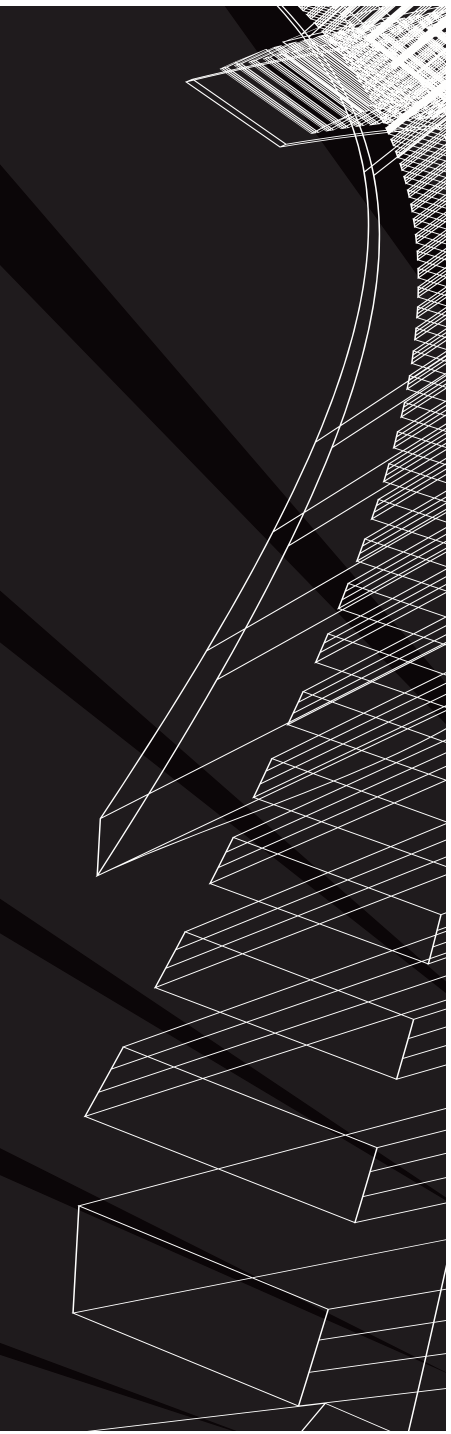
Aggressive Performance Goals Met Through Integrated Project Delivery

A Case Study of GSA Federal Center South Complex, Phase II - Seattle, Washington



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Continuing education questions can be directed to knowledgecommunities@aia.org.

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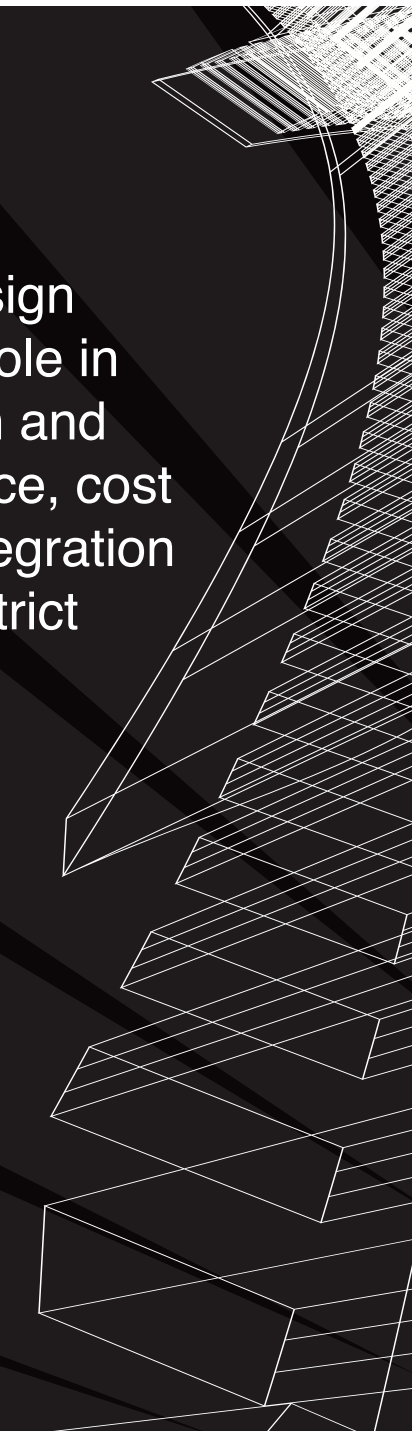
AIA/CES Course Summary

This session will discuss how architects can improve their design management services as contractors push for a more active role in managing the design phase of projects through Virtual Design and Construction using BIM model; and how ambitious performance, cost and delivery goals were met through a heightened level of integration throughout the accelerated design-build process of a new District Headquarters for the U.S. Army Corp. of Engineers in Seattle, Washington.



AIA/CES Learning Objectives

1. Learn LEAN thinking, including set based design and target value design strategies. Learn to apply a rigorous technical, analytic and research-based approach to design and decision making to arrive at best value solutions.

2. Understand the heightened level of team integration and new models of knowledge sharing, through the accelerated design-build competition and project delivery process.

3. Identify best practices for achieving aggressive building performance, cost and project delivery objectives.

4. Discover how an integrated building weaves interdependent systems to achieve a net result greater than the sum of individual systems.

