Abstract

The usage of non-prismatic elements on the gable frame structure turns out to be an option that is widely used to obtain an optimization. The design of prismatic elements and non-prismatic elements practically is using the Effective Length Method or ELM based on AISC (2010) although this method is actually limited to the prismatic elements. Research by Riahi et al (2012) shows that the slope deflection method can be used to calculate the effective length factor. The result indicates that the effective length factor for non-prismatic elements is smaller compared to ELM. This explains why the capacity of non-prismatic elements is larger than that of prismatic elements. The ELM is not appropriate because it is only for prismatic elements. The new method in AISC (2010), that is the Direct Analysis Method or DAM, can calculate a wide range of configurations, including non-prismatic elements using computer-based technologies. It does not need to use effective length factor to calculate the stability of structure. Therefore it is expected that the DAM can provide a better capacity when applied to gable frame structures with non-prismatic elements. Some research has shown that the DAM can give a pretty good capacity of non-prismatic elements for gable frame structure. It can be concluded that using the DAM for non-prismatic elements in gable frame structure can result a cost-saving structure.

Keywords: non-prismatic, effective length method, direct analysis method, gable frame