IPRO 314 Project Plan

Fall 2008

Greening and Reuse of Queen of Peace High School Facilities

Advisors: Jim Braband & Nancy Governale-Hamill

1. Abstract

The problem posed at Queen of Peace High School is one of sustainability. The IPRO 314 team will focus on the reuse and greening of existing school facilities and grounds. Three major spaces currently hold latent potential at the school: the abandoned convent/dormitory, library and inner courtyards, used correctly they can become a catalyst for positive change. It is proposed that the dormitory be torn down, in its place a "community center" would be constructed. The space will service extracurricular activities at the school, public outreach programs (i.e. youth groups, cub/girl scouts, etc.), club rooms and a new space for library books storage and usage. The second space being addressed is the library, given its current isolated position the space would be transformed into a communication and media center equipped with the technology necessary for worldwide communication. The third space addressed is the inner courtyards of the building. With six dispersed throughout the school grounds, they can become an active part of the recreational aspect of the school's environment: places of social interaction, outdoor classrooms, etc. Additionally, the greening techniques proposed for the school's facilities will include methods for efficiency improvement, education and school promotion.

2. Background

A. Queen of Peace, a private, all-girl high school in the southern suburb of Burbank, has experienced a decline in enrollment in the past 3-5 years. Once at 1500 students, Peace is now comprised of only 650. Reasons for this decline include a competing school turning co-educational as well as many schools overlapping into Peace's drawing radius. Peace is excited about the prospect of working with an IPRO team to explore creative solutions in a variety of areas that can benefit the students at Queen of Peace in the years ahead. The overall goal of the project is to both increase revenue (enrollment and funding) and decrease costs at Peace within a five year window. Initial possible solutions include greening of school campus, facility space re-use, alternative funding, and social networking.

B. The IPRO 314 project is being supported with a generous donation by IIT Trustee, Ellen Jordan Reidy, an alumnus of IIT's Institute of Psychology and Stuart School of Business as well as Queen of Peace High School. Several Queen of Peace alums on the IIT campus also have an interest in this IPRO project, including Jackie Sokolowski and Lauren Joyce.

C. During an initial meeting with the principal of Queen of Peace, it was discovered that one of the identified structures for space reuse (convent/dormitory building) needs a minimum of 1.5 million dollars in renovations prior to use; as a result the decision was made to focus on a tear down of the building and the reuse of the occupied land for new construction. Additionally, the principal explained the existing plans for creating a social network for the school's alumni. A computer application has already been purchased and a team has been formed to develop the application. In order to avoid duplicating efforts, the IPRO team will only focus on the greening, reuse and alternative funding solutions and leave the social networking aspect to the Peace team. A last outcome of the meeting was a request from the school's principal to research the integration of an international communication center into the school's current environment.

3. Methodology

A. To analyze the problem stated in the background section, research will have to be conducted in the several solution areas identified: reuse, greening and funding (further detail of the solutions areas are discussed in the objectives section of this document). When considering the reuse of building facilities, the needs of the school population and surrounding community will be considered. Research into these areas could dictate the form and function of the space. Research on green and passive technologies could also greatly benefit the image of the school as well as the overall structure of the school facilities. To organize the research effort, two sub-teams have been created: one to focus specifically on solutions dealing with space reuse and the other greening techniques.

B. After research is complete, analysis of the collected data will be performed to tabulate the pros and cons of each possible solution. Each sub-team will be responsible for completing analysis for their individual team's proposed solutions. Analysis will include:

   I. A cost versus benefit analysis of each solution for the purpose of identifying the most cost-effective solutions for the school. The cost and benefit analysis will compare each solution's initial and residual costs to the solution's projected increase in revenue and reduction in institutional spend over the next five years.

   II. Identifying the projected non-fiscal benefit realization of each solution within a five year window (increase in school rapport with the community, decrease in carbon - footprint, etc.).

