design development workshop #2
University of Oregon, Student Recreation Center

August 14-16, 2012
# Table of Contents

University of Oregon, Student Recreation Center

## Agenda

- Project User Group (PUG) Meeting 8 Minutes
- Project User Group (PUG) Meeting Exhibits

**Tuesday, August 14, 2012**

- Project User Group (PUG) Meeting 8 Minutes
- Project User Group (PUG) Meeting Exhibits

**Wednesday, August 15, 2012**

- Integrated Design Session Meeting Minutes
- Integrated Design Session Exhibits
- Subject Area Group (SAG) Exhibits
<table>
<thead>
<tr>
<th><strong>DATE</strong></th>
<th>August 14-16, 2012</th>
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</thead>
<tbody>
<tr>
<td><strong>LOCATION</strong></td>
<td>University of Oregon – SRC Bonus Room</td>
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**Tuesday, August 14, 2012**

<table>
<thead>
<tr>
<th><strong>1:00 – 4:00 pm</strong></th>
<th><strong>Project User Group Meeting 8</strong></th>
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<tbody>
<tr>
<td>1:00pm</td>
<td>Opening Comments/Project Update (Gene Mowery)</td>
</tr>
<tr>
<td>1:05pm</td>
<td>Student Steering Committee (More time to be allotted if needed)</td>
</tr>
<tr>
<td>1:10pm</td>
<td>Welcome back</td>
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<tr>
<td></td>
<td>• Budget (36.2 M), Healthy Oregon postponed, etc</td>
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<tr>
<td></td>
<td>• Redirect budget to the Natatorium/Pool</td>
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<td></td>
<td>• Subject Area Group Highlights</td>
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<tr>
<td></td>
<td>• Schedule</td>
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<tr>
<td>1:25pm</td>
<td>Review current plans and building arrangements</td>
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<tr>
<td></td>
<td>• Main Street SD Revisit</td>
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<td></td>
<td>• Other Building DD Improvements</td>
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<tr>
<td>2:30pm</td>
<td>BREAK</td>
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<tr>
<td>2:40pm</td>
<td>Sustainable Approach / Strategies</td>
</tr>
<tr>
<td>2:50pm</td>
<td>Lighting Design / Daylighting / Integration Overview</td>
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<td></td>
<td>• Overview / Introduction &amp; Light Level changes</td>
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<td></td>
<td>• Field Lighting</td>
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<td></td>
<td>• Daylighting</td>
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<tr>
<td>3:20pm</td>
<td>Public Spaces – Design Overview</td>
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<td></td>
<td>• Convey recommendations of the Subject Area Groups for Interior Character</td>
</tr>
<tr>
<td>3:50pm</td>
<td>Summarize Key Decisions</td>
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<td>4:00pm</td>
<td>Adjourn</td>
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### Wednesday, August 15, 2012

<table>
<thead>
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<th>Time</th>
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<tbody>
<tr>
<td>8:30 – 12:00pm</td>
<td><strong>Integrated Design Session</strong></td>
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<tr>
<td>8:30am</td>
<td>Presentation &amp; Overview</td>
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<tr>
<td>9:15am</td>
<td>Mechanical Systems</td>
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<tr>
<td>10:15am</td>
<td>Lighting and Daylighting</td>
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<tr>
<td>11:00am</td>
<td>Other systems</td>
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<tr>
<td>11:30am</td>
<td>Wrap-up</td>
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<thead>
<tr>
<th>Time</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>1:00pm – 5:00pm</td>
<td><strong>Subject Area – Group Presentation &amp; Break-out Sessions</strong></td>
</tr>
<tr>
<td>1:00pm</td>
<td>Large Group Presentation</td>
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<tr>
<td>2:15pm</td>
<td>BREAK</td>
</tr>
<tr>
<td>2:30pm</td>
<td>Concurrent Break-out Sessions</td>
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<tr>
<td></td>
<td>• Aquatic</td>
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<tr>
<td></td>
<td>• Main Street – includes Control Desk, Equipment Check-out, and Main Street circulation and social spaces</td>
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<tr>
<td></td>
<td>• Exercise spaces – includes Group Ex and Weights and Fitness</td>
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<tr>
<td>5:00pm</td>
<td>Adjourn</td>
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### Thursday, August 16, 2012

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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>8:00am – 6:00pm</td>
<td><strong>Design Team Work Sessions and Meeting with City Building Department</strong></td>
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<tr>
<td>8:00am – 6:00pm</td>
<td>Design Team Work continued, as required</td>
</tr>
<tr>
<td>2:00pm</td>
<td>Meeting with City Staff to discuss alternatives to Engineered Smoke Control</td>
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### WORKSHOP OBJECTIVES

- Review / Adjust / Confirm Design Development Direction
- Confirm Project Budget
- Advance and coordinate Energy Design and Strategies
# UO Student Recreation Center

