

Generic Form 15—Compliance Certificate for building Design or Specification

NOTE	<p>This is to be used for the purposes of section 10 of the <i>Building Act 1975</i> and/or section 46 of the <i>Building Regulation 2006</i>.</p> <p>RESTRICTION: A building certifier (class B) can only give a compliance certificate about whether building work complies with the BCA or a provision of the QDC. A building certifier (Class B) can not give a certificate regarding QDC boundary clearance and site cover provisions.</p>	
<p>1. Property description This section need only be completed if details of street address and property description are applicable. EG. In the case of (standard/generic) pool design/shell manufacture and/or patio and carport systems this section may not be applicable.</p>	<p>Street address <i>(include no., street, suburb / locality & postcode)</i> XX</p> <p>Lot & plan details <i>(attach list if necessary)</i> XX</p> <p>In which local government area is the land situated? XX</p>	
<p>2. Description of component/s certified</p>	<p>Mega Anchor Design as detailed in Drawing Set 30413-Sheets S1-S7 (dated APR2013). Details of the Anchors and Brackets have been supplied to us by Mega Building Industries. Based on the information and test reports supplied, the anchors and brackets are considered satisfactory to support the safe working loads as listed on the drawings according to accepted sound engineering principles and the requirements of the following codes: AS 1554 - Part 1 - 2011: Structural Steel Welding Code AS 3566 - 2002: Self-drilling Screws for the Building and Construction Industry Code AS 4100 - 2012: Steel Structures Code</p>	
<p>3. Basis of certification</p>	<p>AS/NZS1170.0, AS/NZS1170.1, AS/NZS1170.2, AS4100, AS1554, AS3566.</p>	
<p>4. Reference documentation</p>	<p>Drawing Set 30413-Sheets S1-S7 April 2013, Test Report April 2014, Test Report October 2015, Test Report F9206 April 2011, Test Report F9207 April 2011, Structerre Computations 92481.</p>	
<p>5. Building certifier reference number</p>	<p>Building certifier reference number</p> <p>_____</p>	
<p>6. Competent person details</p>	<p>Name <i>(in full)</i> Ronald Albert BELL</p> <p>Company name <i>(if applicable)</i> Summermore Pty Ltd</p> <p>Contact person Ronald Bell</p> <p>Phone no. <i>business hours</i> 07 38000973</p> <p>Mobile no. 0438288116</p> <p>Fax no. 07 38001860</p> <p>Email address ron@summermore.com.au</p> <p>Postal address PO Box 1671, Browns Plains BC, Queensland, 4118</p> <p>Licence or registration number <i>(if applicable)</i> RPEQ 6715</p>	
<p>7. Signature of competent person This certificate must be signed by the individual assessed by the building certifier as competent.</p>	<p>Signature</p> <div data-bbox="571 1686 916 1928" style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">Ronald A. Bell Registered Professional Engineer Grad Cert (Tech Mgr), BEng Civil (Hons), PEng, MIEAust (891940), MIPENZ (1027605) 19OCT2016</p> <p>Signed _____ RPEQ (6715), RBPNT (60596ES), RBP(Vic) (EC27967), RBP(Tas)(CC5556), MAIB (9225), JP(Qual).</p> <p style="text-align: center;">STRUCTURAL DETAILS CONCURRED</p> </div>	<p>Date</p> <p>Wednesday, October 19, 2016</p>

LOCAL GOVERNMENT USE ONLY

Date received		Reference Number/s	
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The *Building Act 1975* is administered by the
Department of Housing and Public Works



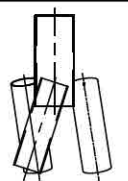
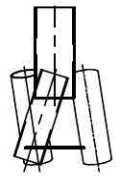
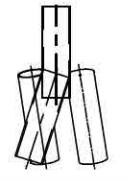
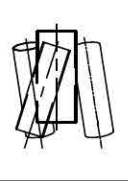
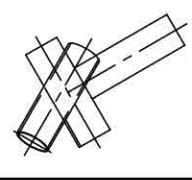
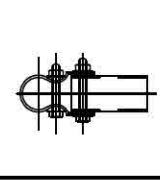
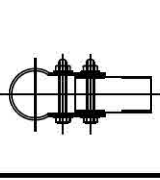
**Queensland
Government**

**NOTES
GENERAL**

- G1 All dimensions are in millimetres unless stated otherwise.
- G2 Workmanship and materials are to be in accordance with the relevant current S.A.A. codes including all amendments.
- G3 During construction the Contractor shall be responsible for maintaining the structure in a stable condition and ensuring no part shall be overstressed under construction activities. All temporary propping and bracing necessary shall be the Contractor's responsibility, however, approval shall be obtained from the Engineer.
- G4 The approval of a substitution shall be sought from the Engineer but is not an authorisation for a cost variation. All cost variations involved must be agreed with the Engineer before the work commences.
- G5 The items detailed in these drawings are not to be used in any way which causes loading beyond the limits shown.
- G6 All calculated safe working loads are limited to the ranges shown on drawings.

STEELWORK

- S1 Welds unless otherwise noted to be special purpose (SP) 3mm continuous fillet laid down with approved covered electrodes. Butt welds must develop the full tensile strength of the member.
- S2 Bolts unless otherwise noted to be 10mm diameter black bolts in 1.5mm clearance holes.
- S3 All steelwork shall be hot-dipped galvanised to the requirements of AS, 4680: 2006
- S4 All welding shall be carried out in accordance with AS 1554 - Part 1 2011: SAA Structural Steel Welding code.

MARK	ITEM	DESCRIPTION	SHEET
MA1#		HEAVY DUTY ANCHOR	S2
MA1#1		POST ANCHOR	S3
MA2#		STANDARD ANCHOR	S4
MA24#		SQUAT ANCHOR	S5
MA3#		BRACE ANCHOR	S6
MA6#		STANDARD BRACE BRACKET	S7
MA7#		HEAVY DUTY BRACE BRACKET	S7

AUSTRALIA PATENT No: AU 752228
 NEW ZEALAND PATENT No: NZ 509249
 UNITED STATES OF AMERICA PATENT No: US 6,298,618 B1
 CANADA PATENT No: 2 336 164
 CHINA PATENT No: ZA 99808169.8
 INDIA PATENT No: IN/PCT/2000/00460/DEL
 SOUTH AFRICA PATENT No: 2001/0025

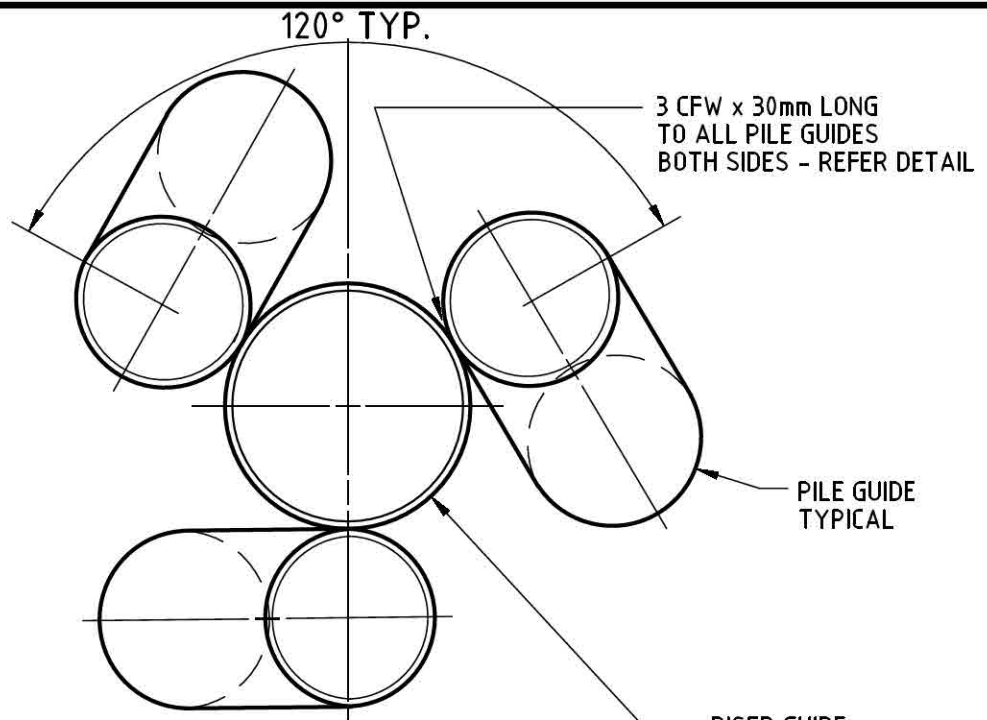
Ronald A. Bell
 Registered Professional Engineer
 Grad Cert (Tech Mgt), BEng Civil (Hons), PEng,
 MIE Aust (891940), MIPENZ (1027605)
 19OCT2016
 Signed: RPEC 67151, RPPNTY 6090653, RBVVA 1EC27967,
 RBYT 6CC5561MAIB 0225, JPCQual.
 STRUCTURAL DETAILS CONCURRED

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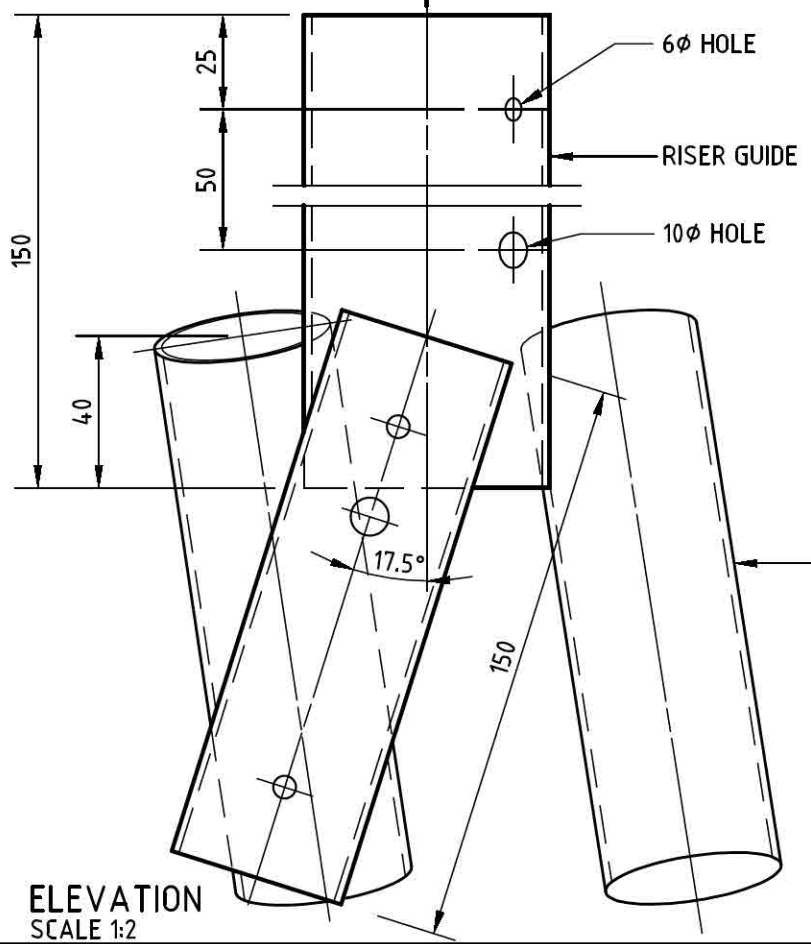
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CHRIS O'BRIEN & COMPANY PTY LTD
 CONSULTING CIVIL & STRUCTURAL ENGINEERS
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 Traralgon Vic. 3844
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 Traralgon Vic. 3844
 Telephone 03 5174 9911
 Facsimile 03 5174 0011

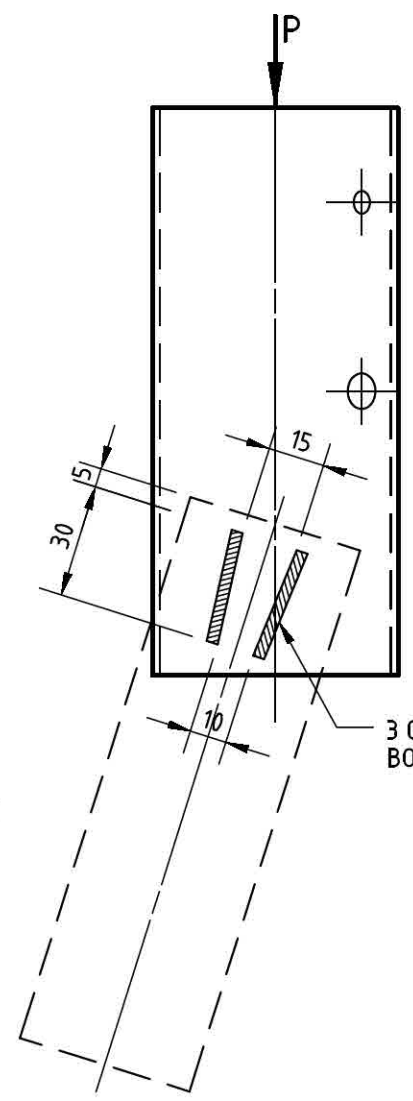
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LDM		APR 2013
DESIGNED		SCALE
GMW		AS SHOWN
CHECKED		SHEET No.
COB		S1
SIGNED	PROJECT No.	
		30413



PLAN VIEW
SCALE 1:2



ELEVATION
SCALE 1:2



PILE GUIDE CONNECTION TO RISER GUIDE
SCALE 1:2

SWL (kN)	RISER CONNECTION	PILE CONNECTIONS
P = ±30	6 SCREWS	3 SCREWS
P = ±25	6 SCREWS	3 SCREWS
P = ±20	5 SCREWS	2 SCREWS
P = ±15	4 SCREWS	2 SCREWS
P = ±10	3 SCREWS	2 SCREWS
P = ±5	2 SCREWS	2 SCREWS

