FORMIT SERVICES

EXECUTIVE SINGLE SKIN TOP LIFT

FRAME CERTIFICATION

6 June 2023

Rev No. 1

IZZAT CONSULTING ENGINEERS PTY LTD
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Revision	Issue Date	Revision Details
0	24/08/2016	Issued for certification
1	06/06/2023	Updated Top Lifting Frame

Author: Benjamin Landers BEng(Civil) GradMIEAust
Structural / Civil Engineer
Signed:

Reviewed By: Nicholas Diemar BEng(Civil)(Hons)
MIEAust CPEng NER RPEQ
Principal Engineer & Associate
Signed:

TABLE OF CONTENTS

1. INTRODUCTION

In accordance with your request to provide certification of the Single Skin Top Lift Executive Frame structure, we submit the following information.

2. ENGINEER

Benjamin Landers
Bachelor of Engineering (Civil) (Hons)
University of Newcastle

3. SUPERVISING ENGINEER

Nicholas Diemar
Bachelor of Engineering (Civil) (Hons)
University of Newcastle
Chartered Professional Engineer (NPER-3)
Member of the Institution of Engineers Australia (Reg No.2175285)
Registered Professional Engineer of Queensland (Registration No.10030)

4. GENERAL

This document should be read in conjunction with the drawings provided by Formit listed in Table 1, attached in Appendix A.

Table 1: FORMIT Drawings

Drawing Number	Revision	Title
1002015H	H	RC7582 - FSMS-TS40 - Frame, Top, Galv PROFILE DETAILS
1002019	E	RC7544 - FSMS-TS28G - Skid, Base, Ultra PROFILE DETAILS
FMT104	A	FMT104 01 LIFTING LUG
001 FORM 05 13	-	FORMIT 2012 LIFT ROD 2.1

5. DESIGN BASIS

Our office was engaged to provide certification for the Single Skin Top Lift Executive portable toilet lifting frame. This certification applies to both the Single Skin Top Lift Executive waste tank arrangement and the Sewer Connect arrangement of the portable toilet.

The Single Skin Top Lift Executive is to be lifted by top only and as set out in in allowable lifting regimes below:

- Using four lifting rods and a spreader beam simultaneously.
- Using four lifting rods and no spreader beam.
- Using two opposite lifting rods and no spreader beam only when mobile toilet is empty.

The adequacy of spreaders, slings and lifting devices are the responsibility of others.

When in use the frame is located on firm level ground and is tied down as per the requirements listed below.

All design loads are as determined by Australian Standards and information provided by Formit.

All design work was carried out in accordance with the following standards;

- AS/NZS 1170.0 General principles
- AS/NZS 1170.1 Permanent, imposed and other actions

- AS/NZS 1170.2 Wind loads
- AS1418.1 – 2002 Cranes, hoists and winches – General requirements
- AS4100 – 1998 Steel Structures

Ultimate limit states design factors used in design are as follows:
- Dead load factor of 1.2
- Live load factor of 1.5
- Dynamic factor of 1.5

6. DEFINED CRITERIA

Rational engineering judgement has been used to decide which structural components require checking with design certification calculations.

Most suitable design check methods are as determined by Izzat Consulting Engineers.

7. DESIGN LOADINGS

The following design loads as provided by Formit were considered, in addition to other loading criteria as required by the Australian Standards;

The design loading for the lifting frame of the Ultra 01 Lifting is as follows:

- Dry Weight of toilet – 129kg
- Fresh Water Tank when full – 110 litres
- Waste Water Tank when full – 400 litres
- Maximum mass lifted – 639 kg

Ultimate lifting loads for the purpose of lifting devices is as follows:
- Load per lug = 345 kg (3.38 kN) vertical
- Total lifting load = 1380 kg (13.54 kN) vertical

N.B. Design of lifting devices should consider the possibility of uneven loading.

Wind loads were calculated for Australia Region A, Terrain Category 2 (non-cyclonic). Wind speeds are as follows:
- Regional wind speed = 45 m/s
- Design ultimate wind speed = 40.95 m/s

The ultimate tie down force (assumed 4 tied downs, 1 at each corner of skid frame) under the design ultimate wind speed noted above, is as follows:
- Uplift per tie down = 110 kg uplift (1.079 kN)

When located in regions other than that stated above, the required tie downs should be calculated by a qualified engineer for ultimate design wind speeds other than those noted above.