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Webinar Schedule

75 min. - Eastern Standard Time (EST)

1:00 - 1:15 pm

Welcome, General Comments, and Introductions

Stephen Hagan & Jeffrey Ouellette

1:15 – 2:00 pm

Case Study: GSA Federal Center South Complex, Phase II - Seattle, Washington

Jack Avery, Sellen Construction

Todd Stine AIA, LEED AP BD+C, ZGF Architects

Stephen Hagan, FAIA, US GSA

2:00 - 2:15 pm

Q & A

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Aggressive Performance Goals & IPD

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Who is TAP?

David Scheer
Chair - 2012

Kimon Onuma
Chair - 2013

Calvin Kam

Stephen Hagan

Kristine Fallon

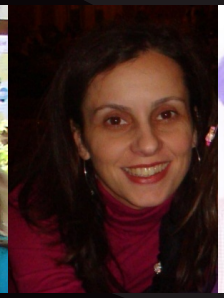
Tony Rinella

Active Past Chairs

Brian Skripac

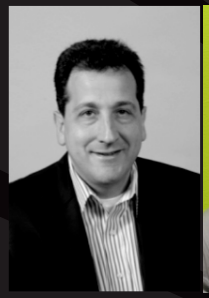
Jeffrey Ouellette

Karen Kensek

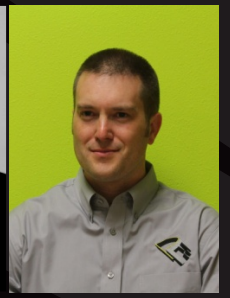


Luciana Burdi

Marty Doscher



Mike Kenig



Pete Evans

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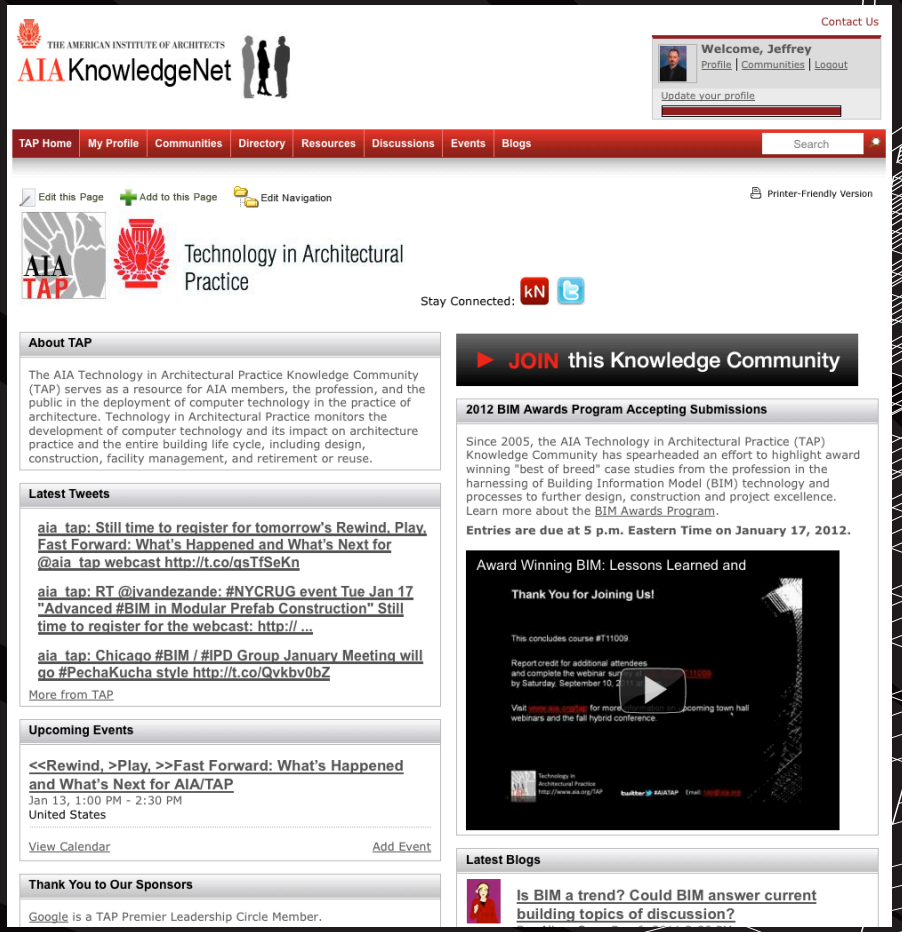
Coming Up…

- **Monthly TAP Webinars**
  - *March 09: BIM For Small Projects II*
  - *April 13: Interoperability Series*
  - *May 16: TAP@ AIA2012 - DC*
- **AIA BIM Awards**
  - *Judging: Monday, February 13, 2012*
  - *BIMForum, San Antonio, April 25th*
- **TAP Workshop @ AIA National Convention (DC)**
- **Local TAP**
- **BIM Curriculum**
- ***Stay Tuned…***



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Aggressive Performance Goals & IPD

Joining the TAP Revolution

ask not only

"What can TAP do for you?"

but also,

"What can I do for TAP?"

