Section 4.2.1: please summarise the results from Strand7 and compared with results from the permanent case (in service). How's the soil bearing pressure under the temporary loads compared to the permanent case?		D	C.Ng: The temporary loads are significantly less than the design loads (i.e. Dead load + Superimposed dead load + Live load) in permanent condition. Therefore, the permanent structures (Pad footing/Pilecap and piles) are adequate to take the temporary loads. This statement has been included in the design report section 4.	19/11/2015					Closeout Check Print provided
32	FDD	DL85.21	A	TD	12-Nov-2015	Bridge	RMS	Report	Section 6: there are numerous notes about the piles, pile caps and breakdown of piles but these elements are not shown on the drawings. Please clarify		O	C.Ng: Piles and Pilecap are only applicable to pier 92. Pier 93 and 94 are on pad footing. Section 6 of the report has been updated.						Closeout Check Print provided
33	FDD	DL85.21	A	TD	12-Nov-2015	Bridge	RMS	Drawings	Sheet 2 - 5: the cast in dowels appear to be cut-off and left in place. Therefore they should be stainless steel.		M	C.Ng: A note has been added on drawing 852104 to ensure the cut dowel is to be coated by epoxy resin.	19/11/2015					Closeout Check Print provided
34	FDD	DL85.21	A	TD	12-Nov-2015	Bridge	RMS	Drawings	Sheet 6: Stage 2 - It should be noted on this drawings that the footing / pile cap to be thoroughly inspected after the completion of the temporary works for any cracking or defect before backfilling. It may be useful to carry out a survey of the footing / pile cap to ascertain it has not moved or settled during the temporary works.		M	C.Ng: Noted. This note has been added on drawing 852104.	19/11/2015					Closeout Check Print provided
35	FDD	DL85.21	A	IK	13-Nov-2015	Pavement	RMS	Drawings	Provide copy of drawing referred in Note 1 of DRWG No. 852106 and 852107. This will allow comparison of the permanent pavement joints and the Stage 2 pavement joints on the drawings submitted for review.		D	B.Basso: Note the latest drawing series NWRLSVC-ISM-SRH-RE-DRG-255300 is accessible on TeamBinder. These drawings within this series range from NWRLSVC-ISM-SRH-RE-DRG-255331 to NWRLSVC-ISM-SRH-RE-DRG-255391.	26/11/2015					Response Only
36	FDD	DL85.21	A	GD	13-Nov-2015	DS	RMS	Report & Drawings	Please confirm if the design documentation submitted below will be certified by IC & Proof engineer as per the requirement in the WAD.		D	ISJV : (Harsha on behalf of Subbu N.) - This package is certifiable by the IC. The affected piers and spans were proof engineered as a part of DL01-4 submission previously. The four (4) off precast pedestals will be removed and the lower ring will be remained above the pile cap. By leaving lower ring, the gravity load exerted on the pile cap will be similar to the previously considered overburden; hence there is no necessity to proof engineer again.						ISJV to review

CAMPBELL Clarinda

From: MCMAHON Anthony J
Sent: Tuesday, 6 September 2016 2:22 PM
To: McMahan, Anthony
Subject: Fwd: Sydney Metro Assurance Letter Tuesday Modified Rev

Sent from my iPhone

Begin forwarded message:

From: HEAD Steven <Steven.HEAD@rms.nsw.gov.au>
Date: 6 September 2016 at 2:18:45 PM AEST
To: GRANT Katie <Katie.GRANT@rms.nsw.gov.au>, MCMAHON Anthony J <Anthony.MCMAHON@rms.nsw.gov.au>
Cc: THURSTON Claire F2 <Claire.THURSTON@rms.nsw.gov.au>
Subject: RE: Sydney Metro Assurance Letter Tuesday Modified Rev

The letter is done. It just needs to be included into the Brief

Anthony
Could you please call Katie and actually discuss

Regards
Steven

From: GRANT Katie
Sent: Tuesday, 6 September 2016 2:02 PM
To: HEAD Steven; MCMAHON Anthony J
Cc: THURSTON Claire F2
Subject: RE: Sydney Metro Assurance Letter Tuesday Modified Rev

Hi Steven

How about this? I'm not sure if this is what you are envisaging for the letter, or if it needs more detail.

Anthony, in relation to Steven's comments about remaining risks, can you please advise if anything needs to be added?