8. STATEMENTS & DISCLAIMERS

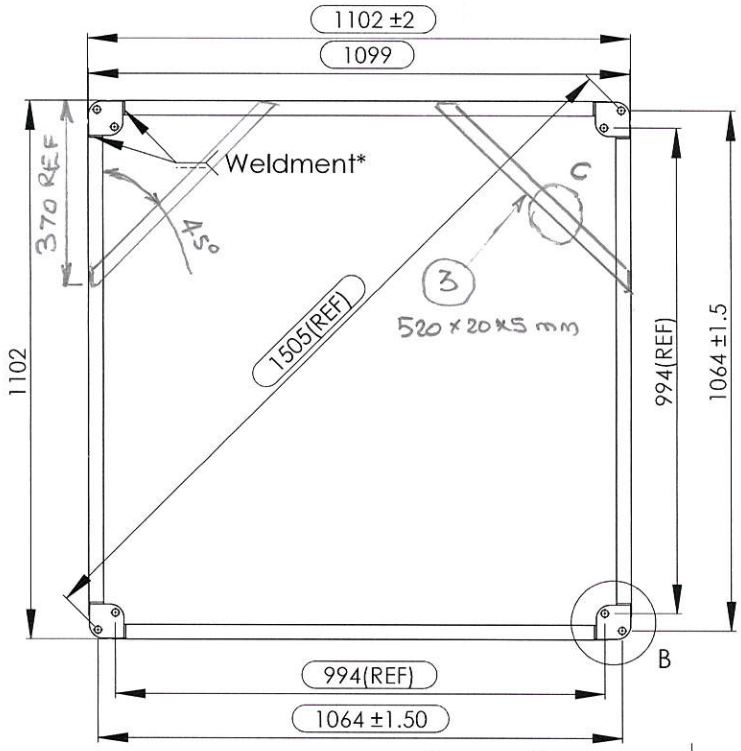
We confirm that the Single Skin Top Lift Executive frame as detailed in the drawings noted in Table 1 (above), is structurally satisfactory for the Load Limits noted in Section 7 above, provided the following are adhered to;
- Allowable lifting regimes as follows:
    - Using four lifting rods and a spreader beam simultaneously.
    - Using four lifting rods and no spreader beam.
    - Using two opposite lifting rods and no spreader beam only when mobile toilet is empty.
- The frame is located on firm level ground and adequately tied down.
- The structure is inspected every 12 months (maximum), or as otherwise required to ensure no structural damage is evident.
- The certificate is applicable only if the structures are not affected by heat, adverse chemicals, excessive vibrations or other external factors unknown and not noted to the certifying engineer.

