Project Plan

IPRO 328 – Solar thermal Technologies for Large Scale Buildings

Primary Project Objective

To provide heating to the pool facility and surrounding spaces of Keating Sport Facility through the use of solar thermal collectors placed in the immediate area.

Secondary Project Objectives

- To discover which form or solar collector has the highest potential payback if used.
- To discover if modification of the building envelop has a potential to reduce the energy load produced by Keating Sports Facility.
- To study the possibilities of using sustainable system to provide for the cooling of Keating sports facility.
- To study the impact of solar thermal Technologies can have on Chicago as a whole.

Project Background

Solar thermal technologies have been in use since ancient times around the world. The use of solar collectors has been going for decades and having its greatest period of discovery in the 1970s. Though solar thermal impact has been limited to times of energy crisis the potential for solar thermal collectors to greatly reduce a buildings dependence on fossil fuels is great. The recent push by Mayor Daily to make Chicago a green city gives great cause to study the potential used of solar thermal collectors.

Though there are several types of solar collectors in use to today, the focus of the IPRO will be on the two most largely used types, evacuated tubes and flat plate collectors. These devices can be retro fitted to a current building or can be mounted in a separate structure. Though each collector has its own potential to succeed in Chicago, the combinations of factors will certainly make one type more viable then the other.

Keating Sport Facilities design has made it a perfect example of the use of solar collectors. The buildings energy use for climate control is great and still the climate achieved is not optimal for use. The pool facility needing to be warmer then other parts of the building to be used is a big factor in the amount of energy use.

Research Methodology

The past IPRO 328 groups have been focused on discovering which of the two collectors has the greatest potential for use in Chicago. Using gathered data of the groups the choice of the type collector to be used should be achievable in the first week. With this determined the focus will be on implementation of the solar collectors around Keating facility. The study will consist of:

- The mechanical system needed to incorporate with the solar collectors for proper use.
- The proper placement and attachment of the solar collectors to the site.
- The development of system to reduce the loss of energy gained.
- The analysis of gathered data to show potential energy saving and financial plans to show benefits of implementation.

Each of these aspects will be focused on by separate team that will work in tandem to achieve the project objective. The research will be handled by individuals who will submit what they have found to there individual group and then to the group as a whole once found pertinent by their group. There also will be information sessions for the whole group with specialists who will be able to help with there experience and knowledge of a specific field pertaining to the project.

Expected Results

Three different teams have been created to focus on different aspects of the project. Two teams will be working on the initial research of the two main aspects of the project while the third team will be doing analysis and verifying the factual nature of the predictions made by the other two groups of the proposed design.

Keating Hall Modification Team

The selection and installation process for an insulating pool cover. The development and installation procedure of a mechanical system and secondary devices for the energy gathering system. The possible application of an integrated system that can be used for cooling in the pool incorporated in the heating system.

Enclosure Team

The integration and design a structure which a thermal solar collection system can be incorporated in to and place it properly on the site. Researching the possibilities for a new curtain wall system for Keating hall that would help reduce energy load.

Analysis Team

To discover which system for solar collection has the best possible energy capabilities. To review the proposed design of the enclosure and Keating hall groups to discover the actual energy savings of the design system. The use of the gathered data and discover possible integration of the designed system into applications for commercial spaces around Chicago. The determining of a cost analysis to see the viability for the project to be actually created.

Project Budget

No projected cost at this time

Field Trips = $?

