



Artwork K – Structural Design Report

Southbank Major Public Art Commission

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Report Amendment Register

Issue Ref	Amended Section(s)	Issue/Amendment Details	Author(s)	Reviewer	Date
A	-	Preliminary	Bridget Scanlan	James Hrysikos	31 March 2025



Bridget Scanlan
Senior Engineer



James Hrysikos
Principal



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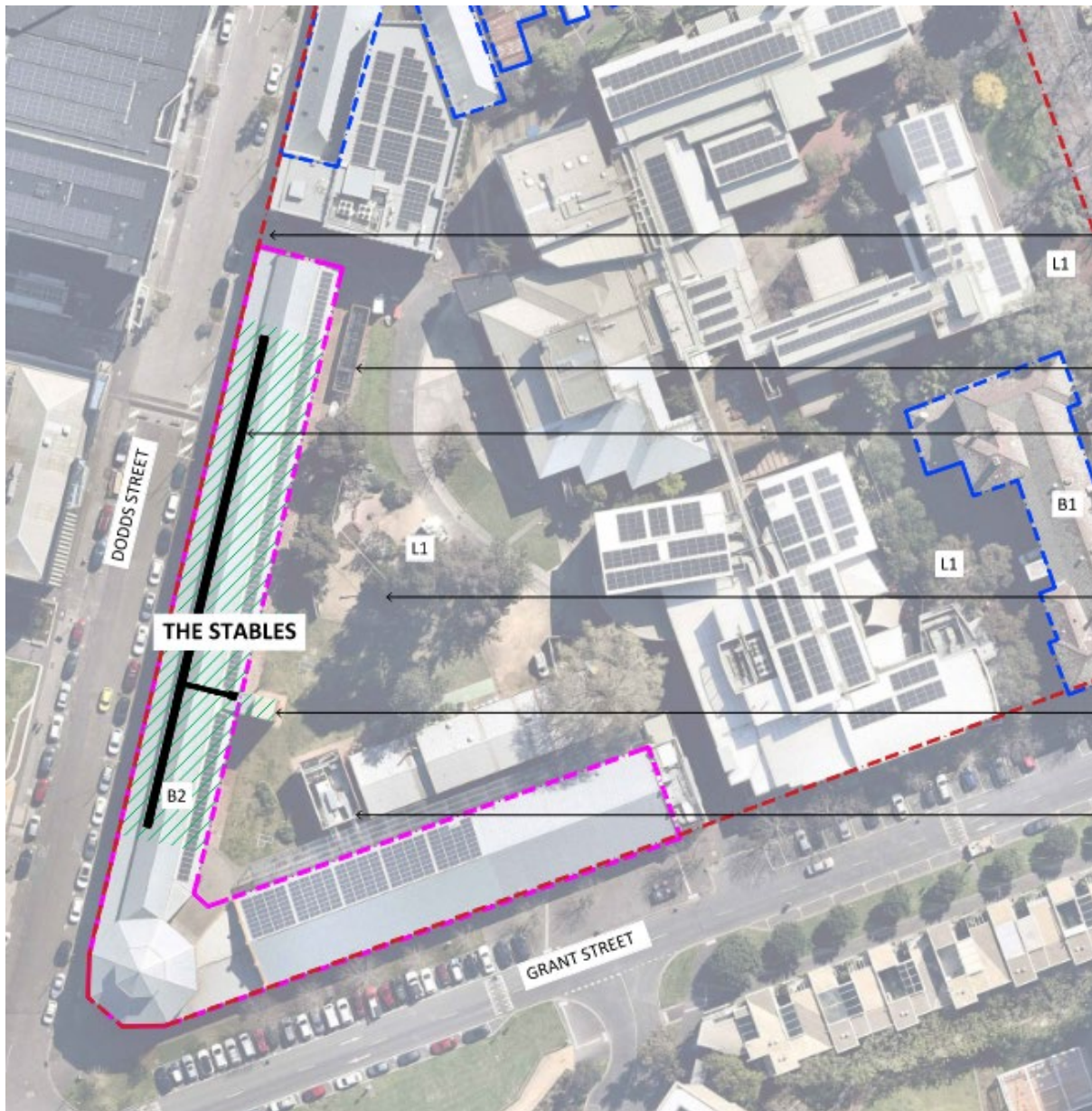
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1. Introduction

As part of the South Melbourne Major Public Art Commission project, Artwork K proposes to install a large-scale neon artwork on the roof of the existing VCA police stables building at 56 Dodds St, Southbank. Site context for the artwork is indicated below in Figure 1.

Figure 1: VCA Police Stables Site Context



Robert Bird Group (RBG) has been engaged by City of Melbourne to provide structural advice regarding the steel frame structure directly supporting the artwork, associated maintenance access stairs, and the existing stables structure. Previously, RBG was engaged as the structural engineer for the Police Stables Refurbishment project that was completed in 2018.

The proposed artwork is to be supported by a steel frame, which is to connect to the existing steel rafters (installed in the refurbishment). The remainder of the stables building primarily consists of original timber framing, with a small precast concrete lift extension and associated steel frame “bridge” also added in the refurbishment.

2. Design Loads

RBG has assessed the artwork frame and existing stables roof structure based on the following wind loading parameters according to AS1170.2:

Design life:	25 years
Importance Level:	2 (in-line with the stables refurbishment)
Annual probability of exceedance:	1/250
Region:	A5
Terrain Category:	3

Artwork “background” has a permeability assumed to be 90%

The artwork wind loads were calculated as for a rectangular hoarding, with loads applied to the face area of the sign. Loads on the stables roof structure were calculated as for an impermeable enclosed building.

Full wind load calculations are shown in Appendix A.

The rafters and artwork frame have been assessed for vertical “live” and “dead” loads according to the following assumptions:

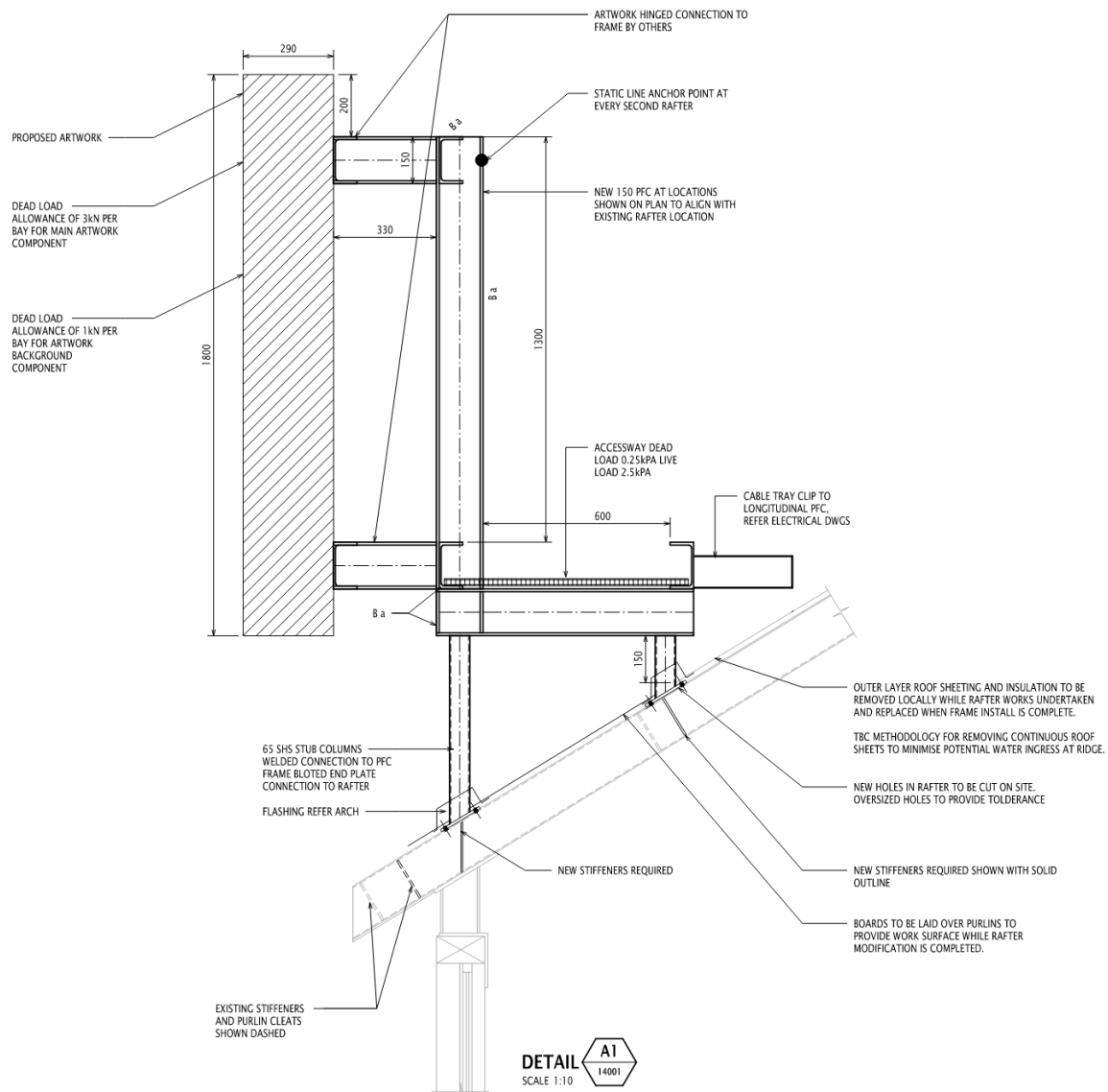
- Artwork weight of 3kN per bay, as advised by artist
- Access walkway dead load of 0.25kPa
- Access walkway live load of 2.5kPa
- Roof dead loads of 0.6kPa

3. Artwork Support Frame

The proposed artwork support frame consists of PFC beams spanning between L-shaped PFC cantilever frames, which connect to the existing steel rafters via SHS stub columns. The artwork is to connect to the supporting beams via a hinged connection (by others) to allow the artwork components to be turned around for maintenance access from the walkway located on the back of the frame. Electrical services will also be reticulated along the access walkway. This arrangement is shown in section in Figure 2.

The artwork is to be accessed via a proprietary access stair which climbs from a hatch in the recently constructed lift extension, over the roof pitch, and then down to the artwork walkway. Support points for the access stair and associated static line anchors have been considered in our structural assessment.

Figure 2: Artwork Support Frame Section View



Within the central part of the artwork, cantilever frames are located at each existing rafter location, whereas in the lighter “background” sections, frames are located at every second rafter. This structural concept has been developed to minimise points where the artwork frame punctures the stables roof sheeting. At the stub column locations, square hollow sections are adopted as they are practical from a waterproofing perspective.

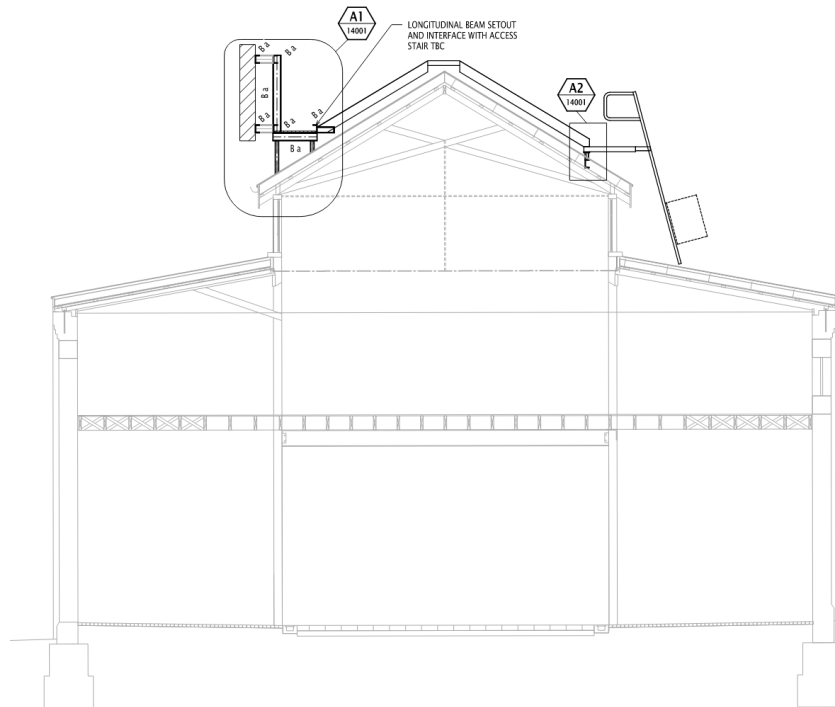
Longitudinal stability of the frame is intended to be achieved by fabricating four bays in the main artwork section as portal frame modules, thereby avoiding the visual impact of cross-bracing.

RBG has produced a preliminary SpaceGass model to verify that the structural system outlined above is capable of resisting the loads set out in Section 2, which is included in Appendix B.

4. Existing Structure

The existing VCA Police Stables building primarily consists of timber frame construction, with some localised steel and concrete modifications such as the lift core, added in the 2018 refurbishment. As a key part of this refurbishment, the roof of the stables was strengthened by placing new steel rafters and purlins over the existing timber truss roof, sandwiched between two layers of corrugated metal roof sheet. An indicative section view of the existing structure is shown in Figure 3.

Figure 3: Section View of Existing Structure & Access Stair



All connections to the existing structure proposed as part of this artwork commission interface with recently installed steel members. This proposal does not include modifications or connections to the earlier timber structure. Connections to the existing roof structure include:

- Puncturing the outer layer of roof sheet and bolting the artwork support frames to the top flange of existing steel rafters,
- Web stiffeners are to be welded to the rafters to distribute localised forces, and
- Addition of new trimming beams in the same plane as the existing rafters to support the access stair and hatch.

In performing capacity checks for the existing structure, we have made the following assumptions:

- Existing structure is according to the RBG drawings (job number 15039) included in Appendix C, with no major structural dilapidation occurring since the refurbishment.
- Prior to fabrication of artwork support frames, the existing structure is to be surveyed to ensure that the fabricated steel members fit accurately to any small variations existing structure.
- Existing timber columns have a capacity equivalent to F8 structural grade timber

Existing rafters and columns have been assessed for additional wind and gravity loads imposed by the proposed artwork, as demonstrated by the calculations in Appendixes A, B, and D. RBG has not conducted comprehensive checks of the existing structure under its current load state, as the global compliance of the stables structure was assessed in the recent refurbishment project.

5. Construction & Decommissioning Methodology

As the project currently stands, the anticipated construction methodology includes the following:

- Establishment of site, likely to include a mobile crane and boom
- Install each frame module:
 - Localised removal of outer roof sheets and insulation at rafter connection points
 - From the boom, install temporary fall protection which may consist of a handrail and/or temporary anchor points
 - From the boom, place ply over exposed purlins with localised cutouts at rafter connection points
 - Weld web stiffeners and cut bolt holes in rafters
 - Remove ply and replace roof sheets and insulation
 - Install cantilever support frames and waterproofing
 - Connect to other frame modules
- At new trimmer beam locations:
 - Install fall protection, potentially consisting of a scaffold next to the lift extension
 - Localised removal of outer roof sheets and insulation
 - Weld new fin plates to existing roof beams
 - Install new beams
 - Relocate roof cross bracing as required to fit between new trimmers
 - Replace roof sheets and insulation
 - Install access stair via mobile crane
- Install access stair
- Install artwork elements

The above methodology is preliminary and subject to further detailed development as the project progresses. The final installation methodology is to be determined by the contractor.

At the end of the artwork's design life, the artwork and frame elements are to be removed by:

- Un-bolting artwork frame elements and making-good the roof sheets
- Un-bolting the access stair
- To remove the stub supporting the access stair:
 - Locally remove roof sheeting

- Cut off the stub column
- Replace roof sheeting

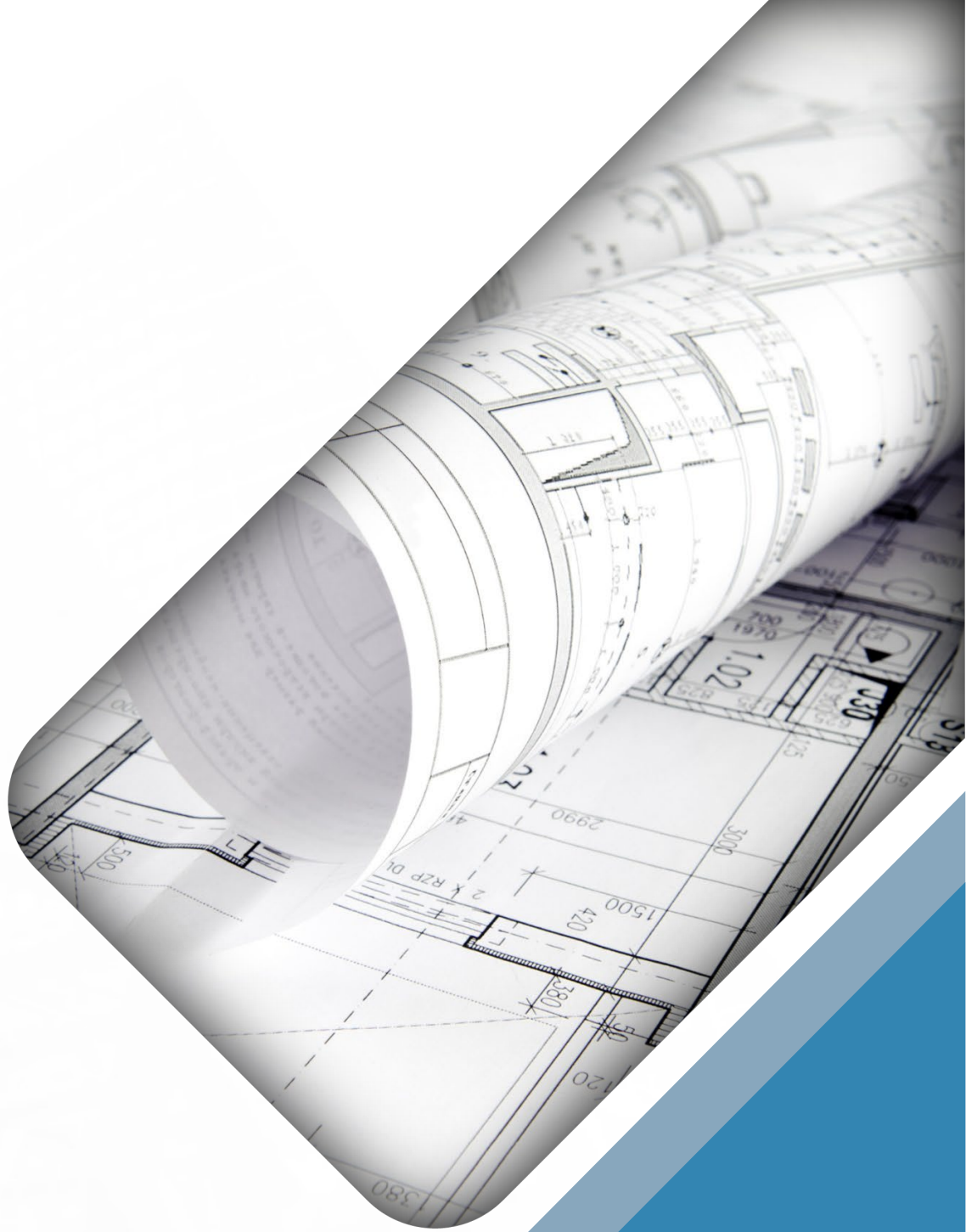
6. Stakeholder Queries

Further to the above project description, stakeholder queries to date are summarised below with RBG responses:

Query	RBG Comment
Confirm that new holes in rafters for baseplate fixing have no structural impact,	Confirming the existing rafters are adequate when accounting for the new holes to be added
Confirm if holes in rafters need any treatment in the reinstatement / removal phase	The holes do not require rectification upon removal of the artwork
Confirm method for removing welded stub column to access stair at end of license agreement / reinstatement.	Removal methodologies are outlined in section 5
Would CHS columns be more appropriate for waterproofing?	The existing rafters are 125PFC sections which have a 65mm wide flange. We use a square section because a 65SHS provides more structural capacity than a similar thickness 60CHS within the limited width available. We believe a properly fitted square flashing (by others) is adequate.

7. Conclusion

RBG has performed design calculations according to the parameters outline in this report, and we confirm that the existing rafter structure is adequate for the support of the artwork and does not require additional strengthening beyond local stiffeners and new members as noted on RBG drawings. Where undertaken, modifications to the existing structure do not jeopardise the integrity of the existing structure.



Appendix A

Wind Load Calculations

Southbank Major Public Art Commission

ROBERT BIRD GROUP

Page title: **ARTWORK K - STRUCTURAL CALCULATIONS**DESIGN **B.Scanlan**

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JOB No. 22245

DATE 28.03.2025

1. WIND LOADS

Importance Level: 2
 Design Life: 25 years
 V_{250} : 43 m/s

Direction	Md	TC	Mzcat	Ms	Mt	Vsit
NW	0.95	3	0.83	1	1	33.9
SE	0.8	2.5	0.915	1	1	31.5

Loads on main section of artwork:

Consider as a rectangular hoarding

height, c: 1.9 m

width, b: 1.5 m

elevation, h: 10 m

b/c 0.78947

c/h 0.19

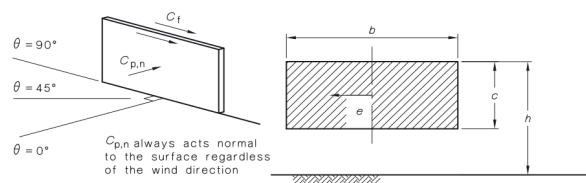


FIGURE D1 FREESTANDING HOARDINGS AND WALLS

For wind perpendicular or at 45 degrees, $C_{p,n}$ is given by the same formula

TABLE D2(A)

NET PRESSURE COEFFICIENTS ($C_{p,n}$)—HOARDINGS AND FREESTANDING WALLS—WIND NORMAL TO HOARDING OR WALL, $\theta = 0^\circ$

b/c	c/h	$C_{p,n}$	e
0.5 to 5	0.2 to 1	$1.3 + 0.5(0.3 + \log_{10}(b/c))(0.8 - c/h)$	0
>5		$1.7 - 0.5 c/h$	0
all	<0.2	$1.4 + 0.3 \log_{10}(b/c)$	0

TABLE D2(B)

NET PRESSURE COEFFICIENTS ($C_{p,n}$)—HOARDINGS AND FREESTANDING WALLS—WIND AT 45° TO HOARDING OR WALL, $\theta = 45^\circ$

b/c	c/h	$C_{p,n}$	e
0.5 to 5 inclusive	0.2 to 1	$1.3 + 0.5(0.3 + \log_{10}(b/c))(0.8 - c/h)$	0.2b
	<0.2	$1.4 + 0.3 \log_{10}(b/c)$	0.2b

TABLE D2(C)

NET PRESSURE COEFFICIENTS ($C_{p,n}$)—HOARDINGS AND FREESTANDING WALLS—WIND AT 45° TO HOARDING OR WALL, $\theta = 45^\circ$

b/c	c/h	Distance from windward free end	$C_{p,n}$ (see Note)
>5	≤0.7	0 to 2c	3.0
		2c to 4c	1.5
		>4c	0.75
	>0.7	0 to 2h	2.4
		2h to 4h	1.2
		>4h	0.6

NOTE: Where a return wall or hoarding forms a corner extending more than 1c, the $C_{p,n}$ on 0 to 2c for a hoarding shall be 2.2, and 0 to 2h for a wall $C_{p,n}$ shall be 1.8.

 $C_{p,n}$: 1.3692

Wind pressure, p: 0.9441 kPa

Face area of artwork components is approximately 2.4 m²

Wind reaction per artwork component is 2.3 kN

Considering 7 artwork components spread over 6 rafters, allow for one rafter to take 1.2 * component reaction

Design load: 2.71901 --> round up to 3kN

Loads on background section of artwork:

Solidity: 10 % porosity factor: 0.190

height, c: 1.9 m

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width, b: 87 m
elevation, h: 10 m

b/c 45.7895
c/h 0.19

TABLE D2(A)
NET PRESSURE COEFFICIENTS ($C_{p,n}$)—HOARDINGS AND FREESTANDING WALLS—WIND NORMAL TO HOARDING OR WALL, $\theta = 0^\circ$

b/c	c/h	$C_{p,n}$	e
0.5 to 5	0.2 to 1	$1.3 + 0.5(0.3 + \log_{10}(b/c))(0.8 - c/h)$	0
>5		$1.7 - 0.5 c/h$	0
all	<0.2	$1.4 + 0.3\log_{10}(b/c)$	0

TABLE D2(B)
NET PRESSURE COEFFICIENTS ($C_{p,n}$)—HOARDINGS AND FREESTANDING WALLS—WIND AT 45° TO HOARDING OR WALL, $\theta = 45^\circ$

b/c	c/h	$C_{p,n}$	e
0.5 to 5	0.2 to 1	$1.3 + 0.5(0.3 + \log_{10}(b/c))(0.8 - c/h)$	0.2b
inclusive	<0.2	$1.4 + 0.3\log_{10}(b/c)$	0.2b

TABLE D2(C)
NET PRESSURE COEFFICIENTS ($C_{p,n}$)—HOARDINGS AND FREESTANDING WALLS—WIND AT 45° TO HOARDING OR WALL, $\theta = 45^\circ$

b/c	c/h	Distance from windward free end	$C_{p,n}$ (see Note)
>5	≤0.7	0 to 2c	3.0
		2c to 4c	1.5
		>4c	0.75
	>0.7	0 to 2h	2.4
		2h to 4h	1.2
		>4h	0.6

NOTE: Where a return wall or hoarding forms a corner extending more than 1c, the $C_{p,n}$ on 0 to 2c for a hoarding shall be 2.2, and 0 to 2h for a wall $C_{p,n}$ shall be 1.8.

Wind case:	Cpn	p (kPa)	Bay width	main artwork area (m2)	background area (m2)	F (kN per rafter)
Perpendicular:	1.89823	0.25	3.7	2.4	5	1.15
45 degrees, near ends:	3	0.39	7.4	0	14	5.53
45 degrees, middle:	0.75	0.10	3.7	2.4	5	0.45

Therefore, worst case at main artwork section = 3.87 kN per rafter
worst case at background component = 5.53 kN per rafter

Wind Loads parallel to artwork frame:

height, c: 1.9 m
width, b: 87 m
Cf: 0.04 (background friction)
Cp: 1.4 (prelim assumption for edges of main components, based on above calculation)
length of main section: 20 m
Cp average: 0.35264
lateral pressure: 0.24316
Total lateral load: 40.1938 kN
Therefore check moment frames for 10kN per frame

Roof Wind Loads:

Impermeable rectangular enclosed building
Cpi: -0.2 or 0
height, h: 10
depth, d: 15 or 6.3
roof pitch: 30 degrees

TABLE 5.3(B)
ROOFS—EXTERNAL PRESSURE COEFFICIENTS (C_{pe}) FOR RECTANGULAR ENCLOSED BUILDINGS—UPWIND SLOPE (U) $\alpha \geq 10^\circ$

Upwind slope, (U)	Ratio h/d (see Note)	External pressure coefficients (C_{pe})						
		Roof pitch (α) degrees (see Note)						
		10	15	20	25	30	35	≥ 45
$\alpha > 10^\circ$	≤ 0.25	-0.7, -0.3	-0.5, 0.0	-0.3, 0.2	-0.2, 0.3	-0.2, 0.4	0.0, 0.5	
	0.5	-0.9, -0.4	-0.7, -0.3	-0.4, 0.0	-0.3, 0.2	-0.2, 0.3	-0.2, 0.4	0.0, 0.8 sin α
	≥ 1.0	-1.3, -0.6	-1.0, -0.5	-0.7, -0.3	-0.5, 0.0	-0.3, 0.2	-0.2, 0.3	

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Page title: **ARTWORK K - STRUCTURAL CALCULATIONS**DESIGN **B.Scanlan**

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h/d: 0.66667 or 1.5873

b/d: 5.8

Upwind slope: -0.3 or 0.3

upwind pressure: -0.2069 0.20686

Downwind slope: -0.768

downwind pressure: -0.5296

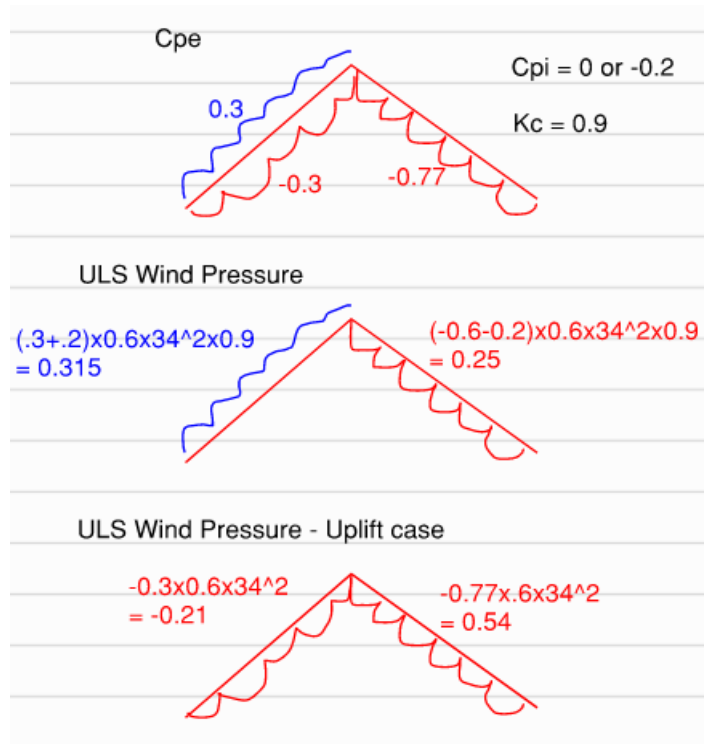
combination factor, Kc: 0.9

NOTE: For intermediate values of roof slopes and h/d ratios, linear interpolation shall be used. Interpolation shall only be carried out on values of the same sign.

TABLE 5.3(C)

ROOFS—EXTERNAL PRESSURE COEFFICIENTS (C_{pe}) FOR RECTANGULAR ENCLOSED BUILDINGS—DOWNWIND SLOPE (D), AND (R) FOR HIP ROOFS, FOR $\alpha \geq 10^\circ$

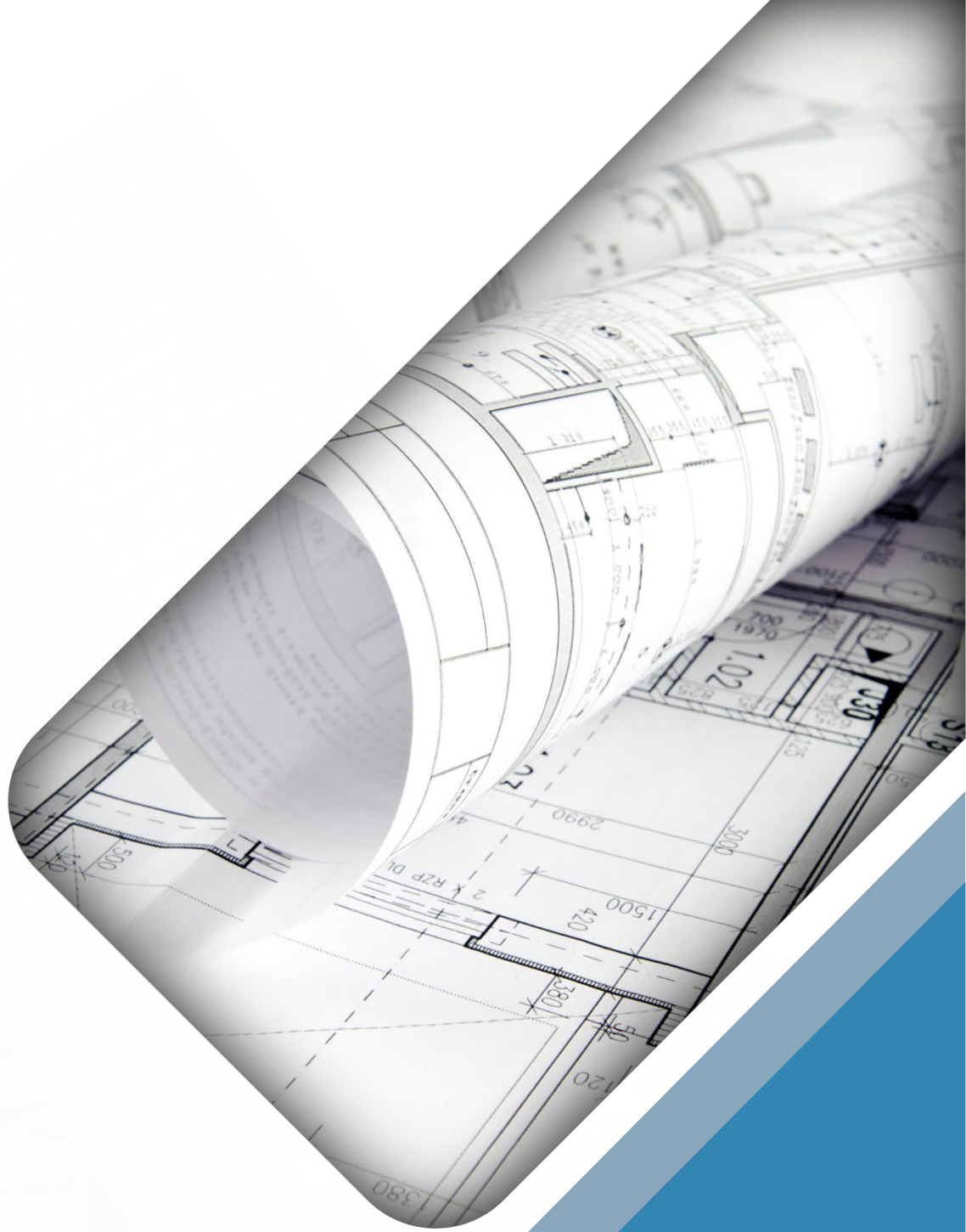
Roof type and slope		Ratio h/d (see Note)	External pressure coefficients (C_{pe})			
Crosswind slope for hip roofs (R)	Downwind slope (D)		Roof pitch (α), degrees (see Note)			
			10	15	20	≥ 25
		< 0.75	-0.3	-0.5	-0.6	For $h/d < 3$: -0.6
		0.5	-0.5	-0.5	-0.6	For $3 \leq h/d \leq 8$: $-0.6(1 + h/d)$
		≥ 1.0	-0.7	-0.6	-0.6	For $h/d > 8$: -0.9

NOTE: For intermediate values of roof slopes and h/d ratios, linear interpolation shall be used. Interpolation shall only be carried out on values of the same sign.

