Project Status Report: CEEn-2017CPST-009: HSS Triangular section evaluation

Team Members: Nathan Wainwright, Christopher Macias, Nicholas Smith

Date: 1-12-18

1) Summary of technical/non-technical challenges encountered

- We needed to find the yielding and tensile ultimate stresses that are used by ATP
- Difficulty in determining the ultimate bending strength and buckling of the materials
- Difficulty in determining maximum torsion of material to compare to the maximum capability of the lab equipment

2) Team approaches/resolutions to overcome challenges

- Contacted ATP to acquire actual stresses for the 1018 steel used
- Used Euler buckling equations from mechanics and materials textbook and confirmed our results with Dr. Jensen
- Meeting with Dave Anderson to confirm the maximum force that the lab equipment can produce
- Discussed torsion capabilities with Dr. Jensen to figure out the yielding point of the material.

3) Status of challenge resolutions & potential project impacts

- We have recently received the actual stresses used by ATP
- Our predicted buckling testing loads have been confirmed by Dr. Jensen
- We now know the maximum capacity of the laboratory equipment for the bending tests
- We are recalculating torsion based on the actual stresses provided by ATP

4) Project Status & Summary

- A 2x4 rectangular section has been added to the testing matrix
- Hand calculations are nearing completion
- FEA model construction is underway and is currently on schedule