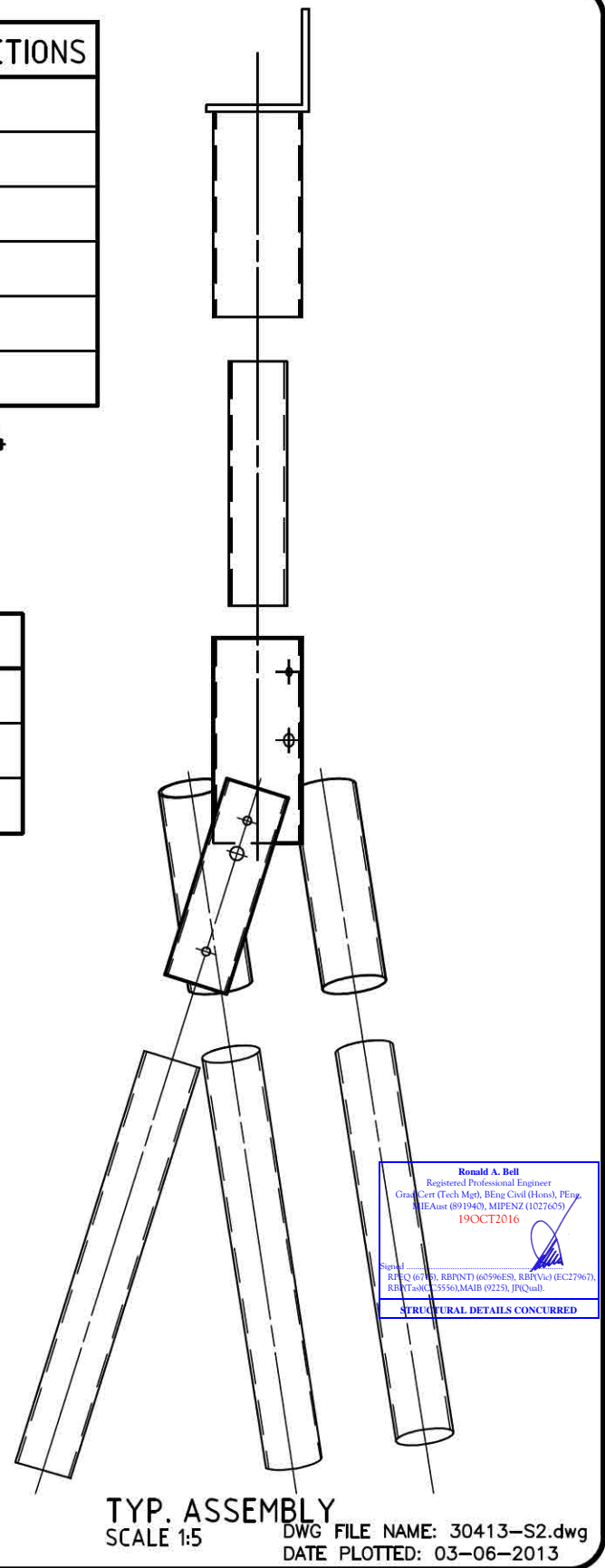
ALL SCREWS TO BE 14 GAUGE 20 x 22 CLASS 4 SELF-DRILLING & TAPPING SCREWS TO THE REQUIREMENTS OF AS. 3566: 2002

MEMBER SCHEDULE		
MARK No.	SIZE	REMARKS
MAIN FRAME	65.0 x 2 CHS	GRADE 300
PILE GUIDE	47.0 x 2 CHS	GRADE 300

NOT TO BE USED TO THE ABOVE SWL'S IN APPLICATIONS OTHER THAN SUPPORTING FULLY BRACED STRUCTURES WHICH PROVIDE FULL TORSIONAL RESTRAINT.

SWL - P AT VERTICAL ONLY

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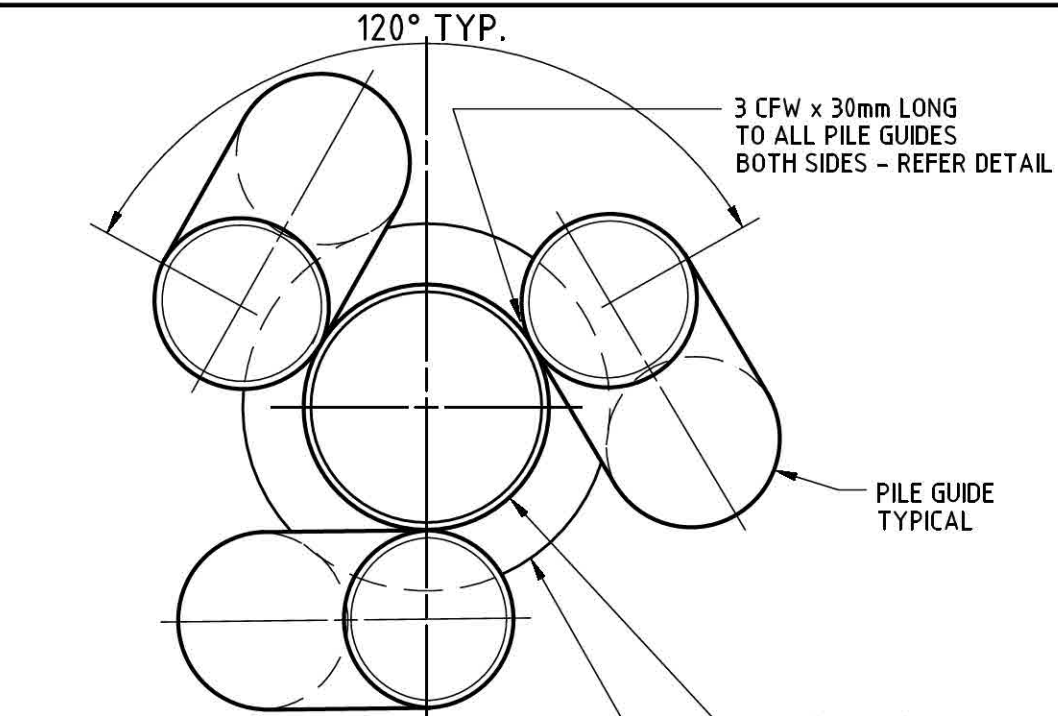
13^A Church Street
 Traralgon Vic. 3844

Telephone 03 5174 9911
 Facsimile 03 5174 0011

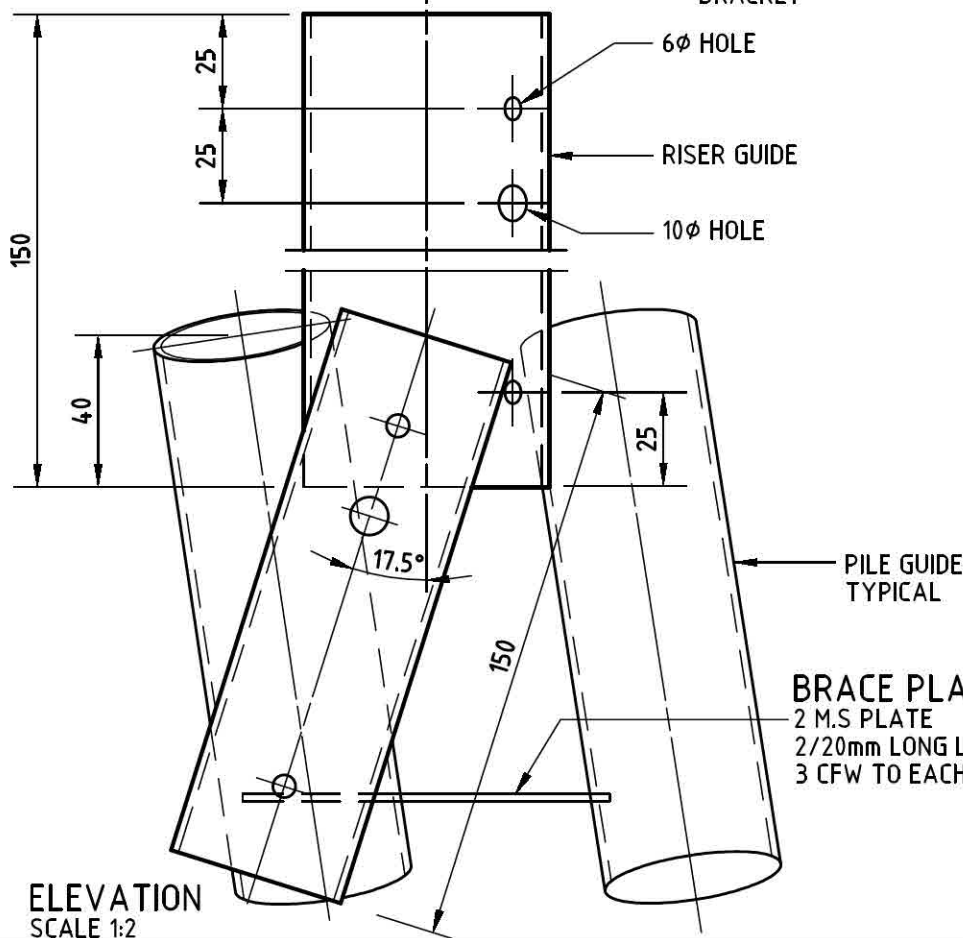
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DESIGNED GMW		SCALE AS SHOWN
CHECKED COB	PROJECT MEGA ANCHOR PROOF ENGINEERING AND DESIGN COMPLIANCE	SHEET No. S2
SIGNED		PROJECT No. 30413

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 2 SCREWS PER PILE AND 2 SCREWS TO THE RISER

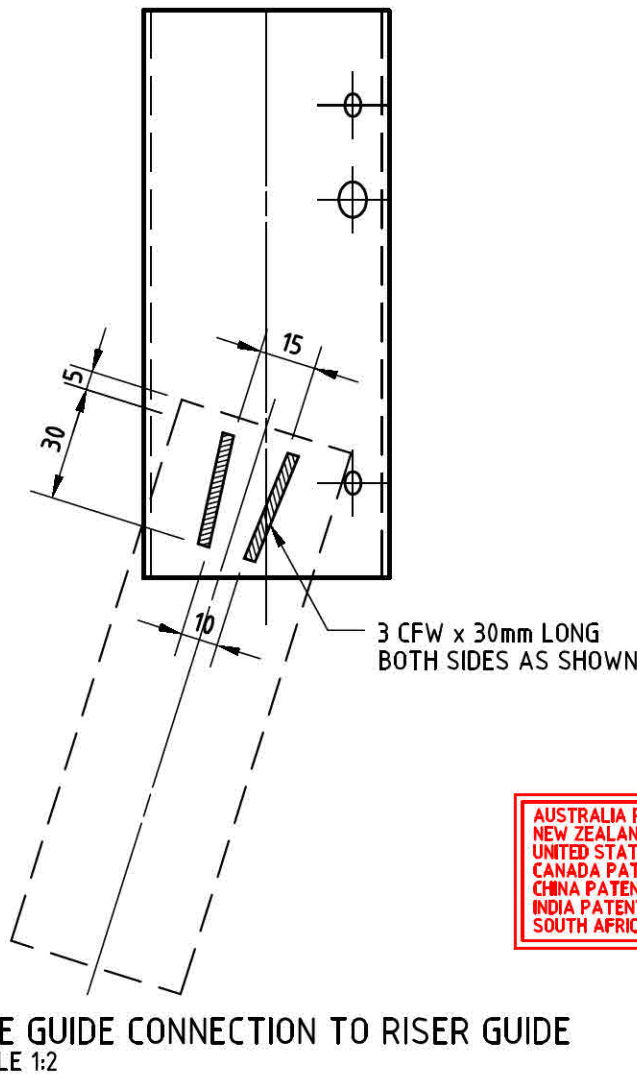
MEMBER SCHEDULE		
MARK No.	SIZE	REMARKS
MAIN FRAME	65.0 x 2 CHS	GRADE 300
PILE GUIDE	47.0 x 2 CHS	GRADE 300



PLAN VIEW
SCALE 1:2

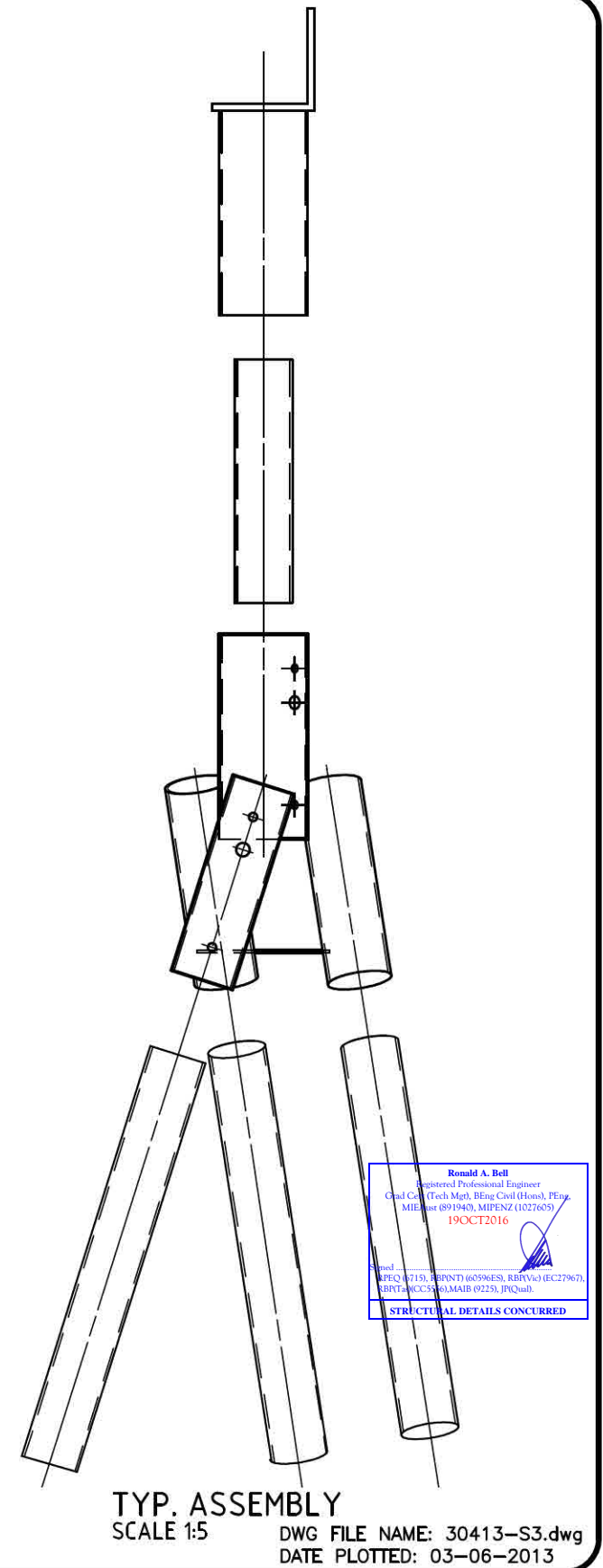


ELEVATION
SCALE 1:2



PILE GUIDE CONNECTION TO RISER GUIDE
SCALE 1:2

AUSTRALIA PATENT No: AU 75228
 NEW ZEALAND PATENT No: NZ 509249
 UNITED STATES OF AMERICA PATENT No: US 6,298,618 B1
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 CHINA PATENT No: ZA 99808169.8
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 SOUTH AFRICA PATENT No: 2001/0025

