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20 July 2011
Ref No. 1861

The Manager
Dalby General Steel
PO Box 365
Dalby Qld 4405

Dear Sir,

Re: ADJUSTABLE STEEL POST HEAD ASSEMBLY.

1.00 INTRODUCTION

1.01 This report has been prepared for the purpose of recording and interpreting the results of a series of "Load Tests" which were conducted under the direction of this firm for the purpose of assessing the structural capacity of the "Adjustable Post Head Assembly" to cater for vertical and horizontal loads.

1.02 The tests were conducted in Dalby General Steel's premises at No. 20 Yumborra Road, Dalby under the supervision of an Engineer from this firm.

1.03 The tests were designed to assess the structural capacity of the "Adjustable Post Head Assembly" under the simulated Gravity and Wind Loading effects which may be expected to occur in domestic sized buildings and similar structures.

2.00 LOADING TESTS

2.01 The samples comprised sections of 75 x 75 x 4.0 SHS and 100 x 100 x 4.0 SHS with the "adjustable steel post head" assembly welded on the top, in the manner detailed on this firm's Drawing No. 1861 Sheet 4.

Loads were applied using a calibrated hydraulic ram and were incrementally increased and removed until failure to reasonably establish the point of yeild.

2.02 Tests were conducted to simulate loading in each of the following directions:-

i) Vertically 'up' and 'down'.

ii) Horizontal at right angles to the join in the top cap plate.

iii) Horizontally in line with the join in the top cap plate.

2.03 The results of this testing are documented on Drawing No. 1861 Sheet 3. These test results enable us to establish the following Limit State Load Capacities for the various different structural member sizes and loadings.

Size	**Rod material / adjusted length above plate**	**Load Direction** (Refer Dwg 1861 Sheet 3)	**Limit State Load Capacity (kN)**	**Critical Mode of Failure**
75 x 75 x 4.0 SHS	Mild steel / 100mm	P2 (Horizontal)	22.7	Rod yeild
	High tensile steel / 100mm	P3 (Horizontal)	20.0	Rod Yield
	Mild steel / 150mm	P3 (Horizontal)	17.0	Rod Yield
	High tensile steel / 150mm	P3 (Horizontal)	11.0	Rod Yield
	M30 bolt	P1 (Down)	85.2	No Yield
	M30 bolt	P1 (Up)	85.2	Top plate Yield
75 x 75 x 4.0 SHS	High tensile steel / 100mm	P2 (Horizontal)	22.7	Rod Yield
	High tensile steel / 150mm	P3 (Horizontal)	22.7	Rod Yield
	M30 bolt	P1 (Down)	108.0	No Yield
	M30 bolt	P1 (Up)	119.8	No Yield

2.04 The results above indicate that the general mode of failure in lateral testing was due to yielding of the threaded rod. The 6mm rounded plate attached to the internal section of threaded rod reduced bending forces to the top plate and nut assembly, and in effect has increased the strength of the product before excessive deflections develop.

2.05 For domestic application the "adjustable steel post head assembly" will exceed the expected horizontal and vertical strength capacities required for most applications required in general domestic sized project applications. The designer shall be required to take into account the size and height of the posts (bending and compression capacities) when using this adjustable head assembly.

Yours faithfully,

LINDSAY B. REID *BE (Hons1) M.I.E.Aust, R.P.E.Q., CP.Eng, N.P.E.R.3*

ATTACHMENTS:

- Reid Consulting Engineers Drawing No. 1861 Sheet 3.
- Reid Consulting Engineers Drawing No. 1861 Sheet 4.