Kind regards,
Katie

From: HEAD Steven
Sent: Tuesday, 6 September 2016 1:03 PM
To: GRANT Katie; MCMAHON Anthony J; THURSTON Claire F2
Subject: RE: Sydney Metro Assurance Letter Tuesday Modified Rev

Okay
I just read it

Should the brief not broadly say

There was a previous issue with a viaduct over one of our assets

We were given assurances to its safety and allowed works to continue.
There was another issues following

They have conducted a significant investigation which has identified a number of changes to their design, construction and installation process which has been ticked off by proof engineer and IC

Project has applied to again work over our assets to install additional viaducts

There has been lengthy deliberation with the project

Reached agreement with this letter

We support it under those conditions. Any remaining risks as best we can identify.
Ask CE to sign letter

The existing brief doesn't really give any direction.

This needs to get to CE today

From: GRANT Katie
Sent: Tuesday, 6 September 2016 10:35 AM
To: HEAD Steven
Subject: FW: Sydney Metro Assurance Letter Tuesday Modified Rev

Hi Steven,

Anthony has confirmed he's happy with this version.

Kind regards,
Katie

From: McMahon, Anthony [<mailto:Anthony.McMahon@transport.nsw.gov.au>]
Sent: Tuesday, 6 September 2016 10:16 AM
To: GRANT Katie
Subject: RE: Sydney Metro Assurance Letter Tuesday Modified Rev

Katie,

Great editing, I'm happy with your version.
For completeness you should also add the attached to the 'For Information' documents.

Regards

Anthony McMahon
Integration Manager
Roads and Maritime Services
Sydney Metro Project
Transport for NSW

M 0400 619329
Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

From: GRANT Katie [<mailto:Katie.GRANT@rms.nsw.gov.au>]
Sent: Tuesday, 6 September 2016 10:09 AM
To: McMahon, Anthony
Subject: RE: Sydney Metro Assurance Letter Tuesday Modified Rev

Hi Anthony,

I think Steven sent that email just before I sent through your latest version with a few minor edits. Steven has just asked that you confirm you're happy with the changes I've made.

Best,
Katie

From: McMahon, Anthony [<mailto:Anthony.McMahon@transport.nsw.gov.au>]
Sent: Tuesday, 6 September 2016 9:53 AM
To: GRANT Katie
Subject: RE: Sydney Metro Assurance Letter Tuesday Modified Rev

Katie,

I cannot add any more to the brief.

Regards

Anthony McMahon
Integration Manager
Roads and Maritime Services
Sydney Metro Project
Transport for NSW

M 0400 619329
Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

From: HEAD Steven [<mailto:Steven.HEAD@rms.nsw.gov.au>]
Sent: Tuesday, 6 September 2016 9:45 AM
To: McMahon, Anthony; GRANT Katie
Subject: RE: Sydney Metro Assurance Letter Tuesday Modified Rev

Katie

I have not read, could you and Anthony work together to get this finalised. It is urgent for today.

Regards
Steven

From: McMahon, Anthony [<mailto:Anthony.McMahon@transport.nsw.gov.au>]
Sent: Tuesday, 6 September 2016 9:01 AM
To: GRANT Katie; HEAD Steven
Subject: Sydney Metro Assurance Letter Tuesday Modified Rev

Katie, Steven,

Revised edit to promote consideration of the Sydney Metro request.

Regards

Anthony McMahon
Integration Manager
Roads and Maritime Services
Sydney Metro Project
Transport for NSW

M 0400 619329

Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

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CAMPBELL Clarinda

From: McMahon, Anthony
Sent: Tuesday, 6 September 2016 9:01 AM
To: 'GRANT Katie'; HEAD Steven
Subject: Sydney Metro Assurance Letter Tuesday Modified Rev
Attachments: CE16_1077 - Sydney Metro Viaduct Construction Approval Monday Rev.docx

Katie, Steven,

Revised edit to promote consideration of the Sydney Metro request.

Regards

Anthony McMahon
[Integration Manager](#)
Roads and Maritime Services
Sydney Metro Project
Transport for NSW

M 0400 619329

Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

Sydney Metro Northwest Viaduct Construction Issues

From: A/Chief Operating Officer

Topic: Roads and Maritime Services' response to Sydney Metro's request to continue constructing an elevated viaduct over White Hart Drive, Rouse Hill.

Analysis: Roads and Maritime to consider approval for construction of the viaduct over publicly accessible areas of the site and have required Sydney Metro to address concerns about the work. These concerns include public safety and the viaduct's structural integrity, as well as a lack of independent certification, and non-compliance with conditions of the Works Authorisation Deed (WAD).

It is recommended that Roads and Maritime considers the commitments made by the TfNSW Sydney Metro management in the assurance letter they have recently issued before making a decision regarding construction approval. This will provide the opportunity for RMS to identify and consider instances of WAD non-compliance and the public safety risk, and if necessary invite the project team to provide further technical assurance so that Roads and Maritime can issue approval.

Sydney Metro has indicated that they will escalate the matter if approval is not forthcoming given key project delivery risks they face.

