

Building Act 1993
Building Regulations 2006

REGULATION 1507: CERTIFICATE OF COMPLIANCE—DESIGN

To

Relevant building surveyor:

Postal address:

Postcode:

From

Building practitioner: **KAH K. HON**

Category and class: **ENGINEER/CIVIL** Registration No: **EC-1697**

Postal address: **387 AUBURN ROAD**
HAWTHORN EAST Postcode: **3123**

Property details (if applicable)

Number: Street/road: City/suburb/town:

Lot/s: LP/PS: Volume: Folio:

Crown allotment: Section: Parish: County:

Municipal District:

Compliance

I did ~~not~~ prepare the design and I certify that the part of the design described as **STRUCT. COMPUTATIONS** complies with the following provisions of the Regulations **TO CHECK 200 N.B SCH 80 PIPE SPREADER**
BEA- VOL 1, PART B.
AS 1170 LOADING CODE
AS 4100 STEEL CODE
FOR 45 TONNES SWL @ 4.40
40 TONNES SWL @ 5.140
30 TONNES SWL @ 6.100

Design documents

Drawing Nos: Prepared by: Date:

Specifications: Prepared by: Date:

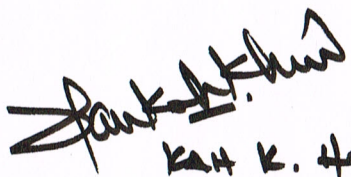
Computations: **2012/190-PAGES** Prepared by: **KH ENGINEERING P/L** Date: **13/8/2012**

Test reports: **1 TO 6** Prepared by: Date:

Other documentation: Prepared by: Date:

Signature

Signed:


KAH K. HON

Date: **13/8/2012**



KH ENGINEERING PTY LTD.

Consulting Engineers ACN 052 937 185

387 AUBURN ROAD,
EAST HAWTHORN VIC 3123
Tel: (03) 9882 1997
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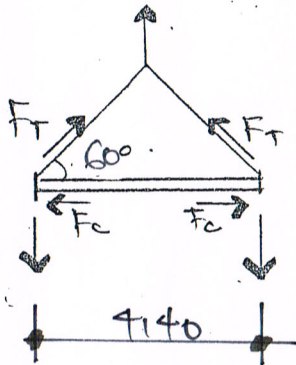
STRUCTURAL COMPUTATIONS
TO CHECK 200 M.B. SCH 80
PIPE SPREADER BEAM FOR
45 TONNES SWL @ 4140
40 TONNES SWL @ 5140
30 TONNES SWL @ 6100 .

JOB NO:- 2012/190

CLIENT:- METCALF CRANE SERVICES P/L

DATE :- 13/8/2012

CHECK 4140 FOR 45.0 TONNES SWL.



$$P = 1.04(45) + 9.6 = 56.4 \text{ tonnes.}$$

$$= 564 \text{ kN.}$$

$$F_T \sin 60 = 564/2 \text{ kN.}$$

$$F_T = \frac{282}{\sin 60} = 329.6 \text{ kN.}$$

$$\therefore \text{AXIAL FORCE } F_C = 329.6 \cos 60$$

$$= 162.8 \text{ kN.}$$

FOR 200 NOM BORE SCH. 80 PIPE SECTION

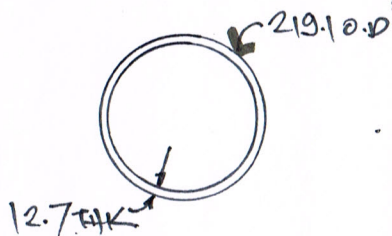
$$\frac{L}{r_y} = \frac{4140}{73.11} = 56.63$$

ALLOWABLE $f_c = 131 \text{ MPa.}$

ACTUAL $f_c = \frac{162.8 \times 10^3}{8235} = 17.8 \text{ MPa} < 131 \therefore \text{O.K.}$

HENCE SPREADER ADEQUATE FOR 45.0 TONNE @ 4140 LENGTH.

ASIDE: SECTIONAL PROPERTIES.



