STEEL COLUMNS UNDER FIRE LOADING

Response of Fire Loading on Multi-story Continuous Steel Columns

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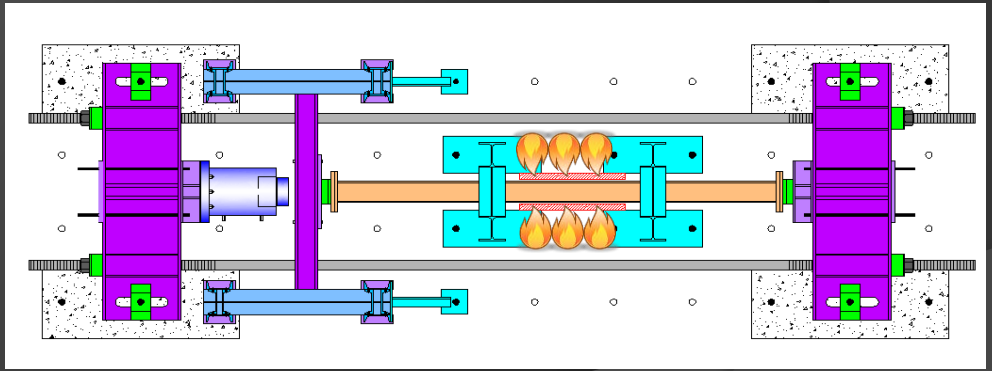

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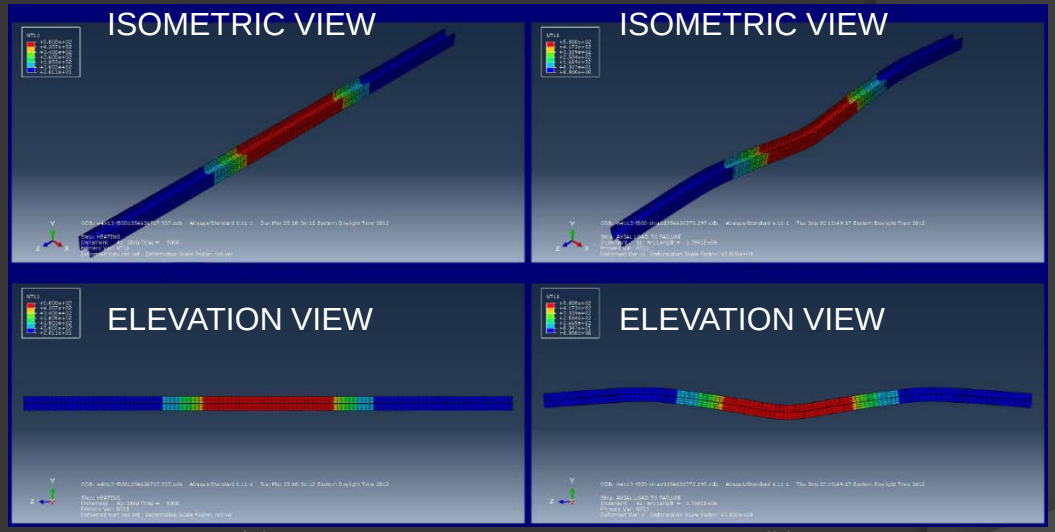
Research Objectives

- Study the behavior of continuous steel column buckling under compartmental fire loading.
- Characterize the stabilizing moment by surround ambient columns.
- Use experimental data to improve on current structural models.



(a) (b)

Abaqus model of a three story wide flange column buckling under combination axial and fire loading. (a) Step 1: column is heated to a temperature of 500°C while maintaining 10 kip axial load. (b) Step 2: axial load to inelastic buckling failure.

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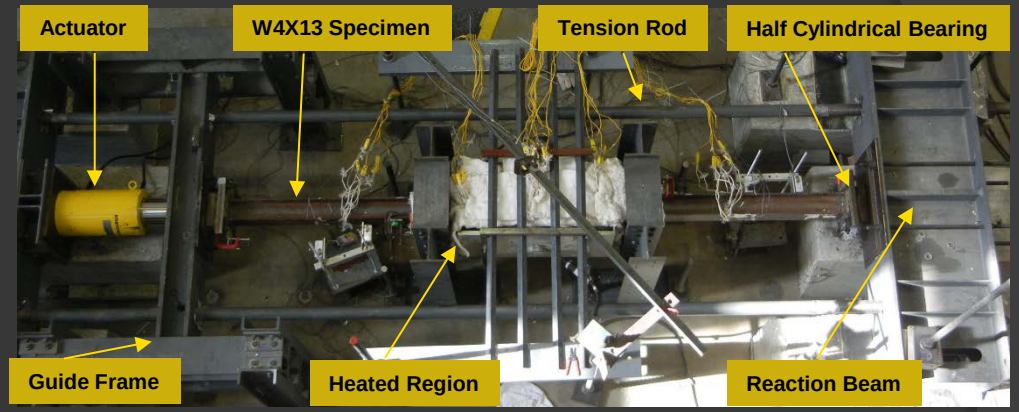
Testing Procedure

- Pre-load specimen to stabilize and restrain axial thermal expansion.
- Heat the specimen at a designated rate to a target temperature.
- Once the target temperature is held constant, the column is loaded quasi-statically until inelastic buckling occurs.



Top view of self-reacting test frame (above) and deformed column specimen(below).

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