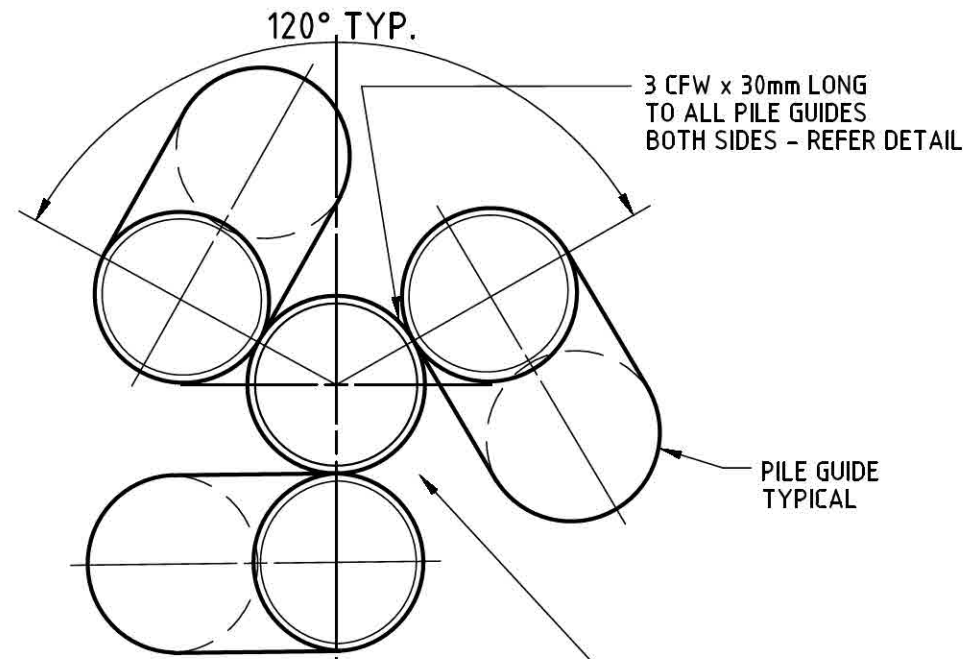


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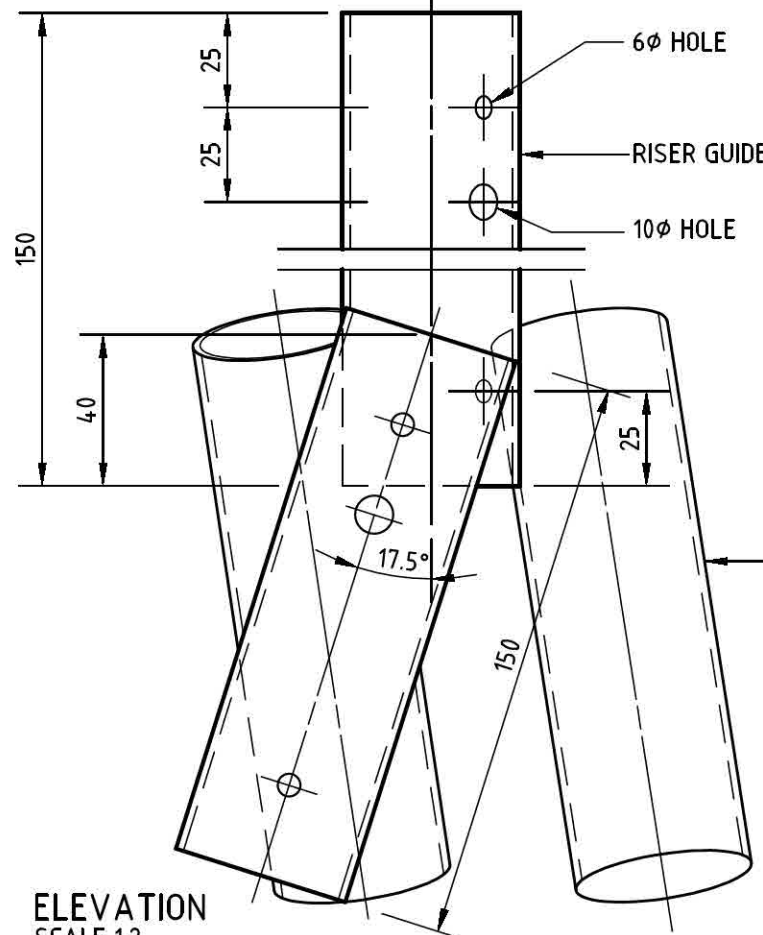
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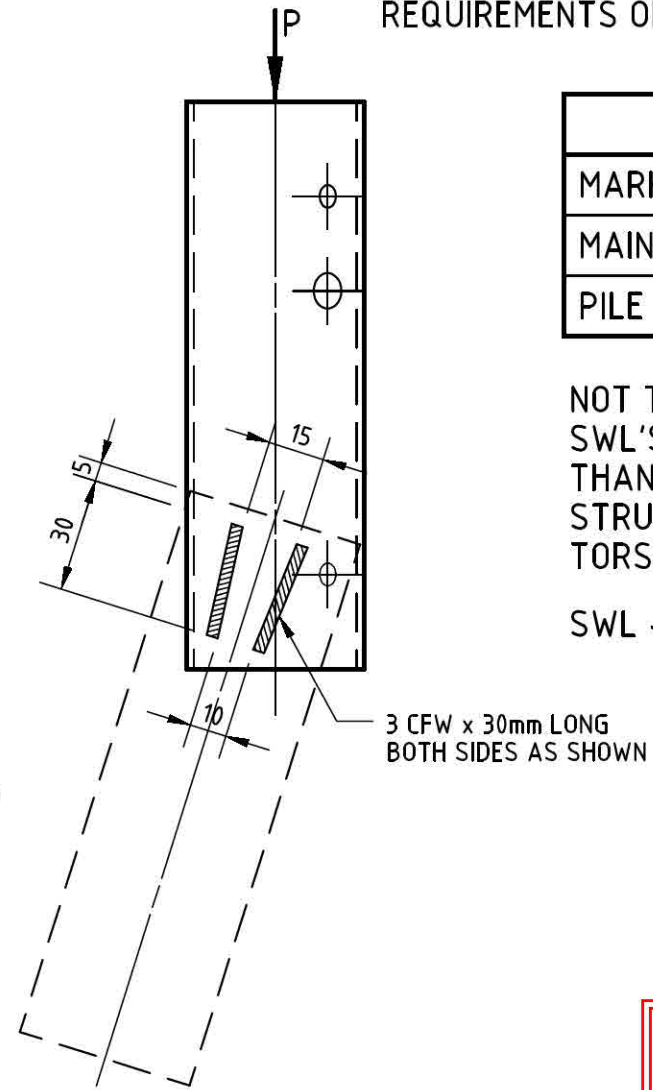
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LDM		APR 2013
DESIGNED		SCALE
GMW		AS SHOWN
CHECKED	MEGA ANCHOR PROOF ENGINEERING AND DESIGN COMPLIANCE	SHEET No.
COB		S3
SIGNED		PROJECT No.
		30413



PLAN VIEW
SCALE 1:2



ELEVATION
SCALE 1:2



PILE GUIDE CONNECTION TO RISER GUIDE
SCALE 1:2

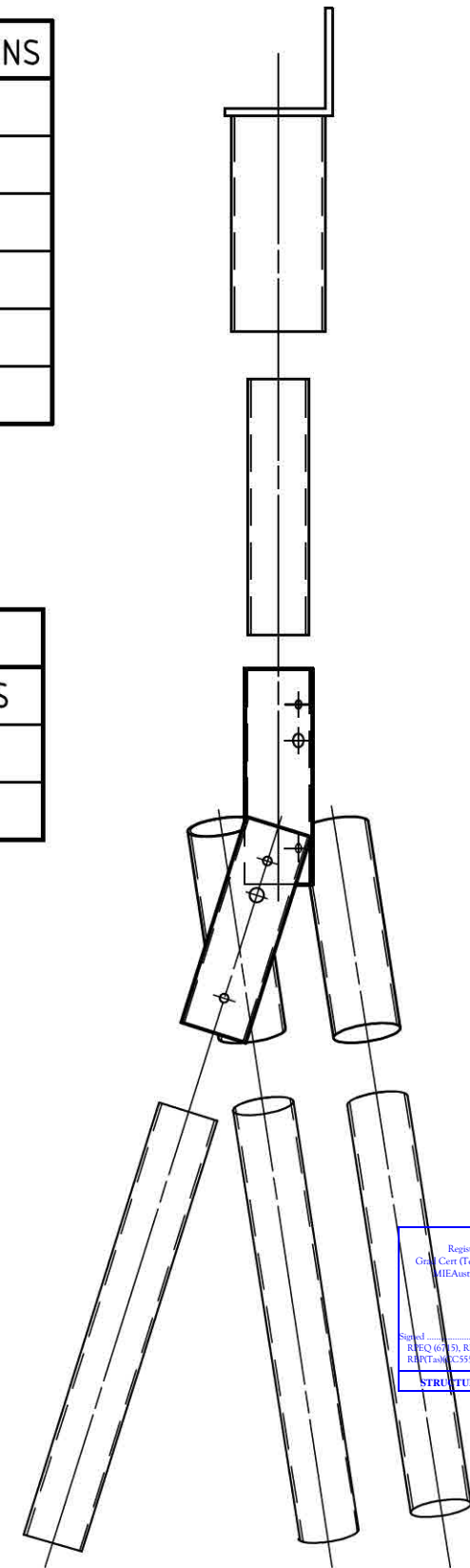
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P = ±30	6 SCREWS	3 SCREWS
P = ±25	6 SCREWS	3 SCREWS
P = ±20	5 SCREWS	2 SCREWS
P = ±15	4 SCREWS	2 SCREWS
P = ±10	3 SCREWS	2 SCREWS
P = ±5	2 SCREWS	2 SCREWS

ALL SCREWS TO BE 14 GAUGE 20 x 22 CLASS 4 SELF-DRILLING & TAPPING SCREWS TO THE REQUIREMENTS OF AS. 3566: 2002

MEMBER SCHEDULE		
MARK No.	SIZE	REMARKS
MAIN FRAME	47.0 x 2 CHS	GRADE 300
PILE GUIDE	47.0 x 2 CHS	GRADE 300

NOT TO BE USED TO THE ABOVE SWL'S IN APPLICATIONS OTHER THAN SUPPORTING FULLY BRACED STRUCTURES WHICH PROVIDE FULL TORSIONAL RESTRAINT.

SWL - P AT VERTICAL ONLY



TYP. ASSEMBLY
SCALE 1:5

Ronald A. Bell
Registered Professional Engineer
Civil (Tech Mgt), BEng Civil (Hons), PEng
MIEAust (891940), MIPENZ (1027605)
19OCT2016
STRUCTURAL DETAILS CONCURRED

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INDIA PATENT No: IN/PCT/2000/00460/DEL
SOUTH AFRICA PATENT No: 2001/0025

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DATE PLOTTED: 03-06-2013

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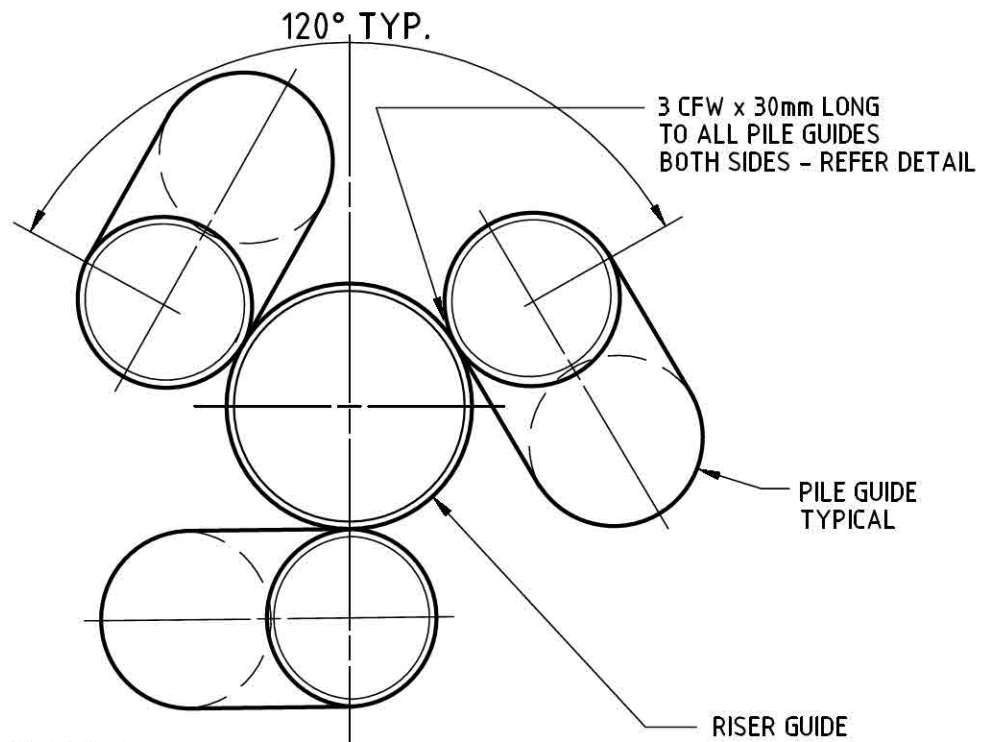
Telephone 03 5174 9911
Facsimile 03 5174 0011

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LDM
DESIGNED
GMW
CHECKED
COB
SIGNED

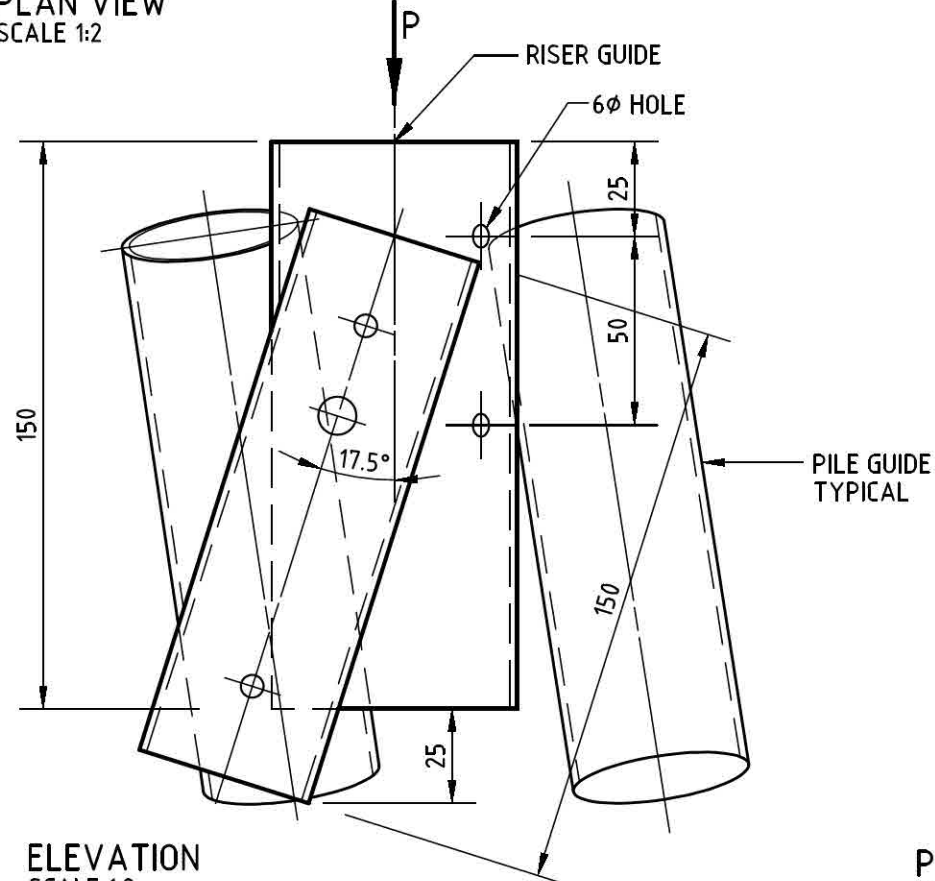
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PROJECT