2. Existing Column Design Check

Existing column load:	52.6	kN	ULS
Additional Load:	31	kN	reaction from SpaceGass
	- 1.2*8.7	kN	existing dead load reaction
	20.56	kN	ULS
Total Column Design load:	73.16	kN	ULS
	14	kNm	ULS

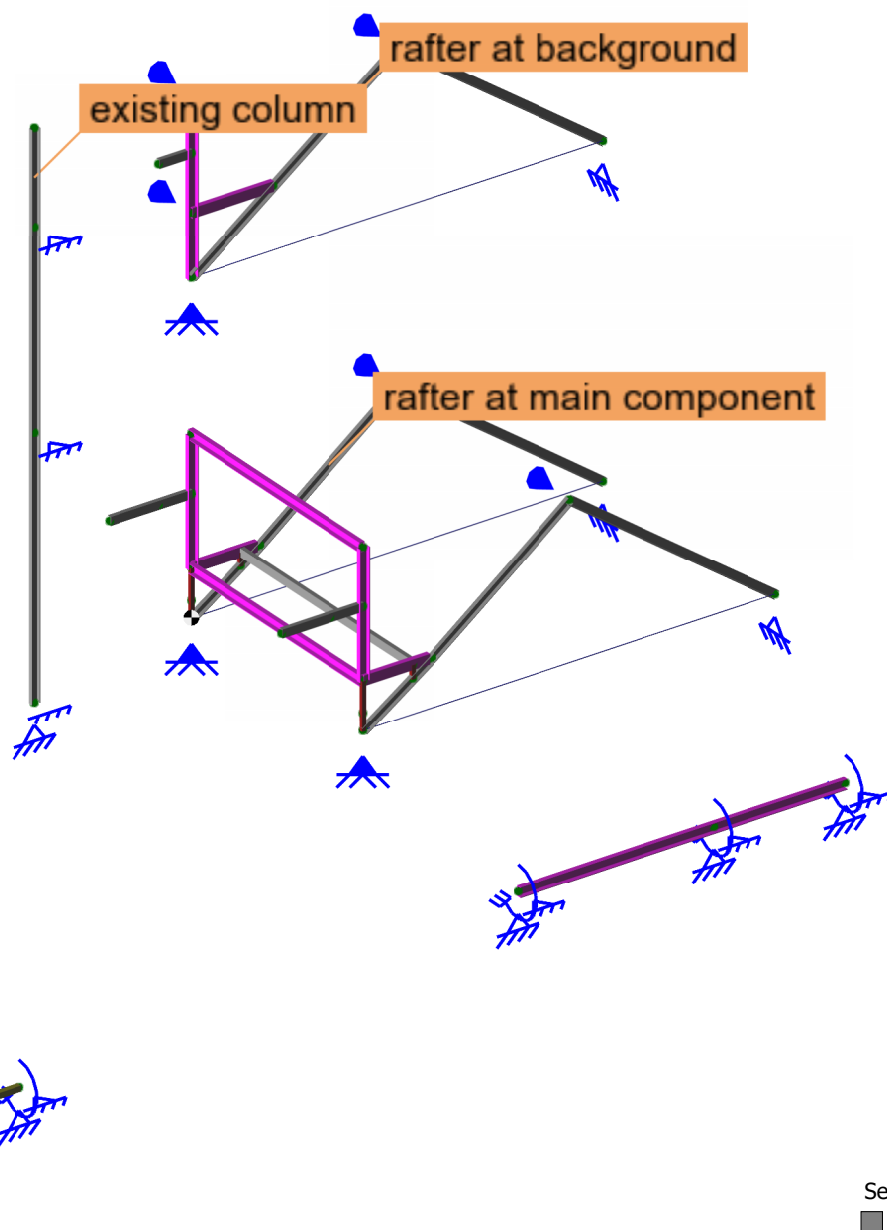
Refer STK check, existing column is ok.



Appendix B

SpaceGass Model

Southbank Major Public Art Commission



Viewpoint (-35,28)

Sections:

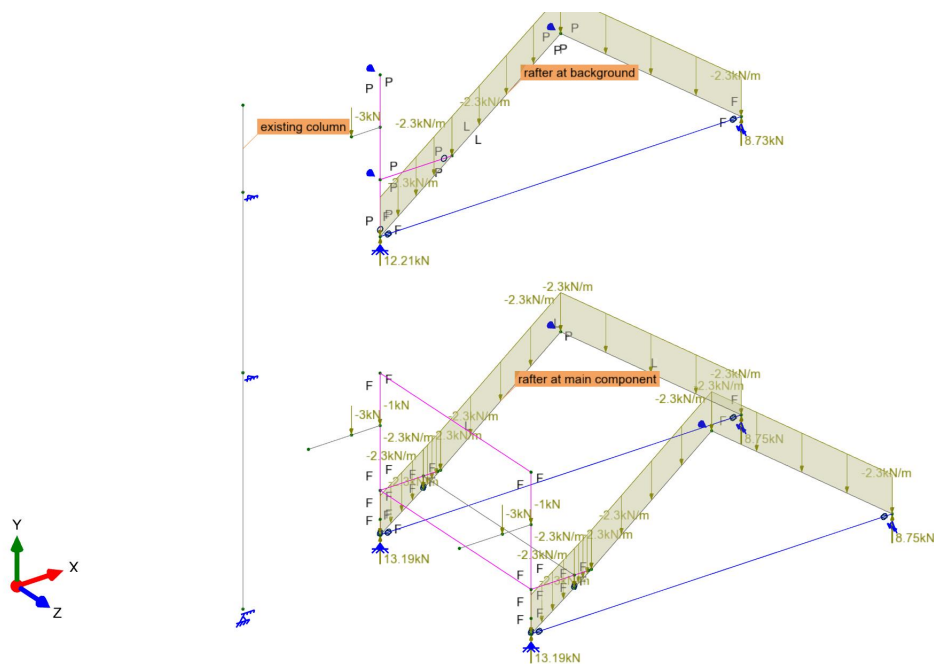
- 1 125 PFC
- 2 12.5 Round
- 3 150 PFC
- 4 65*4 SHS
- 5 89*5 SHS

Materials:

- 1 STEEL
- 5 89*5 SHS

Load case 1

■ Max



Sections:

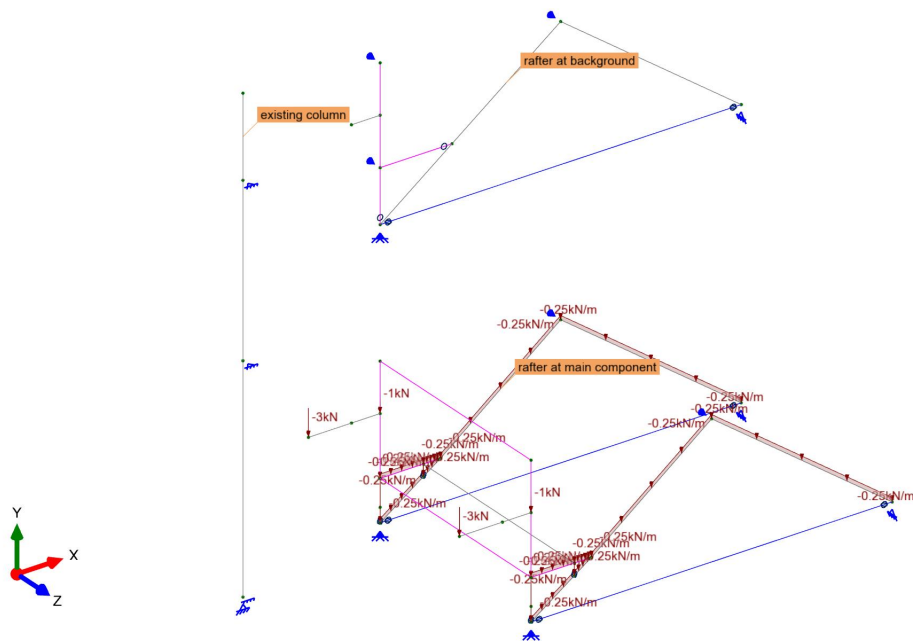
- 1 125 PFC
- 2 12.5 Round
- 3 150 PFC
- 4 65*4 SHS
- 5 89*5 SHS

Materials:

- 1 STEEL
- 5 89*5 SHS

Load case 10

■ Max



Sections:

- 1 125 PFC
- 2 12.5 Round
- 3 150 PFC
- 4 65*4 SHS
- 5 89*5 SHS

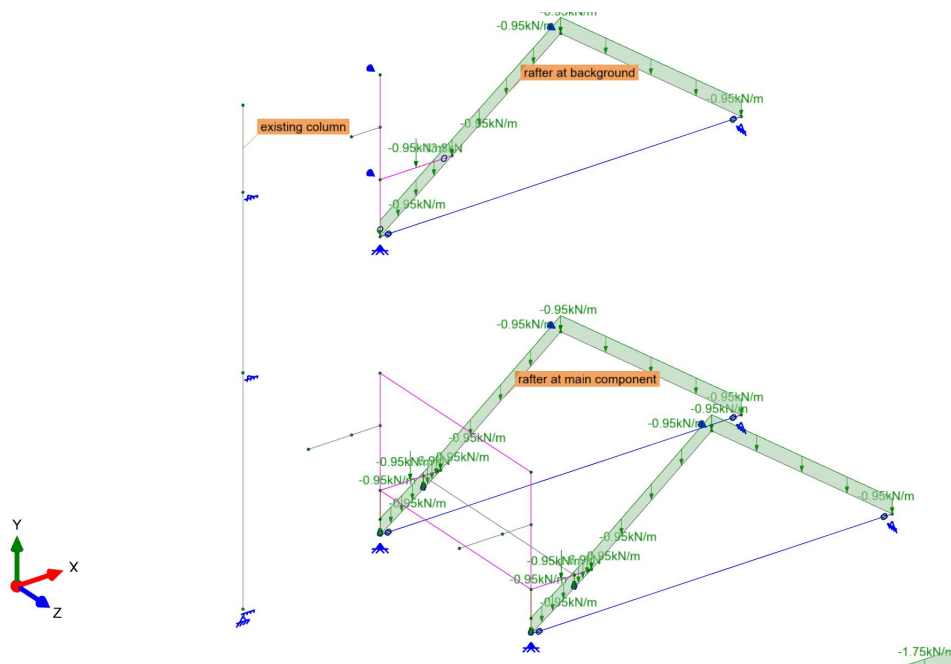
Materials:

- 1 STEEL
- 5 89*5 SHS

Viewpoint (-35,28), Loads

Load case 2

■ Max



Sections:

- 1 125 PFC
- 2 12.5 Round
- 3 150 PFC
- 4 65*4 SHS
- 5 89*5 SHS

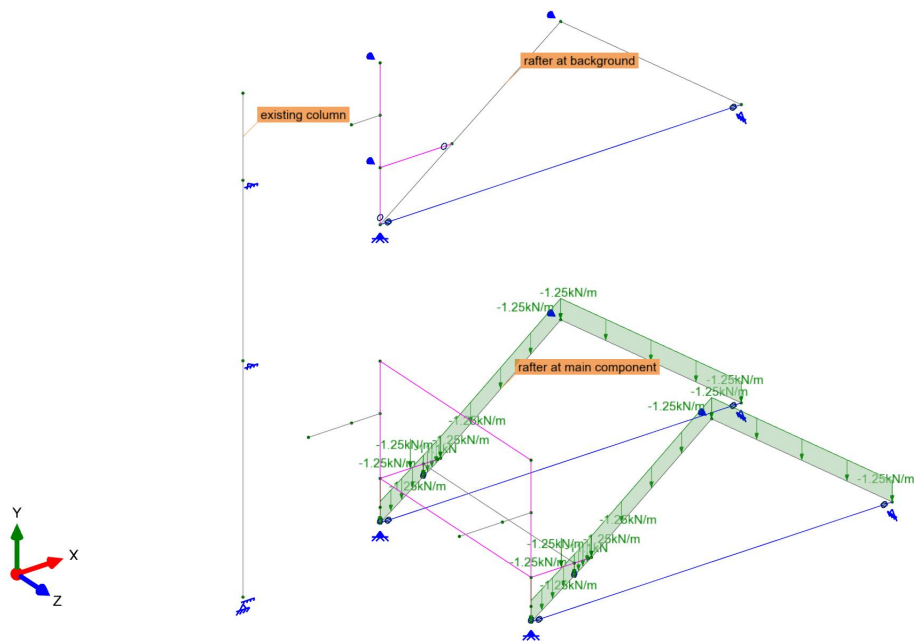
Materials:

- 1 STEEL
- 5 89*5 SHS

Viewpoint (-35,28), Loads

Load case 12

■ Max



Sections:

- 1 125 PFC
- 2 12.5 Round
- 3 150 PFC
- 4 65*4 SHS
- 5 89*5 SHS

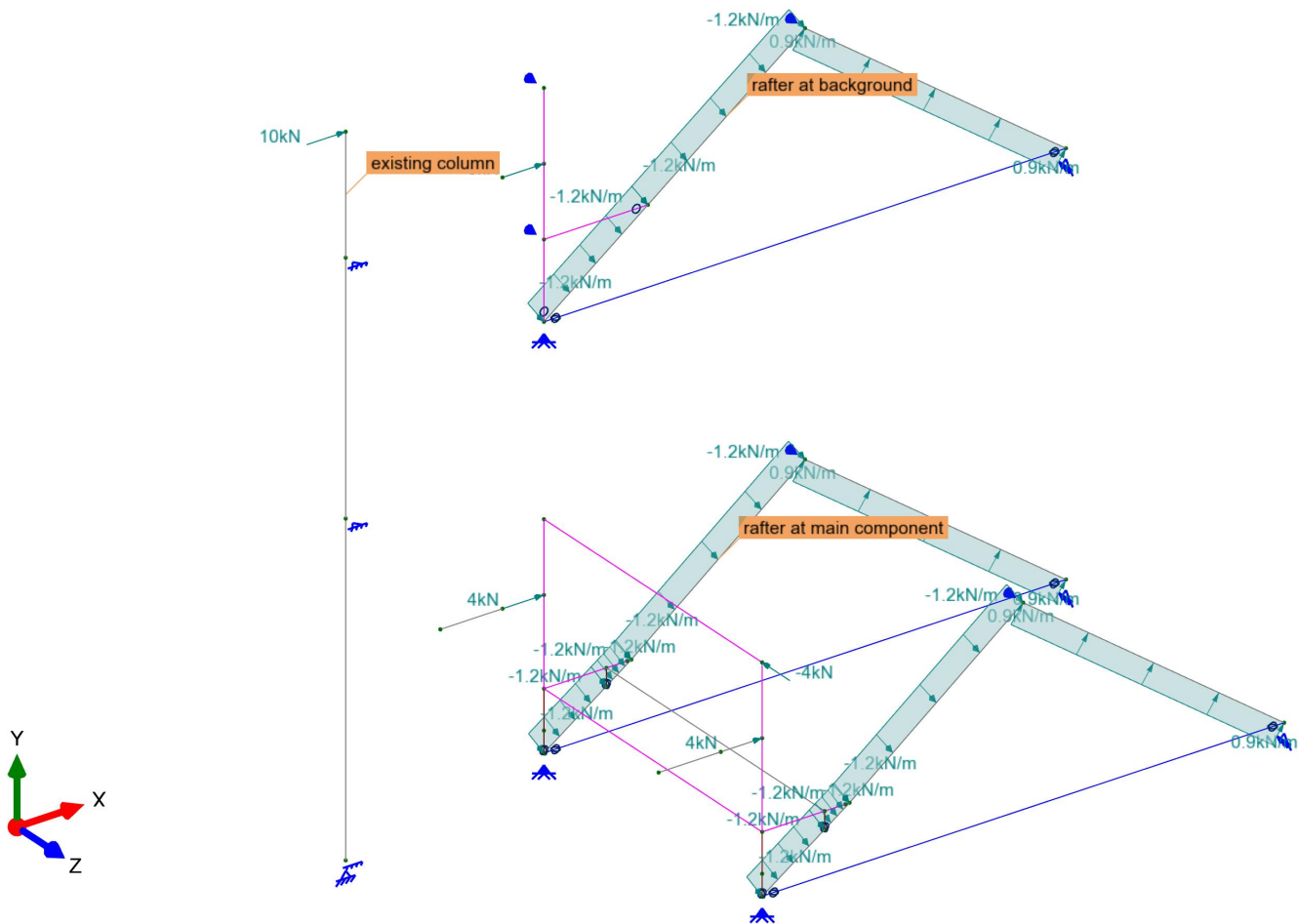
Materials:

- 1 STEEL
- 5 89*5 SHS

Viewpoint (-35,28), Loads



Load case 3
■ Max



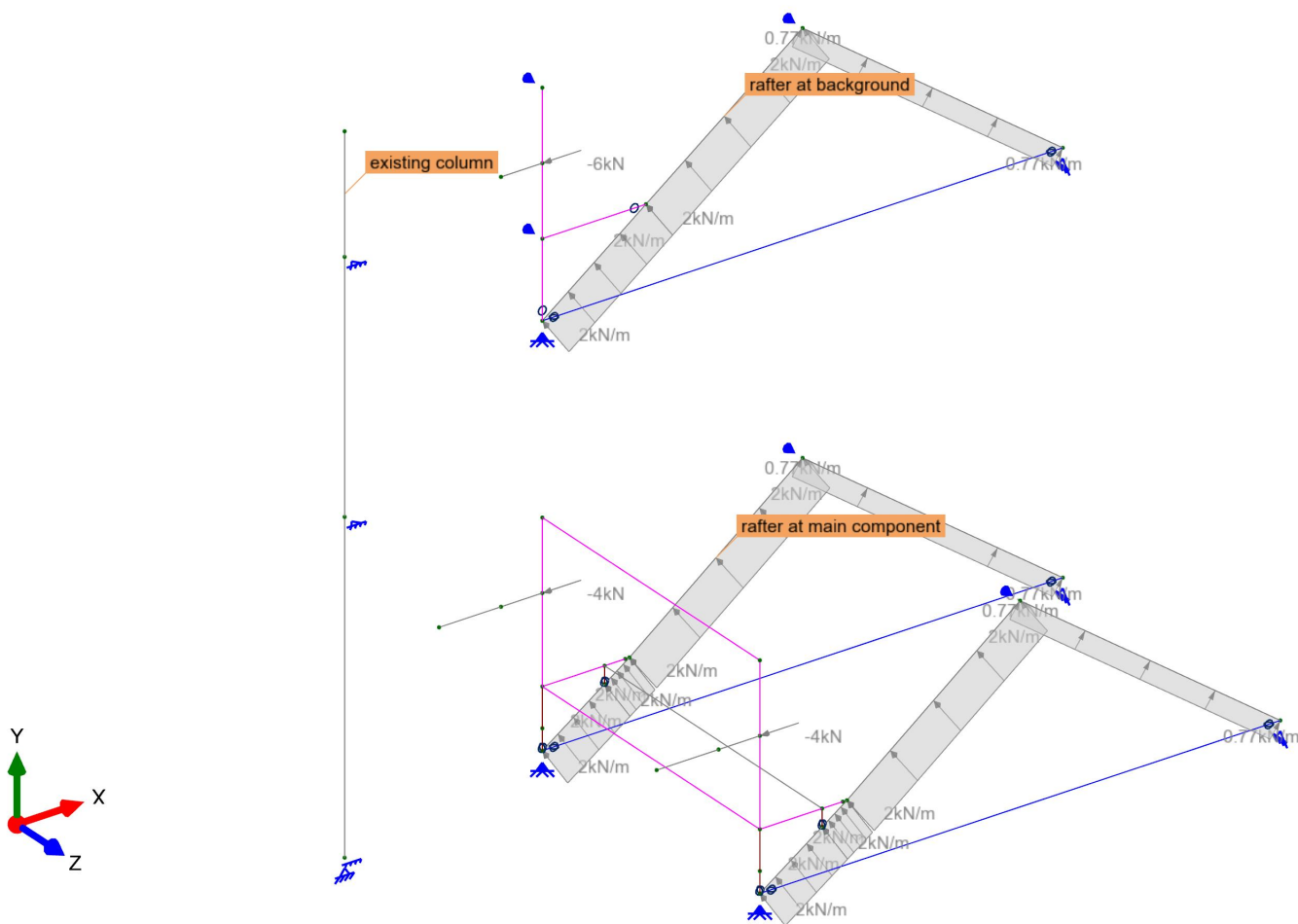
- Sections:
- 1 125 PFC
 - 2 12.5 Round
 - 3 150 PFC
 - 4 65*4 SHS
 - 5 89*5 SHS

Materials:

- 1 STEEL



Load case 6
■ Max



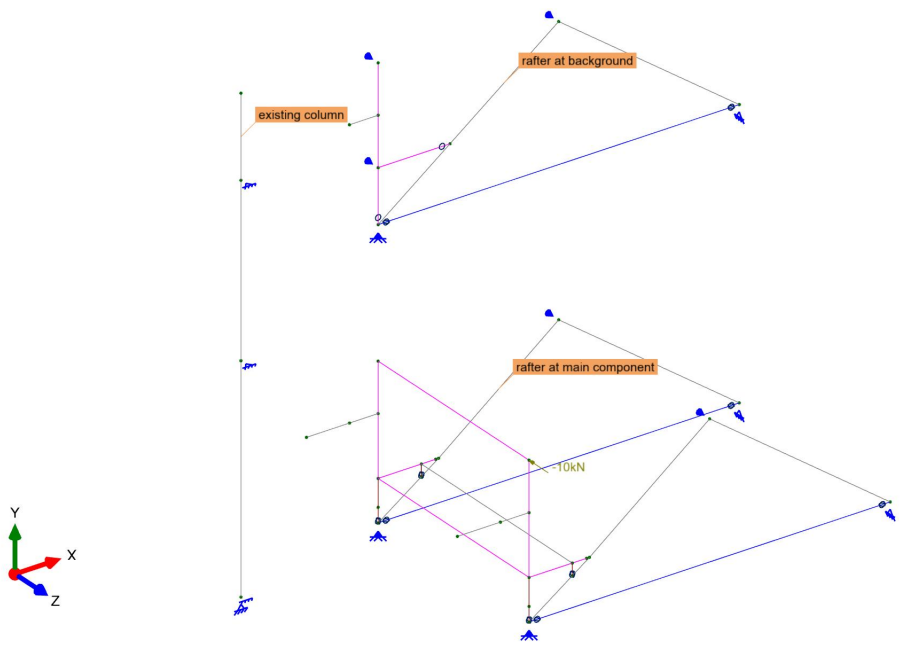
- Sections:
- 1 125 PFC
 - 2 12.5 Round
 - 3 150 PFC
 - 4 65*4 SHS
 - 5 89*5 SHS

Materials:

1 STEEL



Load case 11
■ Max

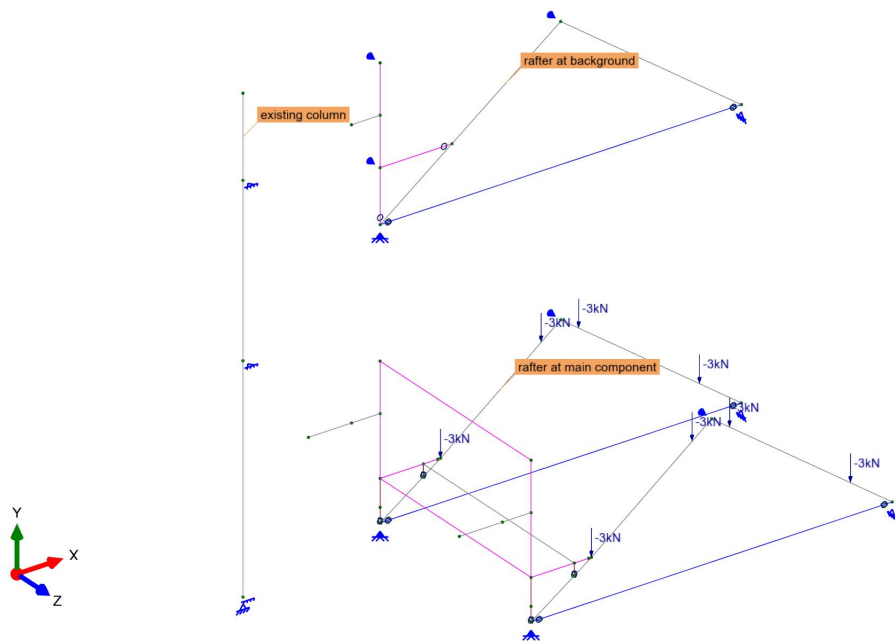


- Sections:
- 1 125 PFC
 - 2 12.5 Round
 - 3 150 PFC
 - 4 65*4 SHS
 - 5 89*5 SHS

Materials:
1 STEEL

Load case 14

■ Max



Sections:

- 1 125 PFC
- 2 12.5 Round
- 3 150 PFC
- 4 65*4 SHS
- 5 89*5 SHS

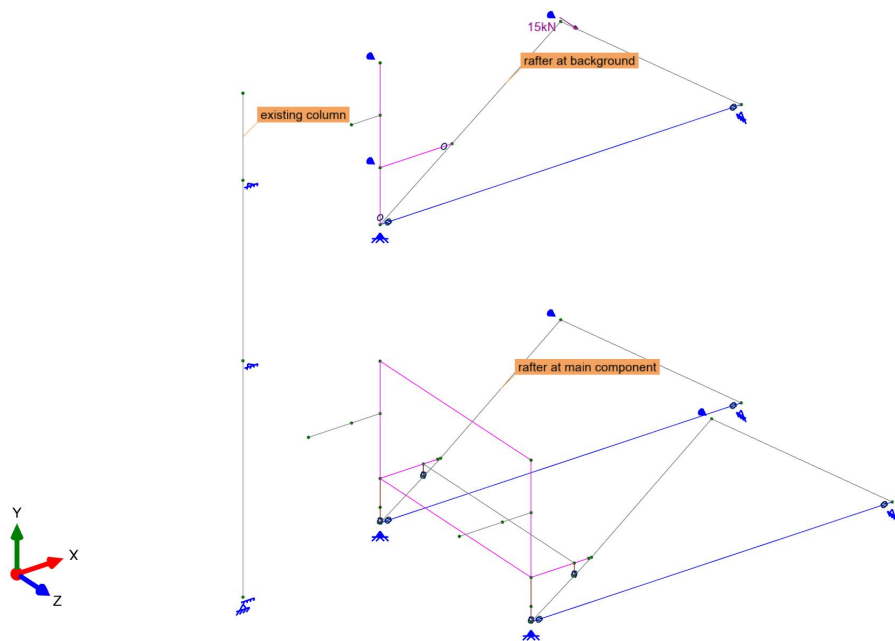
Materials:

- 1 STEEL
- 5 89*5 SHS

Viewpoint (-35,28), Loads

Load case 15

■ Max



Sections:

- 1 125 PFC
- 2 12.5 Round
- 3 150 PFC
- 4 65*4 SHS
- 5 89*5 SHS

Materials:

- 1 STEEL
- 5 89*5 SHS

Viewpoint (-35,28), Loads

SPACE GASS 14.10 - ROBERT BIRD GROUP

Path: P:\2022 JOBS\22245 Southb...\Existing Structure\existing rafter 250328

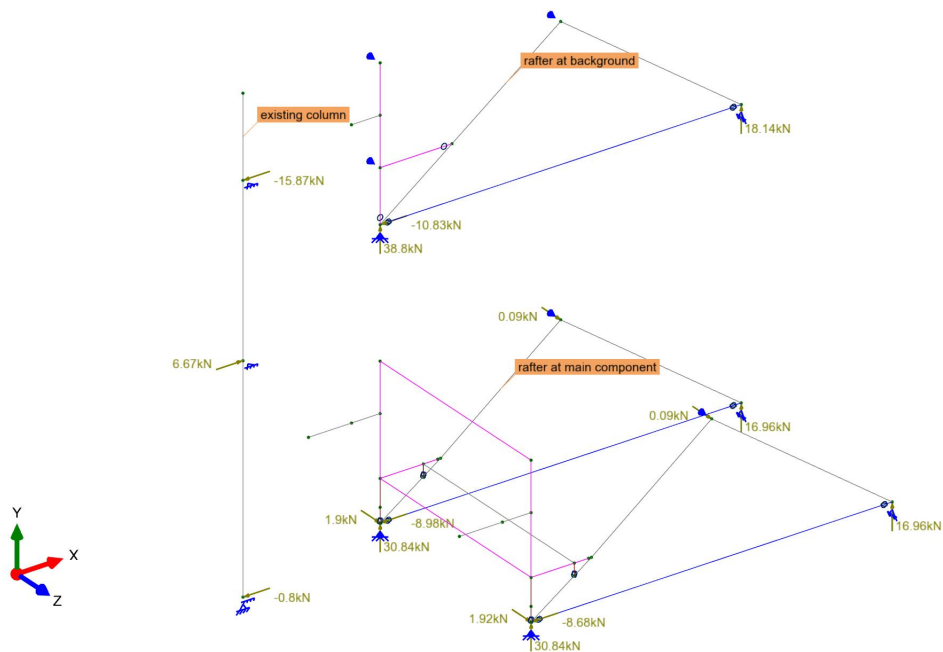
Designer:BS Date: Friday, March 28, 2025 3:38 PM, Page: 1

Combination Case	1 G	2 Q	3 Wu	6 Wu_uplift	10 G (maintenance)	12 Q maintenance	14 Access stair
4	1		1				
5	1.2	1.5					
7	1.2		1				
8	0.5			1			
9			0.8				
13					1	1	1

Load Case	Title
1	G
2	Q
3	Wu
4	G + Wu
5	1.2G + 1.5Q
6	Wu_uplift
7	1.2G + Wu
8	0.5G + Wu_up
9	Ws
10	G (maintenance)
11	Wu_lateral
12	Q maintenance
13	1.2G + 1.5Q (maintenance)
14	Access stair
15	anchor point

Envelope of absolute maximums for All combination load cases

■ Max



Sections:

- 1 125 PFC
- 2 12.5 Round
- 3 150 PFC
- 4 65*4 SHS
- 5 89*5 SHS

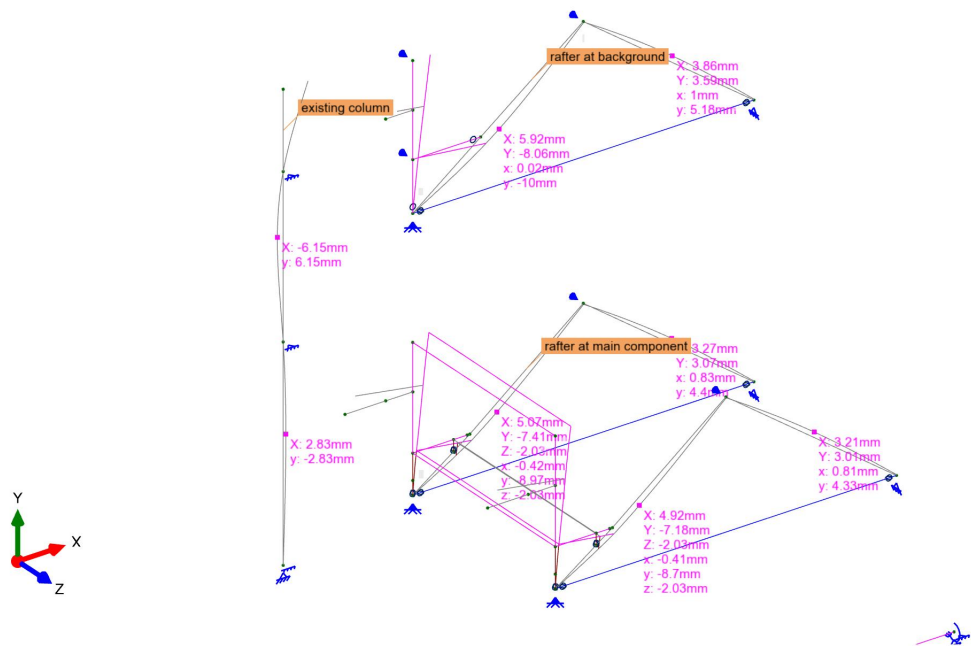
Materials:

- 1 STEEL
- 5 89*5 SHS

Viewpoint (-35,28), Reactions



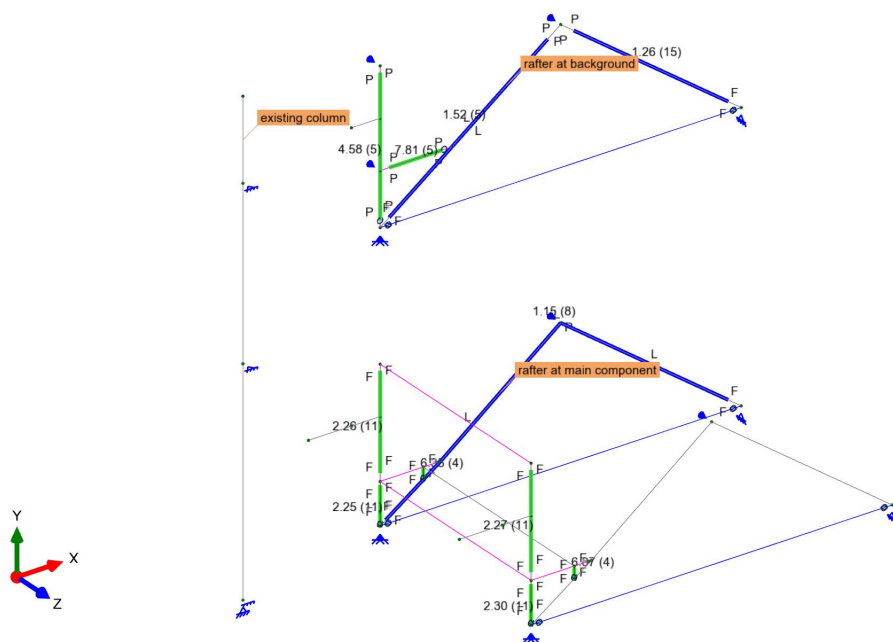
Load case 9
9 Ws





AS4100:2020 Load Factors:

- ≥ 2.00 (Pass)
- ≥ 1.10 (Pass)
- ≥ 1.00 (Pass)
- < 1.00 (Fail)
- < 0.90 (Fail)
- < 0.50 (Fail)
- Seismic failure
- L/r failure
- Design error
- Not Designed

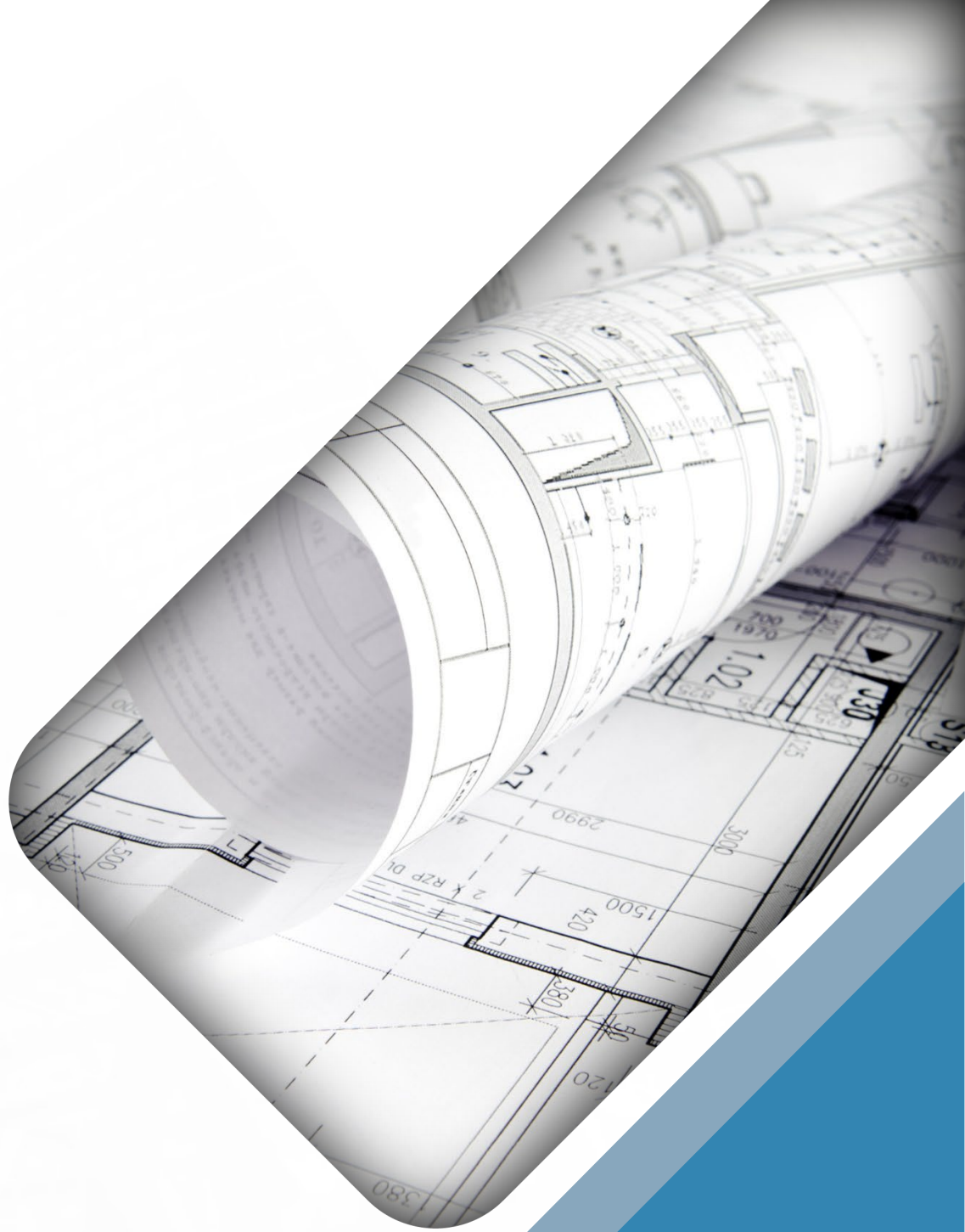


Sections:

- 1 125 PFC
- 2 12.5 Round
- 3 150 PFC
- 4 65*4 SHS
- 5 89*5 SHS

Materials:

- 1 STEEL
- 5 89*5 SHS



Appendix C

Existing Drawings

Southbank Major Public Art Commission

VCA POLICE STABLES REDEVELOPMENT

SOUTHBANK

GENERAL NOTES

- THESE ENGINEERING DRAWINGS ARE TO BE READ IN CONJUNCTION WITH PROJECT SPECIFICATIONS AND OTHER CONSULTANTS DRAWINGS ON THE PROJECT.
- THESE ENGINEERING DRAWINGS HAVE BEEN PREPARED FROM INFORMATION AVAILABLE AT THE TIME OF ISSUE. AS THIS INFORMATION MAY BE THE SUBJECT OF CHANGE PRIOR TO OR DURING CONSTRUCTION THE CONTRACTOR IS TO ADVISE THE ENGINEER WHERE DISCREPANCIES OCCUR.
- THE STRUCTURE HAS BEEN DESIGNED FOR THE IN-SERVICE LOADS ACTING WHEN THE STRUCTURE IS COMPLETE ONLY. LOADS OR ACTIONS DUE TO CONSTRUCTION AND INSTALLATION METHODOLOGIES AND/OR EQUIPMENT HAVE NOT BEEN CONSIDERED UNLESS CLEARLY STATED OTHERWISE.
- THESE DRAWINGS SHALL NOT BE USED FOR FINAL SETOUT OF THE PROJECT UNLESS SPECIFICALLY STATED.
- WHERE STRUCTURAL CERTIFICATION IS REQUIRED, INSPECTIONS ARE TO BE PERFORMED BY A DULY APPOINTED INSPECTOR FROM 'ROBERT BIRD GROUP'. THESE INSPECTIONS ARE TO BE PERFORMED IN ACCORDANCE WITH THE INSPECTION & TEST PLANS PREPARED BY 'ROBERT BIRD GROUP.' THE INSPECTOR IS TO BE GIVEN A MINIMUM OF 48 HOURS NOTICE THAT AN INSPECTION IS REQUIRED.
- PRIOR TO THE COMMENCEMENT OF WORKS THE CONTRACTOR IS TO IDENTIFY ALL EXISTING SERVICES. ANY SERVICES SHOWN ON 'ROBERT BIRD GROUP' DRAWINGS ARE INDICATIVE ONLY.
- THE CONTRACTOR SHALL CHECK OR OBTAIN ALL DIMENSIONS RELEVANT TO SETTING OUT OF SITE WORKS, AND THE PROVISION OF ANY TEMPORARY BRACING, INCLUDING DESIGN, IN ACCORDANCE WITH THE SPECIFICATION.
- DURING CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STABILITY OF THE WORKS AND ENSURE NO PART IS OVERSTRESSED. THE DESIGN AND CERTIFICATION OF ALL FORMWORK AND BACKPROPPING IS TO BE THE RESPONSIBILITY OF THE CONTRACTOR. (REFER TO CONCRETE NOTES FOR STRIPPING PROCEDURES FOR IN-SITU CONCRETE).
- THE CONTRACTOR IS TO OBTAIN DESIGN ADVICE FROM A SUITABLY QUALIFIED ENGINEER REGARDING DEMOLITION, RETROFITTING, TEMPORARY WORKS, HEALTH & SAFETY AND NUISANCE. THIS HAS BEEN REFERRED TO AS THE "CONTRACTORS ENGINEER" THROUGHOUT THE REMAINING NOTES.
- WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CURRENT AUSTRALIAN STANDARDS AND BCA STATUTORY REQUIREMENTS, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT SUFFICIENT TOLERANCES ARE PROVIDED AND INTEGRATED THROUGHOUT ALL ELEMENTS OF THE WORKS.
- ALL NON-LOAD BEARING ELEMENTS SHALL BE KEPT CLEAR OF THE STRUCTURE SOFFIT BY AN ALLOWANCE DETERMINED FROM SPAN/250 OR CANTILEVER/125 BUT NOT LESS THAN 20mm, UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.
- SUPERIMPOSED DEAD LOADS AND LIVE LOADS HAVE BEEN DETERMINED IN ACCORDANCE WITH AS1170 AND ARE SHOWN ON THE GENERAL ARRANGEMENT DRAWINGS.
- WIND AND EARTHQUAKE LOADS HAVE BEEN DETERMINED IN ACCORDANCE WITH AS1170 BASED ON THE FOLLOWING DESIGN CRITERIA :-

BCA STRUCTURAL IMPORTANCE LEVEL: 2

WIND LOADS:

ANNUAL PROBABILITY OF EXCEEDANCE 1/500
REGION A5
TERRAIN CATEGORY 3
REGIONAL WIND SPEED V_R (m/s) 45
SHIELDING M_S 1
TOPOGRAPHIC M_t 1

EARTH QUAKE LOADS:

ANNUAL PROBABILITY OF EXCEEDANCE --
PROBABILITY FACTOR K_p --
HAZARD FACTOR --
SITE SUB-SOIL CLASS --
STRUCTURAL DUCTILITY FACTOR μ --
STRUCTURAL PERFORMANCE FACTOR (S_p) --
EARTHQUAKE DESIGN CATEGORY --

A WIND LOADING REPORT HAS BEEN PERFORMED BY:

REPORT NO : DATE :

16. THE GEOTECHNICAL INVESTIGATION HAS BEEN PERFORMED BY:

AECOM REPORT NO : 60487219_GEO-002 DATE : 07-03-2018

HEALTH & SAFETY

- THE CONTRACTOR SHALL DEVELOP, IMPLEMENT AND ADMINISTER A WORKPLACE HEALTH AND SAFETY PROGRAM THAT WILL ENSURE THAT ALL CONSTRUCTION ACTIVITIES ARE PERFORMED TO THE RELEVANT WORKPLACE HEALTH AND SAFETY REQUIREMENTS AND ANY OTHER RELEVANT STATUTORY REQUIREMENTS.
- THE WORKPLACE HEALTH AND SAFETY PROGRAM MUST BE CO-ORDINATED WITH ADJOINING PROPERTY OWNERS AND ALL RELEVANT PARTIES AS NECESSARY TO ENSURE A SAFE BUILDING ENVIRONMENT AT ALL TIMES.

NUISANCE

- THE CONTRACTOR SHALL DEVELOP, IMPLEMENT, AND ADMINISTER A PLAN THAT WILL ENSURE THE MANAGEMENT OF NOISE AND VIBRATION RESULTING FROM CONSTRUCTION WORKS. REFER TO SPECIFICATIONS FOR REQUIRED LIMITS, OTHERWISE, CONTACT ENGINEER FOR GUIDANCE.
- THE CONTRACTOR WILL NEED TO ENSURE ALL ADJOINING PROPERTY REQUIREMENTS RELATING TO NOISE AND VIBRATION ARE MET.
- IF IT IS ESTABLISHED THAT THERE ARE NO SITE SPECIFIC REQUIREMENTS, THEN THE CONTRACTOR SHALL REFER TO MINIMUM REQUIREMENTS FOR ABATEMENT OF NOISE AND VIBRATION NOMINATED BY RELEVANT STATUTORY REQUIREMENTS
- THE CONTRACTOR WILL NEED TO PREPARE AND ADVISE ON MONITORING AND MANAGEMENT OF NOISE AND VIBRATION BASED ON PROFESSIONAL ADVICE FROM SUITABLY QUALIFIED PERSON OR PERSONS.

TEMPORARY WORKS

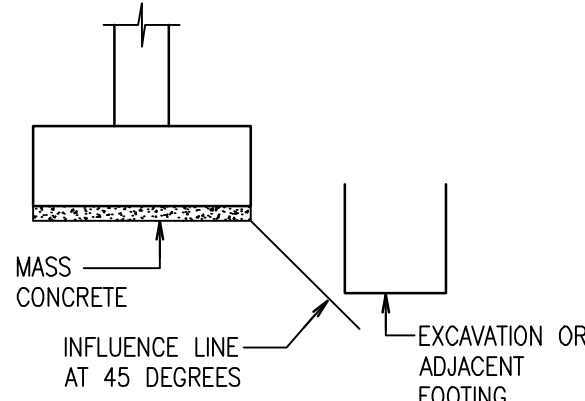
- THE CONTRACTOR SHALL ALLOW FOR IN THEIR PRICE ALL COSTS ASSOCIATED WITH THE DESIGN, SUPPLY, INSTALLATION AND REMOVAL OF ALL TEMPORARY BACK PROPPING, SAFETY SCREENS, SCAFFOLDING AND OTHER REQUIREMENTS OF THE CONSTRUCTION PROCESS. THE CONTRACTOR SHALL ENGAGE SUITABLY QUALIFIED ENGINEER REFERRED TO AS "CONTRACTORS ENGINEER". TO DESIGN INSPECT AND CERTIFY ALL TEMPORARY WORKS, AND DEMOLITION WORKS.
- THE CONTRACTOR IS TO PROVIDE ALL TEMPORARY WORKS CONTRACTOR ENGINEERING DRAWINGS TO THE STRUCTURAL ENGINEER FOR INFORMATION.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THE OVERALL STABILITY OF THE STRUCTURE AND NO PART IS OVERSTRESSED DUE TO CONSTRUCTION & INSTALLATION METHODOLOGIES AND/OR EQUIPMENT DURING CONSTRUCTION. THE CONTRACTOR SHALL OBTAIN ADVICE FROM THE CONTRACTORS ENGINEER.
- THE CONTRACTOR IS TO HAVE CONSTRUCTION METHODOLOGY STATEMENTS PREPARED AND SUBMITTED FOR GENERAL REVIEW TO ENSURE IT IS ACCORDANCE WITH THE DESIGN INTENT.
- ALL VERTICAL DISPLACEMENTS AND MOVEMENTS ARE TO BE LIMITED TO ENSURE THE STRUCTURE IS NOT SUBJECTED TO LOADS OR MOVEMENTS CAUSING STRUCTURAL DISTRESS TO ANY ELEMENT WHILE THE STRUCTURE IS BEING TEMPORARILY SUPPORTED.
- DEPENDING ON THE CONTRACTORS PREFERRED CONSTRUCTION SEQUENCE, PRE-LOADING OF STRUCTURAL ELEMENTS MAY BE REQUIRED TO LIMIT TOTAL VERTICAL DISPLACEMENTS.
- STRUCTURE TO BE ADEQUATELY BRACED TO PREVENT ANY HORIZONTAL MOVEMENT OR DEFLECTIONS.

LEGEND/ABBREVIATIONS

ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION
HORIZ	HORIZONTAL	N/S	NEAR SIDE
VERT	VERTICAL	F/S	FAR SIDE
CENT	CENTRALLY PLACED	B/S	BOTH SIDES
CRS	CENTRES	U/S	UNDER SIDE
B	BOTTOM FACE	LG	LENGTH/LONG
T	TOP FACE	w	WIDTH/WIDE
T&B	TOP & BOTTOM	h	HEIGHT/HIGH
NF	NEAR FACE	d	DEPTH/DEEP
FF	FAR FACE	NOM	NOMINAL
EF	EACH FACE	REQ'D	REQUIRED
EW	EACH WAY	REINF	REINFORCEMENT
EQ	EQUAL	OPP	OPPOSITE
NSOP	NOT SHOWN ON PLAN	SIM	SIMILAR
NSOE	NOT SHOWN ON ELEVATION	GA	GENERAL ARRANGEMENT
UNO	UNLESS NOTES OTHERWISE	PT	POST TENSION
TYP	TYPICAL	DWG	DRAWINGS
CL	CENTRE LINE	NTS	NOT TO SCALE
PL	PLATE	LL	LIVE LOAD
CFW	CONTINUOUS FILLET WELD	SIDL	SUPERIMPOSED DEAD LOAD
FSBW	FULL STRENGTH BUTT WELD	THRU	THROUGH
FPBW	FULL PENETRATION BUTT WELD	NLB	NON LOAD BEARING

FOUNDATION NOTES

- REFER TO THE GEOTECHNICAL ENGINEERING REPORT SPECIFIED IN THE GENERAL NOTES FOR SITE SPECIFIC GEOTECHNICAL INFORMATION.
- FOOTINGS TO BE FOUNDED ON MATERIAL HAVING AN ALLOWABLE BEARING CAPACITY OF 100 kPa. WHERE DIFFICULTY IN REACHING THE REQUIRED CAPACITY IS EXPERIENCED, 'ROBERT BIRD GROUP' IS TO BE CONTACTED TO REASSESS THE FOOTING DESIGN.
- THE CONTRACTOR IS TO ENGAGE AND PAY A GEOTECHNICAL ENGINEER TO VERIFY THE BEARING CAPACITY OF THE FOUNDATIONS PRIOR TO PLACEMENT OF THE BLINDING LAYER.
- ALL LOOSE MATERIAL AND WATER TO BE CLEANED OUT OF THE FOUNDATION. FORM WORK TO BE USED WHERE THE SIDES OF THE FOUNDATION ARE NOT STABLE.
- A 50mm MINIMUM BLINDING LAYER SHOULD BE APPLIED TO THE BASE OF ALL FOUNDATIONS IMMEDIATELY AFTER VERIFICATION OF THE BEARING CAPACITY BY THE GEOTECHNICAL ENGINEER. WHERE THE FOUNING MATERIAL IS DEEPER THAN REQUIRED FOR THE FOOTING THE EXCAVATION IS TO BE BACKFILLED WITH A WEAK MIX CONCRETE (N10) TO THE UNDERSIDE OF THE FOOTING.
- WHERE AN EXCAVATION IS REQUIRED OR EXISTS BELOW THE BASE OF A FOOTING THE SIDE OF THE EXCAVATION SHALL BE LOCATED AWAY FROM EDGE OF FOOTING BY THE SAME DISTANCE THAT THE EXCAVATION IS BELOW FOOTING BASE. WHERE THIS CANNOT BE ACHIEVED, 'ROBERT BIRD GROUP' SHALL BE CONTACTED FOR FURTHER DIRECTION. MASS CONCRETE IS TO EXTEND TO THE INFLUENCE LINE AS REQUIRED.
- ALL WALLS AND COLUMNS SHALL BE CONCENTRIC WITH THE SUPPORTING FOOTINGS UNLESS NOTED OTHERWISE ON THE DRAWINGS.



BORED PIER NOTES

- BORED PIERS SHALL BE IN ACCORDANCE WITH AS2159 AND WITH THE PROJECT SPECIFICATIONS.
- REFER TO THE GEOTECHNICAL ENGINEERING REPORT SPECIFIED IN THE GENERAL NOTES FOR SITE SPECIFIC GEOTECHNICAL INFORMATION.
- ALL BORED PIERS SHALL FOUND IN MATERIAL HAVING AN ALLOWABLE BEARING CAPACITY OF 200 kPa.
- THE CONTRACTOR SHALL ENGAGE AND PAY FOR A GEOTECHNICAL ENGINEER TO VERIFY THE BEARING CAPACITY OF THE FOUNING MATERIAL AND BORED PIER CAPACITY PRIOR TO THE PLACEMENT OF REINFORCEMENT OR POURING OF CONCRETE.
- REFER TO THE FOOTING DRAWING FOR BORED PIER DIAMETERS AND DESIGN LOADS.
- BORED PIERS SHALL BE DESIGNED TO CARRY THE DESIGN LOADS AT 75mm ECCENTRICITY TO MAKE ALLOWANCE FOR CONSTRUCTION TOLERANCE. ALL PIER CENTRELINES ARE TO BE CHECKED BEFORE ANY CONCRETE IS POURED. IF A VECTOR ECCENTRICITY GREATER THAN 75mm IS MEASURED 'ROBERT BIRD GROUP' ARE TO BE CONTACTED IMMEDIATELY.
- UNLESS NOTED OTHERWISE THE CENTRELINE OF THE BORED PIER IS TO COINCIDE WITH CENTRELINE OF COLUMN ABOVE. REFER TO THE ARCHITECTURAL DRAWINGS FOR COLUMN SETOUT DETAILS.
- BORED PIERS SHALL BE DRILLED USING A RIG CAPABLE OF BORING A HOLE WITH A VERTICAL TOLERANCE OF 1:100 INCLINATION.
- NOTIFY 'ROBERT BIRD GROUP' IMMEDIATELY OF ANY OBSTRUCTIONS ENCOUNTERED DURING BORING, OTHER THAN THOSE INDICATED IN THE SITE INVESTIGATION.
- THE BORED PIERS MAY HAVE TO BE LINED TO RETAIN LOOSE FILL.
- REMOVE ALL LOOSE OR DISTURBED MATERIAL FROM THE SHAFT AND BASE OF THE BORED PIER.
- BORED PIERS NOT CONCRETE FILLED BY THE END OF THE DAY WILL REQUIRE RE-DRILLING TO REMOVE ANY LOOSE MATERIAL.
- PLACE CONCRETE TO ENSURE A SOUND MONOLITHIC COMPACTED CONCRETE SHAFT OF THE FULL DIAMETER REQUIRED TO CUT-OFF LEVEL. TAKE ADEQUATE MEASURES TO AVOID SEGREGATION, BLEEDING AND GROUT DEFICIENCY OF THE PIER.
- EACH PIER SHALL BE TRIMMED TO ± 25mm OF THE CUT-OFF LEVEL. ANY DAMAGE CAUSED TO THE BORED PIER DURING TRIMMING AND CAPPING IS TO BE REMOVED AND ADEQUATELY REPAIRED.

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DO NOT SCALE DRAWINGS, USE FIGURED DIMENSIONS

REFER COVER SHEET FOR NOTES UNLESS NOTED OTHERWISE

Rev.	Revision Description	By.	App.	Date	Rev.	Revision Description	By.	App.	Date
C1	CONSTRUCTION ISSUE	CB	BO	17.11.16					
A1	CERTIFICATION/APPROVAL	CB	BO	12.10.16					
T2	TENDER ISSUE ONLY	CB	BO	29.07.16					
T1	TENDER ISSUE ONLY	CB	BO	30.03.16					
P2	PRETENDER REVIEW	CB	BO	10.03.16					
P1	COST PLAN ISSUE	CB	BO	09.12.15					

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Client

THE UNIVERSITY OF MELBOURNE

Title
CONSTRUCTION NOTES
SHEET 1 OF 3

Project
VCA POLICE STABLES
REDEVELOPMENT
SOUTH BANK

APPROVED FOR CONSTRUCTION

Date DEC. 2015	Designer M.SUSOY	Design Checker Z. ZAMAN
Scale at A1	Drawn C.BEAIRE	Principal/Project Leader B. ONSLOW

Job Number 15039	Drawing Number S0-01	Revision C1
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VCA POLICE STABLES REDEVELOPMENT

SOUTHBANK

CONCRETE NOTES

GENERAL

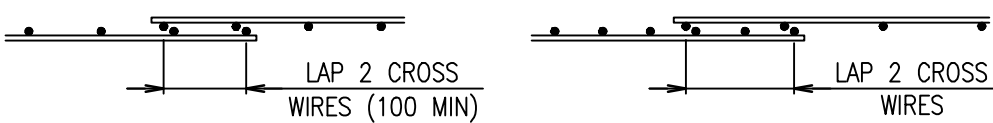
- CONCRETE WORK & MATERIALS SHALL BE IN ACCORDANCE WITH AS3600, AS3610 AND WITH THE PROJECT SPECIFICATIONS.
- CONSTRUCTION JOINTS SHALL BE PROPERLY FORMED, SCABBLED, CLEANED AND USED ONLY WHERE SHOWN ON 'ROBERT BIRD GROUP' DRAWINGS OR SPECIFICALLY APPROVED BY 'ROBERT BIRD GROUP'.
- ALL THICKNESSES SHOWN ARE MINIMUM STRUCTURAL REQUIREMENTS, NO REDUCTION IN THICKNESS DUE TO FALLS OR TOPPING IS PERMITTED. REFER ARCHITECT DRAWINGS FOR ALL SLAB FALLS AND CONFIRMATION OF SLAB STEPS.
- UNLESS A GROOVE LINE ALLOWANCE HAS BEEN NOTED ON THE DRAWINGS, NO GROOVE LINES ARE PERMITTED, EXCEPT AT SLAB LINES. ALL GROOVE LINES ARE TO BE SUBMITTED TO 'ROBERT BIRD GROUP' FOR APPROVAL.
- THE FACE OF ALL CONCRETE AGAINST WHICH NEW CONCRETE IS TO BE CAST IS TO BE THOROUGHLY MECHANICALLY SCABBLED, FULLY EXPOSING THE AGGREGATE MATRIX.
- NO PENETRATIONS GREATER THAN 150mm DIAMETER, OR EMBEDMENT OF PIPES GREATER THAN 40mm DIAMETER OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE SLABS. FOR ALL OTHER CONCRETE MEMBERS NO PENETRATIONS, CHASES OR EMBEDMENTS SHALL BE MADE WITHOUT PRIOR APPROVAL BY 'ROBERT BIRD GROUP'.
- CONDUITS GREATER THAN 25mm DIAMETER CAST INTO CONCRETE MEMBERS SHALL BE SPACED AT A MAXIMUM DISTANCE POSSIBLE AND UNDER NO CIRCUMSTANCES CLOSER THAN A CLEAR SPACING OF TWICE THE LARGER CONDUIT DIAMETER FROM PARALLEL REINFORCEMENT OR ANY OTHER CONDUIT.
- CONCRETE SURFACE FINISHES TO BE IN ACCORDANCE WITH THE ARCHITECTURAL OR OTHER PROJECT DRAWINGS OR SPECIFICATIONS

CONCRETE

- THE CHARACTERISTIC COMPRESSIVE STRENGTH (f_c) AT 28 DAYS OF IN PLACE CONCRETE SHALL BE AS NOTED ON THE DRAWINGS.
- MAXIMUM AGGREGATE SIZE.....20mm
- SLUMP.....80mm
- ALL CONCRETE SHALL BE VIBRATED.
- ALL CONCRETE SHALL BE CURED IN ACCORDANCE WITH THE SPECIFICATION
- ALL CONCRETE SHALL BE SAMPLED AND TESTED IN ACCORDANCE WITH AS1012 AND THE PROJECT SPECIFICATION.
- ALL FORM WORK SHALL COMPLY WITH SECTION 17.6 OF AS3600 AND AS3610
- FORMWORK STRIPPING:
UNLESS SPECIFIED OTHERWISE IN THE PROJECT DOCUMENTATION, MINIMUM STRIPPING TIMES FOR IN-SITU CONCRETE FORMWORK SHALL COMPLY WITH THE MORE STRINGENT REQUIREMENTS OF SECTION 17.6 OF AS3600 & SECTION 5.4.3 (TABLE 5.1.1) OF AS3610.
- REMOVAL OF FORMWORK SUPPORTS FROM SLABS AND BEAMS NOT SUPPORTING STRUCTURES ABOVE:
UNLESS SPECIFIED OTHERWISE IN THE PROJECT DOCUMENTATION AND FORMWORK DOCUMENTATION APPROVED BY 'ROBERT BIRD GROUP', THE REMOVAL OF FORMWORK SUPPORTS FOR SLABS AND BEAMS NOT SUPPORTING STRUCTURES ABOVE SHALL COMPLY WITH SECTION 17.6 OF AS 3600
- MULTISTOREY FORMWORK:
UNLESS SPECIFIED OTHERWISE IN THE PROJECT DOCUMENTATION AND FORMWORK DOCUMENTATION APPROVED BY 'ROBERT BIRD GROUP', THE MINIMUM NUMBER OF LEVELS OF SUPPORT TO BE IN PLACE DURING THE TIME OF EACH POUR ON A FLOOR SHALL BE IN ACCORDANCE WITH SECTION 5.4.4 (TABLE 5.4.3) OF AS3610.

CONCRETE NOTES CONTINUED

REINFORCEMENT

- REINFORCEMENT IS TO BE MANUFACTURED IN ACCORDANCE WITH AS4671 AND SHALL BE FIXED AS SHOWN ON DRAWINGS.
- MATERIAL IS INDICATED BY THE FOLLOWING SYMBOLS:--
Y DEFORMED BAR GRADE 400
N DEFORMED BAR GRADE 500 (NORMAL DUCTILITY)
R PLAIN ROUND BAR GRADE 250
W PLAIN WIRE GRADE 450
SL SQUARE FABRIC GRADE 500
RL RECTANGULAR FABRIC GRADE 500
- THE BAR SIZE IS INDICATED BY A NUMBER AFTER THE SYMBOL, WHICH INDICATES THE BAR DIAMETER IN MILLIMETRES.
- REINFORCEMENT SPACING NOMINATED ON DRAWINGS IS TO ASSIST SCHEDULER AND STEEL FIXER TO ASSESS TOTAL NUMBER OF BARS REQUIRED. WHERE BARS PLACED IN ACCORDANCE WITH SPACING NOMINATED FOUL WITH OTHER STRUCTURAL REQUIREMENTS, PREFERENCE IS TO BE GIVEN TO RELOCATING BARS BY LOCALLY ADJUSTING SPACING TO ENABLE ASSEMBLY OF REINFORCEMENT TO BE COMPLETED. ENGINEER IS TO BE CONTACTED IN THE EVENT THAT REINFORCEMENT IS NEEDED TO BE CUT ON SITE PRIOR TO CONTINUING.
- SPLICING OF REINFORCEMENT SHALL BE MADE ONLY WHERE SHOWN ON THE DRAWINGS OR OTHERWISE APPROVED BY THE ENGINEER. LAP LENGTHS AND DEVELOPMENT LENGTHS FOR REINFORCEMENT BARS TO BE AS NOTED ON THE RELEVANT DRAWINGS.
- LAP FABRIC REINFORCEMENT THUS:

- COVER SHALL BE AS NOTED ON THE RELEVANT DRAWINGS.
- CONCRETE COVERS NOTED ARE MEASURED FROM THE FORM WORK OR GROUND FACE TO THE OUTERMOST REINFORCEMENT COMPONENT. i.e.. IN COLUMNS AND BEAMS TO THE OUTSIDE OF TIES OR LIGATURES.
- COVER TO BE MAINTAINED DURING POURING BY THE USE OF PLASTIC CHAIRS OR PLASTIC TIPPED METAL CHAIRS WHICH ARE TO BE LOCATED AT 800mm MAX CRS BOTH WAYS. BARS TO BE TIED WITH TIE WIRE AT ALTERNATIVE INTERSECTIONS. ALL REINFORCEMENT BAR CHAIRS TO CONFORM TO THE REQUIREMENTS OF AS/NZS2425 AND TO BE STRENGTH GRADE 120 MINIMUM. NO TIE WIRE REINFORCEMENT TO PROTRUDE INTO THE CONCRETE COVER.
- WHERE NO REINFORCEMENT IS SHOWN ON THE DRAWING AT RIGHT ANGLES TO THE MAIN REINFORCEMENT DISTRIBUTION REINFORCEMENT IS TO BE PROVIDED.
- BENDING & STRAIGHTENING
COLD BENDING: BARS CANNOT BE COLD BENT WITHOUT PRIOR APPROVAL FROM THE PROJECT STRUCTURAL ENGINEER. CORRECT MINIMUM DIAMETER FORMERS ARE TO BE USED IN ACCORDANCE WITH AS3600.
HOT BENDING: HOT BENDING MAY ONLY BE CONDUCTED WITH THE APPROVAL OF THE PROJECT STRUCTURAL ENGINEER. HOT BENDING CAN ONLY BE PERFORMED BY A CERTIFIED WELDER. TEST CERTIFICATE OF AFFECTED AREA TO BE OBTAINED.
STRAIGHTENING: WHEN RE-STRAIGHTENING PARTIALLY EMBEDDED BARS, DO NOT BEND OVER FORMERS OF SMALLER DIAMETER THAN PERMITTED IN AS 3600. DO NOT SUBJECT REINFORCEMENT BARS TO IMPACT IN ORDER TO STRAIGHTEN.
- NO WELDING OF REINFORCEMENT, INCLUDING TACK WELDING, ALLOWED UNLESS SPECIFICALLY SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER.

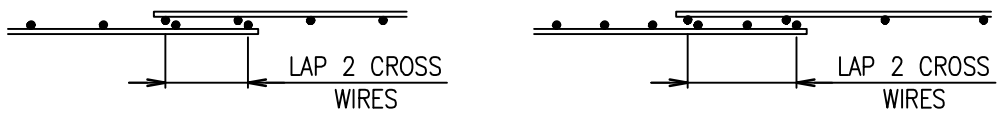
PILING NOTES – SCREW PIERS

- SCREW PIERS SHALL BE IN ACCORDANCE WITH AS2159.
- REFER TO THE GEOTECHNICAL ENGINEERING REPORT SPECIFIED IN THE GENERAL NOTES FOR SITE SPECIFIC GEOTECHNICAL INFORMATION.
- DETAILS OF PIER DESIGN AND SPECIFICATION FOR MATERIALS AND CONSTRUCTION SHALL BE SUBMITTED TO 'ROBERT BIRD GROUP' PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
- REFER TO THE FOOTING DRAWING FOR PIER DESIGN LOADS.
- PIERS SHALL BE DESIGNED TO CARRY THE DESIGN LOADS WITH AN ALLOWANCE FOR ECCENTRICITIES WHICH ARISE FROM CONSTRUCTION TOLERANCES LIMITED TO THE FOLLOWING:--
TOLERANCES.....IN PLAN..... 50mm IN ANY DIRECTION
TOLERANCES.....VERTICAL..... 1:250
IF THESE TOLERANCES ARE EXCEEDED 'ROBERT BIRD GROUP' ARE TO BE CONTACTED IMMEDIATELY.
- NOTIFY 'ROBERT BIRD GROUP' IMMEDIATELY OF ANY OBSTRUCTIONS ENCOUNTERED DURING PILING, FAILURE OF THE PILE TO REACH THE REQUIRED DEPTH OR ANY OTHER IRREGULARITIES.
- THE HEAD OF EACH PIER SHALL BE PREPARED AT THE REQUIRED CUT-OFF LEVEL.
- THE SEQUENCE OF WORK SHALL AVOID DAMAGE TO EXISTING ADJACENT STRUCTURES.
- WHERE PIER DRIVING WORKS ARE TO BE CONDUCTED IN THE VICINITY OF EXISTING STRUCTURES, GEOTECHNICAL ADVICE MUST BE SOUGHT TO ENSURE THE PROPOSED WORKS DOES NOT CAUSE DAMAGE.
- APPROPRIATE RECORDS SHALL BE TAKEN FOR EACH PIER AND SUBMITTED TO 'ROBERT BIRD GROUP'.