**Project User Group (PUG) Meeting 8 – 8/14/12**

## Design Development

<table>
<thead>
<tr>
<th>User Group</th>
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<tr>
<td>Dennis Munroe</td>
<td>UO</td>
<td>PE &amp; Rec</td>
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<tr>
<td>Kevin Marbury</td>
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<td>PE &amp; Rec</td>
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<td>Mike Eyster</td>
<td>UO</td>
<td>Student Affairs</td>
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<td>Bryan Haunert</td>
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<td>PE &amp; Rec</td>
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<td>Brent Harrison</td>
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<td>PE &amp; Rec</td>
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<tr>
<td>Sue Wieseke</td>
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<tr>
<td>Geoff Hale</td>
<td>Student</td>
<td>SRC Advisory Bd</td>
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<td>Michelle Vander Heyden</td>
<td>Student</td>
<td>ASUO</td>
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<tr>
<td>Derick Olsen</td>
<td>Student</td>
<td>SRC Student Emp</td>
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<tr>
<td>Kristen Gleason</td>
<td>UO</td>
<td>Club Sports</td>
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<tr>
<td>Jen Phillips</td>
<td>UO</td>
<td>Neuroscience</td>
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<td>Julie Haack</td>
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<td>Chemistry</td>
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<td>Rob Thallon</td>
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<td>Gene Mowery</td>
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<td>Emily Eng</td>
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<td>Planning</td>
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<tr>
<td>Charlene Lindsay</td>
<td>UO</td>
<td>FS Cap Con</td>
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<td>Daren Dehle</td>
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<tr>
<td>Jack Patton</td>
<td>RDG</td>
<td>Architect</td>
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<tr>
<td>Jeff Schaub</td>
<td>RDG</td>
<td>Architect</td>
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<tr>
<td>Emlyn Altman</td>
<td>RDG</td>
<td>Lighting Designer</td>
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<tr>
<td>Otto Poticha</td>
<td>PA</td>
<td>Architect</td>
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<tr>
<td>Carl Sherwood</td>
<td>RSA</td>
<td>Architect</td>
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<tr>
<td>Dave Guadagni</td>
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<td>Architect</td>
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<tr>
<td>CMGC Dan Pelissier</td>
<td>HSW</td>
<td>Contractor</td>
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### Support

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<th>Student Steering</th>
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<table>
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<tr>
<td>Peg Rees</td>
<td>UO</td>
<td>PE &amp; Rec</td>
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## MEETING MINUTES

Diagrams and other visual information presented at this workshop and noted below are available at the UO project web site: [http://pages.uoregon.edu/eeng/src.html](http://pages.uoregon.edu/eeng/src.html)

**Student Steering Committee Comments**

1. No representatives of Student Steering Committee in attendance.
Welcome Back

2. We have submitted the Schematic Design (SD) package and it has been accepted by the UO. This package included a placeholder for the Healthy Oregon program along the west edge of Main Street. Since that time it was determined that the Healthy Oregon program would not be included in the project. In addition the design team was given direction by the management group to develop the Main Street area that had been set aside for Healthy Oregon. This in effect pushed this area of the building back into SD. This meeting will present Main Street options without the Healthy Oregon program and in addition present other building areas that have been developed in the our beginning Design Development (DD) phase of work.

3. Healthy Oregon is postponed and we are no longer setting aside a place in the Main Street for this program. It is important to develop Main Street without this program.

4. The budget has changed. The Project had a direct construction cost of $35.5 M at the end of Schematic Design and since then another $1.2M Project Cost was added which adds $700,000 to the direct construction cost for a new direct construction total of $36.2M. The initial direction from the management team was to apply these extra funds back to the natatorium, but as other issues have arisen - such as Healthy Oregon space and some items missed in the SD estimates - the funds need to be considered on a more holistic facility view. We do want to attempt to retain natatorium program but thoughts such as looking at the north pool deck area for reductions and potential leisure pool modifications were discussed.

5. Subject Area Group (SAG) meetings were held and significant additional information was gained from these meetings and has impacted the plans shown today.

6. The project team is looking at strategies for balancing the budget and will provide the contractor with a 50% DD document set for their use in updating their estimates. An updated estimate is essential for decision making as we move the design forward. The group needs to understand the design strategies and potential cost implications as we make choices for further development.

Current Plans

7. Pattern language has continued to inform the design. Continuing goals are for dynamic spaces that support social interactions. Inclusive design, welcoming, visually connectivity, good accessibility, enough space, well supervised, great daylighting etc are key motivators.

8. Revisions and evolution of the design since SD:
   Lower Level
   1. Locker rooms now have gang showers, private changing areas and added capability to hose down area. Question - do we have a good comparison count between existing and proposed locker rooms for showers and lockers etc? Existing showers – 12 men and 14 women (verify). The new layout has about 24 mixed private and gang or 20 showers if all private. Currently there might be more showers than are needed in the existing locker rooms.
   2. Natatorium has modified leisure pool and added accommodations for portable / roll-out spectator seating. Additional 1,300 sf of natatorium space was added along with 450 sf of water area to the leisure pool. Additional space is added at the north that might be too large. Most of leisure pool is 3'-6" at perimeter and 4'-0" at curved BB space. Dennis suggests a water overflow off of raised spa into leisure pool. Jack suggests a possible water curtain as a fun and interesting feature.
   3. Wet classroom area has changed slightly and its separation from pool continues to be OK - keep focus on teaching in the wet classroom. Level of transparency between wet classroom and vestibule is a question - too much might be distracting for teaching. Clear glazing will need to be tempered with window shades. Need wet and dry access to wet classroom and to pool offices.
   4. Lifeguard office is relocated and does not have great visual access to view the whole natatorium. Consider modifying pool edge side of office with curved wall, but it is not necessary to move the office to a new location.
   5. Add towel and locker equipment drop at corner of custodial room.
   6. Lockers off east entry vestibule might present an undesirable opportunity for some persons to change clothes in the vestibule. Provide bench in front of lockers similar to existing locker room set-up.
7  East entry vestibule and hall is very wide and should be reviewed to see if space can be saved in this area.