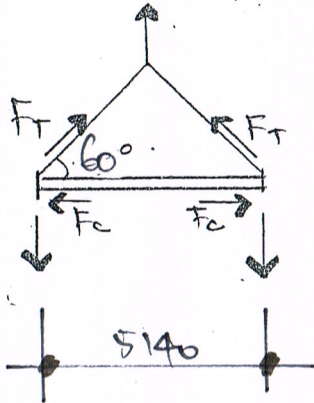
$$\text{AREA} = \frac{\pi}{4} (219.1^2 - 193.7^2) = 8235 \text{ mm}^2.$$

$$r_{yy} = \frac{\sqrt{219.1^2 + 193.7^2}}{4} = 73.11 \text{ mm}$$

DESIGNED DRAWN	DATE	CHECKED	DATE	CLIENT
				TITLE
				SK CALC. No. 2

KH Engineering Pty Ltd
A.C.N. 052 937 185
Consulting Engineers

CHECK 5140 FOR 40 TONNES SWL.



$$P = 1.04(40) + 9.6 = 51.2 \text{ TONNES.}$$

$$= 512 \text{ kN.}$$

$$F_T \sin 60 = 512/2 \text{ kN.}$$

$$F_T = \frac{256}{\sin 60} = 295.6 \text{ kN.}$$

$$\therefore \text{AXIAL FORCE } F_C = 295.6 \cos 60$$

$$= 147.8 \text{ kN.}$$

FOR 200 NOM BORE SWL 80 PIPE SECTION.

$$\frac{L}{r_y} = \frac{5140}{73.11} = 70.30$$

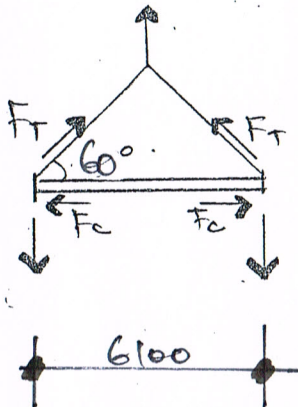
$$\text{ALLOWABLE } f_c = 117 \text{ MPa.}$$

$$\text{ACTUAL } f_c = \frac{147.8 \times 10^3}{8235} = 17.95 \text{ MPa} < 117 \therefore \text{O.K.}$$

HENCE SPREADER ADEQUATE FOR 40 TONNE @ 5140 LENGTH.

DESIGNED DRAWN	DATE	CHECKED	DATE	CLIENT
 KH Engineering Pty Ltd A.C.N. 052 937 185 Consulting Engineers				TITLE
				SK CALC. No. 3

CHECK 6100 FOR 30.0 TONNES SWL.



$$P = 1.04(30) + 9.6 = 40.8 \text{ tonnes.}$$

$$= 408 \text{ kN.}$$

$$F_T \sin 60 = 204 \text{ kN.}$$

$$F_T = \frac{204}{\sin 60} = 235.6 \text{ kN.}$$

$$\therefore \text{AXIAL FORCE } F_c = 235.6 \cos 60 \\ = 118.8 \text{ kN.}$$

FOR 200 NOM BORE SCH 80 PIPE SECTION

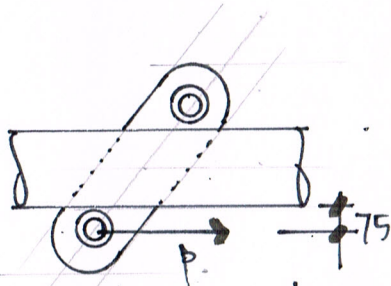
$$\frac{L}{r_y} = \frac{6100}{73.11} = 83.43$$

ALLOWABLE $F_c = 100 \text{ MPa.}$

ACTUAL $f_c = \frac{118.8 \times 10^3}{8235} = 14.43 \text{ MPa} < 100 \therefore \text{O.K.}$

HENCE SPREADER ADEQUATE FOR 30 TONNE @ 6100 LENGTH.

CHECK LUGS.



P - WORST CASE - 162.8 kN.

$$\therefore \text{MOM} = 162.8 (0.075) = 12.2 \text{ kNm.}$$

FOR 200x25 THK PL.

$$\text{BENDING } f_b = \frac{12.2 \times 10^6}{(200)^2 (25)/6} = 73.1 \text{ MPa} \\ \text{O.K.}$$

HENCE LUGS ADEQUATE.

DESIGNED DRAWN	DATE	CHECKED	DATE	CLIENT
KH Engineering Pty Ltd A.C.N. 052 937 185 Consulting Engineers				TITLE
				SK CALC. No.