TIMBER FRAMING NOTES

- ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE FOLLOWING AUSTRALIAN STANDARDS AS APPLICABLE AS1748, AS2858, AS2082, AS1720, AS1684, AS1604 AND IN ADDITION COMPLY WITH THE 'TIMBER UTILISATION AND MARKETING ACT' AND THE D.P.I. & F 'CONSTRUCTION TIMBERS IN QUEENSLAND'.
- ALL STRUCTURAL TIMBER SHALL BE OF STRESS GRADE AS INDICATED ON THE DRAWINGS.
- ALL VISIBLE STRUCTURAL TIMBER SPECIFIED TO BE COATED WITH CLEAR OR TRANSPARENT STAIN FINISH AND SHALL COMPLY WITH THE APPEARANCE GRADE SPECIFIED IN THE RELEVANT AUSTRALIAN STANDARD.
- ALL SOFTWOOD SHALL BE SEASONED TIMBER HAVING A MOISTURE CONTENT RANGE 10% < M.C. < 15% IF REQUIRED BY THE SUPERINTENDENT, EVIDENCE OF THE TIMBERS MOISTURE CONTENT SHALL BE PROVIDED BY THE SUPPLIER.
- ALL TIMBERS EXPOSED TO VIEW EXTERNALLY SHALL BE DRESSED UNLESS SPECIFIED OTHERWISE. WHEN SPECIFIED TO BE SAWN FINISHED ALL EXPOSED CORNERS SHALL BE ARRISSED.
- TIMBER SHALL BE HANDLED AND STORED SO AS NOT TO OVERSTRESS THE MEMBERS AT ANY TIME. TIMBER DELIVERED TO THE SITE SHALL BE STORED AT A LEVEL NOT LESS THAN 150mm OFF THE GROUND, EVENLY SUPPORTED, WELL VENTILATED AND PROTECTED FROM THE ELEMENTS.
- ALL HARDWOODS SHALL HAVE A MINIMUM STRESS GRADING F14 UNLESS NOTED OTHERWISE. ALL SOFTWOODS SHALL HAVE A MINIMUM STRESS GRADING OF F5 UNLESS NOTED OTHERWISE.
- ALL JOINT GROUPS IN SOFTWOOD TIMBER TO BE JD4 UNO. ALL JOINT GROUPS IN HARDWOOD TIMBER TO BE J2 UNO.
- ALL STRUCTURAL TIMBER USED IN EXPOSED AREAS TO BE MINIMUM DURABILITY CLASS 2 & TREATMENT CLASS H3 UNO. ALL STRUCTURAL TIMBER SET IN THE GROUND TO BE DURABILITY CLASS 1 & TREATMENT CLASS H5 UNO.
- ALL BOLTS, NUTS, WASHERS & OTHER FITMENTS IN THE TIMBER TO BE HOT DIP GALVANISED. ALL STEEL STRAPPING, NAIL PLATES & FRAMING ANCHORS TO BE MANUFACTURED FROM GALVANIZED STEEL SHEET.
- IF TIMBER MEMBERS HAVE A NATURAL CAMBER WITHIN THE STRAIGHTNESS TOLERANCE, ERECT THEM WITH THE CAMBER UP.
- ALL BRACING WALLS TO BE CONSTRUCTED IN ACCORDANCE WITH AS1684, RELEVANT MANUFACTURERS DETAILS AND SPECIFICATIONS. REFER TO DRAWINGS FOR BRACING DETAILS.
- TIMBER ROOF TRUSSES, FIXING DETAILS AND LATERAL STABILITY OF ROOF TO BE DESIGNED BY THE TRUSS MANUFACTURER. TRUSS MANUFACTURER TO SUBMIT TWO (2) COPIES OF SHOP DRAWINGS DETAILING ALL TRUSSES, NAILING PLATES AND FIXINGS, TOGETHER WITH ONE (1) COPY OF ALL SUPPORTING CALCULATIONS TO 'ROBERT BIRD GROUP' FOR APPROVAL PRIOR TO FABRICATION OF THE TRUSSES. TRUSS MANUFACTURER TO ALSO SUPPLY ALL NECESSARY DESIGN CERTIFICATION PRIOR TO INSTALLATION OF TRUSSES.

SLAB ON GROUND NOTES

- SLAB ON GROUND TO BE POURED ON A LAYER OF POLYETHYLENE SHEETING 200µm THICK ON TOP OF 50mm OF BEDDING SAND. JOINTS TO BE TAPED
- REFER ARCHITECT FOR WATERPROOFING DETAILS.
- REFER ARCHITECT FOR TERMITE PROTECTION.
- REFER ARCHITECT FOR STEP AND FALLS IN SLABS.
- FABRIC TO BE PLACED ON CHAIRS AT 800 x 800 CENTRES AND CHAIRS TO BE PLACED ON STEEL PANS. ALL REINFORCEMENT BAR CHAIRS TO CONFORM TO THE REQUIREMENTS OF AS/NZS2425 AND TO BE STRENGTH GRADE 120 MINIMUM.
- LAP FABRIC REINFORCEMENT THUS:

- WHERE BEDDING SAND IS REQUIRED UNDER SLAB, THIS SHALL BE COMPACTED SUFFICIENTLY TO SUPPORT REINFORCEMENT PLUS 100kg/CHAIR WITHOUT VERTICAL DISPLACEMENT EXCEEDING 5mm.

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Client

THE UNIVERSITY OF MELBOURNE

Title

**CONSTRUCTION NOTES
SHEET 2 OF 3**

Project

**VCA POLICE STABLES
REDEVELOPMENT
SOUTH BANK**

APPROVED FOR CONSTRUCTION

Date DEC. 2015	Designer M.SUSOY	Design Checker Z. ZAMAN
Scale at A1	Drawn C.BEARE	Principal/Project Leader B. ONSLOW
Job Number 15039	Drawing Number S0-02	Revision C1

VCA POLICE STABLES REDEVELOPMENT

SOUTHBANK

STEELWORK NOTES

GENERAL

- BEFORE FABRICATION COMMENCES, THE CONTRACTOR SHALL SUBMIT TWO COPIES OF SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL OF ARRANGEMENT OF GENERAL STRUCTURAL ELEMENTS.
- ALL DIMENSIONS RELEVANT TO SETTING OUT AND SITE WORK ARE TO BE CHECKED ON SITE BY THE CONTRACTOR PRIOR TO WORK COMMENCING.
- DO NOT SCALE DRAWINGS.
- MINIMUM CONNECTION DETAILS:
 - CONNECTION CLEAT PLATES AND STIFFENER CLEAT PLATES ARE TO HAVE A THICKNESS TO BE EQUAL TO OR LARGER THAN THE WEB THICKNESS OF THE SUPPORTED MEMBER BUT NOT LESS THAN 10mm THICK.
 - CONNECTIONS TO CONSIST OF A MINIMUM OF 2M20 8.8 BOLTS.
 - MINIMUM FILLET WELD WHERE SPECIFIED TO BE AS FOLLOWS:

PLATE THICKNESS (mm) LESS THAN OR EQUAL TO	WELD SIZE (mm) SP GRADE & CONTINUOUS ALL ROUND
16	6
24	8
32	12

- ALL MEMBERS' CENTROIDS AT JOINTS SHOULD BE COINCIDENT UNO
- WHEN CALCULATING STEELWORK QUANTITIES FROM PRELIMINARY DRAWINGS, MULTIPLY PRELIMINARY STEELWORK BY 1.15 (I.E. 15% ALLOWANCE) FOR SPLICE PLATES, STIFFENERS, BOLTS ETC AND A FURTHER 1.15 (I.E. 15% ALLOWANCE) FOR MEMBERS SUCH AS TRIMMERS, MINOR BRACES, GUSSETS, STIFFENERS ETC THAT ARE DESIGNED DURING DETAILED DESIGN STAGE.
- DO NOT GROUT UNDER ANY BASE PLATE OR ADJACENT STEELWORK WHERE STEELWORK WELDING OR ALIGNMENT IS INCOMPLETE.

MATERIALS

- STRUCTURAL STEEL:
 - ALL STEEL SHALL COMPLY WITH REQUIREMENT OF FOLLOWING STANDARDS – AS1163, AS/NZS 1594, AS/NZS 3678, AS/NZS 3679, AS/NZS 3679.1 AND AS/NZS 3679.2.
 - ALL STRUCTURAL STEEL TO BE OF THE FOLLOWING GRADES:
 - AUSTRALIAN STEEL GRADE 250 – HOT ROLLED PLATES & FLATS
 - AUSTRALIAN STEEL GRADE 300 PLUS – UB, UC, PFC & ANGLES
 - AUSTRALIAN STEEL GRADE 300 – WB & WC
 - AUSTRALIAN STEEL GRADE 350 – CHS
 - AUSTRALIAN STEEL GRADE 450 – RHS, AND SHS
 - WHERE THROUGH THICKNESS TENSILE FORCES ARE INDUCED IN MEMBERS OR CONNECTIONS IN THE FOLLOWING CASES, Z GRADE QUALITY STEEL WITH A MINIMUM R_{az} = 3.5% IS REQUIRED:
 - T (TEE) JOINTS: FILLET WELD THROAT THICKNESS > 35mm
 - X (CRUCIFORM) JOINTS: ACROSS PLATE THICKNESS > 25mm
 - L (CORNER) JOINTS: CROSS PLATE THICKNESS > 20mm
 - ALL STEEL DEEMED TO BE UNIDENTIFIED SHALL HAVE THEIR GRADE CONFIRMED USING A FULL TEST IN ACCORDANCE WITH AS1391.
- BOLTS:
 - ALL BOLTS, NUTS AND WASHERS MATERIALS SHALL COMPLY WITH THE FOLLOWING STANDARDS: AS/NZS 1110, AS/NZS 1111, AS/NZS 1112, AS/NZS 1252 AND AS/NZS 1559.
- WELDING CONSUMABLES
 - WELDING CONSUMABLES TO HAVE NOMINAL TENSILE STRENGTH F_{uW}=490MPa WITH CONSUMABLES TO BE B-749 TO AS/NZS ISO 17632 OR B-649 TO AS/NZS2717.1 UNLESS NOTED OTHERWISE
 - ELECTRODES FOR MANUAL METAL– ARC WELDING SHALL COMPLY WITH AS/NZS 4855 OR AZ/NZS 4857
 - ELECTRODES OR FILLER WIRES FOR PROCESS OTHER THAN MANUAL METAL– ARC WELDING SHALL COMPLY WITH AS 1858.1, AS/NZS 1167.2, AS/NZS 2717.1, AS/NZS ISO 17632, ISO 14341 OR ISO 636

DEMOLITION WORKS

- THE CONTRACTOR SHALL ENGAGE & PAY FOR A SUITABLY QUALIFIED ENGINEER TO ACT AS THE CONTRACTORS ENGINEER DURING THE COURSE OF ALL WORKS
- THE CONTRACTOR SHALL ALLOW FOR IN HIS PRICE ALL COSTS ASSOCIATED WITH ANY WORKS PERTAINING TO THE DEMOLITION AND REMOVAL OF THE EXISTING STRUCTURE.
- THE CONTRACTOR IS TO PROVIDE THE CONTRACTORS ENGINEER AND THE DEMOLITION CONTRACTOR THE ENGINEERING DRAWINGS FOR INFORMATION
- IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE THE OVERALL STABILITY OF THE STRUCTURE WHILST DEMOLITION OCCURS AND SHALL BE ADEQUATELY SUPPORTED AND RESTRAINED TO AVOID ALL VERTICAL AND HORIZONTAL DISPLACEMENTS AND DEFORMATIONS DURING DEMOLITION.
- IT IS THE CONTRACTORS RESPONSIBILITY TO SECURE ALL LOOSE AND UNSTABLE BUILDING COMPONENTS DURING THE DEMOLITION PROCESS.
- THE CONTRACTOR IS TO HAVE A CONSTRUCTION METHODOLOGY PREPARED WITH APPROPRIATE ADVICE FROM THE CONTRACTORS ENGINEER AND SUBMITTED TO THE CLIENT FOR GENERAL REVIEW TO ENSURE IT IS ACCORDANCE WITH THE DESIGN INTENT FOR PERMANENT WORKS AS DOCUMENTED IN THESE DRAWINGS.

STEELWORK NOTES CONTINUED

FABRICATION

- GENERAL
 - ALL STEEL FABRICATION SHALL COMPLY WITH AS4100 AND THE REQUIREMENTS OF AS/NZS 3679.2: WELDED I SECTIONS – PART 2.
- BOLTING:
 - ALL BOLTS SHALL BE GRADE 8.8/TB BOLTS UNO. MINIMUM SIZE OF BOLTS TO BE M20 UNO.
 - STEEL BOLTS, NUTS, WASHERS AND THEIR INSTALLATION SHALL COMPLY WITH AS/NZS 1252.
 - BOLTS TO BE INSTALLED AS FOLLOWS:

BOLTING DESIGNATION	METHOD OF INSTALLATION
4.6/S	SNUG TIGHTENED
8.8/S	SNUG TIGHTENED
8.8/TB	FULLY TENSIONED USING LOAD INDICATING WASHERS
8.8/TF	FULLY TENSIONED USING LOAD INDICATING WASHERS

TYPE OF LOAD INDICATING WASHERS TO BE APPROVED BY RBG PRIOR TO INSTALLATION AND TO BE INSTALLED TO MANUFACTURER'S INSTRUCTIONS.

- MINIMUM BOLT LENGTH FOR TENSIONED BOLTS TO BE FOUR BOLT DIAMETERS.

WELDING

- GENERAL
 - ALL WELDING SHALL BE IN ACCORDANCE WITH AS 1554.1 UNO
 - ALL WELDS TO BE FULL STRENGTH FULL PENETRATION BUTT WELDS UNO
 - ALL WELDS ARE TO BE CATEGORY SP UNO
 - CHIP ALL WELDS FREE OF SLAG AFTER EACH RUN
- TESTING
 - ALL WELDS TO BE VISUALLY SCANNED
 - WELDS CONNECTING WEB TO FLANGE PLATE IN WELDED SECTIONS:
 - ALL FLANGE TO WEB WELDS TO BE TESTED IN ACCORDANCE WITH AS/NZS 3679.2
 - IN ADDITION TO DESTRUCTIVE TESTS IN ACCORDANCE WITH AS/NZS 3679.2, 10% OF THE LENGTH OF THE FLANGE TO WEB WELD IS TO BE ULTRASONICALLY TESTED. IF DEFECTS ARE FOUND IN THESE TESTS, THEN 100% OF THE WELD IS TO BE TESTED AND DEFECTS REPAIRED IN ACCORDANCE WITH AS 1554.1
 - WELDS IN MEMBERS SUBJECT TO CYCLIC LOADING AND IN LIFTING DEVICES (E.G. LIFTING LUGS):
 - 100% OF FULL STRENGTH FULL PENETRATION BUTT WELDS ARE TO BE ULTRASONICALLY TESTED
 - 100% OF FILLET WELDS ARE TO BE TESTED USING THE MAGNETIC PARTICLE METHOD.
 - WELDS IN SPECIAL STRUCTURES AND TEMPORARY FALSE WORKS.
 - EXTENT OF NON–DESTRUCTIVE WELD TESTING:

TYPE OF WELD	EXAMINATION METHOD	EXTENT (% TOTAL WELD LENGTH) (SEE ALSO NOTE (j) BELOW)
ALL WELDS	VISUAL SCANNING	100
ALL WELDS	VISUAL EXAMINATION	100
SHOP FILLET WELDS	MAGNETIC PARTICLE	25
FIELD FILLET WELDS	MAGNETIC PARTICLE	25 (100 IF DEFECTS ARE FOUND)
SHOP BUTT WELDS	RADIOGRAPHIC OR ULTRASONIC	100
FIELD BUTT WELDS	RADIOGRAPHIC OR ULTRASONIC	100

- WELDS IN PERMANENT BUILDING WORKS
 - EXTENT OF NON–DESTRUCTIVE WELD TESTING:

TYPE OF WELD	EXAMINATION METHOD	EXTENT (% TOTAL WELD LENGTH) (SEE ALSO NOTE (j) BELOW)
ALL WELDS	VISUAL SCANNING	100
ALL WELDS	VISUAL EXAMINATION	10 FOR GP WELDS/25 FOR SP WELDS
SHOP FILLET WELDS	MAGNETIC PARTICLE	2 FOR GP WELDS/10 FOR SP WELDS
FIELD FILLET WELDS	MAGNETIC PARTICLE	25 (100 IF DEFECTS ARE FOUND)
SHOP BUTT WELDS	RADIOGRAPHIC OR ULTRASONIC	2 FOR GP WELDS/10 FOR SP WELDS
FIELD BUTT WELDS	RADIOGRAPHIC OR ULTRASONIC	100

- ALL DEFECTS TO BE REPAIRED IN ACCORDANCE WITH AS 1554.1
- ALL TESTS TO BE PERFORMED BY A NATA (OR SIMILAR APPROVED) TESTING COMPANY.
- WHERE THE EXTENT OF THE WELDING TO BE EXAMINED IS SPECIFIED TO BE LESS THAN 100%, THE NOMINATED PERCENTAGE OF WELD TYPE TO BE EXAMINED SHALL BE SELECTED TO ENSURE THAT A REPRESENTATIVE SAMPLE OF EACH WELD TYPE AND LOCATION IS EXAMINED.
- FOR CONNECTED PLATES WITH A THICKNESS GREATER THAN 20mm A PORTION OF EACH MULTI–PASS BUTT WELD SHOULD BE EXAMINED ULTRASONICALLY TO DETERMINE WHETHER THERE ARE ANY TRANSVERSE CRACKS IN THE WELD MATERIAL
- IF DEFECTS ARE FOUND IN THE WELDS THEN 100% OF THE WELDS ARE TO BE TESTED.
- CORROSION PROTECTION
 - STEELWORK:
 - CORROSION PROTECTION SHALL COMPLY WITH AS/NZS 2312.1 FOR PAINTED STRUCTURES & AS2312.2 FOR GALVANISED STRUCTURES.
 - DESIGN LIFE OF STRUCTURE = 50 YEARS
 - DURABILITY (COATING LIFE TO FIRST MAJOR MAINTENANCE = 10 YEARS
 - ATMOSPHERIC CORROSIVITY CATEGORY = MEDIUM
 - ALL BOLTS TO BE SUPPLIED WITH GALVANISED FINISH TO AS1214
 - THE BUILDING OWNER SHALL UNDERTAKE ALL NECESSARY CLEANING, MAINTENANCE AND REPAIR OF APPLIED COATINGS TO ENSURE ALL COATINGS AND PROTECTED STEELWORK REACH THEIR STATED DESIGN LIFE.
- CORROSION SYSTEM REQUIRED:

DESCRIPTION	SYSTEM DESIGNATION	SURFACE PREPARATION	FIRST COAT DRY THICKNESS (µm)	PRN	SECOND COAT DRY THICKNESS (µm)	PRN	TOTAL DRY FILM THICKNESS (µm)
–	–	–	–	–	–	–	–

- BOLTS, NUTS, WASHERS ETC
 - ALL BOLTS, NUTS, WASHERS, CAST-IN FERRULES AND HOLDING DOWN BOLTS ARE TO BE HOT DIP GALVANISED TO AS1214 AND AS1650 UNLESS NOTED OTHERWISE. ALL MASONRY ANCHORS TO BE HOT DIP GALVANISED.
- FIRE PROTECTION PROVIDE FIRE PROTECTION TO STRUCTURAL STEEL AS REQUIRED BY THE SPECIFICATION AND ARCHITECT

STEELWORK NOTES CONTINUED

COLD FORMED STEEL

- COLD FORMED STEEL MATERIAL, FABRICATION AND ERECTION SHALL CONFORM TO AS/NZS 4600
- COLD FORMED SECTIONS SHALL BE WELDED WHERE REQUIRED WITH A 2mm CONTINUOUS FILLET WELD UNO.
- ALL WELDS SHALL BE TOUCHED UP WITH AN APPROVED ZINC RICH PRIMER.

PURLINS AND GIRTS

- PURLINS AND GIRTS TO BE GRADE 450MPa (GALVANISED STEEL TO AS2312.2 Z350 ZINC COATING)
- ALL PURLIN AND GIRT DETAILS SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATION.
- SERVICES SUPPORTED BY PURLINS MUST BE CONNECTED TO THE PURLIN WEB.
- LAP ALL Z SECTION PURLINS AND GIRTS THE GREATER OF 15% OF THE SPAN OR 900mm.
- BOLTING OF 100 TO 250 SERIES PURLINS AND GIRTS TO USE M12 GRADE 4.6 BOLTS. BOLTING OF SERIES 300 TO SERIES PURLINS AND GIRTS TO USE M16 GRADE 4.6 BOLTS. GRADE 8.8 BOLTS TO BE ADOPTED AS SPECIFICALLY NOTED ON PURLIN PLAN OR GIRT ELEVATIONS.

MISCELLANEOUS STEELWORK

- THE CONTRACTOR SHALL ALLOW FOR ALL MISCELLANEOUS STEELWORK TO SUPPORT AND TRIM ELEMENTS SUCH AS GUTTERS, ROOF AND WALL CLADDINGS AT PENETRATIONS, ROOF HIPS AND VALLEYS AND DECORATIVE FEATURES.

CERTIFICATION

- TEST CERTIFICATES SHALL BE PROVIDED FOR ALL STEEL MEMBERS AND MUST BE IN ENGLISH AND ALPHA NUMERIC CHARACTERS.
- STRUCTURAL STEEL CERTIFICATION: THE TEST CERTIFICATION SHALL COMPLY WITH AS 1554.1, AS/NZS 1163, AS/NZS 1594 AND AS/NZS 3679 AND MUST CONTAIN ALL THE FOLLOWING ITEMS:
 - MANUFACTURER'S, SUPPLIER'S AND TESTING AUTHORITY'S NAME.
 - TEST CERTIFICATE NUMBER, TEST NUMBER AND DATE
 - ROLLED IN MARK OR PAINT MARKINGS ON STEEL PRODUCTS TO IDENTIFY THE MILL WITH MATCHING CERTIFICATES
 - PRODUCT, TESTING SPECIFICATION AND GRADE, E.G. AS/NZS 3679.1–350
 - PRODUCT DELIVERY CONDITION
 - PRODUCT DESIGNATION E.G. 430UB82.0 OR PRODUCT SIZE AND DIMENSION E.G. 200x100x5.0 RHS
 - PRODUCT STEEL MAKING PROCESS, E.G. BASIC OXYGEN SLAB CAST
 - LENGTH, BUNDLE, PACK OR UNIQUE IDENTIFIER TO WHICH THE TEST CERTIFICATE APPLIES
 - HEAT NUMBER
 - MECHANICAL PROPERTIES

TENSILE TESTS: YIELD STRESS (MPa)	TENSILE STRENGTH (MPa)	% ELONGATION
--------------------------------------	---------------------------	--------------

- CHEMICAL ANALYSIS TYPE, E.G. CAST ANALYSIS 'L' OR PRODUCT 'P'
- CHEMICAL COMPOSITION OF ALL THE FOLLOWING LISTED IN TABLE BELOW

CARBON (C)	PHOSPHOROUS (P)	MANGANESE (Mn)
SILICON (Si)	SULPHUR (s)	CHROMIUM (Cr)
MOLYBDENUM (Mo)	VANADIUM (V)	NICKEL (Ni)
TITANIUM (Ti)	NIOBIUM (Nb)	COPPER (Cu)
ALUMINIUM (Al)	CARBON EQUIVALENCE (CE)	ANY ELEMENT INTENTIONALLY ADDED

- NDT TEST RESULTS
- STATEMENT ACKNOWLEDGING MATERIAL BEING SUPPLIED IN ACCORDANCE TO THE RELEVANT STANDARD
- A THIRD PARTY ACCREDITING BODY RECOGNIZED BY ILAC (MRA) E.G. NATA ACCREDITED LABORATORY
- SIGNATORY FROM MANUFACTURER, SUPPLIER AND TESTING AUTHORITY ATTESTING TO ITEMS ABOVE
- BOLT CERTIFICATION
 - MANUFACTURER'S COMPLIANCE/ TEST CERTIFICATE FROM AN ACCREDITED TESTING ORGANIZATION CONFIRMING COMPLIANCE WITH AS/NZS 1252
 - AN INDEPENDENT COMPLIANCE CERTIFICATE BASED ON APPROPRIATE TESTING AND VERIFICATION BY A LOCAL NATA ACCREDITED LABORATORY FOR BOLTS MANUFACTURED FROM OUTSIDE AUSTRALIA
 - HIGH STRENGTH BOLTS: ALL HIGH STRENGTH BOLTS MUST BE ACCOMPANIED BY A CORRECT CERTIFICATE OF COMPLIANCE TO AS/NZS 1252 AND MUST CONTAIN AT LEAST THE FOLLOWING INFORMATION:
 - IDENTIFICATION AND ADDRESS OF SUPPLIER
 - IDENTIFICATION AND ADDRESS OF THE TEST LABORATORY AND ACCREDITATION SEALS OF THE TEST LABORATORY
 - DATE OF ISSUE AND PAGE NUMBER ON EACH PAGE
 - TEST CERTIFICATE NUMBER
 - BATCH OR HEAT IDENTIFICATION NUMBER
 - PRODUCT IDENTIFICATION
 - CUSTOMER PURCHASE ORDER TO MATCH THE BATCH OR HEAT NUMBERS
 - ANY OTHER SYSTEM REFERENCE NUMBER
 - STATEMENT OF COMPLIANCE REFERRING TO A DEFINITE RELEVANT AUSTRALIAN STANDARD
 - SIGNATORY FROM MANUFACTURER, SUPPLIER AND TESTING AUTHORITY AT TESTING TO ITEMS ABOVE

ERECTION

- THE STRUCTURAL ENGINEER HAS DESIGNED THE WORKS TO BE STABLE ON COMPLETION OF ALL STRUCTURAL ELEMENTS OF THE WORKS, INCLUDING MEMBERS, CONNECTIONS, SUPPORTING STRUCTURAL ELEMENTS, BRACING ELEMENTS AND THE LIKE. THE CONTRACTOR AND/OR HIS SUBCONTRACTORS ARE RESPONSIBLE FOR ENGAGING A TEMPORARY WORKS ENGINEER TO ADVISE ON, AND CERTIFY THE TEMPORARY STABILITY AND SUPPORT (BOTH VERTICALLY AND LaterALLY) OF ALL STEELWORK DURING CONSTRUCTION/ERECTION, INCLUDING DEVELOPING ERECTION METHODOLOGIES FOR SAME, UNTIL FULL ERECTION OF ALL STRUCTURAL ELEMENTS OF THE WORKS IS COMPLETED.THE TEMPORARY WORKS ENGINEER SHALL ENSURE THAT THE METHODOLOGY AND ERECTION SEQUENCE DOES NOT RESULT IN ADVERSE LOCKED IN STRESSES, OR THE TEMPORARY OVER–STRESSING OF ANY ELEMENTS.

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Title
**CONSTRUCTION NOTES
SHEET 3 OF 3**

Project
**VCA POLICE STABLES
REDEVELOPMENT
SOUTH BANK**

APPROVED FOR CONSTRUCTION

Date DEC. 2015	Designer M.SUSOY	Design Checker Z. ZAMAN
Scale at A1	Drawn C.BEAIRE	Principal/Project Leader B. ONSLOW
Job Number 15039	Drawing Number S0–03	Revision C1

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NEW FLOORING TO BE 25mm F17 PLYWOOD
LOAD BEARING WALLS (LBW) 140 x 45 MGP10 AT 450 CTS-2 ROWS OF NOGGINs

STEELWORK SCHEDULE		
COLUMNS		
MARK	SIZE	REMARKS
GC1	150 UC 23	16 BASE PL 2M20 HD BOLTS
SC1	FABRICATED SECTION 300 O/A	REFER DWG S02-03
SSC1	89 x 89 x 6.0 SHS	
GBC1	150 x 50 x 5.0 RHS	
PSC1-PSC4	150 x 150 x 12 PL +	REFER ARCH. DWG FOR ADDITIONAL NON-STRUCTURAL MEMBERS
BEAMS		
MARK	SIZE	REMARKS
GB1	200 UC 60	10 END PL 4M16 8.8/S BOLTS EACH END
GB2	150 UC 37	10 PL CLEAT 2M20 8.8/S BOLTS EACH END
GB3,GB4	150 UC 37	10 PL CLEAT 2M20 8.8/S BOLTS EACH END
GB5,GB6	200 UB 30	10 PL CLEAT 2M20 8.8/S BOLTS EACH END
TR1	150 x 50 x 5.0 RHS	WINDOW TRANSOM WELDED TO NOGGINs GBC1
SR4	STAIR STRINGER	20 PL x 250
SR5	STAIR STRINGER	20 PL x 250
BRACING		
MARK	SIZE	REMARKS
BR1	20 DIAM ROD	THREADED END WITH "D" WASHERS FOR TENSIONING
ST1	114.3# x 6.0 CHS	10 PL CLEAT 2M20 8.8/S BOLTS EACH END
VBS (2400 LNG)	METAL STRAP-1.5 kN/m	VERTICAL STRAP WALL BRACING FIXED TO MANUFACT. DETAILS
VBS1 (1800 LNG)	METAL STRAP-1.5 kN/m	VERTICAL STRAP WALL BRACING FIXED TO MANUFACT. DETAILS
FLOORING		
MARK	SIZE	REMARKS
FJ1	JOISTS	190 x 45 MGP10-450 CTS
FJ2	JOISTS	90 x 45 MGP10-450 CTS
FJ3	JOISTS	190 x 45 MGP12-450 CTS
FB1	BEARERS	

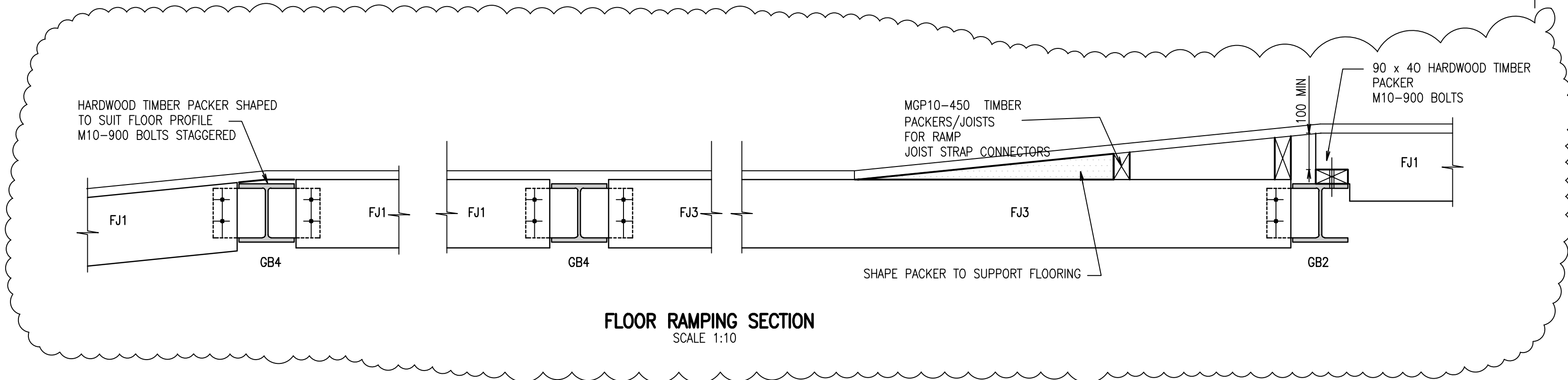
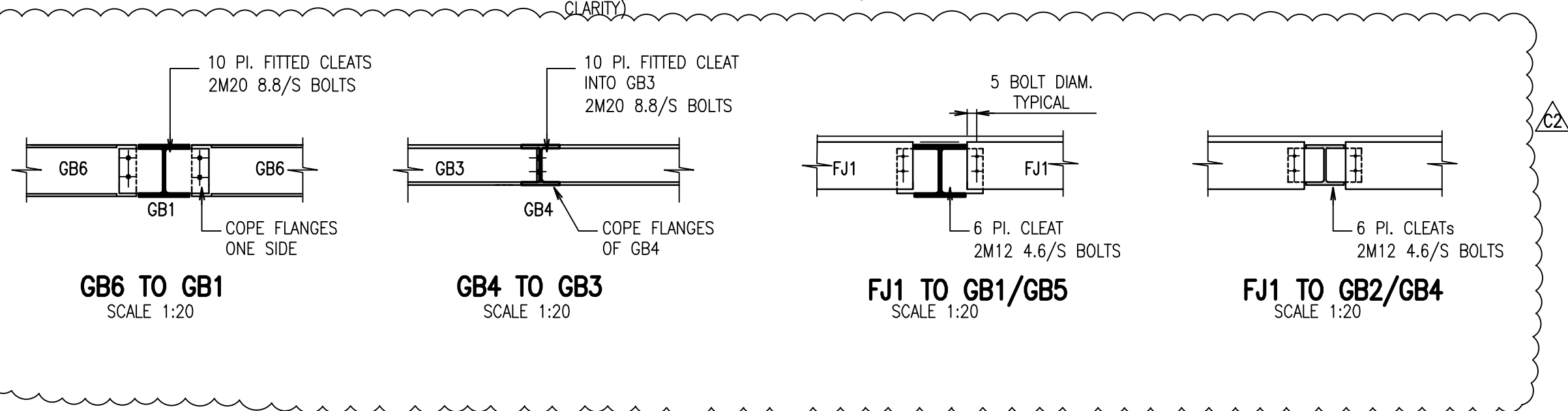
STAIR FRAMING MEMBER SCHEDULE

SR1	12 PL x 250 D
SR2	12 PL x 150 D
SR3	16 PL x 250 D
LA	65 x 65 x 6 EA

GROUND LEVEL -RAISED FLOOR- GENERAL ARRANGEMENT PLAN

SCALE 1:100

NOTE:
REFER TO S01-07 FOR SLAB ON GROUND DETAILS
REFER TO S01-05 FOR FOOTINGS UNDER. (NOT SHOWN FOR
CLARITY)



CONCRETE NOTES:

-REFER NOTES ON COVER SHEET.
-MIN. CONC. STRENGTH AT 28 DAYS.

