University of Oregon

Erb Memorial Union Expansion & Renovation

Sustainability TAG #2

SERA Architects in association with AC Martin

February 22, 2012

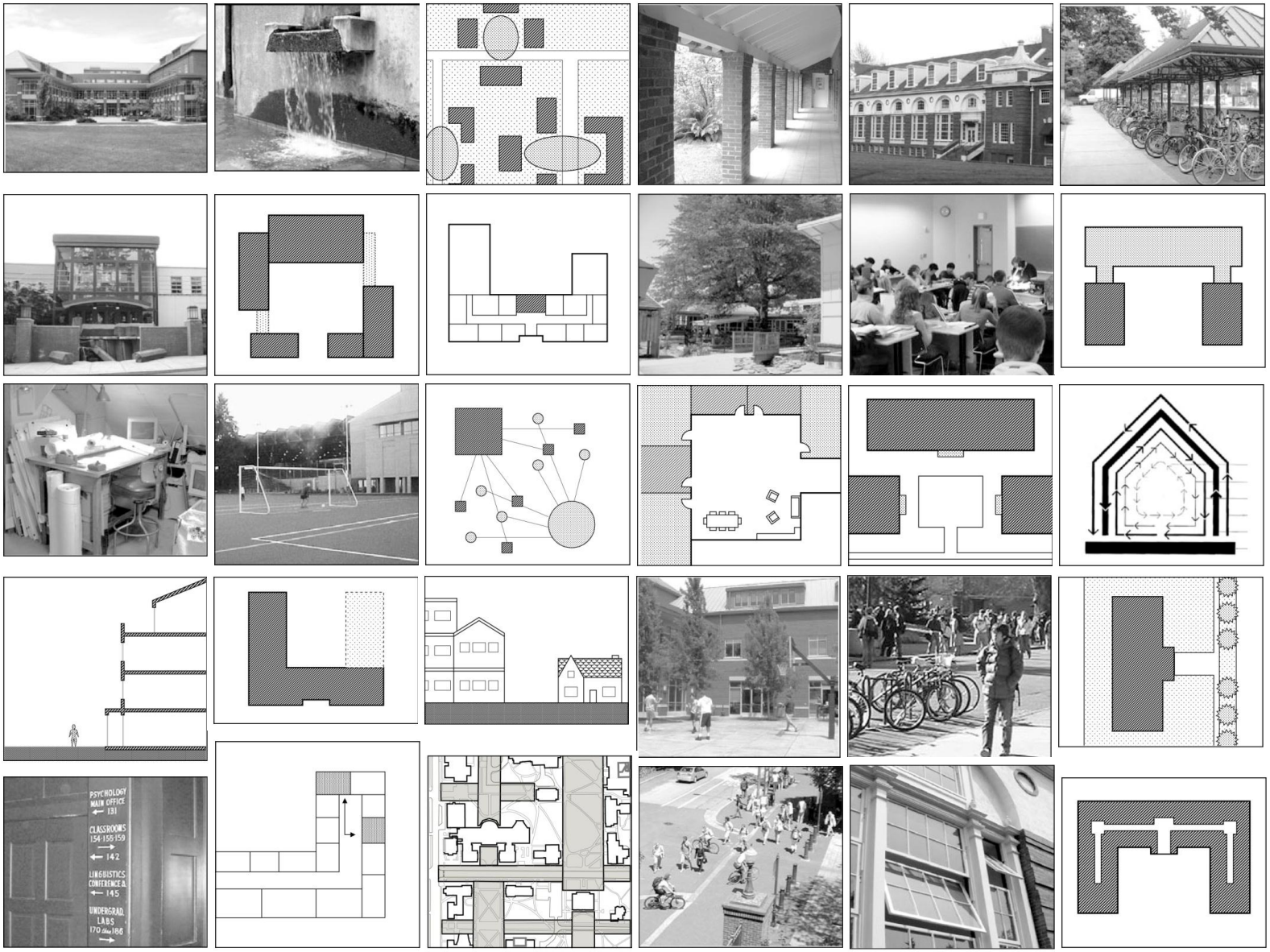
University of Oregon

Erb Memorial Union Expansion & Renovation

WELCOME

DESIGN UPDATE:
Floor Plans

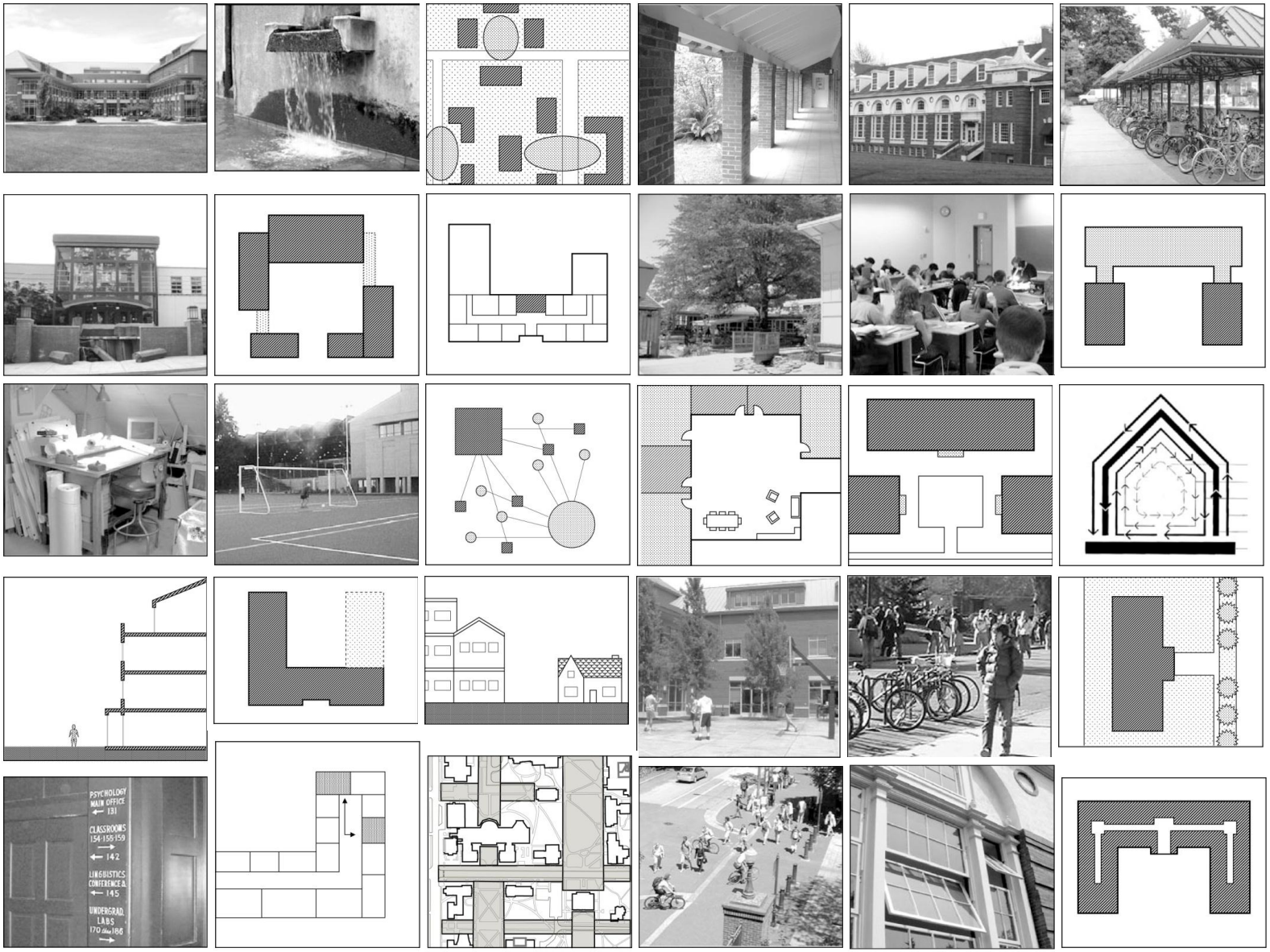
CAMPUS-WIDE PATTERNS



Policy 11: Patterns
BUILDING DESIGN

Building Hearth
Arcades
Architectural Style
Building Character and Campus Context
Flexibility and Longevity
Classroom Distribution
Enough Storage
Pools of Light
Places to Wait
Fabric of Departments
Four Story Limit
Future Expansion
Materials and Operations
No Signs Needed
Public Gradient
Operable Windows
Organizations Clarity
Quality of Light
Office Connections
Wholeness of Project
Wings of Light

CAMPUS-WIDE PATTERNS



Policy 11: Patterns
BUILDING DESIGN

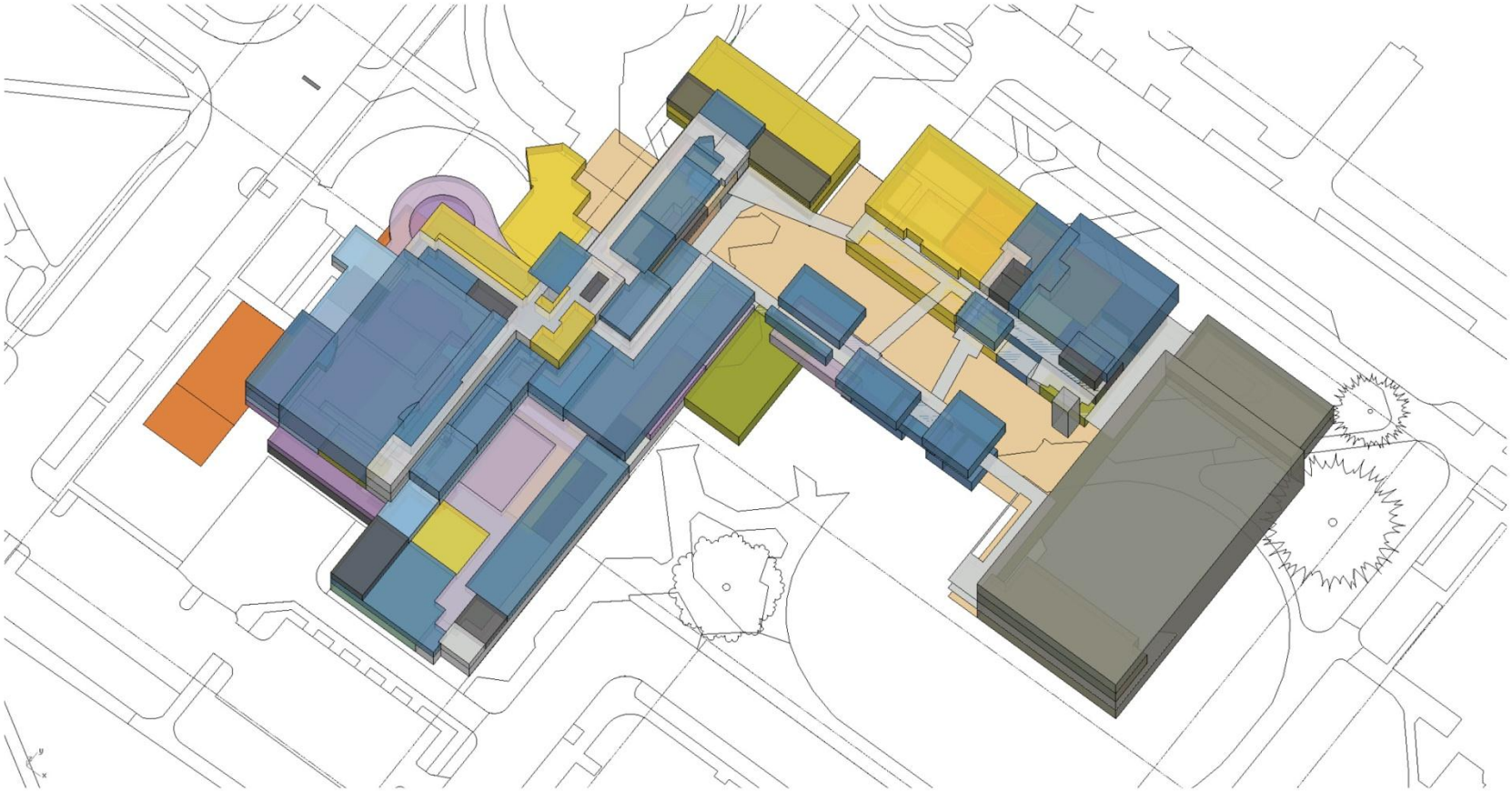
Building Hearth
Create a social heart for every building

Flexibility and Longevity
Provide degrees of flexibility appropriate to each system

Fabric of Departments
Give each department a clearly identified place

Public Gradient
Lay out spaces to create a sequence from most public to most private

Office Connections
Locate frequent contact activities with walking distance of each other



UNIVERSITY OF OREGON SERA ac martin

ERB MEMORIAL UNION
RENOVATION & EXPANSION
FEBRUARY 22, 2012

LEGEND

- FOOD SERVICES ZONE
- RETAIL / TENANT ZONE
- STUDENT UNION & STUDENT ACTIVITY ZONE
- RECREATION SUITE
- MEDIA SUITE
- LOUNGE SPACES
- CONFERENCE SERVICES ZONE
- UNION SUPPORT ZONE
- CONCERT HALL

GROUND LEVEL PLAN
BLOCK & STACK DIAGRAM @ EXISTING BUILDING

ERB MEMORIAL UNION
RENOVATION & EXPANSION
FEBRUARY 22, 2012

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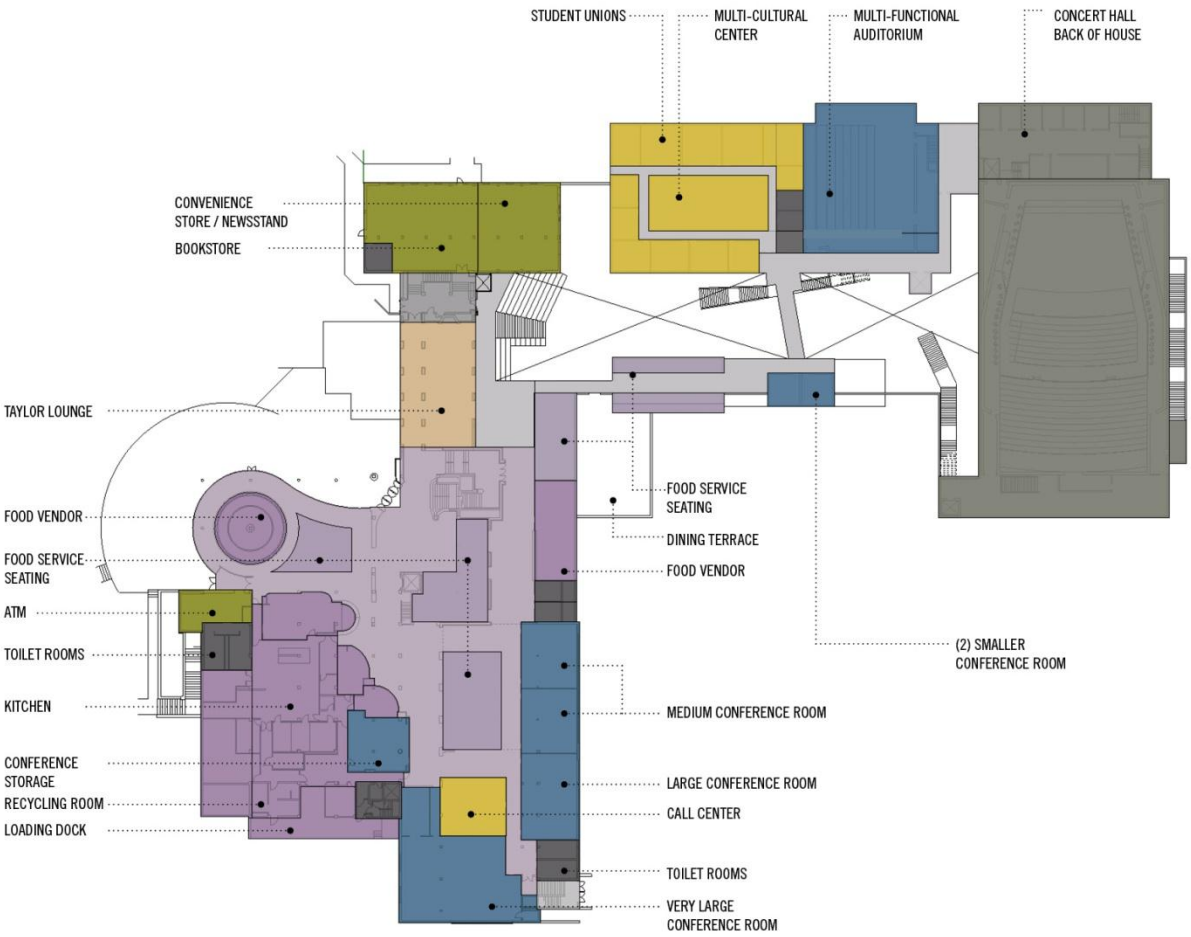

LEGEND

- FOOD SERVICES ZONE
- RETAIL / TENANT ZONE
- STUDENT UNION & STUDENT ACTIVITY ZONE
- RECREATION SUITE
- MEDIA SUITE
- LOUNGE SPACES
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- UNION SUPPORT ZONE
- CONCERT HALL