MEGA ANCHOR PROOF ENGINEERING
AND DESIGN COMPLIANCE

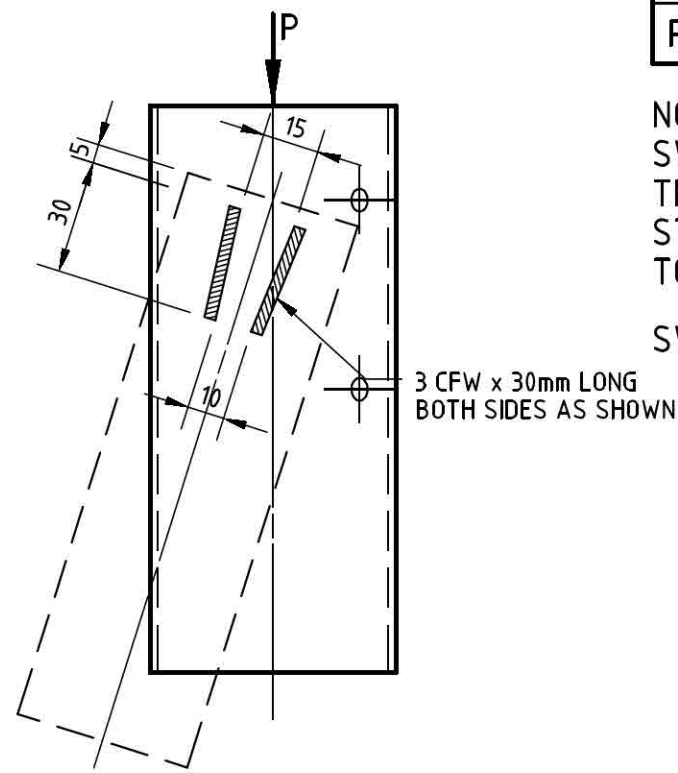
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APR 2013
SCALE
AS SHOWN
SHEET No.
S4
PROJECT No.
30413



PLAN VIEW
SCALE 1:2



ELEVATION
SCALE 1:2



PILE GUIDE CONNECTION TO RISER GUIDE
SCALE 1:2

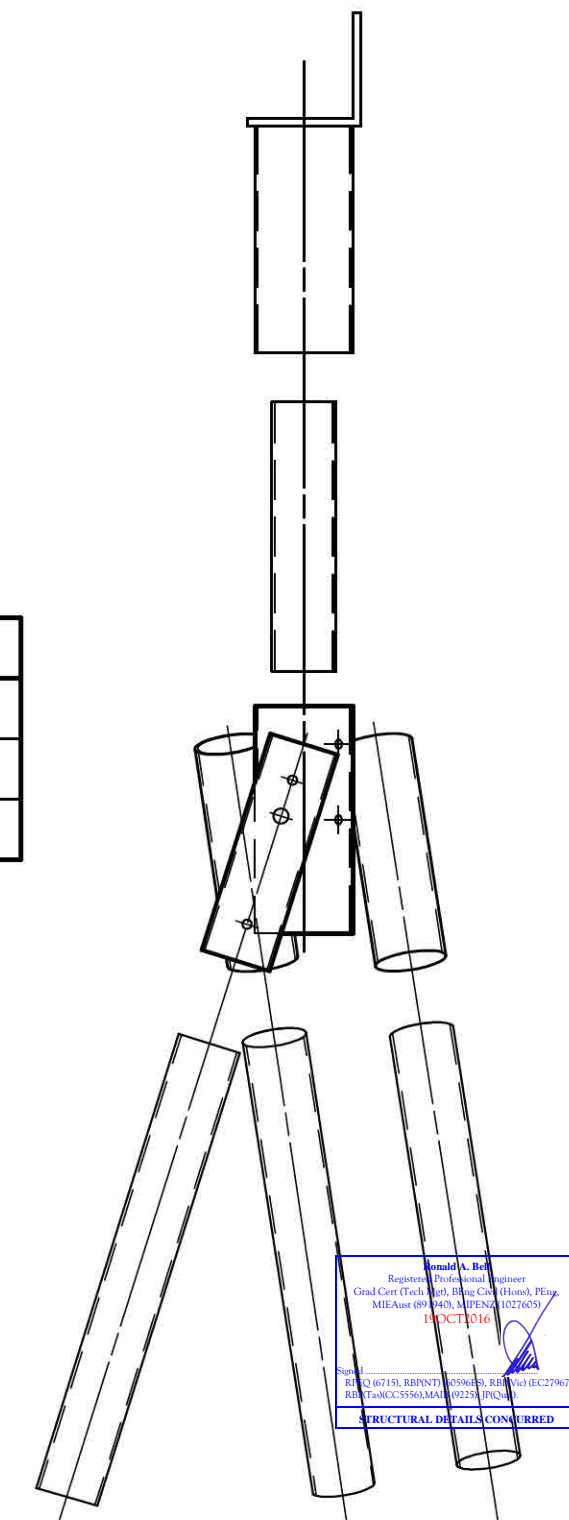
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P = ±25	6 SCREWS	3 SCREWS
P = ±20	5 SCREWS	2 SCREWS
P = ±15	4 SCREWS	2 SCREWS
P = ±10	3 SCREWS	2 SCREWS
P = ±5	2 SCREWS	2 SCREWS

ALL SCREWS TO BE 14 GAUGE 20 x 22 CLASS 4 SELF-DRILLING & TAPPING SCREWS TO THE REQUIREMENTS OF AS. 3566: 2002

MEMBER SCHEDULE		
MARK No.	SIZE	REMARKS
MAIN FRAME	65.0 x 2 CHS	GRADE 300
PILE GUIDE	47.0 x 2 CHS	GRADE 300

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SWL - P AT VERTICAL ONLY



TYP. ASSEMBLY
SCALE 1:5

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CLIENT

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13^A Church Street
Traralgon Vic. 3844

Telephone 03 5174 9911
Facsimile 03 5174 0011

DRAWN
LDM
DESIGNED
GMW
CHECKED
COB
SIGNED

MA24# - SQUAT ANCHOR

PROJECT

MEGA ANCHOR PROOF ENGINEERING
AND DESIGN COMPLIANCE

DATE

APR 2013

SCALE

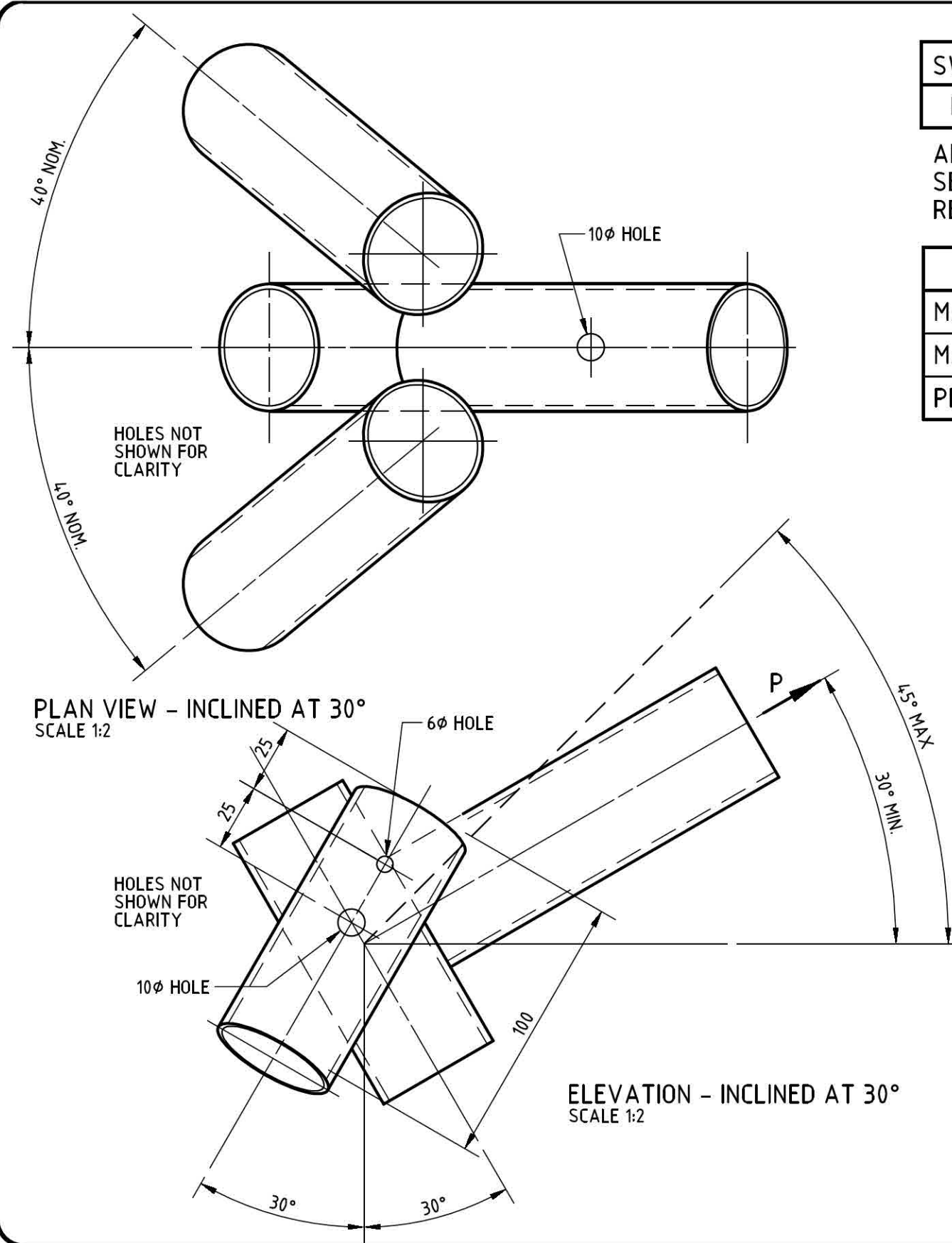
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SHEET No.

S5

PROJECT No.

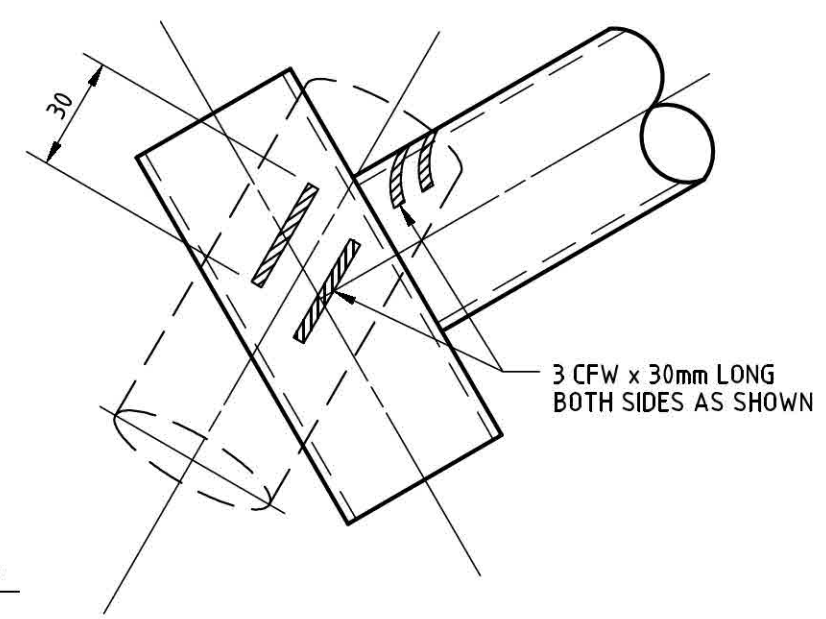
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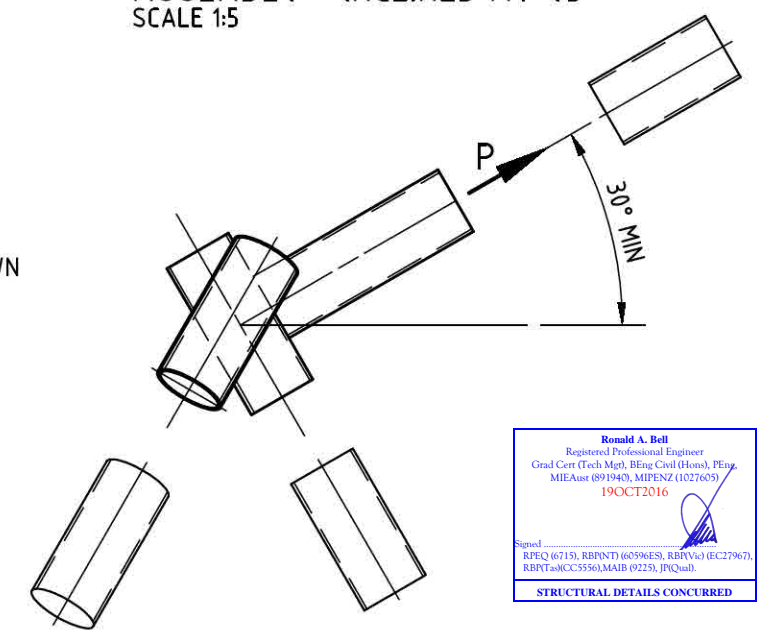
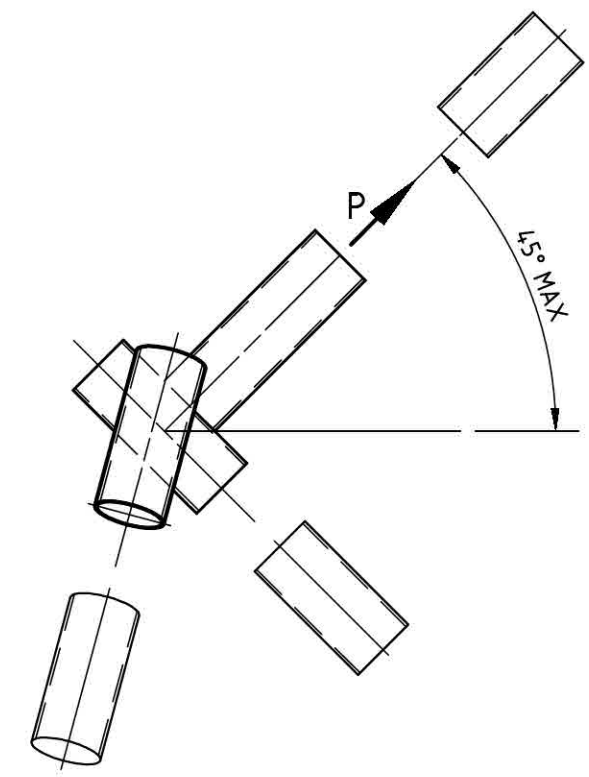
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ALL SCREWS TO BE 14 GAUGE 20 x 22 CLASS 4 SELF-DRILLING & TAPPING SCREWS TO THE REQUIREMENTS OF AS. 3566: 2002