GENERAL NOTES :

- THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL, ENGINEERING, AND OTHER RELEVANT DRAWINGS.
- THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS PRIOR TO THE COMMENCEMENT OF WORK, ANY DISCREPANCIES SHALL BE REFERRED TO THE ENGINEER.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STRUCTURE IN A STABLE CONDITION THROUGH-OUT THE CONSTRUCTION PERIOD.
- ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS OTHERWISE SHOWN.

FOUNDATIONS :

- EXCAVATIONS ARE TO BE ACCURATELY TRIMMED TO LINE AND LEVEL, OR FINISHED TO LEVEL WITH A MINIMUM OF 50 MILLIMETRES OF BLINDING CONCRETE OR PACKING SAND. PACKING SAND SHALL NOT BE PLACED TO A GREATER TOTAL DEPTH OF MORE THAN 200 MILLIMETRES.
- THE BASE PREPARATION FOR FOUNDATIONS AND SLABS ON GROUND SHALL BE APPROVED BY THE ENGINEER BEFORE POURING CONCRETE.
- THE SAFE BEARING CAPACITY OF THE MATERIAL SUPPORTING FOOTINGS AND FLOOR SLABS SHALL BE 100 kpa.
- STRIP ALL TOP-SOIL, ORGANIC MATERIAL, AND UNSOUND MATERIAL FROM BENEATH THE SITE OF ALL PROPOSED WORKS.

CONCRETE NOTES :

- ALL CONCRETE MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH AS 3600-THE CONCRETE STRUCTURES CODE, AND THE CODES REFERRED TO THEREIN.
- THE CHARACTERISTIC COMPRESSIVE STRENGTH (F'c) OF CONCRETE USED SHALL BE 25 MPA, EXCEPT FOR BLINDING CONCRETE WHICH SHALL BE 15 MPA.
- THE MINIMUM CEMENT CONTENT OF 25 MPA CONCRETE SHALL BE 290 KG/CUBIC METRE.
- CONCRETE SHALL BE SEPARATED FROM SUPPORTING BRICKWORK BY TWO LAYERS OF MALTHOID.
- MAXIMUM CONCRETE SLUMP SHALL BE 80 MILLIMETRES.
- CLEAR CONCRETE COVER TO REINFORCEMENT SHALL, UNLESS NOTED OTHERWISE, BE AS FOLLOWS (IN MILLIMETRES):

CONCRETE MEMBER	EXPOSURE CONDITION	
	DEPOSITED IN FORMS DEPOSITED IN FORMS	CONCRETE
	AND NOT EXPOSED TO (OR PROTECTED BY	PLACED IN
	WEATHER, GROUND- W-PROOF MEMBRANE)	CONTACT
	WATER, ETC.	AND LATER EXPOSED
	TO WEATHER,	WITH THE
	GROUNDWATER, ETC.	GROUND.
PAD FOOTINGS;	-	75
STRIP FOOTINGS;	-	65
COLUMNS	-	65
PEDESTALS;	40	75
WALLS;	20	65
BEAMS;	25	65
CONCRETE SLABS;	20	65

- ALL CONCRETE SHALL BE CURED IN ACCORDANCE WITH AS 1600
- FORMWORK SHALL NOT BE STRIPPED UNTIL THE FOLLOWING NUMBER OF DAYS AFTER POURING THE CONCRETE;

BEAM SIDES, VERTICAL WALLS, & COLUMNS,	5 DAYS
SLABS & BEAM SOFFITS,	14 DAYS

- ALL SUSPENDED SLABS SHALL REMAIN PROPPED FOR 21 DAYS AFTER POURING THE CONCRETE.
- ALL SUSPENDED BEAMS SHALL REMAIN PROPPED FOR A MINIMUM OF 28 DAYS AFTER POURING THE CONCRETE.
- BRICKWORK SHALL NOT BE BUILT OR STACKED ON PROPPED SLABS OR BEAMS.
- FILLER BOARD SHALL BE 'CELLOX B' EXPANSION JOINT MATERIAL, AND JOINT SEALER SHALL BE 'THIOLOX SL' SEALANT, OR APPROVED EQUIVALENTS USED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.
- THE LOCATION OF ALL CONSTRUCTION JOINTS SHALL BE SUBJECT TO THE WRITTEN APPROVAL OF THE ENGINEER.
- WATERPROOF MEMBRANES WHERE SPECIFIED SHALL BE A 200 mm THICK POLYTHENE SHEET, LAPPED AND TAPED TO PREVENT THE TRANSMISSION OF MOISTURE THROUGH THE MEMBRANE.