LEVEL 1 PLAN
BLOCK & STACK DIAGRAM @ EXISTING BUILDING

ERB MEMORIAL UNION
RENOVATION & EXPANSION
FEBRUARY 22, 2012

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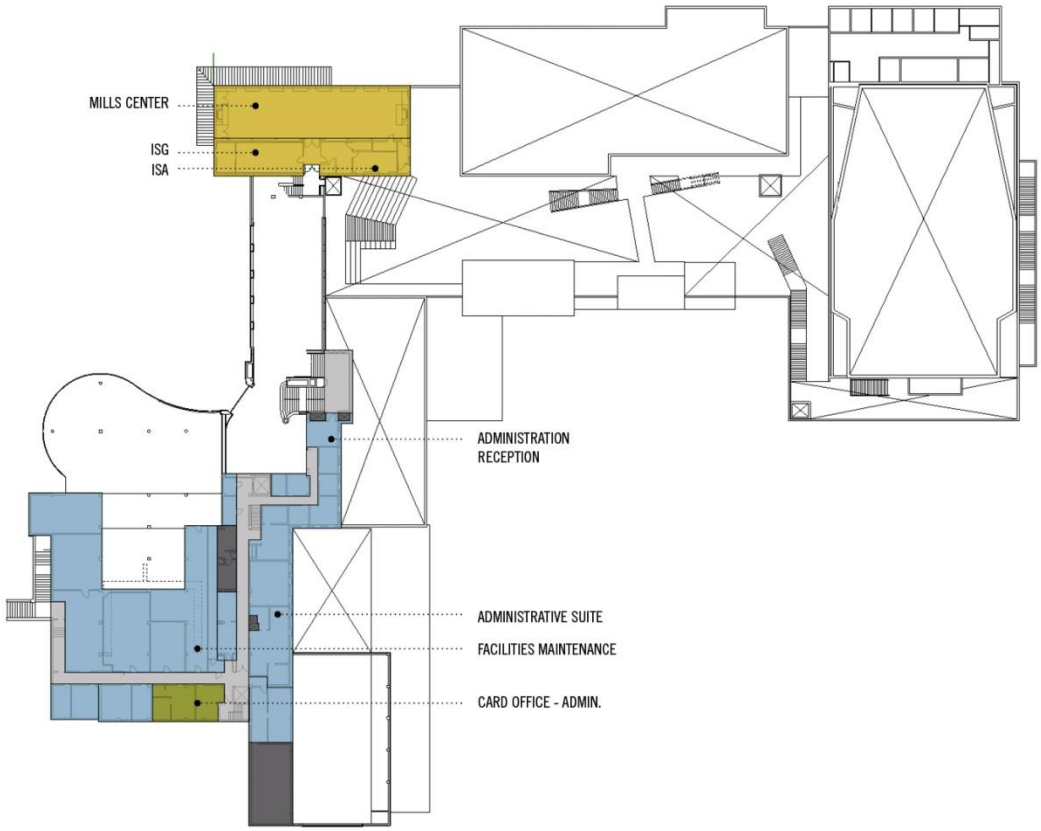

LEGEND

- FOOD SERVICES ZONE
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- RECREATION SUITE
- MEDIA SUITE
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- CONFERENCE SERVICES ZONE
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- CONCERT HALL

MEZZANINE / MILLS CENTER PLAN
BLOCK & STACK DIAGRAM @ EXISTING BUILDING

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RENOVATION & EXPANSION
FEBRUARY 22, 2012

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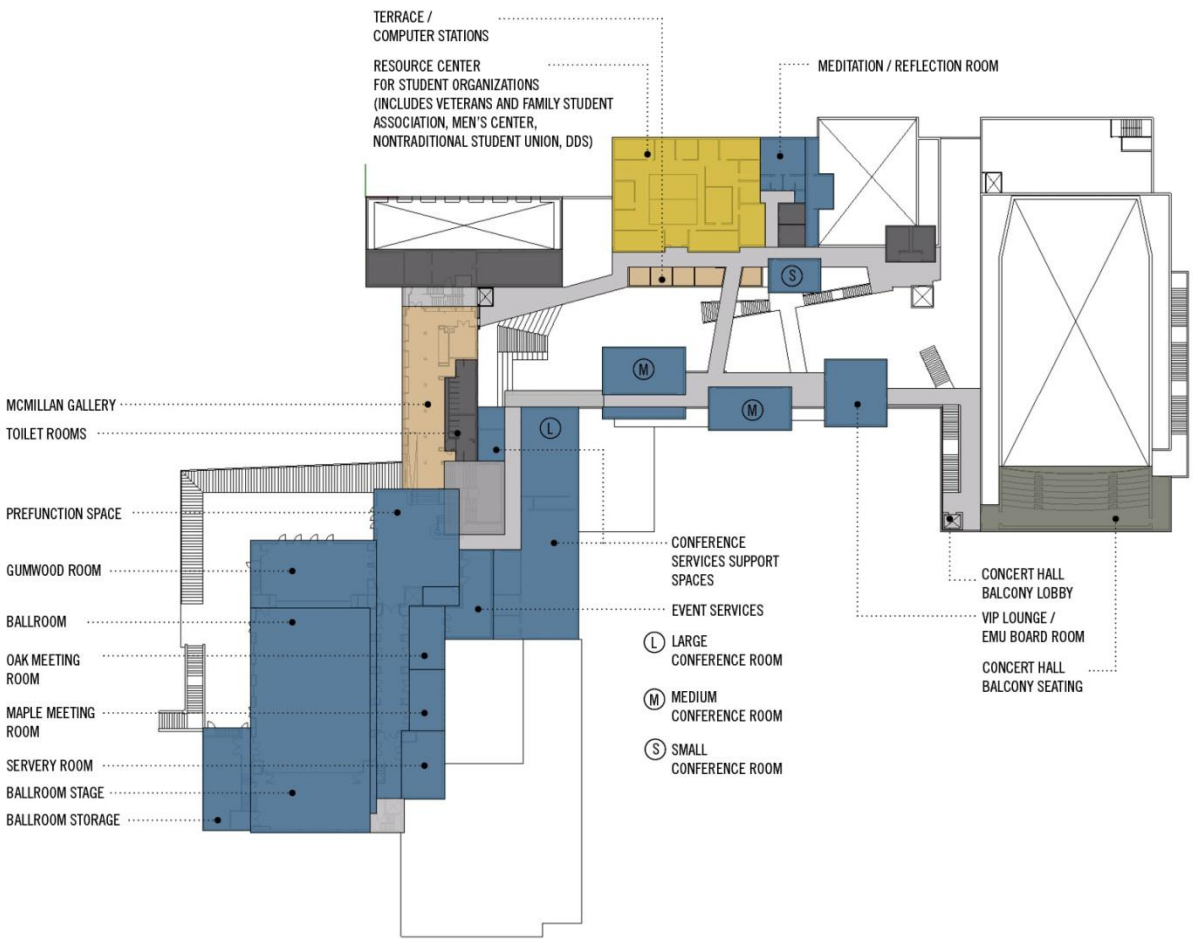

LEGEND

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- RECREATION SUITE
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- LOUNGE SPACES
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LEVEL 2 PLAN
BLOCK & STACK DIAGRAM @ EXISTING BUILDING

ERB MEMORIAL UNION
RENOVATION & EXPANSION
FEBRUARY 22, 2012

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LEGEND

- FOOD SERVICES ZONE
- RETAIL / TENANT ZONE
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- RECREATION SUITE
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- CONCERT HALL

LEVEL 3 PLAN
BLOCK & STACK DIAGRAM @ EXISTING BUILDING

ERB MEMORIAL UNION
RENOVATION & EXPANSION
FEBRUARY 22, 2012

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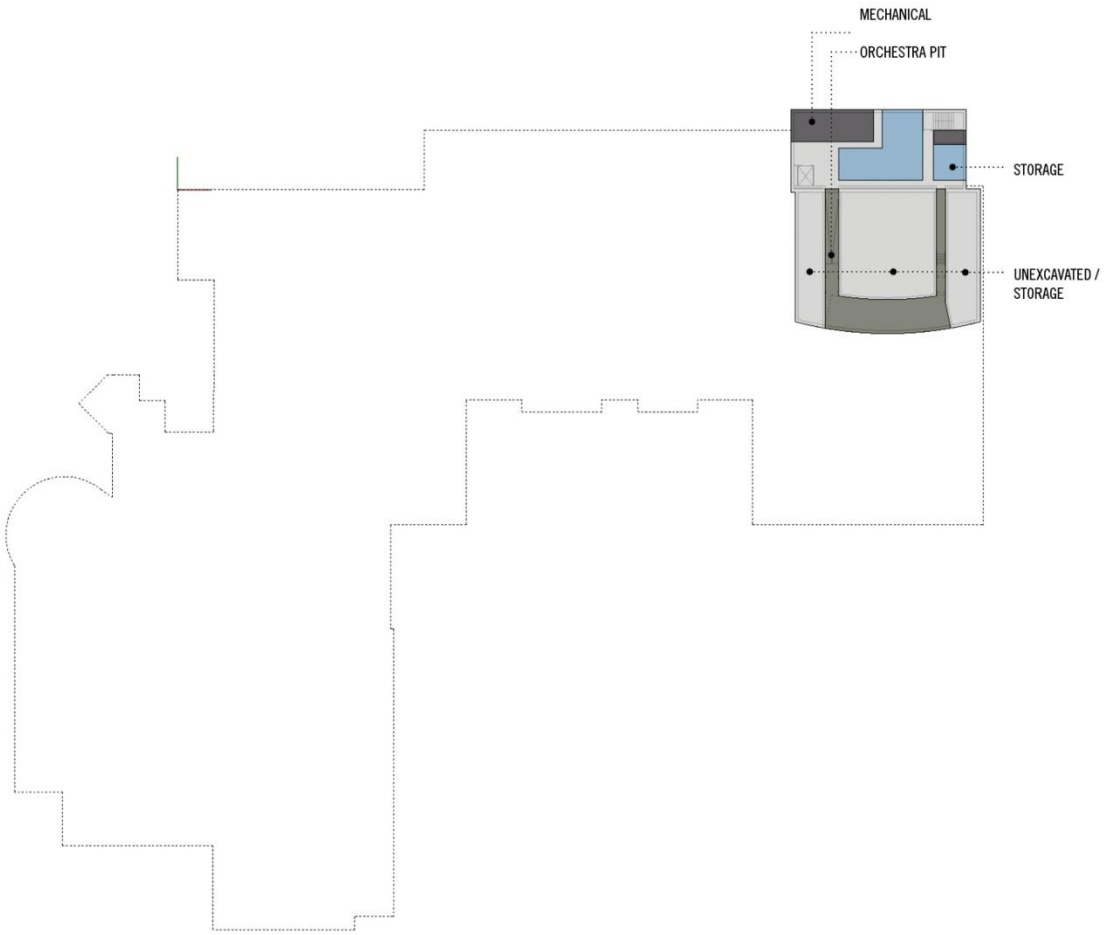

LEGEND

- FOOD SERVICES ZONE
- RETAIL / TENANT ZONE
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- RECREATION SUITE
- MEDIA SUITE
- LOUNGE SPACES
- CONFERENCE SERVICES ZONE
- UNION SUPPORT ZONE
- CONCERT HALL

BASEMENT / ORCHESTRA PIT PLAN
BLOCK & STACK DIAGRAM @ EXISTING BUILDING

ERB MEMORIAL UNION
RENOVATION & EXPANSION
FEBRUARY 22, 2012

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BLOCK & STACK DIAGRAM

- FOOD SERVICES ZONE
- RETAIL / TENANT ZONE
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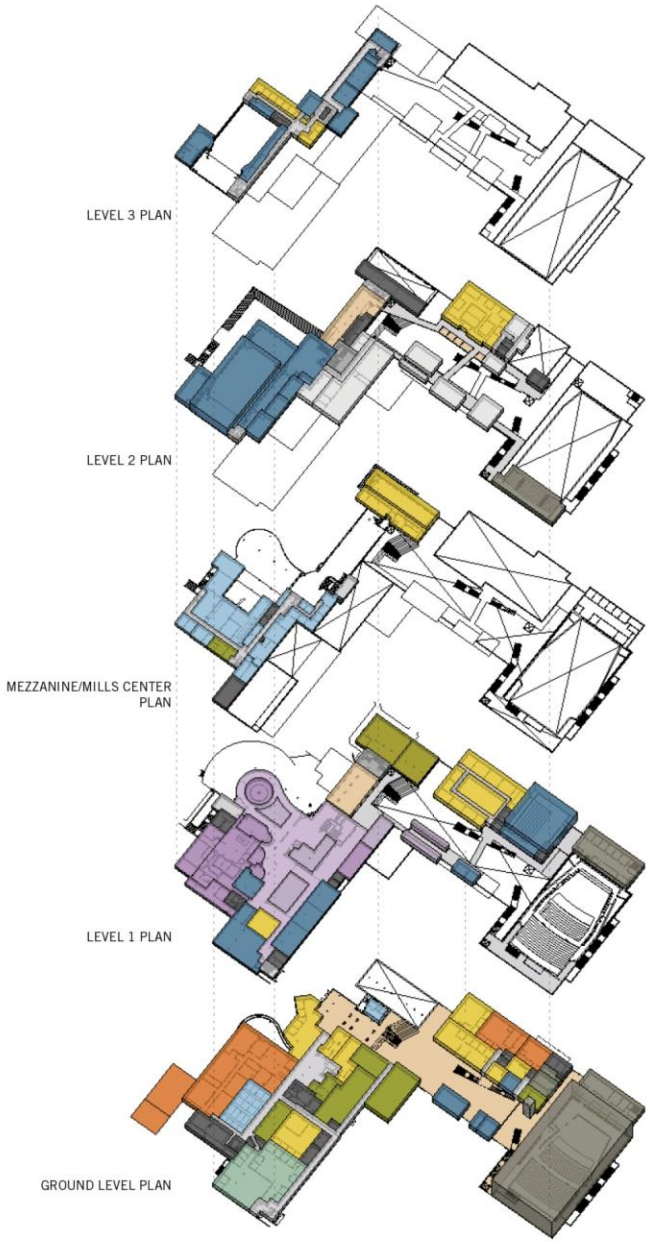
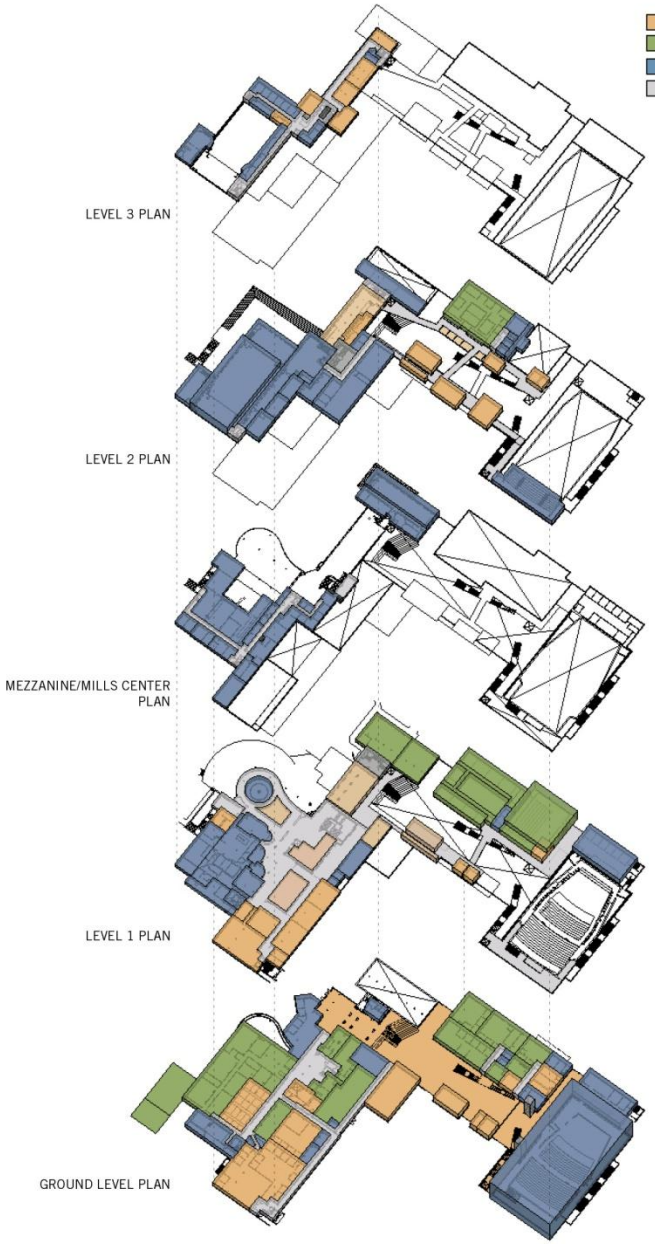


