3.1 INTRODUCTION

As mentioned in Chapter 2, the objective of this study is to increase the stiffness of PSSDB. The purpose of this study is to find out the stiffness and the values that can be used in the future. Previous studies have been carried out by past researchers such as Wright and Ahmed (1996), Akhand (2001), Harsoyo (2004) and Hanizam (2008) which is all of them have obtained different results based on different element and material used.

Peva45 and plywood have been used in this experiment as steel sheeting and dry board in PSSDB. Meanwhile, the type of screws used is Screw Phil Flat Head SDS Zinc Plated. For in filled, this experiment used foam concrete with a density of foam is 700 kg/m³. The size of steel sheeting used is 2400 mm x 800 mm with the thickness 1.0 mm. While the size of plywood used is 2400 mm x 1000 mm with thickness 3 mm, 4 mm and 6 mm respectively. This dryboard will screw together with Peva45 by using self-tapping or self-drilling screw. These three panels were subjected to the bending test experiment to determine its stiffness by using Magnus Frame and Apparatus 30 Tonnes Machine. Figure 3.1 below represents the cross section of Peva45.
Each dry board was marked first in order to make it easier and faster to do the work before the screw were drilling. The distance between each screw that need to be tapped on the dry board and profile steel sheeting are 150 mm. Table 3.1 below shows the type of screws that were used in this experiment.

**Table 3.1**: The information of the screw

<table>
<thead>
<tr>
<th>Code</th>
<th>Size</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS 438 FH</td>
<td>½’ x 8</td>
<td>30mm</td>
</tr>
</tbody>
</table>

The other equipment used in order to complete this project was hand-drill. The function of this equipment is to tap the screw through the plywood and steel sheeting to make sure it is attached with each other. The type of hand drill used is Bosch Hand-Drill. The figure below shows the image of a hand-drill.
Other than that, the filling that was used in this experiment is lightweight foam concrete by using Ordinary Portland cement. To make sure the foam concrete is mixed well, the density for each concrete and foam were weighed. 1 L foaming agent will be mixed with 24 L water. Then water will added in the machine, followed by cement and silica sand that were weighed earlier by using the ratio 2:1:1. Lastly, when the concrete reached the density, the foam will be added. The density of foam concrete needed to fulfill the hole of profiled steel sheeting are 700 kg/m$^3$ while the density of concrete is 1970 kg/m$^3$. Before the compressive strength of the concrete was determined, the samples of cubes needed to undergo curing process for about 7 days. After curing, the testing of the compression strength was carried out. The machine used for mixed the concrete were shown below.

Figure 3.2: Bosch Hand-Drill