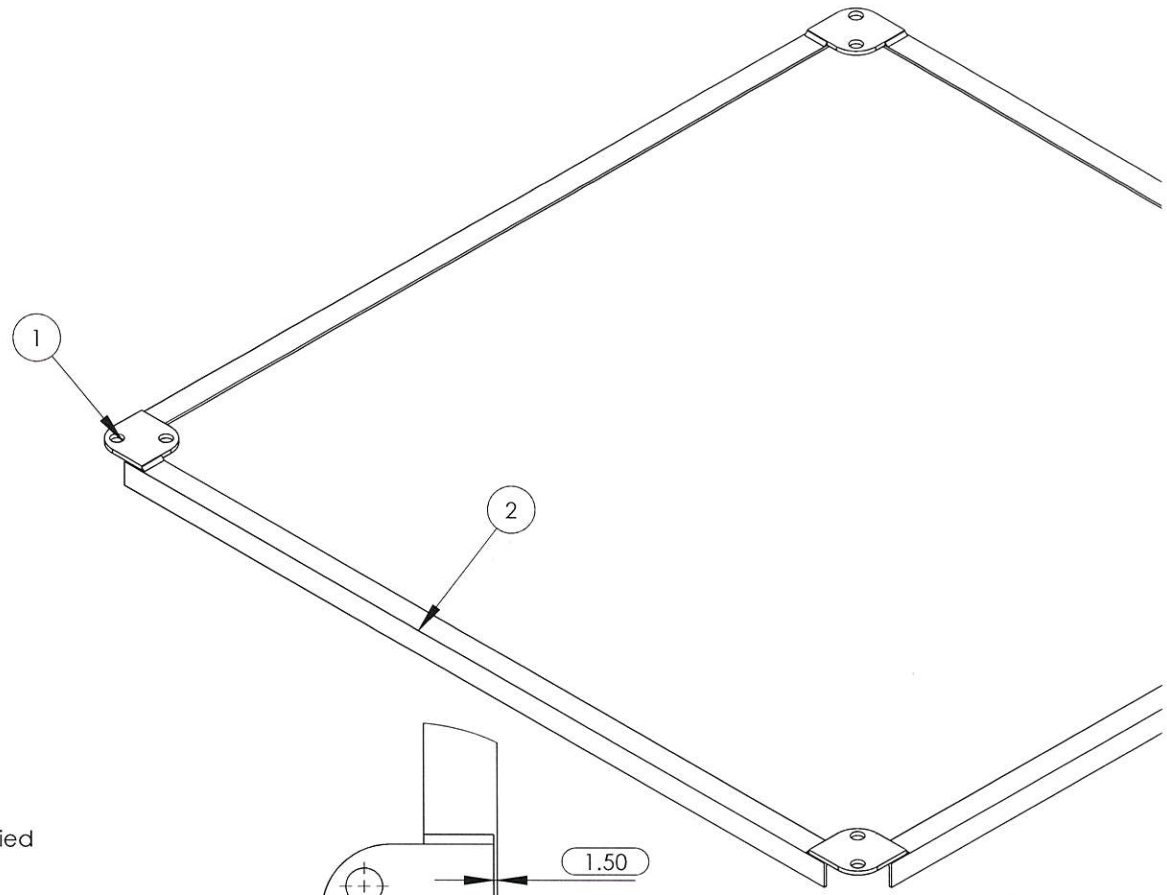
- All items constructed are in accordance with the drawings & specifications as referenced by this certificate.
- All construction and materials is in accordance with Australian Standards, particularly AS4100 Clause 2.2.
- All welding is a minimum of 6mm GP continuous fillet welds all around, UNO.
- No modifications shall be made, which would significantly increase the mass, alter the stability or affect the design strength of the structure.

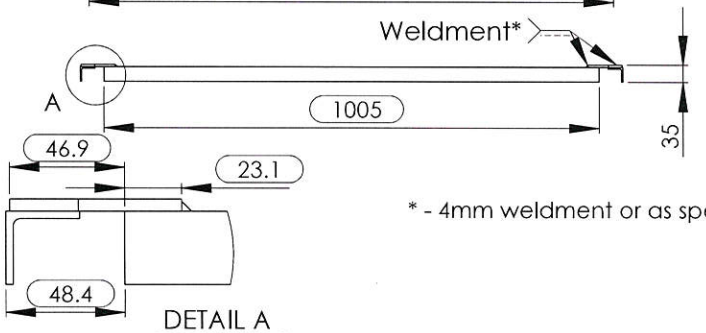
APPENDIX A DRAWINGS

Profile Details - RC7582 - FSMS-TS40 - Frame,Top,Galv

1002015 - H

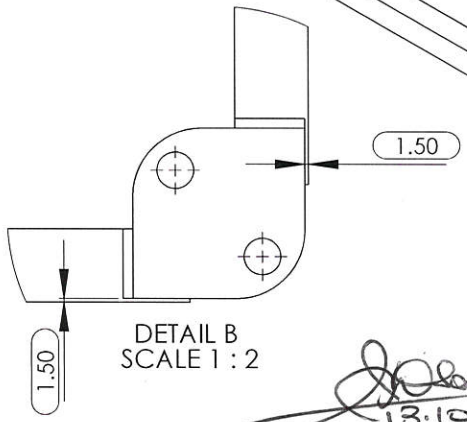




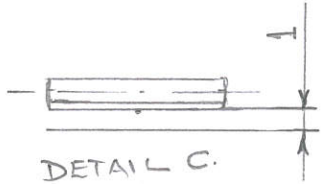


DETAIL A
SCALE 1 : 2

* - 4mm weldment or as specified



DETAIL B
SCALE 1 : 2



DETAIL C.
SCALE 2:5

13.10.2016

Bill of Material					
ITEM NO.	QTY.	DESCRIPTION	Drawing No.	Rev	Length
1	4	RC7582 - FSMS-TS40 - Angle,30X30X3	1002016	A	1005mm
2	4	RC7582 - FSMS-TS40 - Pad,Corner,Galv	1002017	B	
3	2	Support Torsion	1002018	B.	520mm.

