

Mec E 460 Project Proposal

Project Title: Wildland Fire Fighting Sprinkler System

Objective

Sprinkler systems are commonly used in wildland firefighting for structural protection and fire line re-enforcement. The sprinklers used are generally the garden variety type which can be purchased at the local hardware store. Sprinklers are typically mounted on the ground, or they are elevated using a simple methods e.g. pole or roof mount. These systems are effective in many situations, but water dispersal is generally restricted by water pressure, mounting apparatus used and sprinkler design. This study is geared towards sprinkler design improvements to allow for increased vertical spray which is thought to allow for more overall deployment flexibility and options.

Scope of Work

- Define design specifications through conversation with customer.
- Prepare three design concepts by creative brainstorming.
- Select design concept through consultation with customer.
- Prepare detailed design calculations and analysis.
- Prepare assembly and parts drawings suitable for manufacture.
- Review detailed design drawings for manufacturability.

Preliminary Design Specifications

- Sprinkler to deliver 15 l/minute per head
- Inlet water pressure minimum 300 kPa, maximum 2MPa
- Vertical throw minimum 7m
- Horizontal throw 6m
- Standard NPT connections to water supplyability.

Deliverables

- Dimensioned and toleranced assembly and parts manufacturing drawings.
- Engineering report
- Test results if prototype testing undertaken

Prototype Resources

Students are encouraged to perform experimental work to confirm ideas. Funds for prototype or experimental work not to exceed \$500

Project Sponsor

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Available Meeting Time

The client is available by phone or email and would be willing to meet the students on the University campus twice during the project.

Maximum Number of Groups

Maximum 2 groups

Intellectual Property Ownership

Design IP will remain the property of the student group

Images

A recent prototype dual head is shown in Figure 1. Orientation of the sprinkler heads directs water into the forest canopy.



Figure 1 Prototype Dual Head Sprinkler Using Home Sprinkler Heads