LOCATION	f'c
PAD FOOTINGS	32
FOOTING BEAMS	32
SLAB ON GROUND	32

-CONCRETE COVER

LOCATION	COVER
PAD FOOTINGS	55
FOOTING BEAMS	55
SLAB ON GROUND	35 TOP

DESIGN LOADS:

-THESE ARE UNFACTORED LOADS (kPa)

LOCATION	DESIGN VALUE	
	LL	SIDL
GROUND FLOOR	5.0	0.5
STAIR	4.0	

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P5	CO-ORDINATION ISSUE	CB	BO	26.05.16					
T1	TENDER ISSUE ONLY	CB	BO	30.03.16					
P4	PRETENDER REVIEW	CB	BO	10.03.16					
P3	CO-ORDINATION ISSUE	CB	BO	16.02.16					
P2	CO-ORDINATION ISSUE	CB	BO	18.12.15	C2	BEAMS AMENDED IN CLOUD	CB	BO	03.02.17
P1	COST PLAN ISSUE	CB	BO	09.12.15	C1	CONSTRUCTION ISSUE	CB	BO	17.11.16

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Client

THE UNIVERSITY OF MELBOURNE

Title

GROUND FLOOR
GENERAL ARRANGEMENT PLAN
SHEET 1

Project

VCA POLICE STABLES
REDEVELOPMENT
SOUTH BANK

APPROVED FOR CONSTRUCTION

Date DEC. 2015	Designer M.SUSOY	Design Checker Z. ZAMAN
Scale at A1 1:100,1:20	Drawn C.BEARE	Principal/Project Leader B. ONSLOW
Job Number 15039	Drawing Number S01-01	Revision C2

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Rev.	Revision Description	By.	App.	Date	Rev.	Revision Description	By.	App.	Date
A1	CERTIFICATION/APPROVAL	CB	BO	12.10.16					
T2	TENDER ISSUE ONLY	CB	BO	29.07.16					
P6	QS REVIEW	CB	BO	08.07.16					
P5	CO-ORDINATION ISSUE	CB	BO	26.05.16					
T1	TENDER ISSUE ONLY	CB	BO	30.03.16					
P4	CO-ORDINATION ISSUE	CB	BO	16.02.16					
P3	CO-ORDINATION ISSUE	CB	BO	01.02.16					
P2	COST PLAN ISSUE	CB	BO	18.12.15	C2	AMENDED IN CLOUDS	CB	BO	03.02.17
P1	COST PLAN ISSUE	CB	BO	09.12.15	C1	CONSTRUCTION ISSUE	CB	BO	17.11.16

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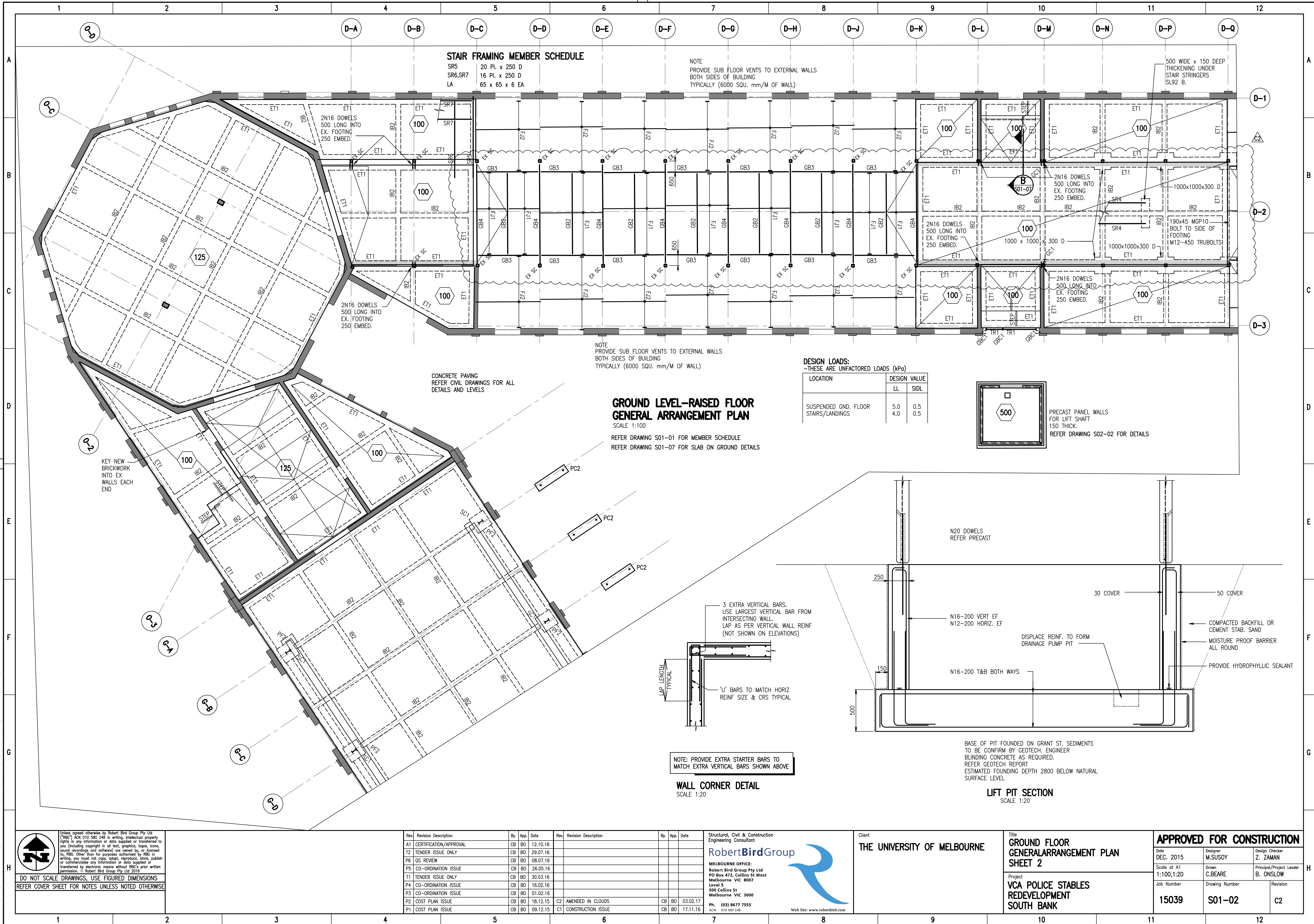
GROUND FLOOR
GENERALARRANGEMENT PLAN
SHEET 2

Project

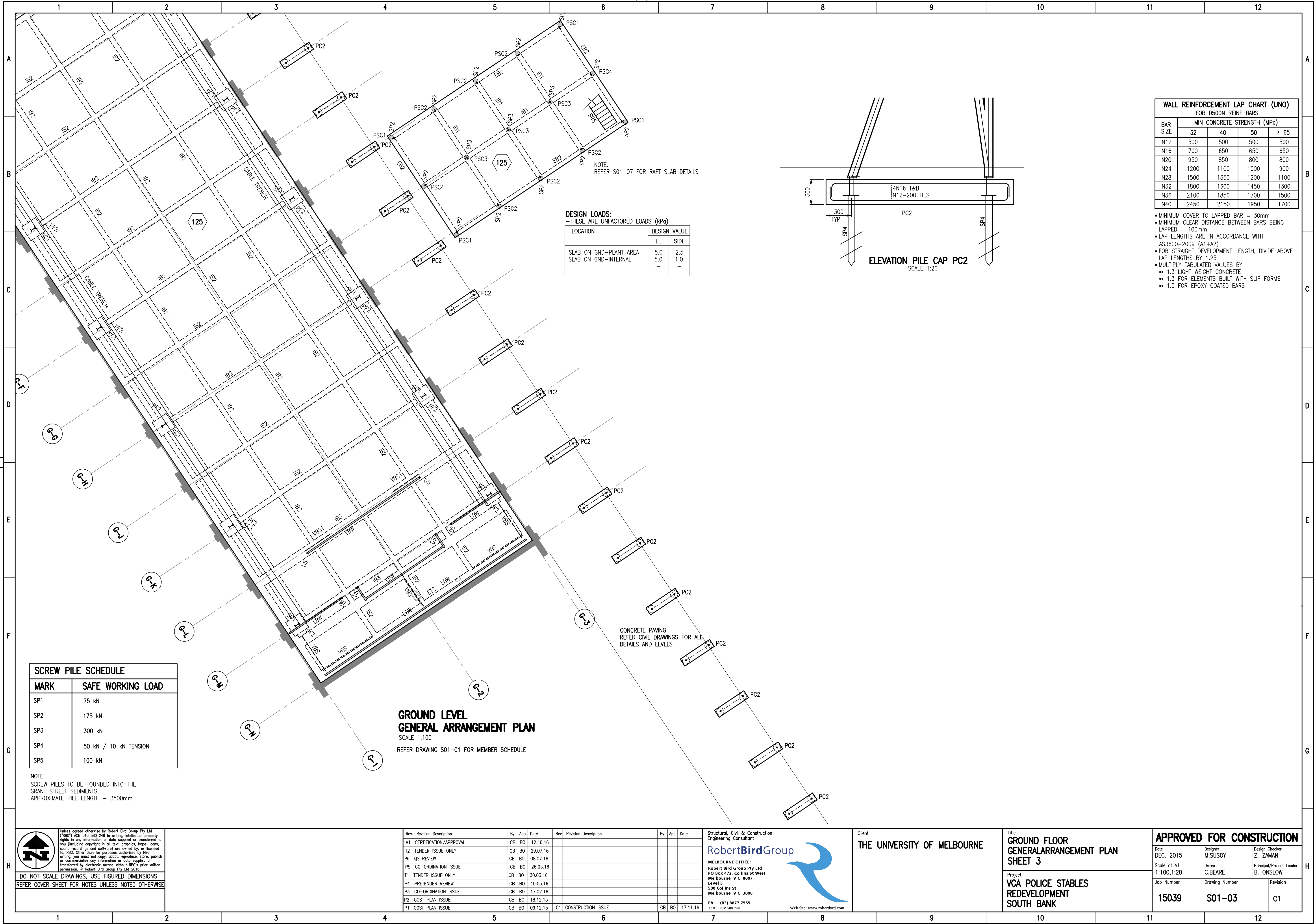
VCA POLICE STABLES
REDEVELOPMENT
SOUTH BANK

APPROVED FOR CONSTRUCTION

Date DEC. 2015	Designer M.SUSOY	Design Checker Z. ZAMAN
Scale at A1 1:100,1:20	Drawn C.BEAIRE	Principal/Project Leader B. ONSLOW
Job Number 15039	Drawing Number S01-02	Revision C2



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SCREW PILE SCHEDULE	
MARK	SAFE WORKING LOAD
SP1	75 kN
SP2	175 kN
SP3	300 kN
SP4	50 kN / 10 kN TENSION
SP5	100 kN

NOTE:
SCREW PILES TO BE FOUNDED INTO THE
GRANT STREET SEDIMENTS.
APPROXIMATE PILE LENGTH - 3500mm



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GROUND LEVEL GENERAL ARRANGEMENT PLAN

SCALE 1:100
REFER DRAWING S01-01 FOR MEMBER SCHEDULE

Rev.	Revision Description	By.	App.	Date	Rev.	Revision Description	By.	App.	Date
A1	CERTIFICATION/APPROVAL	CB	BO	12.10.16					
T2	TENDER ISSUE ONLY	CB	BO	29.07.16					
P8	QS REVIEW	CB	BO	08.07.16					
P5	CO-ORDINATION ISSUE	CB	BO	26.05.16					
T1	TENDER ISSUE ONLY	CB	BO	30.03.16					
P4	PRETENDER REVIEW	CB	BO	10.03.16					
P3	CO-ORDINATION ISSUE	CB	BO	17.02.16					
P2	COST PLAN ISSUE	CB	BO	18.12.15					
P1	COST PLAN ISSUE	CB	BO	09.12.15	C1	CONSTRUCTION ISSUE	CB	BO	17.11.16

Structural, Civil & Construction
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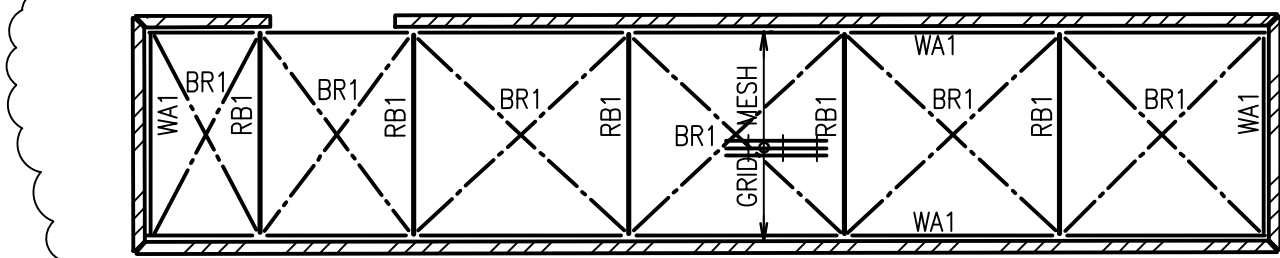
Client
THE UNIVERSITY OF MELBOURNE

Title
**GROUND FLOOR
GENERALARRANGEMENT PLAN
SHEET 3**

Project
**VCA POLICE STABLES
REDEVELOPMENT
SOUTH BANK**

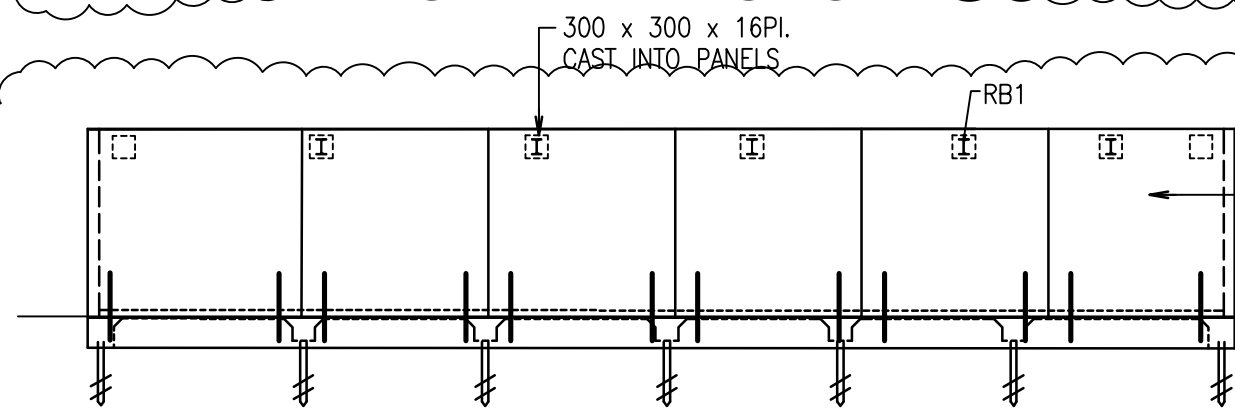
APPROVED FOR CONSTRUCTION			
Date DEC. 2015	Designer M.SUSOY	Design Checker Z. ZAMAN	
Scale at A1 1:100,1:20	Drawn C.BEAIRE	Principal/Project Leader B. ONSLOW	
Job Number 15039	Drawing Number S01-03	Revision C1	

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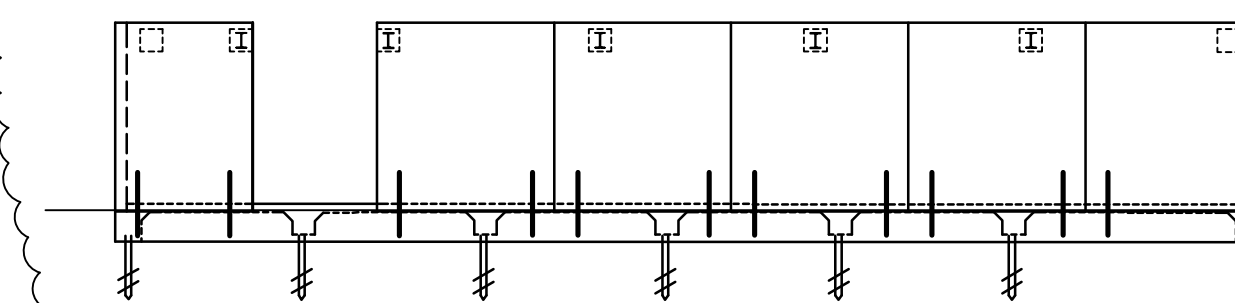
GENERAL ARRANGEMENT PLAN

SCALE 1:100
REFER DRAWING S02-01 FOR STEELWORK MEMBER SCHEDULE
REFER DRAWING S01-05 FOR FOOTING GENERAL ARRANGEMENT PLAN



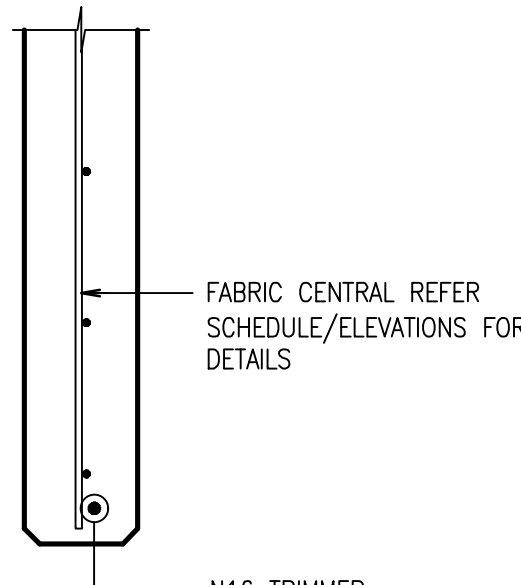
SIDE WALL ELEVATION

SCALE 1:100



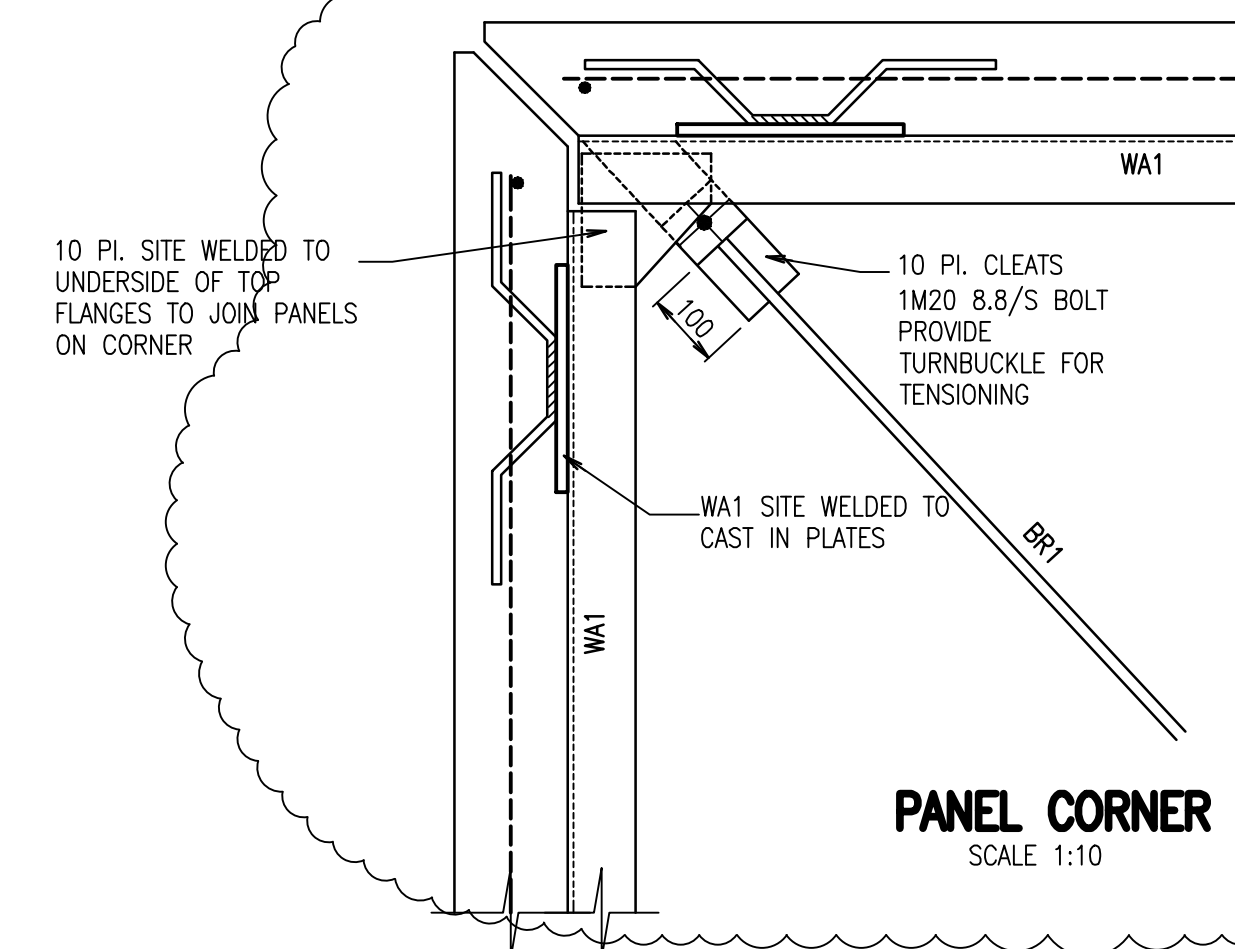
SIDE WALL ELEVATION

SCALE 1:100



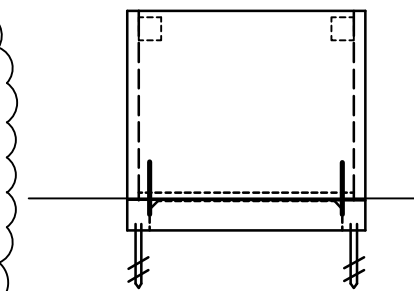
TYPICAL SECTION 150 THK PANEL

SCALE 1:10



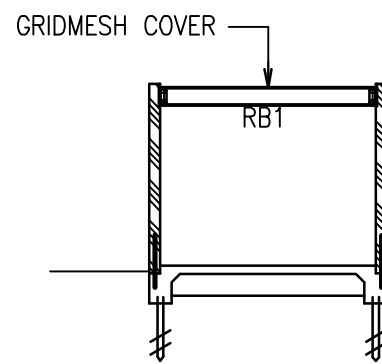
PANEL CORNER DETAIL

SCALE 1:10



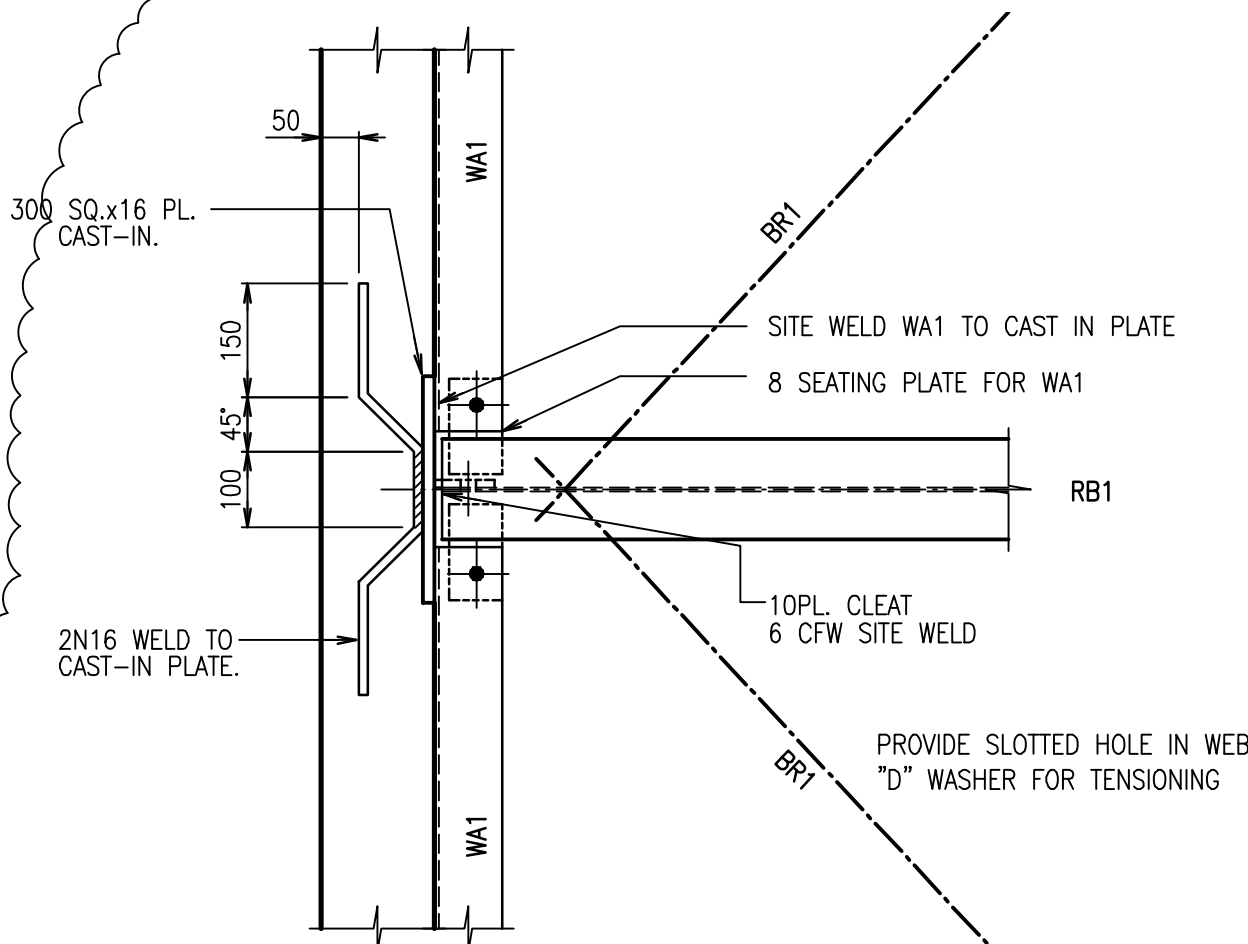
END WALL ELEVATION

SCALE 1:100



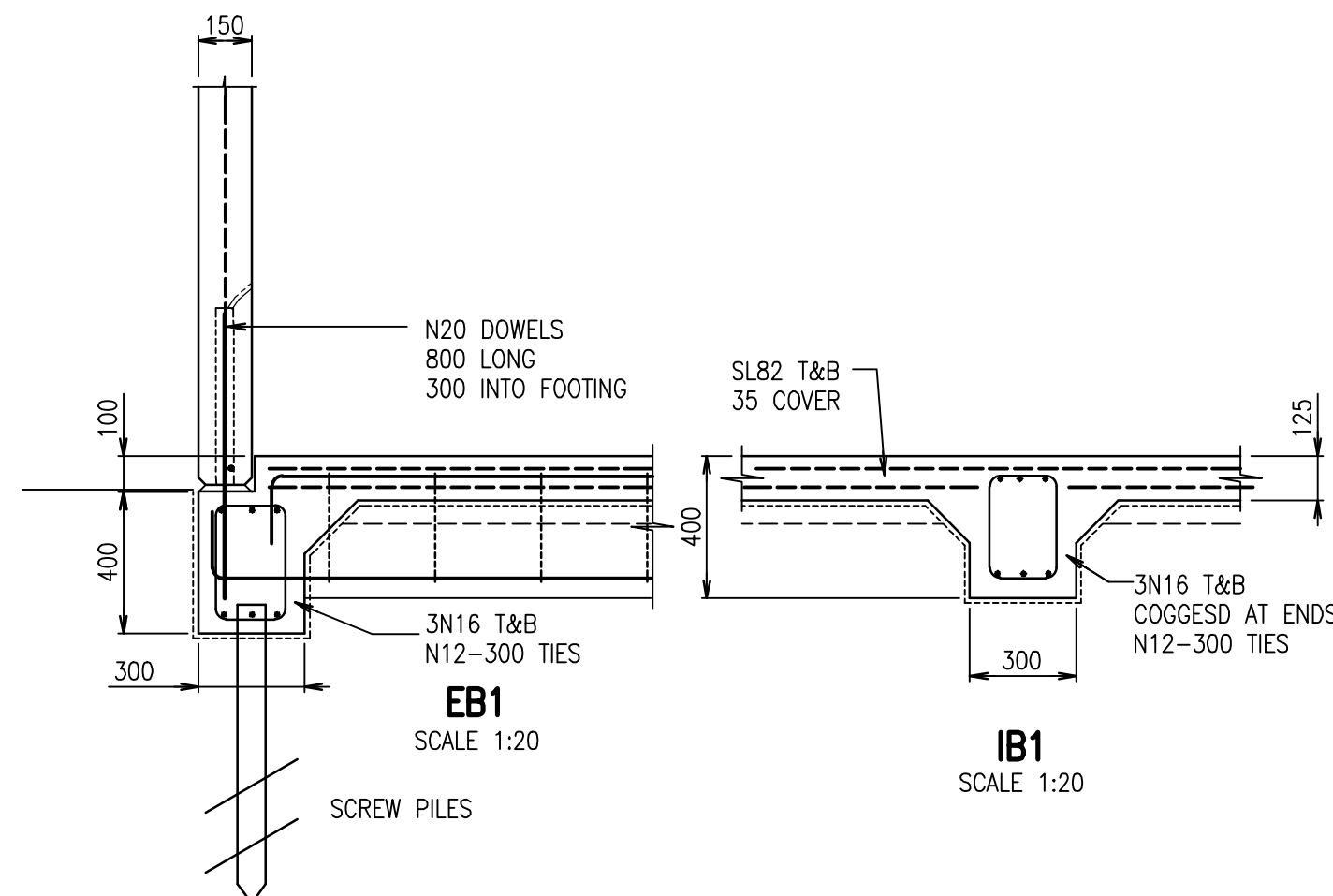
SECTION

SCALE 1:100



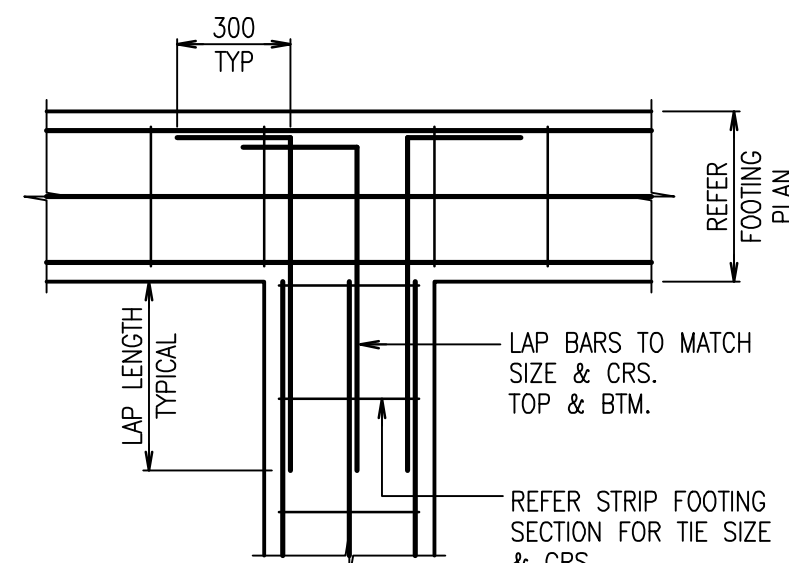
DETAIL RB1 TO PANEL

SCALE 1:10



90 DEGREES STRIP FOOTING CORNER DETAIL

SCALE 1:20



STRIP FOOTING T-INTERSECTION DETAIL

SCALE 1:20

DESIGN LOADS:

-THESE ARE UNFACTORED LOADS (kPa)

LOCATION	DESIGN VALUE	
	LL	SIDL
FIRST FLOOR	5.0	0.5
ROOF	0.25	-
PLANT PLATFORM	5.0	1.0

CONCRETE NOTES:

-REFER NOTES ON COVER SHEET.
-MIN. CONC. STRENGTH AT 28 DAYS.

