Abstract: The Civil Engineering industry is moving towards achieving net-zero carbon emissions. In terms of structural design, wood has proven to be among the top choices when it comes to life-cycle assessment and raw material processing. This has led researchers and designers to investigate various types of connections that will successfully resist gravity and lateral loads. To properly perform under said forces, the actual connections of various structural elements are a critical component. This project investigates a glulam beam-column connection made of mass timber with intermediary elements in between made of steel. To dissipate energy induced by seismic forces, a Holz-Stahl-Komposit (HSK) system is embedded and glued into glulam beams and connected through steel plates to the panel zone of columns. A numerical nonlinear model is created to obtain the rotational stiffness and ductility of the connection. Using the rotational stiffness, the nonlinear connection properties are assigned as links on a model of a 6-story structure. Following the FEMA P-695 guidelines, the seismic response modification (R), overstrengt (Ω), and displacement amplification (cd) factors are obtained for this archetype structure.

Keywords: Mass Timber, Energy Dissipation, HSK Fuse