8  Main Level
   Locker room / showers have been changed similar to lower level locker room.
9  Additional weights and fitness space in now located over east entry - no longer lounge space.
10 Main street changes include moving existing boulder onto Main Street.
11 Additional work at Esslinger includes: Renovation of room 50, potential for renovation of cycling studio. Two new offices at administration. Not all this is in budget
12 Two options for main street:
   Option 1:
   - Membership services at north west of Leighton Pool with two support offices
   - Free zone toilets in Esslinger
   - Boulder on west side of climbing wall
   - Control desk inside Leighton Pool shell at south west corner and has student hub and lounge adjacent
   - Laundry room next to equipment issue at south end of Main Street with space above for second level with cardio and functional training space that will overlook Main Street. The space above forms terminus to main street
   - Personal training is added space within Esslinger by laundry area
   - Draping and curved ceiling ribbon-like structures are proposed to be hung from the ceiling between the existing Leighton Pool structural joists. These ribbon structures would be used to tie Main Street together by linking the exiting entry to the Leighton area and then to the area south of control by having continuous elements at the ceiling plane. Currently the existing volumes and their ceilings are quite different in form, shape and height. These ribs could be made of slatted wood members or if that becomes too dark, heavy or expensive other materials yet to be determined could be used to create the effect.

   Option 2
   - Cycling studio at front entry
   - Boulder and fitness at west side of rock wall
   - Member services at northwest similar to Option 1
   - Control space further south
   - Laundry at south end similar to Option 1 but less room between turnstiles and laundry. Space above laundry is similar to Option 1.

   Visual 3-D imagery of Main Street and Great hall volumes
   - Series of ceiling ribbons that will link entry to Leighton and Leighton to spaces beyond
   - Ribbons will be interrupted by and integrated with east/west skylights.
   - Glazed screen wall separating boulder from Main Street

   East Entry Facade
   - East entry is evolving to reflect current plans. New opaque (combination of solid and glass) screen wall above and to south of east entry extends into building as an organizing element along edge of Great Hall. Angle of this wall is more acute than at SD.

9. Main Street Options 1 and 2 group reactions;
   - Option 1 - like free zone
   - Option 1 - turnstile location preferred
   - Option 1 - Personal training suite adjacent to last racquetball court to east of enlarged cycling studio. Do not need to replace racquetball court elsewhere.
   - Option 2 - like back of control desk
• Option 2 – like offices open to hall - is better than opening into front desk
• Option 2 – do not like cycling studio at main north entry - cardio is better
Other comments:
• Make easy climbing side of boulder face away from Main Street
• Need seating at bouldering area
• Consider cycling studio at north end of men’s locker room
• Need equipment layouts on the main level by the floor openings
• Need to determine if the amount of social spaces indicated to date is appropriate of if too much area is set aside for this use.
• Need to develop basic furniture layouts to test designated social spaces

Public Spaces
10. Restating what we heard from the Subject Area Groups, public spaces should be: active, invigorating, functional, unique, and should use wood and other high quality materials, while building excitement within.
11. Group generally likes images shown of the interior aesthetics. Creates "wow". Perhaps too much wood on ceiling - need to find balance for wood between ceiling, wall and floor surfaces.

Lighting Design
12. Emlyn discussed the overall lighting levels proposed for the facility - lesser values than approved during Programming.
13. Emphasis on daylighting
14. Visual comfort goal – no glare or areas of high contrast
15. Fixtures: energy efficient, meet light level requirements, primarily indirect, integrated into architecture, easily maintained, and future appeal
16. Lamps: long life, and minimize number of lamp types.
17. Think ahead - plan as we can for future technology.
18. Lighting will make the building a lantern in the area.
19. OK to mount replacement field lighting on building per Jeff Madsen

Budget discussion
20. The following scope of work items are above budget for this project. While each of these items is desirable, the PUG, out of necessity, has prioritized them in the following order (e.g.: if budget allows, design and build Item 1 first, Item 2 second, etc. And, if possible fund as many of these items as possible by achieving incremental savings throughout the project (e.g.: no one wants to cut any program to achieve budget)
• Incremental savings might include the following.
  • Evaluate value of thermal battery
  • Review leisure pool layout and extra space at north end of Natatorium
  • Look at MEP systems
• Item 1: Main street Activation $$
• Item 2: Increase size of Natatorium $$
• Item 3: Increase size of Leisure Pool $
• Item 4: Add 2nd floor main street above Laundry / Student Employee Lounge $$$
• Item 5: Additional Esslinger Renovations $ (PUG noted that Room 50 is a must). It is part of the basic scope of the project.)
• Item 6: Gym Occupant load & future Roof Patio $$

End of Report
University of Oregon
Project User Group Meeting 8
August 14, 2012

Welcome Back!
Welcome Back!

• Important Milestones
  – Student Referendum Passed
  – May / June 2012 focused on Strategy
  – Official Start to DD – July 1, 2012
  – Healthy Oregon postponed. Need new front door activator!
  – July 2012 Meeting with SAGs
  – Management Committee continued to meet

• Look Ahead Schedule
  – 50% Design Development
  – Cost Estimate
  – 100% Design Development

Welcome Back!

• Budget
  – $35.5 M Direct Project Cost, increased to $36.2 M Direct
  – Where to allocate these additional resources?
    • Natatorium?
    • Replacing Healthy Oregon Space?
    • Main Street?
Welcome Back!