ERB MEMORIAL UNION
RENOVATION & EXPANSION
FEBRUARY 22, 2012

HOURS OF USE
BLOCK & STACK DIAGRAM

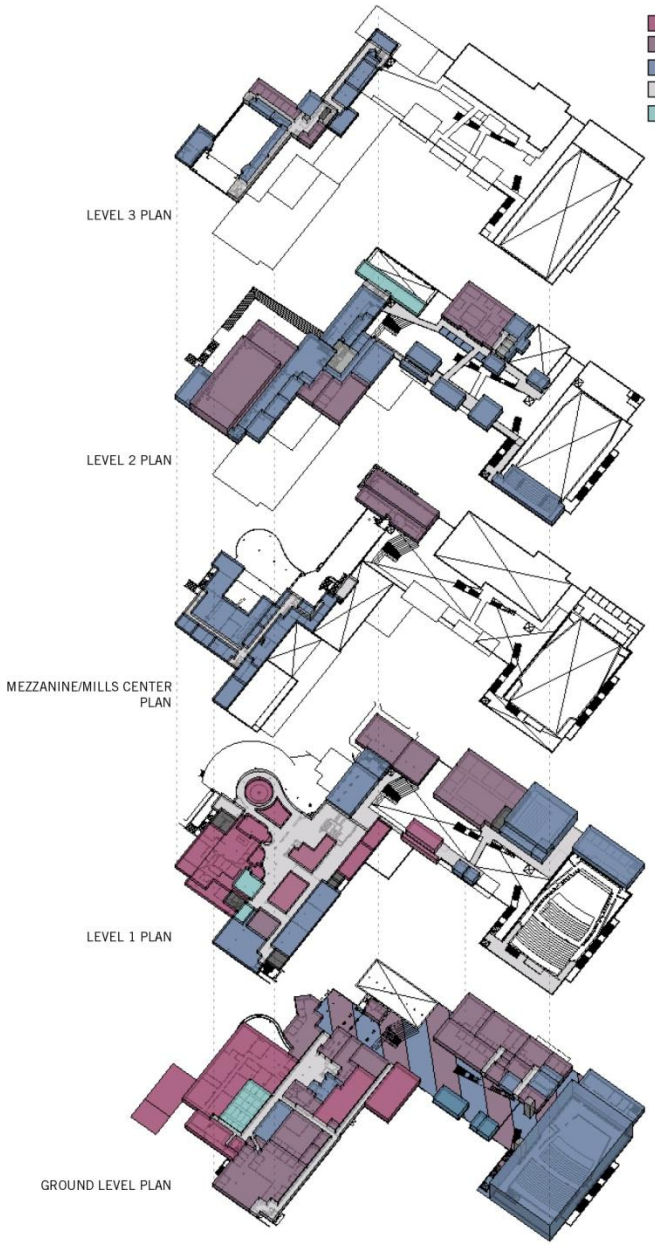
- 24 Hours
- 8am-2am
- 8am-5pm
- Circulation



ERB MEMORIAL UNION
RENOVATION & EXPANSION
FEBRUARY 22, 2012

ACOUSTICS
BLOCK & STACK DIAGRAM

- Noisy
- Mixed
- Quiet
- Circulation
- Storage



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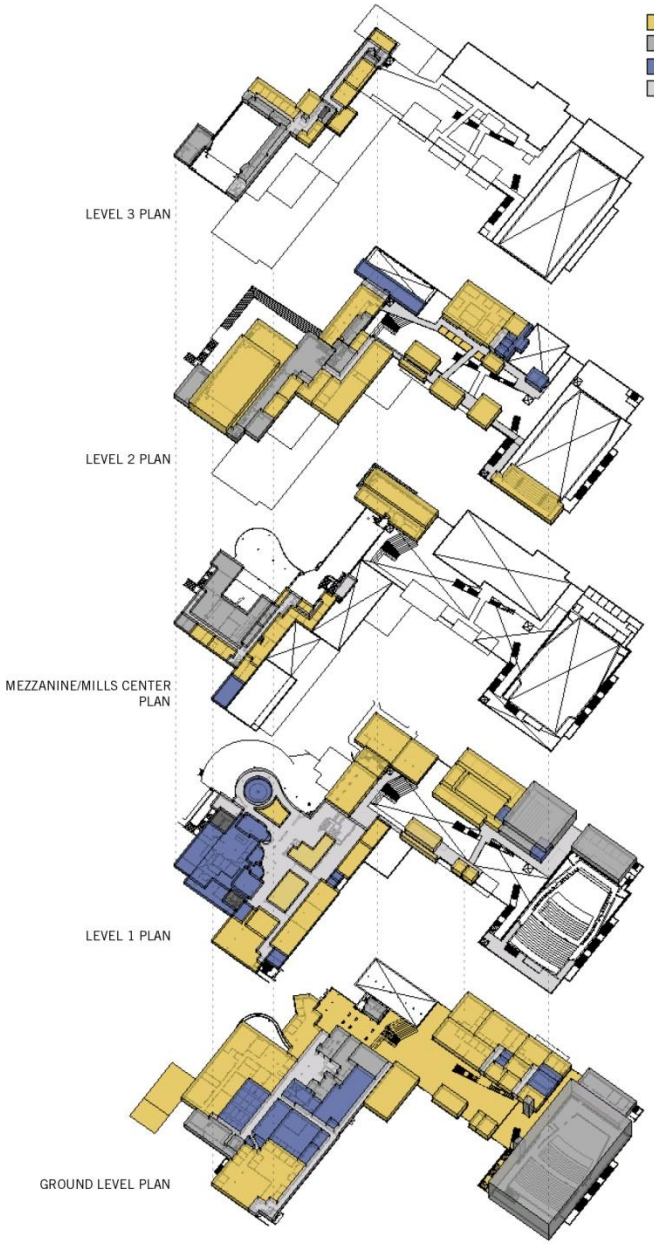
ERB MEMORIAL UNION
RENOVATION & EXPANSION
FEBRUARY 22, 2012

DAYLIGHT
BLOCK & STACK DIAGRAM

- Full Access to Daylight
- Partial Access to Daylight
- No Daylighting
- Circulation



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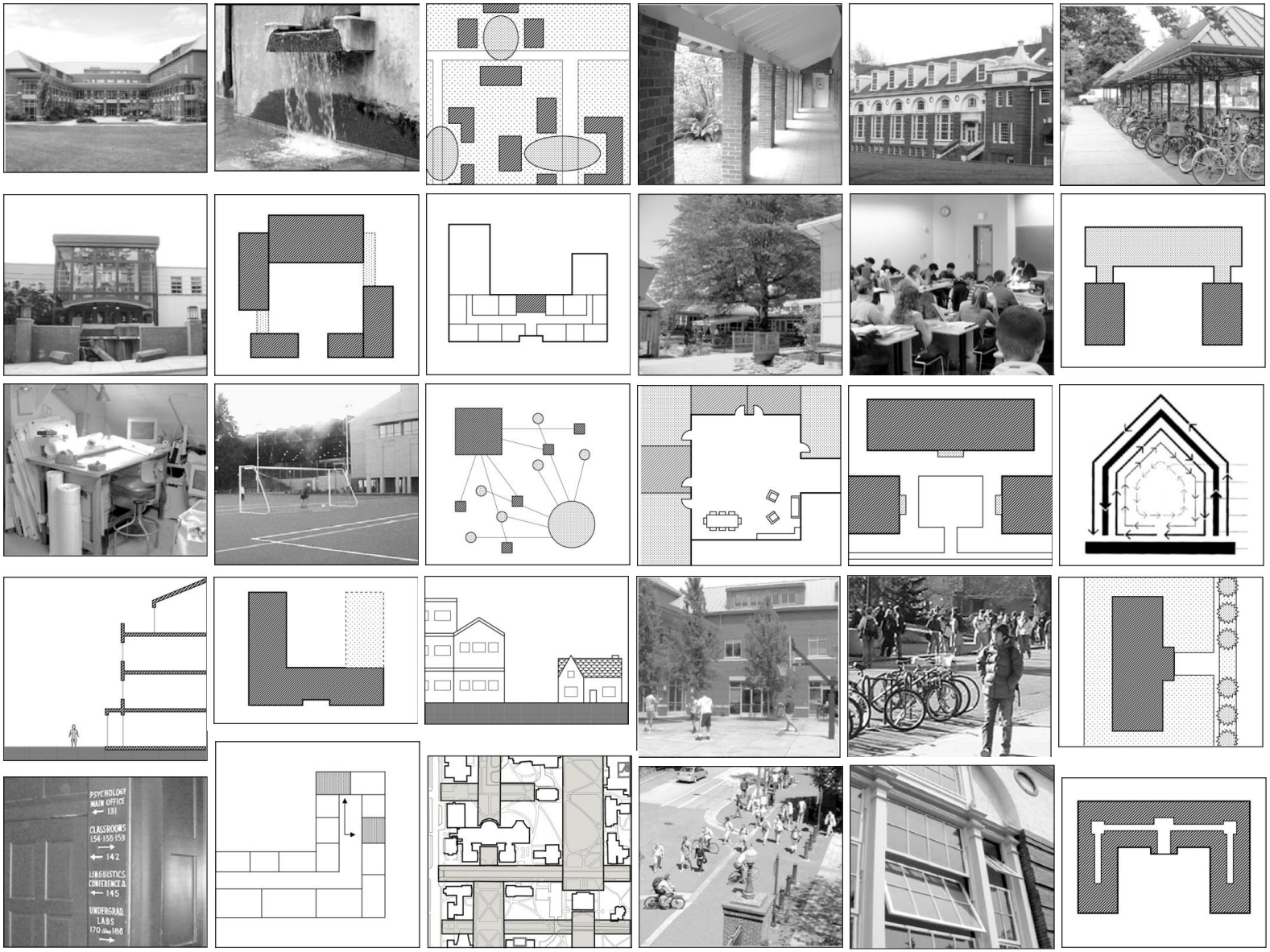
DESIGN UPDATE:
Daylighting

CAMPUS-WIDE PATTERNS



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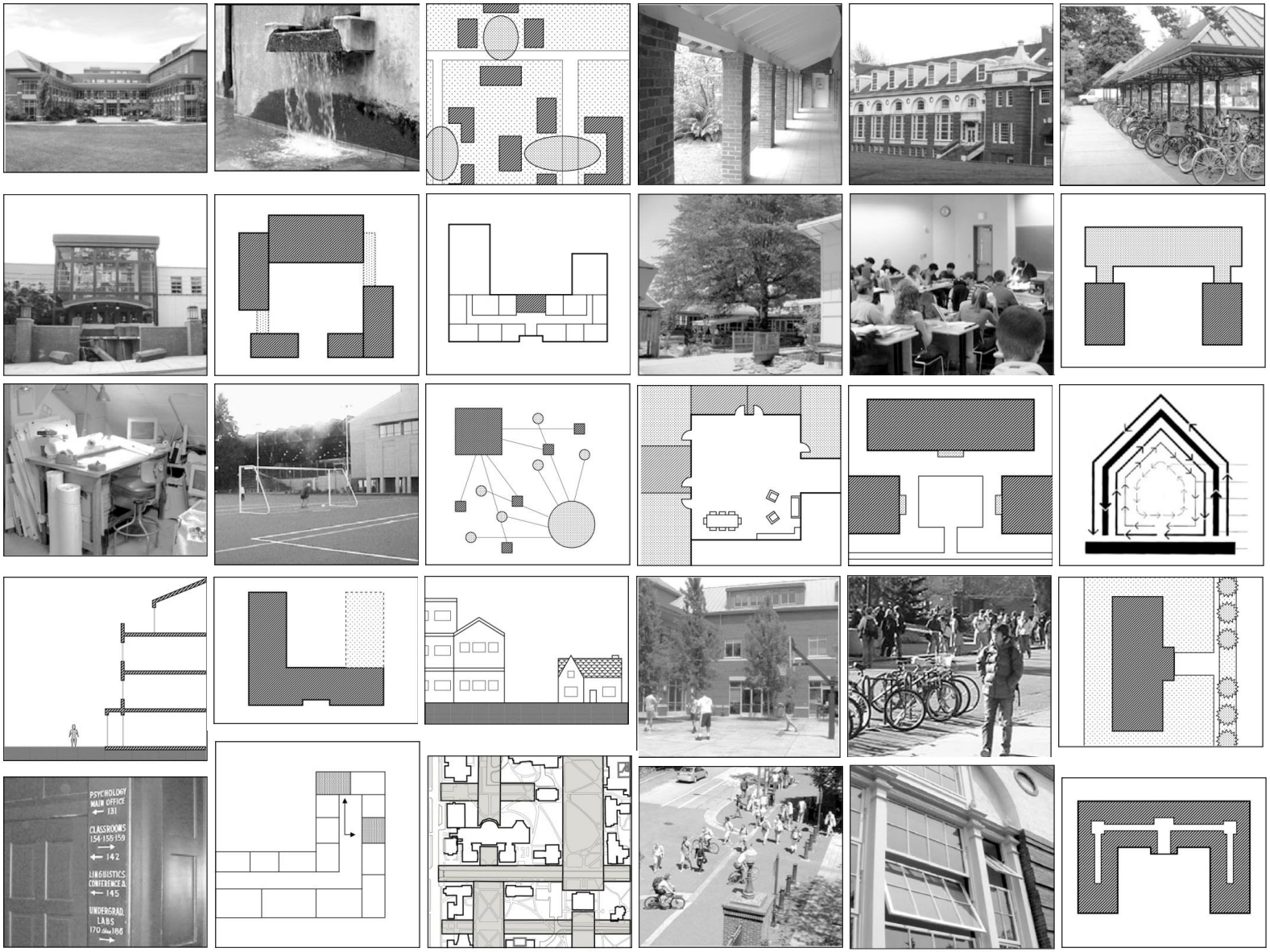
Wings of Light

CAMPUS-WIDE PATTERNS



Policy 11: Patterns
BUILDING DESIGN

Quality of Light
Provide ample opportunities for daylighting – provide appropriate shading and defusing device to eliminate glare

Wings of Light
Shape buildings in ways that allow natural light to penetrate far into their centers. Use architectural elements to bounce daylight even further into spaces.

DAYLIGHT: Window Form/Function

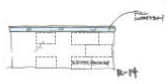
DAYLIGHT Comparisons

UO ERB MEMORIAL UNION
ATRIUM DAYLIGHTING STUDY
FEB. 13 2012

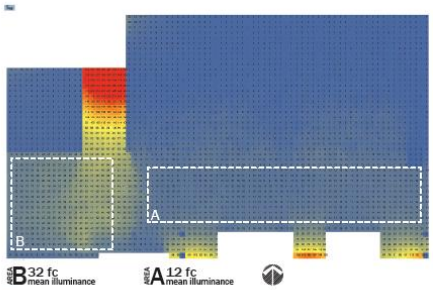
ATRIUM ILLUMINANCE: LEVEL 1
ALL NUMBERS SHOWN IN FOOTCANDLES
0 fc — 200 fc
DAYLIGHTING CALCULATIONS MODELED UNDER A CIE OVERCAST SKY ON MARCH 21 AT NOON. MEASUREMENTS TAKEN 30" ABOVE FLOOR HEIGHT

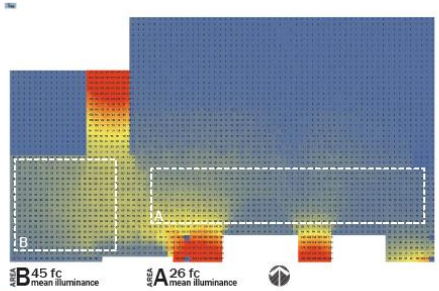
FULL CONFERENCE ROOMS

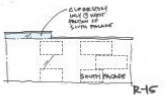
FEWER CONFERENCE ROOMS



R14
FULL CLERESTORY







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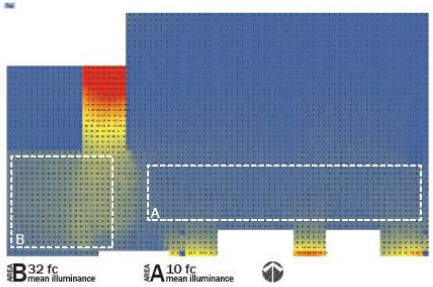
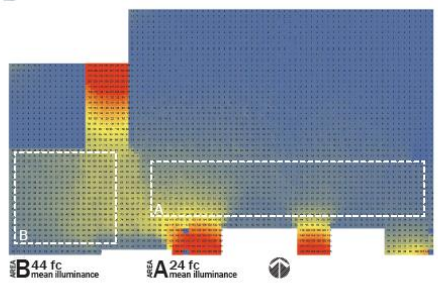
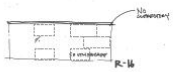
WEST CLERESTORY







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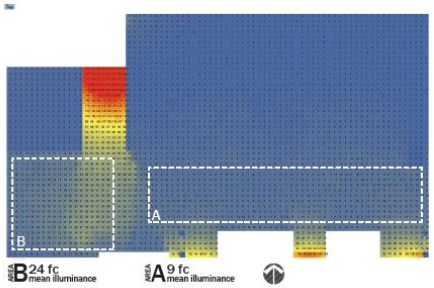
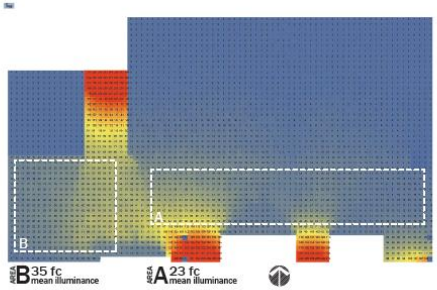
NO CLERESTORY





DAYLIGHT Comparisons

UO ERB MEMORIAL UNION
ATRIUM DAYLIGHTING STUDY
FEB. 13 2012

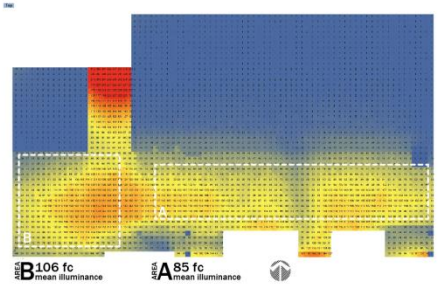
ATRIUM ILLUMINANCE: LEVEL 1
ALL NUMBERS SHOWN IN FOOTCANDLES
0 fc — 200 fc