LOCATION	f'c
FOOTINGS & SLAB	32
PRECAST WALLS	N40

-CONCRETE COVER

LOCATION	COVER
FOOTINGS	50
SLAB ON GROUND	35 T&B
PRECAST PANELS	CENTRAL-50 MIN

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Rev.	Revision Description	By.	App.	Date	Rev.	Revision Description	By.	App.	Date
C2	CONSTRUCTION ISSUE	CB	BO	25.01.17					
C1	CONSTRUCTION ISSUE	CB	BO	17.11.16					
A1	CERTIFICATION/APPROVAL	CB	BO	12.10.16					
T2	TENDER ISSUE ONLY	CB	BO	29.07.16					
P3	CO-ORDINATION ISSUE	CB	BO	26.05.16					
T1	TENDER ISSUE ONLY	CB	BO	30.03.16					
P2	PRETENDER REVIEW	CB	BO	10.03.16					
P1	CO-ORDINATION ISSUE	CB	BO	16.02.16					

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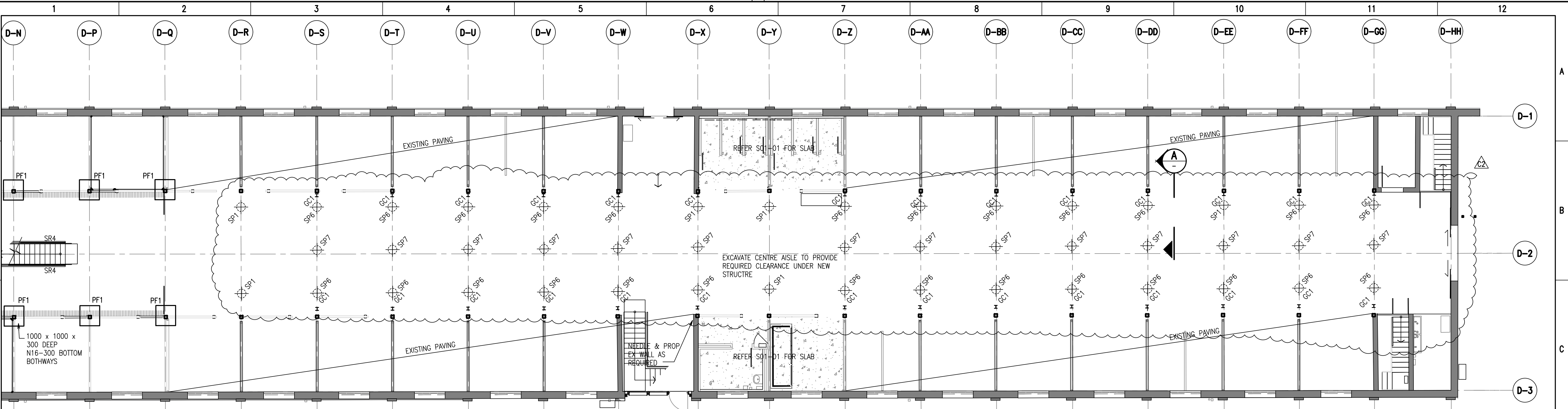
Title
**GROUND LEVEL PLANT AREA
GENERAL ARRANGEMENT PLAN
& DETAILS**

Project
**VCA POLICE STABLES
REDEVELOPMENT
SOUTH BANK**

APPROVED FOR CONSTRUCTION

Date DEC. 2015	Designer M.SUSOY	Design Checker Z. ZAMAN
Scale at A1 1:100,1:20	Drawn C.BEAIRE	Principal/Project Leader B. ONSLOW
Job Number 15039	Drawing Number S01-04	Revision C2

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**FOOTING
GENERAL ARRANGEMENT PLAN**

SCALE 1:100
REFER S01-06 FOR PC1 INSTALLATION PROCEDURE

CONCRETE NOTES:
-REFER NOTES ON COVER SHEET.
-MIN. CONC. STRENGTH AT 28 DAYS.

LOCATION	f'c
PAD FOOTINGS	32
FOOTING BEAMS	32
SLAB ON GROUND	32
EXTERNAL SLAB	40

-CONCRETE COVER

LOCATION	COVER
BORED PIERS	55
FOOTING BEAMS	55
SLAB ON GROUND	35 TOP

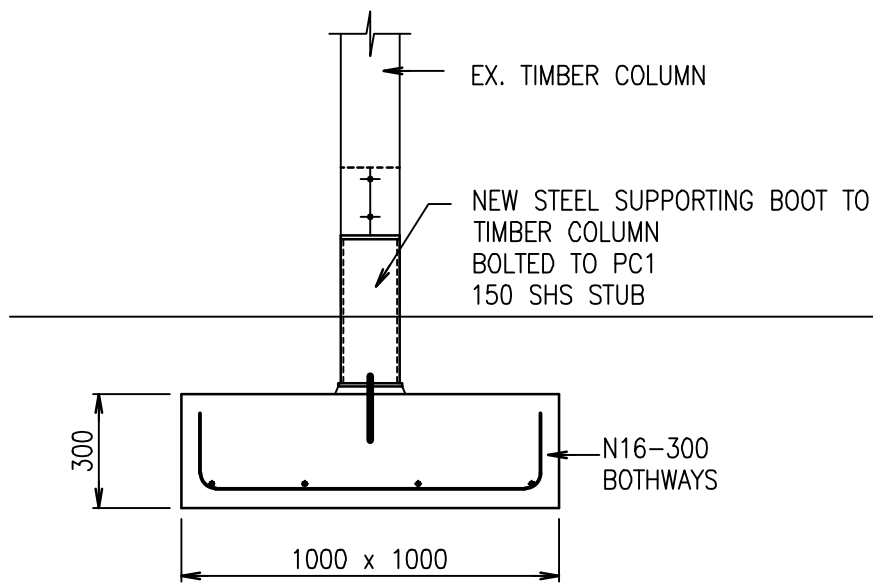
DESIGN LOADS:
-THESE ARE UNFACTORED LOADS (kPa)

LOCATION	DESIGN VALUE	
	LL	SIDL
GROUND FLOOR	5.0	0.5

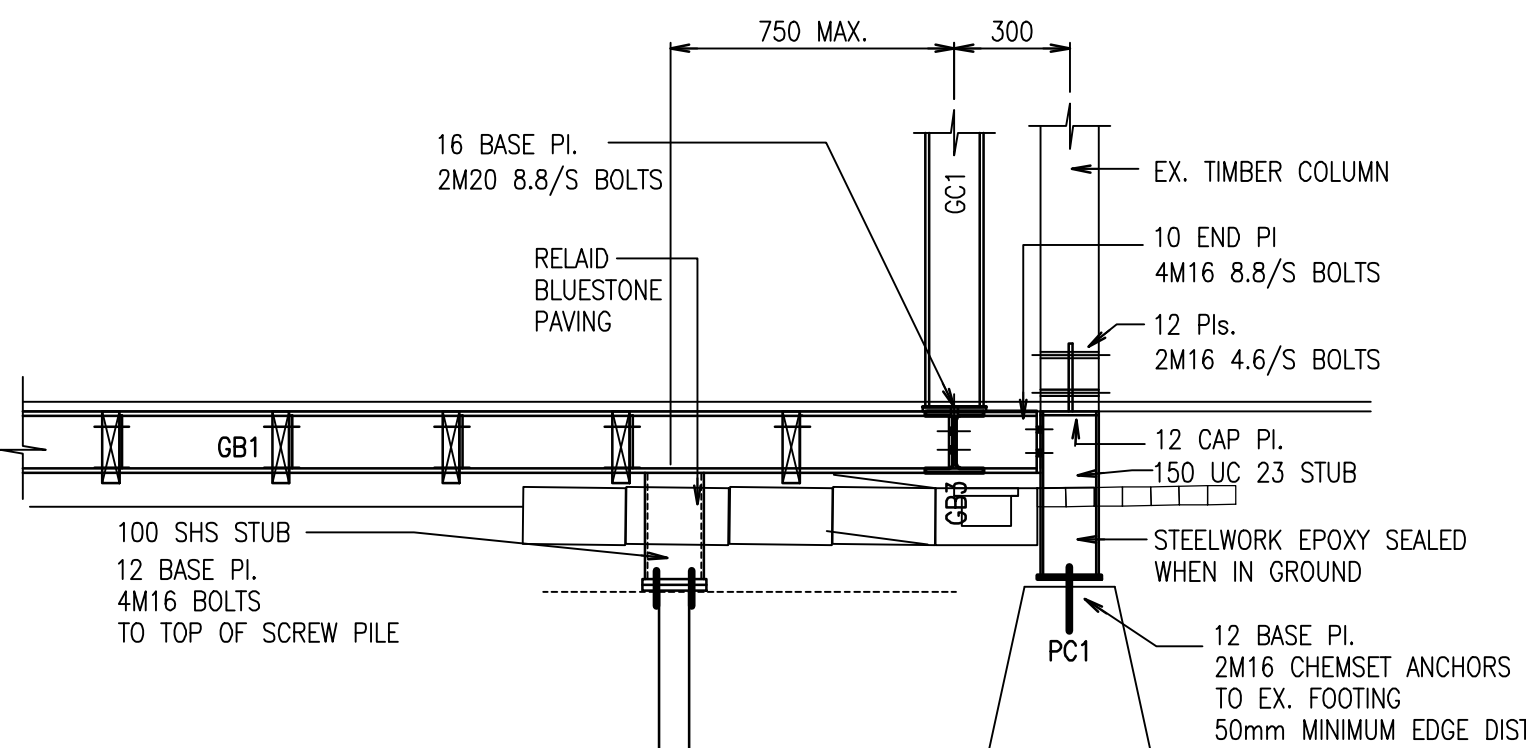
SCREW PILE SCHEDULE

MARK	SAFE WORKING LOAD
SP1	75 kN
SP2	175 kN
SP3	300 kN
SP4	50 kN / 10 kN TENSION
SP5	100 kN
SP6	200 kN
SP7	20 kN / 110kN TENSION

NOTE:
SCREW PILES TO BE FOUNDED INTO THE
GRANT STREET SEDIMENTS.
DEPTH TO BE CONFIRM BY PILING CONTRACTOR



DETAIL PAD FOOTING PF1
SCALE 1:20



SECTION A
SCALE 1:20
DETAIL GB1 TO SCREW PILE SP6
SCALE 1:20



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Rev.	Revision Description	By.	App.	Date
C2	AMENDED WITHIN THE CLOUD	CB	BO	03.02.17
C1	CONSTRUCTION ISSUE	CB	BO	17.11.16
A1	CERTIFICATION/APPROVAL	CB	BO	12.10.16
T2	TENDER ISSUE ONLY	CB	BO	29.06.16
P2	CO-ORDINATION ISSUE	CB	BO	26.05.16
T1	TENDER ISSUE ONLY	CB	BO	30.03.16
P1	PRETENDER REVIEW	CB	BO	10.03.16

Rev.	Revision Description	By.	App.	Date

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Client

THE UNIVERSITY OF MELBOURNE

Title
**FOOTING
GENERALARRANGEMENT PLAN
SHEET 1**

Project
**VCA POLICE STABLES
REDEVELOPMENT
SOUTH BANK**

FOR APPROVAL NOT FOR CONSTRUCTION

Date DEC. 2015	Designer M.SUSOY	Design Checker Z. ZAMAN
Scale at A1 1:100,1:20	Drawn C.BEARE	Principal/Project Leader B. ONSLOW

Job Number 15039	Drawing Number S01-05	Revision C2
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Rev.	Revision Description	By.	App.	Date	Rev.	Revision Description	By.	App.	Date
C2	AMENDED WITHIN CLOUD	CB	BO	03.02.17					
C1	CONSTRUCTION ISSUE	CB	BO	17.11.16					
A1	CERTIFICATION/APPROVAL	CB	BO	12.10.16					
T2	TENDER ISSUE ONLY	CB	BO	29.06.16					
P2	CO-ORDINATION ISSUE	CB	BO	26.05.16					
T1	TENDER ISSUE ONLY	CB	BO	30.03.16					
P1	PRETENDER REVIEW	CB	BO	10.03.16					

Rev.	Revision Description	By.	App.	Date	Rev.	Revision Description	By.	App.	Date

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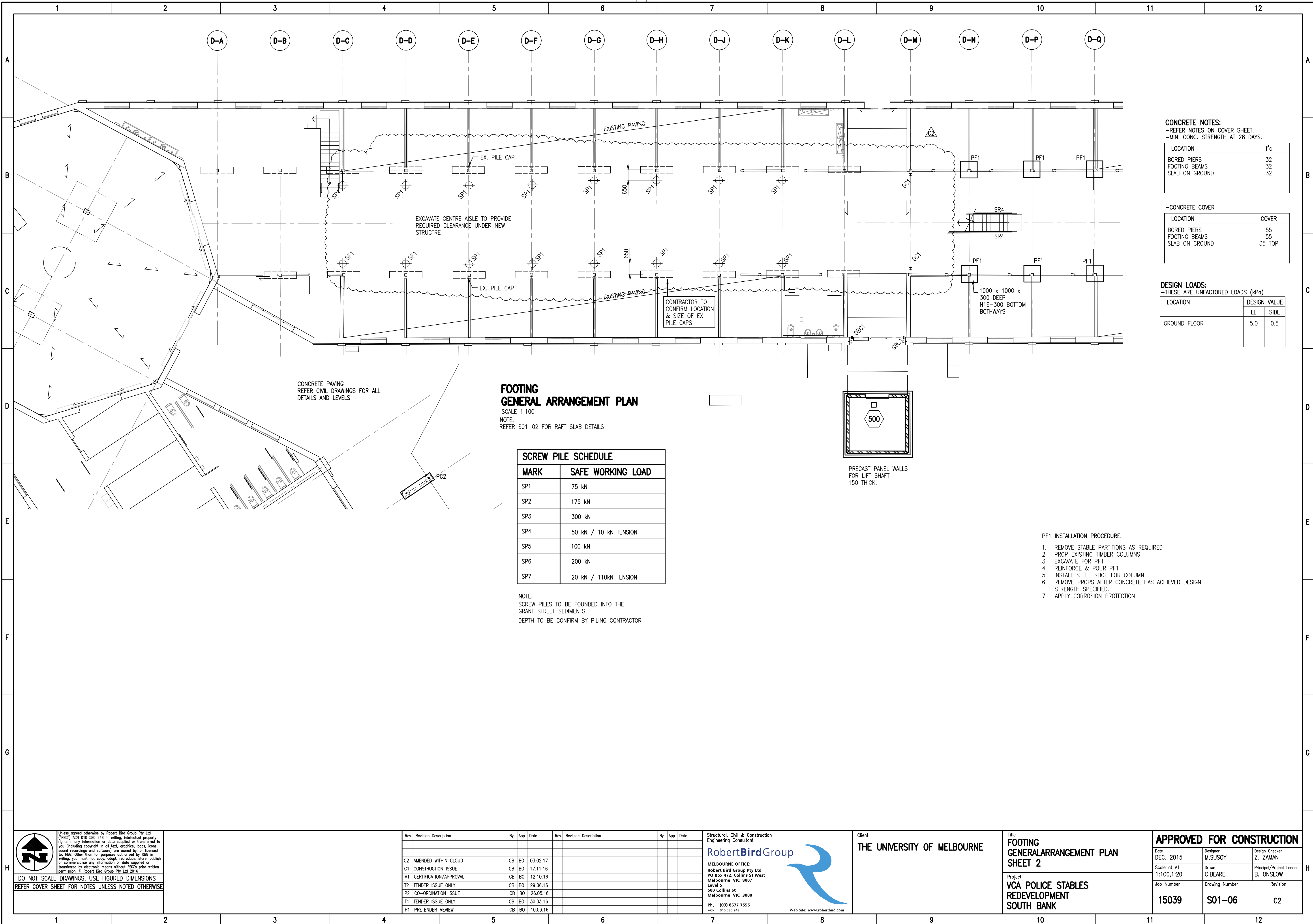
FOOTING
GENERALARRANGEMENT PLAN
SHEET 2

Project

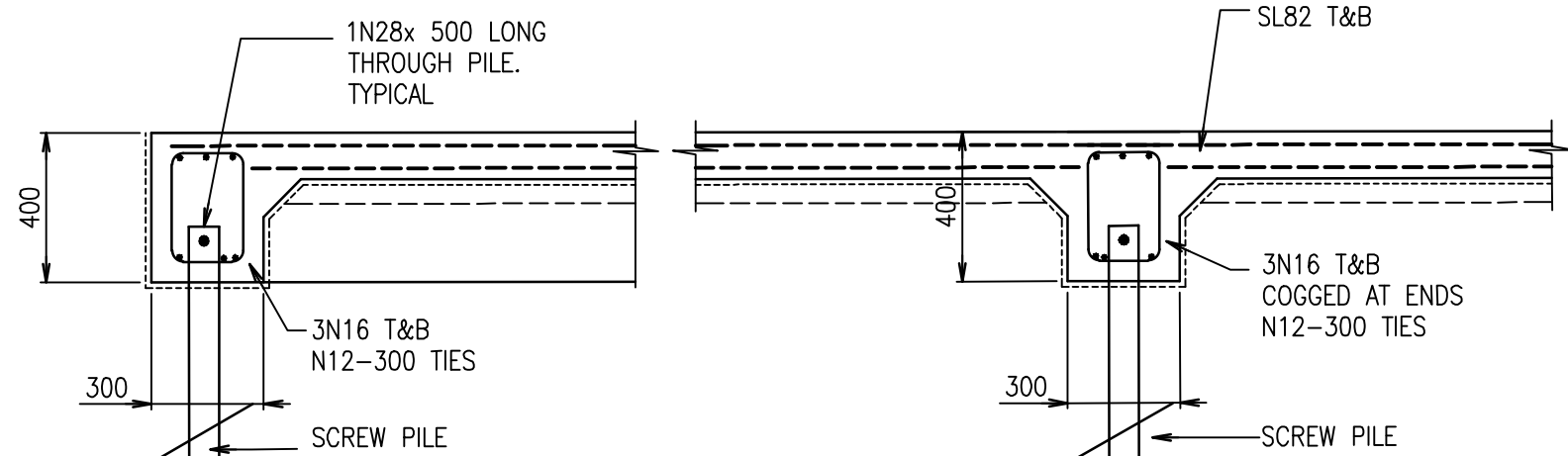
VCA POLICE STABLES
REDEVELOPMENT
SOUTH BANK

APPROVED FOR CONSTRUCTION

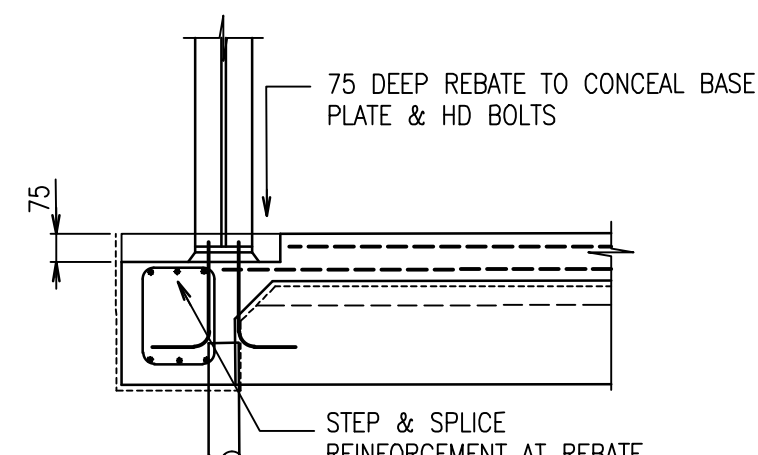
Date DEC. 2015	Designer M.SUSOY	Design Checker Z. ZAMAN
Scale at A1 1:100,1:20	Drawn C.BEARE	Principal/Project Leader B. ONSLOW
Job Number 15039	Drawing Number S01-06	Revision C2



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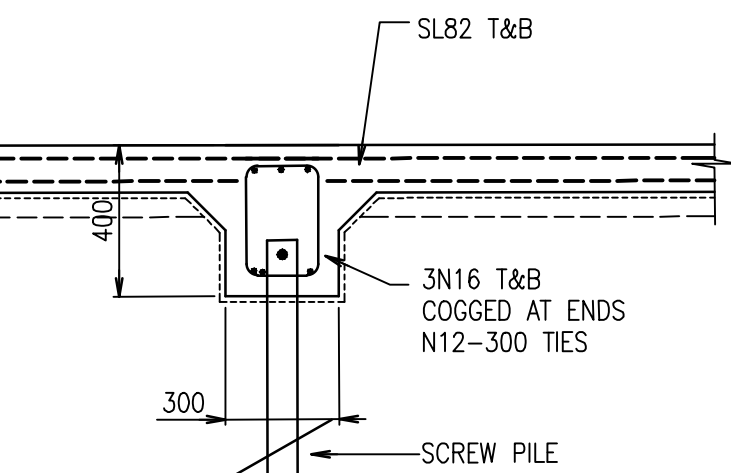


PLANT AREA SLAB ON GROUND

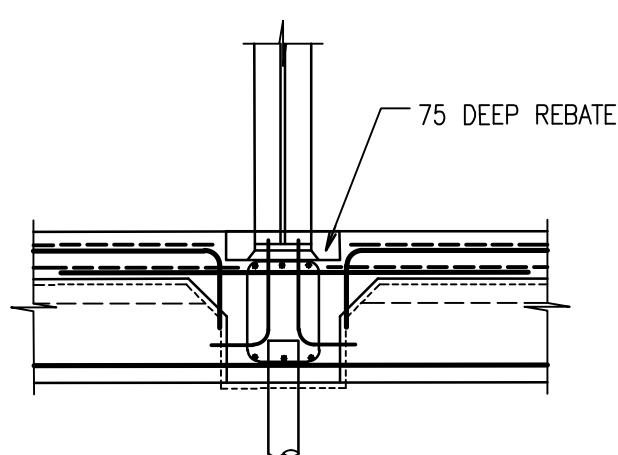


EXTERNAL COLUMN TO EB2

NOTE.
EPOXY COAT ALL STEELWORK BELOW FLOOR

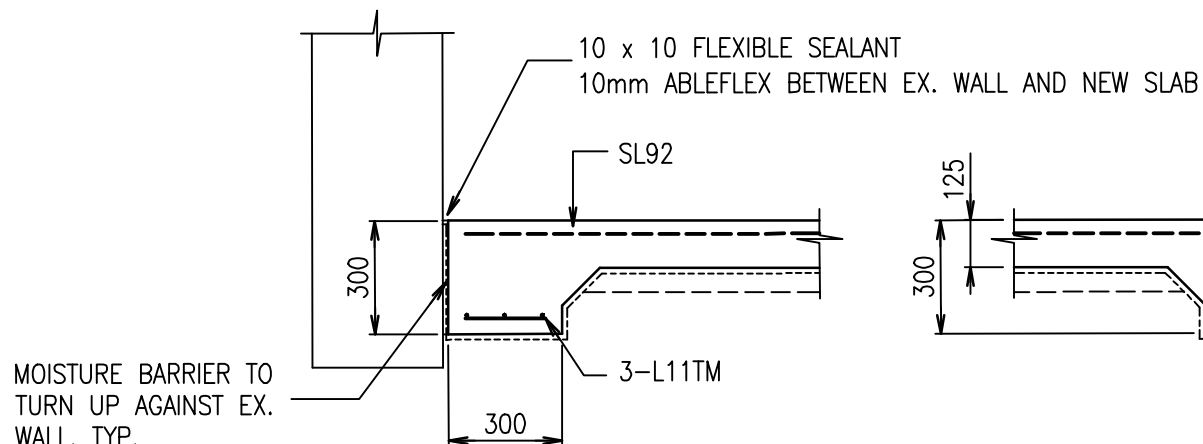


INTERNAL COLUMN TO IB1

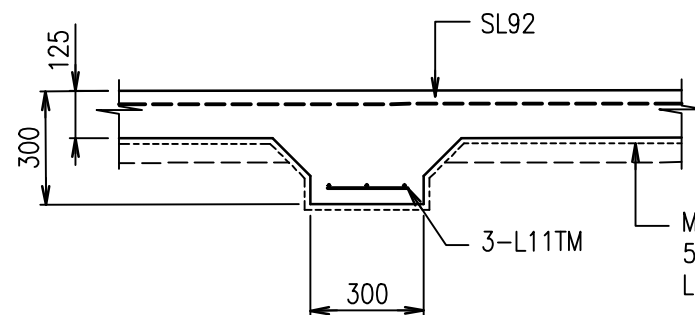


INTERNAL COLUMN TO IB1

NOTE.
EPOXY COAT ALL STEELWORK BELOW FLOOR



ET1

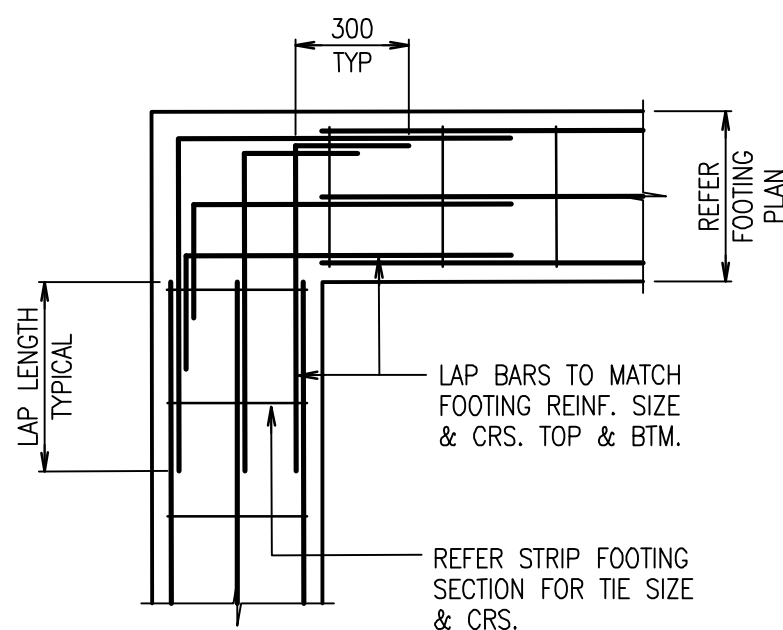


IB2

MOISTURE BARRIER OVER
50mm DEPTH OF COMPACTED
LEVELLING SAND

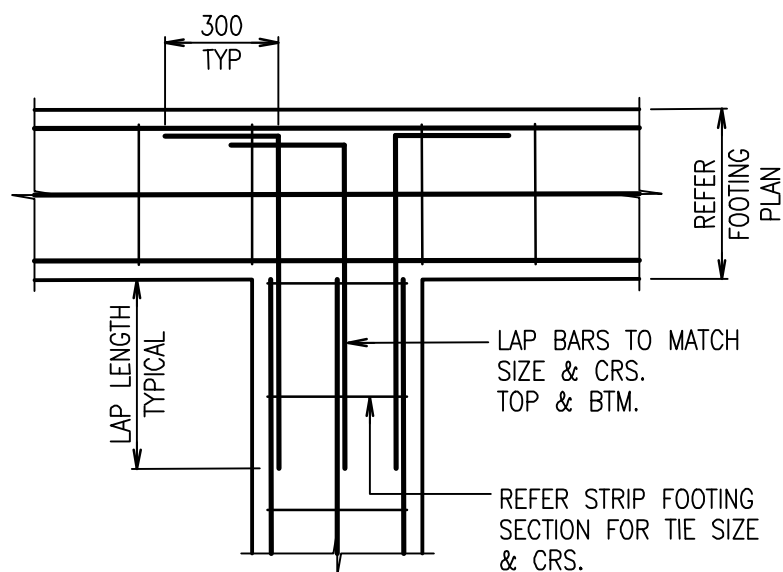
TYPICAL FOOTING & SLAB DETAILS

SCALE 1:20



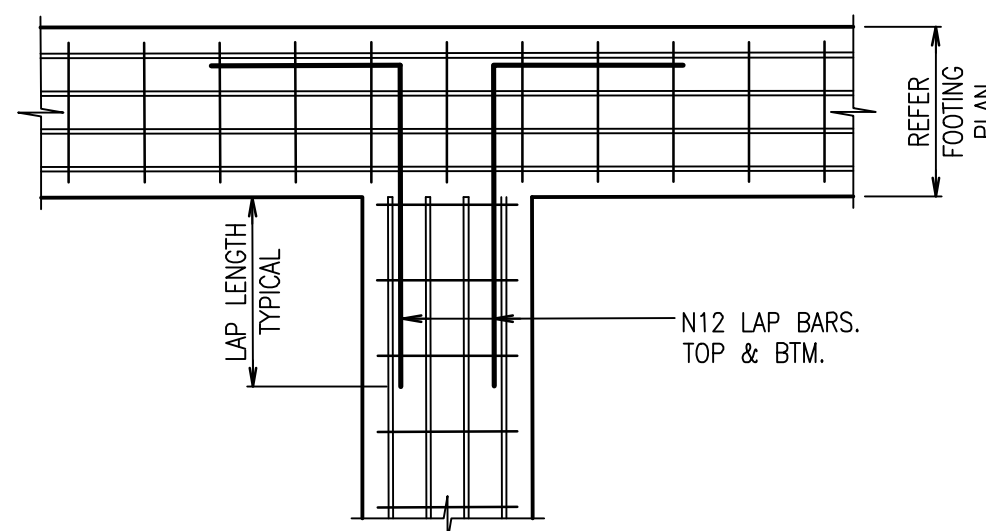
90 DEGREES
STRIP FOOTING CORNER DETAIL

SCALE 1:20



STRIP FOOTING T-INTERSECTION DETAIL

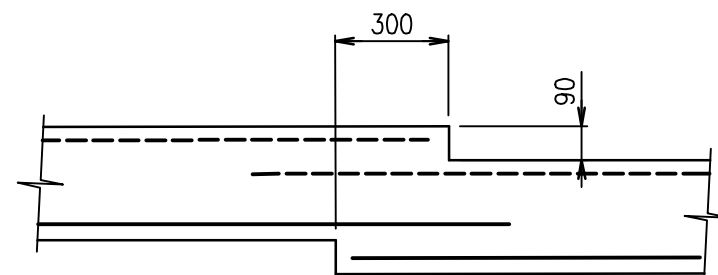
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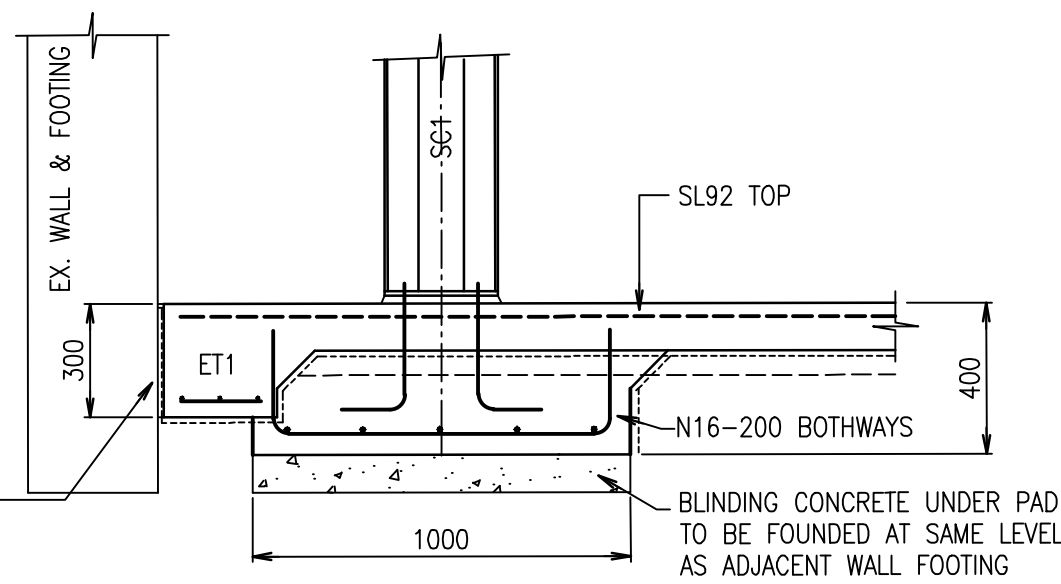
STRIP FOOTING T-INTERSECTION DETAIL

SCALE 1:20

FOR TRENCH MESH REINFORCED FOOTINGS



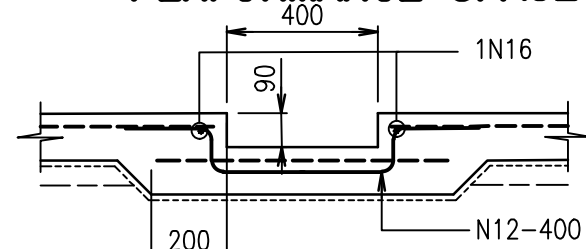
IB2-STEP DETAIL



DETAIL PAD PF2

SCALE 1:20

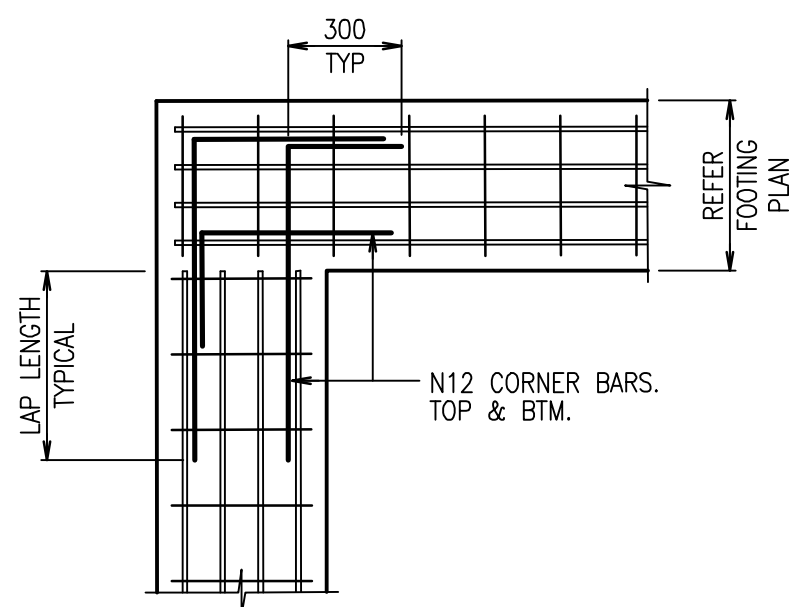
PERFORMANCE SPACE AREA



CABLE TRENCH DETAIL

SCALE 1:20

ARCHITECT TO CONFIRM DIMENSIONS



90 DEGREES
STRIP FOOTING CORNER DETAIL

SCALE 1:20

FOR TRENCH MESH REINFORCED FOOTINGS

CONCRETE NOTES:

-REFER NOTES ON COVER SHEET.
-MIN. CONC. STRENGTH AT 28 DAYS.