Key issues

Roads and Maritime and the independent certifier have concerns about public safety and quality assurance

Sydney Metro wishes to continue constructing an elevated viaduct across White Hart Drive and has applied for consent from Roads and Maritime through the WAD mechanism.

On a prior road crossing of Memorial Avenue, Transport for NSW was able to provide adequate assurance that it had matters in hand and that the safety of road users and assets was protected. However, a subsequent incident of spalling has raised fresh concerns. In addition, there has been no progress certification from an independent certifier for any of the works completed within the past two years and many records exist that identify issues with WAD quality compliance.

Roads and Maritime has previously approved continuation of construction over areas of the site that are not publicly accessible. When Transport for NSW last requested approval to proceed, Roads and Maritime asked that Sydney Metro endorse its contractor's plans to construct over live roads, and provide assurance that Roads and Maritime's concerns have been addressed before submitting any further applications to start works over live roads.

Roads and Maritime assessed the current application and accompanying documents (**Attachment A**), and advised that it cannot provide approval for Sydney Metro to start construction due to concerns about compliance with WAD conditions. Roads and Maritime's primary concerns relate to construction, including quality assurance, which in turn raise issues of structural reliability and public safety. Roads and Maritime's project representative considers Sydney Metro has not yet provided adequate assurance that the project meets WAD requirements. The independent certifier has raised similar concerns (**Attachment B**).

Roads and Maritime also considers that the Prescribed Quality Management Plan, required under the WAD, needs to be updated to incorporate the augmented safeguards and controls (outlined in the letter at **Attachment C**) and the independent certifier should ideally

provide comments on the plan. Roads and Maritime may then need to further consider these comments with Transport for NSW.

Once Sydney Metro provides adequate technical assurance, Roads and Maritime can approve construction to proceed

Sydney Metro has now provided an assurance statement letter nominating that issues relating to construction, including quality assurance, have been considered, addressed and mitigated within this letter they have also committed to presenting verification that the appropriate quality information will be forthcoming however cannot commit to providing this prior to the White Hart Drive works commencing.

Roads and Maritime are now in a position to consider approving the commencement of works.

Although Transport for NSW has provided Roads and Maritime with broad indemnities in relation to the works, including the viaduct, Roads and Maritime retains responsibility for ensuring public safety as the roads authority with powers to issue the WAD and authorise works. There is also a whole of Government responsibility to manage rail safety requirements, WHS issues, and roads authority responsibilities.

Discussions with Sydney Metro are ongoing to achieve a satisfactory solution.

Supporting analysis

Provisions of the WAD

Roads and Maritime has an existing WAD with Sydney Metro for viaduct construction over public roads, Roads and Maritime owned land, and associated road works.

The WAD requires Transport for NSW to retain a proof engineer for the viaducts over roads and an independent certifier for the works generally, including aspects of the viaducts.

Where Roads and Maritime has concerns about the quality and safety systems it can undertake an audit, and can direct that works cease if there are concerns for public safety.

Financial impact

N/A.

Consultation

Roads and Maritime staff have been in ongoing contact with Transport for NSW and Sydney Metro project staff, and will continue to work with them to establish the minimum commitments required in order for Roads and Maritime to approve access to the road network.

Angus Mitchell, A/Chief Operating Officer	
Chief Executive's comments Noted	
Briefing for Minister or Secretary	

CAMPBELL Clarinda

From: MCMAHON Anthony J
Sent: Tuesday, 27 September 2016 11:18 AM
To: McMahon, Anthony
Subject: Fwd: Sydney Metro Northwest SVC Project
Attachments: Sydney Metro WAD.docx; ATT00001.htm

Follow Up Flag: Follow up
Flag Status: Flagged

Sent from my iPhone

Begin forwarded message:

From: HEAD Steven <Steven.HEAD@rms.nsw.gov.au>
Date: 27 September 2016 at 10:03:51 AM AEST
To: MCMAHON Anthony J <Anthony.MCMAHON@rms.nsw.gov.au>
Cc: BOCK Sally E <Sally.BOCK@rms.nsw.gov.au>
Subject: **FW: Sydney Metro Northwest SVC Project**

Hi Anthony

Steven asked me to send this to you for registering and appropriate action. You will note that it is unsigned. We will send you a signed copy as soon as possible, however, that probably won't be until Thursday.

Sally – for your records.