Individual Team Assignments

Keating Hall Modification Team
Jaesua
Joe
Kristin

Analysis Team
Saram
Sean
Ragive

Enclosure Team
Justin
Chris
Harsut

ID	Task Name	Duration	Start	Finish	Predecessors	Resource Names	W
1	Learn Ret Screen Software	3 days	Fri 9/10/04	Tue 9/14/04		Analysis	
2	Review past semesters Work	7 days	Fri 9/10/04	Mon 9/20/04		Analysis,Enclousure,K	
3	Begin Learning information about K	14 days	Fri 9/10/04	Wed 9/29/04		Analysis,Keating Hall I	
4	Report on whats in place now at Ke	1 day	Thu 9/16/04	Thu 9/16/04		Analysis	
5	Research theory behind solar therm	14 days	Tue 9/21/04	Wed 10/6/04		Analysis	
6	Produce report on retscreen simula	7 days	Thu 9/30/04	Wed 10/6/04		Analysis	
7	Mini Presentation: RetScreen	1 day	Thu 10/7/04	Thu 10/7/04		Analysis	
8	Prepare midterm report	3 days	Mon 10/11/04	Wed 10/13/04		Analysis,Enclousure,K	
9	Update retscreen simulation	15 days	Mon 10/11/04	Fri 10/29/04		Analysis	
10	Update train-trace simulation	10 days	Thu 10/28/04	Wed 11/10/04		Analysis	
11	Update status/progress report	14 days	Tue 9/28/04	Wed 10/13/04		Analysis	
12	Produce report on knowledge gaine	12 days	Mon 10/25/04	Wed 11/10/04		Analysis	
13	Mini Presentation: Analysis Combination method	1 day	Thu 10/14/04	Thu 10/14/04		Analysis	
14	Work on Ipro exhibit and other deliv	5 days	Mon 11/1/04	Fri 11/5/04		Analysis,Enclousure,K	
15	Produce big picture Chicago study	10 days	Mon 11/8/04	Fri 11/19/04		Analysis	
16	Finish Final report	9 days	Mon 11/8/04	Thu 11/18/04		Analysis,Enclousure,K	
17	Produce report on Train Trace simu	7 days	Thu 10/14/04	Fri 10/22/04		Analysis	
18	Mini Presentation: Train Trace	1 day	Thu 10/21/04	Thu 10/21/04		Analysis	
19	Collect information from other grou	1 day	Tue 9/14/04	Tue 9/14/04		Analysis	
20	Collect information from other grou	1 day	Tue 9/28/04	Tue 9/28/04		Analysis	
21	Collect information from other grou	1 day	Tue 10/12/04	Tue 10/12/04		Analysis	
22	Collect information from other grou	1 day	Tue 10/26/04	Tue 10/26/04		Analysis	
23	Collect information from other grou	1 day	Tue 11/9/04	Tue 11/9/04		Analysis	
24	Collect information from other grou	1 day	Tue 11/23/04	Tue 11/23/04		Analysis	
25	Investigation of pool covers	7 days	Mon 9/13/04	Tue 9/21/04		Keating Hall Modificati	
26	Invsetigate storage capbilites and o	7 days	Mon 9/13/04	Tue 9/21/04		Keating Hall Modificati	
27	Final selection of pool cover metho	2 days	Wed 9/22/04	Thu 9/23/04		Keating Hall Modificati	
28	Mini Presentation: Pool Cover	1 day	Thu 9/23/04	Thu 9/23/04		Keating Hall Modificati	
29	Development of mechaical system a	19 days	Fri 9/24/04	Mon 10/18/04		Keating Hall Modificati	
30	Mini Presentaion: Mechanical Syste	1 day	Thu 10/21/04	Thu 10/21/04			
31	Locating mechanical system	14 days	Mon 10/4/04	Thu 10/21/04		Keating Hall Modificati	
32	Investigation of possible installation	14 days	Mon 10/11/04	Thu 10/28/04		Keating Hall Modificati	
33	Mini Presentation: Connection to cu	1 day	Thu 10/28/04	Thu 10/28/04			
34	Complete drawing of how mechanc	14 days	Tue 11/9/04	Fri 11/26/04		Keating Hall Modificati	
35	Update Mecahnical system	14 days	Thu 10/21/04	Tue 11/9/04		Keating Hall Modificati	
36	Investigation of cooling uses for pro	14 days	Mon 11/8/04	Thu 11/25/04		Keating Hall Modificati	
37	Development of 3d Site model	7 days	Fri 9/10/04	Mon 9/20/04		Enclousure	
38	Reasearch in Solar thermal applica	14 days	Fri 9/10/04	Wed 9/29/04		Enclousure	
39	Research of Structural Systems and	18 days	Thu 9/16/04	Thu 10/7/04		Enclousure	
40	Mini Presentation: Materials and St	1 day	Thu 10/7/04	Thu 10/7/04		Enclousure	
41	Development of structural design ar	21 days	Tue 10/5/04	Tue 11/2/04		Enclousure	
42	Research Method of Attachemnt for	21 days	Tue 10/12/04	Tue 11/9/04		Enclousure	