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Aggressive Performance Goals & IPD

TAP Committees

- **BIM Awards**
  - Stephen Hagan
  - Marty Doscher
  - Pete Evans
- **Communication**
  - Jeffrey Ouellette
  - Brian Skripac
- **Education**
  - David Scheer
- **Research**
  - Karen Kensek
  - Luciana Burdi
- **Events**
  - Tony Rinella
  - Kimon Onuma
- **Local Discussion Groups**
  - Brian Skripac
  - Mike Kenig
- **Membership/Volunteers**
  - David Scheer
- **Sponsorship**
  - Stephen Hagan
  - Jeffrey Ouellette
  - Calvin Kam

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Aggressive Performance Goals Met through

Integrated Project Delivery

GSA

ZGF
ZIMMER GUNSUL FRASCA ARCHITECTS LLP

Sellen

Good design
makes a difference™

AIA

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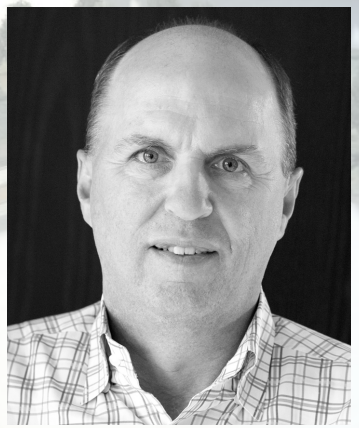

Jack Avery

Integrated Project Delivery/Design Project Manager

Sellen

Todd Stine

Design Project Manager

ZGF
ZIMMER GUNSUL FRASCA ARCHITECTS LLP

Good design
makes a difference™

AIA

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Project Overview

Theme: Architect, contractor, owner all have design aspirations that exceed performance incentive

Recovery Act Design Build Process

Site and Design Objectives

Meet Schedule, Price, and Performance

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Project Team

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Project Team

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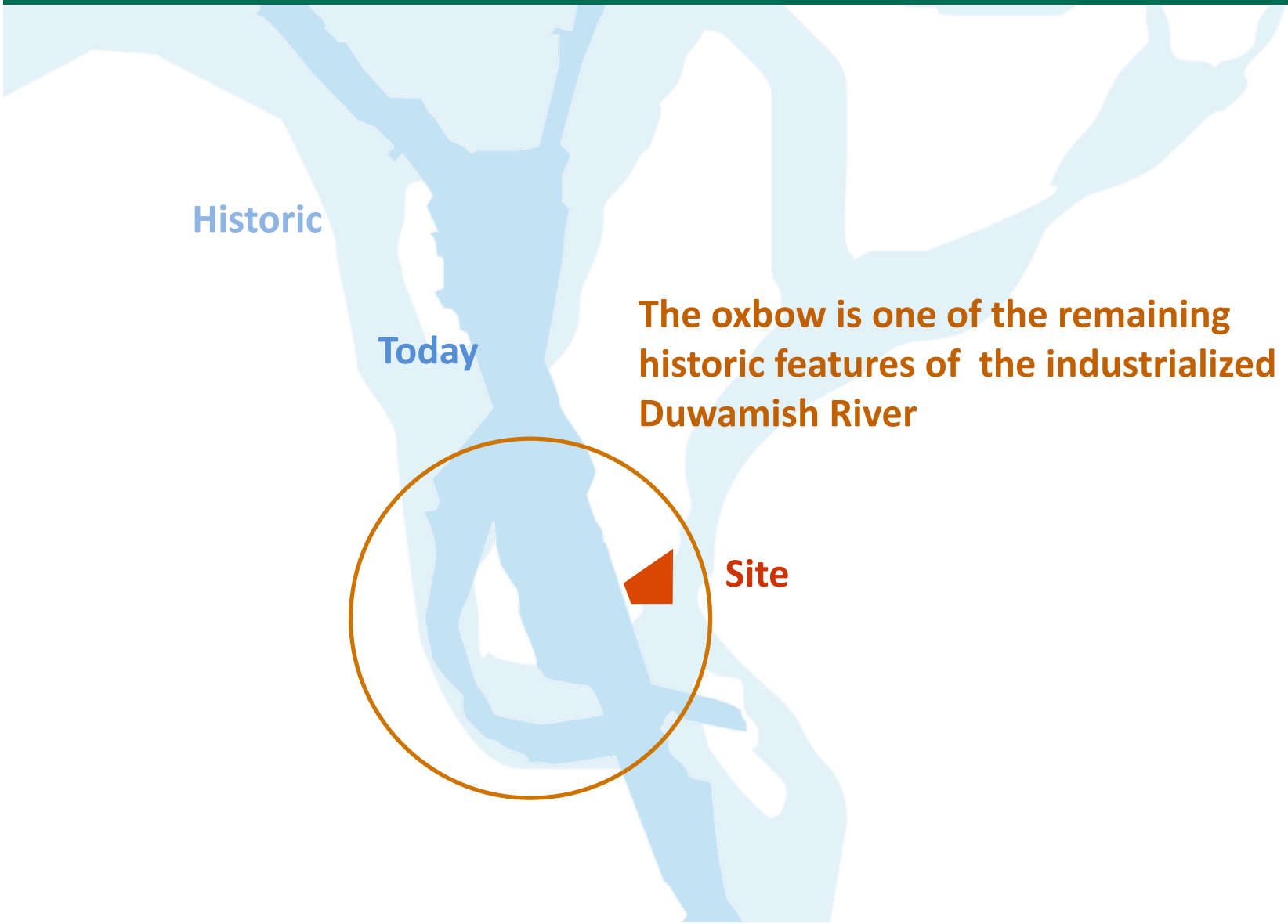
Duwamish River Bed