HORIZONTAL LOADING

TEST SPECIFICATION	MEMBER AND LOAD ORIENTATION	LOAD (kN)	DEFLECTION (mm)	UNLOADED DEFELECTION (mm)	
1	75x75x4.0 SHS 8mm TOP PLATE BOLT: 30ø MILD LOAD AXIS: P2 H=100mm	17 22.7 28.4	0 6 12	0 0 6-7	>22.7kN
2	75x75x4.0 SHS 8mm TOP PLATE BOLT: 30ø MILD STEEL LOAD AXIS: P2 H=100mm	11.4 14.2 17 21.3 28.4	0 1 1.5 5 10	0 0 0 1 5	ESTIMATED APPROXIMATE LOAD TO YIELD. 20.0kN
3	75x75x4.0 SHS 8mm TOP PLATE BOLT: 30ø HIGH-TENSILE LOAD AXIS: P3 H=100mm	5.7 17 28.4 39.8	0 5 13 19	0 0 4 12	>17.0kN
4	75x75x4.0 SHS 8mm TOP PLATE BOLT: 30ø MILD STEEL LOAD AXIS: P3 H=150mm	5.7 11.4 18.5 22.7	0 3 8 11	0 1 3 9	11.0kN
5	75x75x4.0 SHS 8mm TOP PLATE BOLT: 30ø HIGH-TENSILE LOAD AXIS: P3 H=150mm	5.7 17 22.7 28.4 37	0 4 6 15 33	0 0 0 7 22	>22.7kN
6	100x100x4.0 SHS 8mm TOP PLATE BOLT: 30ø HIGH-TENSILE LOAD AXIS: P2 H=100mm	17 22.7 28.4 34 39.8	3 7 8 12 16	0 0 2 3 5	>22.7kN
7	100x100x4.0 SHS 8mm TOP PLATE BOLT: 30ø HIGH-TENSILE LOAD AXIS: P3 H=150mm	17 22.7 28.4 34 39.8	0 3 9 13 19	0 0 5 6 9	>22.7kN