- Subject Area Groups
  - Three Days of Meetings
  - Met / Discussed / Criticized by Building Area & Types of Space
  - Great data gleaned from SAGs

Current Plans & Building Arrangements
Current Plans & Building Arrangements

- **Pattern Language**
  - Revisit Highly Relevant Patterns

- **Main Street Revisited**
  - Two Options for discussion

- **Pools & Natatorium**
  - Added Space in Natatorium
  - Increased size for Leisure Pool

Current Plans & Building Arrangements

- **Overall Building Design Improvements**
  - Revit View of the Building Model
  - Main Street Concept Vignettes
  - Screen Wall
  - Great Hall Vignette
Materials

Knee flexion/extension moment

Knee varus/valga moment

Knee internal/external rotation moment

Hip flexion/extension moment

Hip adduction/abduction moment

Hip internal/external rotation moment

Wedge absorption/generation power

Knee absorption/generation power

Hip absorption/generation power
Current Plans & Building Arrangements

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University of Oregon, Student Recreation Center
Current Plans & Building Arrangements

University of Oregon, Student Recreation Center

PUG meeting 8 exhibits
PUG meeting 8 exhibits

University of Oregon, Student Recreation Center

Current Plans & Building Arrangements
Current Plans & Building Arrangements
PUG meeting 8 exhibits

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Sustainable Approach / Strategies

- Focused on High Performance and Low Energy Demand
- Leighton Pool Tank Reuse (Water, Energy Storage)
- Photovoltaic Power System (Energy)
- Solar Hot Water (Energy)
- Daylighting (Energy, Healthy Building)
- Lighting Controls (Energy)
- Natural Ventilation (Energy, Comfort, Healthy Building)
- CFD Analysis (Energy Reduction, Natural Ventilation)
- Energy Analysis (Metrics / Direction)
University of Oregon: Student Recreation Center
Lighting Design Concepts

Presentation Agenda

• Key Lighting Factors
• Inspiration at the University of Oregon
• Lighting Examples
  – Exterior
  – Main Street / Great Hall
  – Fitness Area
  – Gymnasium
  – Natatorium
  – Multi-purpose Studios
  – Spin Studio
  – Locker Rooms
Key Lighting Factors

• Use daylighting wherever possible
• Visual Comfort – No glare or areas of high contrast
• Fixtures
  – Energy efficient
  – Meet light level requirements
  – Primarily indirect illumination
  – Aesthetically integrated to enhance architecture
  – Easily maintained
• Lamps
  – Long life
  – Minimize number of lamp types
PUG meeting 8 exhibits
University of Oregon, Student Recreation Center

Exterior

Exterior
Main Street / Great Hall

Fitness Areas
PUG meeting 8 exhibits

University of Oregon, Student Recreation Center

Gymnasium

Gymnasium
University of Oregon, Student Recreation Center

Natatorium

Aerobics Studio
PUG meeting 8 exhibits
University of Oregon, Student Recreation Center

Spin Studio

NO DOWNLIGHTS

Locker Rooms
Sustainable Approach / Strategies

- Field Lighting
  - Modify one light pole

- Daylighting
  - Skylights
  - Building Perimeter

Public Spaces - Overview
Public Spaces - Overview

• SAG’s Input for Public Spaces
PUG meeting 8 exhibits
University of Oregon, Student Recreation Center
**Trends**

- Controlled Color!
- Simple bold moves
- Provocative
- Youthful
- Integration of art/architecture/message/graphics
- Experiential...kinetic...lights...change
- Projection...motion graphics
- Materials of the earth...wood, metal
PUG meeting 8 exhibits
University of Oregon, Student Recreation Center

Color

[Image of interior space with orange structures]

Color

[Image of red and pink carpet and interior space with green and white elements]

[Image of additional interior elements]
PUG meeting 8 exhibits
University of Oregon, Student Recreation Center

Vertical Form/Natural Lighting

Vertical Form/Natural Lighting
PUG meeting 8 exhibits
University of Oregon, Student Recreation Center

Scale

Scale
PUG meeting 8 exhibits
University of Oregon, Student Recreation Center

Super-Graphics

Super-Graphics

Super-Graphics
University of Oregon, Student Recreation Center

Super-Graphics

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Super-Graphics

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PUG meeting 8 exhibits
University of Oregon, Student Recreation Center

Super-Graphics

Materials
USER GROUP MTS. 8.14.12

? MATCH CURRENT CARDIO TO NEW AESTHETIC?

? IDENTIFY CUTS BEFORE ESTIMATE

+ INCREASE POOL/NAT + $500K
+ MAIN STREET + $1.3M
- FIRE STRATEGY - $2M
- BUDGET ADD $700K

? NATATORY INCREASE TOO MUCH?

$ WATERFALL $ WATER JETS
LIFEGUARD AREA - ASSERTIVE STAFF
EQUIPMENT ISSUE - LOCK & TOWEL @ LOWER LEVEL

LOWER HALL TOO BIG?
$ BUDGET PRIORITIES

1. MAIN STREET
2.2. POOL/NAUTATORIUM
3. 2ND FLOOR MAIN STREET
4. ESSLINGER RENOVATION
5. $O - OUTSIDE THE PROJECT MUST KEEP
   OTHER SPACES CAN BE DEFERRED
6. GYM LEVEL STAIR

INCREMENTAL SAVINGS:
- SIZE / SF
- CODE MITIGATION
- REDDING GLASS
- STEEL WEIGHTS
- MEP SYSTEM COSTS
- REDUCE SITE DEVELOPMENT COSTS
**Option 1** PERSONAL TRAINING TO 
RIGHT OF CYCLING STUDIO.

