University of Oregon
Erb Memorial Union Expansion & Renovation

Meet the Architects
WELCOME
WHAT IS BEING CONSIDERED?
SUMMARY OF PROGRAM AREAS
232,381 GSF

- RETAIL: 48,656 SF
- UNION SERVICES: 40,255 SF
- CONFERENCE SERVICES: 43,240 SF
- PERFORMANCE CENTER: 32,510 SF
- STUDENT ACTIVITIES: 61,000 SF
- SUPPORT: 14,725 SF
EXISTING BUILDING
WHAT TO SAVE

Erb Memorial Union 1970’s
76,000 gsf
WHAT TO SAVE

Erb Memorial Union 1960’s
22,911 gsf
WHAT TO SAVE

Erb Memorial Union 1950’s
100,575 gsf
WHAT TO SAVE

Erb Memorial Union 1950’s
8,268 gsf
WHAT TO SAVE

Erb Memorial Union 1950’s
22,188 gsf
WHEN?
# PROJECT SCHEDULE V.4.3

<table>
<thead>
<tr>
<th>Construction Documents</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
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<tbody>
<tr>
<td>50% CD Set</td>
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<tr>
<td>Cost Estimate/EV Alternates</td>
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<tr>
<td>95% CD Set</td>
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<tr>
<td>100% CD Set</td>
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<table>
<thead>
<tr>
<th>Permit/Bidding</th>
<th>2012</th>
<th>2013</th>
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<tbody>
<tr>
<td>Construction Administration</td>
<td></td>
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<tr>
<td>Construction - weekly OAC meetings</td>
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<tr>
<td>Grand Opening</td>
<td></td>
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<tr>
<td>Approx 100 weeks, Consultants attend OAC meetings as appropriate</td>
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<table>
<thead>
<tr>
<th>Meeting/Workshops/Co-Location</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
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<tbody>
<tr>
<td>Subject Area Committee Workshops</td>
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<tr>
<td>User Group Workshops</td>
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<td>Management Group Reviews</td>
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<td>I/O Technical Reviews</td>
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<tr>
<td>Design Team Workshops at OAC</td>
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<tr>
<td>SERA/ACMP</td>
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<tr>
<td>Structural</td>
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<tr>
<td>MEP</td>
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<td>Civil</td>
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<tr>
<td>Landscape</td>
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<td>Food Service</td>
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<tr>
<td>Theater Design</td>
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<tr>
<td>AV/Acoustics</td>
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<td>Design Team Meetings (via telecon)</td>
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<tr>
<td>BIM/Rev/Works Clash Detection</td>
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<tr>
<th>Design Team Coordination Worksessions</th>
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<tr>
<td>SERA/ACMP Co-Location</td>
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# Milestones

<table>
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<tr>
<th>Meeting 1</th>
<th>Meeting 2</th>
<th>Meeting 3</th>
<th>Meeting 4</th>
<th>Meeting 5</th>
<th>Meeting 6</th>
<th>Meeting 7</th>
<th>Meeting 8</th>
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</thead>
<tbody>
<tr>
<td>Project Start-Up</td>
<td>Preliminary Program and Concepts</td>
<td>Program and Concepts</td>
<td>100% Concept Design</td>
<td>Schematic Design Start</td>
<td>50% Schematic Design</td>
<td>Schematic Design</td>
<td>100% Schematic Design</td>
</tr>
</tbody>
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## Programming
- Confirm overall program objectives
- Confirm space needs, type/size with SAC
- Define adjacencies and functional efficiencies
- Capture aspirations

- Overall Program Agreement
- Review program findings from Subject Area Committee meetings
- Review and discuss blocking and stacking alternatives
- Prioritize program based on budget

## Design Concept
- Explore site & program influences
- Develop 3-4 Big Ideas for Exploration
- Decide parking requirement
- Decide concert hall requirement

- Explore concept alternatives
- Review and discuss concept alternatives
- Recommend a concept for preliminary review with CPC

## Sustainability Plan
- Identify goals and opportunities for sustainable strategies
- Refine goals and opportunities
- Align budget and goals
- Finalize project Sustainability Plan

- Start SEED process
- Refine LEED scorecard

## Project Cost
- Align project budget and program
- Identify project quality related to cost
- Conduct LCA/evaluations

- Overview of project budget
- Review and discuss preliminary construction cost based on program
- Review program and budget

- Review 100% concept cost estimate
- Identify value engineering options
- Review 50% SD cost estimate
- Review final schematic design cost estimate
PROCESS
CAMPUS-WIDE PATTERNS