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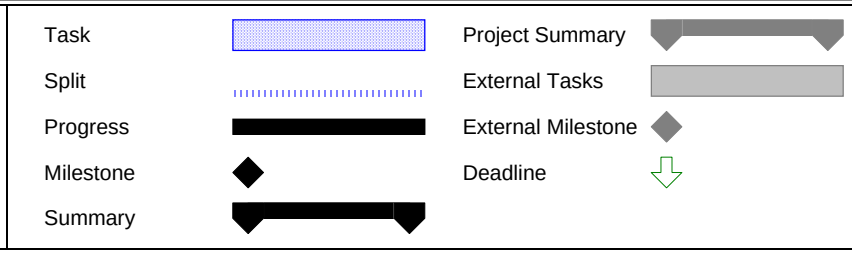

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43	Development of Enclosure envelop	18 days	Tue 10/26/04	Thu 11/18/04		Enclousure	
44	3D development of design proposal	14 days	Mon 11/1/04	Thu 11/18/04		Enclousure	
45	Mini Presentation:Design and Attac	1 day	Thu 11/18/04	Thu 11/18/04		Enclousure	
46	Incorporation into prposed mechani	4 days	Tue 11/9/04	Fri 11/12/04		Enclousure,Keating Ha	
47	Mini Presentation: Conncection to M	1 day	Thu 11/18/04	Thu 11/18/04		Enclousure	
48	Guest Speaker	1 day	Thu 9/23/04	Thu 9/23/04		Faculty	
49	Guest Speaker	1 day	Thu 10/7/04	Thu 10/7/04		Faculty	
50	Guest Speaker	1 day	Thu 10/21/04	Thu 10/21/04		Faculty	
51	Guest Speaker	1 day	Thu 11/4/04	Thu 11/4/04		Faculty	
52	Field trip	1 day	Thu 10/14/04	Thu 10/14/04			
53	Field trip	1 day	Thu 9/30/04	Thu 9/30/04			