Regards

Alison
Alison Martin
Administration Manager
Network Sydney | Journey Management
T 02 8849 2433 M 0408929494

www.rms.nsw.gov.au
Every journey matters

Roads and Maritime Services
27 Argyle Street Parramatta NSW 2150

Out of Scope

Out of Scope

Out of Scope

CAMPBELL Clarinda

From: KANOFSKI Ken
Sent: Friday, 8 July 2016 10:57 AM
To: DUNCAN Peter J
Cc: JOZELICH Natalie; THURSTON Claire F; HEAD Steven; MCMAHON Anthony J
Subject: North West Rail Issues

Peter,

Steven and Anthony could give you more detail if required, however, the high level story is that:

- We met with North West Rail
- We have agreed the form and process to close out the remaining issues to give us enough comfort to allow them to cross over
- We are going to fast track some approvals for areas of viaduct that do not cross the road (ie are completely in a dedicated construction zone
- These actions (provided everything proves up as expected) should allow Sydney Metro to stay on program.

Regards

Ken

CAMPBELL Clarinda

From: HEAD Steven
Sent: Wednesday, 31 August 2016 2:45 PM
To: MCMAHON Anthony J
Subject: RE: 20160826_Roads and Maritime Services_Rev 2_Tracked Changes (4) Aug 31.docx

You're okay with it? **LPP**

Regards

Steven

From: MCMAHON Anthony J
Sent: Wednesday, 31 August 2016 2:40 PM
To: HEAD Steven
Subject: Re: 20160826_Roads and Maritime Services_Rev 2_Tracked Changes (4) Aug 31.docx

Steven,

The letter with your amendments could work.

Tony McMahon

Sent from my iPhone

On 31 Aug 2016, at 2:34 PM, HEAD Steven <Steven.HEAD@rms.nsw.gov.au> wrote:

Thanks Anthony

I've made a couple of changes. Could you quickly read and tell me you are okay. I will make reference in the email that I send to Sydney Metro that it would have been preferable that the QMS was updated in time for the commencement of this component of the project but in the interests of doing all we can to assist and to safeguard public safety we have some suggested amendments to the letter they propose to send.

I need feedback pretty quickly

Regards

Steven

<20160826_Roads and Maritime Services_Rev 2_Tracked Changes (4) Aug 31.docx>

CAMPBELL Clarinda

From: HEAD Steven
Sent: Thursday, 1 September 2016 6:57 AM
To: MCMAHON Anthony J
Subject: RE: 20160826_Roads and Maritime Services_Rev 2_Tracked Changes (5) Aug 31.docx

Thanks Anthony

If you keep my general direction but spell it out a bit more clearly or strengthen it a little I have no issue with that at all. Lets just try and get it to a point where its resolved, or at least we have given the project something to comment on

Thanks again

Regards
DSteven

From: MCMAHON Anthony J
Sent: Thursday, 1 September 2016 6:54 AM
To: HEAD Steven
Subject: Re: 20160826_Roads and Maritime Services_Rev 2_Tracked Changes (5) Aug 31.docx

No problem.

Sent from my iPhone

On 1 Sep 2016, at 6:51 AM, HEAD Steven <Steven.HEAD@rms.nsw.gov.au> wrote:

I think this is the letter I sent which is not the orginal. Could you check and follow up this morning including negotiations to bring this to a conclusion. If it needs to be stronger and you want to add in more then that's okay, just needs to be in a way that gets the process moving forward

Regards
Steven

Out of Scope

LPP

LPP

Out of Scope

Out of Scope

CAMPBELL Clarinda

From: McMahon, Anthony
Sent: Wednesday, 15 June 2016 11:25 AM
To: HEAD Steven; MOGA Dora A; THURSTON Claire F; LITHGOW Christine
Cc: BOCK Sally E
Subject: RE: copy of assurance letter please
Attachments: Sydney Metro Viaduct Construction Approval CEO Brief Version 2.docx

Steven,

Please consider the attached revised CEO Brief on Sydney Metro Viaduct Issue.

Regards

Anthony McMahon
Integration Manager
Roads and Maritime Services
Sydney Metro Project
Transport for NSW

M 0400 619329
Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

From: HEAD Steven [mailto:Steven.HEAD@rms.nsw.gov.au]
Sent: Wednesday, 15 June 2016 10:30 AM
To: McMahon, Anthony; MOGA Dora A; THURSTON Claire F; LITHGOW Christine
Subject: RE: copy of assurance letter please

Dora

Following our meeting this morning with Tom Gellibrand I asked Anthony to work with you to update the Brief along the lines of how we discussed last night and also reflecting the discussion with Sydney metro this morning. Our understanding at this point is that they will be bringing a separate report to us before again asking to commence construction over Sanctuary Drive.