Federal Center South B1202 Redevelopment

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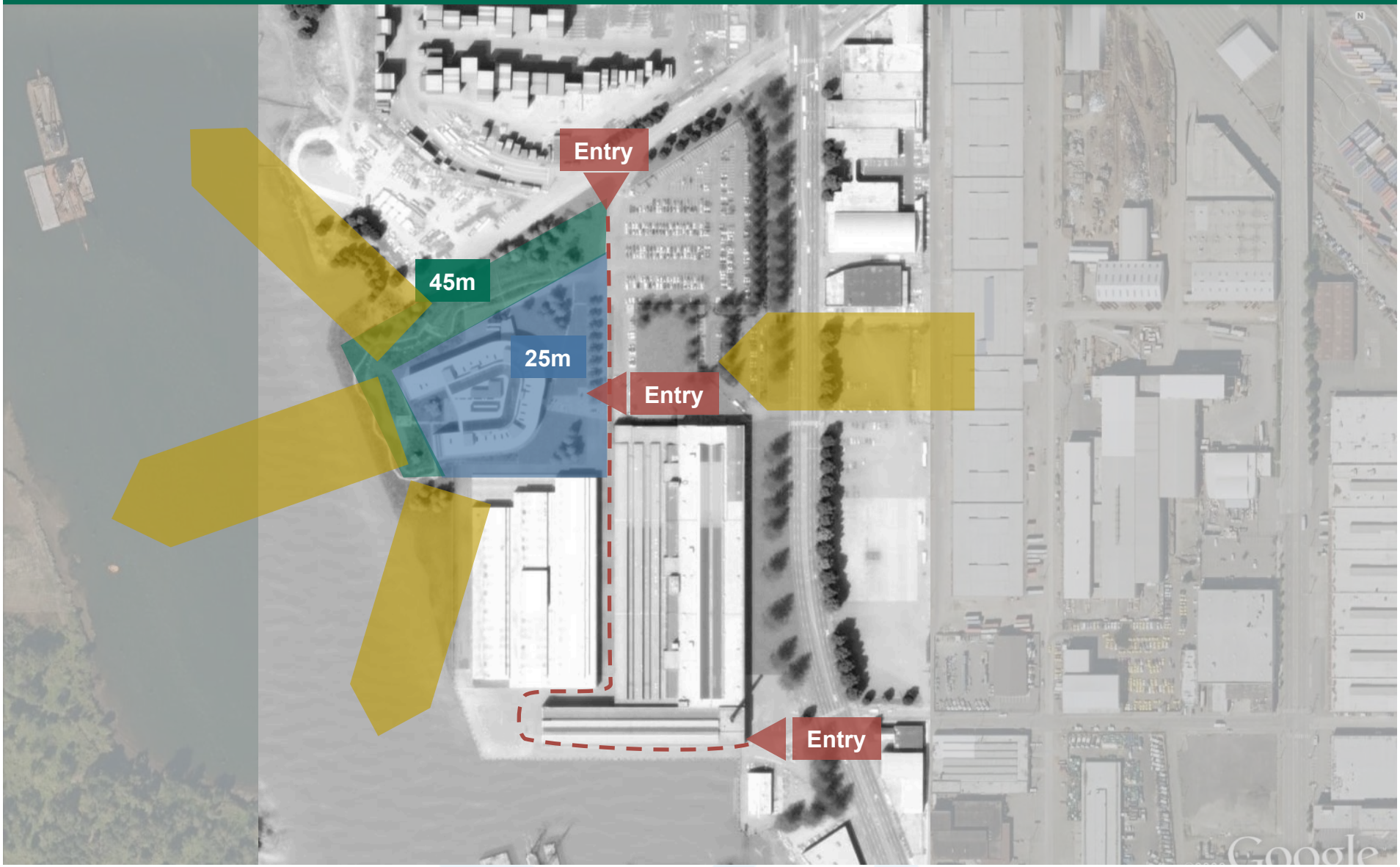
Site Context