Made from	- MildSteel	Weight	- 7.9Kg
Remove	- All sharp edges and burrs	Surface finish	- Hot Dipped Galvanized
Number off	- 1. per Assembly		

Reg PDF DXF

DO NOT SCALE FROM DRAWING.
DIMENSIONS IN MILLIMETERS
UNLESS OTHERWISE SPECIFIED

NO DECIMAL PLACES ±0.5mm
ONE DECIMAL PLACE ±0.25mm
TWO DECIMAL PLACES ±0.05mm
ANGLES (DEGREES) ±0.5°

A3 Drawing Third Angle Projection

Issue	DATE	ISSUE DESCRIPTION	BY	CHECKED
H	29/03/10	Dimensions revised for manufacturing	AK	CA

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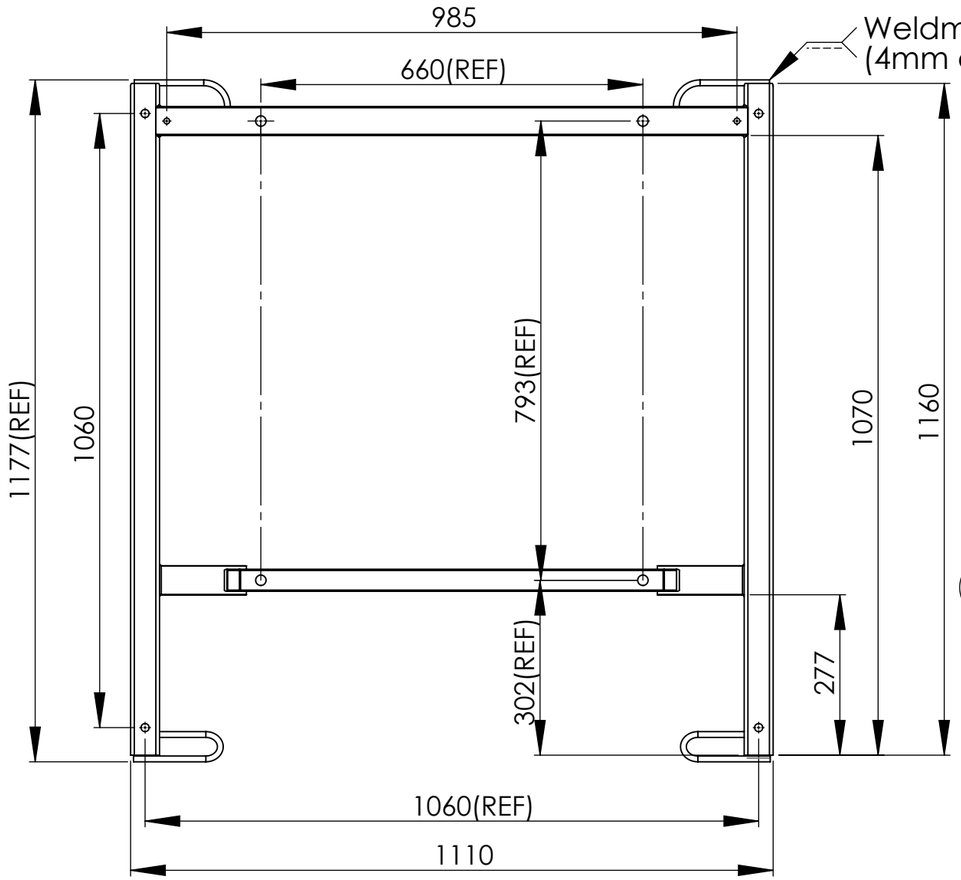
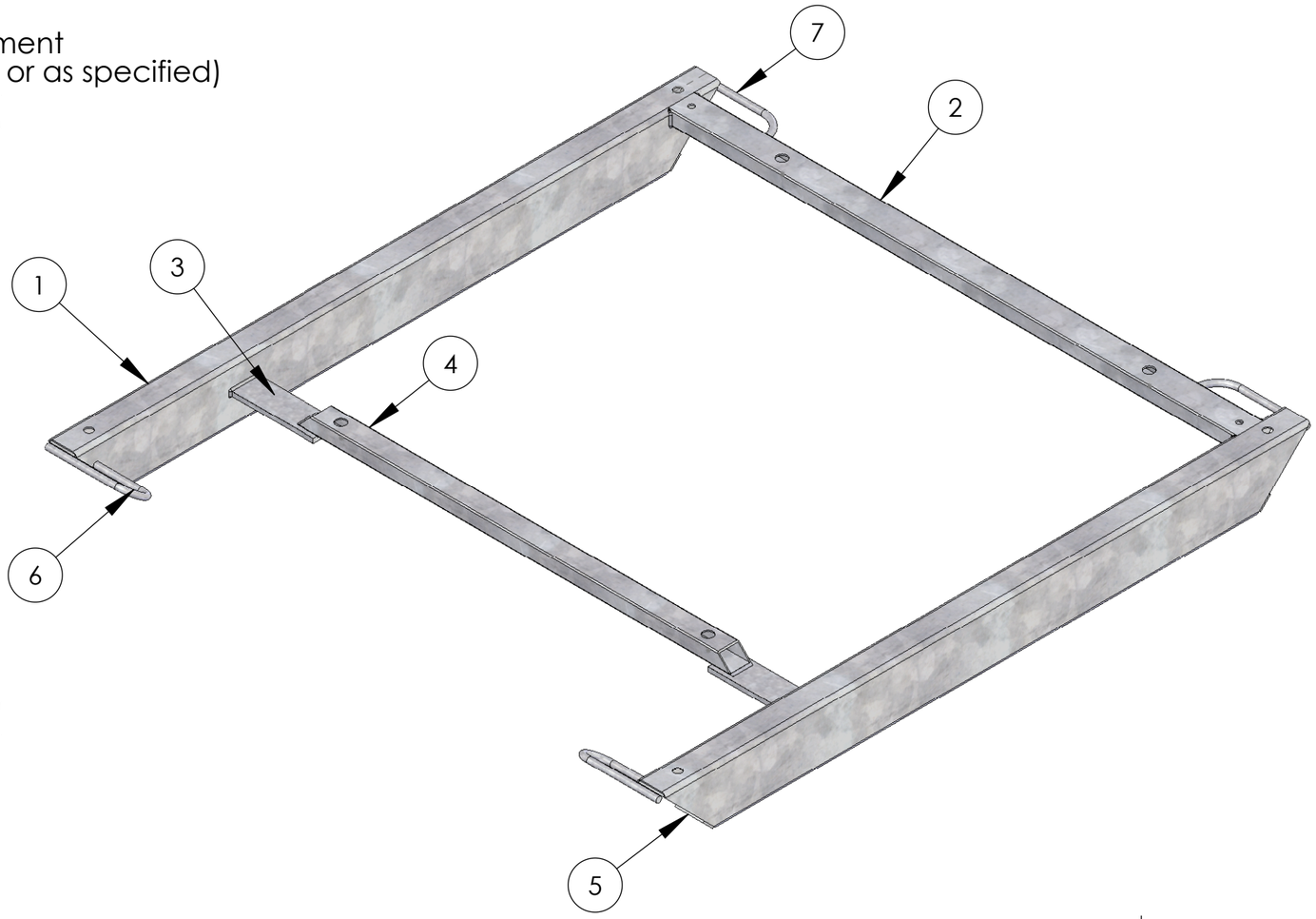
Formit - Toilet - Top Frame

