

# AUT STRUCTURES LAB

## Consultancy REPORT



**Client:** Industrial Fittings (IFNZ Ltd.)

**Date:** 10/03/2023

### Scope of service

Providing consultancy service for IFNZ Ltd. as an independent engineer by validating the test results of the pipe support base plates following the code minimum gravity load requirements, as per the performance objective of the Clause 4.3.9.1 of NZS4541:2020.

### Summary of consultation

The range of the pipe sizes which could be supported by each of the tested base plates of **BPM10W**, **BPM10W45**, **BPM12W** and **BPM12W45** are identified.

**NOTE:** This report is prepared at the request of IFNZ, based on the test information provided. Therefore, the data provided herein is intended to be reliable. The consultant takes no liability for the accuracy of the test data.

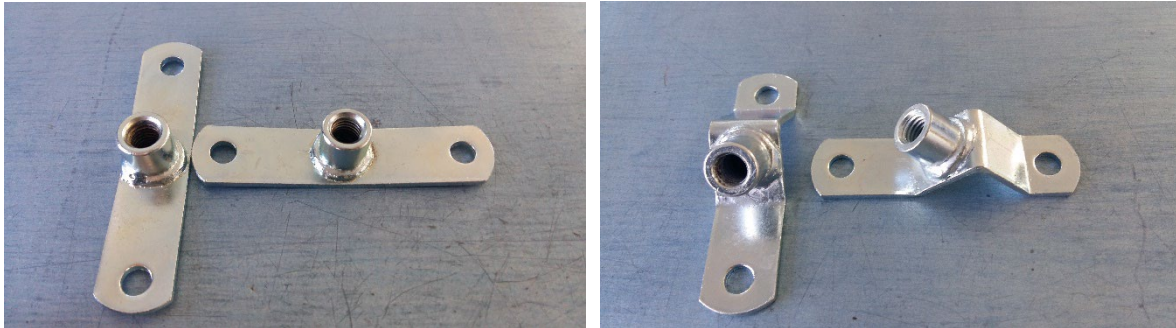
*Sincerely,*

A handwritten signature in blue ink that reads 'Pouyan Zarnani'.

*Pouyan Zarnani PhD, MEngNZ, ME, BE (Hons)*

*Academic Director of AUT Structures Lab  
Senior lecturer in Structural/Earthquake Eng*

The test results for each of the IFNZ pipe support base plates are presented in Appendix (conducted by AON). The summary of the results is listed in the following table.

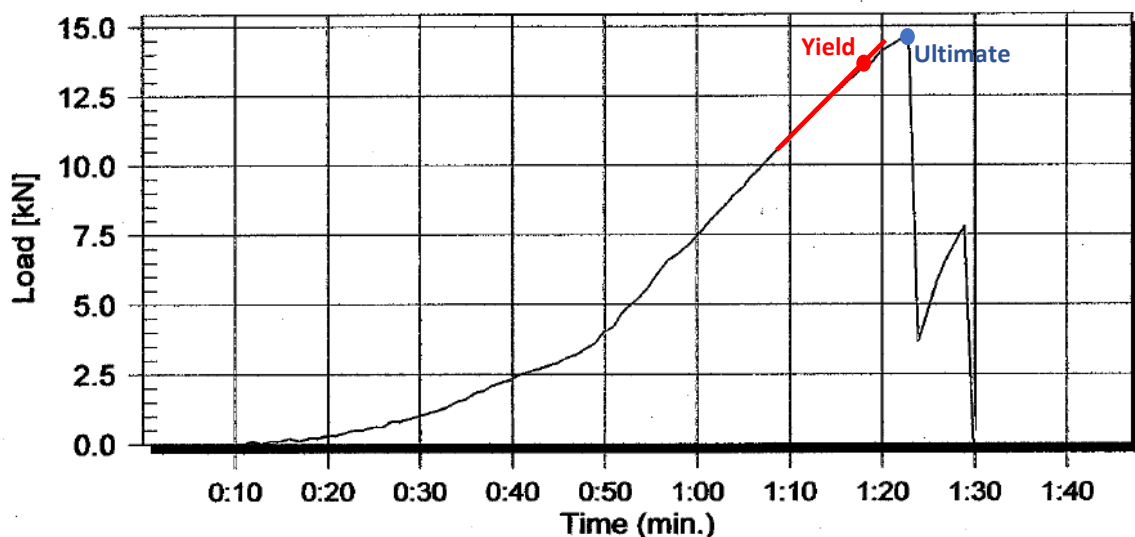


CODE	MATERIAL WIDTH	MATERIAL THICKNESS	BOSS	ANGLE	BREAK	DESIGN LOAD
BPM10W	22	2.5	M10		11	5.5 kN
BPM10W45	22	2.5	M10	45deg	12	6 kN
BPM12W	22	2.5	M12		15	7.5 kN
BPM12W45	22	2.5	M12	45deg	14	7.0 kN