There did appear to be some disconnect between what we were told this morning and whether or not Rod Staples still seeks to discuss the matter with Peter or Ken

Regards
Steven

From: McMahon, Anthony [mailto:Anthony.McMahon@transport.nsw.gov.au]
Sent: Tuesday, 14 June 2016 9:46 PM
To: MOGA Dora A
Cc: HEAD Steven
Subject: RE: copy of assurance letter please

Dora, Steven,

Attached is the assurance statement we received from TfNSW in Jan 2016 following the previous concrete spalling incident adjacent to Memorial Avenue. Although this version is marked as Draft the final version is word for word identical (I just don't have a copy on this machine).

As regards which commitments of this letter that have not been met since the most recent concrete spalling incident adjacent to Sanctuary Drive there are two areas of concern for RMS:-

- The segments proposed to be used over Sanctuary Drive were actually manufactured prior to the enacting of the mitigations referred to in the Executive Summary report which accompanied the attached assurance statement; so although RMS have recently been made aware by TfNSW that some of these segments are now known to exhibit manufacturing non-conformances similar to those that have recently failed we do not know if TfNSW or their contractor retrospectively checked these segments after the initial spalling incident or did they consider the implications of proposing to use these segments prior to the most recent spalling incident occurring.
- With the most recent incident TfNSW initially attempted to obtain RMS approval to commence construction without providing any assurance that their contractors mitigation proposals were adequate or any confirmation that any live roadway risks had been considered despite lessons learned from the previous incident, their assurance statement and the entire matter being discussed at length in a PCG meeting 1 week prior to their application.

I will provide a more simplistic version of the brief that summarises the previous issues in the context of the current situation and nominates the RMS risks in the morning after our 7.30 meeting.

Regards

Anthony McMahon
Integration Manager
Roads and Maritime Services
Sydney Metro Project
Transport for NSW

M 0400 619329
Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

From: MOGA Dora A [<mailto:Dora.MOGA@rms.nsw.gov.au>]
Sent: Tuesday, 14 June 2016 6:05 PM
To: McMahon, Anthony
Cc: HEAD Steven
Subject: copy of assurance letter please

Hi, can you pls send us a copy of this letter you mentioned earlier.

Thank you

Dora Moga
A/Manager Government Information Services Officer - JMD
Government Information Services | Customer, Engagement and Planning Division
T 02 9462 6412
www.rms.nsw.gov.au
Every journey matters

Roads and Maritime Services
Level 1 – Ennis Rd | Kirribilli | Sydney NSW
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LPP

LPP

CAMPBELL Clarinda

From: McMahon, Anthony
Sent: Thursday, 8 September 2016 9:37 AM
To: HEAD Steven
Subject: RE: Need those comments urgently

Steven,

RMS currently require:-

The Prescribed Quality Plan which describes how the Contractors quality management plan will be specifically applied to meet the WAD requirements.

This Prescribed Quality Plan produces a schedule of hold and witness points (Sign offs by subject matter experts) for the nominated stages of design, manufacture, installation and maintenance plus ITP's (Inspection and Test Plans) that identify appropriate inspections and tests then provides the results of these that verify these tests and also Lot records which confirm all these tests and inspections have occurred on the sections of works relevant to RMS. Without this information it is not possible to formally demonstrate that the Viaduct has been constructed correctly.

Above all RMS contractually requires TfNSW to verify all of this information is correct in content and context.

The above three points are the foundations of the comments from the IC.

After I offered this morning to participate in an informal desktop audit of this information in conjunction with the IC and TfNSW I have just received a call from TfNSW rejecting this proposal on the grounds that they are not ready and instead wish to attempt to convince the IC that the information is available?

Regards

Anthony McMahon
Integration Manager
Roads and Maritime Services
Sydney Metro Project
Transport for NSW

M 0400 619329
Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

-----Original Message-----

From: HEAD Steven [<mailto:Steven.HEAD@rms.nsw.gov.au>]
Sent: Thursday, 8 September 2016 9:08 AM
To: BOCK Sally E; McMahon, Anthony; MITCHELL Angus
Subject: Need those comments urgently

Sent from my iPhone

CAMPBELL Clarinda

From: THURSTON Claire F2
Sent: Monday, 19 September 2016 12:14 PM
To: HEAD Steven; MCMAHON Anthony J; DINAN John P; GRANT Katie
Cc: OATEN Martin
Subject: RE: Serious Recent Viaduct Spalling Incident

Thanks Steven. Do we really need to turn this into a formal brief?

Claire

From: HEAD Steven
Sent: Monday, 19 September 2016 12:10 PM
To: MCMAHON Anthony J; DINAN John P; GRANT Katie
Cc: THURSTON Claire F2; OATEN Martin
Subject: FW: Serious Recent Viaduct Spalling Incident

Thanks Anthony

Some relief there at least.

Katie could we turn this into a CE Brief that we can finalise at end of day once Tony gets further information. I would like this to get to ken today so we keep him in the loop from an RMS perspective.

