

# Construction & Steel Structure

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## Seismic evaluation of the diagrid structure based on the low-to-moderate seismicity region earthquake data

**Yong jae Lee**

Korea University, Korea

As the number of the high-rise buildings increase, it shows new trends such as freeform shape (twisted, tapered, tilted). As a structural solution for the new trend buildings, the diagrid structural system was developed that are used in high-rise buildings. Diagrid structural system consist of brace and beam member without vertical columns. So, diagrid structural system is more safety from progressive collapse. When the structure member has damaged, brace-beam structure is more easy to load-transfer than column-beam structure. But it is required to be reviewed for stability of lateral loads, such as wind loads and seismic loads, because it is difficult to investigate the load transfer mechanism of the diagrid nodes due to their combination of various structural members. Because of these problems, FEMA (Federal Emergency Management Agency), proposed to carry out seismic performance evaluation through the IDA (Incremental Dynamic Analysis) for structures such as the diagrid structure. The FEMA P695 method has suggested a 22 earthquake data for performing an IDA. These data are corresponding to the earthquake ground motions in high seismicity regions. However, in the case of low-to moderate seismicity region such as Korea, the effective ground acceleration(s) is under 0.2 g. According to the effective ground acceleration, the Korea region is represented in a low-to-moderate seismicity region. Therefore, the seismic performance evaluation from FEMA method were over-designed. In this paper, the seismic performance of the diagrid structures was evaluated by IDA. IDA was used for 12 earthquake data in a low-to-moderate seismicity region.

### Biography

Yong jae Lee is a candidate for PhD in Korea University. He did research in the diagrid node experiments and analysis from 2010 to 2012. He has studied the seismic performance evaluation of the diagrid structure. His research topic is modified IDA method used by various earthquake data.

[sagam2000@hanmail.net](mailto:sagam2000@hanmail.net)

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