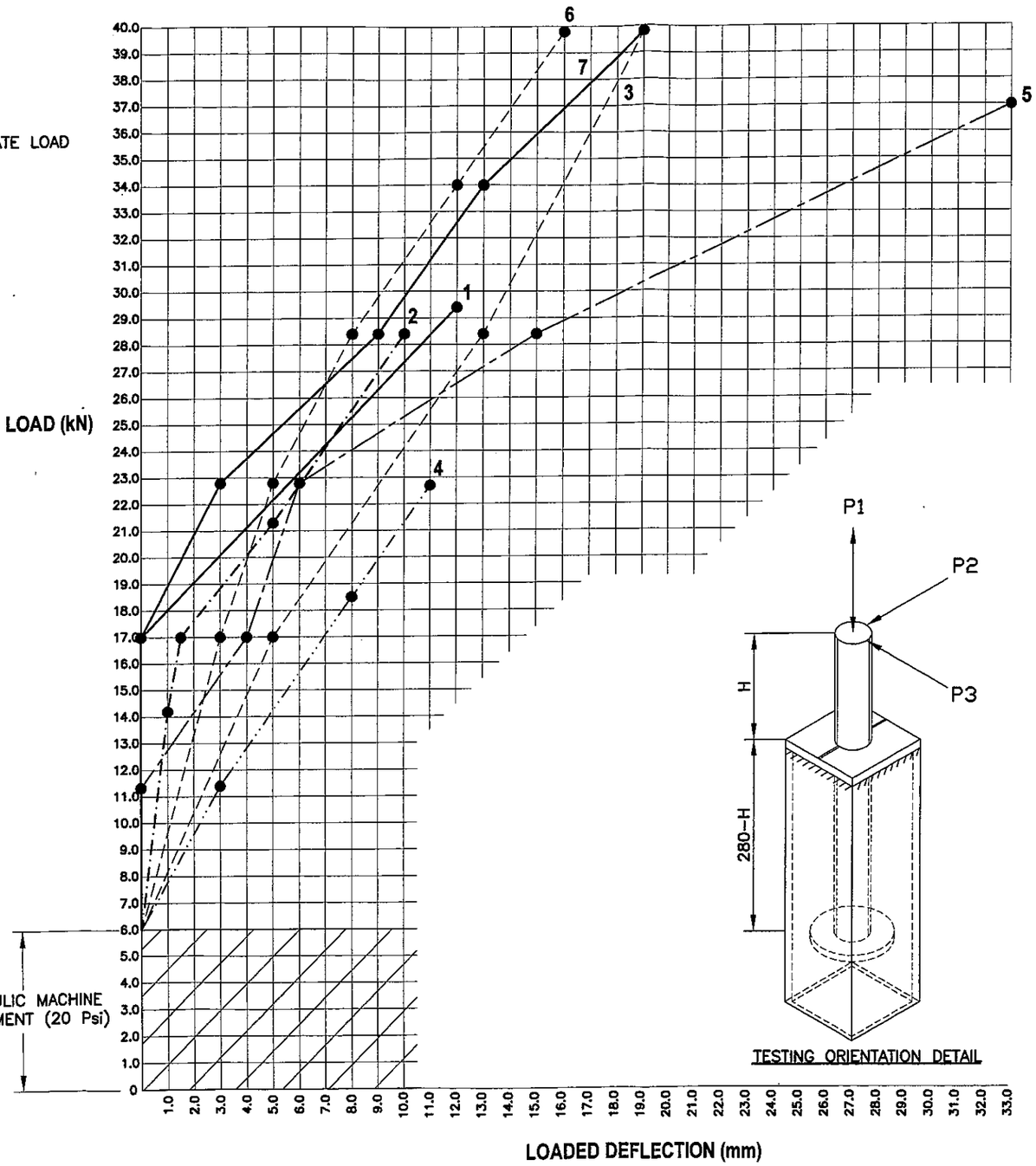
VERTICAL LOADING

75x75x4.0 SHS	P1 (DOWN)	85.2	NO YIELD	0
75x75x4.0 SHS	P1 (UP)	85.2	PLATE YIELD	-
100x100x4.0 SHS	P1 (DOWN)	108.0	NO YIELD	0
100x100x4.0 SHS	P1 (UP)	119.8	NO YIELD	0

NOTES:

1. ALL LOADED MEMBERS CONSTRUCTED WITH INTERNAL PLATE WELDED TO END OF THREADED ROD. REFER 1861 SHEET 4 FOR DETAILS.

LOAD vs DEFLECTION



TESTING ORIENTATION DETAIL

PLOT SCALE 1:100
PLOT DATE 15/07/11
\WORKING FILES\1800\1861\1861_3.dwg

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No	DATE	DRAFTER	AMENDMENT
A	05/10/10	AWR	INITIAL ISSUE