   III. The impact each solution will have on the student and faculty population as well as the surrounding community.

   IV. Testing the appeal of each solution by conducting surveys with the community, faculty and students.

C. After researching, analyzing, testing, and surveying, the sub-teams will meet to present their findings to the entire IPRO 314 group. The group as a whole will then be responsible for coming to a consensus on identifying specific solutions for implementation and execution within the school's environment. The executable solutions will be selected based on their projected return on investment over the five year window, improvement of institutional image, and appeal to the client.

D. A final proposal will be drafted by the group as a whole to present to the client. The proposal will include a description of the group's method for brainstorming, identifying, researching, analyzing, comparing and contrasting, and finally selecting the best solutions to address the client's problem statement. Further, the proposal will include a detailed plan to implement and execute the selected solutions in addition to a control plan to maintain the solutions ensuring maximum effectiveness over time. The presentation of the proposal to the client will be an open-feedback session and with enough advance time prior to IPRO day to allow for modifications to the proposal if necessary and a final proposal will be delivered back to the client upon completion of the class.

E. In preparation for IPRO day, the team will use the final proposal document to create abstracts, brochures, posters, and any other tools used during the presentation to the client (illustration boards, models, etc.) to be used during the presentation to the IPRO community. The presentation should be a thorough and cohesive explanation of the team's process, findings, client satisfaction, and lessons learned.

4. Objectives

A. Reuse Sub-team

I. To draw up a formal proposal of possible alternative space reuse techniques including, but not limited to, the following solutions.

a. Tear down of the dormitory building at Queen of Peace High School and the construction of a new community center. The benefit of the community center to the school will be realized through new revenue streams and increased visibility and use by the community.

i. A portion of this new facility will be open to the students during school hours and the other portion will be open to the public.

ii. The new facility will be available, whether for profit and non-profit purposes, for use by Burbank's residents, surrounding schools and churches.

iii. With the schools laptop program, the library is no longer used by students. The books currently housed in the library will be moved to the new center and will be open to the public.

Figure 2: Entrance to dormitory facility

b. Converting the library space into an international communications center, as well as an area with conference rooms to be utilized by the faculty. This media center will allow classes to learn new ideas and interact with other schools around the world by means of watching classes, lectures, experiments, etc.

Figure 3: Entrance to library facility

c. Perform a campus wide redesign, where architectural features and eco-friendly materials will be used to better define the common areas (i.e. the multiple outdoor courtyards within the schools property).

