Inspection and Testing of Nail Plates

Testing was done at the offices of Shock Proof Investments 9 (Pty) Ltd at 4 Laurel Crescent, Merrivale.

**Objective**

The objective is to test the strength of the nail plate.

**Attendance**

In attendance of the testing – Mr J. Mahabeer, Mr S. Nicholson and Mr K. Taylor (outside attendee)

1. **OBJECT OF THE TEST**

   To witness the maximum load (force) the nail plate can withstand and the movement of the nail plate.

2. **Testing Equipment**

   The above Load cell is used to measure the force during the testing and the 2 items on the right are the LVDTs which is used to measure the displacement.

   ![Load cell](image1.png)

   ![LVDTs](image2.png)

   This Load cell was used to measure the compression force.
3. **SAMPLES**
   
a. **NAIL PLATE SAMPLE 1**
   
The samples that were used are as follows:

   100mm x 100mm truss nail plate.

   As requested for the testing some teeth had to be removed images are below.
b. **NAILPLATE SAMPLE 2**

80mm x 12mm

Teeth were removed as requested.

4. **Nail plate detail.**

Teeth between 8 – 9mm long and 4mm wide.
5. **Timber Details**

All timber used for the testing where G5 Roof truss pine treated timber 36x114, each piece timber was measured and weighed to get the density of the timber for the testing. The results are as follows.

<table>
<thead>
<tr>
<th>Timber</th>
<th>Length(cm)</th>
<th>Width(cm)</th>
<th>Height(cm)</th>
<th>Mass(Kg)</th>
<th>Density cm$^3$/Kg</th>
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<tbody>
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<td>T1</td>
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</table>
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The test samples were hammered in and then put through the roller press as requested. The LVDTs were placed in the front for the 90_90 test and the top member was bolted 200mm from the nail plate.

The LVDTs were placed on either side of the of the 0_0 test the members were bolted 200mm away from the nail plate on the top and bottom.
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**Test Results Pictures of the 90_90 Test**

Test -T01 max pull force 956Kg

Test -T02 Max pull force 1.151Kg

Test –T03 Max Pull force 1.033Kg
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Test – T04 Max Pull force 866Kg

Test – T05 Max Pull force 1.150Kg
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Test Results Pictures of the 0_0 Test

Test – T06 Max pull force 2.717Kg

Test – T07 Max pull force 2.326Kg

Test – T08 Max pull force 2.712Kg
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Test – T09 Max pull force 2.053Kg

Test – T10 Max pull force 2.300Kg
6. **Compression Test**

6 Samples were used, 3 with the 100mm x 100mm plate and 3 with the 80mm x 125mm plate. All the samples had a gap of 4mm separating the top and bottom timber.

Compression test set up.
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**Compression Test Picture Results**

C1 - Max compression 990kg.  
C2 - Max compression 870kg.  
C3 – Max compression 1150kg.  
C4 – Max compression 1570kg.  
C5 – Max Compression 1280kg.  
C6 – Max compression 610kg.