Extending the Season for the New White Salmon Pool

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The city of White Salmon will be home to a new outdoor, public pool in the coming years in hope that the community’s identity and participation can continue to grow. While the design is nearly complete, a new challenge has been set to investigate ways in which this new aquatic facility can host an extended season via a temporary enclosing structure. During the past few months, the White Salmon team has been investigating various options for enclosing systems and researching how, if at all, an extended season is possible using Sefaira simulation software and energy performance data.

### Case Studies and Material Research

- **Permanent Skeleton w/ Removable Panels**
- **Tensile/Take-Down Structures**

### Timeline

### MODEL STANDARDS

#### Base model
- Metal Stud Wall: R-Value = 18
- Metal Joists Roof: R-Value = 12
- Glazing: 30%
- Months of Use: January-December

#### Model 1
- Steel Tube Frame w/ Plastic Panels: R-Value = 6
- Metal Joists Roof: R-Value = 6

#### Model 2
- Steel Tensile Structure w/ Canvas Cover: R-Value = 6
- Metal Joists Roof: R-Value = 6

### SEFAIRA AND DATA ANALYSIS

#### Energy Costs ($)
- **Base Model**: $21,200
- **Model 1**: $4,400
- **Model 2**: $5,180

#### Energy Consumption (kBTU)
- **Base Model**: 317,950
- **Model 1**: 70,800
- **Model 2**: 115,600

#### Heat Loss (kBTU)
- **Base Model**: 617,242
- **Model 1**: 878,611
- **Model 2**: 927,291

### Process and Summary

To begin the project, we researched White Salmon's climate and demographics. To extend the pool season, we first needed to find when the temperature and heating loads will be most extreme. We also factored in what user groups would potentially use the pool during the extended season. Both of these points caused us to conclude that extending the season, currently June-August, to April-September would be most feasible. Next, we researched materials and current projects that implemented temporary structures. We found that three common systems exist: permanent skeleton with removable panels, inflatable structures, and tensile structures with a canvas cover. From here we began to run simulations in Sefaira and Sketch Up to determine what the cost and energy implications of each system were.

While primarily focusing on the tensile structure and permanent skeleton systems, we found that a temporary structure can very much be a feasible alternate to a permanent facility. Having a temporary structure up, with conditioned air and less insulation capability, for three months was still cheaper than having a highly efficient building up and running all year around. We then began to compare the other elements pertaining to each temporary system to see what makes the most sense for the White Salmon Community. We found through continued research that each option has advantages and disadvantages and to make a decision on which one to use, the White Salmon community will have to prioritize their project goals and intentions.

### Option Comparison

<table>
<thead>
<tr>
<th>Initial Costs</th>
<th>Long-Term Costs</th>
<th>Natural Lighting</th>
<th>Design Opportunity</th>
<th>PV Integration</th>
<th>Storage</th>
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### Next Steps

- Survey the Community for Interest
- Research Pricing Options
- Research HVAC Systems
- Research Take-Down Assembly Methods
- Investigate Funding Options