Figure 4: Courtyard example 1

Figure 5: Courtyard example 2

II. Gantt Chart

ID	Task Name	Duration	Start	Finish	Predecessors
1	Project Organization	22 days?	Thu 8/21/08	Fri 9/19/08	
2	Project Objectives and Goals	9 days	Thu 9/4/08	Tue 9/16/08	
3	Division into Teams and Task Division	4 days?	Thu 9/11/08	Tue 9/16/08	
4	Preliminary research	6 days?	Thu 9/4/08	Thu 9/11/08	
5					
6	Research Phase	9 days?	Thu 9/18/08	Tue 9/30/08	
7	Cost Analysis and Research	9 days?	Thu 9/18/08	Tue 9/30/08	
8	Survey of Community/School Needs	9 days?	Thu 9/18/08	Tue 9/30/08	
9	Evaluation of Survey	9 days?	Thu 9/18/08	Tue 9/30/08	
10	Site Analysis	9 days?	Thu 9/18/08	Tue 9/30/08	
11	Green and Passive Technologies	9 days?	Thu 9/18/08	Tue 9/30/08	
12	Landscaping Techniques and Design	9 days?	Thu 9/18/08	Tue 9/30/08	
13	International Telecommunication	9 days?	Thu 9/18/08	Tue 9/30/08	
14					
15	Identifying Possible Solutions	4 days?	Thu 10/9/08	Tue 10/14/08	
16	Cost Evaluation for Each Possible Solution	4 days?	Thu 10/9/08	Tue 10/14/08	
17	Effect on Enrollment	4 days?	Thu 10/9/08	Tue 10/14/08	
18	Effect on Community/Students/Potential Students/Faculty	4 days?	Thu 10/9/08	Tue 10/14/08	
19	Effect on School's Image	4 days?	Thu 10/9/08	Tue 10/14/08	
20					
21	Design Phase	26 days?	Fri 10/17/08	Tue 11/18/08	
22	Developing Initial Program Based on Needs	4 days?	Wed 10/22/08	Mon 10/27/08	24
23	Finalized Program	1 day?	Sat 10/18/08	Sat 10/18/08	
24	Identifying Design Concept	3 days?	Sat 10/18/08	Tue 10/21/08	
25	Schematic Design	15 days?	Tue 10/21/08	Thu 11/6/08	
26	Floor Plans	8 days?	Tue 10/21/08	Thu 10/30/08	
27	Elevations	6 days?	Tue 10/28/08	Sun 11/2/08	
28	Sections	8 days?	Tue 10/21/08	Thu 10/30/08	
29	Model	5 days?	Sun 11/2/08	Thu 11/6/08	
30					
31	Presenting Possible Solutions to Students/Faculty/Board/(	1 day?	Thu 11/6/08	Thu 11/6/08	
32	Receive Feedback	4 days?	Thu 11/6/08	Tue 11/11/08	
33	Modifying Final Solution	6 days?	Tue 11/11/08	Tue 11/18/08	
34					
35	IPRO Deliverables	62 days?	Tue 9/16/08	Fri 12/5/08	
36	Project Plan	7 days?	Thu 9/11/08	Fri 9/19/08	
37	Task Division Among Team	1 day?	Tue 9/16/08	Tue 9/16/08	
38	Completion of Tasks	3 days?	Tue 9/16/08	Thu 9/18/08	
39	Compilation of Project Plan	2 days?	Thu 9/18/08	Fri 9/19/08	
40	Submittal	1 day?	Fri 9/19/08	Fri 9/19/08	38
41	Preparation for Midterm Review	5 days?	Tue 9/30/08	Mon 10/6/08	
42	Task Division Among Team	1 day?	Tue 9/30/08	Tue 9/30/08	
43	Presentation Slides	3 days?	Thu 10/2/08	Mon 10/6/08	
44	Midterm Review	8 days?	Mon 10/6/08	Wed 10/15/08	
45	Preparation for IPRO Day	14 days?	Tue 11/18/08	Fri 12/5/08	
46	Abstract/Brochure	7 days?	Tue 11/18/08	Wed 11/26/08	
47	Poster	7 days?	Tue 11/18/08	Wed 11/26/08	
48	Final Presentation Slides	7 days?	Tue 11/25/08	Wed 12/3/08	
49	IPRO Day Presentation	1 day?	Fri 12/5/08	Fri 12/5/08	
50	Final Report	8 days?	Tue 11/25/08	Thu 12/4/08	
51	IPRO Delivrables CD	1 day?	Fri 12/5/08	Fri 12/5/08	50
52					
53	COMPLETION OF PROJECT	1 day?	Thu 9/18/08	Thu 9/18/08	