* LOSING CURRENT ROCK WALL 
EXPERIENCE - OFF PATH - 
NEED MORE PRIVACY FOR BOULDERING 
IN SOME AREAS

CONSENSUS ON NO SPINNING 
UP FRONT

SPINNING TO MEN’S LOCKER 
CONSIDER STRONGLY
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PUG meeting 8 exhibits

Fitness & Weights
Aquatics / Lockers
University of Oregon, Student Recreation Center

- PUG meeting 8 exhibits

- WOMEN'S LOCKER 2626 SF
- MEN'S LOCKER 2674 SF
- FITNESS 2330 SF
- CLIMBING WALL 2483 SF
- BUILDING MECHANICAL 116 SF
- CHEM 116 SF
- CHEM 116 SF
- CHEM 116 SF
- CONTROL 528 SF
- 168 SF
- STUDENT HUB 117 SF
- OPERATIONS 485 SF
- WOMEN'S 507 SF
- STUDENT BREAK 103 SF
- LACT. 40 SF
- CUST. 56 SF
- LIGHT WEIGHTS & CORE TRAINING 2088 SF
- VOLLEYBALL EQUIPMENT ISSUE 501 SF
- SKYLIGHT 52 SF
- OUTDOOR STORAGE 473 SF
- CUST. 52 SF
- 48 SF
- ALL USE TOILET 189 SF
- EQUIP. REPAIR 215 SF
- STUDENT BREAK 120 SF
- OFFICE 120 SF
- 143 SF
- OFFICE 139 SF
- 147 SF
- CUST. HUB 229 SF
- MAC STOR. 489 SF
- GROUP EXERCISE 810 SF
- PERSONAL TRAINING 560 SF
- BENCH W/ CUBBIES MIRRORS CHANGING 4' - 0"FFE =
- BASKETBALL DN
- 0' - 0"FFE =
- BENCH DN
- 4' - 0"FFE =
University of Oregon, Student Recreation Center

PUG meeting 8 exhibits

Previous Pool Plans

Current Pool Plans
# UO Student Recreation Center
## Integrated Design Meeting – 8/15/12

### Design Development

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<th>Position</th>
<th>Institution</th>
<th>Present Status</th>
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<tr>
<td>Dennis Munroe</td>
<td>UO PE &amp; Rec</td>
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<td>Derick Olsen</td>
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<td>Kristen Gleason</td>
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<td>Rob Thallon</td>
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<tr>
<td>Charlene Lindsay*</td>
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<td>Daren Dehle</td>
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<td>Art Corliss*</td>
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<tr>
<td>Jack Patton</td>
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<td>Jeff Schaub</td>
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<td>Michael Andresen</td>
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<td>Emlyn Altman*</td>
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<td>Otto Poticha</td>
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<tr>
<td>Andy Frichtl*</td>
<td>IE Mech Eng</td>
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<td>Steve Dacus*</td>
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<td>Chris Larson*</td>
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<tr>
<td>Mitch Dec*</td>
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<td>Dan Pelissier*</td>
<td>HSW Contractor</td>
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<tr>
<td>Peg Rees</td>
<td>UO PE &amp; Rec</td>
<td>present (second half)</td>
<td></td>
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</table>

*Also attended the break-out session*
MEETING MINUTES – Note that there was an initial large meeting followed by a break-out session. The participants in the initial meeting are listed above. Those who also attended the break-out session are noted with an asterisk.

Diagrams and other visual information presented at this workshop and noted below are available at the UO project web site: http://pages.uoregon.edu/eeng/src.html

Target Goals and Modeling
1. LEED gold and 35% better then Oregon Energy Code are our targets.

Energy Efficiency Measures
2. The Energy Efficiency Measures (EEM) Energy Metric spread sheet developed by Mitch at Glumac has rough order of magnitude cost information that is preliminary and only intended to illustrate relative costs. During the break-out session the items on this matrix were priority ranked with one being the lowest priority and five the highest. An updated matrix is attached.
3. Basis of Design / Design Intent is at 34.8% energy use savings before evaluating steam tunnel or pool heat recovery system options. The tunnel/pool heat recovery options put us well above 35% goal for energy use savings with SEED program.
4. Basis of Design / Design Intent achieves more than 40% energy cost savings relative to the Oregon Energy Code. Reverting back to the ASHRAE 90.1-2007 requirements should put the project on track to achieve more than 50% energy cost savings for LEED before the tunnel heat recovery. This will be updated after the VE exercise is completed to see where the revised results sit.
5. Factoring in the basis of design with all items that have a priority number of “3” or higher, the potential exists to achieve an 80% energy use reduction and 67% energy cost reduction relative to the 2010 Oregon energy code.
6. Additional EEMs - louvered skylights, “earth tube” concept, automated pool cover, optimized pool cover r-value – will be added when the model is updated per the 50% DD set being issued next week.
7. Steam tunnel heat source - helps with both providing energy to building but also reduces loses in the chilled water system in tunnel as tunnel is cooled. A heat exchanger will draw waste heat, generated by heat loss from steam lines in the tunnel, for use in the building. Jeff has diagram that shows where heat draws and ventilation will occur in the tunnel in the future. Note: Later it was determined that the tunnel under the very hot administration area office might not be significantly cooled since this area is remote from where the heat exchangers will be located.
8. Project will be using central plant system and its efficiency is already determined. This will limit some of our possible energy credits since it is an existing building.
9. Baseline design is 16% better than the 2010 OESC (Oregon Energy Efficiency Code). Measures can take us to 40% or 50% depending on what measures are adopted.
10. The pool HVAC system is key energy system due to its size and the need for relatively high heat in area. Heat recovery option gives free pre-heat for this area.
11. A dehumidification system is not recommended for natatorium because it is not necessary in our climate and creates issues with air quality.
12. Pool covers are required by code. We can not take credit and is not included in the analysis.
13. 100% outside air (OSA) versus optimized OSA. Air quality is dependent on the pool chemistry. HVAC system needs to respond to dynamic nature of pool chemistry.
14. Chilled beams will be used in only a few enclosed areas such as the upper level Mind/Body room. Active or passive are possible. This should be included in the base rather than as an option.
15. Radiant floor and radiant wall panels are in base EEM assumption and will be used in most locations where possible.