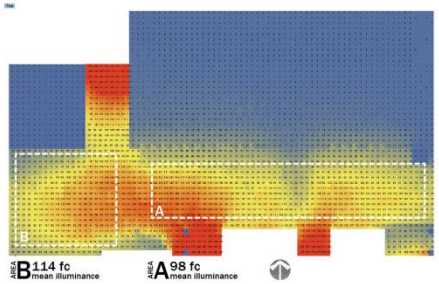
DAYLIGHTING CALCULATIONS MODELED UNDER A CIE OVERCAST SKY ON MARCH 21 AT NOON. MEASUREMENTS TAKEN 30" ABOVE FLOOR HEIGHT

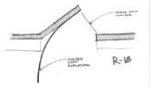
FULL CONFERENCE ROOMS

FEWER CONFERENCE ROOMS

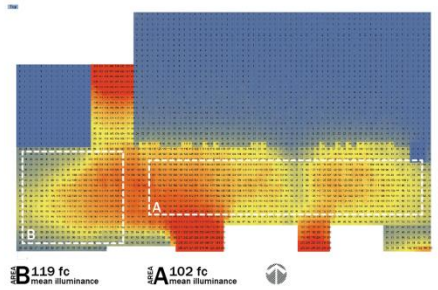
R17
SKYLIGHT WITH N. FACING MONITOR







R18
SKYLIGHT WITH N. FACING MONITOR & LIGHT REFLECTOR



DAYLIGHT Comparisons

UO ERB MEMORIAL UNION N. FACADE / ATRIUM DAYLIGHTING STUDY FEB. 15 2012

ALL STUDIES ON THIS PAGE MODELLED WITH THE FOLLOWING CONDITIONS:

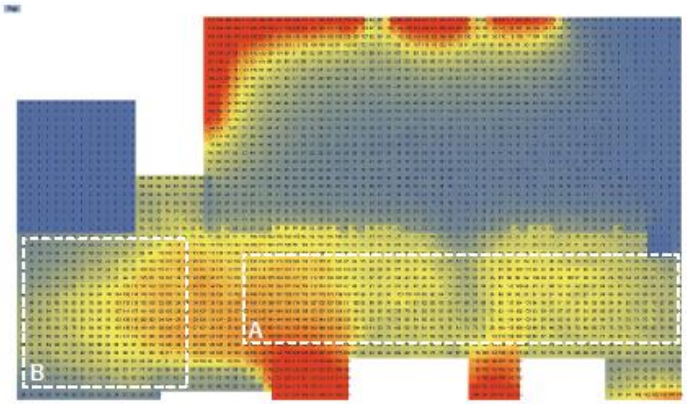
ROOF

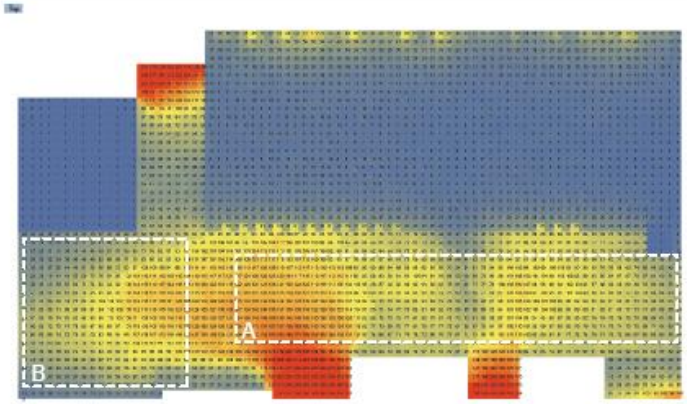
S. FACADE

NORTH FACADE
OPTION 1

NORTH FACADE
OPTION 2

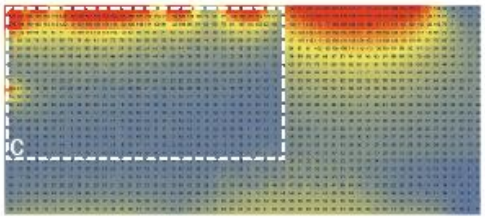
LVL 1



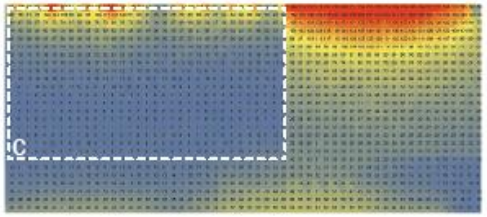


LVL 2

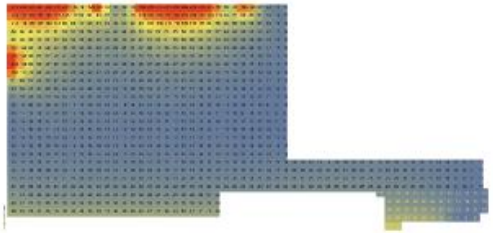
AREA A 92 fc mean illuminance
AREA B 82 fc mean illuminance
AREA C 52 fc mean illuminance

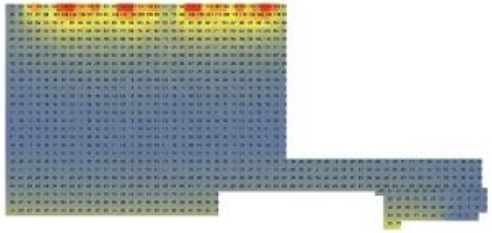


AREA A 91 fc mean illuminance
AREA B 78 fc mean illuminance
AREA C 24 fc mean illuminance



LVL 3





ILLUMINANCE
ALL NUMBERS SHOWN
IN FOOTCANDLES

0 fc — 200 fc

DAYLIGHTING CALCULATIONS MODELED UNDER A CIE OVERCAST SKY ON MARCH 21 AT NOON. MEASUREMENTS TAKEN 30" ABOVE FLOOR HEIGHT

DAYLIGHT Comparisons

UO ERB MEMORIAL UNION N. FACADE / ATRIUM DAYLIGHTING STUDY FEB. 15 2012

ALL STUDIES ON THIS PAGE MODELLED WITH THE FOLLOWING CONDITIONS:

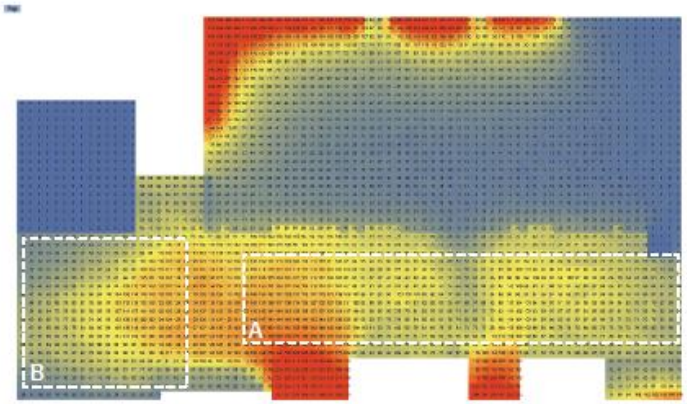
ROOF

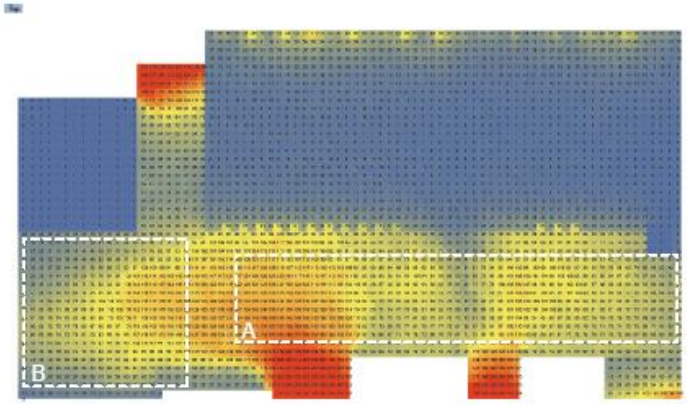
S. FACADE

NORTH FACADE
OPTION 1

NORTH FACADE
OPTION 2

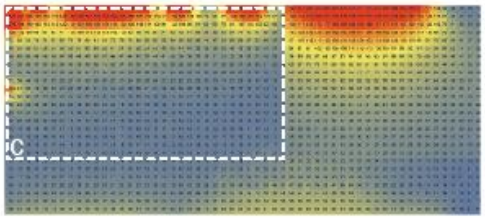
LVL 1





LVL 2

AREA A 92 fc mean illuminance
AREA B 82 fc mean illuminance
AREA C 52 fc mean illuminance



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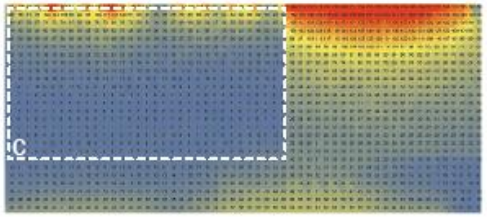
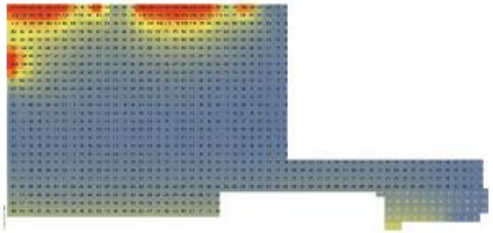
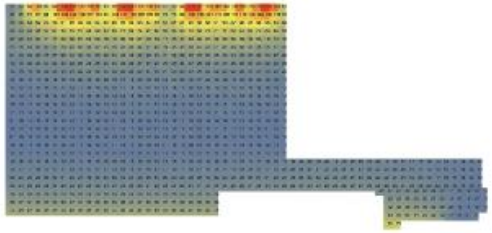


LVL 3





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ROOF

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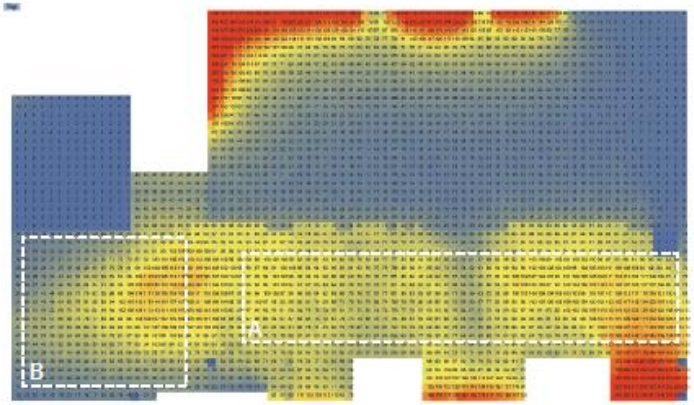
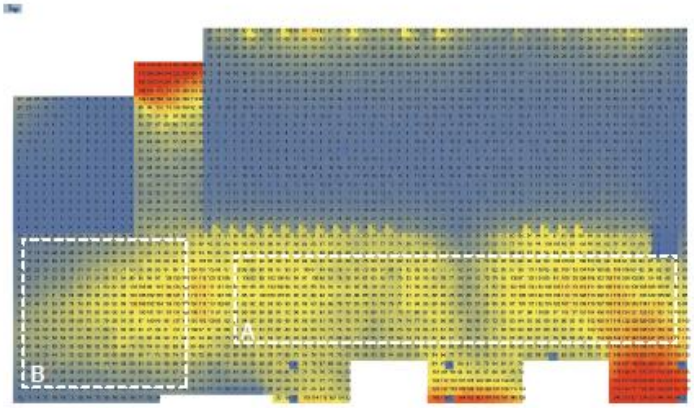
NORTH FACADE OPTION 1

NORTH FACADE OPTION 2

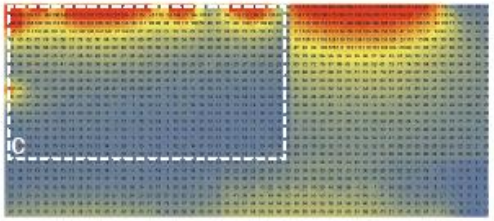
LVL 1



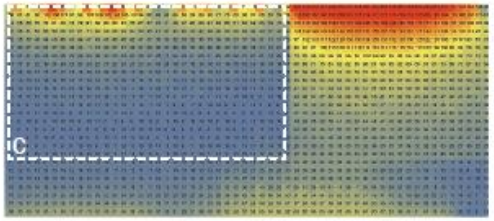


LVL 2

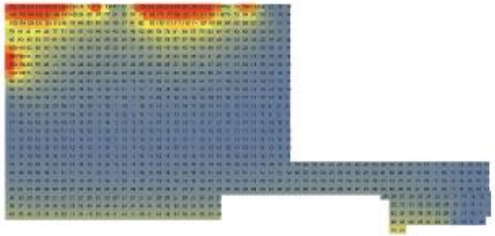
AREA A 87 fc mean illuminance
AREA B 68 fc mean illuminance
AREA C 52 fc mean illuminance

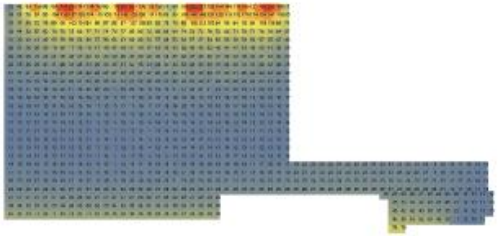


AREA A 86 fc mean illuminance
AREA B 65 fc mean illuminance
AREA C 29 fc mean illuminance



LVL 3





ILLUMINANCE
ALL NUMBERS SHOWN
IN FOOTCANDLES

0 fc — 200 fc

DAYLIGHTING CALCULATIONS MODELED UNDER A CIE OVERCAST SKY ON MARCH 21 AT NOON. MEASUREMENTS TAKEN 30" ABOVE FLOOR HEIGHT

DAYLIGHT Comparisons

UO ERB MEMORIAL UNION N. FACADE / ATRIUM DAYLIGHTING STUDY FEB. 16 2012

ALL STUDIES ON THIS PAGE MODELLED WITH THE FOLLOWING CONDITIONS:

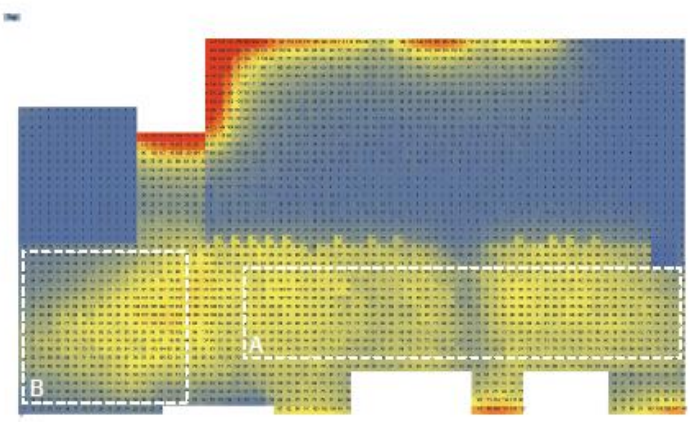
ROOF

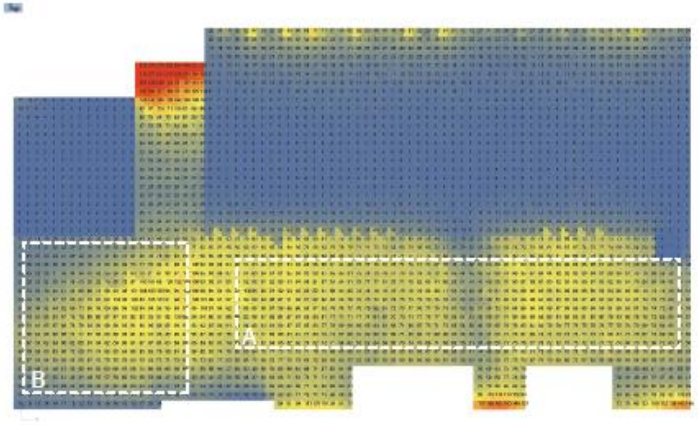
S. FACADE

NORTH FACADE OPTION 1

NORTH FACADE OPTION 2

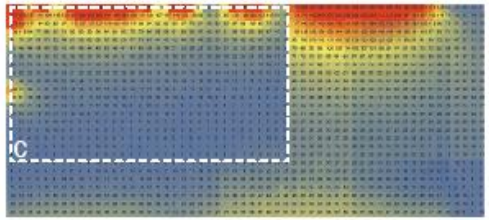
LVL 1



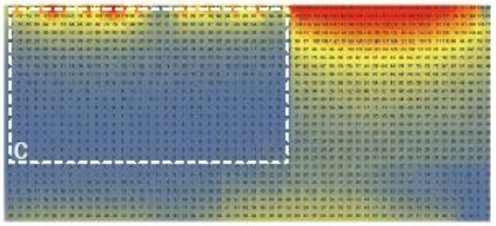


LVL 2

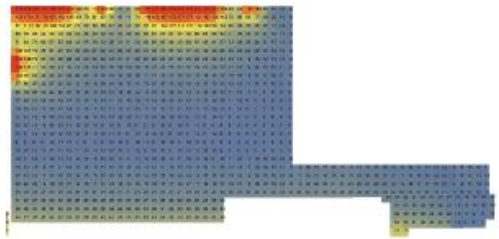
AREA A 74 fc mean illuminance
AREA B 70 fc mean illuminance
AREA C 42 fc mean illuminance

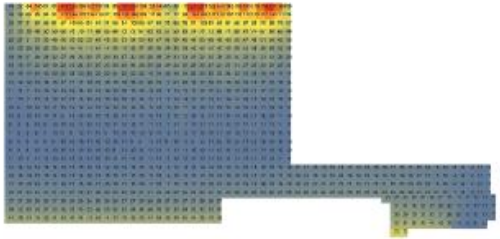


AREA A 74 fc mean illuminance
AREA B 67 fc mean illuminance
AREA C 23 fc mean illuminance