MEMBER SCHEDULE		
MARK No.	SIZE	REMARKS
MAIN FRAME	47.0 x 2 CHS	GRADE 300
PILE GUIDE	47.0 x 2 CHS	GRADE 300



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 Grad Cert (Tech Mgt), BEng Civil (Hons), PEng,
 MIEAust (891940), MIPENZ (1027605)
 19OCT2016
 Signed: RPEC/67151, RBPN/6299658, RBV/6101 (EC27967),
 RBPT/6005561MAIB (0225), JPC/Qual.
 STRUCTURAL DETAILS CONCURRED

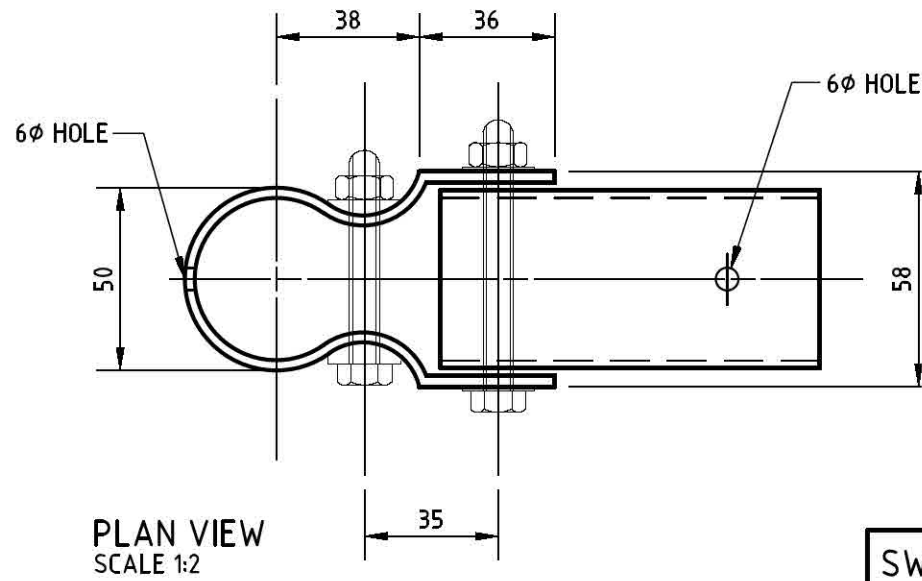
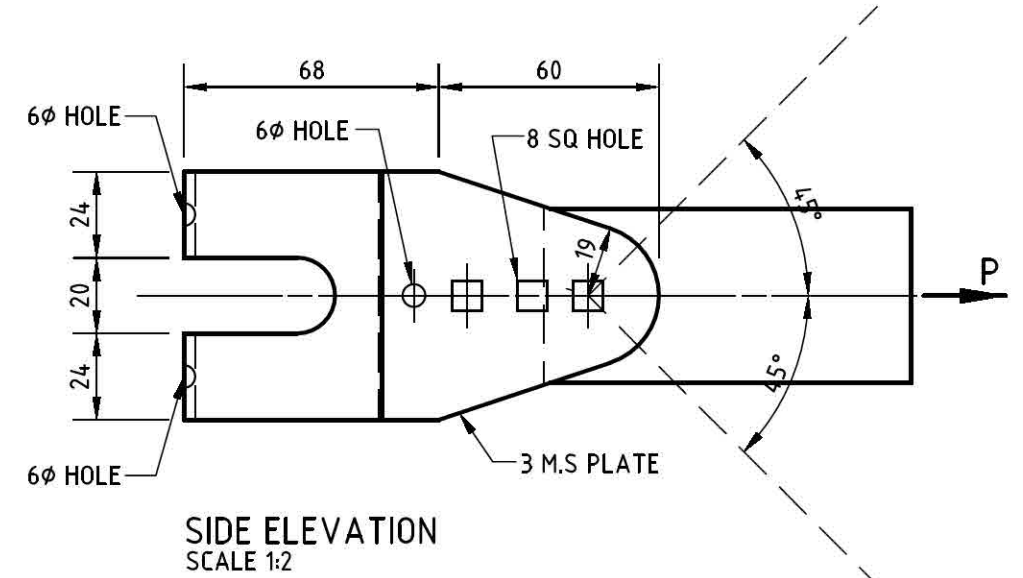
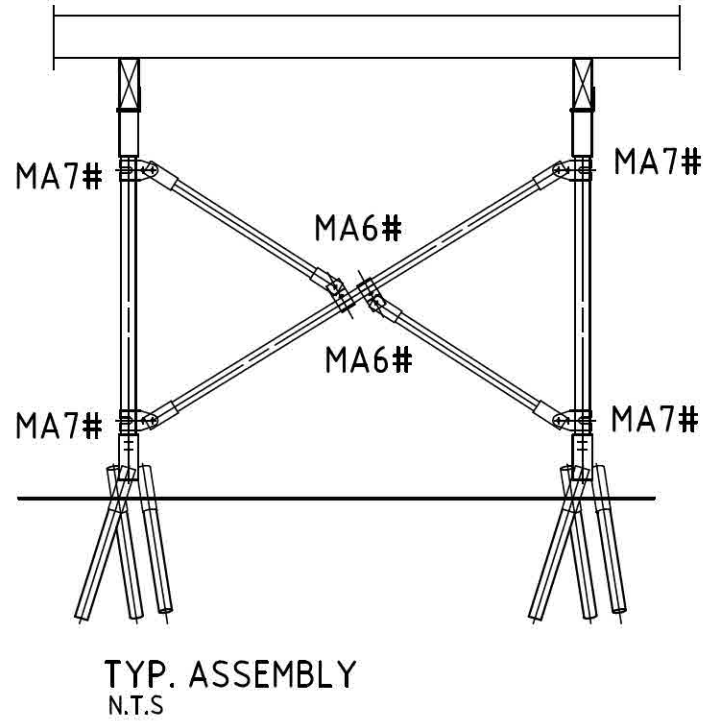
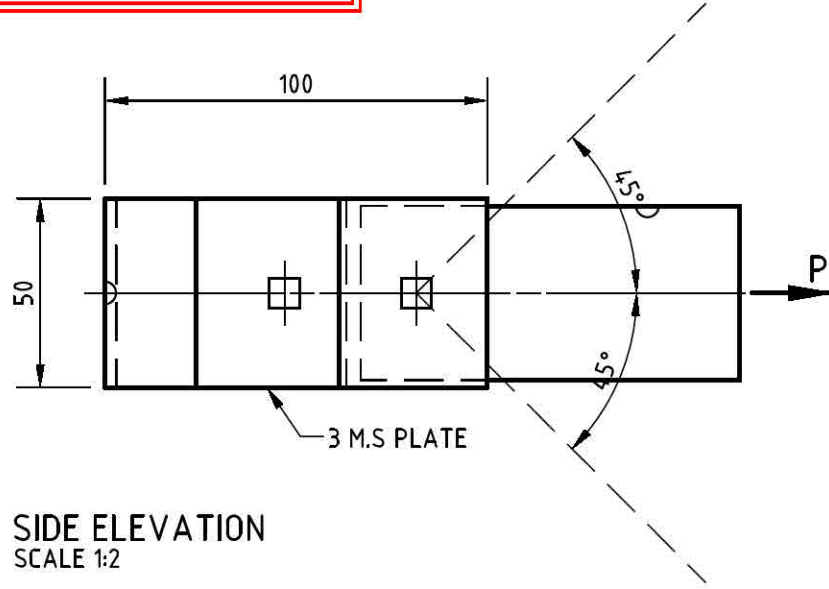
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 DATE PLOTTED: 03-06-2013

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CLIENT
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DRAWN	MA3# - BRACE ANCHOR	DATE	APR 2013
LDM	PROJECT	SCALE	AS SHOWN
DESIGNED	MEGA ANCHOR PROOF ENGINEERING AND DESIGN COMPLIANCE	SHEET No.	S6
GMW		PROJECT No.	30413
CHECKED			
COB			
SIGNED			

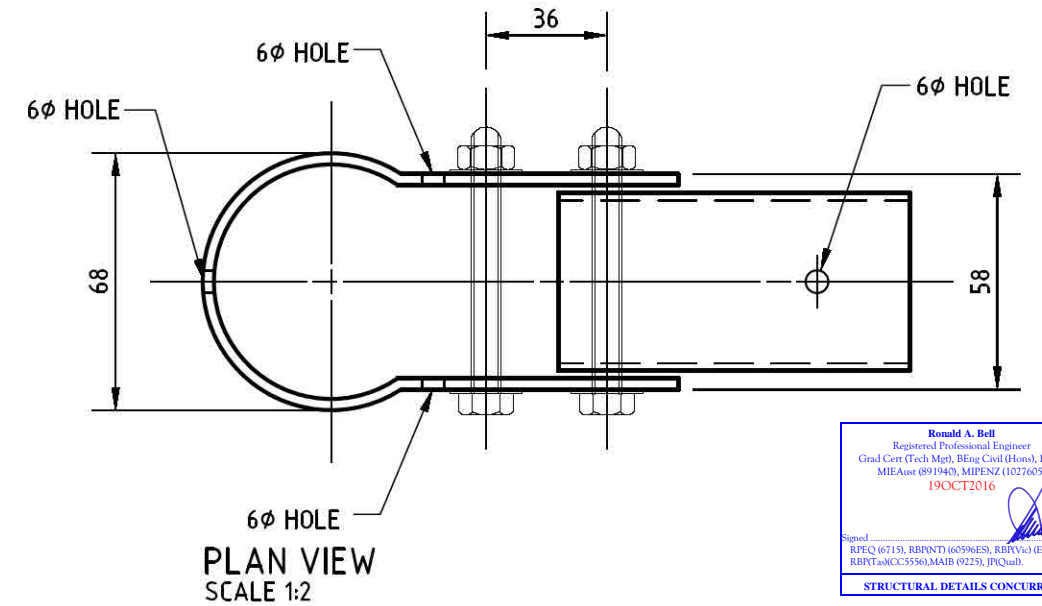
AUSTRALIA PATENT No: AU 752228
 NEW ZEALAND PATENT No: NZ 509249
 UNITED STATES OF AMERICA PATENT No: US 6,298,618 B1
 CANADA PATENT No: 2 336 164
 CHINA PATENT No: ZA 99808169.8
 INDIA PATENT No: IN/PCT/2000/00460/DEL
 SOUTH AFRICA PATENT No: 2001/0025



SWL (kN)
P = 5

ALL BOLTS TO BE M8 4.6/S GALV BOLTS

MA6#
STANDARD BRACE BRACKET
 USED FOR BRACING MA2# RISER



MA7#
HEAVY DUTY BRACE BRACKET

Ronald A. Bell
 Registered Professional Engineer
 Grad Cert (Tech Mgt), BEng Civil (Hons), PEng,
 MIEAust (891940), MIPENZ (1027605)
 19OCT2016
 Signed: RPEC/67151, RBPNT/6090653, RBPA/6027967,
 RBYT/6025561/MAIB (0225), JPC/Qual.
 STRUCTURAL DETAILS CONCURRED

DWG FILE NAME: 30413-S7.dwg
 DATE PLOTTED: 03-06-2013

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CLIENT

MR ROBERT LAWSON

CHRIS O'BRIEN & COMPANY PTY LTD
 CONSULTING CIVIL & STRUCTURAL ENGINEERS

All correspondence to:
 P.O. Box 18
 Traralgon Vic. 3844

13^A Church Street
 Traralgon Vic. 3844

Telephone 03 5174 9911
 Facsimile 03 5174 0011

DRAWN
 LDM
 DESIGNED
 GMW
 CHECKED
 COB
 SIGNED

MA6# & MA7# - STANDARD & HEAVY DUTY BRACE BRACKETS
 PROJECT

MEGA ANCHOR PROOF ENGINEERING
AND DESIGN COMPLIANCE

DATE	APR 2013
SCALE	AS SHOWN
SHEET No.	S7
PROJECT No.	30413

Mega Anchor Product Testing

Proposed Load Testing for Mega Anchor Products

Introduction:

A selection of mega anchor products will be load tested to determine different loading capacities with different length piles. This will include mainly Down Load & Upload capacities. The data will be considered in calculations for general building and construction and solar structures. Mega Anchor products will be subject to multiple load tests under controlled conditions. The tests will also test tensile strength of Mega Anchor products and fixings.

Maximum Load test will not exceed 90KN Download & 45KN upload. All anchors will be installed as per design compliance drawing S2 for 30KN support.

All test will be filmed.

Testing Plan:

Test Date: 12/04/2014

Test Location:

Travers Lane, Heathcote, Victoria, Australia



Tests will be carried out on Mega Anchor products as described below.

MA1# Heavy Duty Mega Anchor

MA15# Heavy Duty Mega Anchor Flat Top

Each test will consist of 3 anchors being installed in close proximity of each other. The anchors will be installed in a straight line, multiple tests will be conducted on anchors installed with different pile depths. A bearer will span the 3 anchors with a 20t hydraulic Jack and 20t load cell placed between the centre anchor and the bearer the anchors on the end will be attached directly to the bearer.