Claire

Ken is already aware. He messaged martin and I this morning.

Regards
Steven

From: McMahon, Anthony [<mailto:Anthony.McMahon@transport.nsw.gov.au>]
Sent: Monday, 19 September 2016 11:52 AM
To: HEAD Steven; DINAN John P
Subject: RE: Serious Recent Viaduct Spalling Incident

Steven,

Please consider the attached.

Regards

Anthony McMahon
Integration Manager
Roads and Maritime Services
Sydney Metro Project
Transport for NSW

M 0400 619329
Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

From: HEAD Steven [<mailto:Steven.HEAD@rms.nsw.gov.au>]
Sent: Monday, 19 September 2016 11:34 AM
To: DINAN John P; McMahon, Anthony
Subject: RE: Serious Recent Viaduct Spalling Incident

Anthony

Just an email update will be enough. Ill try and call you a bit later to do in person as well

Regards
Steven

From: DINAN John P
Sent: Monday, 19 September 2016 11:22 AM
To: McMahon, Anthony; HEAD Steven
Subject: RE: Serious Recent Viaduct Spalling Incident

Anthony – is the cross section of the units the same for White Hart Lane as for the failed section?

John

From: McMahon, Anthony [<mailto:Anthony.McMahon@transport.nsw.gov.au>]
Sent: Monday, 19 September 2016 11:08 AM
To: HEAD Steven; DINAN John P
Subject: RE: Serious Recent Viaduct Spalling Incident

Gents,

To be honest it may be easier to explain the current situation in person as a brief will be complicated. TfNSW have so far provided verbal assurance that the White Hart Drive works pose no risk to the public but will be meeting soon with their contractors designers to obtain technical assurance that no risks exist, they do not expect to have a response for RMS until late this afternoon, I would prefer something sooner, Steven could you speak to Tom G to have this action prioritised?

Regards

Anthony McMahon
Integration Manager
Roads and Maritime Services
Sydney Metro Project
Transport for NSW

M 0400 619329
Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

From: HEAD Steven [<mailto:Steven.HEAD@rms.nsw.gov.au>]
Sent: Monday, 19 September 2016 10:57 AM
To: McMahon, Anthony; DINAN John P
Subject: RE: Serious Recent Viaduct Spalling Incident

Hi Anthony

Thanks.

I sent you a text a little earlier about these.

We need to get an update for Ken on where this is all at and preferably today. I agree with your comments on White Hart Drive and are what are our views on further installations over roads at this point.

Regards
Steven

From: McMahon, Anthony [<mailto:Anthony.McMahon@transport.nsw.gov.au>]
Sent: Monday, 19 September 2016 10:50 AM
To: DINAN John P; HEAD Steven
Subject: Serious Recent Viaduct Spalling Incident

Gents,

If you are not already aware there has been another spalling incident on the Sydney Metro viaduct. The incident has not occurred over or adjacent to any RMS managed assets. The scale of the incident is very substantial with an entire viaduct span at risk. I have just met with the TfNSW SVC project team and requested that they confirm ASAP that their works over White Hart Drive are safe (They have a gantry over the road with segments in place that are partially stressed). I have asked the TfNSW SVC project team to confirm if it will be necessary to close White Hart Drive to traffic.

Please call to discuss.

Regards

Anthony McMahon
Integration Manager
Roads and Maritime Services
Sydney Metro Project
Transport for NSW

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Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

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CAMPBELL Clarinda

From: McMahon, Anthony
Sent: Friday, 8 July 2016 11:57 AM
To: HEAD Steven
Subject: Sydney Metro Viaduct Update

Steven,

Please be aware of the following:-

L P P P

Regards

Anthony McMahon
Integration Manager
Roads and Maritime Services
Sydney Metro Project
Transport for NSW

M 0400 619329
Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

CAMPBELL Clarinda

From: McMahon, Anthony
Sent: Monday, 19 September 2016 5:07 PM
To: HEAD Steven; 'DINAN John P'
Subject: Sydney Metro Viaduct Serious Structural Failure

Gents,

Current update for the viaduct issue.

Substantial Structural Failure of Viaduct

RMS was informed this morning that on Sunday 18/9/16 a new viaduct span to the South of (But not over) Windsor Road had experienced substantial structural failure during one of the post-stressing stages which are conducted after all the viaduct segments have been installed. The event is of such an extent as to place the entire span at risk of failure.

