IZZAT
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FORMIT SERVICES

STRUCTURAL CERTIFICATION OF WASTE TANK FRAMES LIFTING LUGS

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Rev No. 0

Consulting Engineers Corrosion & Asset Control Shade Design
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TABLE OF CONTENTS

1. INTRODUCTION 2
2. ENGINEER 2
3. SUPERVISING ENGINEER 2
4. DESIGN BASIS 2
5. DEFINED CRITERIA 2
6. DESIGN LOADING 2
7. STATEMENTS 3
APPENDIX A FORMIT PART DRAWINGS 4

Revision No.	Issue Date	Revision Details
0	23/3/2012	Original certificate

Authors: Nicholas Diemar Signed:

Reviewed by: Tony Dockrill Signed:

1. INTRODUCTION

In accordance with your request we submit the following information regarding the certification for the waste tank frames lifting lugs.

2. 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)

3. SUPERVISING ENGINEER

Anthony Robert Dockrill

Bachelor of Engineering (Civil) (Hons)
University of Newcastle.
Chartered Professional Engineer (NPER-3).
Member of the Institution of Engineers Australia (Reg No.210112).

4. DESIGN BASIS

This document should be read in conjunction with the part drawings provided by John Aitken of Formit Services, located in Appendix A.

Four lifting lugs are present on each of the 2000L, 4000L and 6000L waste tank frames. There are also two types of lifting lugs, a welded lug and a bolted lug. Welds are to be a minimum of 3mm fillet welds and bolts are to be minimum M10.

All design work was carried out in accordance with:

- AS1170.0 – 2002 Structural Design Actions Part 0: General Principles
- AS1170.1 – 2002 Structural Design Actions Part 1: Permanent, Imposed & Other Actions
- AS1418.1 – 2002 Cranes, hoists and winches
- AS4100 – 1998 Steel Structures

The certification of the actual frames is covered by other separate certificates. Furthermore the lifting system, attachments and devices are the responsibility of others.

5. DEFINED CRITERIA

The frames are to be lifted from a central point or from a spreader bar with the use of slings, shackles and hooks. The slings connected to the lifting lugs are to have a minimum angle to the horizontal of 45 degrees. Also the load is to be evenly distributed between all four lifting lugs.

The waste tanks within the frames are to be empty during lifting.

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

6. DESIGN LOADING

The maximum frame and empty waste tank combined mass to be lifted is to be **1000kg**. Appropriate design factors have been applied in accordance with AS1170.0 and AS1418.1.

Ultimate limit states design factors used in design are as follows:

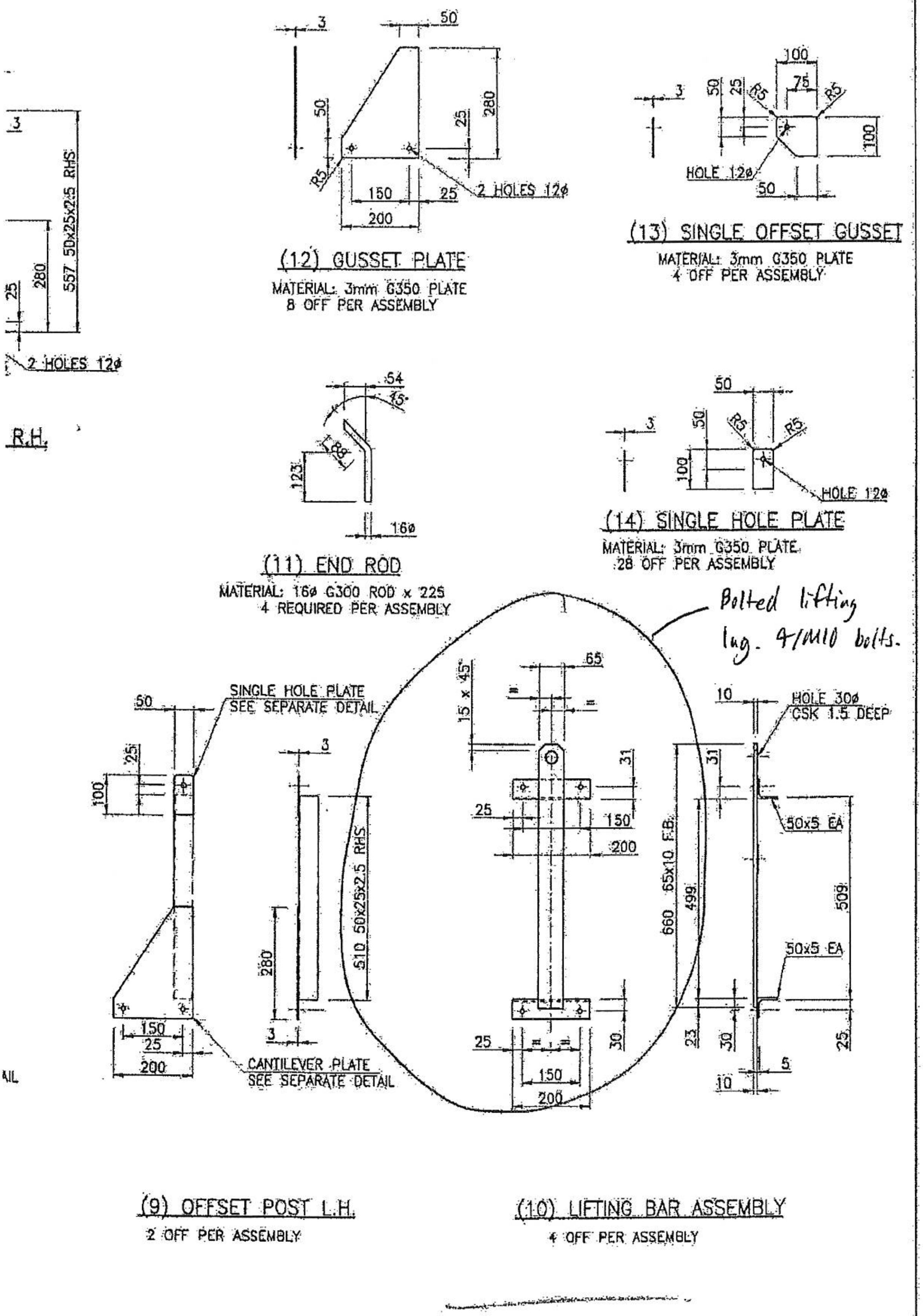
- Dead load (only) factor of 1.35
- Dynamic factor of 1.2