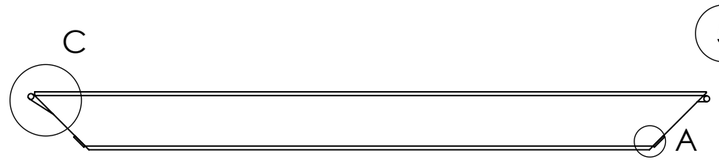
Part of	
Part No. 1002015	RC7582 - FSMS-TS40 - Frame,Top,Galv
Description:	Profile Details
Scale: 1:10	Drawing No: 1002015 H

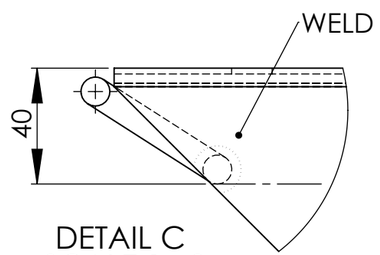
Profile Details - RC7544 - FSMS-TS28G - Skid,Base,Ultra

1002019 - E

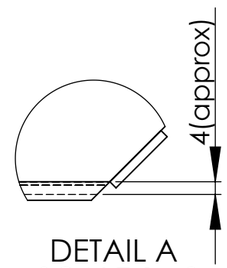




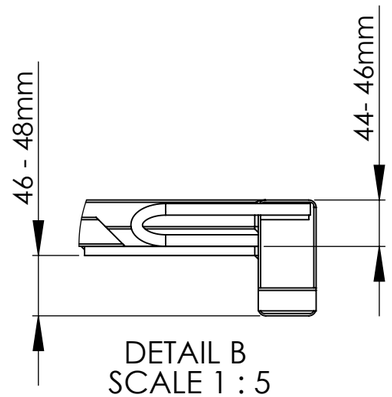




DETAIL C
SCALE 1 : 2



DETAIL A
SCALE 1 : 2



DETAIL B
SCALE 1 : 5

Bill of Material

ITEM NO.	QTY.	DESCRIPTION	Drawing No.	Rev
1	2	RC7544 - FSMS-TS28G - Skid,Base,RHS,100X50X2	1002020	D
2	1	RC7544 - FSMS-TS28G - Beam,RHS,50X25X2.5	1002021	B
3	2	RC7544 - FSMS-TS28G - Support,Flatbar,150X50X8	1002023	A
4	1	RC7544 - FSMS-TS28G - Beam,RHS,38X25X2	1002022	B
5	4	RC7544 - FSMS-TS28G - Pad,Skid,Flatbar	1002026	A
6	2	RC7544 - FSMS-TS28G - Hook,Lifting,Long	1002024	E
7	2	RC7544 - FSMS-TS28G - Hook,Lifting,Short	1002025	E

Made from	- MildSteel	Weight	- 20Kg
Remove	- All sharp edges and burrs	Surface finish	- Hot Dipped Galvanized
Number off	- 1. per Assembly		

Reg / PDF / DXF

DO NOT SCALE FROM DRAWING.
DIMENSIONS IN MILLIMETERS
UNLESS OTHERWISE SPECIFIED

NO DECIMAL PLACES ±0.5mm
ONE DECIMAL PLACE ±0.25mm
TWO DECIMAL PLACES ±0.05mm
ANGLES (DEGREES) ±0.5°

A3 Drawing
Third Angle Projection

Issue	DATE	ISSUE DESCRIPTION	BY	CHECKED
E	28/09/09	New modification	AK	CA

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Formit - Toilet - Base

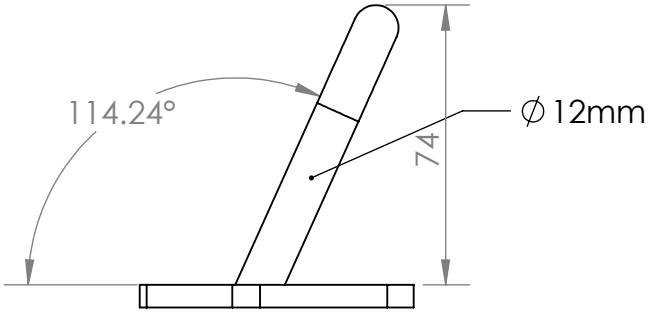
Part of

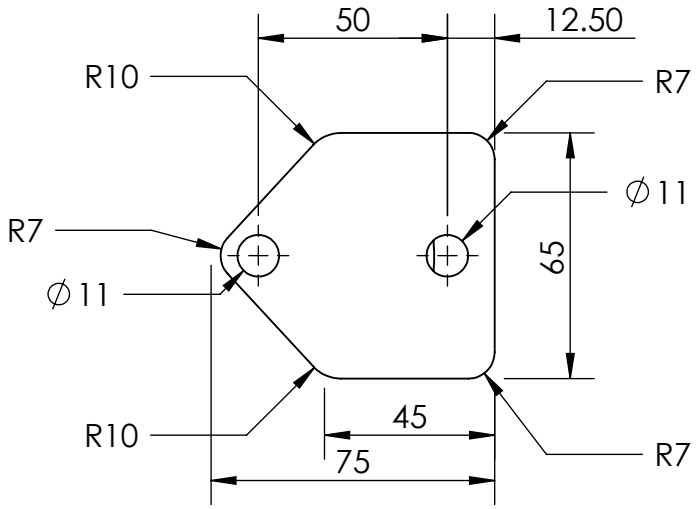
Part No. **1002019** **RC7544 - FSMS-TS28G - Skid,Base,Ultra**