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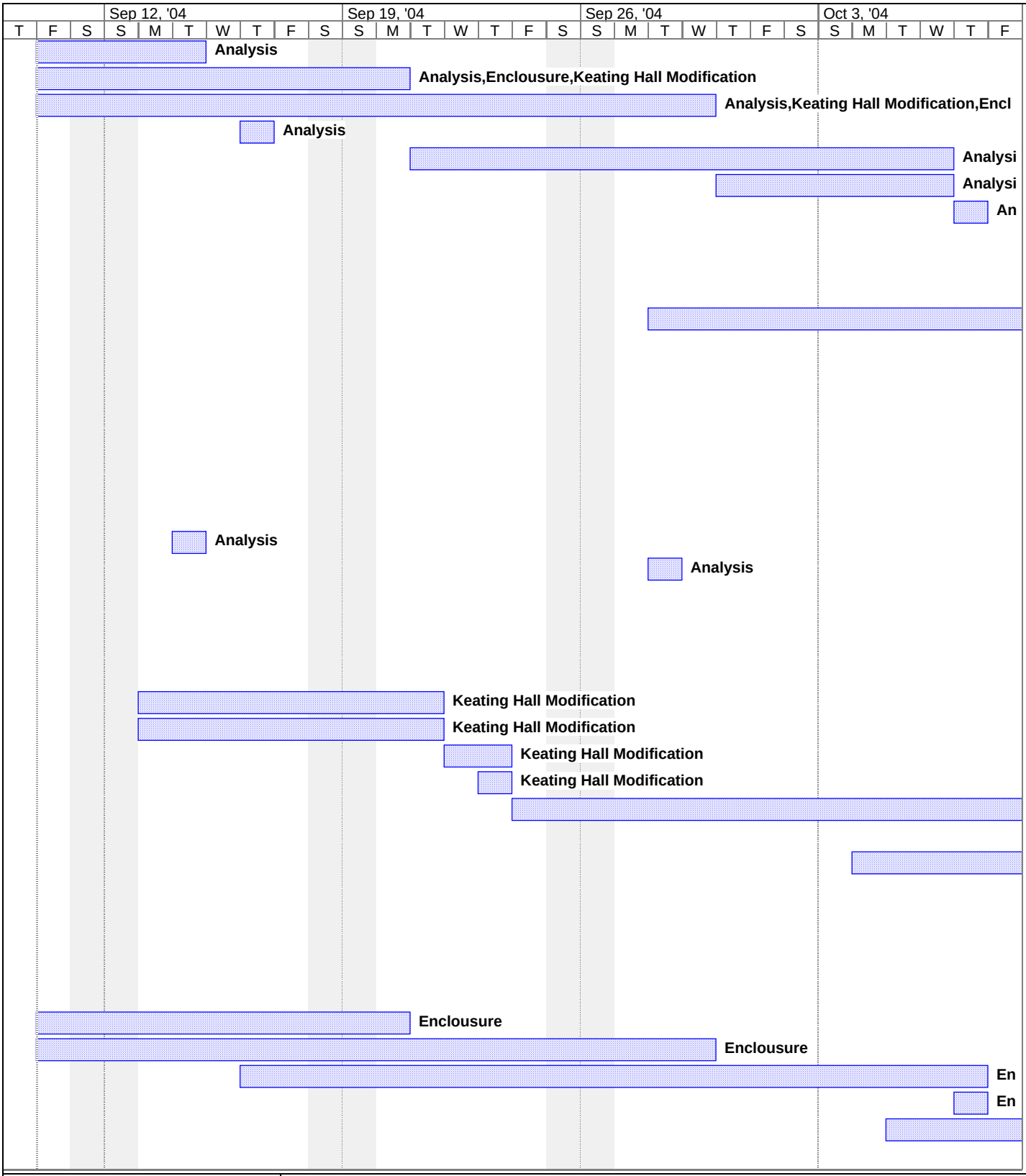
Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline



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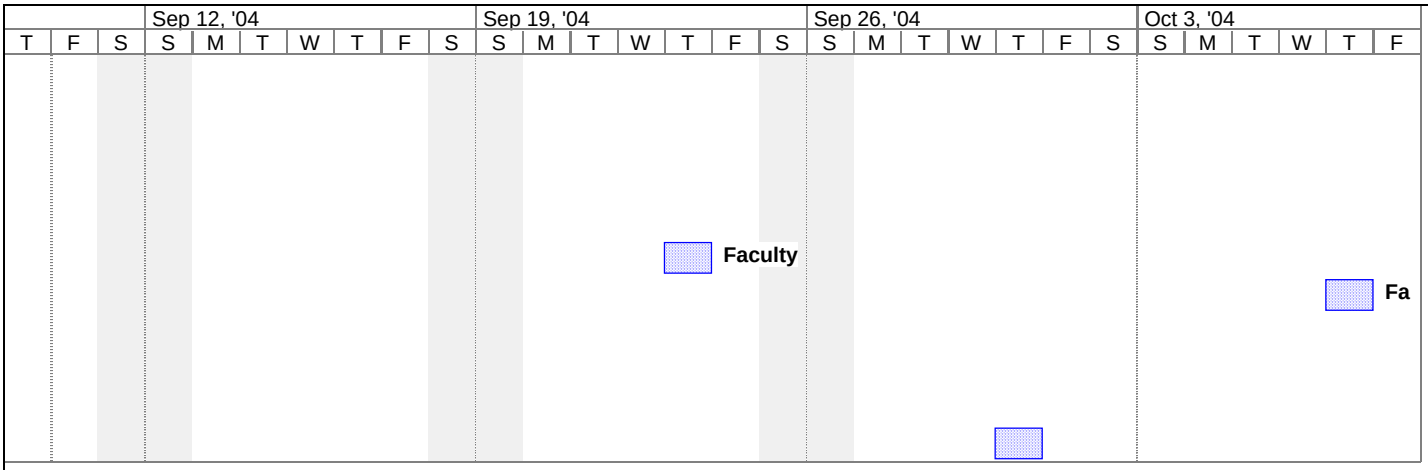

