論　文　内　容　の　要　旨

氏　　名	Tanim Ahmed	専 攻 名	Architecture and Civil Engineering　工学専攻	学籍番号	09TA329K
論文題目	Influence of a hole on the dynamic behavior of a thin-walled steel portal frame.				

This thesis is an investigation of the dynamic behavior of portal frames having a hole at the beam to column connection. Many fatigue cracks have been found in the beam-column connection of steel portal frames over the last few decades. As a measure to remove the cracks and characteristic internal flaws, now a day in some cases a hole is provided at the beam to column connection. The primary objective of this study is to find out this coring/hole method's usability, limitations and the effects on the structural behavior. The results of the study on a thin walled steel portal frame, which is used in Japan as a basic structural frame for motorway viaducts, are presented here.

In this research, dynamic analysis using real earthquake data from different earthquakes have been carried out. Non-linear, large displacement analysis has been made using the FEM program MSC. Marc. The hole radius has been varied and used as a parameter of study. Observation has been made on the horizontal displacement behavior of the structure; the local displacement of the steel plates at different locations and the stress pattern near the beam to column connection. The results of this research indicate that the behavior of the structure is influenced by the presence of the hole. The effect of the hole is mainly found in the horizontal displacement behavior of the structure and in the local out of plane displacement of the plates near the hole. The stress pattern of the plates surrounding the hole is also affected. The out of plane displacement behavior of the plates near the bottom end of the column is not found to be affected by the change of the hole radius. The main conclusion of the thesis is that the coring method can be used as an effective remedy in removing the stress concentrated zones and can act as a retrofitting method as long as the radius of the hole is kept under a certain limit. The optimum hole radius for the frame studied in this research has been found to be 100 mm.

（１０００字程度）