STEELWORK NOTES :

- ALL STEELWORK SHALL BE MANUFACTURED, FABRICATED, AND ERECTED IN ACCORDANCE WITH AS 4100 - THE STEEL STRUCTURES CODE, AND THE STANDARDS AND CODES MENTIONED THEREIN.
- ALL BOLTS SHALL BE M20 HIGH STRENGTH BOLTS, FULLY TENSIONED IN ACCORDANCE WITH AS 1511 UNLESS NOTED OTHERWISE. ALL BOLTED CONNECTIONS SHALL HAVE TWO OR MORE BOLTS UNLESS NOTED OTHERWISE.
- BOLTS FOR HANDRAILS, LADDERS, PURLINS, AND GIRTS SHALL BE M16 COMMERCIAL GRADE BOLTS TO AS 1111, UNLESS NOTED OTHERWISE.
- ALL WELDS SHALL BE 6 MILLIMETRE CONTINUOUS FILLET WELDS, UNLESS NOTED OTHERWISE.
- ALL HOT WORK (WELDING, GRINDING, ETC.) SHALL BE CARRIED OUT WITH SUITABLE PROTECTION AGAINST DAMAGE TO OTHER ITEMS.
- ALL CAVITIES BETWEEN SUPPORTS AND BASEPLATES SHALL BE FILLED WITH DENSE, DRY MIXED GROUT, RAMMED SOLIDLY INTO POSITION. THE GROUT SHALL HAVE A 2:1 CONCRETE SAND TO CEMENT RATIO.
- ALL CLEATS AND STIFFENERS SHALL BE FABRICATED FROM 10 THICK PLATE, EXCEPT PURLIN AND GIRT CLEATS WHICH SHALL BE FABRICATED FROM 6 THICK PLATE, UNLESS NOTED OTHERWISE.
- ALL STRUCTURAL STEEL, UNLESS NOTED OTHERWISE, SHALL BE SAND BLASTED TO A CLASS 2 1/2 FINISH IN ACCORDANCE WITH AS 1627 PART 4, IMMEDIATELY FOLLOWED BY ONE COAT OF AN APPROVED ZINC RICH PRIMER TO A DRY FILM THICKNESS OF 75 MICRONS.
- GALVANIZED COATINGS WHERE SPECIFIED SHALL CONFORM WITH THE REQUIREMENTS OF AS 1650 (INCLUDING COATING THICKNESS). STEELWORK SHALL BE PRE-CLEANED IN ACCORDANCE WITH AS 1627 PART 1, FOLLOWED BY ACID PICKLING IN ACCORDANCE WITH AS 1627 PART 5.

