

Whitmore Laboratory Renovation

Title Page

Project Background
Depth Analysis 1
Breadth Analysis Mechanical
Breadth Analysis Structural
Depth Analysis 2
Depth Analysis 3
Research topic
Conclusion and Recommendations

Pennsylvania State University

Architectural Engineering

Senior Thesis Final Presentation

Mazin Alrashdi
Advisor: Dr. Asadi
Construction Management

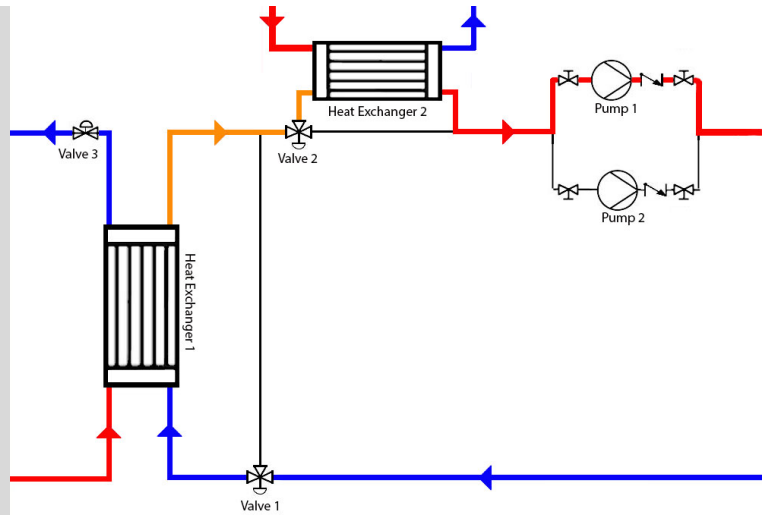
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Image Courtesy of: Stantec

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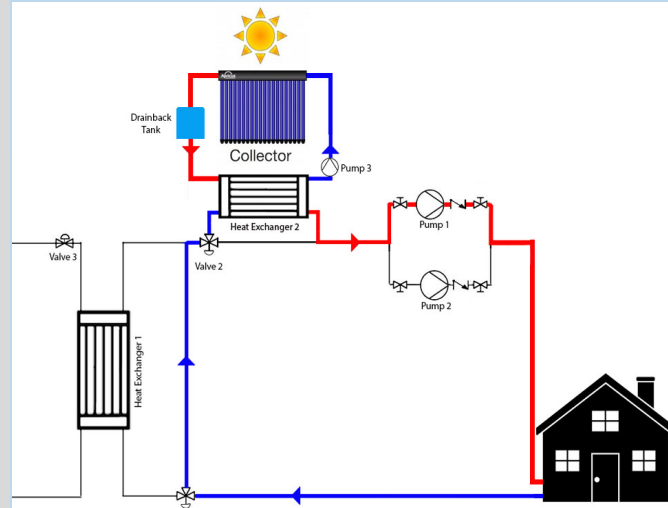


Solar – steam heating three cases

	Case 1	Case 2	Case 3
Valve 1	Diverting flow to HX 2	Diverting flow to HX 1	Diverting flow to HX 1
Valve 2	Diverting flow to HX 2	Diverting flow to DHW distribution	Diverting flow to HX 2
Valve 3	Shut off	Open	Partially Open
Pump 1	Operating	Operating	Operating
Pump 3	Operating	Switched off	Operating

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- Drain-back system
- Evacuated-tube solar collector
- Heat exchangers
- Steam loop
- Pumps

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Depth Analysis 1

Breadth Analysis Mechanical

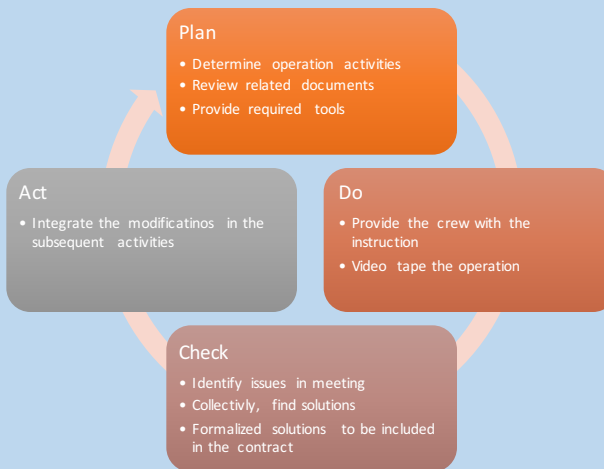
Breadth Analysis Structural

Depth Analysis 2

Depth Analysis 3

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Participants:

1. Barton Malow (Project Manager)
2. Barton Malow (Project Engineer)
3. J.C. Orr (Superintendent)
4. North Central Mechanical (Ductwork Foreman)
5. North Central Mechanical (Plumbing Foreman)
6. Westmoreland Electrical (Electrical Foreman)
7. Northeast Interior Systems (Lab Casework Foreman)