Welcoming to All
Outdoor Classroom
Campus Trees
Good Neighbor
Open University
Paths and Goals
Road Crossings
Pedestrian Pathways
Spillover Parking
Shielded Parking and
Service Areas
Quiet Backs
Main Building Entrance
Building Complex
Connected Buildings
Access to Water
Sitting Walls
Seat Spots
Tree Places
Waste Quality
Accessible Green
Local Sports
Public Outdoor Room
Small Public Squares
Activity Nodes
Arcades
Operable Windows
Flexibility and Longevity
Future Expansion
Pools of Light
Wholeness of Project
Wings of Light
Quality of Light
Building Hearth
Office Connections
Public Gradient
Classroom Distribution
Fabric of Departments
No Signs Needed
Faculty-Student Mix
Places to Wait
Enough Storage
SITE / ENVIRONMENTAL INFLUENCES
EMBODIED ENERGY

- Building Operations: 43.5%
- Transportation: 28.2%
- Industry: 22.7%
- Building Construction & Materials: 5.5%
EMBODIED ENERGY
BUILDING BREAKDOWN

- Structure: 26%
- Interiors: 13%
- Services (HVAC, Electrical, Plumbing, etc.): 24%
- Envelope (Exterior Closure, Roofing): 24%
- Construction: 7%
- Site: 6%
EMBODIED ENERGY

Note: Embodied energy is measured by weight of material. Some materials have a low Kbtu/lb but are heavy (ex. concrete) and some materials have a high Kbtu/lb but are lightweight (ex. aluminum).
EMBODIED ENERGY

EMBODIED ENERGY FOR TYPICAL CONCRETE BUILDING (Mmbtu/lb)*

MATERIAL

<table>
<thead>
<tr>
<th>Structural</th>
<th>Concrete</th>
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<tr>
<td>Cement</td>
<td>0</td>
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<tr>
<td>Timber</td>
<td>502</td>
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<tr>
<td>Glue-Lam Timber</td>
<td>72.156</td>
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<tr>
<td>Steel</td>
<td>69.312</td>
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<tr>
<td>Terrazzo Tiles</td>
<td>16.688</td>
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</tr>
<tr>
<td>Gypsum Plaster</td>
<td>12.152</td>
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<tr>
<td>Marble</td>
<td>11.587</td>
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<tr>
<td>Bricks (Common)</td>
<td>9.789</td>
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<tr>
<td>Plasterboard</td>
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<tr>
<td>Granite</td>
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<tr>
<td>Ceramic Tiles</td>
<td>0.52</td>
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<tr>
<td>Plywood</td>
<td>11.87</td>
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<tr>
<td>Glass</td>
<td>7.434</td>
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<tr>
<td>Linoleum</td>
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<tr>
<td>Glass Fiber Insulation</td>
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<tr>
<td>Ceramic Fixtures</td>
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<td>Vinyl Flooring</td>
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<tr>
<td>PVC</td>
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<tr>
<td>EPS Insulation</td>
<td>13.481</td>
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<tr>
<td>Aluminum</td>
<td>3.602</td>
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* Based on a typical large concrete office building (GFA= 511,758 sf, twelve 13' stories and a basement). Data from the DOE Buildings Database (US DOE 2004).
CLIMATE
TEMPERATURE

[Diagram showing climate temperature and comfort zone]
CLIMATE TEMPERATURE BINS

SUMMER (JUNE 15– SEPT 15)
Mon– Fri: 7am- 7pm
Sat- Sun: Closed

SCHOOL YEAR (SEPT 16– JUNE 14)
All Days: 7am- 11:30pm
CLIMATE
CLOUD COVER

AVERAGE % OF SKY COVERED BY CLOUDS

- JAN: 85%
- FEB: 73%
- MAR: 78%
- APR: 79%
- MAY: 66%
- JUN: 46%
- JUL: 35%
- AUG: 34%
- SEP: 43%
- OCT: 62%
- NOV: 82%
- DEC: 84%
CLIMATE
RAINFALL

<table>
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<tr>
<th>Month</th>
<th>Average Rainfall (in)</th>
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<tr>
<td>JAN</td>
<td>7.9</td>
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<td>FEB</td>
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<td>MAR</td>
<td>5.5</td>
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<tr>
<td>APR</td>
<td>3.1</td>
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<td>MAY</td>
<td>2.2</td>
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<td>JUN</td>
<td>1.4</td>
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<tr>
<td>JUL</td>
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<tr>
<td>AUG</td>
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<td>SEP</td>
<td>1.7</td>
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<td>OCT</td>
<td>3.4</td>
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<td>NOV</td>
<td>8.3</td>
</tr>
<tr>
<td>DEC</td>
<td>8.6</td>
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</table>
SUSTAINABLE / CLIMATE RESPONSIVE DESIGN INFLUENCES
SITE ANALYSIS

SUMMER SOLSTICE 69°
SUNRISE 8:31 AM
SUNSET 8:56 PM

WINTER SOLSTICE 22°
SUNRISE 8:16 AM
SUNSET 5:34 PM

SUMMER WIND NORTH

WINTER WIND SOUTH

OPTIMAL ORIENTATION FOR SOLAR MANAGEMENT
SHADING
ANALYSIS
MASSING
PROGRAM
SUSTAINABILITY ISSUES /
ENERGY PROGRAMMING
EUI
ENERGY USE INTENSITY