Immediate RMS Concerns

Although the section of viaduct that has failed is not over or adjacent to any RMS managed assets there are other viaduct installation works that are only partially complete ongoing over White Hart Drive. These works are at the stage where all the viaduct segments have been installed but the post-stressing operation is only partially complete. RMS has sought urgent assurance from TfNSW that these works pose no risk to the public or any RMS managed asset. RMS has so far obtained verbal assurance that the works over White Hart Drive have a different construction methodology to those that have recently failed and in fact the gantry over White Hart Drive is of a type that sits in an 'underslung' position beneath the viaduct segments supporting them until their stressing is complete. This gantry is currently in this position and should not be moved until TfNSW are satisfied it is safe and appropriate to do so.

RMS has requested that TfNSW confirm if it is necessary that White Hart Drive be closed to public access and are awaiting this confirmation.

The TfNSW site management team have now met with their main contractors designers (SMEC) of the viaduct structure and have verbally informed RMS that they are not aware of any immediate risk to the public posed by the current works over White Hart Drive. TfNSW have instructed SMEC to double check that all quality information for those works is correct and report back to TfNSW.

TfNSW have also discontinued plans to proceed with further viaduct works in the short term.

Regards

Anthony McMahon
Integration Manager
Roads and Maritime Services
Sydney Metro Project
Transport for NSW

M 0400 619329
Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

CAMPBELL Clarinda

From: McMahon, Anthony
Sent: Friday, 27 November 2015 3:03 PM
To: steven.head@rms.nsw.gov.au
Subject: Sydney Metro Current Issue

This message has been archived. [View the original item](#)

Steve,

Regarding our recent conversation, one issue that will be raised by the Sydney Metro Program Manager Rodd Staples tomorrow concerns the following.

ISJV – the main contractor for the construction and installation of the viaduct, suspended all further pre-cast segment installation works until further notice. This decision was made following substantial pressure from TfNSW who have great concerns regarding cracking and de-lamination of concrete from segments that have already been installed and partly as a consequence of RMS writing to TfNSW almost 3 months ago seeking re-assurance that these issues would not place any RMS assets or asset users at risk. The works were suspended yesterday as ISJV were about to commence installation of viaduct units over the T-Way adjacent to Memorial Avenue and soon the installation of single span bridge units over Windsor Road.

If TfNSW and ISJV don't reach a resolution for these issues very soon the critical path for the entire project is at risk.

Please call if you need to know any more.

Other main issues: -

- P.S. Resolution of potential congestion issues from day of opening directly attributable to the project is still the main issue for RMS on this project.
- Plus the sanctity of RMS WADs is critical!

T.

CAMPBELL Clarinda

From: McMahon, Anthony
Sent: Monday, 5 September 2016 2:37 PM
To: 'GRANT Katie'; HEAD Steven
Subject: Revised Sydney Metro Viaduct Exec Brief
Attachments: CE16_1077 - Sydney Metro Viaduct Construction Approval Monday Rev.docx

Steven, Katie;

Please consider the attached revised Exec Brief.

Regards

Anthony McMahon
[Integration Manager](#)
Roads and Maritime Services
Sydney Metro Project
Transport for NSW

M 0400 619329

Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

Sydney Metro Northwest Viaduct Construction Issues

From: A/Chief Operating Officer

Topic: Roads and Maritime Services' response to Sydney Metro's request to continue constructing an elevated viaduct over White Hart Drive, Rouse Hill.

Analysis: Roads and Maritime could continue to withhold approval for construction of the viaduct over publicly accessible areas of the site until Sydney Metro addresses concerns about the work. These concerns include public safety and the viaduct's structural integrity, as well as a lack of independent certification, and non-compliance with conditions of the Works Authorisation Deed (WAD).

It is recommended that Roads and Maritime considers the commitments made by the TfNSW Sydney Metro management in the assurance letter they have recently issued before making a decision regarding construction approval. This will provide the opportunity for RMS to identify and consider instances of WAD non-compliance and the public safety risk, and if necessary invite the project team to provide further technical assurance so that Roads and Maritime can issue approval.

Sydney Metro has indicated that they will escalate the matter if approval is not forthcoming given key project delivery risks they face.

Key issues

Roads and Maritime and the independent certifier have concerns about public safety and quality assurance

Sydney Metro wishes to continue constructing an elevated viaduct across White Hart Drive and has applied for consent from Roads and Maritime through the WAD mechanism.

On a prior road crossing of Memorial Avenue, Transport for NSW was able to provide adequate assurance that it had matters in hand and that the safety of road users and assets was protected. However, a subsequent incident of spalling has raised fresh concerns. In addition, there has been no progress certification from an independent certifier for any of the works completed within the past two years and many records exist that identify issues with WAD quality compliance.

Roads and Maritime has previously approved continuation of construction over areas of the site that are not publicly accessible. When Transport for NSW last requested approval to proceed, Roads and Maritime asked that Sydney Metro endorse its contractor's plans to construct over live roads, and provide assurance that Roads and Maritime's concerns have been addressed before submitting any further applications to start works over live roads.