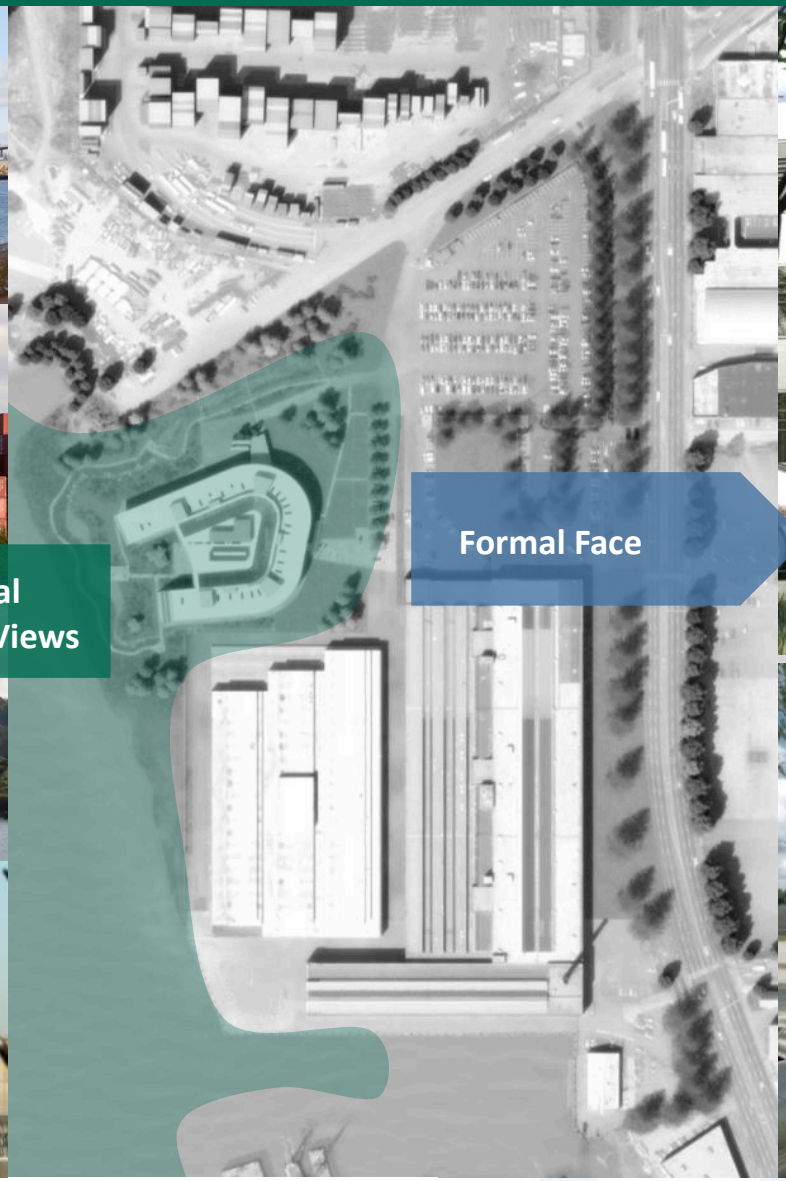
Site Context

View to North West Seattle Bridge

River View Northwest

River View Southwest

Natural
Face and Views



Formal Face

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Key Design Objectives

Reflect USACE mission

Optimize site amenities

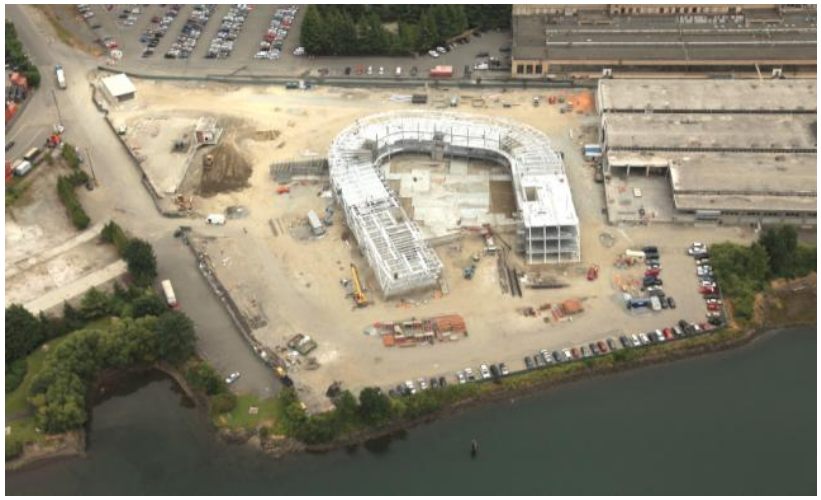
Solidify site and soil conditions

Assure air quality

Create a modern 21st century workplace

Achieve 30% energy reduction

Re-use 1202 materials



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21st Century Workplace

Create a sense of place

Enhance collaboration and identity

Reduce silos

Provide connectivity

Support generational work styles

Air quality

Daylight and connection to nature

Thermal comfort

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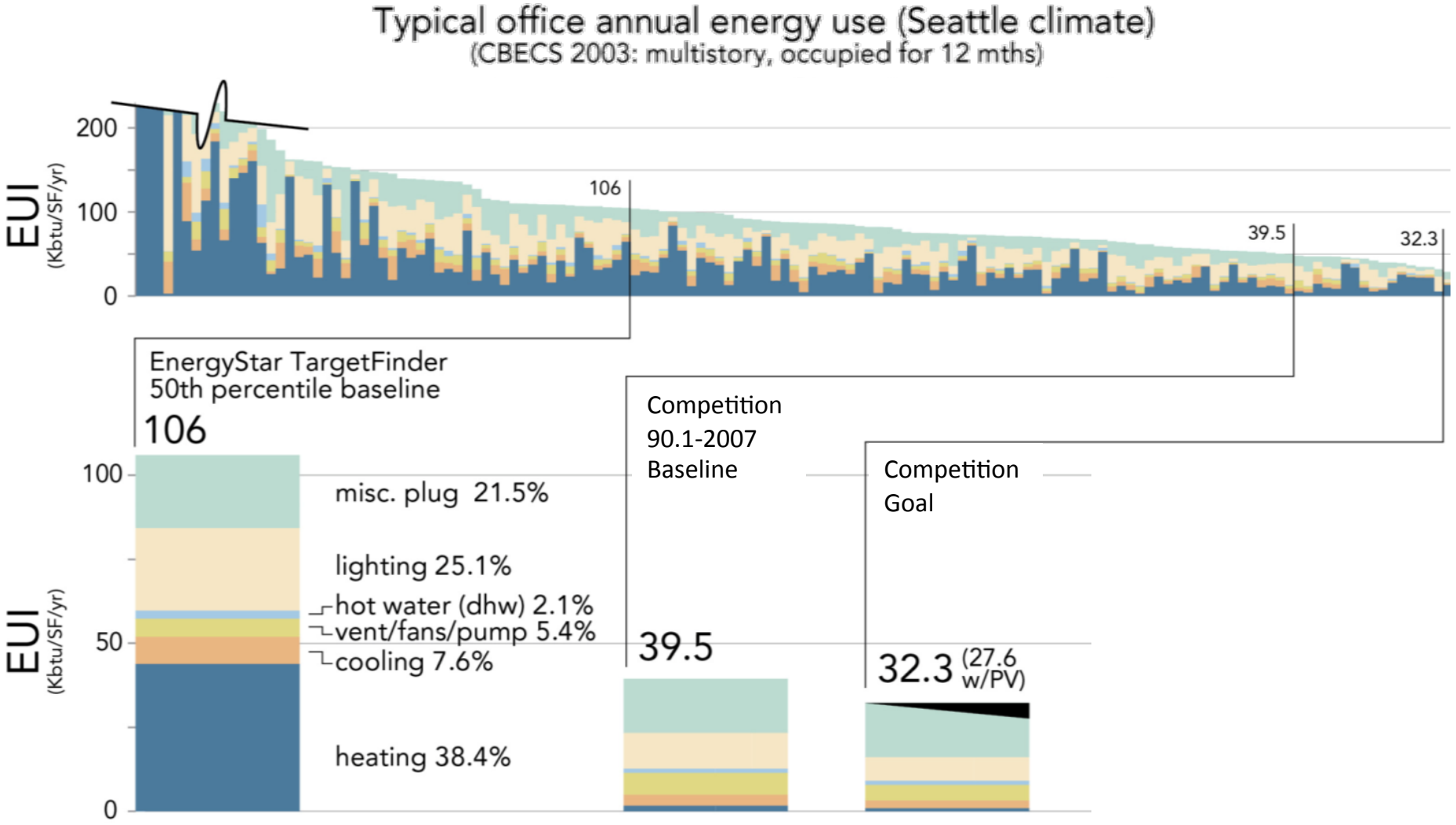
Overall Energy Goals



High Performance Green Building

LEED Gold minimum

Employ **integrated approach** to meet sustainability goals