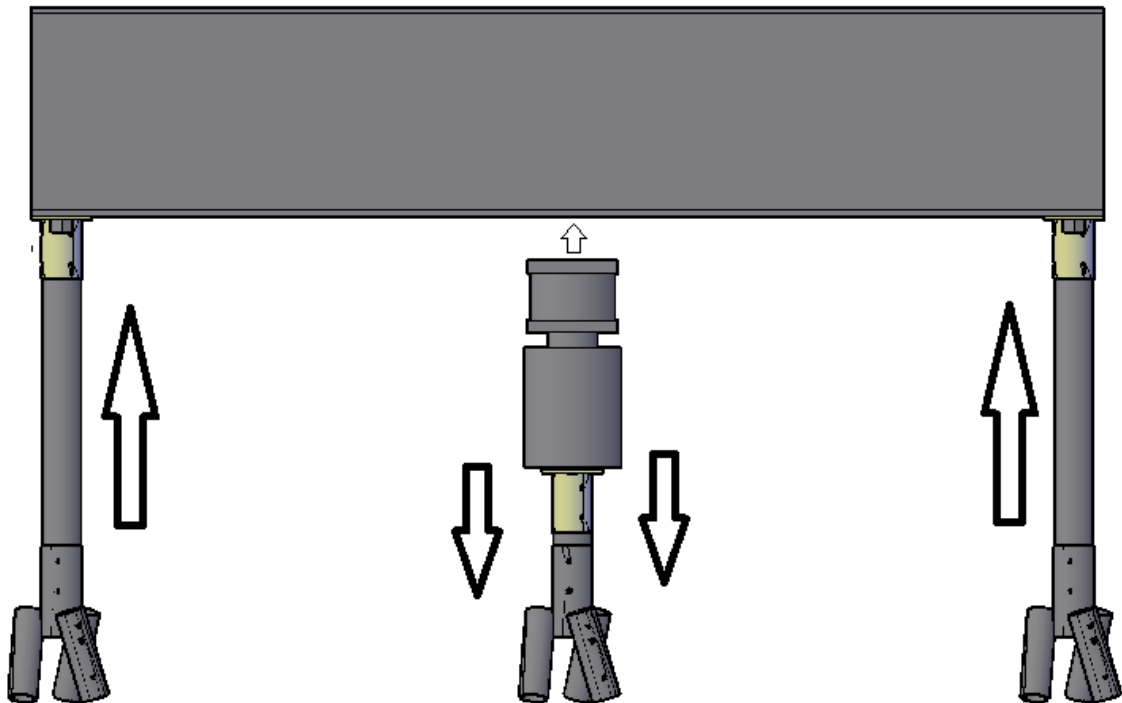
Mega Anchor Product Testing

Test Plan Details:

Items Required:

Item	QTY
MA1# Heavy Duty Mega Anchor	6
MA15# Heavy Duty Flat Top	9
Risers 50NB Gal Pipe	9
900mm Piles 32NB Pipe 2mm Gal	9
1200mm Piles 32NB Pipe 2mm Gal	9
1500mm Pipe 32NB Pipe 2mm Gal	9
Tek screws 14g class 4 20x22	300
Bolts nuts & 4mm washes M14	4
Bearer / Beam 350mm I Beam	1
20t (tonne) Hydraulic Jack	1
20t (tonne) Load Cell	1
Load Cell Display	1
Video Camera	1
Still Camera	1
Mega Anchor Standard Installation Tool Set	1

Testing Diagram:



Mega Anchor Product Testing

1st Test MA1# MA15# 900MM Piles

3 MA1# Heavy Duty Mega Anchors will be installed. The 3 anchors will be installed in a line. The hydraulic jack and load cell will be placed on the middle Anchor and the other 2 MA1# anchors fitted with the MA15# Flat Top will attach directly to the bearer. The 2 MA1# anchors on the outside of the beam will be tested for uplift and the centre anchor will be tested for down force. The Anchors will have a set pile depth of 900mm with the piles penetrating 750mm into the ground. It has been calculated that the 2 outer anchors will share the uplift force making the uplift force approximately half the download force applied to the middle anchor.

Items Required:

- 3 x MA1#
- 3 x MA15#
- 1 x 20t Hydraulic Jack
- 1 x 20t Load Cell + Display
- 9 x 900mm piles
- Screws & Bolts

2nd Test MA1# MA15# 1200MM Piles

3 MA1# Heavy Duty Mega Anchors will be installed. The 3 anchors will be installed in a line. The hydraulic jack and load cell will be placed on the middle Anchor and the other 2 MA1# anchors fitted with the MA15# Flat Top will attach directly to the bearer. The 2 MA1# anchors on the outside of the beam will be tested for uplift and the centre anchor will be tested for down force. The Anchors will have a set pile depth of 1200mm with the piles penetrating 1050mm into the ground. It has been calculated that the 2 outer anchors will share the uplift force making the uplift force approximately half the download force applied to the middle anchor.

Items Required:

- 3 x MA1#
- 3 x MA15#
- 1 x 20t Hydraulic Jack
- 1 x 20t Load Cell + Display
- 9 x 1200mm piles
- Screws & Bolts

Mega Anchor Product Testing

3rd Test MA1# MA15# 1500MM Piles

3 MA1# Heavy Duty Mega Anchors will be installed. The 3 anchors will be installed in a line. The hydraulic jack and load cell will be placed on the middle Anchor and the other 2 MA1# anchors fitted with the MA15# Flat Top will attach directly to the bearer. The 2 MA1# anchors on the outside of the beam will be tested for uplift and the centre anchor will be tested for down force. The Anchors will have a set pile depth of 1500mm with the piles penetrating 1350mm into the ground. It has been calculated that the 2 outer anchors will share the uplift force making the uplift force approximately half the download force applied to the middle anchor.

Items Required:

3 x MA1#

3 x MA15#

1 x 20t Hydraulic Jack

1 x 20t Load Cell + Display

9 x 1500mm piles

Screws & Bolts

Mega Anchor Product Testing

Test Results

1st Test

Load Direction	Uplift	Download	Uplift	
Anchor	MA1#	MA1#	MA1#	Max Load Applied
Pile Length	900	900	900	3000KG
Pile Ground Penetration	750	750	750	
Down Load Applied	NA	3000KG	NA	
Up Load Applied	1500KG	NA	1500KG	
Point Of failure Load	1500KG	None	1500KG	
Type Of failure	Lifting	NA	Lifting	
Damage to Product	None	None	None	

Pile Log

Anchor No	Pile 1	Pile 2	Pile 3	Practical Refusal
1	750	750	750	N
2 (Centre Anchor)	750	750	750	N
3	750	750	750	N

Conclusion

The test results indicate that 900mm piles that penetrate 750mm can withstand an upload force of approximately 1500KG before the anchor starts to lift. No damage was sustained to the anchor, fixings or any attachments.

This test also indicates that although the anchor piles were not installed to practical refusal they were still able to withstand down load forces up to 3000KG.

Mega Anchor Product Testing



Mega Anchor Product Testing

Centre Anchor
900mm piles



Anchor Test 900mm Piles 2000KG Load



Mega Anchor Product Testing

2nd Test

Load Direction	Uplift	Download	Uplift	
Anchor	MA1#	MA1#	MA1#	Max Load Applied
Pile Length	1200	1200	1200	4700
Pile Ground Penetration	1050	1050	1050	
Down Load Applied	NA	4700KG	NA	
Up Load Applied	2350	NA	2350	
Point Of failure Load	None	None	2000KG	
Type Of failure	None	None	Lifting	
Damage to Product	None	None	None	

Pile Log

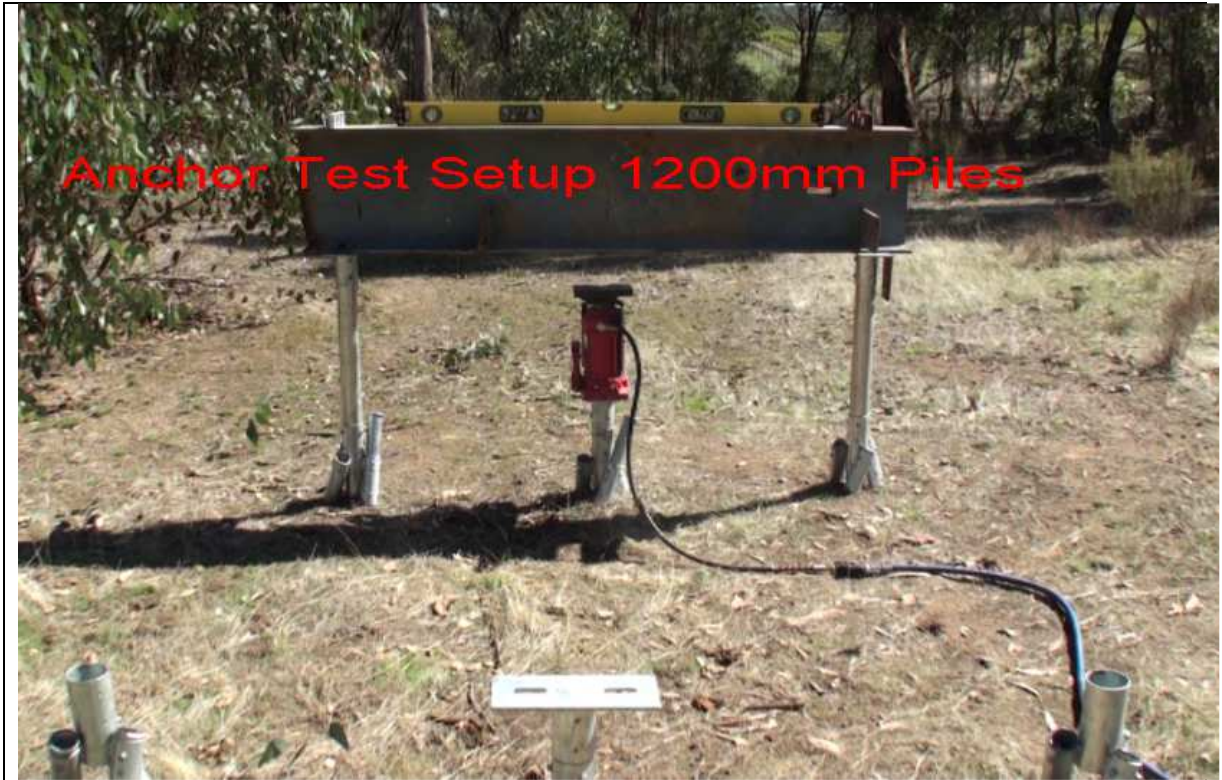
Anchor No	Pile 1	Pile 2	Pile 3	Practical Refusal
1	1050	1050	950	Y
2	1050	1050	1050 /N	Y/N
3	1050	1050	950	Y

Notes

The test results indicate that 1200mm piles that penetrate 1050mm can withstand an upload force of approximately 2350KG before the anchor starts to lift. No damage was sustained to the anchor, fixings or any attachments.

This test also indicates that anchor piles installed to practical refusal were able to exceed the design load of the Mega Anchor and withstand down forces up to 4700KG without failure.

Mega Anchor Product Testing



Mega Anchor Product Testing

3rd Test

Load Direction	Uplift	Download	Uplift	
Anchor	MA1#	MA1#	MA1#	Max Load Applied
Pile Length	1500	1200	1500	8000KG
Pile Ground Penetration	1350	1050	1350	
Down Load Applied	NA	8000KG	NA	
Up Load Applied	4000 KG	NA	4000 KG	
Point Of failure Load	Between 3500KG – 4000KG	5500KG 7600KG	Between 3500KG – 4000KG	
Type Of failure	MA15# Flat Top Connection Welds Failure	Push down Into Ground At 5500KG Riser Tek Screw Sheer At 7600KG	MA15 Flat Top Connection Welds Failure	
Damage to Product	Flat Top	No	Flat Top	

Pile Log

Anchor No	Pile 1	Pile 2	Pile 3	Practical Refusal
1	1180	1350	1300	Y
2	1050	1050	950	Y
3	1350	1350	1350	Y

Notes

The test results indicate that 1500mm piles that penetrate 1350mm can withstand an upload force in excess of 4000KG however it was observed that the MA15# flat top was the first component to fail in this test with the flat top connection welds breaking when the load applied exceeded 3500KG. There was some deflection in the centre anchor at loads between 5000KG & 8000KG but no physical breaks or destructive damage to the anchor. The centre anchor was installed with 1200mm piles. At the higher end of the load testing, the fixings on the anchor gave way between 7000KG & 8000KG. This test also indicates that anchor piles installed to practical Refusal were able to exceed the design load of the Mega Anchor and withstand down forces up to 5500KG without failure and loads up 7000KG before Tek screw shear.

Mega Anchor Product Testing



Mega Anchor Product Testing



Mega Anchor Product Testing



Mega Anchor Product Testing



Mega Anchor Product Testing





Mega Anchor Pile Test

A pile test was conducted to determine the depth of the piles for the Mega Anchor foundation system. A pile was driven to practical refusal on the specified site in the location where the building will be situated. The test details are outlined below.