LOCATION	f'c
PAD FOOTINGS	32
FOOTING BEAMS	32
SLAB ON GROUND	32

-CONCRETE COVER

LOCATION	COVER
PAD FOOTINGS	55
FOOTING BEAMS	55
SLAB ON GROUND	35 TOP

DESIGN LOADS:

-THESE ARE UNFACTORED LOADS (kPa)

LOCATION	DESIGN VALUE	
	LL	SIDL
GROUND FLOOR	5.0	0.5

NOTES--INTERNAL SLAB ON GROUND

1. FOUNDING FILL MATERIAL TO BE IDENTIFIED AS CLAYEY GRAVEL. OTHER UNCONTROLLED FILL SHOULD BE REMOVED & REPLACED
2. PROOF ROLL & REMOVE ANY SOFT SPOTS, BACKFILL & COMPACT IN LAYERS WITH SELECTED MATERIAL
3. WHERE REMOVAL OF PRE-EXISTING STRUCTURE DISTURBS FOUNDING MATERIAL, PROVIDE BLINDING CONCRETE TO 100MM BELOW DISTURBED LEVEL
4. PROVIDE CONTROLLED FILL UNDER SLABS WHERE REQUIRED TO ACHIEVE FINISHED LEVELS
5. TO BE READ IN CONJUNCTION WITH GEOTECHNICAL REPORT

NOTES

THIS DRAWING TO BE READ IN CONJUNCTION WITH THE GEOTECHNICAL REPORT

FOUNDING MATERIAL TO BE IDENTIFIED AS CLAYEY GRAVEL
OTHER UNCONTROLLED FILL SHOULD BE REMOVED & REPLACED

PROOF ROLL & REMOVE ANY SOFT SPOTS, BACKFILL IN LAYERS WITH
SELECTED MATERIAL
SUBGRADE PREPARATION TO BE IN ACCORDANCE WITH THE
GEOTECHNICAL REPORT

WHERE REMOVAL OF PRE-EXISTING STRUCTURE DISTURBS THE
FOUNDING MATERIAL, PROVIDE BLINDING CONCRETE TO 10mm BELOW
DISTURBED LEVEL.

PROVIDE CONTROLLED FILL UNDER SLABS WHERE REQUIRED TO ACHIEVE
FINISHED LEVELS

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Rev.	Revision Description	By.	App.	Date	Rev.	Revision Description	By.	App.	Date
C1	CONSTRUCTION ISSUE	CB	BO	17.11.16					
A1	CERTIFICATION/APPROVAL	CB	BO	12.10.16					
T2	TENDER ISSUE ONLY	CB	BO	29.07.16					
P2	QS REVIEW	CB	BO	08.07.16					
P1	CO-ORDINATION ISSUE	CB	BO	26.05.16					
T1	TENDER ISSUE ONLY	CB	BO	30.03.16					

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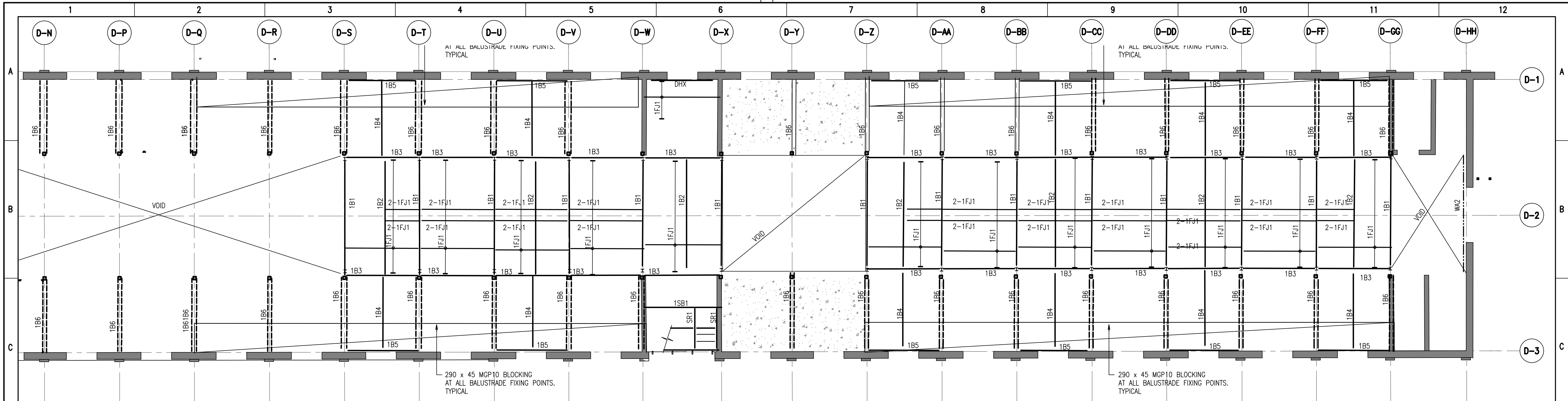
Title
FOOTING & GROUND FLOOR
DETAILS

Project
VCA POLICE STABLES
REDEVELOPMENT
SOUTH BANK

APPROVED FOR CONSTRUCTION

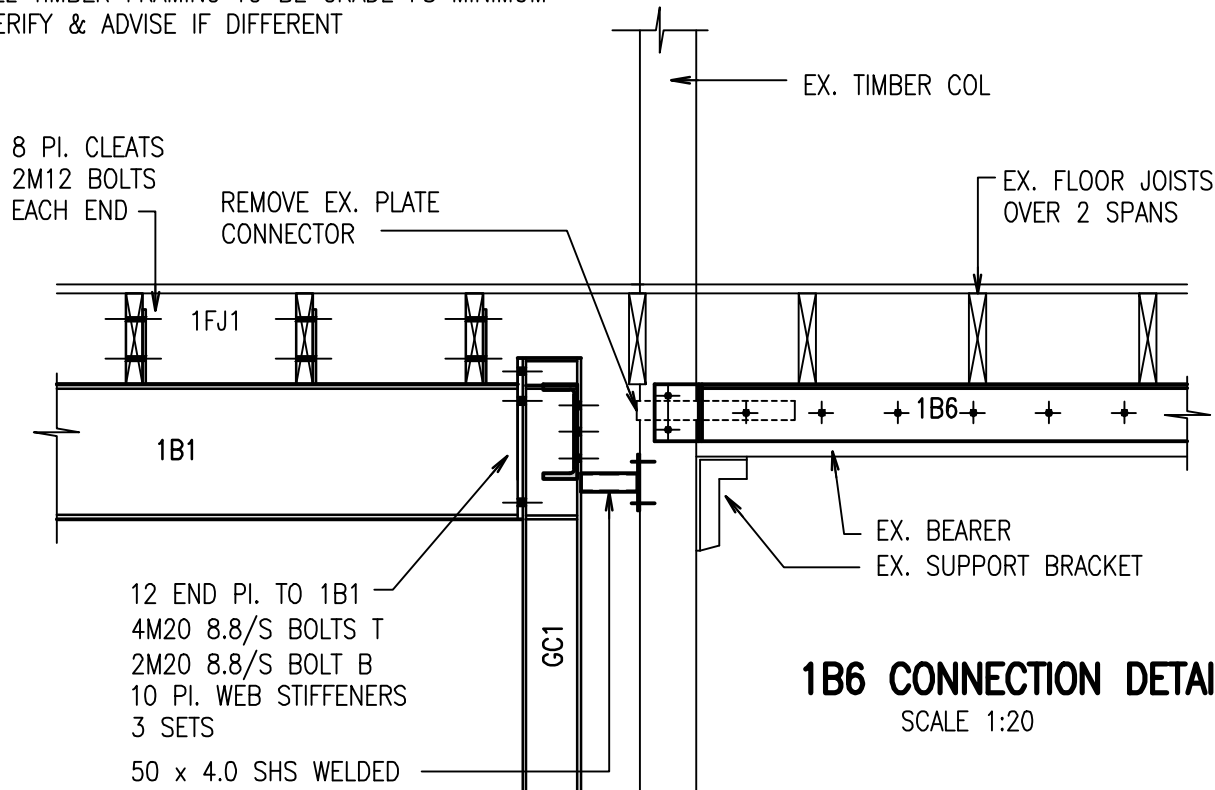
Date DEC. 2015	Designer M.SUSOY	Design Checker Z. ZAMAN
Scale at A1 1:100,1:20	Drawn C.BEARE	Principal/Project Leader B. ONSLOW
Job Number 15039	Drawing Number S01-07	Revision C1

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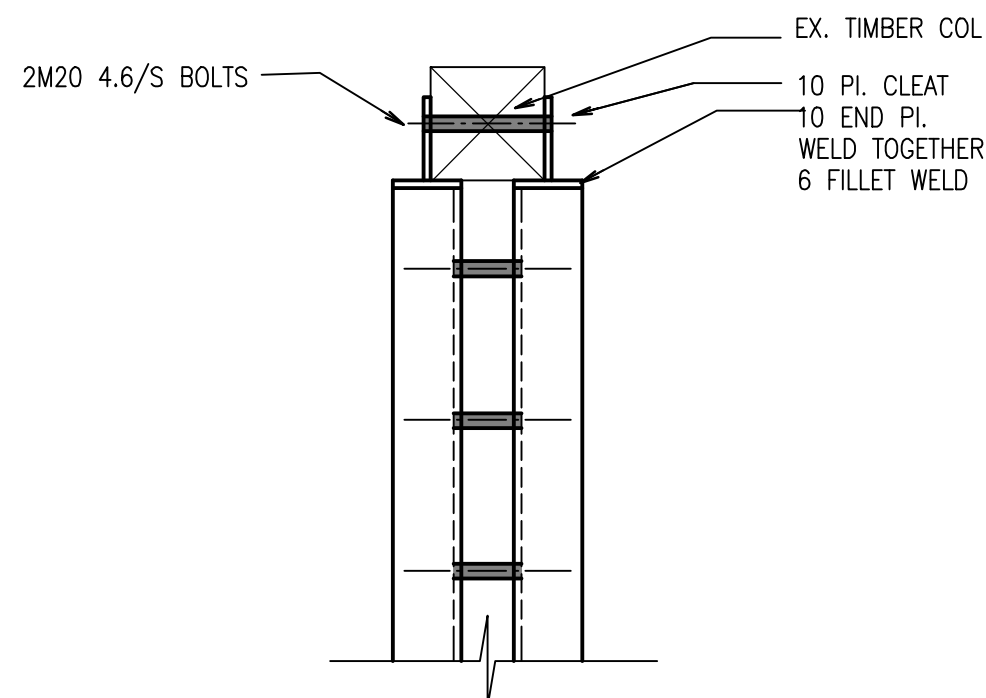
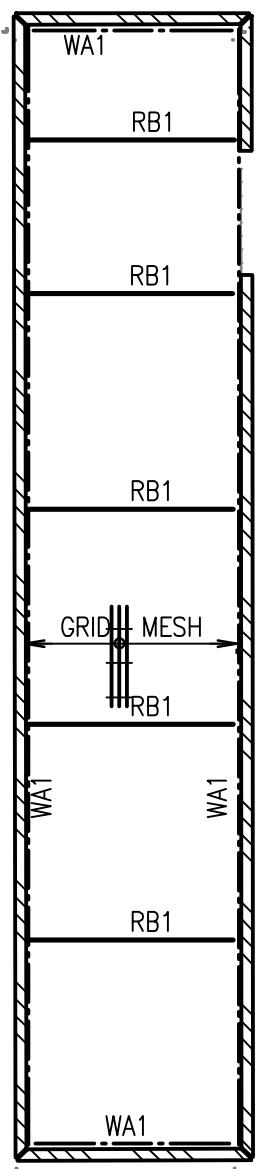
FIRST FLOOR PART GENERAL ARRANGEMENT PLAN

SCALE 1:100
NOTE:
REPLACE OR REPAIR ANY DAMAGED TIMBER MEMBERS
ALL TIMBER FRAMING TO BE GRADE F8 MINIMUM
VERIFY & ADVISE IF DIFFERENT

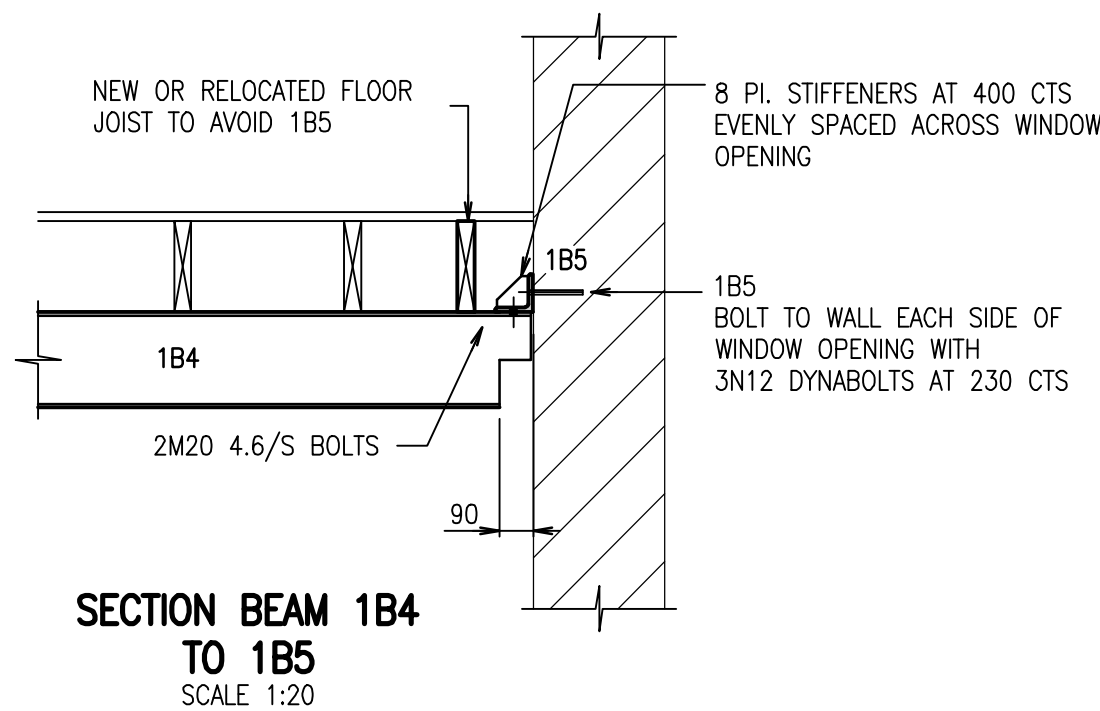


SECTION BEAM 1B6
SCALE 1:20

SECTION BEAM 1B6
TO EX.WALL
SCALE 1:20



1B6 CONNECTION DETAILS
SCALE 1:10



SECTION BEAM 1B4
TO 1B5
SCALE 1:20

STEELWORK SCHEDULE

COLUMNS			BRACING		
MARK	SIZE	REMARKS	MARK	SIZE	REMARKS
1SC2 ABOVE 1ST. FLOOR	90 BT 11	BOLTS TO 1st FLOOR STEEL BEAM BOLT TO ROOF STEEL FRAME AT TOP	ET1	2-90 x 90 x 10 EA	STITCH WELD TO FORM CROSS
PSC1,WC1,DSC	89 x 89 x 6.0 SHS	DSC TO FIT INTO WINDOW OPENING FIX TO LINTELS T & B	BR1,VB1	16 DIAM ROD	
BC1	100 x 50 PFC		CVB1	40 x 40 x 5 EA	
BEAMS			FLOORING		
MARK	SIZE	REMARKS	MARK	SIZE	REMARKS
1B1	360 UB 51	MOMENT CONNECTION REFER DETAIL	1FJ1 JOISTS	240 x 45 F17 HW-450 CTS	1 ROW OF BLOCKING AT MID SPAN
1B2,1B4	250 UB 31	10 PL. CLEAT 2M20 8.8/S BOLTS EACH END	1FJ2 JOISTS	140 x 45 F17 HW-450 CTS	
1B3	250 x 90 PFC	10 PL. CLEAT 3M20 8.8/S BOLTS EACH END	1FJ3 JOISTS	130 x 45 HYSpan-450 CTS	
1B5	100 x 100 x 10 EA	BOLT TO EX. WALL-3M12 DYNABOLTS EACH END	1FJ4 JOISTS	200 x 45 HYSpan-450 CTS	
1B6	2-150 x 90 x 12 EA		BFJ JOISTS	C10019-400 CTS	
1B7	360 UB 51		NEW FLOORING TO BE 25mm F17 PLYWOOD OR SIMILAR APPROVED		
WA2	180 x 75 PFC	BOLT TO WALL WITH M12 CHEMSETS AT 600 CTS. 65 EMBEDMENT			
WH1,1UB3	150 UC 23	BEAMS ON U/SIDE OF EX. FLOOR			
1UB1	BEAM ON U/SIDE OF EX. FLOOR	10 PL. CLEATS, 2M20 8.8/S BOLTS EACH END			
1UB2	BEAM ON U/SIDE OF EX. FLOOR	10 PL. CLEATS, 2M20 8.8/S BOLTS EACH END			
1UB3	150 UC 23				
RB1	200 UB 25	10 PL. CLEATS, 2M20 8.8/S BOLTS EACH END			
WA1	90 x 90 x 8 EA	BOLT TO WALL WITH M12 CHEMSETS AT 600 CTS. 65 EMBEDMENT			
1SB1	250 x 90 PFC				
SR4	20 PL. x 250	STAIR STRINGER			
PB1,PB3,PB4	250 x 75 PFC	10 PL. CLEATS, 2M20 8.8/S BOLTS EACH END			
PB2,PB5	250 UB 31	20 DIAM SHEAR STUDS AT 400 CTS REFER DETAIL FOR CONNECTION			
1LB1	230 x 75 PFC				
1LB2	240 x 63 HYSpan				
HD1 DOOR HEADER	200 x 63 HYSpan				
1RB1	150 UB 14	10 PL. CLEATS, 2M20 8.8/S BOLTS EACH END			
BB1	200 x 75 PFC				
BB2	150 UB 14	10 PL. CLEATS, 2M16 8.8/S BOLTS EACH END			
SR4	20 PL. x 250	10 PL. CLEATS, 2M16 8.8/S BOLTS EACH END			
DH1	150 x 75 PFC	10 PL. CLEATS, 2M20 8.8/S BOLTS EACH END			
TB1	150 x 75 PFC	10 PL. CLEATS, 2M20 8.8/S BOLTS EACH END			

CONCRETE NOTES:
-REFER NOTES ON COVER SHEET.
-MIN. CONC. STRENGTH AT 28 DAYS.

LOCATION	f'c
BORED PIERS	32
FOOTING BEAMS	32

-CONCRETE COVER

LOCATION	COVER

DESIGN LOADS:
-THESE ARE UNFACTORED LOADS (kPa)

LOCATION	DESIGN VALUE	
	LL	SIDL
FIRST FLOOR	5.0	0.5

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T1	TENDER ISSUE ONLY	CB	BO	30.03.16					
P4	PRETENDER REVIEW	CB	BO	10.03.16					
P3	CO-ORDINATION ISSUE	CB	BO	16.02.16					
P2	COST PLAN ISSUE	CB	BO	18.12.15					
P1	COST PLAN ISSUE	CB	BO	09.12.15	C1	CONSTRUCTION ISSUE	CB	BO	17.11.16

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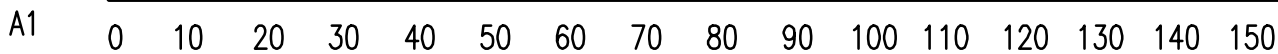
Client
THE UNIVERSITY OF MELBOURNE

Title
**FIRST FLOOR
GENERAL ARRANGEMENT PLAN
SHEET 1**

Project
**VCA POLICE STABLES
REDEVELOPMENT
SOUTH BANK**

APPROVED FOR CONSTRUCTION

Date DEC. 2015	Designer M.SUSOY	Design Checker Z. ZAMAN
Scale at A1 1:100,1:20	Drawn C.BEARE	Principal/Project Leader B. ONSLOW
Job Number 15039	Drawing Number S02-01	Revision C1



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T1	TENDER ISSUE ONLY	CB	BO	30.03.16					
P4	CO-ORDINATION ISSUE	CB	BO	04.03.16					
P3	CO-ORDINATION ISSUE	CB	BO	16.02.16					
P2	COST PLAN ISSUE	CB	MS	01.02.16	C2	CONSTRUCTION ISSUE	CB	BO	30.01.17
P1	COST PLAN ISSUE	CB	BO	09.12.15	C1	CONSTRUCTION ISSUE	CB	BO	17.11.16

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Title
**PERFORMANCE SPACE & CANOPY
GENERAL ARRANGEMENT PLAN**
Project
**VCA POLICE STABLES
REDEVELOPMENT
SOUTH BANK**

APPROVED FOR CONSTRUCTION		
Date DEC. 2015	Designer M.SUSOY	Design Checker Z. ZAMAN
Scale at A1 1:100,1:20	Drawn C.BEAIRE	Principal/Project Leader B. ONSLOW
Job Number 15039	Drawing Number S02-03	Revision C2

STEELWORK SCHEDULE		
COLUMNS		
MARK	SIZE	REMARKS
1SC2 ABOVE 1ST. FLOOR	90 BT 11	BOLTS TO 1st FLOOR STEEL BEAM BOLT TO ROOF STEEL FRAME AT TOP
PSC1,WC1,DSC	89 x 89 x 6.0 SHS	
BC1	100 x 50 PFC	
BEAMS		
MARK	SIZE	REMARKS
1B1	360 UB 51	MOMENT CONNECTION REFER DETAIL
1B2,1B4	250 UB 31	10 PL. CLEAT 2M20 8.8/S BOLTS EACH END
1B3	250 x 90 PFC	10 PL. CLEAT 3M20 8.8/S BOLTS EACH END
1B5	150 x 75 PFC	BOLT TO EX. WALL-M12 TRUBOLTS-460CTS
1B6	2-150 x 90 x 12 EA	
1B7	360 UB 51	
1B8		
WH1 BEAM ON U/SIDE OF EX. FLOOR	150 UC 23	
1UB1 BEAM ON U/SIDE OF EX. FLOOR	310 UB 40	10 PL. CLEATS, 3M20 8.8/S BOLTS EACH END
1UB2 BEAM ON U/SIDE OF EX. FLOOR	200 UB 22	10 PL. CLEATS, 2M20 8.8/S BOLTS EACH END
1UB3	150 UC 23	
RB1	200 UB 25	10 PL. CLEATS, 2M20 8.8/S BOLTS EACH END
WA1	90 x 90 x 8 EA	BOLT TO WALL WITH M16 TRUBOLTS AT 600 CTS. 75 EMBEDMENT
1SB1	250 x 90 PFC	
SR4	20 PL. x 250	STAIR STRINGER
PB1,PB3,PB4	250 x 75 PFC	10 PL. CLEATS, 2M20 8.8/S BOLTS EACH END 20 DIAM SHEAR STUDS AT 400 CTS 20 DIAM SHEAR STUDS AT 400 CTS REFER DETAIL FOR CONNECTION
PB2,PB5	250 UB 31	
1LB1	230 x 75 PFC	
1LB2	240 x 63 HYSPAN	
HD1 DOOR HEADER	200 x 63 HYSPAN	
1RB1	150 UB 14	10 PL. CLEATS, 2M20 8.8/S BOLTS EACH END
BB1	200 x 75 PFC	
BB2	150 UB 14	10 PL. CLEATS, 2M16 8.8/S BOLTS EACH END
DB1	200 x 100 x 6.0 RHS	DUCT SUPPORT BEAM UNDER CANOPY 10 PL. CLEAT, 2M16 TRUBOLTS WALL
BRACING		
MARK	SIZE	REMARKS
ET1	2-90 x 90 x 10 EA	STITCH WELD TO FORM CROSS
BR1,VB1	16 DIAM ROD	
CVB1	40 x 40 x 5 EA	
FLOORING		
MARK	SIZE	REMARKS
1FJ1 JOISTS	240 x 45 F17 HW-450 CTS	
1FJ2 JOISTS	140 x 45 F17 HW-450 CTS	
1FJ3 JOISTS	130 x 45 HYSPAN-450 CTS	
1FJ4 JOISTS	200 x 45 HYSPAN-450 CTS	
BFJ JOISTS	C10019-400 CTS	

NEW FLOORING TO BE 21mm F17 PLYWOOD OR SIMILAR APPROVED
ALL EXTERNAL STEELWORK TO BE HOT DIPPED GALVANISED. REFER NOTES

DESIGN LOADS: -THESE ARE UNFACTORED LOADS (kPa)		
LOCATION	DESIGN VALUE	
	LL	SIDL
FIRST FLOOR	5.0	0.5
ROOF	0.25	-
PLANT ROOM	5.0	1.0
FIRST FLOOR STORE	5.0	1.0

CONCRETE NOTES:
-REFER NOTES ON COVER SHEET.
-MIN. CONC. STRENGTH AT 28 DAYS.

LOCATION	f'c
SUSPENDED PLANT	32

-CONCRETE COVER

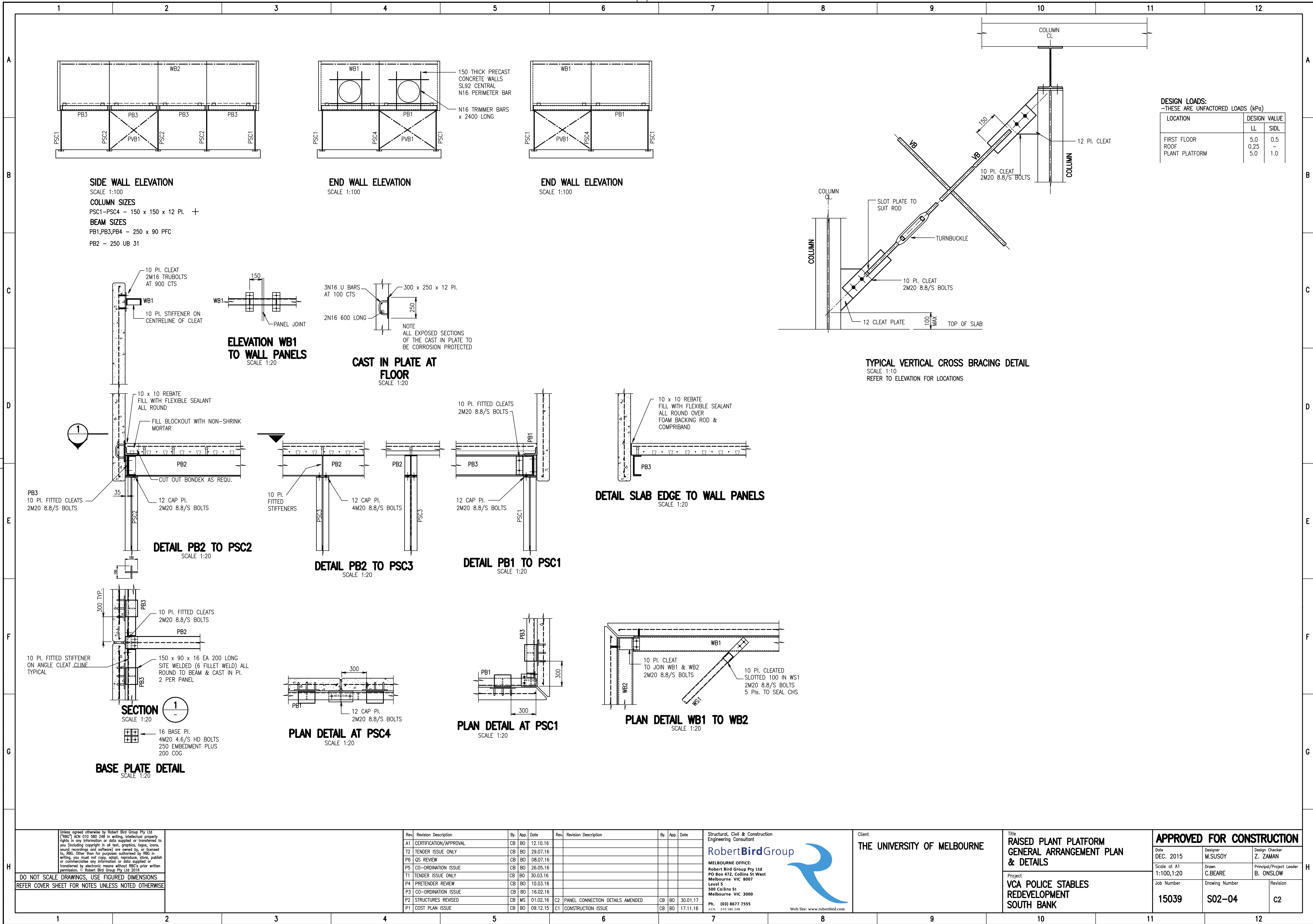
LOCATION	COVER
SUSPENDED PLANT	35 TOP

PERFORMANCE SPACE FRAMING
GENERAL ARRANGEMENT PLAN
SCALE 1:100

RAISED PLANTROOM
GENERAL ARRANGEMENT PLAN
- DENOTES 140 THICK BONDEK SLAB (1.0 BMT)
SL62 TOP
N12-200 BOTTOM

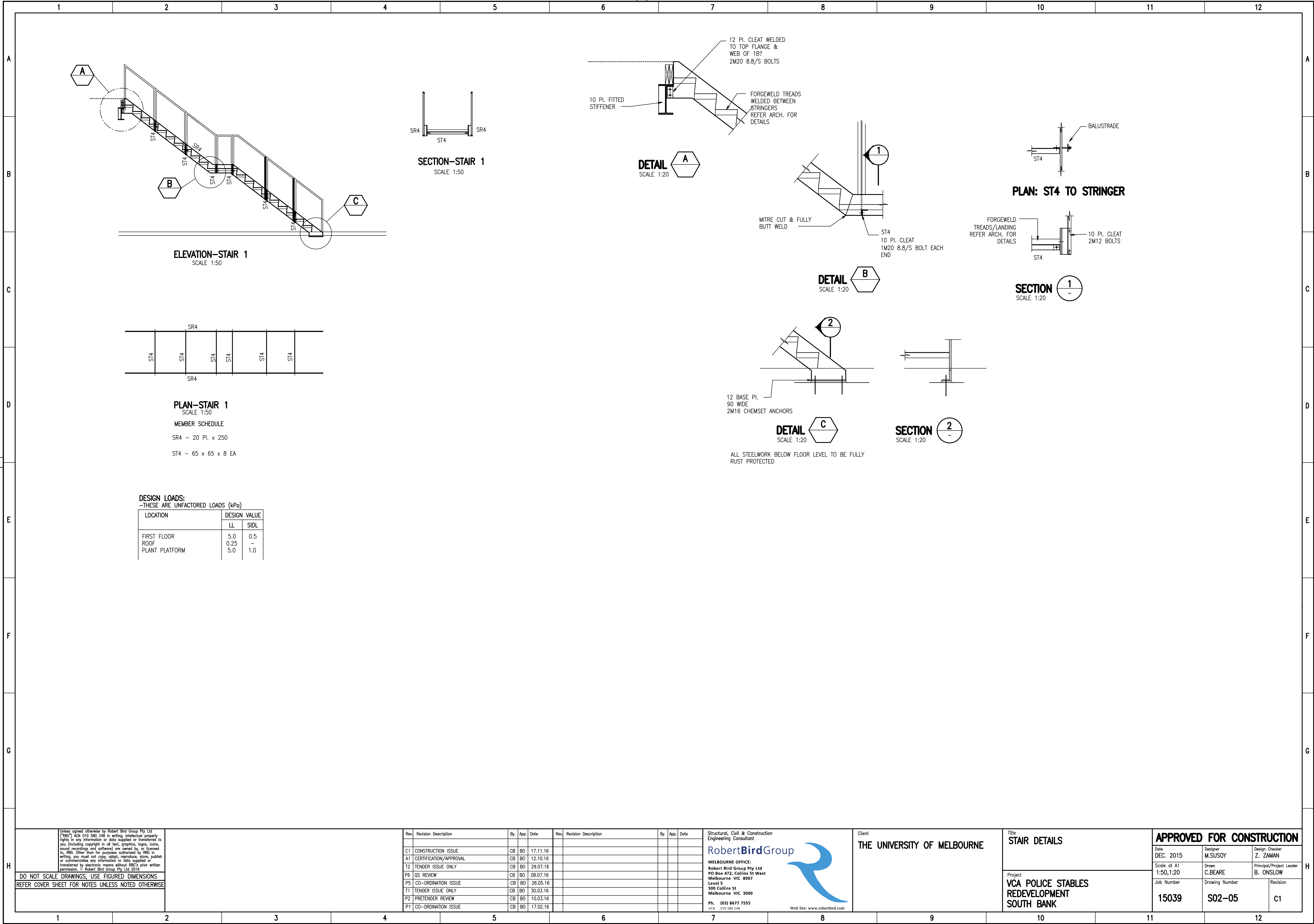
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A1