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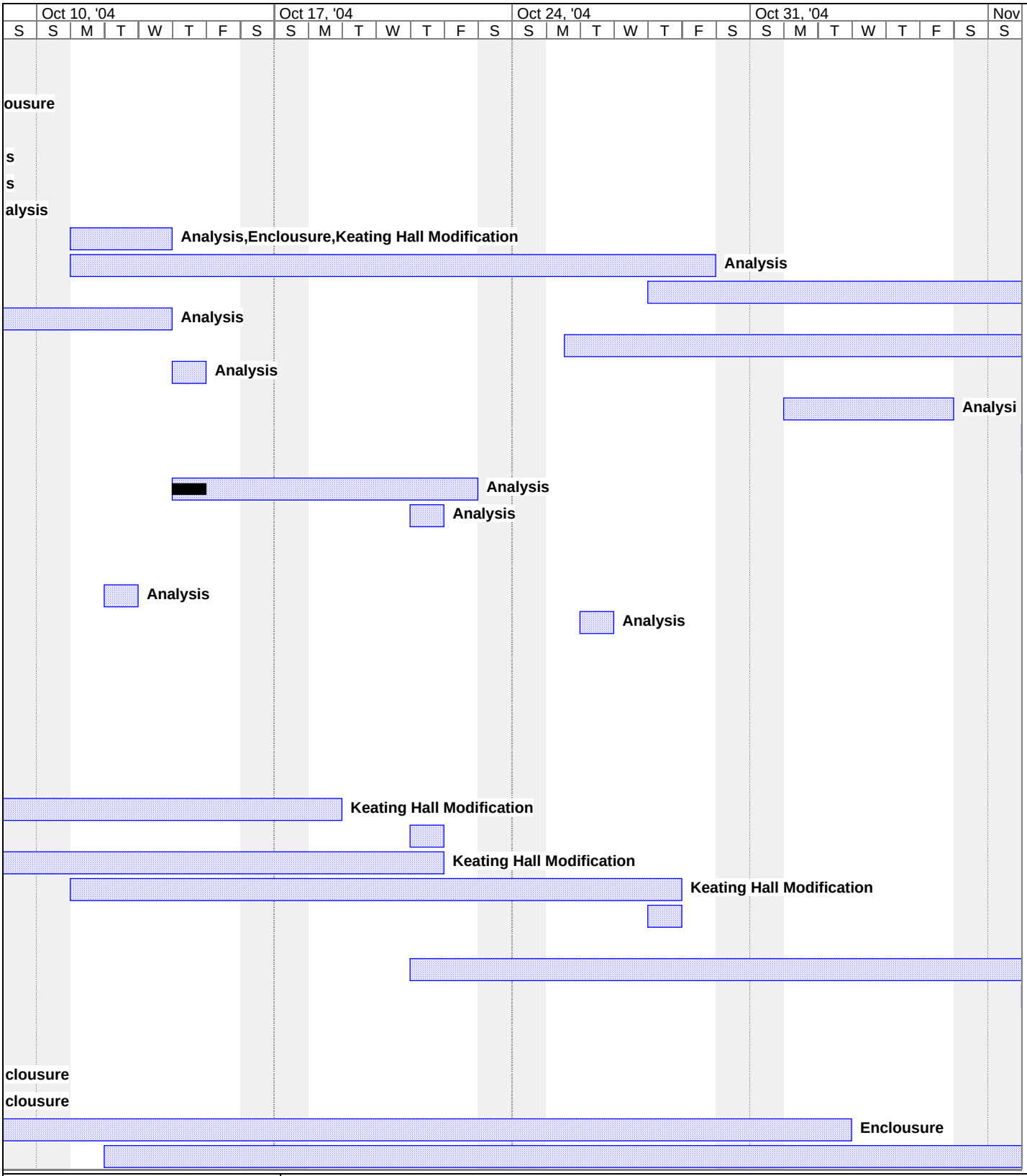

