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Extending the Season for the New White Salmon Pool

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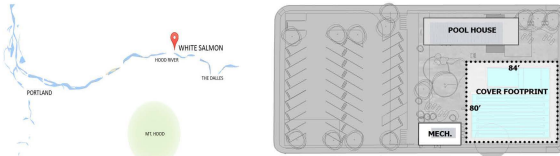
EXTENDING THE SEASON

FOR THE NEW WHITE SALMON POOL

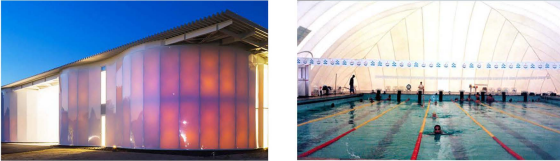
ARCH 560: ADVANCED ARCHITECTURAL TECHNOLOGY
CHRIS JONES & MAT STOCKSTILL
YOST GRUBE HALL ARCHITECTURE
YOST GRUBE HALL
ARCHITECTURE

RESEARCH PROPOSAL

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.

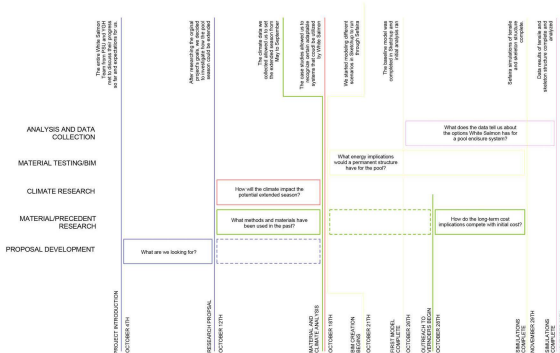


CASE STUDIES AND MATERIAL RESEARCH

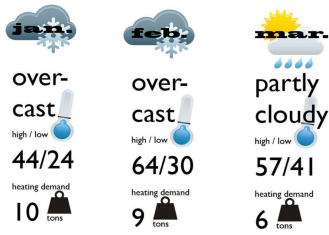


Permanent Skeleton w/ Removable Panels vs Tensile/Take-Down Structures

TIMELINE



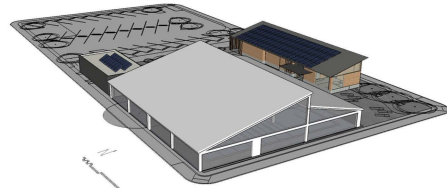
CLIMATE RESEARCH



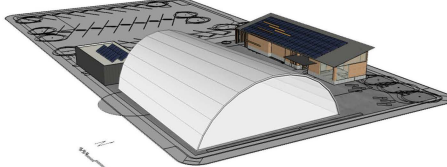
MODEL STANDARDS

Base model
Metal Stud Wall: R-Value = 18
Metal Joists Roof: R-Value = 12
Massing: Similar to Model 1
Glazing: 30%
Months of Use: January-December

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

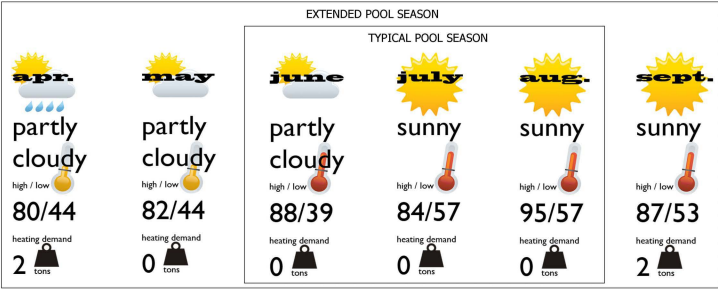


Model 2
Steel Tensile Structure w/
Canvas Cover: R-Value = 6
Metal Joists Roof: R-Value = 6

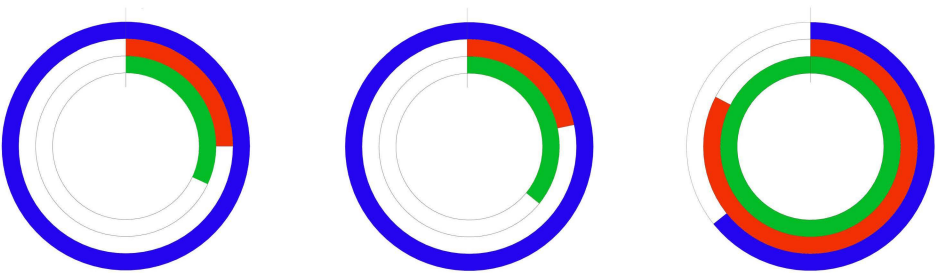


OPTION COMPARISON

	INITIAL COSTS	LONG-TERM COSTS	NATURAL LIGHTING	DESIGN OPPORTUNITY	PV INTEGRATION	STORAGE
	\$\$	\$\$\$				
	\$\$\$	\$\$				



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 begin 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.

NEXT STEPS

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