\*\*Design load safety factor of 2.0\*\*

**Table 1:** IFNZ BASE PLATES (ZINC PLATED / GALVANISED – WELDED M10/M12 BOSS)

As can be found on the load-time curves of the test results, for different base plates, the yield values are at about 90% of the ultimate failure loads. It should be noted that the yielding load has been captured as the onset of nonlinearity through reduction of slope in the curves indicating the initiation of plastic deformation decreasing the loading rate. An example is presented for the test result of the M12 base plate (Yield load at about 14kN and Ultimate at 14.5kN).



**Fig. 1:** Test result of M12 base plate (BPM12W)

The code minimum gravity load requirements for base plates, as per the performance objective of the Clause 4.3.9.1 of NZS4541:2020 is presented in the following table.

Nominal bore (mm)	Maximum spacing (m)	Weight per meter (kg/m)	100 kg	Total Mass (kg)
20	2.4	1.95	100	123
25	3.7	3.05	100	156
32	3.7	4.19	100	178
40	4.6	5.03	100	216
50	4.6	7.37	100	270
65	4.6	10.3	100	337
80	4.6	13.7	100	415
100	4.6	21.1	100	585
150	4.6	38.8	100	992
200	4.6	62.6	100	1540

**Table 3:** minimum gravity load requirements for pipes clamps  
(Clause 4.3.9.1 of NZS4541:2020)

Comparing the minimum requirements from Table 2 with the provided test results in Table 1 (after being reduced by a factor of 0.9 - considering the yield point rather than ultimate as per Fig. 1), it can be deduced that:

- **BPM10W & BPM10W45** base plate have sufficient design capacity to support pipes up to Nominal Bore (NB) of **80mm**
- **BPM12W & BPM12W45** base plate have sufficient design capacity to support pipes up to NB of **100mm**

Therefore, for the NB of 150mm and above, higher capacity base plates will be required.

### FORM 9

Aon File Reference: \_\_\_\_\_

<b>APPLICATION FOR LISTING OF EQUIPMENT</b> As per section 114 of NZS 4541:2007 and NZS4515:2009 Appendix G	
Item: <b>IFN2 Baseplates</b>	
For use as: <b>Hanger Baseplates</b>	
Manufacturer: <b>IFN2</b>	
Supplier: <b>IFN2</b>	
Address: <b>30 Maisey Place</b>	Contact: <b>Emma Field</b>
<b>PO Box 1681</b>	Phone No: <b>07 460 0463</b>
<b>Rotorua</b>	Fax No: <b>021 332 582</b>
Make: <b>Welded Boss Baseplates m10/m12</b>	
Model: <b>BPM10W / BPM12W</b>	
Reference information: <b>As attached.</b>	
Range limitations: <b>Baseplates</b>	
Restrictions and warnings: <b>Do not exceed design load</b>	
Special conditions:	
Signed:	Date: <b>9.3.17</b>
Name: <b>Emma Field</b>	Designation: <b>Director</b>

Note: Please attached manufacturer's data sheets, proof of overseas approvals or listings and any other pertinent information

# Certificate of Testing

**CHAIN & RIGGING SUPPLIES LTD**  
136 Captain Springs Rd, Onehunga  
P O Box 13 312, Onehunga, Auckland, N.Z.  
Ph: 09 636 4775 Fax: 09 636 7543  
158 TONNE COMPUTERISED TESTING EQUIPMENT