7. STATEMENTS

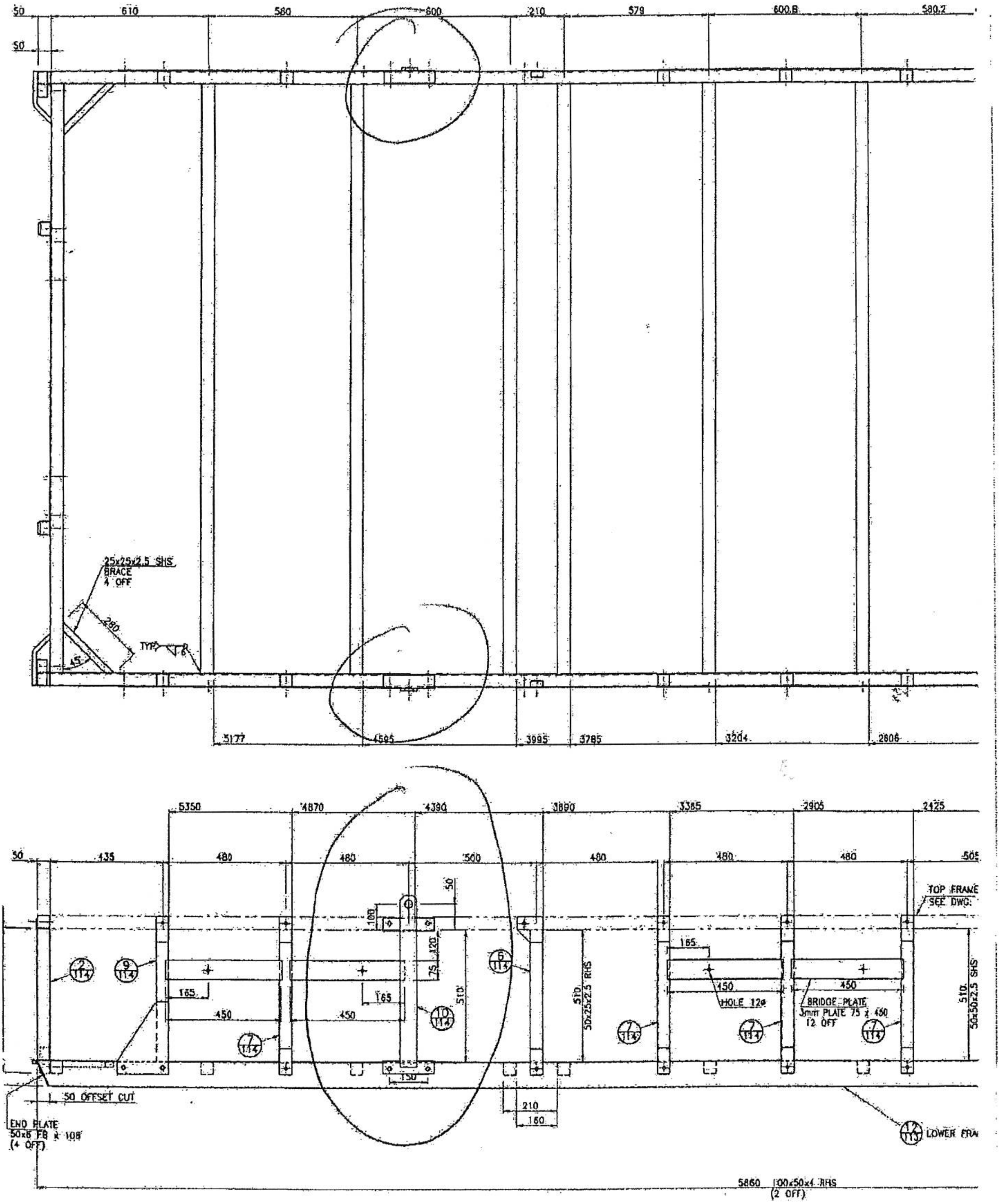
The two types of lifting lugs, four per frame, as detailed in the drawings attached in Appendix A, are structurally satisfactory for the load limits noted previously in Section 6, provided the following are adhered to:

- The above certificate is applicable only if the lugs are not affected by heat, adverse chemicals, excessive vibrations or other external factors unknown and not noted to the certifying engineer.
- The design certification is provided on the basis that materials used meet Australian Standards, Construction practices are in accordance with industry standards
- No modifications shall be made from the drawings attached in Appendix A.
- The lifting system, attachments and devices used are adequate for the lifted weights.
- The effluent tanks are fully pumped out before lifting such that they are empty.
- The loads are shared equally between all four lifting lugs and the slings and attachments are at least 45 degrees to the horizontal.