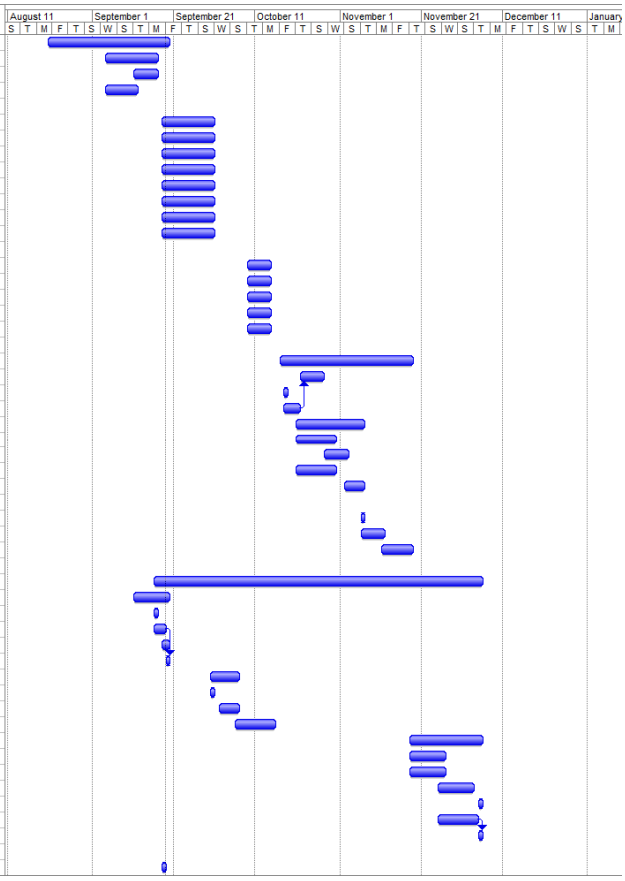

Figure 6: Reuse Team Gantt chart

B. Greening Sub-team

I. To draw up a formal proposal of possible greening techniques including, but not limited to, the following solutions.

a. Solutions aimed at increasing efficiency of existing school facilities:

i. Replacement of inefficient machinery for the purpose of reducing utility costs.

Figure 7: Machinery example 1

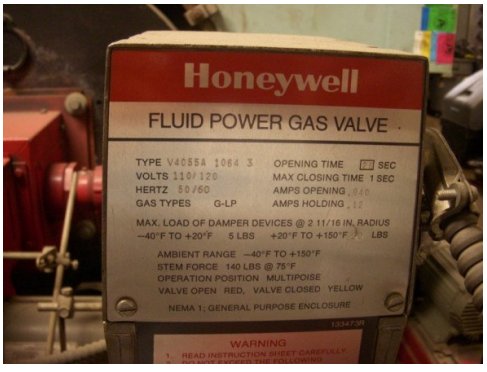

Figure 8: Machinery example 2

ii. Replacement or improvement of existing windows for the purpose of lowering utility costs by reducing heating and cooling loss.

Figure 9: Window example

iii. Installation of reflective roofing technology for the purpose of reducing utility costs by introducing alternative energy sources.

iv. Installation of a water collection system for the purpose of gathering rain water into a collection pool and channeling to gardens and playgrounds to reduce water usage.

v. Installation of wind mill technology for the purpose of reducing utility costs by introducing alternative energy sources.

vi. Improvement of current lighting efficiency for the purpose of reducing utility costs by introducing energy-saving lighting systems.

b. Solutions aimed at increasing efficiency of the new community center replacing the old dormitory space:

i. Construction of an earth-friendly facility for the purpose of creating a cost-friendly building and reducing the school's carbon footprint.

c. Solutions aimed at increasing the education of greening techniques to school population:

i. Education of faculty and students on how to reduce waste inside the school environment.

ii. Introduction of school sponsored fundraisers to teach the community "how to live green".

d. Solutions aimed at promotion of the school:

i. Promotion of the schools greening efforts to the community, corporate sponsors and government for the purpose of acquiring donations, sponsorships and grants.