Site Address:	Test Pile	Date 13.10.2015
Johnson Rd, Claymore, NSW	32 NB Galvanized Pipe 2mm Wall thickness	

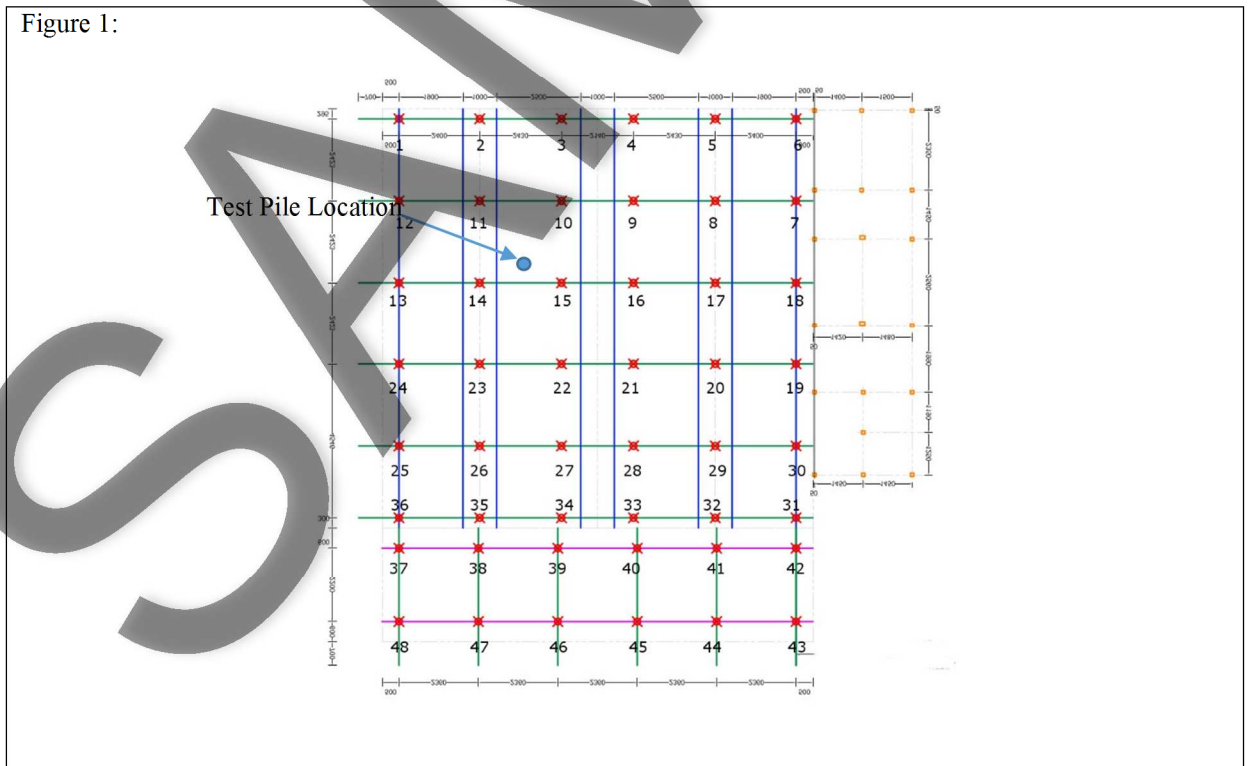
Practical Refusal for Mega Anchor Pile Test
 Pile Driver: 45 Joules @ 1300BPM
 Pile penetration: 5mm / 10 seconds

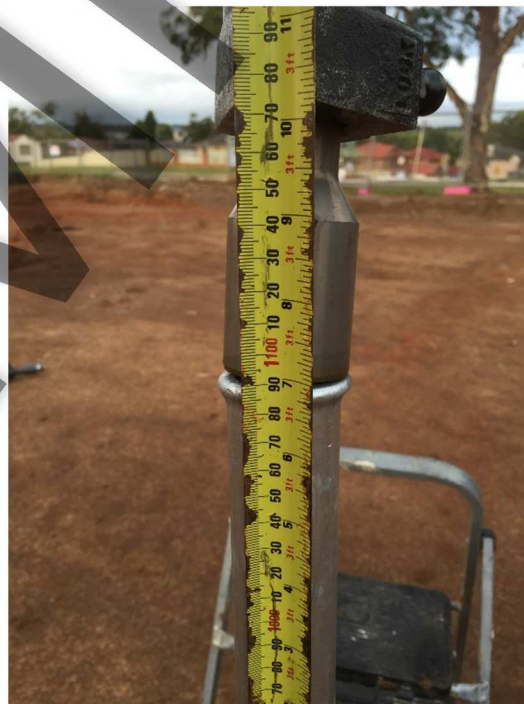
Test Pile: 1

This test pile was driven to practical refusal on site in the location outlined in figure 1, Test pile location. The test pile reached practical refusal at 910mm

Test Pile Material	Test Pile Length	Pile Penetration	Driver	Recommended Pile depth
32 NB Galvanized Pipe 2mm Wall Thickness	2000mm	910mm	45 Joule Demolition Hammer	1100mm

Figure 1:





A Noble & Son Ltd.

A.B.N. 18 007 513 395



TESTED LIFTING GEAR & MINING EQUIPMENT SPECIALISTS

WESTERN AUSTRALIAN DIVISION

50 Kewdale Road Welshpool WA 6106 P.O. Box 355, Welshpool DC WA 6986 Telephone: (08) 9358 5266 Facsimile: (08) 9451 3866
 Email: perthsales@nobles.com.au Website: www.nobles.com.au

CERTIFICATE OF TENSILE TEST AND EXAMINATION

QUANTITY	DISTINGUISHING MARKS	DESCRIPTION	LOAD APPLIED	WORK LOAD LIMIT
1	NPF9206	<p>PULL TO FAILURE TEST WAS COMPLETED ON A MEGA ANCHOR</p> <p>ANCHOR FAILED AT 8.05T</p> <p>ANCHOR WAS INSTALLED IN A SAND/CLAY BASE</p> <p>TEST LOCATION: ON SITE/VIVASH</p> <p>LOAD CELL#: 97823</p> <p><small>"Where A. Noble & Son Ltd carry out proof tests on goods which are not their manufacture they are not responsible for the final integrity of the product if a proof test and careful visual inspection by a competent person does not identify any short-comings in design or manufacture."</small></p> <p><small>The Goods covered by this certificate have been examined and tested in accordance with the specified requirements.</small></p>	78.9 kN	N/A

<p>DATE OF TEST: 23/03/2011</p> <p>TEST SPECIFICATION: WT029</p> <p>OUR REFERENCE: 789076</p> <p>CUSTOMER ORDER No.: PCN0027/500283</p>	<p>AS SPECIFIED WAS APPLIED</p> <p>A LOAD OF WHICH REPRESENTS THE W.L.L.</p> <p>.....</p> <p>AFTER REMOVAL OF THE LOAD, EACH ITEM WAS EXAMINED BY A COMPETENT OFFICER AND FOUND TO BE FREE FROM PERMANENT SET, FLAW OR OTHER VISUAL DEFECT, AND COMPLIES WITH THE REQUIREMENTS OF THE TEST.</p>
---	--

TO: **PINDAN CONTRACTING PTY LTD**
UNIT 8/1 LONGFELLOW CT
BELMONT WA 6104



NATA Accredited Laboratory
 Number: 1836

This Laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of accreditation. This document shall not be reproduced except in full.

Approved NATA Signatory **MURRAY TOZER**

- 8 APR 2011

A Noble & Son Ltd.

A.B.N. 18 007 513 395



TESTED LIFTING GEAR & MINING EQUIPMENT SPECIALISTS

WESTERN AUSTRALIAN DIVISION

50 Kewdale Road Welshpool WA 6106 P.O. Box 355, Welshpool DG WA 6986 Telephone: (08) 9358 5266 Facsimile: (08) 9451 3866
 Email: perthsales@nobles.com.au Website: www.nobles.com.au

CERTIFICATE OF TENSILE TEST AND EXAMINATION

QUANTITY	DISTINGUISHING MARKS	DESCRIPTION	LOAD APPLIED	WORK LOAD LIMIT
1	NPF9207	<p>PROOF LOAD TEST CARRIED OUT ON CUSTOMERS OWN MEGA ANCHOR TO CUSTOMERS NOMINATED LOAD 68.67 KN IN ACCORDANCE WITH NOBLES INTERNAL NON DESTRUCTIVE TEST PROCEDURE.</p> <p>NO DRAWINGS/MATERIAL CERTIFICATES OR WELDERS QUALIFICATION SITED.</p> <p>MANUFACTURED BY: PINDAN</p> <p>THE EQUIPMENT SHOWED NO DELITERIOUS EFFECTS AT THE TIME OF LOAD TEST</p> <p>TEST LOCATION: NOBLES PERTH LOAD CELL#: 97823</p> <p><small>"Where A. Noble & Son Ltd. carry out proof tests on goods which are not their manufacture they are not responsible for the final integrity of the product if a proof test and careful visual inspection by a competent person does not identify any short-comings in design or manufacture."</small></p> <p><small>The Goods covered by this certificate have been examined and tested in accordance with the specified requirements.</small></p>	68.67 kN	N/A

DATE OF TEST: **23/03/2011**

TEST SPECIFICATION: **WT029**

OUR REFERENCE: **789076**

CUSTOMER ORDER No.: **PCN0027/500283**

A LOAD OF **AS SPECIFIED** WAS APPLIED WHICH REPRESENTS **THE W.L.L.**

AFTER REMOVAL OF THE LOAD, EACH ITEM WAS EXAMINED BY A COMPETENT OFFICER AND FOUND TO BE FREE FROM PERMANENT SET, FLAW OR OTHER VISUAL DEFECT, AND COMPLIES WITH THE REQUIREMENTS OF THE TEST.

TO: **PINDAN CONTRACTING PTY LTD
UNIT 8/1 LONGFELLOW CT
BELMONT WA 6104**



NATA Accredited Laboratory
Number: 1836

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Approved NATA Signatory

MURRAY TOZER

- 8 APR 2011

STRUCTURAL COMPUTATIONS

PROPOSED RESIDENCE: **No. 4 Waratah Way,
Cockatoo**

CLIENT: **Mega Building Industries Pty Ltd**
PO Box 475
Diamond Creek, VIC 3089

JOB No: 92481

REFERENCES

- B.C.A. Building Code of Australia
- AS/NZS 1170.0- 2002 Structural Design Actions: General Principles
- AS/NZS 1170.1- 2002 Structural Design Actions:
Permanent, Imposed and other actions
- AS/NZS 1170.2- 2011 Structural Design Actions: Wind Actions
- AS1720.1 - 2010 Timber Structures: Design Methods
- AS3600 - 2009 Concrete Structures Code
- AS4100 - 1998 Steel Structures
- AS3700 - 2011 Masonry Structures
- AS1684.2 & .4 - 2010 Residential timber-framed Construction
- AS2870 - 2011 Residential Slabs and Footings

Nadir Yonan

Structerre Consulting Engineers

Mark : B1 Floor bearers

Try 100x50x2 C350LO Rect Hollow Sections for length = 1900 1900
Top Restraint at 3800 mm c/c, Bottom Restraint at 3800 mm c/c

Section Properties
Z_{yy} = 10.3x10⁶ mm³
Z_{xx} = 574 mm³
I_{yy} = 15.0x10⁸ mm⁴
I_{xx} = 0.75x10⁸ mm⁴
E = 200000 MPa

DL RLL FLL
UL1: User Defined UDL 1 = 0.37 0.25 0
UL2: Default UDL 2 = 0.4 0 1.5
Applied Loads
LC TYPE MAGNITUDE LOCATION
A U 4.87(UDL1)
A U 1.5(UDL2)

COMBINATION FACTORS
DL DL+RLL DL+FULL
L1 x 1.35 1.20 (1.00) 1.20 (1.00)

Note: LC that can be applied to other members are in bold
Values in () are the serviceability combination factors

X-AXIS Actions/Results

Critical Combination for Strength is DL+FULL

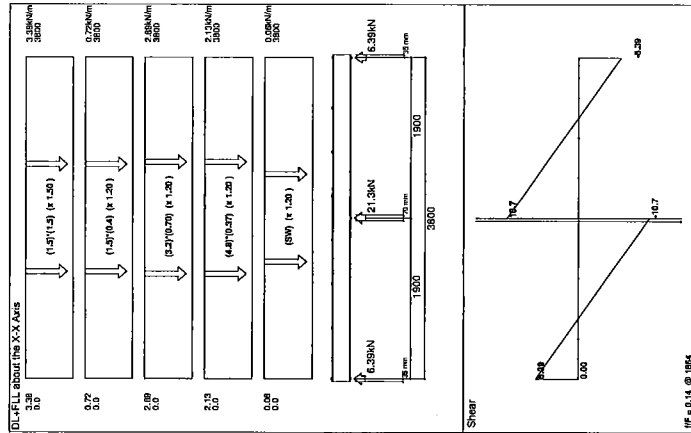
LIMIT STATE DESIGN	DL	DL+RLL	DL+FULL
Max Internal Actions			
Axial (kN) (c/c + comp)	0.00	0.00	0.00
Shear (kN)	7.47	8.78	10.7
-Moment (kNm)	-2.84	-3.34	-4.05
IF Max (kNm)	0.45 (0)	0.57 (0)	0.69 (0)
Deflection (mm)	2.2 (2)	2.7 (2)	3.2 (2)
Deflection Ratio L/d	875 (2)	895 (2)	892 (2)

Reactions
R1 (kN) (LH Reaction) 4.48 5.27 6.39
R2 (kN) (RH Reaction) 4.48 5.27 6.39
R3 (kN) (RH Reaction) 4.48 5.27 6.39

ADOPT : 100x50x2 C350LO Rect Hollow Sections for B1

NOTES

Continuous over 2 spans.



Mark : B1 Floor bearers

Try 100x50x2 C350LO Rect Hollow Sections for length = 1900 1900
Top Restraint at 3800 mm c/c, Bottom Restraint at 3800 mm c/c

Section Properties
Z_{yy} = 10.3x10⁶ mm³
Z_{xx} = 574 mm³
I_{yy} = 15.0x10⁸ mm⁴
I_{xx} = 0.75x10⁸ mm⁴
E = 200000 MPa

DL RLL FLL
UL1: User Defined UDL 1 = 0.37 0.25 0
UL2: Default UDL 2 = 0.4 0 1.5
Applied Loads
LC TYPE MAGNITUDE LOCATION
A U 4.87(UDL1)
A U 1.5(UDL2)

COMBINATION FACTORS
DL DL+RLL DL+FULL
L1 x 1.35 1.20 (1.00) 1.20 (1.00)

Note: LC that can be applied to other members are in bold
Values in () are the serviceability combination factors

X-AXIS Actions/Results

Critical Combination for Strength is DL+FULL

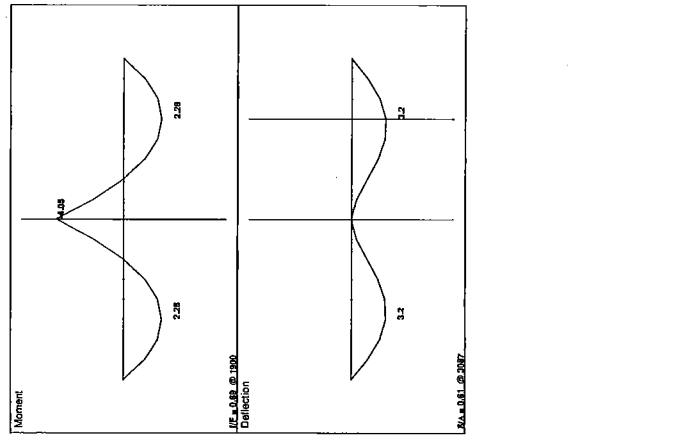
LIMIT STATE DESIGN	DL	DL+RLL	DL+FULL
Max Internal Actions			
Axial (kN) (c/c + comp)	0.00	0.00	0.00
Shear (kN)	7.47	8.78	10.7
-Moment (kNm)	-2.84	-3.34	-4.05
IF Max (kNm)	0.45 (0)	0.57 (0)	0.69 (0)
Deflection (mm)	2.2 (2)	2.7 (2)	3.2 (2)
Deflection Ratio L/d	875 (2)	895 (2)	892 (2)

Reactions
R1 (kN) (LH Reaction) 4.48 5.27 6.39
R2 (kN) (RH Reaction) 4.48 5.27 6.39
R3 (kN) (RH Reaction) 4.48 5.27 6.39

ADOPT : 100x50x2 C350LO Rect Hollow Sections for B1

NOTES

Continuous over 2 spans.