TOTAL ENERGY CONSUMPTION OF A BUILDING

\[ \text{EUI} = \frac{\text{Natural Gas} + \text{Electricity} - \text{Renewables}}{\text{Gross Building Area}} \text{ kBTU/SF/YR} \]
ENERGY USE
CAMPUS BUILDINGS

- ZEBRAFISH LABORATORY: 390
- LEWIS INTEGRATED SCIENCE COMPLEX - PHASE II: 171
- MATTHEW KNIGHT ARENA: 100
- EAST CAMPUS RESIDENCE HALL: 82
- ALLEN HALL: 28

ENERGY UTILIZATION INTENSITY kBTU/SF/yr
ENERGY USE
STUDENT UNIONS

Baseline EUI based on ASHRAE 90.1-2004: 95 kBTU/SF/yr

PSU: URBAN CENTER
PORTLAND, OR
147,000 SF: 73 kBTU/SF/yr

USC STUDENT UNION
LOS ANGELES, CA
240,000 SF: 67 kBTU/SF/yr

MGMT BUILDING AT GEORGIA TECH
ATLANTA, GA
248,000 SF

HOMER SCIENCE & STUDENT LIFE CENTER
ATHERTON, CA
44,100 SF: 60 kBTU/SF/yr

Energy Utilization Intensity (kBTU/SF/yr)
ENERGY REDUCTION STRATEGIES

Understand your Context
  Climate
  Base building typical energy use

Load Reductions
  Passive Systems
  Daylighting

Right Sizing / Dual Use

Target Key Systems/ Reduce Load
  Active Mechanical Solutions

Occupant Engagement

Apply Renewables
ENERGY USE

FOOD SERVICE/ PUB

BASE EUI:
588 Kbtu/sf/yr

- PLUG LOADS: 48%
- HEATING: 24%
- COOLING: 2%
- HVAC AUX: 6%
- LIGHTING: 10%
- DOMESTIC HOT WATER: 10%

PROPOSED EUI:
385 Kbtu/sf/yr

- PLUG LOADS: 60%
- HEATING: 9%
- COOLING: 3%
- HVAC AUX: 5%
- LIGHTING: 13%
- DOMESTIC HOT WATER: 10%
ENERGY USE

RETAIL

BASE EUI:
72 Kbtu/sf/yr

- PLUG LOADS: 24%
- HEATING: 18%
- COOLING: 7%
- HVAC AUX: 9%
- LIGHTING: 37%
- DOMESTIC HOT WATER: 5%

PROPOSED EUI:
48 Kbtu/sf/yr

- PLUG LOADS: 37%
- HEATING: 17%
- COOLING: 8%
- HVAC AUX: 11%
- LIGHTING: 22%
- DOMESTIC HOT WATER: 5%

Savings: 33%
ENERGY USE
UNION SERVICES/STUDENT ACTIVITIES

BASE EUI:
86 Kbtu/sf/yr

PROPOSED EUI:
46 Kbtu/sf/yr

PLUG LOADS 14%
LIGHTING 25%
HEATING 44%
DOMESTIC HOT WATER 3%
HVAC AUX 8%
COOLING 6%

PLUG LOADS 24%
LIGHTING 24%
HEATING 33%
DOMESTIC HOT WATER 4%
HVAC AUX 9%
COOLING 6%

46% SAVINGS
ENERGY USE
CONFERENCE SERVICES

BASE EUI:
90 Kbtu/sf/yr

- PLUG LOADS: 13%
- HEATING: 37%
- LIGHTING: 18%
- HVAC AUX: 16%
- DOMESTIC HOT WATER: 6%
- COOLING: 10%

PROPOSED EUI:
59 Kbtu/sf/yr

- PLUG LOADS: 20%
- HEATING: 28%
- LIGHTING: 18%
- HVAC AUX: 19%
- DOMESTIC HOT WATER: 4%
- COOLING: 11%

34% SAVINGS
# EUI for our Building

<table>
<thead>
<tr>
<th>Service</th>
<th>Percentage</th>
<th>EUI (sq ft)</th>
<th>Min (sq ft)</th>
<th>Max (sq ft)</th>
<th>Total (sq ft)</th>
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<tbody>
<tr>
<td>FOOD SERVICES/PUB</td>
<td>16%</td>
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<td>182-212</td>
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<td>RETAIL</td>
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<td>UNION SERVICES</td>
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<td>CONFERENCE SERVICES</td>
<td>19%</td>
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<td>PERFORMANCE CENTER</td>
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<td>57-66</td>
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<td>STUDENT ACTIVITIES</td>
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<td>86</td>
<td>51-60</td>
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<td>36-42</td>
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<td>TOTAL PROGRAM</td>
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<td>54-63</td>
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<td>EXISTING BUILDING</td>
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Thank you!

Student Referendum Nov. 14th to Nov. 18th
Please vote