II. Gantt chart

ID	Task Name	Duration	Start	Finish
1	Project Organization	22 days?	Thu 8/21/08	Fri 9/19/08
2	Project Objectives and Goals	9 days	Thu 9/4/08	Tue 9/16/08
3	Division into Teams and Task Division	4 days?	Thu 9/11/08	Tue 9/16/08
4	Preliminary research	6 days?	Thu 9/4/08	Thu 9/11/08
5				
6	Problem Identification	5 days	Mon 9/22/08	Fri 9/26/08
7	Identify Possible Solutions	5 days	Mon 9/22/08	Fri 9/26/08
8				
9	Preliminary Design Phase	18 days?	Mon 9/22/08	Wed 10/15/08
10	Preliminary Research	13 days?	Mon 9/22/08	Wed 10/8/08
11	Social Research	8 days?	Mon 9/29/08	Wed 10/8/08
12	Consumer Questionnaire	8 days?	Mon 9/29/08	Wed 10/8/08
13	Structural Testing	8 days?	Mon 9/29/08	Wed 10/8/08
14	Evaluation of Survey	8 days?	Mon 9/29/08	Wed 10/8/08
15	Cost Assessment	8 days?	Mon 9/29/08	Wed 10/8/08
16	Midterm Proposal	5 days?	Thu 10/9/08	Wed 10/15/08
17				
18	Final Design Phase	30 days	Fri 10/17/08	Fri 11/28/08
19	Concept Identification	2.5 days?	Fri 10/17/08	Tue 10/21/08
20	Schematic Design	8 days?	Tue 10/21/08	Thu 10/30/08
21	Testing	20 days?	Tue 10/21/08	Tue 11/18/08
22	Final Design	13 days?	Thu 10/30/08	Tue 11/18/08
23	Cost Assessment	13 days?	Thu 10/30/08	Tue 11/18/08
24	Proposal	1 day	Tue 11/18/08	Tue 11/18/08
25				
26	Funding Research	42 days?	Mon 9/22/08	Tue 11/18/08
27				
28	IPRO Deliverables	59 days?	Tue 9/16/08	Fri 12/5/08
29	Project Plan	7 days?	Thu 9/11/08	Fri 9/19/08
30	Task Division Among Team	1 day?	Tue 9/16/08	Tue 9/16/08
31	Completion of Tasks	3 days?	Tue 9/16/08	Thu 9/18/08
32	Compilation of Project Plan	2 days?	Thu 9/18/08	Fri 9/19/08
33	Submittal	1 day?	Fri 9/19/08	Fri 9/19/08
34	Preparation for Midterm Review	5 days?	Tue 9/30/08	Mon 10/6/08
35	Task Division Among Team	1 day?	Tue 9/30/08	Tue 9/30/08
36	Presentation Slides	3 days?	Thu 10/2/08	Mon 10/6/08
37	Midterm Review	8 days?	Mon 10/6/08	Wed 10/15/08
38	Preparation for IPRO Day	14 days?	Tue 11/18/08	Fri 12/5/08
39	Abstract/Brochure	3.5 days?	Tue 11/18/08	Fri 11/21/08
40	Poster	3.5 days?	Tue 11/18/08	Fri 11/21/08
41	Final Presentation Slides	3.5 days?	Tue 11/25/08	Fri 11/28/08
42	IPRO Day Presentation	1 day?	Fri 12/5/08	Fri 12/5/08
43	Final Report	8 days?	Tue 11/25/08	Thu 12/4/08
44	IPRO Deliverables CD	1 day?	Fri 12/5/08	Fri 12/5/08