Mark : B1 BALCONY Floor bearers

Try 100x50x2 C350LO Rect Hollow Sections for length = 1900 1900
Top Restraint at 3800 mm c/c, Bottom Restraint at 3800 mm c/c

Section Properties
Z_{yy} = 10.3x10⁶ mm³
Z_{xx} = 574 mm³
I_{yy} = 15.0x10⁸ mm⁴
I_{xx} = 0.75x10⁸ mm⁴
E = 200000 MPa

DL RLL FLL
UL1: User Defined UDL 1 = 0.37 0.25 0
UL2: Default UDL 2 = 0.4 0 1.5
Applied Loads
LC TYPE MAGNITUDE LOCATION
A U 4.87(UDL1)
A U 1.5(UDL2)

COMBINATION FACTORS
DL DL+RLL DL+FULL
L1 x 1.35 1.20 (1.00) 1.20 (1.00)

Note: LC that can be applied to other members are in bold
Values in () are the serviceability combination factors

X-AXIS Actions/Results

Critical Combination for Strength is DL+FULL

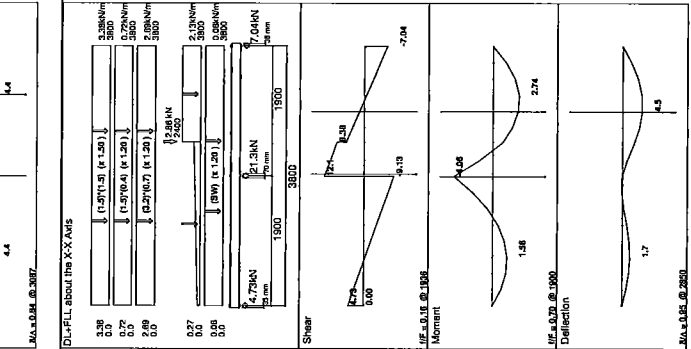
LIMIT STATE DESIGN	DL	DL+RLL	DL+FULL
Max Internal Actions			
Axial (kN) (c/c + comp)	0.00	0.00	0.00
Shear (kN)	7.48	9.12	15.3
-Moment (kNm)	-2.89	-3.47	-5.80
IF Max (kNm)	1.88 (0)	1.95 (0)	3.26 (0)
Deflection (mm)	2.2 (2)	2.8 (2)	4.4 (2)
Deflection Ratio L/d	835 (2)	671 (2)	429 (2)

Reactions
R1 (kN) (LH Reaction) 4.72 5.47 9.16
R2 (kN) (RH Reaction) 15.7 16.2 30.5
R3 (kN) (RH Reaction) 4.72 5.47 9.16

ADOPT : 100x50x2 C350LO Rect Hollow Sections for B1_BALCONY

NOTES

Continuous over 2 spans.



Mark : B1 TG TRUSS Floor bearers

Try 100x50x2 C350LO Rect Hollow Sections for length = 1900 1900
Top Restraint at 3800 mm c/c, Bottom Restraint at 3800 mm c/c

Section Properties
Z_{yy} = 10.3x10⁶ mm³
Z_{xx} = 574 mm³
I_{yy} = 15.0x10⁸ mm⁴
I_{xx} = 0.75x10⁸ mm⁴
E = 200000 MPa

DL RLL FLL
UL1: User Defined UDL 1 = 0.37 0.25 0
UL2: Default UDL 2 = 0.4 0 1.5
Applied Loads
LC TYPE MAGNITUDE LOCATION
A U 4.87(UDL1)
A U 1.5(UDL2)

COMBINATION FACTORS
DL DL+RLL DL+FULL
L1 x 1.35 1.20 (1.00) 1.20 (1.00)

Note: LC that can be applied to other members are in bold
Values in () are the serviceability combination factors

X-AXIS Actions/Results

Critical Combination for Strength is DL+FULL

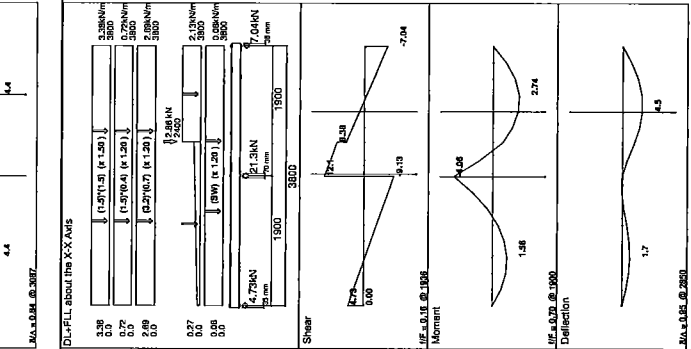
LIMIT STATE DESIGN	DL	DL+RLL	DL+FULL
Max Internal Actions			
Axial (kN) (c/c + comp)	0.00	0.00	0.00
Shear (kN)	7.48	9.12	15.3
-Moment (kNm)	-2.89	-3.47	-5.80
IF Max (kNm)	1.88 (0)	1.95 (0)	3.26 (0)
Deflection (mm)	2.2 (2)	2.8 (2)	4.4 (2)
Deflection Ratio L/d	835 (2)	671 (2)	429 (2)

Reactions
R1 (kN) (LH Reaction) 4.72 5.47 9.16
R2 (kN) (RH Reaction) 15.7 16.2 30.5
R3 (kN) (RH Reaction) 4.72 5.47 9.16

ADOPT : 100x50x2 C350LO Rect Hollow Sections for B1_TG_TRUSS

NOTES

Continuous over 2 spans.



STRUCTURAL WORKS

Page : B3
 Engineer : 92481
 Consulting Engineers
 1/321 Whitehorse Rd BALWYN Vic 3103
 Phone : 03 9888 4588 Fax : 03 9888 4511
 email : works@knok.holkey.net.au

Page : B4
 Engineer : 92481
 Consulting Engineers
 1/321 Whitehorse Rd BALWYN Vic 3103
 Phone : 03 9888 4588 Fax : 03 9888 4511
 email : works@knok.holkey.net.au

Mark : B1 Balcony Beam

Try 100x50x2 C350LO Rect. Hollow Sections for length = 2300
 Top Restraints calculated with a left offset = 0, left spacing = 600, internal spacing = 600, right spacing = 600, right offset = 0

Section Properties
 CSA = 574 mm²
 I_{xx} = 0.75x10⁹ mm⁴
 I_{yy} = 0.28x10⁹ mm⁴
 Z_{xx} = 15.0x10³ mm³
 Z_{yy} = 10.3x10³ mm³
 F_y = 350 MPa
 E = 200000 MPa

GRAVITY/VERTICAL LOADS

UDL LIST (kPa) DL RLL FLL LOCATION
 USER : User Defined UDL = 0.2 0.2 2.12
 A U SW S/W Self Weight
 COMBINATION FACTORS
 DL 1.35 1.20
 RLL 1.50 (1.00)
 FLL 1.50 (1.00)

Note : LC that can be applied to other members are in bold
 Values in () are the serviceability combination factors

X-AXIS ACTIONS/RESULTS

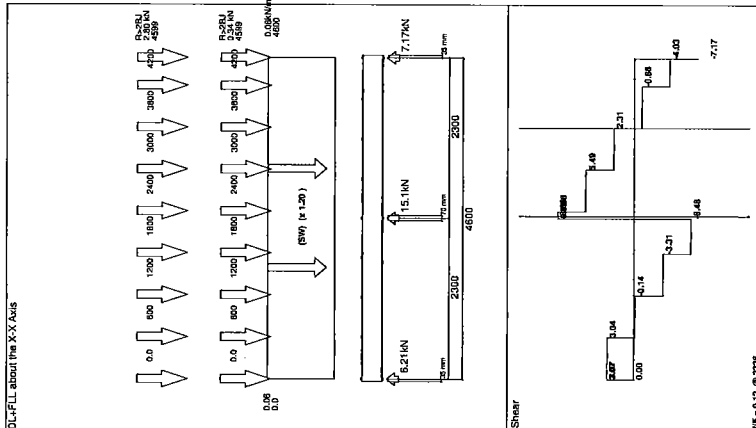
Critical Combination for Strength is DL+FLL
 LIMIT STATE DESIGN
 DL DL+FLL
 Max Internal Actions
 Axial (kN) (ve = comp) 0.00 0.00
 Shear (kN) -0.25 -2.07
 Moment (kNm) -0.04 -0.37
 Deflection (mm) 0.13 0.98
 I/F max 0.06 (m) 0.59 (m)
 Deflection Ratio L/d 43.95 (2) 80.7 (2)

Reactions
 R1 (kN) (LH Reaction) 0.80 6.21
 R2 (kN) (RH Reaction) 1.98 15.1
 R3 (kN) (RH Reaction) 0.91 7.17

ADOPT : 100x50x2 C350LO Rect Hollow Sections for B1

Continuous over 2 spans.

DL+FLL about the X-X Axis



STRUCTURAL WORKS

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STRUCTURAL WORKS

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Mark : B2 Balcony Joists

Try 100x50x2 C350LO Rect. Hollow Sections for length = 2550 - 700
 Top Restraint at 3520 mm c/c; Bottom Restraint at 3250 mm c/c

Section Properties
 CSA = 574 mm²
 I_{xx} = 0.75x10⁹ mm⁴
 I_{yy} = 0.28x10⁹ mm⁴
 Z_{xx} = 15.0x10³ mm³
 Z_{yy} = 10.3x10³ mm³
 F_y = 350 MPa
 E = 200000 MPa

GRAVITY/VERTICAL LOADS

UDL LIST (kPa) DL RLL FLL LOCATION
 USER : User Defined UDL = 0.2 0.2 2.12
 A U SW S/W Self Weight
 COMBINATION FACTORS
 DL 1.35 1.20
 RLL 1.50 (1.00)
 FLL 1.50 (1.00)

Note : LC that can be applied to other members are in bold
 Values in () are the serviceability combination factors

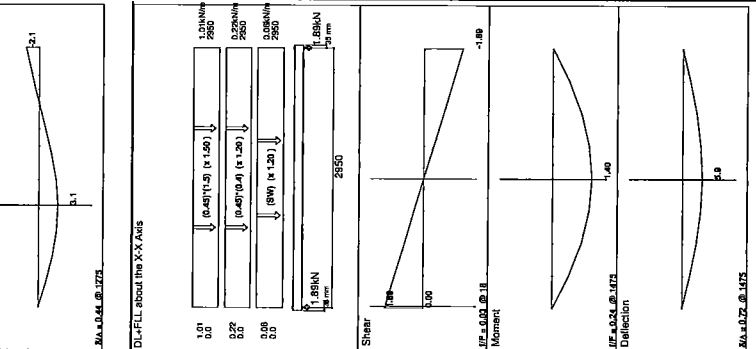
X-AXIS ACTIONS/RESULTS

Critical Combination for Strength is DL+FLL
 LIMIT STATE DESIGN
 DL DL+FLL
 Max Internal Actions
 Axial (kN) (ve = comp) 0.00 0.00
 Shear (kN) -0.25 -2.07
 Moment (kNm) -0.04 -0.37
 Deflection (mm) 0.13 0.98
 I/F max 0.06 (m) 0.59 (m)
 Deflection Ratio L/d 6240 (1) 819 (1)
 Cant. Deflection (mm) -0.3 (2) -2.1 (2)

Reactions
 R1 (kN) (LH Reaction) 0.22 1.78
 R2 (kN) (RH Reaction) 0.38 3.13

ADOPT : 100x50x2 C350LO Rect Hollow Sections for B2

DL+FLL about the X-X Axis



Mark : FJ Floor Joists

Try 100x50x2 C350LO Rect. Hollow Sections for length = 2950
 Top Restraint at 2950 mm c/c; Bottom Restraint at 2550 mm c/c

Section Properties
 CSA = 574 mm²
 I_{xx} = 0.75x10⁹ mm⁴
 I_{yy} = 0.28x10⁹ mm⁴
 Z_{xx} = 15.0x10³ mm³
 Z_{yy} = 10.3x10³ mm³
 F_y = 350 MPa
 E = 200000 MPa

GRAVITY/VERTICAL LOADS

UDL LIST (kPa) DL RLL FLL LOCATION
 USER : User Defined UDL = 0.4 0 1.5
 A U SW S/W Self Weight
 COMBINATION FACTORS
 DL 1.35 1.20
 RLL 1.50 (1.00)
 FLL 1.50 (1.00)

Note : LC that can be applied to other members are in bold
 Values in () are the serviceability combination factors

X-AXIS ACTIONS/RESULTS

Critical Combination for Strength is DL+FLL
 LIMIT STATE DESIGN
 DL DL+FLL
 Max Internal Actions
 Axial (kN) (ve = comp) 0.00 0.00
 Shear (kN) 0.45 1.89
 Moment (kNm) 0.13 0.98
 Deflection (mm) 0.06 (m) 0.24 (m)
 Deflection Ratio L/d 1966 498

Reactions
 R1 (kN) (LH Reaction) 0.45 1.89
 R2 (kN) (RH Reaction) 0.45 1.89

ADOPT : 100x50x2 C350LO Rect Hollow Sections for FJ

$$hs = 1.8 \text{ m}$$

as per clause 2.3.2 (B) (2) & G4.3 & G5.3 in AS2870-2011

The geotechnical design strength should be based on base resistance plus side friction or adhesion where effective. No side adhesion or friction should be assumed to exist to a depth of 0.75Hs for down loads. For uplift load due to soil swelling, side friction or adhesion should be assumed to be effective.

$$\text{thus ignore top } 0.75hs = 1.35 \text{ m}$$

Soil Bearing Capacity	250 kPa
SKIN FRICTION	50 kPa

Loads

Load DL	12.3 kN
Load LL	14 kN
Total Load	19.3 kN

Pad area	0.10 x	0.10	=	0.01 m ²
Pad capacity			=	2.50 kN

Stump Check

Try	50NB	60.3	x	2.3 mm	C350
Ultimate Design Load		26.3 kN			
Lef	≤	2.5 m			
e		30 mm			
M*		0.789 kN.m			
φMs		2.44 kN.m			
φNc		44.8 kN			
φMbx		1.0 kN.m	>	0.8 kN.m	Thus OK

Mega Anchor Capacity

Number of Piles		3			
Try	30NB	42.4	x	4 mm	C250
End bearing capacity	=	1.1 kN			
Design Load - Pad capacity	=	15.7 kN			

Total surface area per meter	0.3996 m ² /m
Pile capacity	19.98 kN/m
pile length required	0.8 m
min. depth of 3 piles	2.1 m

Adopt 2.1m Deep Mega-Anchors (3No. 30NB Gal. piles) founded below ground level

Note: Pile founding depth is 0.8m minimum into natural silty clay as noted on soil report and 2.1m minimum below ground level whichever is deeper or to Penetration Resistance on to natural rock. Anchors should be proof loaded and tested during construction to ensure that design loads are being achieved. Consideration should be given to corrosion protection of anchors, particularly where permanent or long-term anchors are proposed.