LVL 3





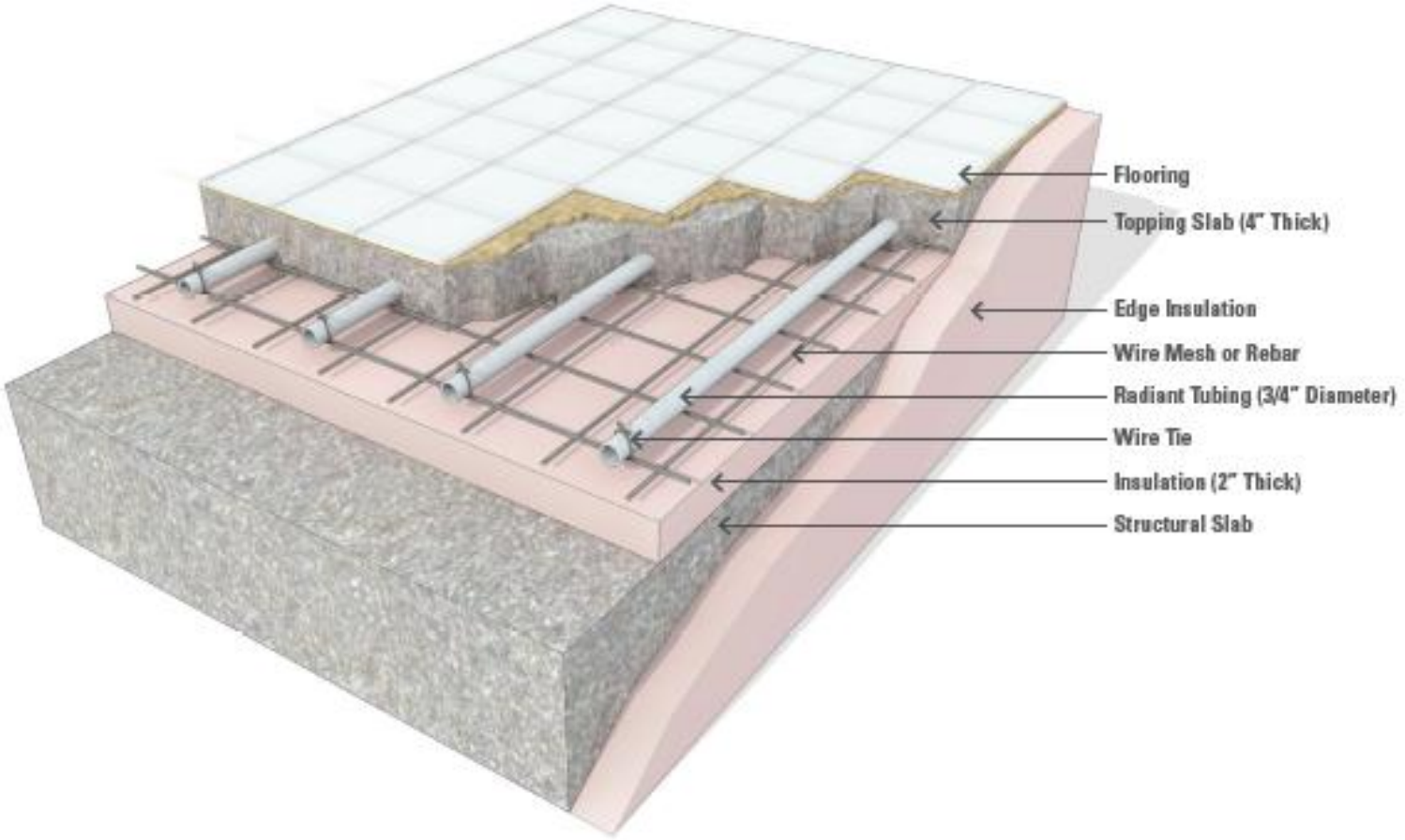
ILLUMINANCE
ALL NUMBERS SHOWN
IN FOOTCANDLES

0 fc — 200 fc

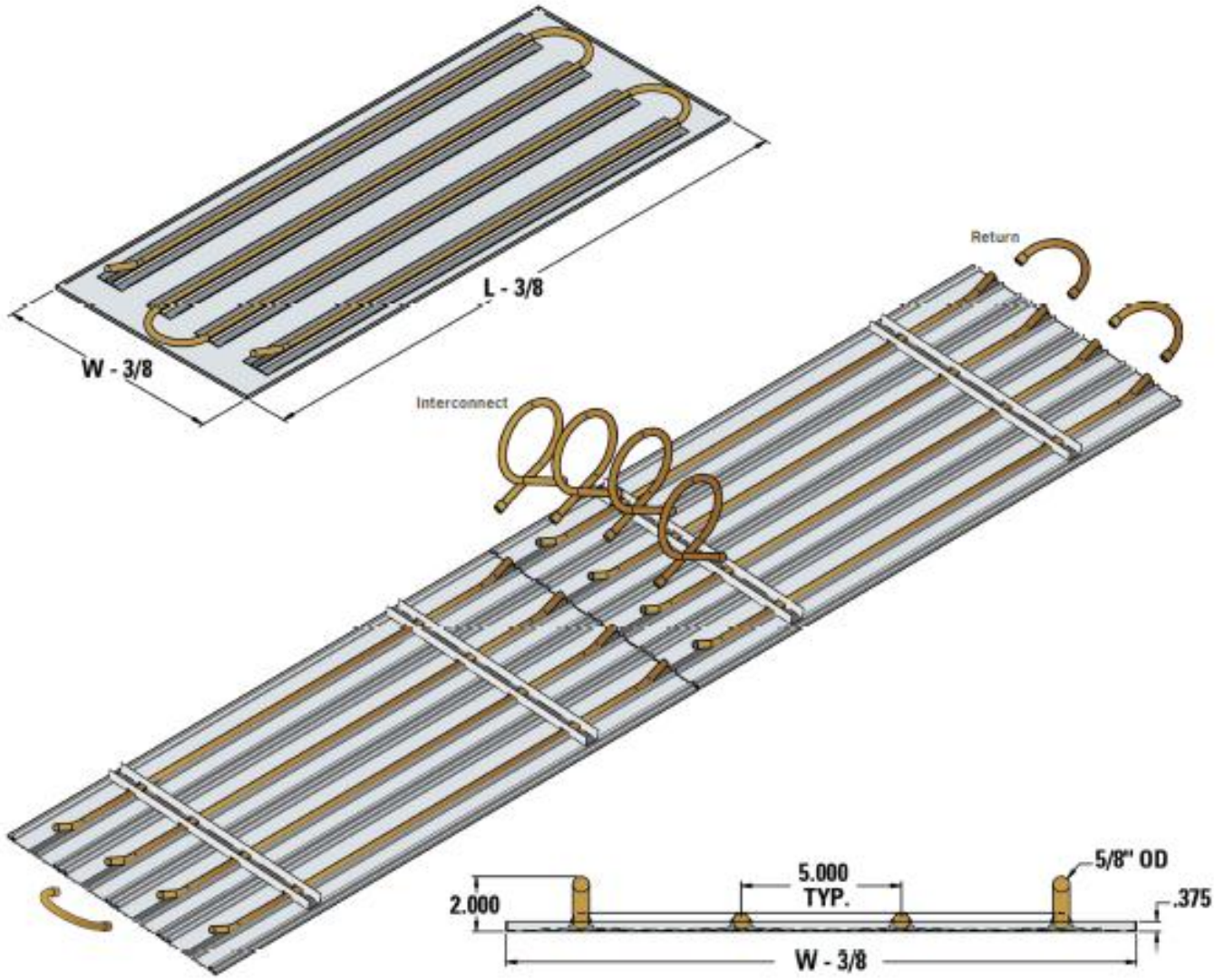
DAYLIGHTING CALCULATIONS MODELED UNDER A CIE OVERCAST SKY ON MARCH 21 AT NOON. MEASUREMENTS TAKEN 30" ABOVE FLOOR HEIGHT

Mechanical System

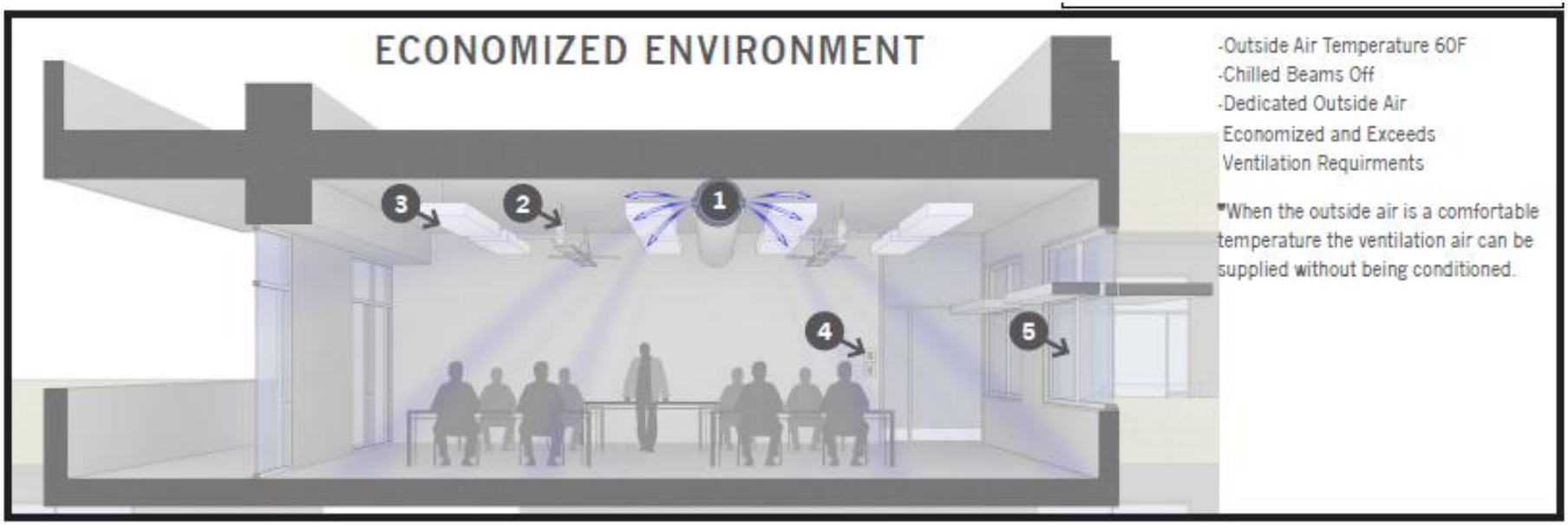
In-SLAB RADIANT



PASSIVE CHILLED PANELS



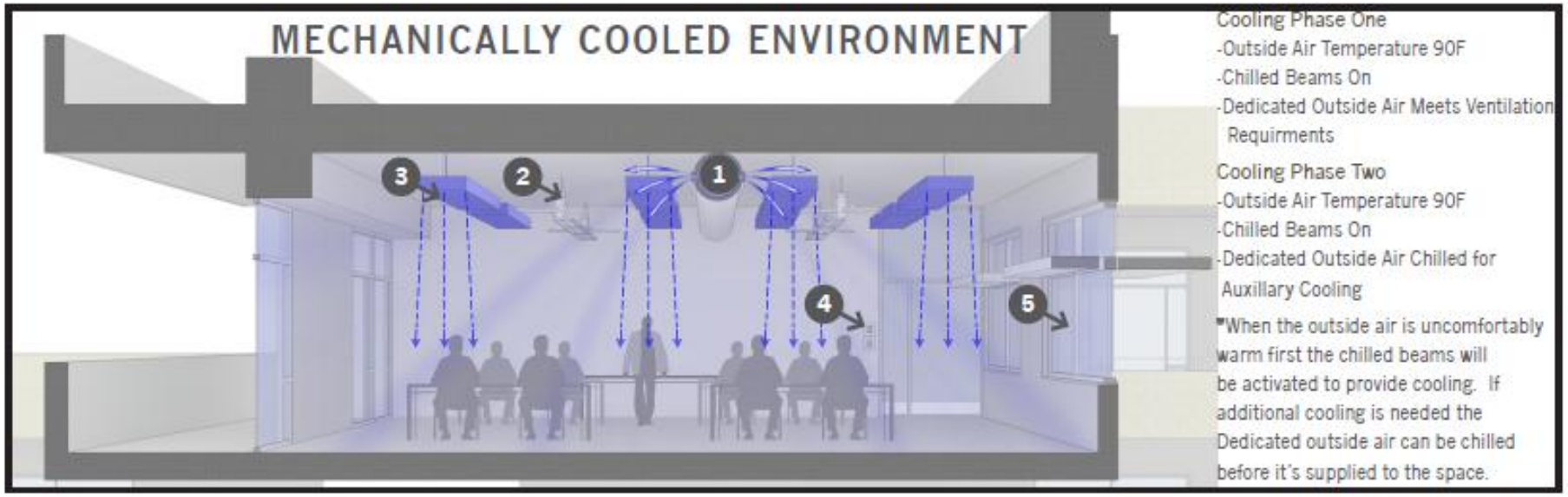
ECONOMIZED ENVIRONMENT



LEGEND

1. Dedicated Ventilation Air Duct
2. Ceiling Fan
3. Passive Chilled Beam
4. Occupant Controls for Mechanical Cooling and Fans
5. Operable Windows

MECHANICALLY COOLED ENVIRONMENT



LEGEND

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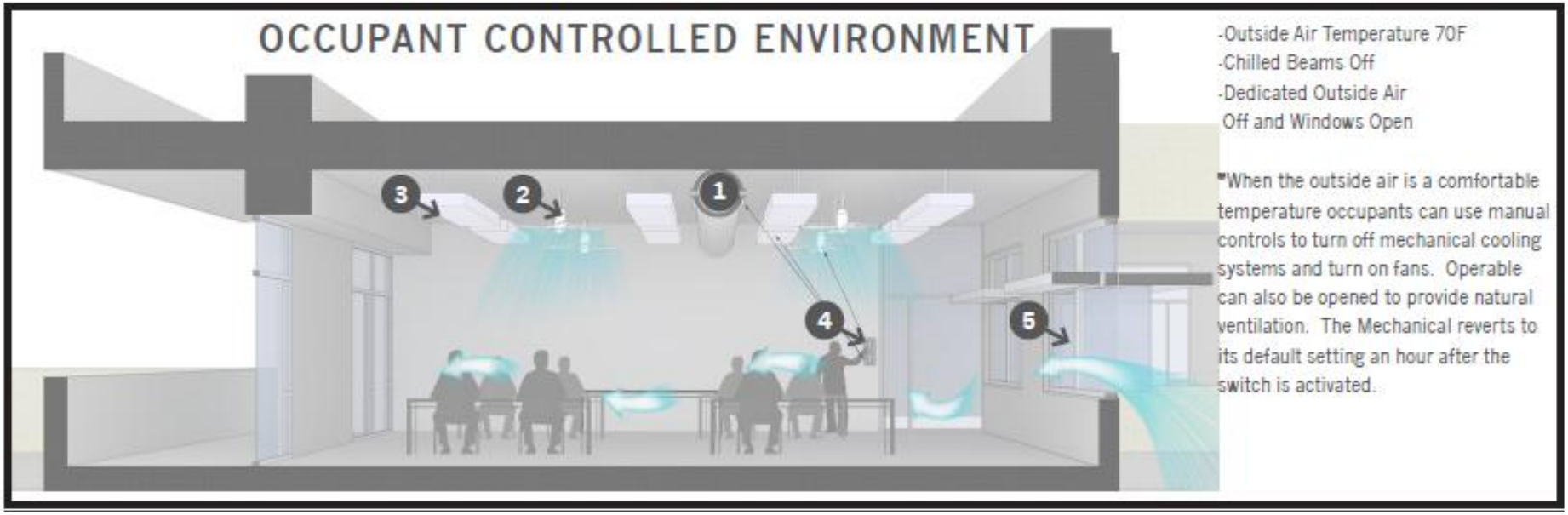
ECONOMIZED ENVIRONMENT