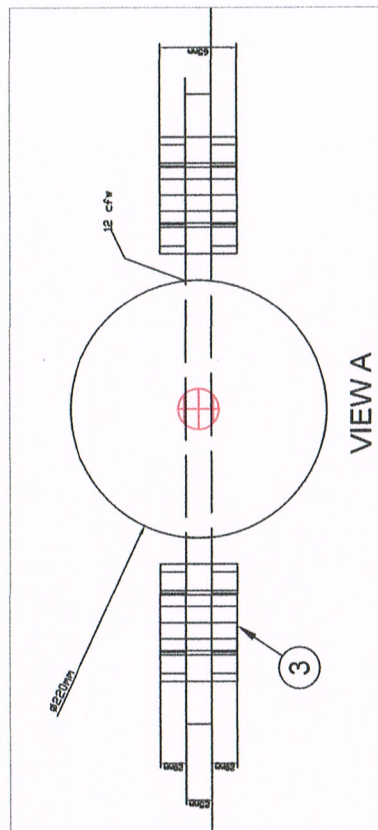
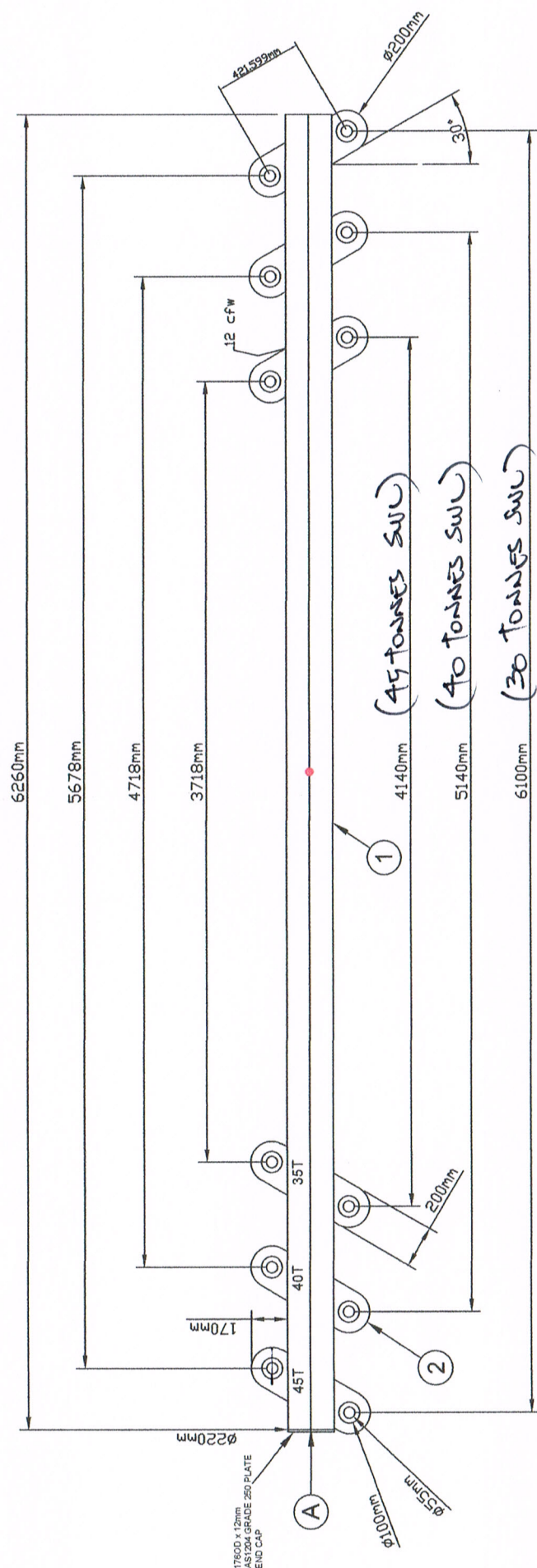
BRICKWORK NOTES :

- ALL BRICKWORK AND BRICKWORK CONSTRUCTION SHALL BE IN ACCORDANCE WITH AS 1700 - 'THE BRICKWORK CODE'.
- ALL BRICKWORK SHALL BE CONSTRUCTED USING A 1:1:6 CEMENT:LIME:SAND MORTAR AND 'B' GRADE BRICKS (30 MPa), UNLESS NOTED OTHERWISE.
- ALL BRICKWORK SHALL BE CONSTRUCTED USING 'B' GRADE BRICKS AND A 1:1:6 CEMENT:LIME:SAND MORTAR, UNLESS NOTED OTHERWISE.
- ALL BLOCKWORK SHALL BE CONSTRUCTED USING GRADE '12' BLOCKS AND A 1:1:6 CEMENT:LIME:SAND MORTAR, UNLESS NOTED OTHERWISE.

TIMBER NOTES :

- ALL STRUCTURAL TIMBER, ASSOCIATED FASTENERS AND MATERIALS, AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH AS 1684, AS 1720, AND THE CODES MENTIONED THEREIN.

Rev No:	Revision Note	Date	Signature	Checked
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ITEM	MATERIAL	QUANTITY
1	200NB SCH80 (219.1 OD x 12.7w) ASME B36.10 UNEPIPE	1
2	25mm THICKNESS PLATE AS1204 GRADE 350	6
3	20mm THICK PLATE AS1204 GRADE 350	24
4	176OD x 12mm AS1204 GRADE 250 PLATE	2

	METCALF CRANE SERVICES PTY LTD 74-76 FREIGHT DRIVE, SOMERTON VICTORIA 3062 PH (03) 9308 0044 FAX (03) 9308 0123				Client: METCALF CRANE SERVICES		Project: 451_401_30t SPREADER BAR	Edition: A	Sheet: 1 of 1
	Drawn By:	Checked By: T.A.	Approved By - Date:	Job No: 002017	Date: 08/08/12	Scale: N.T.S			
L.Z.									

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