**Customer: INDUSTRIAL FITTINGS NZ**

**Test Number: 20776**

**Serial No.: BPM10/W**

**Test Date: 26/03/15**

**Order No.: PO-1282**

**Description: BASE PLATE**

**Test Method: Break**

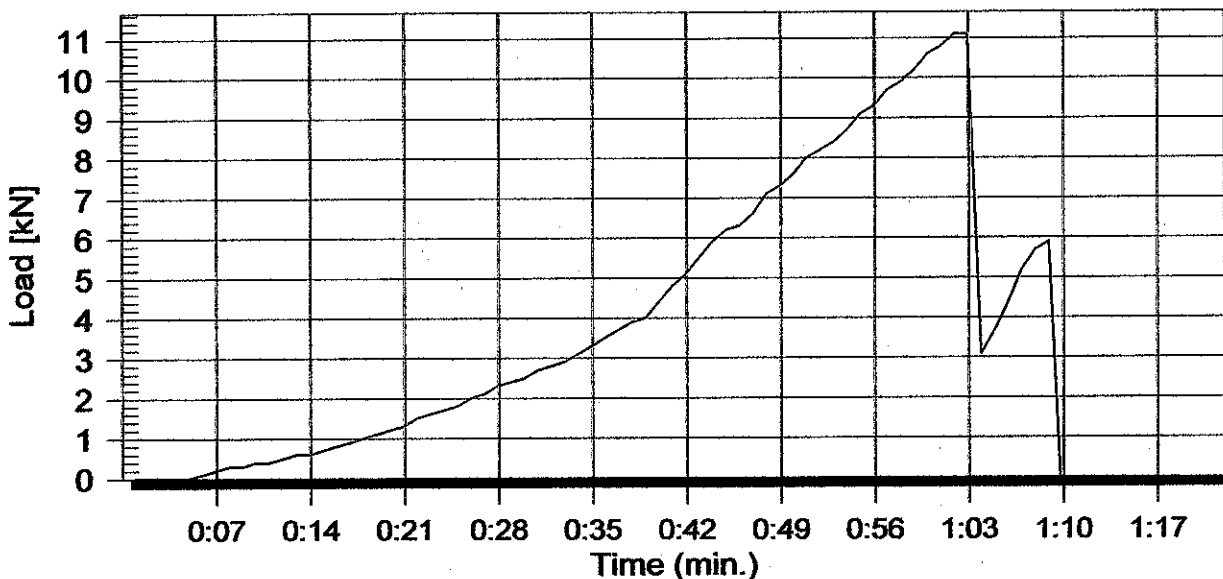
**Invoice No.:**

**Size: 10 mm**

**Peak Load: 11 kN**

**Length: 0 m**

**Test Duration: 1.4 Minutes**



TO CONVERT kN TO TONNES, MULTIPLY BY 0.102.

OUR INSPECTION AND TESTING SERVICES DO NOT INCLUDE CRACK TESTING  
OR OTHER SPECIALISED SURFACE INSPECTION.

**CALIBRATED BY AUSTRALIASIAN CALIBRATING SERVICES 06-01-2015**

Test Results

Acceptable  
 Not Acceptable

Conducted by:

  
Ben Dickinson



## Certificate of Testing

CHAIN AND RIGGING SUPPLIES LTD  
136 Captain Springs Road  
Onehunga  
PO Box 13 312,  
Onehunga, Auckland

PH: 09 636 4775, EMAIL : info@chainandrigging.co.nz

158 TONNE COMPUTERISED TESTING EQUIPMENT

CUSTOMER: IFNZ LTD

TEST DATE: 7/03/2017

SERIAL No: BPM10W45

ORDER No:

INVOICE No:

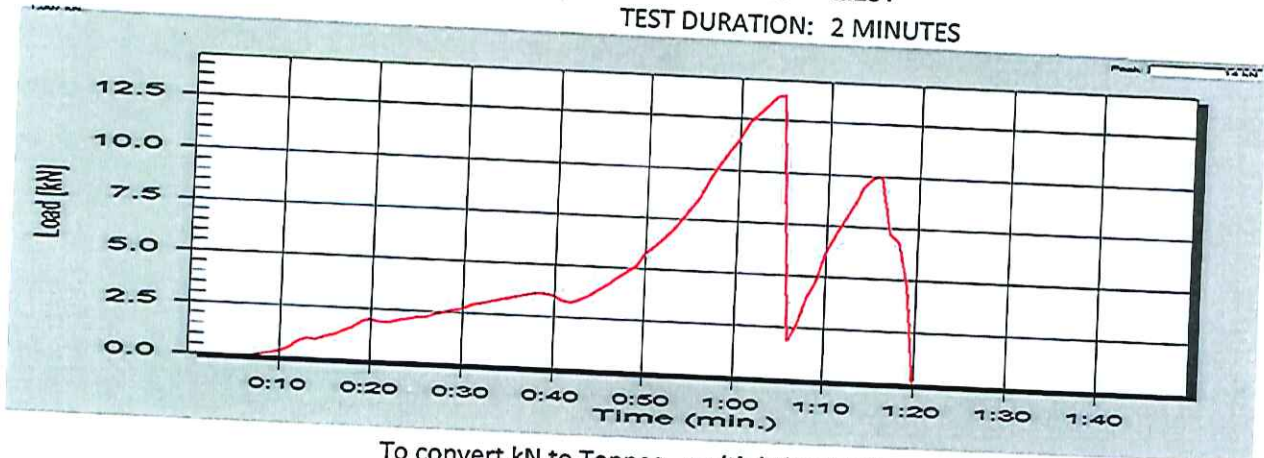
DESCRIPTION: Break Test

TEST METHOD: Break

WLL: 0T

PEAK LOAD: 1.25T

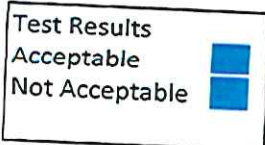
TEST DURATION: 2 MINUTES



To convert kN to Tonnes , multiply by 0.102  
WLL on Certificate of Test is at Zero degrees

OUR INSPECTION AND TESTING SERVICES DO NOT INCLUDE CRACK TESTING  
OR OTHER SPECIALISED SURFACE INSPECTION

CALIBRATED BY AUSTRALASIN CAILRATING SERVICE (294-A-19) 28/1/2016



TEST CONDUCTED BY

*Darren Milne*  
Darren Milne

# Certificate of Testing

**CHAIN & RIGGING SUPPLIES LTD**  
136 Captain Springs Rd, Onehunga  
P O Box 13 312, Onehunga, Auckland, N.Z.  
Ph: 09 636 4775 Fax: 09 636 7543  
158 TONNE COMPUTERISED TESTING EQUIPMENT