LEGEND

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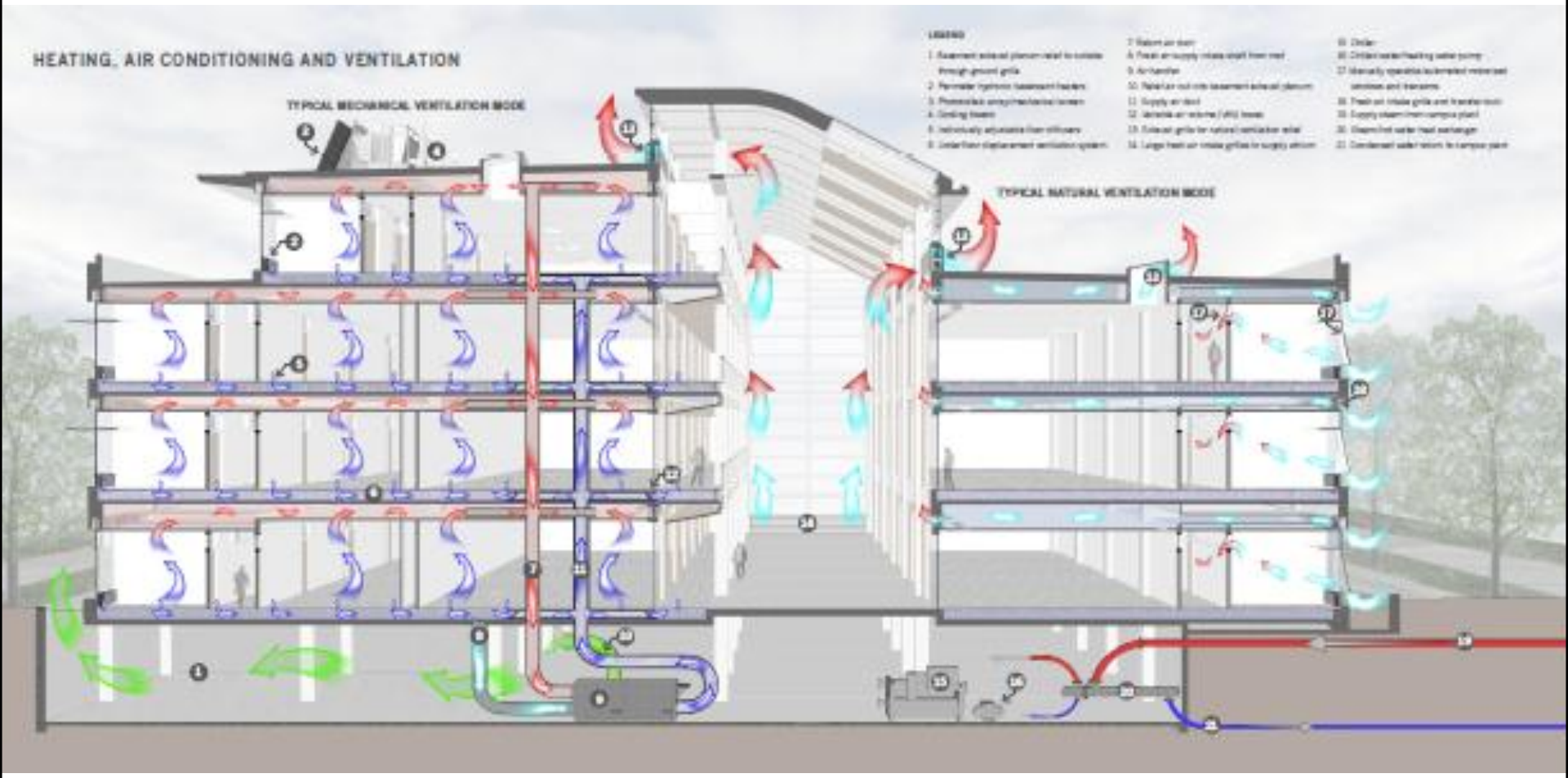
Example – KELLY ENGINEERING

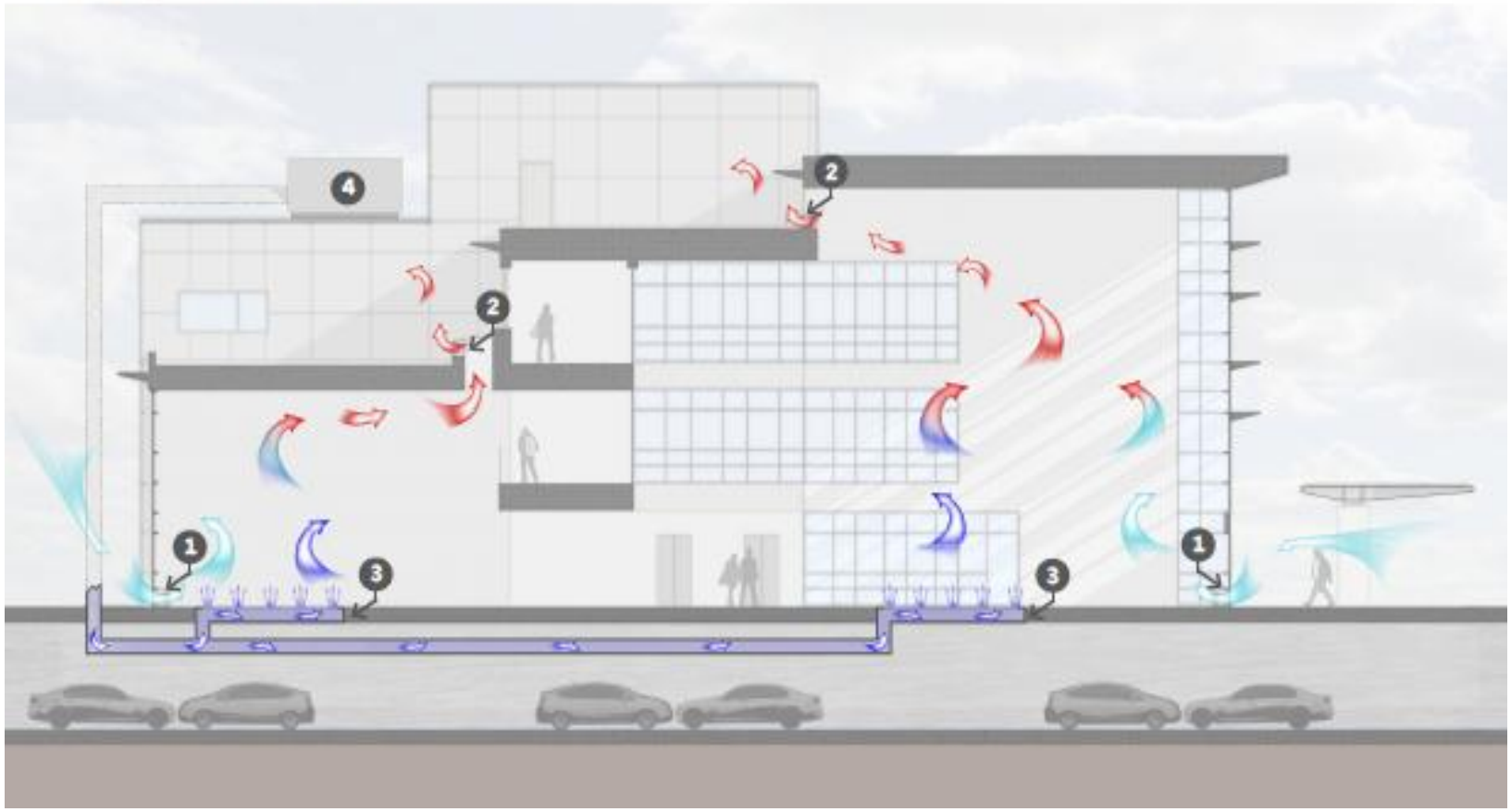


Example – NORTH MALL OFFICE

Natural Ventilation in the State of Oregon North Mall Office Building

LEGEND

1. Natural Ventilation Inlet Integrated into Perimeter Bench
2. Natural Ventilation Relief Integrated Into South Facing Skylight and Clear-story Windows
3. Relief air from Office Space AHU Recirculated in Atrium Through Floor Diffusers
4. Office Space AHU with Relief Air Ducted to Atrium



SEED

SEED Process

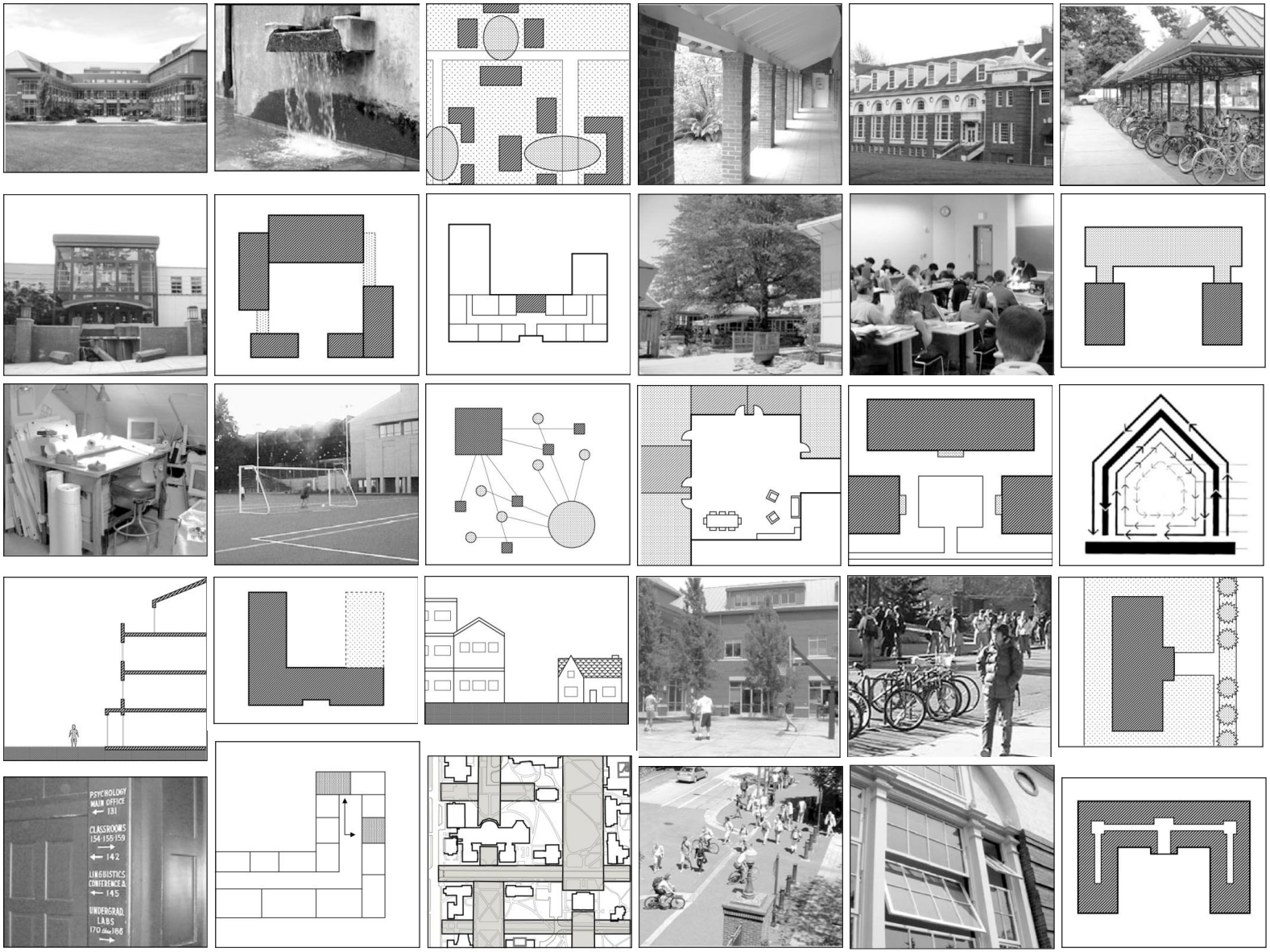
1	**Project Name: O of U Erb Memorial Union Renovation and Addition**						
2	**E100 Envelope**						
3	**Status Code**						
4	**B**	**A**	**N/A**	**ECM#**	**Potential ECMs**	**Base Bid**	**ECM Description**
5				**E110**	**Reduce Heat Losses**		
6		x		E111	Ceiling/roof insulation	Rigid board (R-30) inverted membrane	R-38 or greater
7	x			E112	Wall insulation	R-15 continuous rainscreen system	
8	x			E113	Floor/slab insulation	R-10 continuous	
9			x	E114	Fan penthouse insulation		
10		x		E115	Windows:	U=.35, SHGC = .32 (35% Vision Glass)	30% Glass
11	x			A	Thermal break in metal window frames	Aluminum	Avoid Spandrel glass - eliminate th bridging, fiberglass
12			x	C	Argon gas-filled glazing panels	No	
13	x			D	High-performance low-e (e = 0.05) coating	Yes -	possibly tune tune based on balan
14	x			E	Tinted glazing or reflective coatings	Verify SolarBan 70	Tuned per elevation per floor level
15							
16				**E120**	**Reduce Heat Gain**		
17	x			E121	Architectural shading and overhangs	Required for south, west	SAGE Glass versus equipment siz
18	x			E122	Window sizing and orientation	35% vision glass main building, 25% Concert hall + 10% clerestory	
19	x	x		E123	Cool roof, green roof	Cool roof - base bid. Green roof -Alternate not in base bid	
20							
21				**E130**	**Reduce Infiltration**		
22	x			E131	Seal openings at penetrations of building envelope		
23		x		E132	Air-lock vestibule or revolving doors	Not currently in base (appeal required)	
24							
25				**E190**	**Other Envelope Measures**		
26		x			Model transitional space with and without insulation		
27							
28							

SEED Analysis

ANALYSIS	EXISTING	STUDENT UNION WING	CONCERT HALL
Optimize Insulation		x	x
Optimize % Glass		x	x
Glazing tuned by Elevation		x	x
Specialty Glass (Shading)		x	x
Green Roof		x	
Review Lighting Technology	x	x	x
Solar Hot Water	x	x	
Heat Recovery			
Tunnel	X	X	
Craft Center	X		
Kitchen	X		
Radiant	x	x	
Other Mechanical	x	x	
Kitchen Equipment	x	x	
Exhaust Hoods			