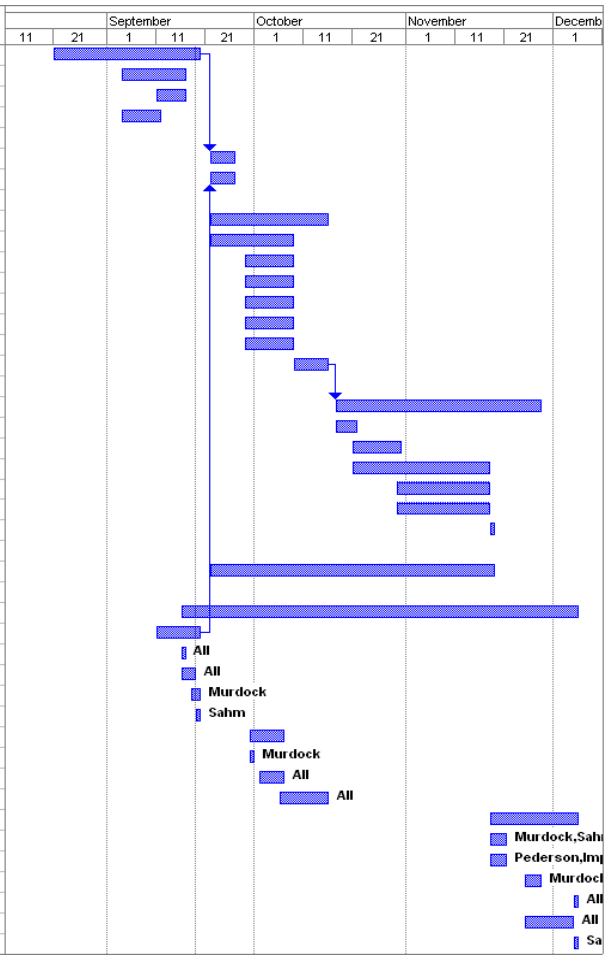

Figure 10: Greening Team Gantt chart

5. Project Budget

A. Itemized list of proposed spending

Item	Unit Price	Quantity	Price	Purpose
Transportation to school facilities	$12.00	8	$96.00	Site visits for facility research, interview of client, presentation to client, etc.
Meeting expenses	$100.00	1	$100.00	Meeting and presentation materials for client visits
Modeling Materials	$200.00	1	$200.00	Model construction
Testing and Analysis	$500.00	1	$500.00	Testing, retail, etc.
Total			**$896.00**	

Figure 11: IPRO 314 Project Budget

6. Team Structure and Assignments

A. List of all team members including their educational background/majors and other skills, strengths, experience and/or academic interests.

Name	Major/ Year	Skills/ Strengths	Experience and Academic Interests	Team
Abbasi, Rawan	Biomedical Engineering Junior	Leadership Skills, Typing, C++, MATLAB, Adobe InDesign, Microsoft Office	School and Space Reusability Research, Design	Reuse
Dralle, Kyle	Architecture Senior	AutoCad, SketchUp, Adobe Illustrator and Photoshop	Planning; Programming, Basic Knowledge of Green Design, Layout Design, Architecture	Reuse
Dudek, Ryan	Architecture Senior	AutoCad, Adobe Photoshop and Illustrator, Microsoft Office, Drafting/Sketching, and Apple Products	Graphic / Layout Design, Planning, Basic knowledge of Green Technology - Architecture	Reuse
Ihmoud, Sana	Architecture Senior	AutoCAD, Adobe Photoshop/ Illustrator, 3ds Max, Microsoft Office, sketching, model-making, drawing	Experience with archtiectural design and structure. Little landscaping experience in studio, specializing in computer aided design.	Greening
Murdock, Meghan	Mechanical Engineering Senior	Disiplined, reliable, punctual, self-starting, practical, focused	Mechanical Engineering experiences and part of ASME (American Society of Mechanical Engineers).	Greening Team Leader
Pedersen, Erin	Architecture Senior	AutoCAD, Photoshop, Microsoft Office, model making with wood, acrylic and metal	Architecture, green technology, working with model making machinery. Experience in architectural design and structure.	Greening
Pfeifer, Sarah	Architecture Senior	AutoCad, Revit, Adobe Photoshop, InDesign, Illustrator	Graphic / Layout Design, Planning, Space Programming, Web Design - Architecture	Reuse
Rossi, James	Architecture Senior	Creative Design, Computer Program Skills, and Good Time Management Skills	Programming / planning, Explanator Graphics (diagrams)	Reuse
Sahm, Nicolas	Architecture Senior	Public speaking, presentation graphics (AutoCAD, Adobe Illustrator/ Photoshop), team leadership, design	Architecture, green technology, experience with structures and architectural design.	Greening IPRO Team Lead
Shah, Kaumil	Mechanical Engineering Junior	Public speaking, microsoft office, good at forming ideas, quick learner.	VP of ASME, wishes to specialize in industrial production.	Greening
Wide, Mimi	Architecture Senior	AutoCad, 3ds Max, Adobe Photoshop, InDesign, and Illustrator	Programming/Layout Design/Planning/Graphics/Diagrams/Model/Architectural Experience	Reuse

Figure 12: IPRO 314 Team Structure and Assignments

B. Team Structure

I. IPRO 314 Team Leader: Nic Sahm

II. Master Schedule Maker: Nic Sahm

III. Weekly Timesheet Collector/Summarizer: Nic Sahm

IV. Minute Taker: Sana Ihmoud

V. iGROUPS Facilitator: Meghan Murdock

VI. Reuse Team Leader: Sarah Pfeifer

a. Team members: Rawan Abbasi, Kyle Dralle, Ryan Dudek, Sarah Pfeifer, James Rossi, and Mimi Wide

b. Task assignments detailed in Reuse Gantt chart

VII. Reuse Team Leader: Meghan Murdock

a. Team members: Sana Ihmoud, Meghan Murdock, Erin Pedersen, Nic Sahm, and Kaumil Shah