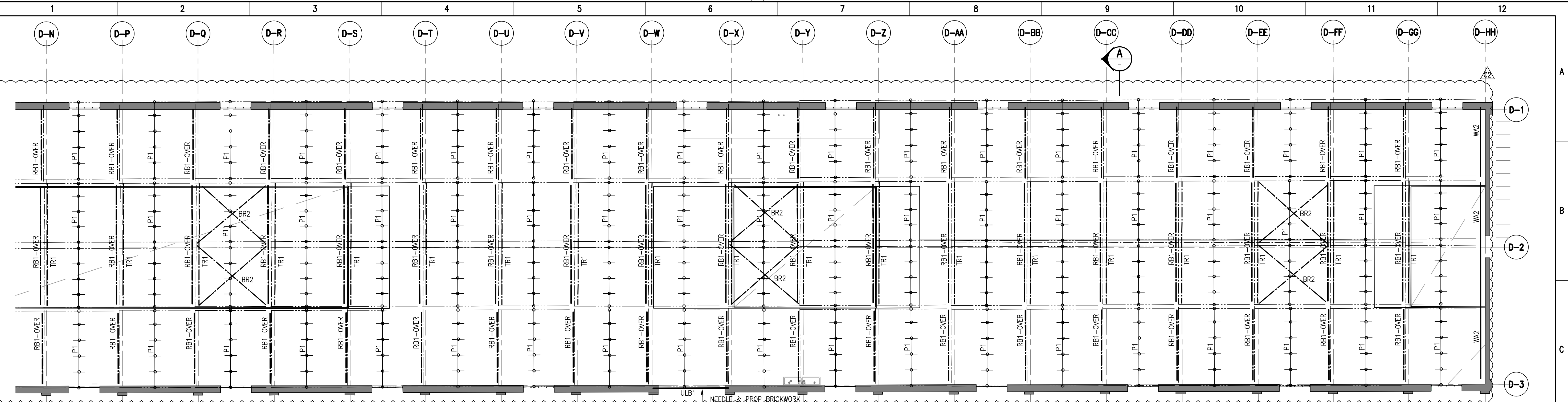


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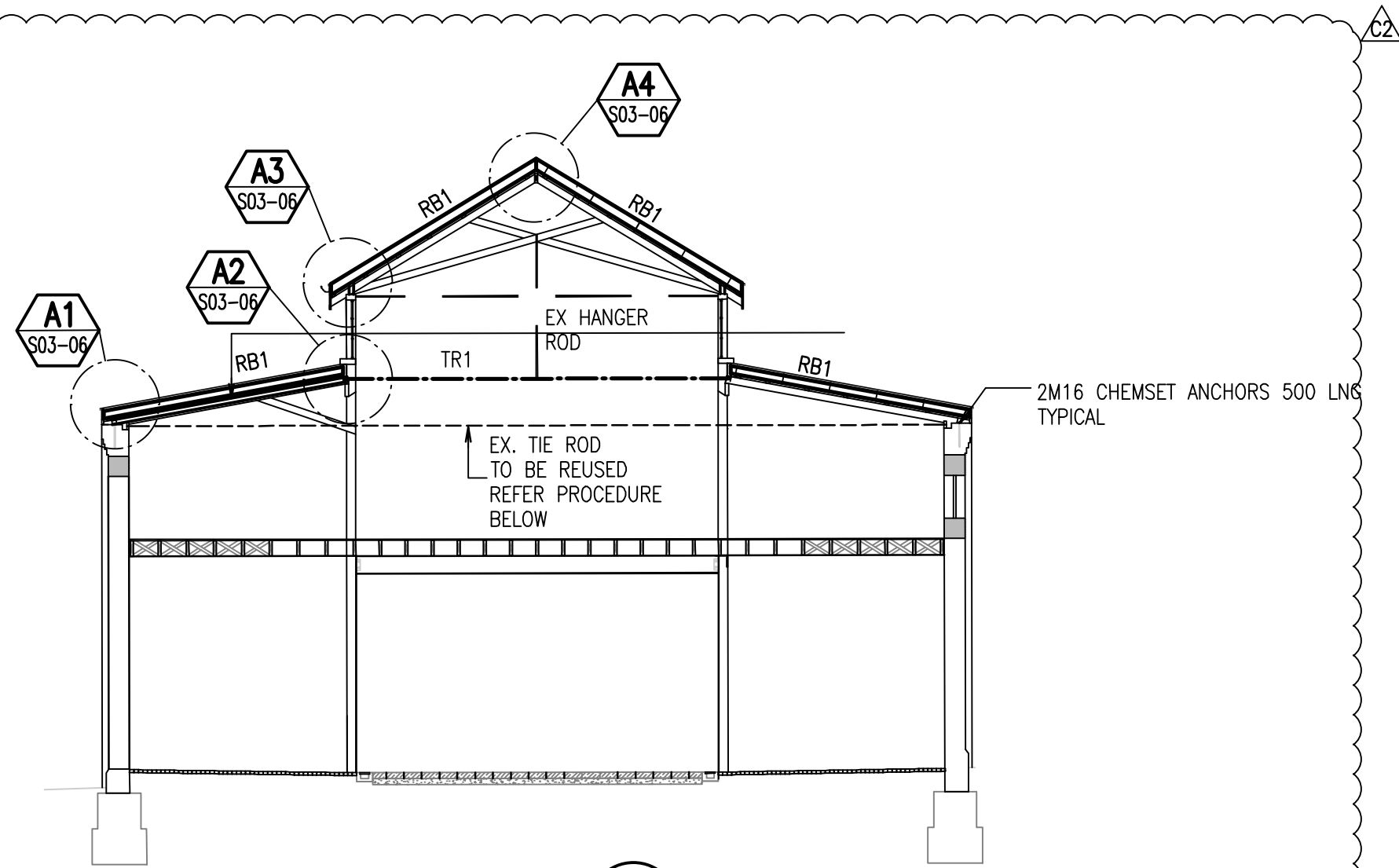


ROOF FRAMING
PART GENERAL ARRANGEMENT PLAN
SCALE 1:100

NOTE:
REPLACE OR REPAIR ANY DAMAGED TIMBER MEMBERS
ALL TIMBER FRAMING TO BE GRADE F8 MINIMUM
VERIFY & ADVISE IF DIFFERENT

STEELWORK SCHEDULE

COLUMNS			BRACING		
MARK	SIZE	REMARKS	MARK	SIZE	REMARKS
1SC2 ABOVE 1ST. FLOOR	90 BT 11	10 BASE PL. 2M10 4.6/S BOLTS TO FLOOR	TR1	RE USE EXISTING ROD	
			BST1	89 x 3.2 CHS	
			BBR,BR1	16# ROD	
			BR2	12# ROD	
BEAMS			WB1,WB2	180 x 75 PFC	10 PL. CLEATS, 2M16 TRIBOLTS EACH END INTO PANELS
RP1	8 PL. x 75 W	BOLT TO SIDE OF EX. RAFTER M12 4.6/S BOLTS -400CTS	WS1	76 x 3.6 CHS	10 PL. CLEAT, 2M20 8.8/S BOLTS EACH END
RB1	125 x 65 PFC	RAFTER OVER EX. ROOF	VB1	65 x 65 x 8 EA	10 PL. CLEAT, 2M16 8.8/S BOLTS EACH END
STB1	310 UB 40	10 PL. CLEAT, 2M20 8.8/S BOLTS EACH END	PURLINS		
SDB1	150 UC 30	BUILD INTO WALL ONE END 10 PL. CLEAT, 2M20 8.8/S BOLTS	MARK	SIZE	REMARKS
UWH1	150 x 75 PFC	-	P1	C15012-900CTS	1 ROW OF BRIDGING AT MID-SPAN
WA1	90 x 90 x 8 EA	BOLT TO WALL M16 TRIBOLTS AT 600 CTS	P2	Z10012-900CTS	LAP 900 OVER SUPPORTS
BRB1	150 x 75 PFC		P3	100 CT 23	1 ROW OF BRIDGING AT MID-SPAN
ULB1 LINTEL	150 x 100 x 6.0 RHS + 10 PL. x 325 WIDE	MINIMUM 230 END BEARING			
LLB1	200 UB 25	10 PL. CLEAT, SITE WELDED TO CASTIN PL. 2M20 8.8/S BOLTS			
WA2	75 x 75 x 8 EA RAKER	BOLT TO WALL M12 CHEMSET ANCHORS AT 450 CTS			
PWH1	150 x 100 x 6.0 RHS	10 PL. CLEAT 2M20 8.8/S BOLTS EACH END			



- THE ROD RELOCATION PROCEDURE (TR1)
1. INSTALL RB1 ABOVE EXISTING RAFTER & ANCHOR TO MASONRY WALL
 2. REMOVE ALTERNATE TIE RODS FOR REUSE
 3. CUT REMOVED RODS TO REQUIRED LENGTH & THREAD ENDS
 4. INSTALL REWORKED RODS IN NEW LOCATION WITH HANGING ROD IN THE CENTRE.
 5. REPEAT ITEMS 2,3 & 4 ABOVE

CONCRETE NOTES:

- REFER NOTES ON COVER SHEET.
- MIN. CONC. STRENGTH AT 28 DAYS.

LOCATION	f'c
BORED PIERS	32
FOOTING BEAMS	32

-CONCRETE COVER

LOCATION	COVER
BORED PIERS	50
FOOTING BEAMS	50

DESIGN LOADS:

- THESE ARE UNFACTORED LOADS (kPa)

LOCATION	DESIGN VALUE	
	LL	SIDL
FIRST FLOOR	5.0	0.5
ROOF	0.25	0.6

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P4	PRETENDER REVIEW	CB	BO	10.03.16					
P3	CO-ORDINATION ISSUE	CB	BO	16.02.16					
P2	COST PLAN ISSUE	CB	BO	18.12.15	C2	AMENDED IN CLOUDS	CB	MS	10.03.17
P1	CO-ORDINATION ISSUE	CB	BO	09.12.15	C1	CONSTRUCTION ISSUE	CB	BO	17.11.16

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Title
**ROOF FRAMING
GENERAL ARRANGEMENT PLAN
SHEET 1**

Project
**VCA POLICE STABLES
REDEVELOPMENT
SOUTH BANK**

APPROVED FOR CONSTRUCTION

Date DEC. 2015	Designer M.SUSOY	Design Checker Z. ZAMAN
Scale at A1 1:100	Drawn C.BEAIRE	Principal/Project Leader B. ONSLOW
Job Number 15039	Drawing Number S03-01	Revision C2

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T2	TENDER ISSUE ONLY	CB	BO	29.07.16					
P7	QS REVIEW	CB	BO	08.07.16					
P6	CO-ORDINATION ISSUE	CB	BO	26.05.16					
T1	TENDER ISSUE ONLY	CB	BO	30.03.16					
P5	PRETENDER REVIEW	CB	BO	10.03.16					
P4	CO-ORDINATION ISSUE	CB	BO	16.02.16					
P3	CO-ORDINATION ISSUE	CB	MS	15.01.16	C2	AMENDED IN CLOUDS	CB	MS	10.03.17
P2	COST PLAN ISSUE	CB	BO	18.12.15	C1	CONSTRUCTION ISSUE	CB	BO	17.11.16
P1	CO-ORDINATION ISSUE	CB	BO	09.12.15	A1	CERTIFICATION/APPROVAL	CB	BO	12.10.16

Rev.	Revision Description	By.	App.	Date	Rev.	Revision Description	By.	App.	Date

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Client

THE UNIVERSITY OF MELBOURNE

Title

ROOF FRAMING
GENERAL ARRANGEMENT PLAN
SHEET 2

Project

VCA POLICE STABLES
REDEVELOPMENT
SOUTH BANK

APPROVED FOR CONSTRUCTION

Date DEC. 2015	Designer M.SUSOY	Design Checker Z. ZAMAN
Scale at A1 1:100,1:20	Drawn C.BEAIRE	Principal/Project Leader B. ONSLOW
Job Number 15039	Drawing Number S03-02	Revision C2

STEELWORK SCHEDULE

COLUMNS			BRACING		
MARK	SIZE	REMARKS	MARK	SIZE	REMARKS
1SC2 ABOVE 1ST. FLOOR	90 BT 11	10 BASE PL. 2M10 4.6/S BOLTS TO FLOOR	TR1	RE USE EXISTING ROD	
			BST1	89 x 3.2 CHS	
			BBR, BR1	16# ROD	
			BR2	12# ROD	
			WB1, WB2	180 x 75 PFC	10 PL. CLEATS, 2M16 TRUBOLTS EACH END INTO PANELS
			WS1	76 x 3.6 CHS	10 PL. CLEAT, 2M20 8.8/S BOLTS EACH END
			VB1	65 x 65 x 8 EA	10 PL. CLEAT, 2M16 8.8/S BOLTS EACH END
BEAMS			PURLINS		
MARK	SIZE	REMARKS	MARK	SIZE	REMARKS
RP1	8 PL. x 75 W	BOLT TO SIDE OF EX. RAFTER M12 4.6/S BOLTS -400CTS	P1	C15012-900CTS	1 ROW OF BRIDGING AT MID-SPAN
RB1	125 x 65 PFC	RAFTER OVER EX. ROOF	P2	Z10012-900CTS	LAP 900 OVER SUPPORTS 1 ROW OF BRIDGING AT MID-SPAN
STB1	310 UB 40	10 PL. CLEAT, 2M20 8.8/S BOLTS EACH END	P3	100 CT 23	
SDB1	150 UC 30	BUILD INTO WALL ONE END 10 PL. CLEAT, 2M20 8.8/S BOLTS			
UWH1	150 x 75 PFC	-			
WA1	90 x 90 x 8 EA	BOLT TO WALL M16 TRUBOLTS AT 600 CTS			
BRB1	150 x 75 PFC				
ULB1 LINTEL	150 x 100 x 6.0 RHS + 10 PL. x 325 WIDE	MINIMUM 230 END BEARING			
LLB1	200 UB 25	10 PL. CLEAT, SITE WELDED TO CASTIN PL. 2M20 8.8/S BOLTS			
WA2	75 x 75 x 8 EA RAKER	BOLT TO WALL M12 CHEMSET ANCHORS AT 450 CTS			
PWH1	150 x 100 x 6.0 RHS	10 PL. CLEAT 2M20 8.8/S BOLTS EACH END			

ROOF FRAMING PART GENERAL ARRANGEMENT PLAN

SCALE 1:100

DESIGN LOADS:

THESE ARE UNFACTORED LOADS (kPa)

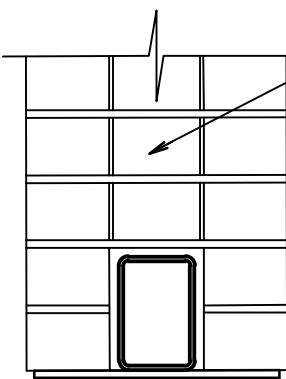
LOCATION	DESIGN VALUE	
	LL	SIDL
FIRST FLOOR	5.0	0.5
ROOF	0.25	

FRAME OPENING IN
ROOF FOR BRIDGE
WITH 190 x 45 F17

C10015 PURLINS
1 ROW OF BRIDGING
AT MID SPAN

PRECAST PANEL WALLS
FOR LIFT SHAFT
150 THICK.

C15015 PURLINS
1 ROW OF BRIDGING AT
MID-SPAN

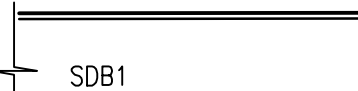


BRICKWORK TO BE NEEDED
ABOVE OPENING TO ALLOW
INSTALLATION OF ULB1

SECTION LINTEL ULB1

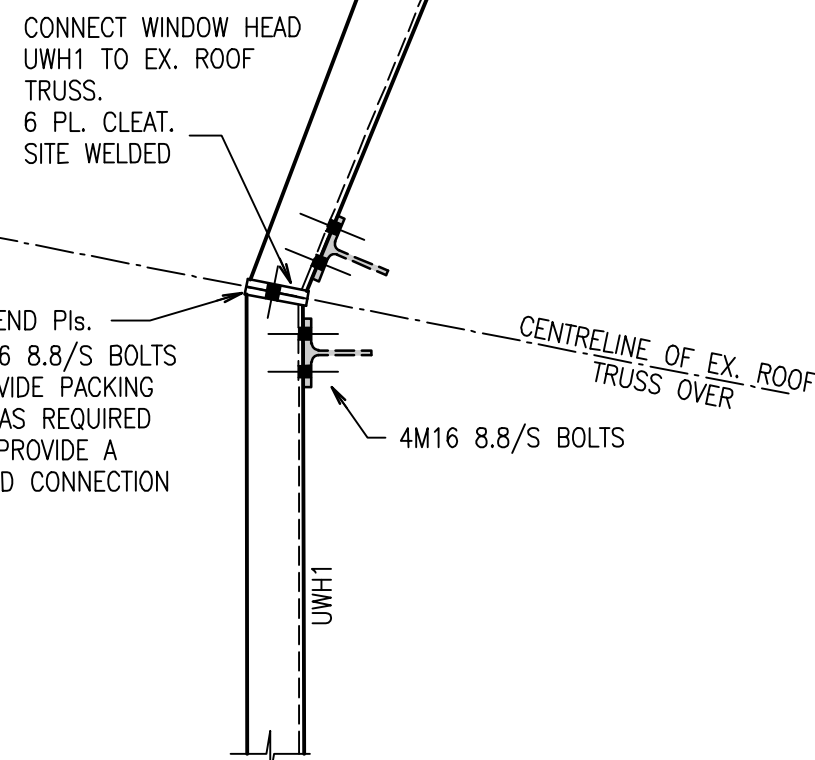
SCALE 1:10

COPE FLANGES ONE SIDE



DETAIL SDB1 TO UWH1

SCALE 1:10



PLAN AT CORNER OF UWH1

SCALE 1:10

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Client

THE UNIVERSITY OF MELBOURNE

Title
**PERFORMANCE SPACE
RIGGING FRAME
GENERAL ARRANGMENT PLAN**

Project
**VCA POLICE STABLES
REDEVELOPMENT
SOUTH BANK**

APPROVED FOR CONSTRUCTION

Date DEC. 2015	Designer M.SUSOY	Design Checker Z. ZAMAN
Scale at A1 1:100,1:20	Drawn C.BEARE	Principal/Project Leader B. ONSLOW

Job Number 15039	Drawing Number S03-03	Revision C1
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DESIGN LOADS:
-THESE ARE UNFACTORED LOADS (kPa)

LOCATION	DESIGN VALUE	
	LL	SIDL
FIRST FLOOR	5.0	0.5
ROOF	0.25	
STB1	3kN/m	
ET1	0.7kN/m	

ROOF FRAMING PART GENERAL ARRANGEMENT PLAN

SCALE 1:100

BOLT WALL HEADER
TO CAST IN PLATE IN
PRECAST WALL
EACH END

SECTION 
SCALE 1:100

CANOPY FRAME SECTION

SCALE 1:100

MEMBER SCHEDULE

C1 - 100 x 12 PL. CRUCIFORM	+
B1 - 100 x 12 PL. CRUCIFORM	+
B2 - 100 x 75 x 12 PL. T	⊥
WEBS - 50 x 50 x 3 EA	
ST1 - 100 x 12 PL. CRUCIFORM	+
P3 - 100 CT 23	

PART CANOPY ELEVATION
SCALE 1:100

DETAIL 
SCALE 1:10

SECTION 
SCALE 1:10

DETAIL RT1 TO STB1
SCALE 1:10

ROOF TRUSS (RT1) SECTION
SCALE 1:10

COLUMN (SC1) SECTION
SCALE 1:10

COLUMN BASE PLATE
SCALE 1:10

NEW PURLIN P2 SUPPORT DETAIL
SCALE 1:10

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T1	TENDER ISSUE ONLY	CB	BO	30.03.16					

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	Client
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THE UNIVERSITY OF MELBOURNE

Title	PERFORMANCE SPACE RIGGING FRAMING SECTION & DETAILS
-------	---

Project
**VCA POLICE STABLES
REDEVELOPMENT
SOUTH BANK**

APPROVED FOR CONSTRUCTION

Date DEC. 2015	Designer M.SOUSY	Design Checker Z. ZAMAN
Scale at A1 1:100, 1:10	Drawn C.BEARE	Principal/Project Leader B. ONSLOW

Job Number	Drawing Number	Revision
15039	S03-04	c1

SECTION
SCALE 1:10

DETAIL
SCALE 1:10

SECTION
SCALE 1:10

SECTION  1C
SCALE 1:10

DETAIL
SCALE 1:10

3
S03-04

DETAIL
SCALE 1:10

1
S03-04

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THE UNIVERSITY OF MELBOURNE

Title	ROOF FRAMING DETAILS SHEET 2
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Project
**VCA POLICE STABLES
REDEVELOPMENT
SOUTH BANK**

APPROVED FOR CONSTRUCTION

Date
DEC 2015

DEC. 2015
Scale at A1

1:10
Job Number

15030

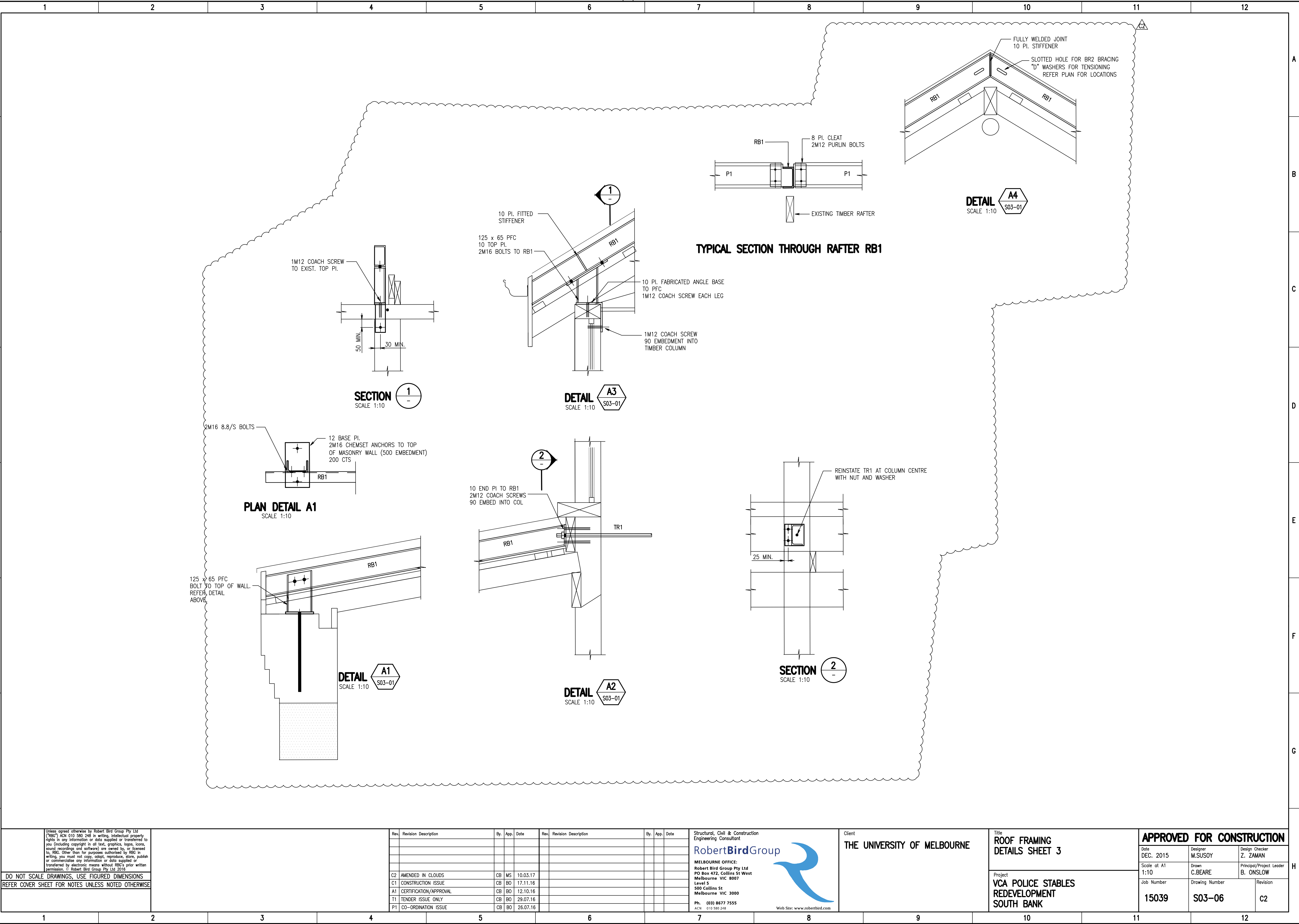
Designer M. SUCOY	Design Checker Z. ZAMAN
----------------------	----------------------------

M.SUSUT	Z. ZAMAN	H
Drawn	Principal/Project Leader	

C.BEARE	B. ONSLOW
Drawing Number	Revision

Drawing Number	Revision
883-05	01

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C1	CONSTRUCTION ISSUE	CB	BO	17.11.16					
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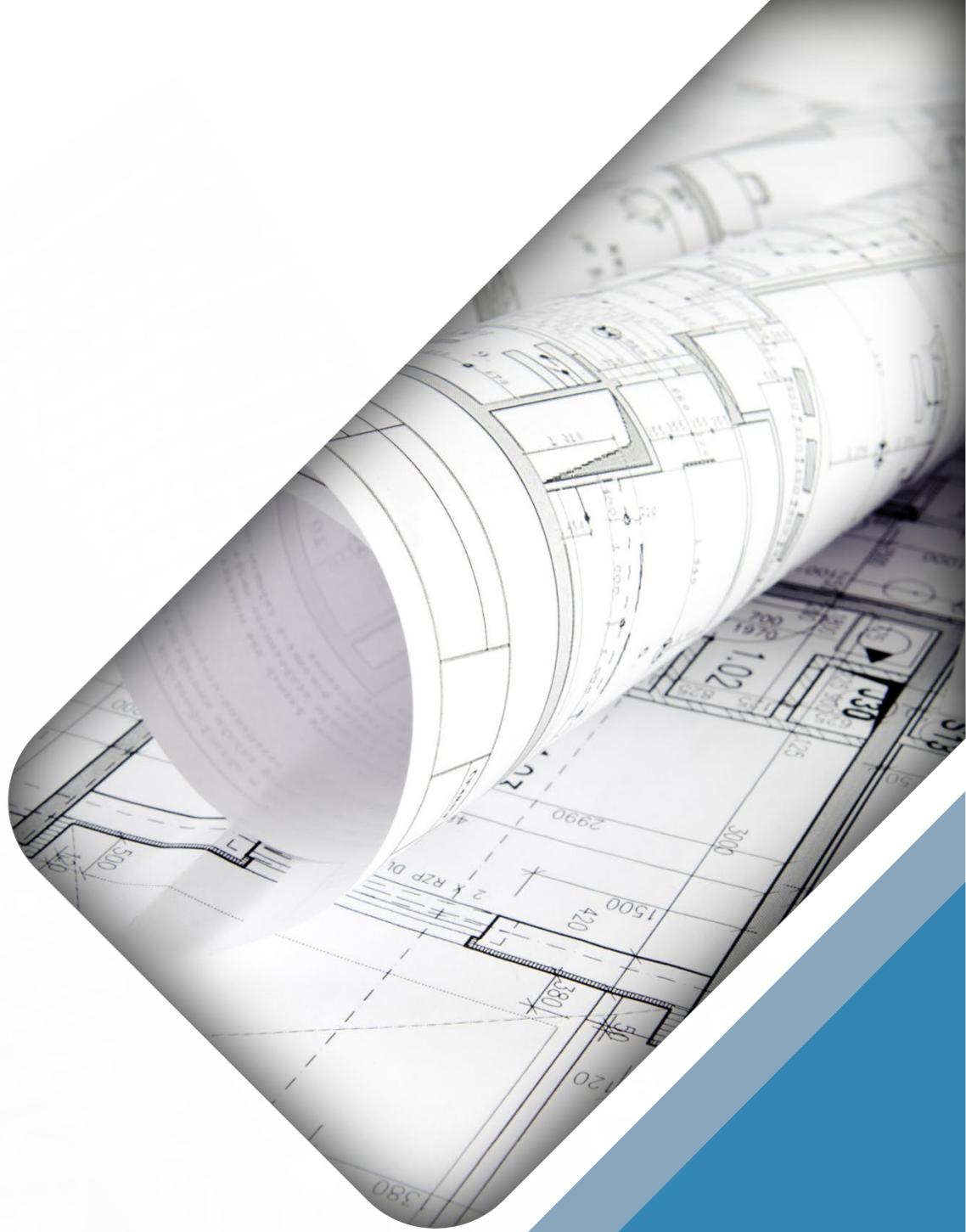
Client
THE UNIVERSITY OF MELBOURNE

Title
**ROOF FRAMING
DETAILS SHEET 3**

Project
**VCA POLICE STABLES
REDEVELOPMENT
SOUTH BANK**

APPROVED FOR CONSTRUCTION

Date DEC. 2015	Designer M.SUSOY	Design Checker Z. ZAMAN
Scale at A1 1:10	Drawn C.BEARE	Principal/Project Leader B. ONSLOW
Job Number 15039	Drawing Number S03-06	Revision C2



Appendix D

Existing Column Checks

Southbank Major Public Art Commission

TIMBER COLUMN V5.03

Robert Bird Group

Column:	(Column C02) 2 / 150mm x 150mm F8 Seasoned** (Fully Laminated*)	
Comp:	$N_c(dl)^* = 72.77\text{kN} < \phi N_c(dl) = 130.83\text{kN}$, $N_c^* = 64.68\text{kN} < \phi N_c = 215.75\text{kN}$ $N_{cw}^* = 64.68\text{kN} < \phi N_{cw} = 229.52\text{kN}$	OK (0.56,0.30) OK (0.28)
Tension:	$N_t(dl)^* = 0.00\text{kN} < \phi N_t(dl) = 233.42\text{kN}$, $N_t^* = 0.00\text{kN} < \phi N_t = 384.93\text{kN}$	
Combined:	Refer table below	OK (0.92)

Geometry (For a primary building member)

Category =	2 (1) House, (2) Primary building elements, (3) Important	
House =	n (Y)es,(N)o	
Length (L) =	8100 mm	
Strong axis eff. length (L _{ax}) =	2900 mm	Edge restrained = C (T)ension, (C)omp.
Weak axis eff. length (L _{ay}) =	6700 mm, (C)ontinuous	Bending (Layb) = 6700 mm
Effective length factor (g ₁₃) =	1.00	Studs in framing=0.9, Restrained both ends in pos.=1.0, Other cases - Table 3.2

Loadings

Compression		Tension	
Dead load (N _{dl}) =	53.90 kN	Dead load (N _{dl}) =	kN
Live load (N _{ll}) =	0.00 kN	Live load (N _{ll}) =	kN
Wind load (N _{wl} *) =	kN (Comp.)	Wind load (N _{wl} *) =	kN (Tension)
Live Load Duration = Roof		Bending	
Duration (k ₁) = 0.94 Table 2.3		M(dl)* =	kNm
Long term LL factor (ψ _{lp}) = 0.00 Table 4.1, AS1170.0		M* =	kNm
Combination factor (ψ _{cp}) = 0.00 Table 4.1, AS1170.0		M _w * = 14.00	kNm
N _{cdl} * = 1.35*(N _{cdl} +ψ _{lp} *N _{cll}) = 72.77 kN		N _{tdl} * = 1.2*N _{tdl} +1.5*ψ _{lp} *N _{tdl} =	0.00 kN
N _c * = 1.2*N _{dl} +1.5*N _{ll} = 64.68 kN		N _t * = 1.2*N _{dl} +1.5*N _{ll} =	0.00 kN
N _{cw} * = 1.2*N _{dl} + N _{wl} * + 1.5*ψ _c *N _{ll} = 64.68 kN		N _{tw} * = 1.2*N _{dl} + N _{wl} * + 1.5*ψ _c *N _{ll} =	0.00 kN

Axial capacity - Cl 3.3 & Cl 3.4

Member = 2 / 150mm x 150mm F8 Seasoned	Area (A) =	45000 mm ²
Description = F8 seasoned hardwood	Section modulus (Z _x) =	1125 x10 ³ mm ³
Design depth (dD) = 150 mm	Section modulus (Z _y) =	2250 x10 ³ mm ³
Design width (dW) = 300 mm	Stiffness (I _x) =	84.4 x10 ⁶ mm ⁴
	Modulus of elasticity (E) =	9100 MPa - Table H2.1
Strength reduction factor (φ) =	0.7 Table 2.1	
S _{3x} = min(g ₁₃ *L/dD & L _{ax} /dD) = 19.33	k _{12cx} =	0.538 for 10 < ρ _c *S _{3x} ≤ 20 - Cl 3.3.3
S _{4y} = min(g ₁₃ *L/dW & L _{ay} /dW) = 22.33	k _{12cy} =	0.405 for ρ _c *S _{4y} ≥ 20 - Cl 3.3.3
Critical S = 22.33	k ₁₂ =	0.405 for ρ _c *S ≥ 20 - Cl 3.3.3
φN _c (dl) = φ*0.57*k ₄ *k ₆ *k ₁₂ *f _c *A = 130.8 kN	f _c =	18.0 MPa
φN _c = φ*k ₁ *k ₄ *k ₆ *k ₁₂ *f _c *A = 215.8 kN	f _t =	13.0 MPa
φN _{cw} = φ*(k ₁ =1)*k ₄ *k ₆ *k ₁₂ *f _c *A = 229.5 kN	Material constant (ρ _c) =	1.00 (ρ _c =0.25)
φN _t (dl) = φ*0.57*k ₄ *k ₆ *f _t *A = 233.4 kN	Moisture factor (k ₄) =	1.00
φN _t = φ*k ₁ *k ₄ *k ₆ *f _t *A = 384.9 kN	Temp. factor (k ₆) =	1.00
φN _{tw} = φ*(k ₁ =1)*k ₄ *k ₆ *f _t *A = 409.5 kN	Size modifier (mod.c) =	1.00
	Size modifier (mod.t) =	1.00

Bending capacity - Cl 3.2

S ₁ =1.25*dD/dW*(Lay/dD) ^{0.5} = 4.18	For comp. edge restrained - Cl 3.2.3.2	
k ₁₂ = 1.000	for ρ _b *S < 10 - Cl 3.2.4	
φM(dl) = φ*(k ₁ =0.57)*k ₄ *k ₆ *k ₉ *k ₁₂ *f _b *Z _x = 11.26 kNm	f _b =	22.0 MPa
φM = φ*k ₁ *k ₄ *k ₆ *k ₉ *k ₁₂ *f _b *Z _x = 18.57 kNm	Material constant (ρ _b) =	0.89 (ρ _b =0.25)
φM _w = φ*(k ₁ =1)*k ₄ *k ₆ *k ₉ *k ₁₂ *f _b *Z _x = 19.75 kNm	Duration factor (k ₁) =	0.94
φM _y (dl) = φ*(k ₁ =0.57)*k ₄ *k ₆ *k ₉ *(k ₁₂ =1)*f _b *Z _y = 22.52 kNm	Moisture factor (k ₄) =	1.00
φM _y = φ*k ₁ *k ₄ *k ₆ *k ₉ *(k ₁₂ =1)*f _b *Z _y = 37.13 kNm	Sharing factor (k ₉) =	1.14
φM _{wy} = φ*(k ₁ =1)*k ₄ *k ₆ *k ₉ *(k ₁₂ =1)*f _b *Z _y = 39.50 kNm	Size modifier (mod.b) =	1.00

Combined - Cl 3.5.1, Cl 3.5.2 & E5

Comp/Bend	N _c (dl)*	N _c *	N _c (dl+wl)*	Tension/Bend	N _t (dl)*	N _t *	N _t (dl+wl)*
Out-of-plane	0.56	0.30	0.78	Out-of-plane	0.00	0.00	0.71
In-plane	0.42	0.23	0.92	In-plane	0.00	0.00	0.71

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