## ABSTRACT

In the course of building system is necessary infrastructure for pipelines, power cables, telephone cables and other network. In order to meet the aesthetic needs of architects is expected as closely as possible the network is located inside the walls. This of course requires a hole in the wall and holes that penetrate the steel construction located in the wall. Making a hole in steel construction would result in the weakening of the steel rod.

Australian Code AS\_NZ 4600 legislation there is a provision to calculate the capacity of cold form steel element under compression which on both sides as well as the alignment of spherical cavities is limited by the terms of dh / b  $\leq$  50% and b / t  $\leq$  70 can be calculated by using the formula method of EWM (effective width method ) with modifications factor to the effective width dimensions - be. Additional provisions meaning of hole is when the hole is calculated as dh dimension  $\geq$  15 mm. The regulations covering to accommodate some of the needs of such systems and the placement of a pipeline connection or cable line.

This thesis discusses about: *Effect of Simple reinforcement on hole of C section of Cold form steel under Axial Compression.* Hypothesis is that simple retrofitting on CFS steel C section with holes can add or restore the capacity of strength. Numerical and experimental studies carried out for this research. For numerical studies using Abaqus software.

Many kind of elements are available in Abaqus, element between the type of S4 (4 nodal) is versatile to analyze the effect of buckling in thin plate. Working with a full system integrated (integral full) in analyzing the strain and stress on the element, but it requires a large processor and takes quite a long time. Other elements S4R5 that only 1 of the integration process for each element takes the process much faster. ABAQUS simulation of the profile C the number of elements of size 5 mm x 5mm 705 and number of nodal points 761 obtain the same results buckling capacity but the difference between 53% during time to process. Furthermore S4R5 element used in this study. From the experimental results and numerical analysis shows that the reduction in capacity of C profiles with hole can be solved by adding simple clamp reinforcement around flange near the hole with the terms described in this thesis details.

## Keywords :

Light steel, cold form steel, bending, axial compression, Stress - strain, the effective width, elastic yield stress (fy), ultimate stress (fu), elasticity (E), Poison ratio (v), finite element analysis (FEM), holes, simple hole reinforcement, specimen.