APPENDIX A FORMIT PART DRAWINGS

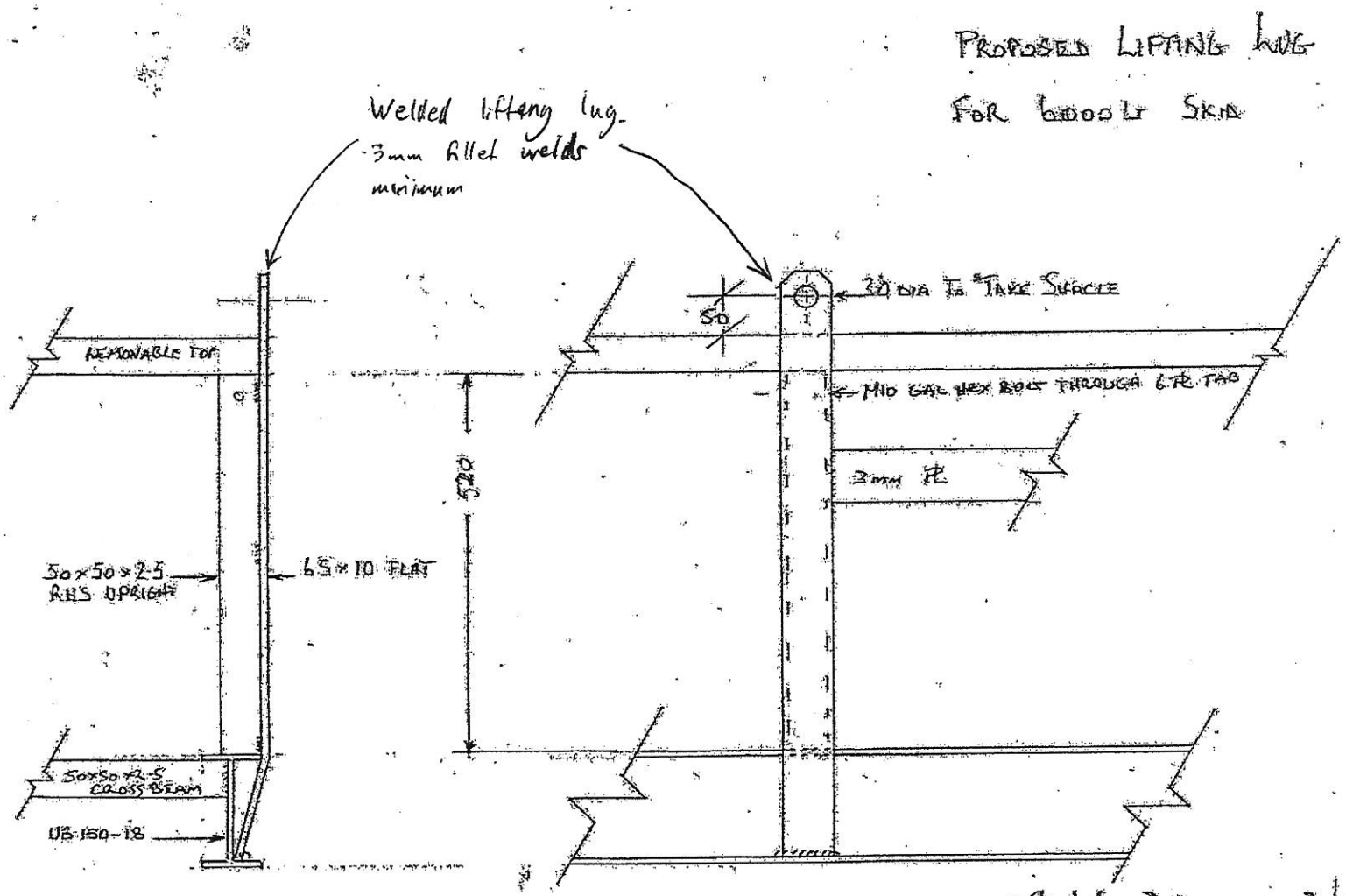


ALTERATION		**FORMIT SERVICES PTY. LTD.** 1 Co-wyn Close Fountaindale NSW 2258 Ph. (612) 4316 1000. Fax. (612) 4389 1300
ISSUE	FORMIT WASTE TANK 6000 Lt FRAME LOWER FRAME – FLAT PACK DETAIL	SCALE 1:10 · WT-1208-114 · A2



25x25x2.5 SHS BRACE 4 OFF
TYP
TOP FRAME SEE DWG.
50x25x2.5 RHS
50x50x2.5 SHS
HOLE 12ø
BRIDGE PLATE 3mm PLATE 75 x 450 12 OFF
50 OFFSET CUT
END PLATE 50x6 FB x 108 (4 OFF)
LOWER FRA
5860 100x50x4 RHS (2 OFF)

PROPOSED LIFTING LUG
FOR 6000 L SKID



Sketch 2a 3/11/08
JCA