16. Night flush and thermal mass is in base but savings are not that significant. Need to review electric and gas consumption. Need to get to 130 lb to cubic foot density for the mass elements. Generally we need to have 2x the floor area in exposed mass. It does not matter whether it is in the floor, walls or ceiling so long as it is visible to the space (not hidden behind other construction).

17. Solar Thermal - UO prefers drain back systems with heat exchanger. Heat will be used for domestic and pool heat use. Might have cascading heat exchangers. About a 5,000 gallon storage tank will be required. There is an existing tank in the existing pool mechanical room that might be adequate.

18. Cogenera systems are an option for solar panel system that uses water for cooling the Photovoltaic panel.

**LEED**

19. Project is registered

20. There is a matrix developed and already distributed by Michael Andresen indicating assignments for each LEED point

21. Preliminary review will be at 100 DD and final at 95% CD

22. LEED project target is 30% energy cost savings.

23. Consider planning simple infrastructure for future net-zero design. Basically photovoltaic systems will be required in future to meet net-zero. Budget for program space is more important than spending current funding for infrastructure or planning to meet net-zero

24. Commissioning agent should be on board in a couple of weeks. They will need a packet of info on project.

**Mechanical Systems**

25. Heating with radiant heated slabs / wall panels, chilled beam locations and ventilation system locations were reviewed as noted below.

26. Ceiling fans will be located in fitness areas to improve comfort levels.

27. Radiant cooling will be located at east entry floor and possibly other areas yet to be determined.

28. Ventilation air will have a small heating and cooling capacity.

29. Very little mechanical heating at Great Hall is anticipated due to the limited exposure to exterior envelope.

30. Natatorium will be a closed environment and will not have operable windows. It will be served by a dedicated heat recovery unit.

31. Natural ventilation at Main Street and Great Hall is anticipated but we need to complete CFD modeling.

32. Open workout spaces will be designed without mechanical cooling but with ceiling fans. We have a target of 78 degrees as determined in earlier Integrated Design sessions with group. Art Corliss has a concern that 78 degree will generate too many user complaints. Art gets calls in fitness areas when temperature reaches over 74 degrees. Those existing areas do not have ceiling fans so the fans might solve the user comfort issue in the new building. Dennis says we can not design cooling systems for the three hottest weeks of the year when student use is at a minimum.

33. Spot cooling will be used in identified areas, if necessary as determined through further analysis.

34. We will have cooling coils in units that do provide spot cooling with ventilation and this will be enhanced by ceiling fans.

35. Mind/body yoga room will have active chilled beams.

36. Currently gym will have radiant heated floor system and east wall openings and roof top turbines. Large ceiling fans are possible.
37. Heat recovery system uses existing Leighton Pool for non-potable water storage (for flushing of urinals and water closets) of about 140,000 gallons. Tank will also be used for heat extraction from the rain water. The design team plans to provide 140 degree heating water supply with 100 degree heating water return using the campus steam system. Air to water heat pumps in tunnel with circulation pumps will be used in order to raise the return water in the heating water and domestic hot water loop from 100 to 130 degrees. Solar thermal will be a heat source for domestic hot water, heating water, and for the pool heating system. Winter gained rain water in pool at 50 degrees will be source for a water to water heat pump. There will be a back up heat exchanger from UO steam system for domestic hot water.

38. Architects have looked at pool tank and have confirmed it will be usable for a cistern. Pool is built very stoutly. We would divide tank with east/west wall at 5’ elevation and fill in shallow end of pool or make it into earth tube. Add another north/south diving wall to form two possible tanks. Also add liners and the total will add will be about $100,000 to $150,000 to project but has good payback and side benefits. Need to verify and look closely at the total cost.

Lighting

39. New lighting standards have been adopted in the last year and light levels are based on age of occupants (less than 25, 25 to 60, and 60 years and older). We would like to design to lowest age group (25 years and younger) which has the lowest light level requirements. Group agrees on this standard - the users and staff are generally very young (with a few exceptions).

40. Existing building light levels are generally at the new lower level recommendations and the building occupants have found these levels acceptable.

41. LED lighting technology, efficacy and cost suggest that they be used where appropriate.

42. Building will have a lighting control system.

43. Areas like the Gym will have skylights with operable louvers that can be coordinated with electrical lighting with multi-level control capability to accommodate flexible light level requirements.

44. Surface color and obstructions will impact lighting design. Light colored reflective surfaces will help minimize lighting requirement.

45. Jeff Madsen asks that the design team try and drive down light energy levels even lower than the EEMs suggest, if possible.