DESIGN UPDATE:
Materials

CAMPUS-WIDE PATTERNS



Policy 10: Patterns
SUSTAINABLE DEVELOPMENT

Bike Paths, Racks and Lockers

Flexibility and Longevity

Local Transport Area

Materials and Operations

Operable Windows

Pedestrian Pathways

Peripheral Parking

Quality of Light

Road Crossings

Site Repair

Sustainable Development

Use Wisely What We Have

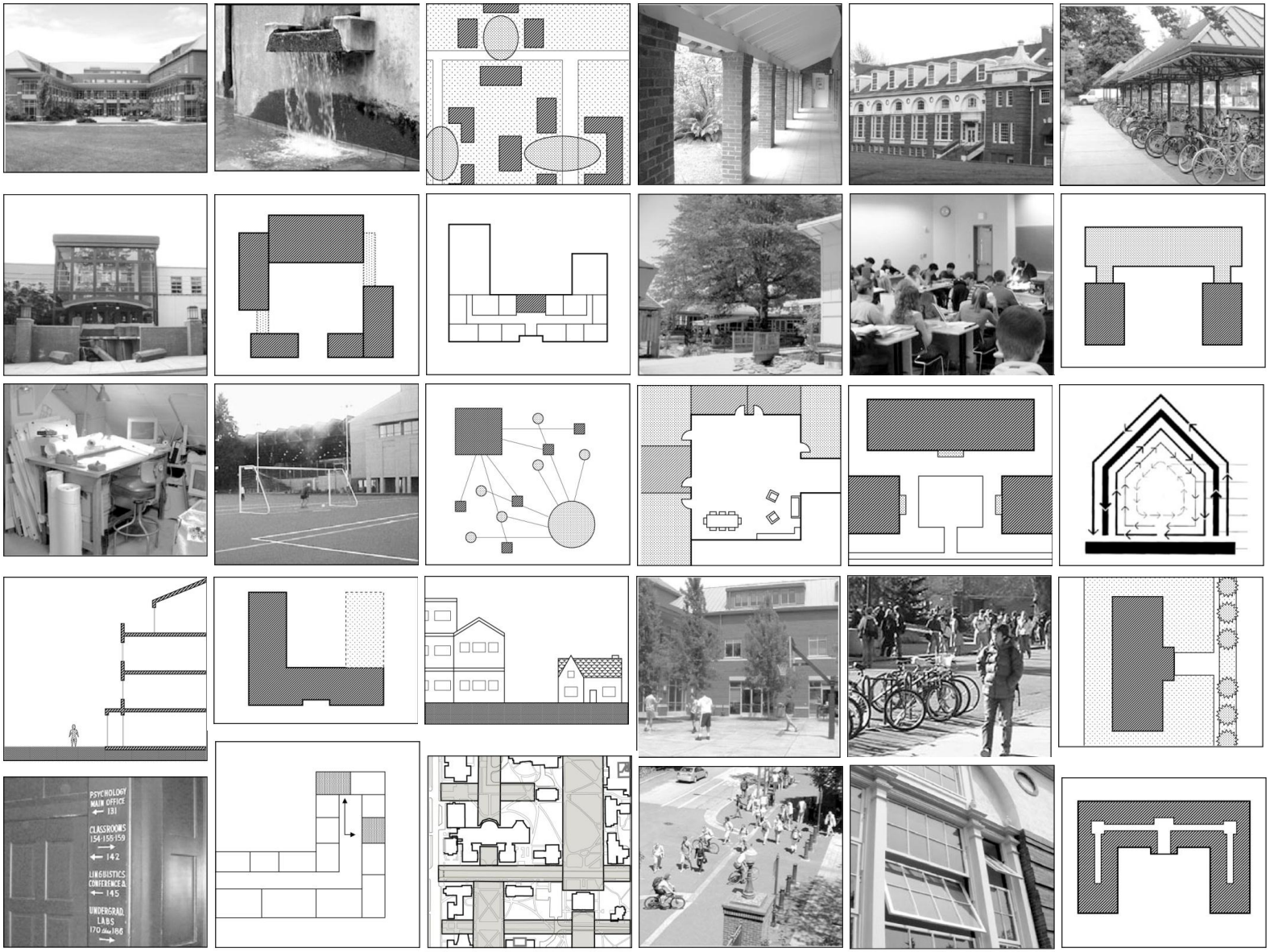
Tree Places

Water Quality

Wings of Light

Pools of Light

CAMPUS-WIDE PATTERNS

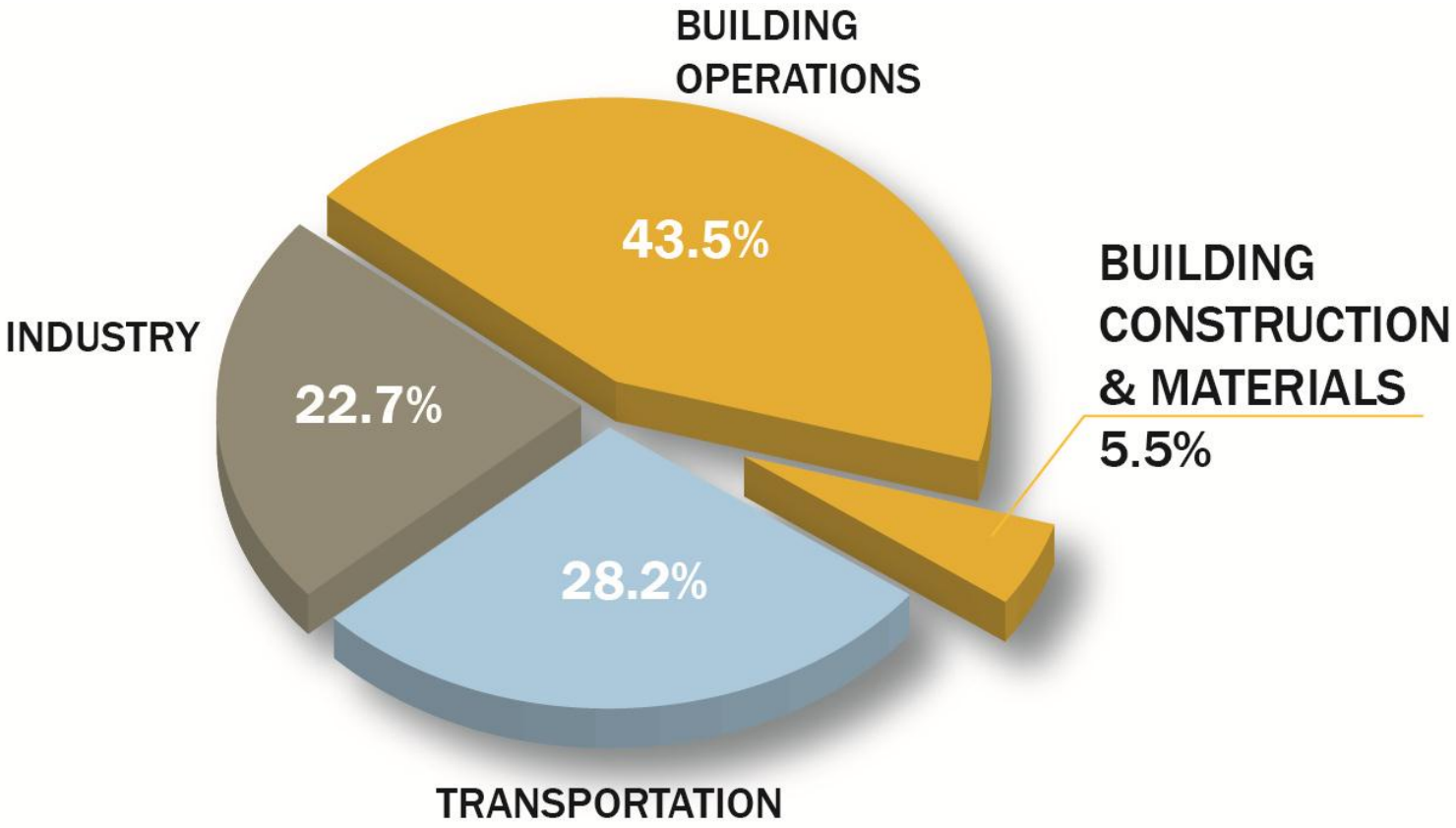


Policy 10: Patterns
SUSTAINABLE DEVELOPMENT

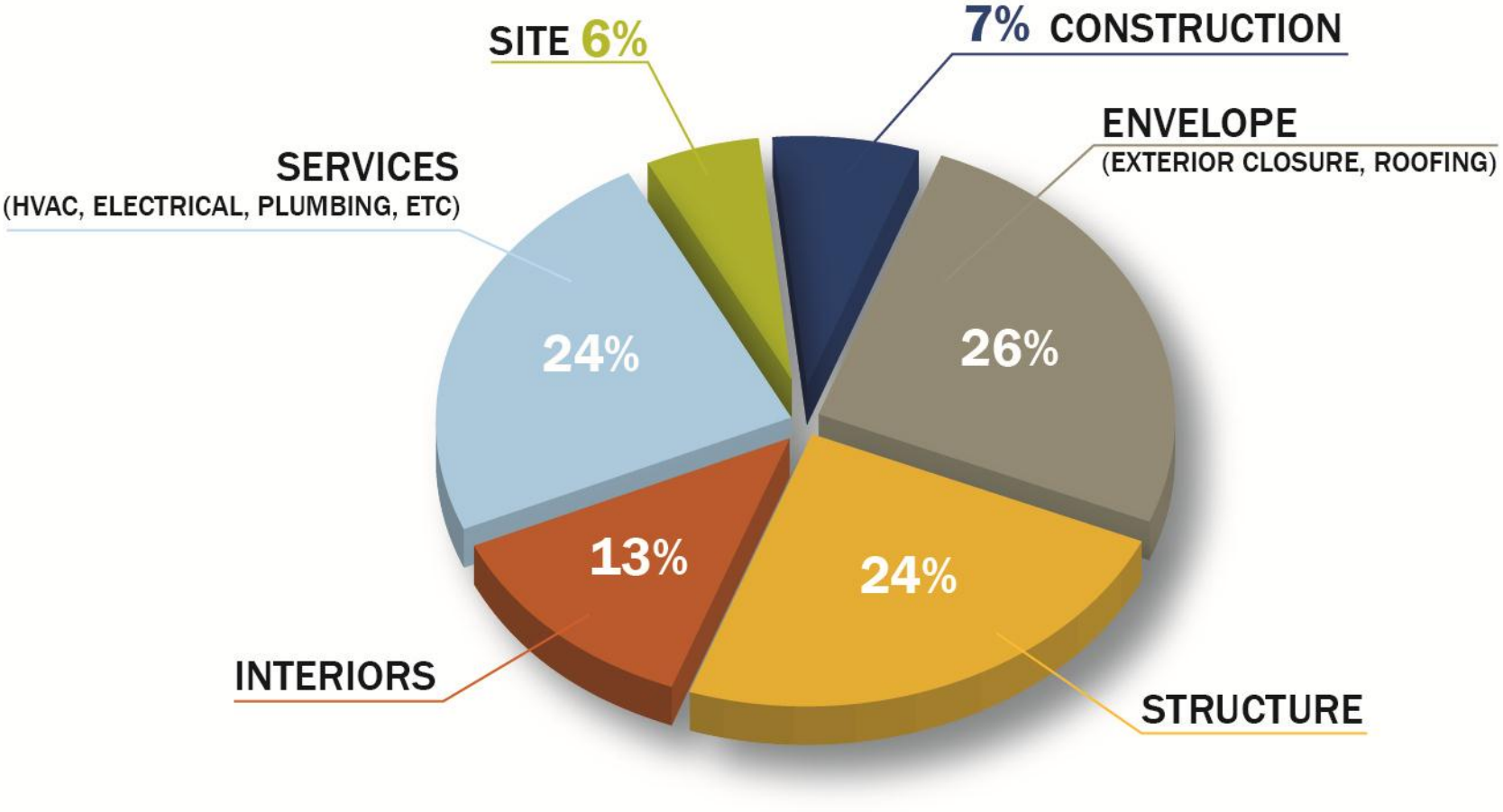
Materials and Operations

Designers should select materials that are easy to maintain and healthy, creating buildings that are energy efficiency and easy to add on to or modify later.