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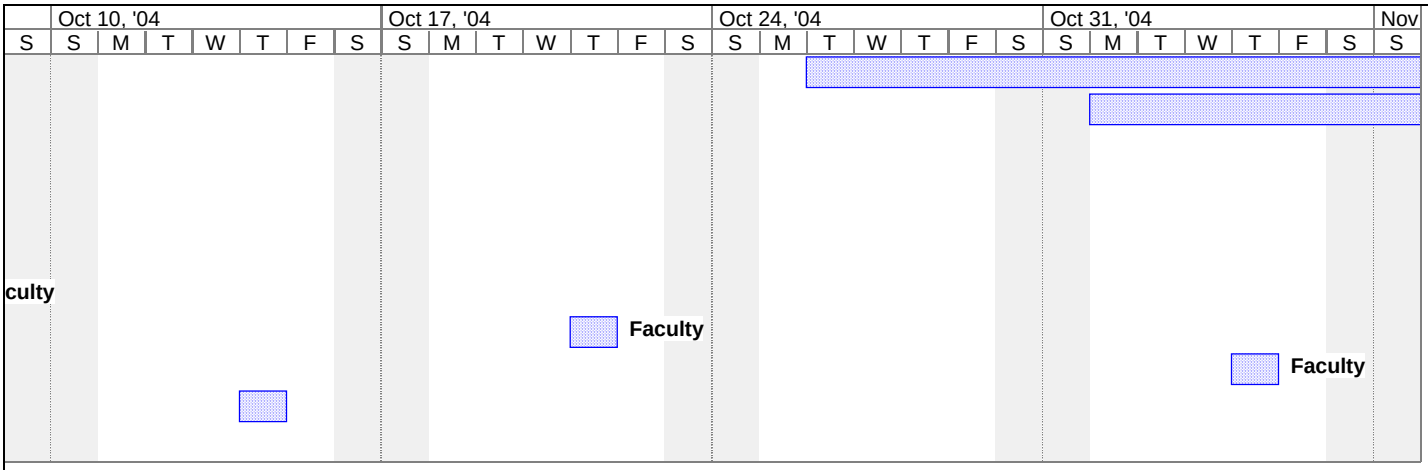

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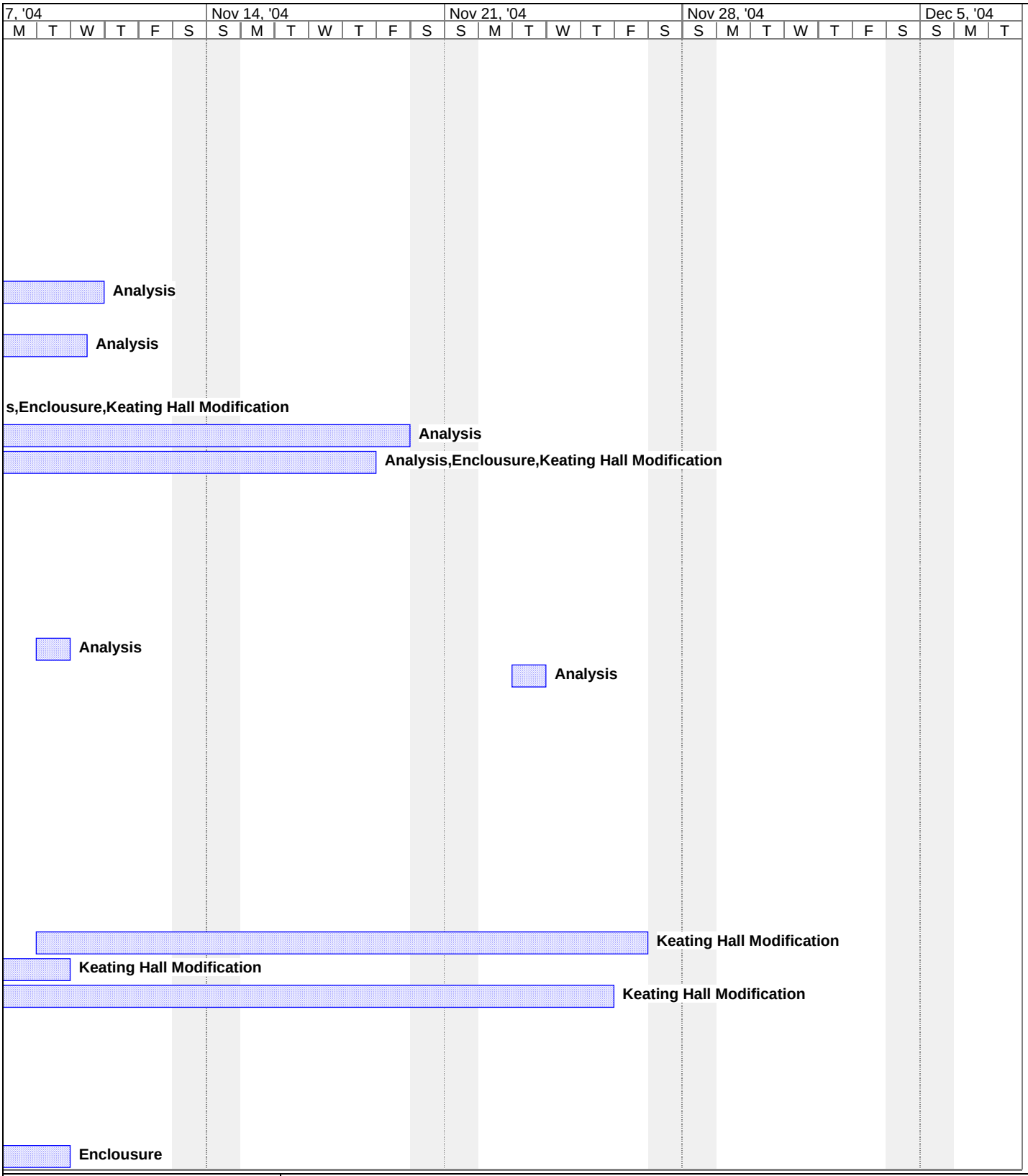

