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SENSITIVITY INDEX

CHANCHAI INGMANISORN : OPTIMUM DESIGN OF PLANE
STEEL RIGID FRAMES BY THE VIRTUAL WORK METHOD.
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By the Virtual Work Method, the development of an optimum design for plane steel rigid frames subject to displacement, stress, buckling and slenderness ratio constraints is presented in this research. The member sensitivity index(SI) which is the index showing the importance of the member contributed to the total displacement can be evaluated. The material should be added to members with high SI and removed from members with low SI. Theoretically, the optimum design is obtained when all members have the same SI. In practice, however, strength and slenderness ratio limitations given by codes must be satisfied. Therefore, after the convergence is obtained, the solution is then rechecked according to specifications from The Allowable Stress Design by American Institute of Steel Construction(AISC/ASD 1989) . The members will be adjusted if necessary.

It has been found from this research that the Virtual Work Method is an effective method in the optimum design of plane steel frames. This method makes solution suitable, safe and the maximum displacement does not exceed the design code requirements.

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