BUCKLING BEHAVIOUR OF STEEL PLATE SUBJECTED TO AXIAL LOAD

BY:

MOHD FAZARUDIN BIN ABDULLAH @ ZAKARIA

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ABSTRACT

This project is to study the buckling behaviour of steel plate subjected to axial load. Column specimens will be tested in Civil Engineering Laboratory and followed by the computer model in order to determine the stress distribution and the deflection. Modulus of elasticity, **(E)** will be taken from tensile test coupon.

In the experiment and investigation reported here only one thickness i.e. **6 mm** mild steel was chosen and rectangular sections, **50 mm x 6 mm** and **300 mm** height were tested. The rectangular columns were supported at both ends and subjected to a compressive load aligned with its centroidal axis. The failure load and deflection was recorded.

The theoretical ultimate load was calculated using the effective width concept. This method was chosen because it gives a more true life picture of the actual behaviour of a compressed plate and plate type sections. For the case of steel plate sections the reduction in cross sectional area was taken into consideration.

Experimental deflection will be used as a reference in order to iterate the modulus of elasticity, **(E)** in the calculation and computer analysis (ANSYS).

Using the same value of axial load, **(P)** than compare the deflection between experimental and computer analysis. If the deflection is not equal than change the modulus of elasticity, **(E)** until get the same deflection.

CHAPTER 1

1.0 INTRODUCTION

1.1 General

Typical application of structural steel is in industrial building, bridge, high-rise building, and spectator stands, stadium, galvanised electricity power-supply pylons, welded pine lines and others. Steel is normally use in heavy and medium construction because it main properties which it strong under both condition either compression and tension comparatively to materials such as timber and concrete. This metal also can take an excessive loading due to wind, earthquake, vibration, impact and snow.

The selection of specific application is determined by the following factor:

i. Strength level required.
ii. Mechanical properties required together with strength.
iii. Steel making heat treatment and other plant available.
iv. Arbitrary local conditions and code of practice.