**Customer: INDUSTRIAL FITTINGS NZ**

**Test Number: 20777**

**Serial No.: BPM12/W**

**Test Date: 26/03/15**

**Order No.: PO-1282**

**Description: BASE PLATE**

**Test Method: Break**

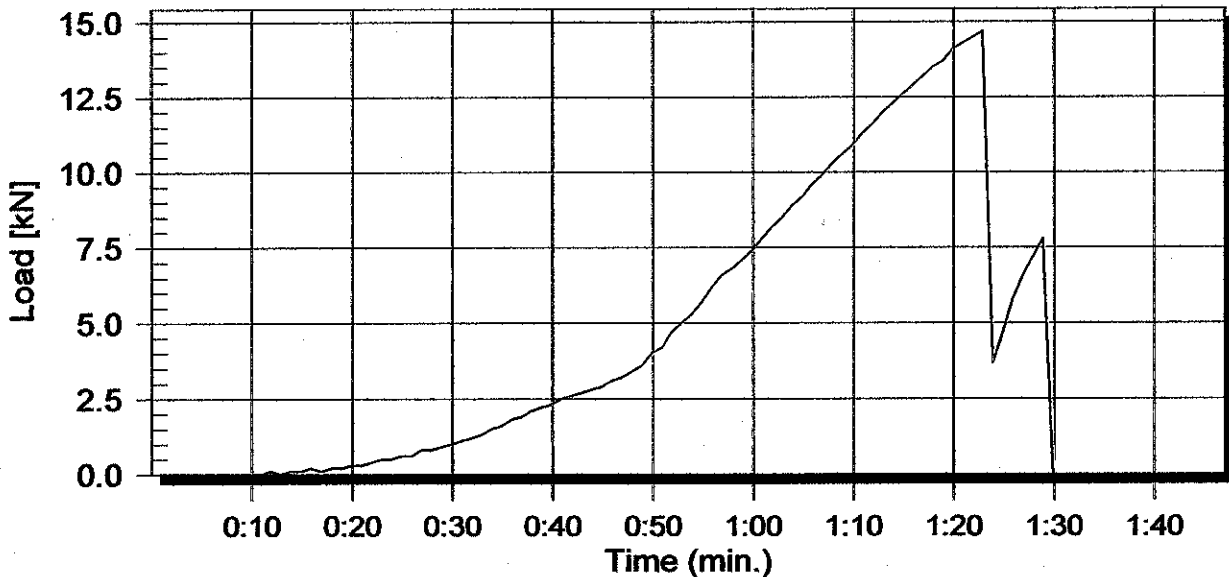
**Invoice No.:**

**Size: 12 mm**

**Peak Load: 15 kN**

**Length: 0 m**

**Test Duration: 1.8 Minutes**



TO CONVERT kN TO TONNES, MULTIPLY BY 0.102.

OUR INSPECTION AND TESTING SERVICES DO NOT INCLUDE CRACK TESTING  
OR OTHER SPECIALISED SURFACE INSPECTION.

CALIBRATED BY AUSTRALIASIAN CALIBRATING SERVICES 06-01-2015

Test Results	
<input checked="" type="checkbox"/>	Acceptable
<input type="checkbox"/>	Not Acceptable

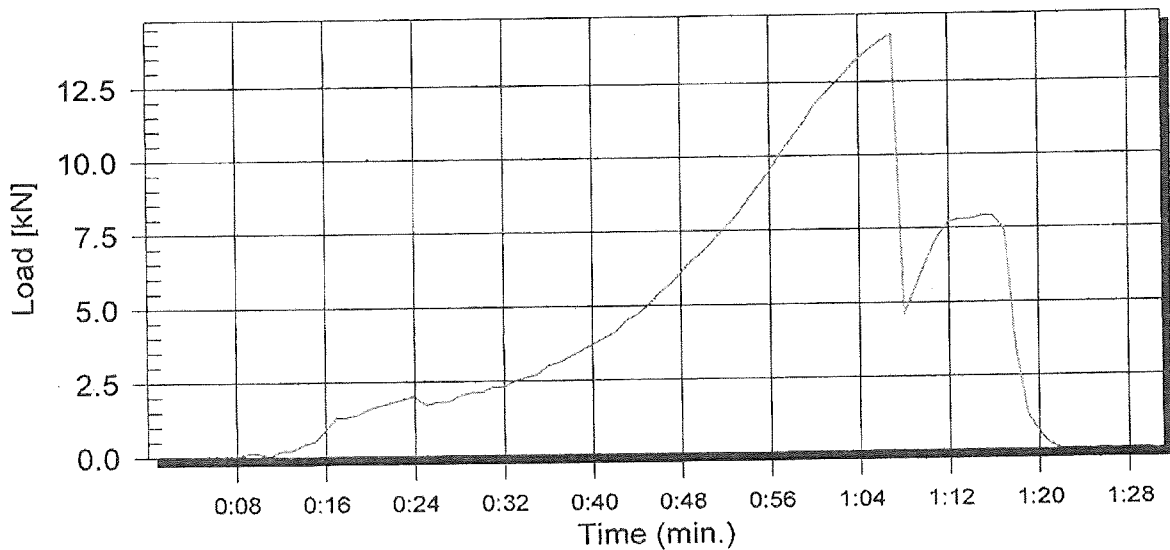
Conducted by:

Ben Dickinson

Certificate of Testing

CHAIN & RIGGING SUPPLIES LTD  
136 Captain Springs Rd, Onehunga  
P O Box 13 312, Onehunga, Auckland, N.Z.  
Ph: 09 636 4775 Fax: 09 636 7543  
158 TONNE COMPUTERISED TESTING EQUIPMENT

Customer: INDUSTRIAL FITTINGS Test Number: 22025  
Serial No.: BPM12W45 Test Date: 17/02/16  
Order No.: Description: BASE PLATES 45  
Invoice No.: Test Method: Break  
Size: mm Peak Load: 14 kN  
Length: m Test Duration: 1.5 Minutes



TO CONVERT kN TO TONNES, MULTIPLY BY 0.102.  
OUR INSPECTION AND TESTING SERVICES DO NOT INCLUDE CRACK TESTING  
OR OTHER SPECIALISED SURFACE INSPECTION.

CALIBRATED BY AUSTRALIASIAN CALIBRATING SERVICES 06-01-2015

Test Results  
 Acceptable  
 Not Acceptable

Conducted by:

  
Harley Ferguson