End of Report
INTEGRATED DESIGN INTO

TUNNEL HEAT SOURCE

- Long term loss as building tap in
  Jeff M. has strategy

- Bottom line 16% -
- Opportunities are much greater
- Can’t claim credit for central plant efficiencies - yet

POOL HVAC (6, 7, 8) 26A
100% OSA vs. Optimized OSA
Pool covers not in analysis (Code required)

AIR QUALITY - NEED RESPONSIVE SYSTEM

ACTIVE CHILLED BEAMS
PASSIVE CHILLED BEAMS

RADIANT PANELS
MASS CONST. NIGHT COOLING
EBM 2 - GET TO 190,000 SF EXPOSED MASS,
STEEL/CONC QUANTITIES (NEED FOR ANALYSIS)
EBM 2.5 OPT. MIXED MODE

SOLAR THERMAL
29 A, 29 B, 29 C
DECIDE WHICH SYSTEMS
CO-GENERA SYSTEM? 30 KW ARRAY
(CONCERN ABOUT COMPETITION (LACK))

BREAK-OUT SESSION
• IDENTIFY GIVENS
• WORK TO IDENTIFY HARD CHOICES

LEED STATUS
REGISTERED, ASSIGNED, 100% DD CHECK IN
SD REPORT
LEED TARGET 30% // SEED TARGET 35%
STEAM TURB\ SOLAR HOT \ ALL IMPORTANT FOR LEED P.V.
Integrated design session exhibits

University of Oregon, Student Recreation Center

Net Zero: Make it ready?
(20,000 - 30,000 sf to get up to 150kW)

LEED - CFD / Daylight Analysis

M&E - Discussion/Decisions

Commissioning - Need OPR Documents

(Merge M&E/Design)

Daylight Modeling - Contribute to LEED

What about load reduction?

Electrical Systems

CFD Modeling - Need to use to determine natural ventilation for central volumes

Revisit temp ranges - currently seem high

Heat recovery - multiple sources
NON-POTTABLE WATER USES
TOILETS, IRRIGATION? (VERIFY)

POOL/TANK - MAKE SURE ALL COSTS CONSIDERED
LEAK DETECTION

• CONSIDER SHALLOW PORTION OF POOL AS HEAT EXCHANGER ON AIR SIDE

LIGHTING SYSTEMS
- IES STANDARDS HAVE BEEN UPDATED
- CURRENT SRC LIGHT LEVELS MEET OR EXCEED CURRENT LEVELS.
- DIMMABLE LED TO BE USED WHERE ECON. FEASIBLE
- DIMMING SYSTEM/CONTROLS TIE TO DAYLIGHTING
- Efficient properly functional lighting selection

- Finishes/color selections will be a factor in placement & selection of fixtures

* Some is true for daylighting

- Look for opportunities to drive lower than standards

- Perception - lower levels in corridors
  - Higher in activity spaces

- Field lighting - move/relocate as economically as possible
integrated design session exhibits

University of Oregon, Student Recreation Center

REVIEWED CALENDAR
- 27th START 50% SD ESTIMATE

REVIEWED 50% SD REQUIREMENTS

* NEED FLOOR COVERING ASAP
  - ANDY WILL SEND R-VALUES CHART TO TEAM

* EXPOSE AS MUCH THERMAL MASS AS POSSIBLE
  - CONCRETE, CMU, TILE, STONE
  - LABYRINTH

* LEED BOUNDARY - B-COURT GYM
  - SUBMIT C.I.R. TO USGBC

* LIFE CYCLE COST ANALYSIS
  - GLUMAC.. APPROX BY SEPT 13th

* AUTOMATIC POOL BLANKET
* WINDOW/CURTAIN WALL SILLS

30” - 36” RECOMMENDED

INSUL. WALL/SPANDRELS
VS. GLASS
integrated design session exhibits

University of Oregon, Student Recreation Center
### U of O SRC Energy Metric - Revision #1

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### Energy Efficiency Measures outlined in Pre-Enrich Document

- **Demand Tapping (cooling)**
  - Refrigeration and Heating (AHU & HPW) allow greater cooling in summer and heating in winter.
  - **Additional Energy Savings ($/kWh)**: $0.00
  - **Additional Energy Savings ($/kW)**: $0.00
  - **Annual Energy Cost Savings ($/kWh)**: $0.00
  - **Annual Energy Cost Savings ($/kW)**: $0.00
  - **Additional Energy Cost Savings**: $0.00
  - **Increased Fuel Cost**: $0.00

- **HVAC System Efficiency**
  - **Additional Energy Savings ($/kWh)**: $0.00
  - **Additional Energy Savings ($/kW)**: $0.00
  - **Annual Energy Cost Savings ($/kWh)**: $0.00
  - **Annual Energy Cost Savings ($/kW)**: $0.00
  - **Additional Energy Cost Savings**: $0.00
  - **Increased Fuel Cost**: $0.00

- **Distribution and Control**
  - **Additional Energy Savings ($/kWh)**: $0.00
  - **Additional Energy Savings ($/kW)**: $0.00
  - **Annual Energy Cost Savings ($/kWh)**: $0.00
  - **Annual Energy Cost Savings ($/kW)**: $0.00
  - **Additional Energy Cost Savings**: $0.00
  - **Increased Fuel Cost**: $0.00

### Additional Notes

- **Optimization Strategies**
  - **Additional Energy Savings ($/kWh)**: $0.00
  - **Additional Energy Savings ($/kW)**: $0.00
  - **Annual Energy Cost Savings ($/kWh)**: $0.00
  - **Annual Energy Cost Savings ($/kW)**: $0.00
  - **Additional Energy Cost Savings**: $0.00
  - **Increased Fuel Cost**: $0.00

- **Other Energy Efficiency Measures**
  - **Additional Energy Savings ($/kWh)**: $0.00
  - **Additional Energy Savings ($/kW)**: $0.00
  - **Annual Energy Cost Savings ($/kWh)**: $0.00
  - **Annual Energy Cost Savings ($/kW)**: $0.00
  - **Additional Energy Cost Savings**: $0.00
  - **Increased Fuel Cost**: $0.00

