



The seismic performance of frames with TKBF knee brace

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Abstract: Knee brace consists of a bending frame and a knee member which is connected to the beams and columns in the form of diagonal. The lateral intensity of the frame depends on the plasticity of joints and knee member. In this paper the effect of knee brace geometrical parameters in the lateral intensity of the structure were studied by ABAQUS software. As a result of roofs' lateral displacement were observed that lateral displacements of all studying models are studied in the regulations. The amount of lateral displacement of systems by TKBF cross and knee bracing has been in the amount of lateral displacements of EBF2, CBF1 ($2.6M_p/V_p$) models. In models by TKBF cross and knee bracing with increasing the ratio of b/B and h/H ; the lateral displacement of system increases.

Keywords: Finite element; knee brace, bending frame, intensity, plasticity, geometric parameters.

1. Introduction

To verify them we consider a frame like Figure 1. This is frames of the TKBF cross and knee braces. The frame which knee member is at the upper end of the diagonal member. In the KBF system; beam to column, beam to knee, and knee to column connections are bending type and brace-column's leg and knee member are assumed as articular connection (Figure 1).

A paper was focused on the laboratory examination of four cold-rolled steel frames by knee brace with dimensions $2.4m \times 2.4m$ and variable profiles under periodic load, then the behavior of two knee braces on light steel buildings were studied by SAP 2000 software, and also numerical studies using ANSYS software on 12 samples of CFS frames with braces to evaluate and optimize the lateral performance of cold-rolled steel by different forms of knee braces were examined, Tahmooresi. et al. These studies have considered the maximum load capacity and deformation behavior of samples, and presented logic evaluation of earthquake response adjustment factor, R , from the walls by knee brace. The results showed that the use of the bracket (holder) on four corners of the wall panels with a knee brace, optimizes the lateral performance of the panel containing shear strength and panel plasticity. The braces were considered to improve the steel shear walls plasticity against relative movement and without any brittle fracture, like predicted breaking or buckling, Hasan Tahmoorsi and Iman Ghorbani, 2013.

In a study; the examination of bending frames system with knee connection was studied, using knee brace in the beam-column connection referred to increase strength and plasticity in bending frames. The system can be used to design both new structures and to improve the seismic behavior of existing bending frames. In this system, using the necessary proportion between knee member with members of beams and