30% reduction in energy usage compared to ASHRAE 90.1-2007

Install advanced meters for electricity, natural gas, and water

Install **solar thermal hot water system** (integrated approach determined not cost effective)

Plan for **on-site renewable energy** systems

Reduce **indoor potable water** use by at least 20%

Reduce **outdoor potable water** use by at least 50%

Manage 95th **percentile rain event** onsite through infiltration

Provide occupancy and **daylight sensors**

Pre-occupancy flush-out

Salvage, recycle, or reuse at least 50% of construction and demolition waste

Energy Independence and Security Act

The Energy Independence and Security Act

Section 433, Federal Building Energy Efficiency Standards requires that all new federal buildings and major renovations **meet the energy performance standards of the 2030 Challenge** beginning in 2010.

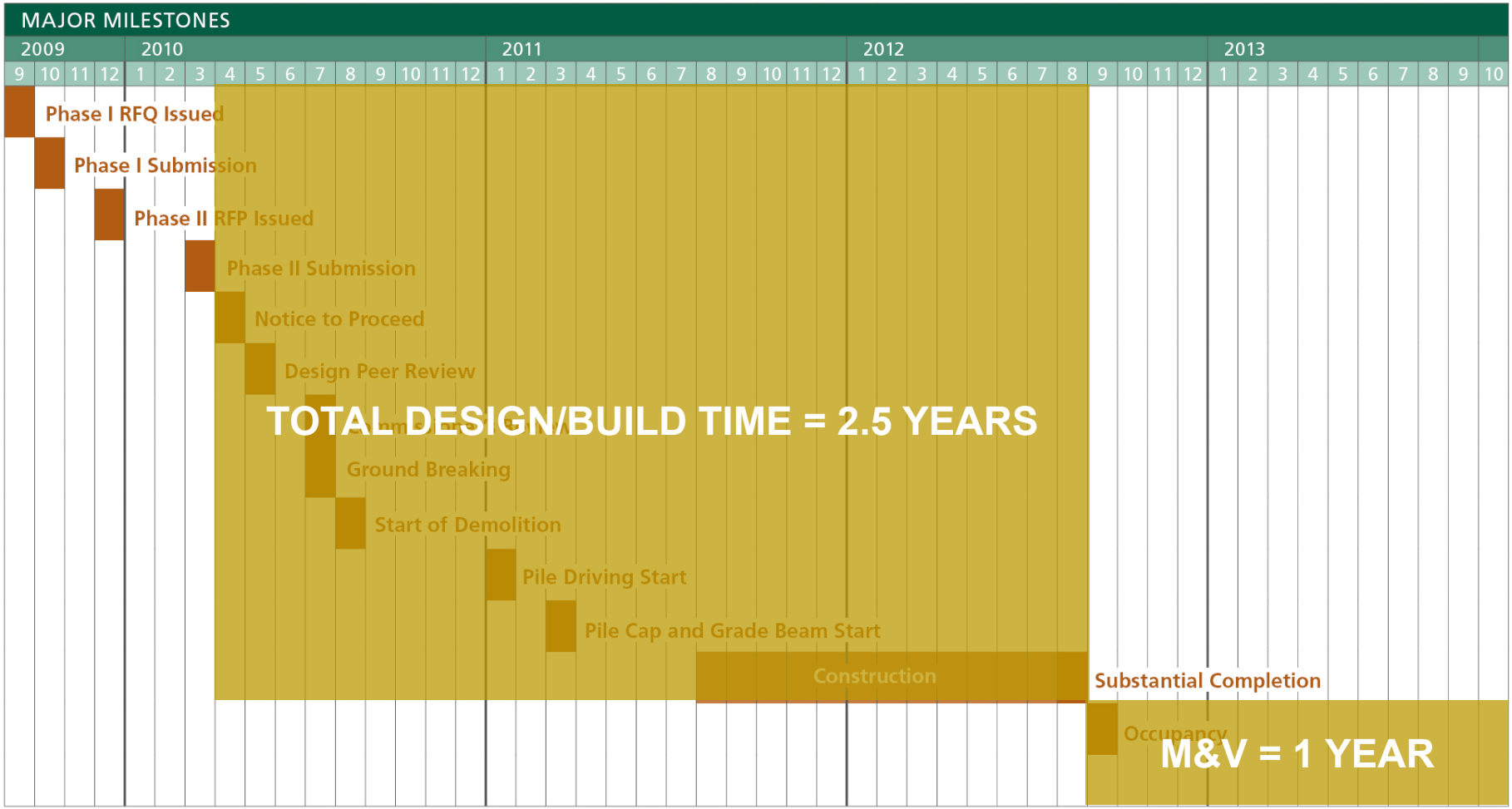
Design-Build Contract Language:

*M&V and Warranty Period Verification. The Government will **retain a pre-determined amount of dollars** from the overall contract award during performance evaluation. Release of **payment** for this withheld amount **will be contingent upon final confirmation that the energy performance standards for the facility (i.e. actual BTU/GSF saved) have been achieved** as verified by the M&V and Warranty Period testing to be conducted within 365 days from final completion. The basis for the pre-determined amount shall be equal to **.5%** of the proposed construction price. Offeror shall calculate the amount and enter it into CLIN 0005 of the Pricing Schedule.*

Proposed Betterments

- Geothermal Heat Pump System
- Laminated Glass Skylight at Atrium
- Triple Glazing at Perimeter
- Solar PV Array
- White Capsheet on Roof
- Solar Thermal Hot Water Heating
- Enhanced Lighting Controls
- Rainwater Capture and Reuse
- Smart Building Technology
- Energy Dashboard
- LEED Platinum

Scheduled Completion by June 2012



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Performance Guides the Design

Goal Setting *understanding 30% better than ASHRAE*

Abstraction of performance *Building width / daylight , Orientation / massing*

Office *flexibility and efficiency*

Competition Process, Goals and Integrated Team

Twofers: *Diagrid: Structural efficiency, Progressive collapse, Support piles*
Building re-use: Timbers and atrium, Composite beams
Atrium: Daylight, Thermal efficiency

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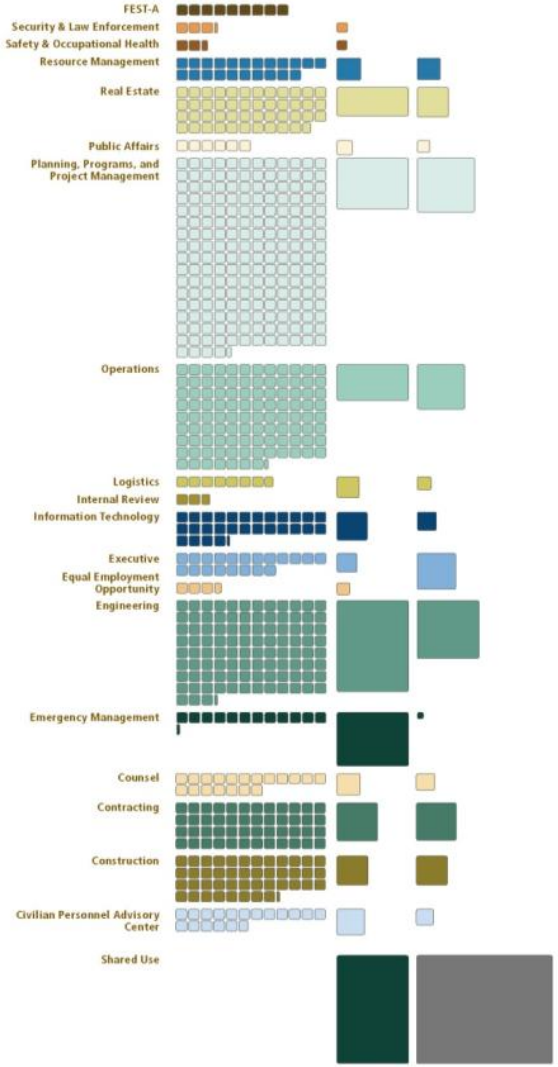
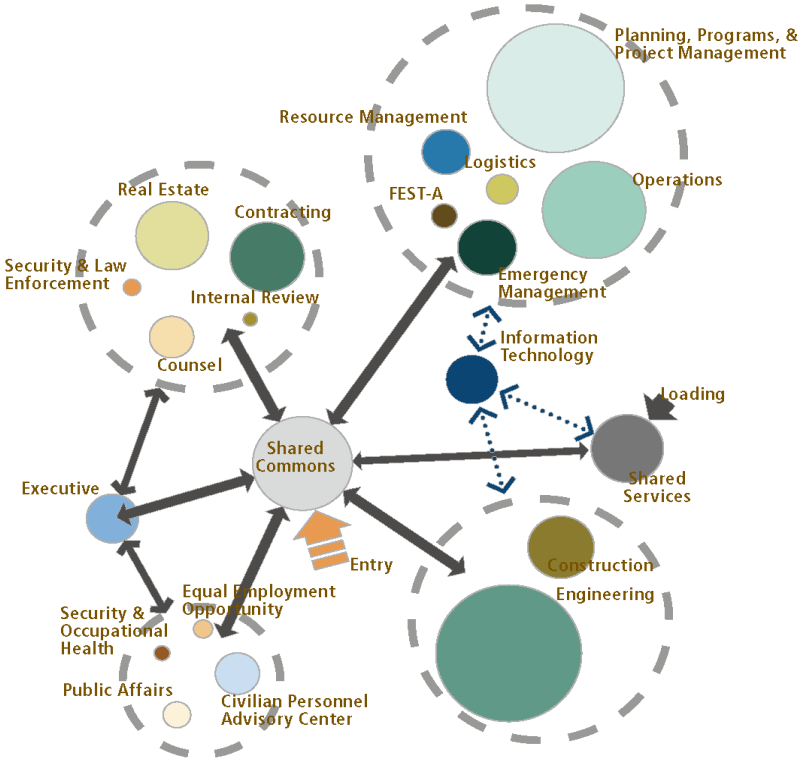
USACE Program Analysis