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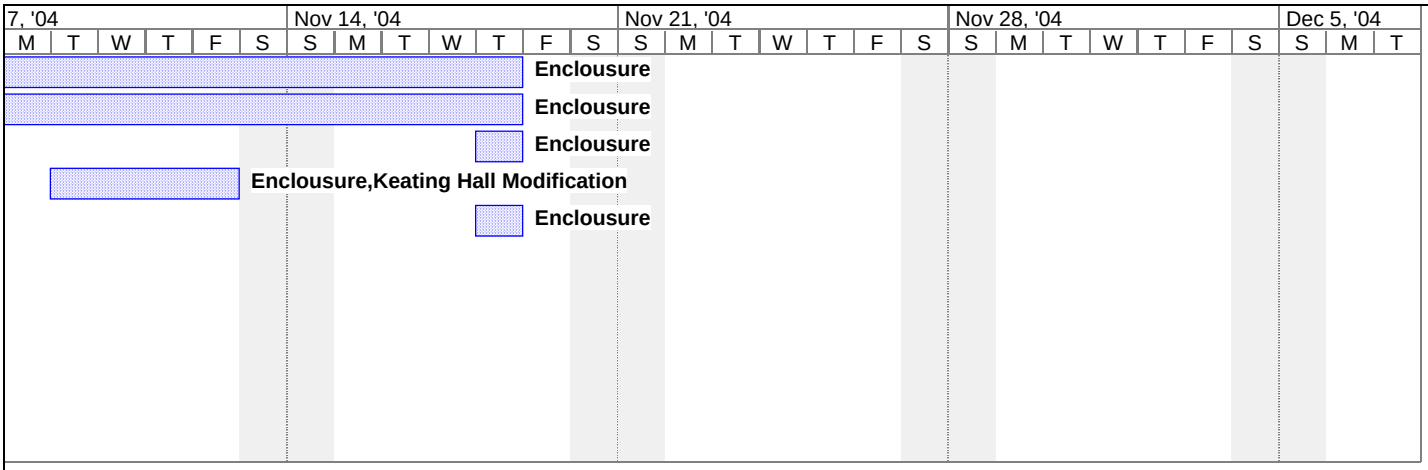

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