J Civil Environ Eng 2016, 6:3 (Suppl)
http://dx.doi.org/10.4172/2165-784X.C1.006

Plastic behavior of steel frames using different concentric bracing configurations

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Extensive experimental studies over the last forty years of conventional buckling brace components and several braced frame specimens have been briefly reviewed, highlighting that the number of studies on the full-scale concentric braced frames is still limited. So for this reason the study surrounds the words plastic behavior, steel structure, brace frame system. In this study, there are two different analytical approaches which have been used to predict the behavior and strength of an un-braced frame. The first is referred as incremental elasto-plastic analysis a plastic approach. This method gives a complete load-deflection history of the structure until collapse. It is based on the plastic hinge concept for fully plastic cross sections in a structure under increasing proportional loading. In this the incremental elasto-plastic analysis- hinge by hinge method is used in this study because of its simplicity to know the complete load- deformation history of two storey un-braced scaled model. After that the experiments were conducted on two storey scaled building model with and without bracing system to know the true or experimental load deformation curve of scaled model. The study named as Plastic Behavior of Steel Frames using Different Concentric Bracing Configurations deals with all this. This study aimed at improving the already practiced traditional systems and to check the behavior and its usefulness with respect to X-braced system as reference model i.e. is how plastically it is different from X-braced. Laboratory tests involved determination of plastic behavior of these models (with and without brace) in terms of load-deformation curve. Thus, the aim of this study is to improve the lateral displacement resistance capacity by using new configuration of brace member in concentric manner which is different from conventional concentric brace. Once the experimental and manual results (using plastic approach) compared, simultaneously the results from both approach were also compared with nonlinear static analysis (pushover analysis) approach using ETABS i.e., how both the previous results closely depicts the behavior in pushover curve and upto what limit. Tests results show that all the three approaches behave somewhat in similar manner upto yield point and also the applicability of elasto-plastic analysis (hinge by hinge method) to know the plastic behavior. Finally the outcome from three approaches show that the newer one configuration which is chosen for study behaves in-between the plane frame (without brace or reference frame) and the conventional X-brace frame.

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Managing landslides risks by human error assessment reduction technique

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In Malaysia, the number of slope failures and landslides have increased tremendously as a result of rapid economic development, especially on hilly terrain, during the last 20 years. Extensive studies on many cases of slope failure reveal that not only rainfall is responsible for these disastrous events. Failures in Malaysia are mostly credited to human factors such as inattention, ineptitude, lack of adequate maintenance, and ignorance of the geological context. This study employs the tailored Human Error Assessment and Reduction Technique (HEART) to quantify the causal factors of Malaysian landslides. HEART is widely used to assess human errors because it is easy to follow and not specific to any particular discipline. In this study, HEART is applied to determine those tasks/subtasks of design, construction, and maintenance that are highly susceptible to human errors. Due to the scarcity of data, expert opinion was used for deriving the probabilities of human error. To contribute to improved slope engineering practices, the authors propose a framework for controlling human error in the context of slope stability and slope failure.

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