b. Task assignments detailed in Greening Gantt chart

C. Master Schedule: green shading indicates availability

I. Reuse Sub-team

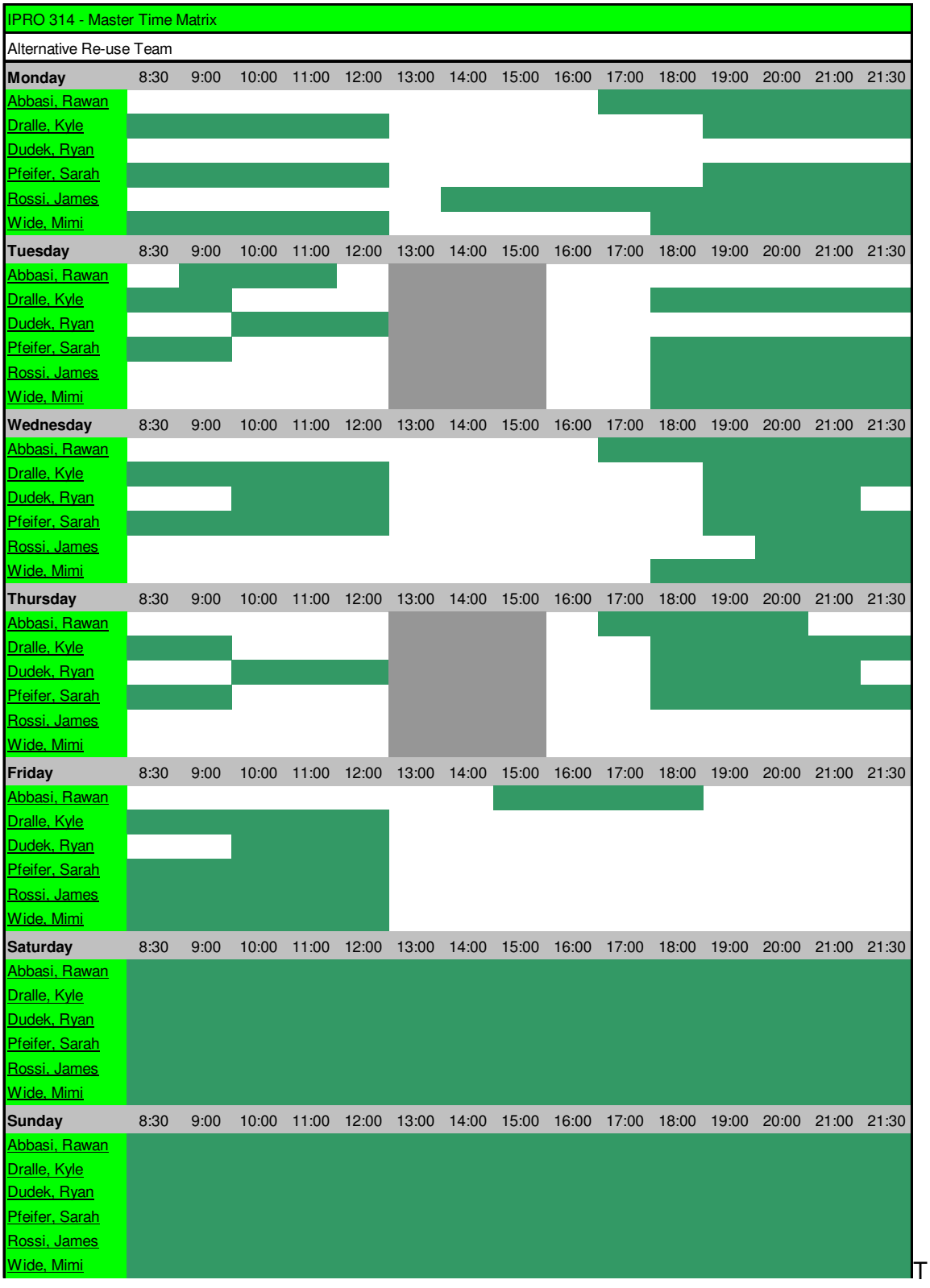

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Figure 13: Reuse Team Master Schedule