### University of Oregon, Student Recreation Center

- **Net Present Value (NPV)**
  - **Additional Energy Savings ($/kWh)**: $0.00
  - **Additional Energy Savings ($/kW)**: $0.00
  - **Annual Energy Cost Savings ($/kWh)**: $0.00
  - **Annual Energy Cost Savings ($/kW)**: $0.00
  - **Additional Energy Cost Savings**: $0.00
  - **Increased Fuel Cost**: $0.00
### U of O SRC Energy Metric - Revision #1

#### Integrated Design Session:

**University of Oregon, Student Recreation Center**

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<tr>
<th>Code Building</th>
<th>Basis of Design</th>
<th>Energy Efficiency Measure</th>
<th>Individual Energy Efficiency Measure</th>
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#### Yearly Energy Efficiency Ratings and Score Card Components:

1. **Base Energy EUI**: 63.5
2. **Base CO2** (lbs/kWh): 28%
3. **Base EUI** (kBtu/sf-yr): 26%
4. **Base CO2** (lbs/kWh): 44%

#### Additional Savings:

- **Annual Savings (therms)**: 6,748
- **Annual Savings (kBtu)**: 1,193
- **Annual Savings (Savings %)**: 1.2%

#### Savings by Performance Metric:

- **Annual Energy Cost**: $17,500
- **Annual Energy Cost (Therms)**: 14,308
- **Annual Energy Cost (kBtu)**: 1,244,639
- **Annual Energy Cost (Savings %)**: 0.8%

#### Energy Efficiency Measures Overview:

1. **Continuous Insulation: Glass Reinforced Concrete Panel**
   - **Type**: HVAC
   - **Priority**: 2

2. **Passive Cooling/Heating**
   - **Type**: HVAC
   - **Priority**: 3

3. **Daylighting Savings with 30" window placement**
   - **Type**: Lighting
   - **Priority**: 2

4. **High Performance Curtainwall System**
   - **Type**: HVAC
   - **Priority**: 4

5. **Pump savings from increased delta T on HW & CHW loops**
   - **Type**: HVAC
   - **Priority**: 5

6. **Energy Efficiency Measures outlined in Pre-SD Documents**

#### Additional Energy Efficiency Measures For Consideration:

- **Thermal Break of high temp. (pool) space from other spaces**
- **Continuous Insulation: R-24 assembly**
- **Passive Cooling/Heating 2: Dehumidification with Latent Heat Recovery**
- **HVAC**: **2**, **3**, **4**
- **Basis of Design with Tunnel/Pool Heat Recovery**
- **Continuous Insulation: Extruded Polyiso board**
- **Glazing Tuned by orientation**
- **Passive Cooling/Heating to Fitness Spaces**
- **Solar Hot Water 2: DHW only**
- **Natural Ventilation of Fitness Spaces**
- **Displacement Ventilation with DOAS**
- **Watt-Stoppers in offices and classrooms for PCs**
- **Steam Tunnel Heat Recovery**
- **Profit Savings from increased delta T on HW & CoolHP Fmps**
- **Equiped with OSA bypass damper**
- **Active Chilled Beams**
- **Natural Ventilation with 30" window placement**

#### Additional Observations:

- **Total Savings using Interactive combinations in the design (from LEED Baseline)**
- **Energy Efficiency Measures outlined in Pre-SD Documents**

---

**Table Notes:**

- **Base EUI**: Energy use intensity
- **Base CO2**: Carbon dioxide emissions
- **Annual Savings**: Annual energy savings
- **Priority**: Priority level of energy efficiency measure

---

**Table Formats:**

- **Base Energy EUI**: Base annual energy use intensity
- **Base CO2**: Base annual carbon dioxide emissions
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- **Base CO2**: Base annual carbon dioxide emissions

---

**Table Data:**

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- **Annual Energy Cost (kBtu)**: 1,244,639
- **Annual Energy Cost (Savings %)**: 0.8%

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**Table Calculations:**

- **Profit Savings from increased delta T on HW & CoolHP Fmps**
  - **Type**: HVAC
  - **Priority**: 5

---

**Table Observations:**

- **Continuous Insulation: Glass Reinforced Concrete Panel**
- **Passive Cooling/Heating**
- **Daylighting Savings with 30" window placement**
- **High Performance Curtainwall System**
- **Pump savings from increased delta T on HW & CHW loops**
- **Energy Efficiency Measures outlined in Pre-SD Documents**

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**Table Calculations:**

- **Profit Savings from increased delta T on HW & CoolHP Fmps**
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**Table Observations:**

- **Continuous Insulation: Glass Reinforced Concrete Panel**
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**Table Calculations:**

- **Profit Savings from increased delta T on HW & CoolHP Fmps**
  - **Type**: HVAC
  - **Priority**: 5

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**Table Observations:**

- **Continuous Insulation: Glass Reinforced Concrete Panel**
- **Passive Cooling/Heating**
- **Daylighting Savings with 30" window placement**
- **High Performance Curtainwall System**
- **Pump savings from increased delta T on HW & CHW loops**
- **Energy Efficiency Measures outlined in Pre-SD Documents**
Light Level Readings
S.A.G. GROUP PRESENT

RECAPTED INPUT

VIEWED INTERIOR IMAGES

REVIEWED NEW PLAN

- WHY MORE BOULDER? CK/UL/STAFF
- ACTIVITY SPACES
- ENTRY SEQUENCE
- CLASSROOM - WHY TRANSPLANT?
- NEED PRIVACY CONTROLS
University of Oregon, Student Recreation Center

SAG meeting exhibits