Roads and Maritime assessed the current application and accompanying documents (**Attachment A**), and advised that it cannot provide approval for Sydney Metro to start construction due to concerns about compliance with WAD conditions. Roads and Maritime's primary concerns relate to construction, including quality assurance, which in turn raise issues of structural reliability and public safety. Roads and Maritime's project representative considers Sydney Metro has not yet provided adequate assurance that the project meets WAD requirements. The independent certifier has raised similar concerns (**Attachment B**).

Roads and Maritime also considers that the Prescribed Quality Management Plan, required under the WAD, needs to be updated to incorporate the augmented safeguards and controls (outlined in the letter at **Attachment C**) and the independent certifier should ideally

LPP

CAMPBELL Clarinda

From: HEAD Steven
Sent: Wednesday, 31 August 2016 2:44 PM
To: GRANT Katie; MCMAHON Anthony J; BOCK Sally E; LITHGOW Christine
Subject: Sydney Metro Viaduct Construction Approval-clean version.docx
Attachments: Sydney Metro Viaduct Construction Approval-clean version.docx

Follow Up Flag: Follow up
Flag Status: Flagged

Katie

Made a couple of changes to the Brief and there is a further attachment to go with it which I will send through shortly. I am happy for this to go to Claire

Regards
Steven

Sydney Metro Northwest Viaduct Construction Issues

From: Chief Operating Officer

Topic: Roads and Maritime Services' response to Sydney Metro's request to continue constructing an elevated viaduct over White Hart Drive, Rouse Hill.

Analysis: Roads and Maritime should continue to withhold approval for construction of the viaduct over publicly accessible areas of the site until Sydney Metro addresses concerns about the work. These concerns include public safety and the viaduct's structural integrity, as well as a lack of independent certification, and non-compliance with conditions of the Works Authorisation Deed (WAD).

It is recommended that Roads and Maritime continues discussions with Transport for NSW and the Sydney Metro project team before issuing any formal refusal. This will provide the opportunity to identify instances of non-compliance, discuss the public safety risk, and invite the project team to provide further technical assurance (preferably in the form of independent certification) so that Roads and Maritime can issue approval.

Sydney Metro has indicated that they will escalate the matter if approval is not forthcoming given key project delivery risks they face.

Key issues

Roads and Maritime and the independent certifier have concerns about public safety and quality assurance

Sydney Metro wishes to continue constructing an elevated viaduct across White Hart Drive and has applied for consent from Roads and Maritime through the SVC WAD mechanism.

On a prior road crossing of Memorial Avenue, Transport for NSW was able to provide adequate assurance that it had matters in hand and was satisfied the safety of road users and assets was protected. However, a subsequent incident of spalling has raised fresh concerns. In addition, there has been no progress certification from an independent certifier for any of the works completed within the past two years.

Roads and Maritime has previously approved continuation of construction over areas of the site that are not publicly accessible. When Transport for NSW last requested approval to proceed, Roads and Maritime asked that Sydney Metro endorse its contractor's plans to construct over live roads, and provide assurance that Roads and Maritime's concerns have been addressed before submitting any further applications to start works over live roads.

Roads and Maritime assessed the current application and accompanying documents (**Attachment A**), and has advised that it cannot provide approval for Sydney Metro to start construction due to concerns about compliance with WAD conditions. Roads and Maritime's primary concerns at this point relate to the construction and quality assurance of the construction, which in turn raise issues of structural reliability and public safety. Roads and Maritime's project representative considers Sydney Metro has not yet provided adequate assurance that the project meets SVC WAD requirements. The independent certifier has raised similar concerns (**Attachment B**).

Roads and Maritime also considers that that the Prescribed Quality Management Plan, required under the SVC WAD, needs to be updated to incorporate the augmented safeguards and controls (outlined in the letter at **Attachment C**) and the independent certifier

LPP

LPP

CAMPBELL Clarinda

From: McMahon, Anthony
Sent: Monday, 29 August 2016 11:35 AM
To: HEAD Steven
Cc: 'DINAN John P'
Subject: Sydney Metro Viaduct Assurance Letter
Attachments: 20160826_Roads and Maritime Services_Rev 2_Tracked Changes.docx

Steven,

Ahead of our teleconference please find attached the current Sydney Metro Assurance statement.

Regards

Anthony McMahon
[Integration Manager](#)
Roads and Maritime Services
Sydney Metro Project
Transport for NSW

M 0400 619329
Pod - D, Level 1, 99 Phillip Street, Parramatta, NSW 2150

Out of Scope