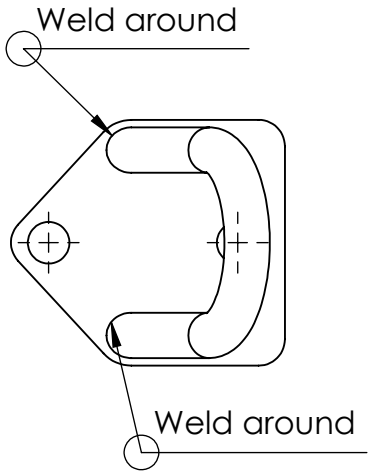
Description: **Profile Details**

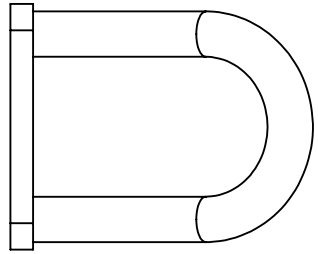
Scale: **1:10** Drawing No: **1002019 E**

FMT104 01 LIFTING LUG









Note: Steel with Galvanised finish. Likely load approx. 500kg

MADE FROM: Galvanised Steel

WEIGHT:

Number off - 1. per Assembly

Reg	DO NOT SCALE DRAWING DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE SPECIFIED	A4 Drawing Third Angle Projection
PDF		
Dxf		

Issue	DATE	ISSUE DESCRIPTION	BY	CHECKED
A	27/07/2010	SPECIFICATION SHEET	P.C.	####

FORMIT SERVICES

FORMIT SERVICES P/L

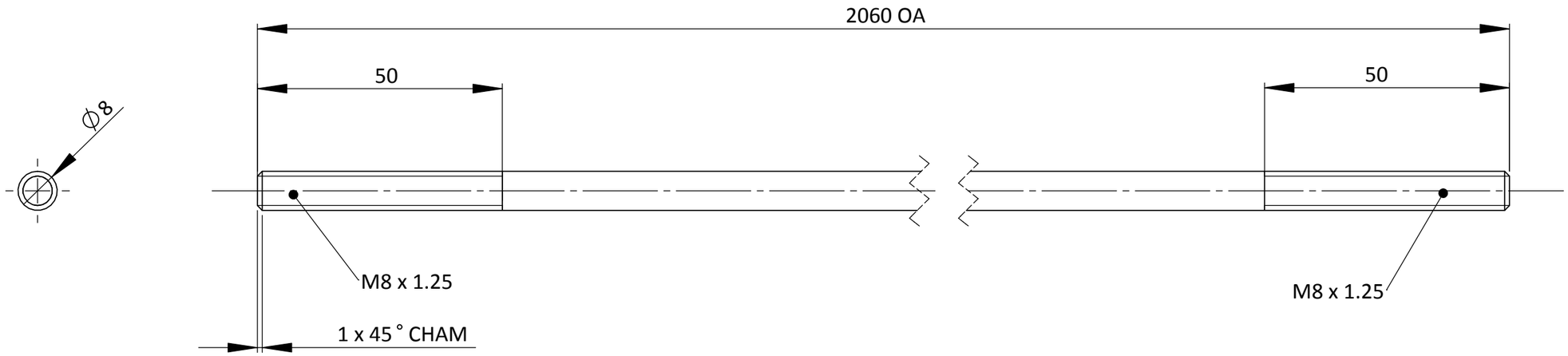
Description: FMT104 01 LIFTING LUG

Scale: 1:2

Part No: FMT104

A

CONFIRM OA LENGTH ON ASSEMBLY PRIOR TO PRODUCTION



NOTE:

- **ALL FINISHES AND COLOURS TO BE CONFIRMED WITH CLIENT BEFORE PRODUCTION**
- **PART SAMPLES AND ASSEMBLY TO BE APPROVED BEFORE PRODUCTION**

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR: ± 2		FINISH: AS MACHINED - DEBURR ENDS				DEBUR AND BREAK SHARP EDGES	**DO NOT SCALE DRAWING** REVISION
	NAME	SIGNATURE					neoindustrialdesign 02 4969 4913
DRAWN	neo		070513				TITLE: **FORMIT 2012**
CHK'D							**LIFT ROD 2.1**
APPV'D							
MFG							
Q.A				**MATERIAL:** ϕ8 316 STAINLESS STEEL			DWG NO. **001 FORM 05 13** **A3**
				WEIGHT:			**SCALE:1:1** **SHEET**01 OF 01