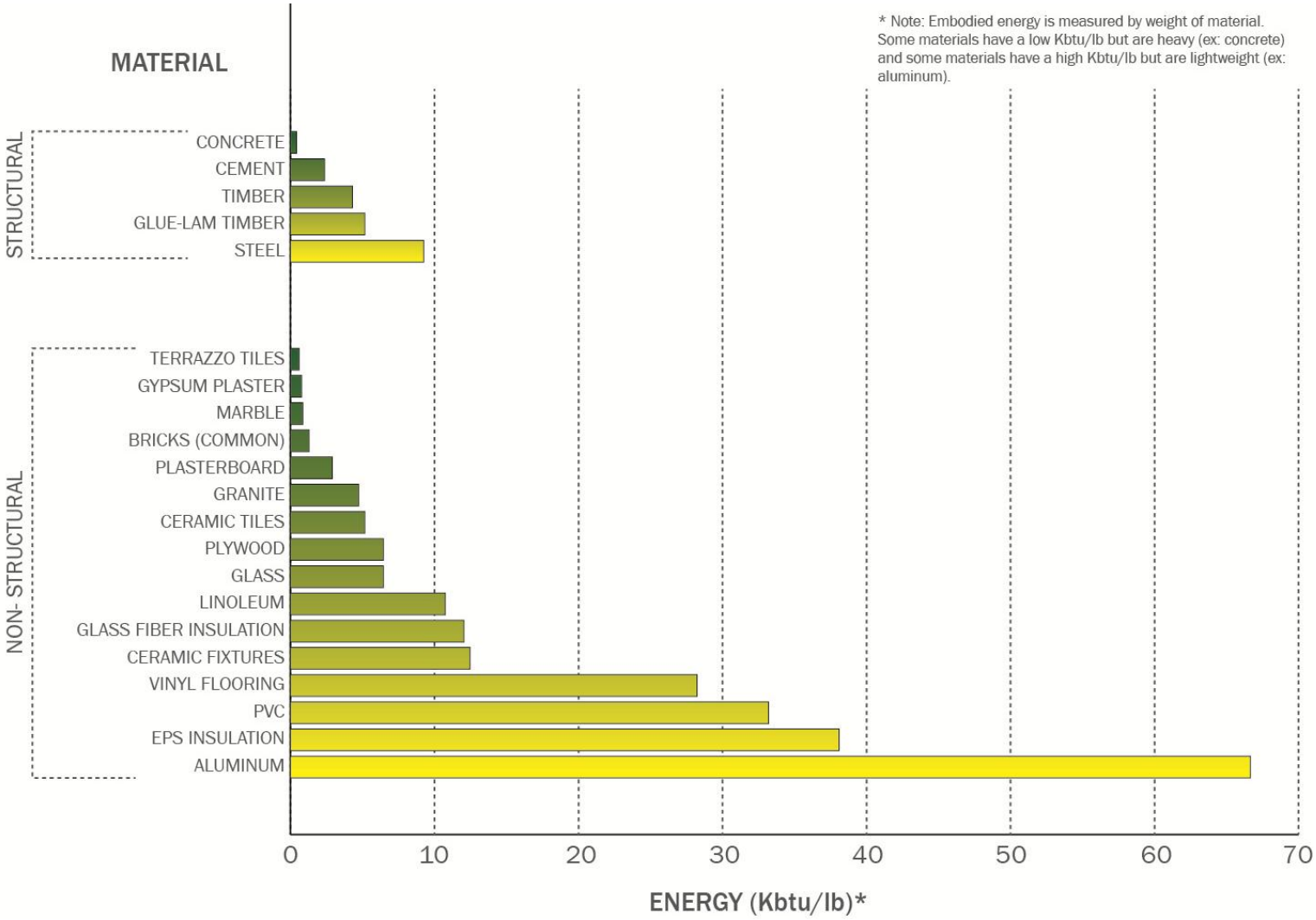
EMBODIED ENERGY



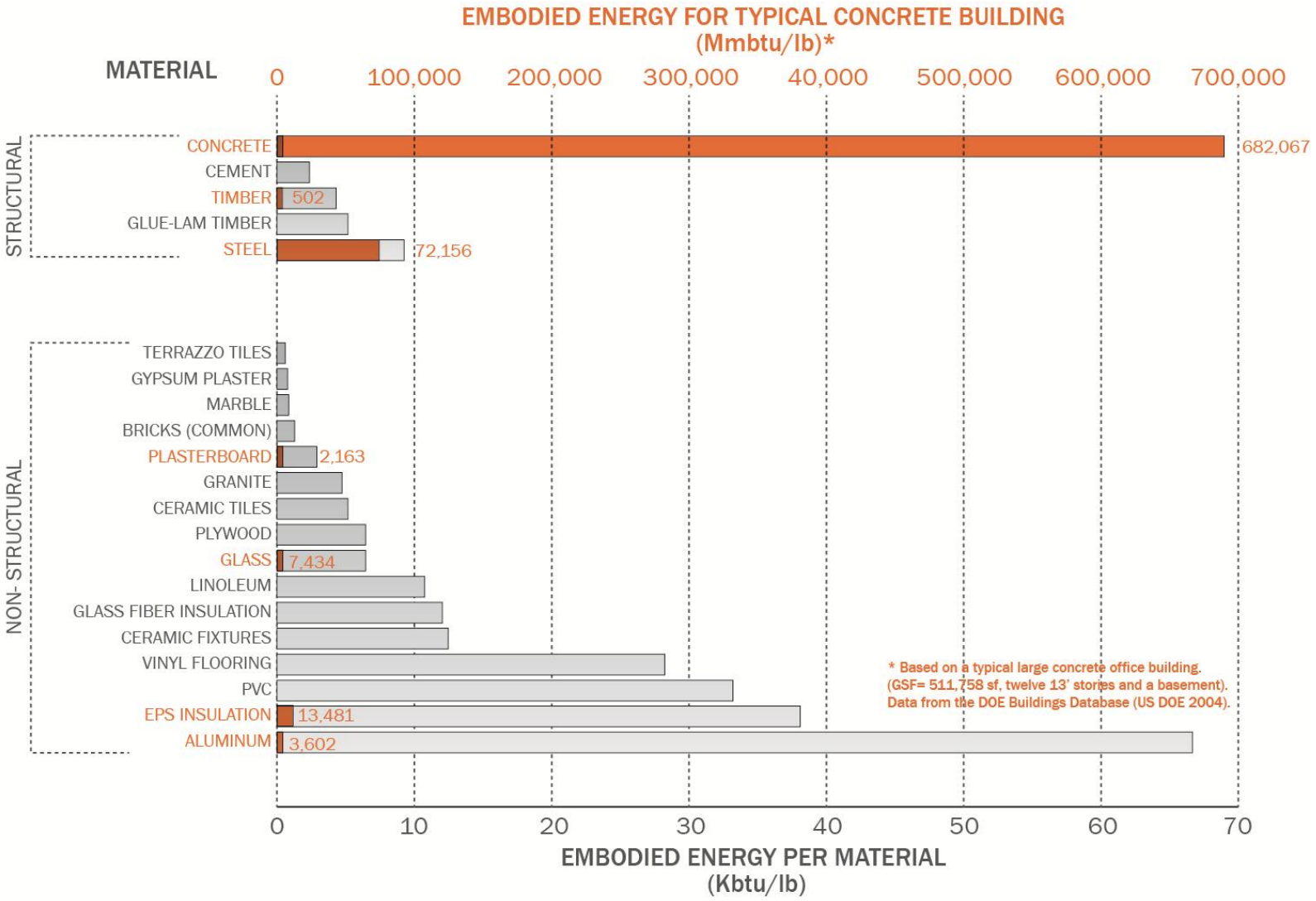
EMBODIED ENERGY
BUILDING BREAKDOWN



EMBODIED ENERGY



EMBODIED ENERGY

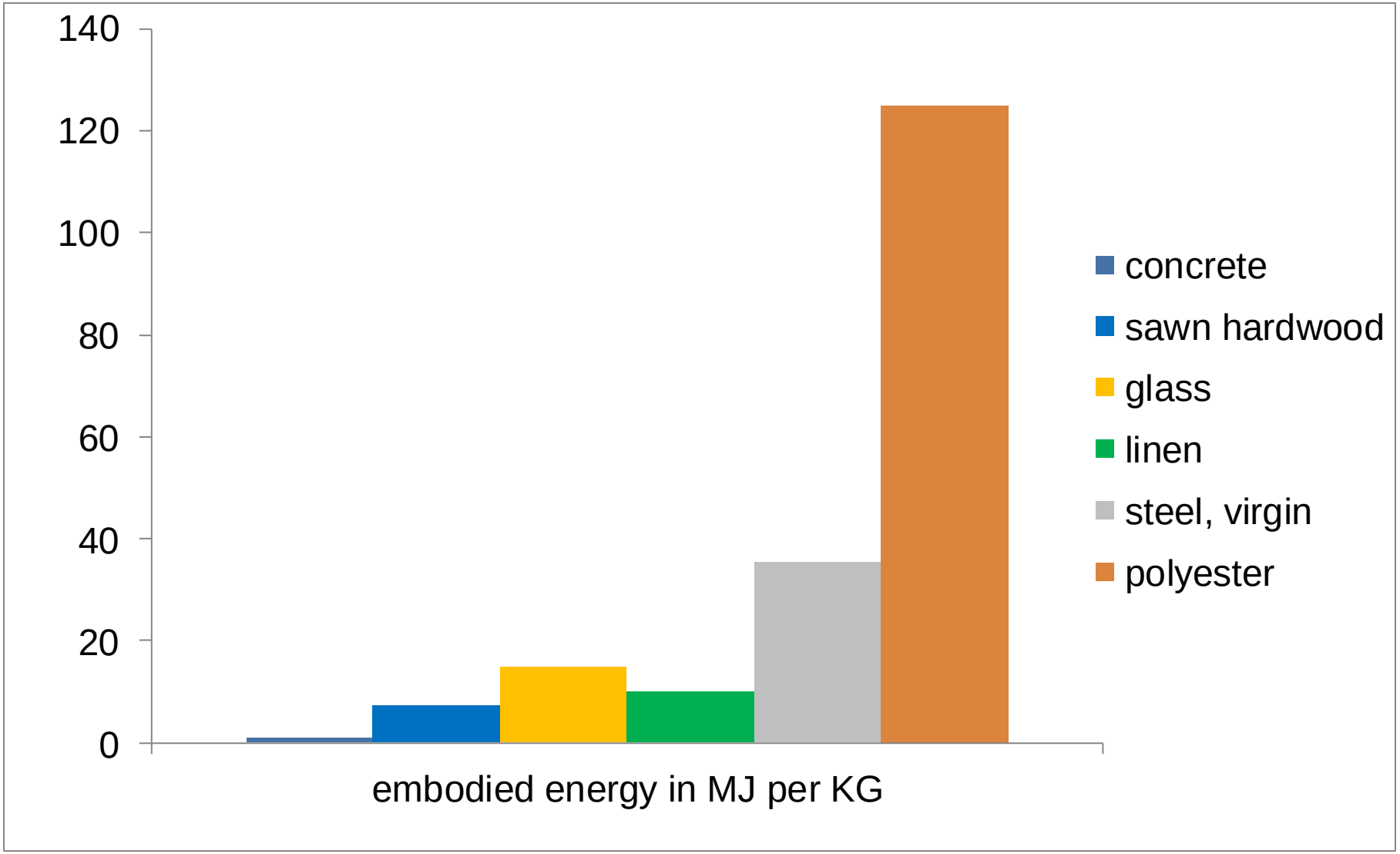


WHY GREEN MATERIALS?
OCCUPANT HEALTH

WHY GREEN MATERIALS?
WORKER HEALTH

WHY GREEN MATERIALS?
ENVIRONMENTAL IMPACT

GREEN MATERIALS
ECOLOGICAL FOOTPRINT

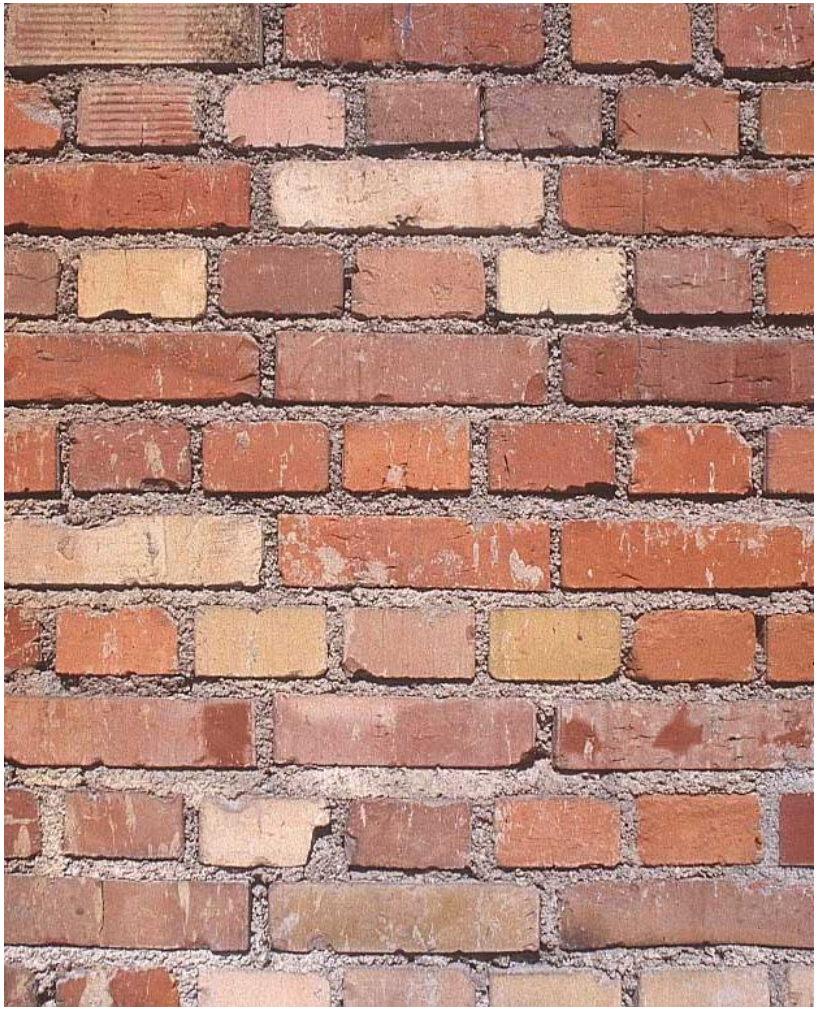


PACIFIC NORTHWEST

MATERIALS

PACIFIC NORTHWEST

MATERIALS



GREEN MATERIALS
ARCHITECTURAL PRECEDENTS

GREEN MATERIALS

DESIGN FOR ENVIRONMENT (DfE)

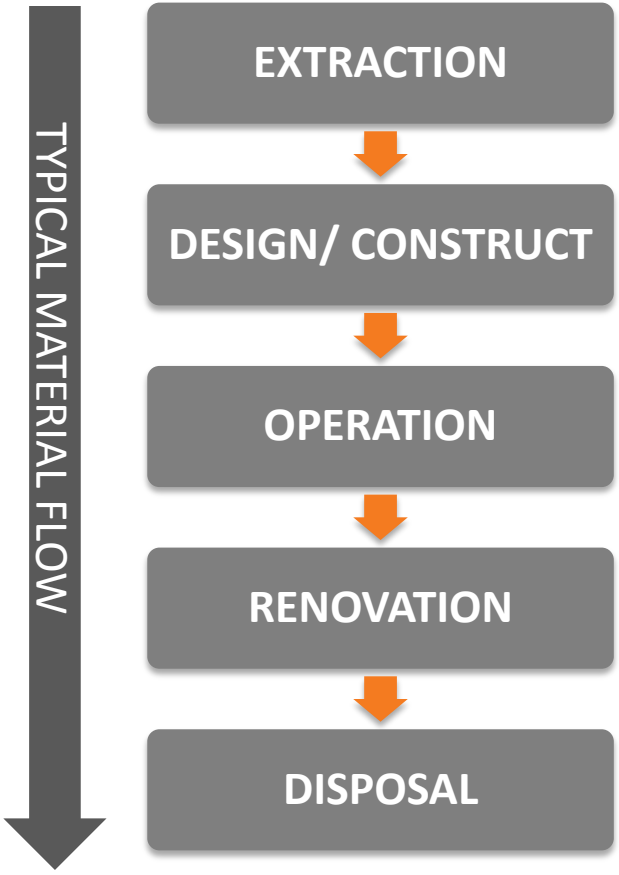
STARTED IN 1992

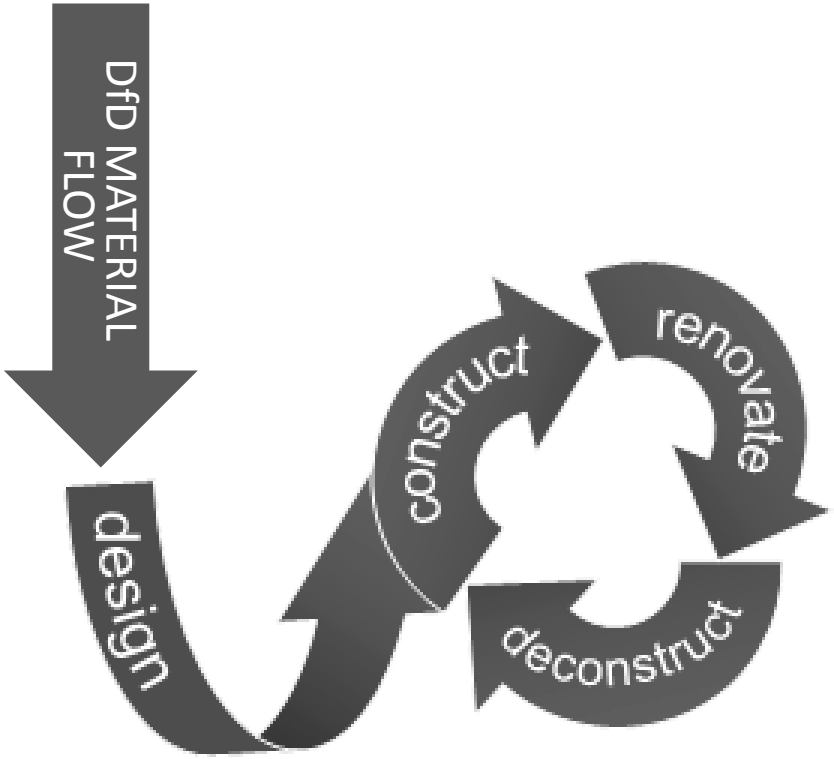
- **MATERIAL CHEMISTRY:** Contains safest materials available
- **DISASSEMBLY:** Can be disassembled after end of useful life
- **RECYCLABILITY:** Contains recycled content and is recyclable after end of useful life

GREEN MATERIALS

DESIGN FOR DISASSEMBLY (DfD)

Facilitate disassembly (in part or whole) for recovery of systems, components and materials.





GREEN LAW?

THE PRECAUTIONARY PRINCIPLE

The precautionary principle or precautionary approach states that if an action or policy has a suspected risk of causing harm to the public or to the environment, in the absence of scientific consensus that the action or policy is harmful, the burden of proof that it is not harmful falls on those taking the action.

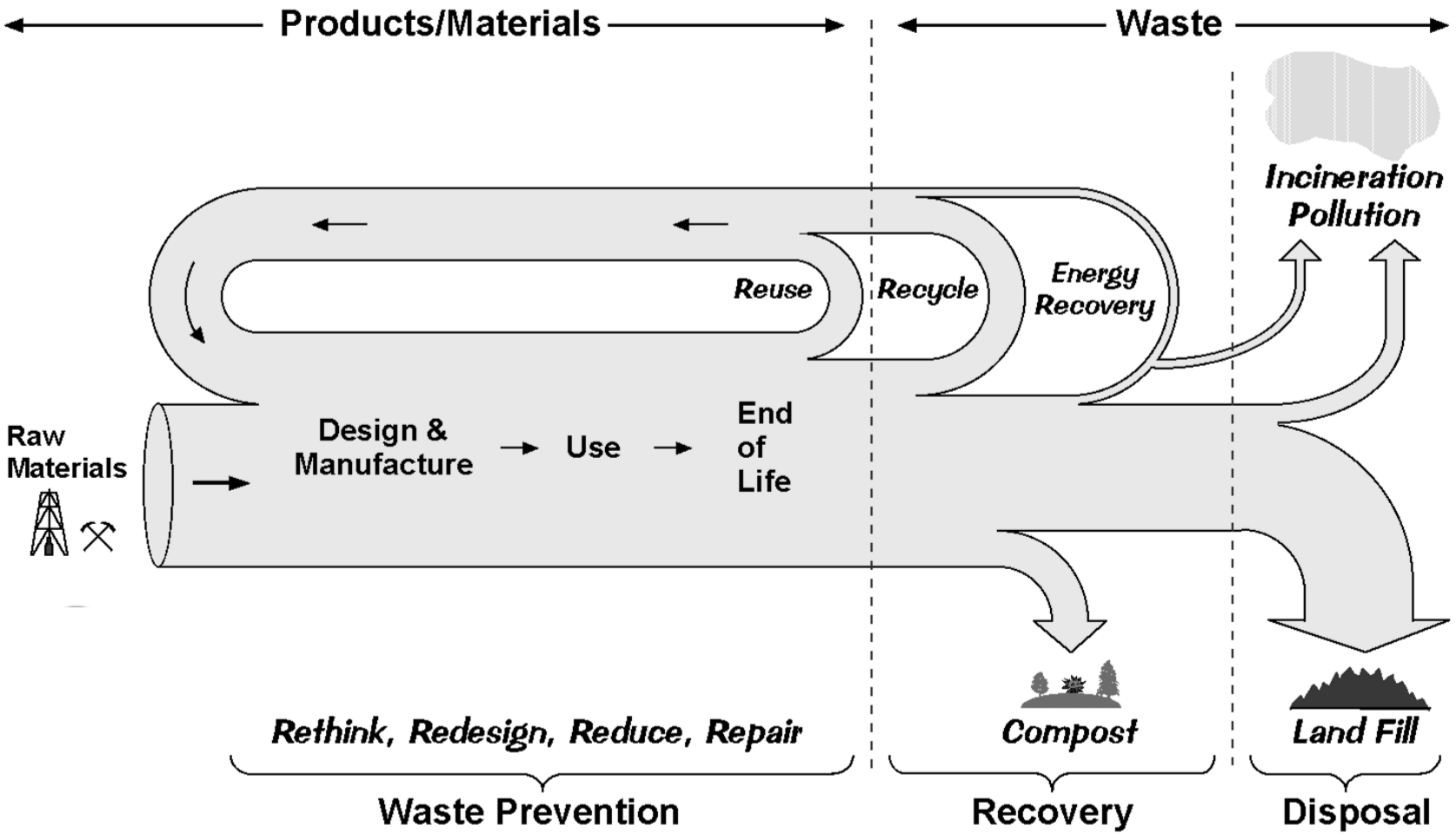
-Wikipedia

Do no harm

-The Hippocratic Oath

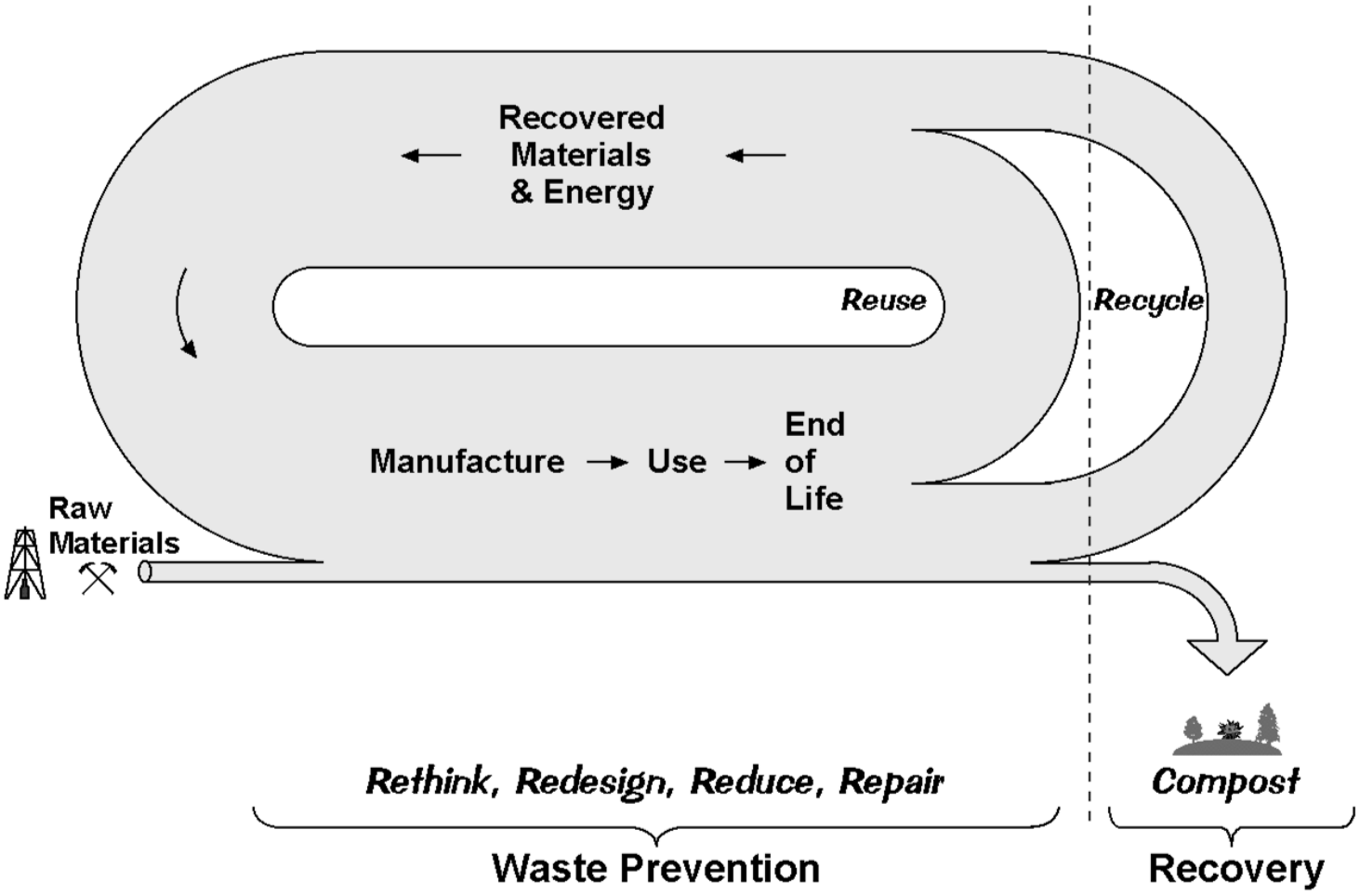
GREEN MATERIALS
CLOSING THE LOOP

LINEAR – TAKE/MAKE/WASTE SYSTEM



GREEN MATERIALS
CLOSING THE LOOP

CYCLICAL– WASTE = FOOD



QUESTIONS?

University of Oregon

Erb Memorial Union Expansion & Renovation

SERA Architects in association with AC Martin - February 22, 2011

University of Oregon

Erb Memorial Union Expansion & Renovation

Sustainability Technical Advisory Group Meeting #2

THANK YOU!

SERA Architects in association with AC Martin

February 22, 2012