II. Greening Sub-team

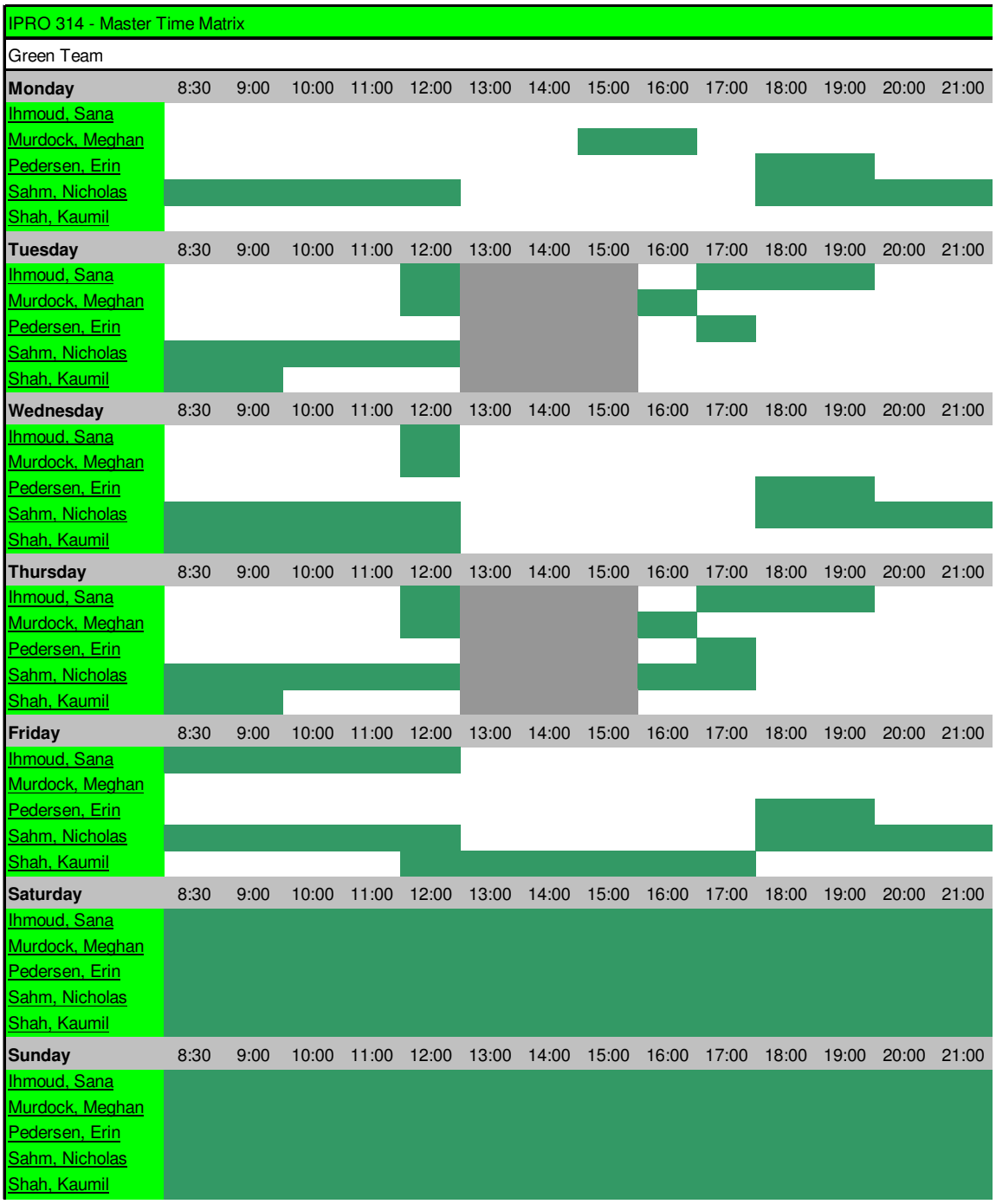

Figure 14: Greening Team Master Schedule