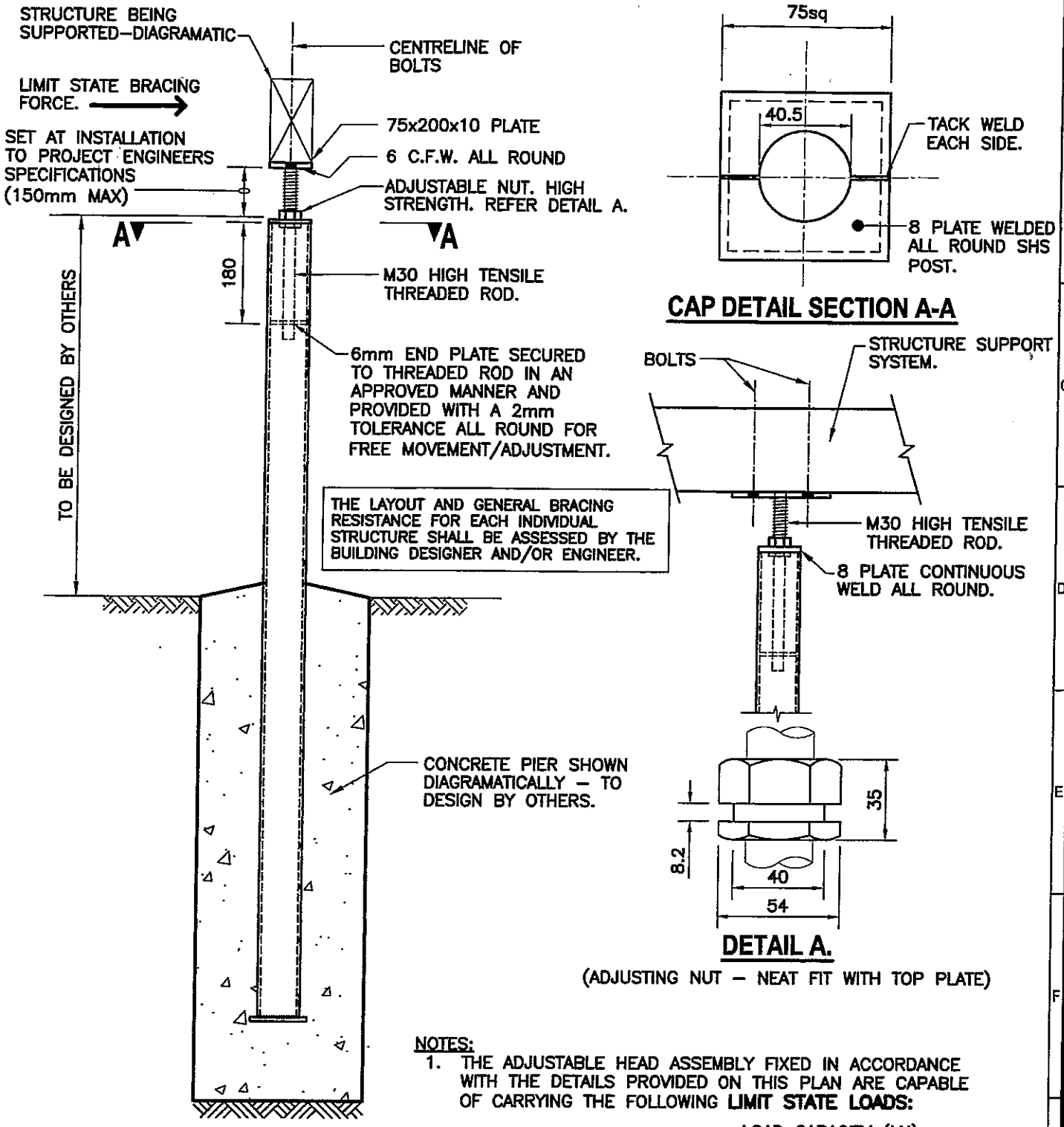
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CLIENT: DALBY GENERAL STEEL

DESIGNED	DRAWN	CHECKED
DAW	AWR	LBR
DATE: 05/10/10	APPROVED	RPEQ 2014

TITLE: **ADJUSTABLE POST HEAD TESTING**

SCALE	DRAWING No	No IN SET	AMDT	
1:100	1861	3	A	A3



NOTES:

1. THE ADJUSTABLE HEAD ASSEMBLY FIXED IN ACCORDANCE WITH THE DETAILS PROVIDED ON THIS PLAN ARE CAPABLE OF CARRYING THE FOLLOWING **LIMIT STATE LOADS:**

MEMBER	LOAD CAPACITY (kN)		
	VERTICAL UP	VERTICAL DOWN	HORIZONTAL
75x75x4.0 SHS	70 kN	70 kN	10 kN
100x100x4.0 SHS	70 kN	70 kN	10 kN

2. ALL OTHER ASPECTS OF THE STRUCTURAL DESIGN OF THE POST AND THE SUPPORTING FOOTING TO CARRY THE DESIGN LOADS FOR THE STRUCTURE SHALL BE DESIGNED BY OTHERS USING CONVENTIONAL ENGINEERING PRINCIPLES.

PLOT SCALE 1:100
PLOT DATE 18/07/11
\WORKING FILES\1800\1861\1861_4.dwg

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REID CONSULTING ENGINEERS PTY LTD
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CLIENT: DALBY GENERAL STEEL

DESIGNED	DRAWN
LBR/DAW	DAW/AWR
DATE: 25/05/11	APPROVED: RPEQ 2014

TITLE: **ADJUSTABLE POST HEAD ASSEMBLY**

SCALE	DRAWING No	SHEET	AMDT	
VARIES	1861	4	A	A4