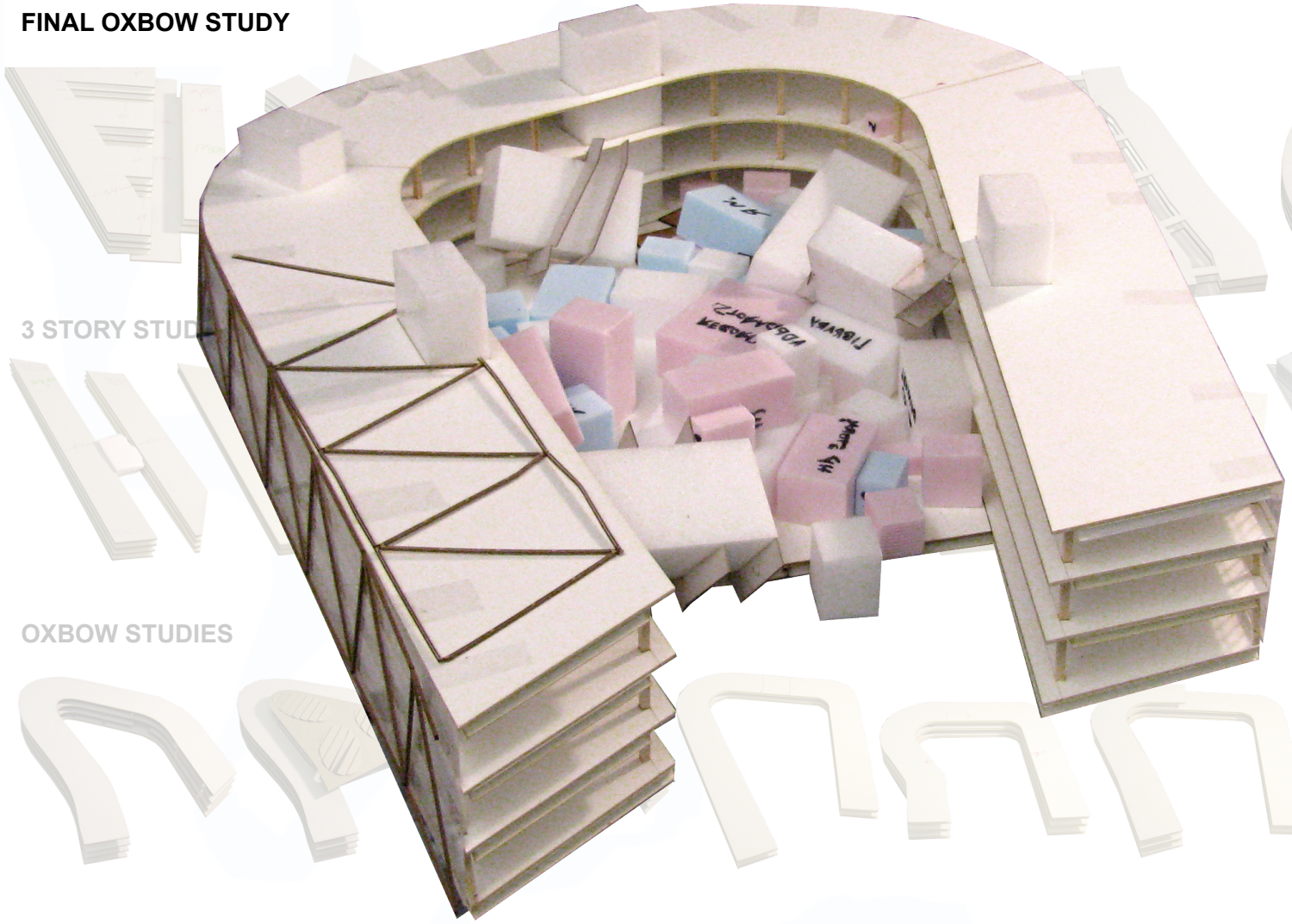
PROGRAM BY DEPARTMENT





Performance Guiding Building Shape

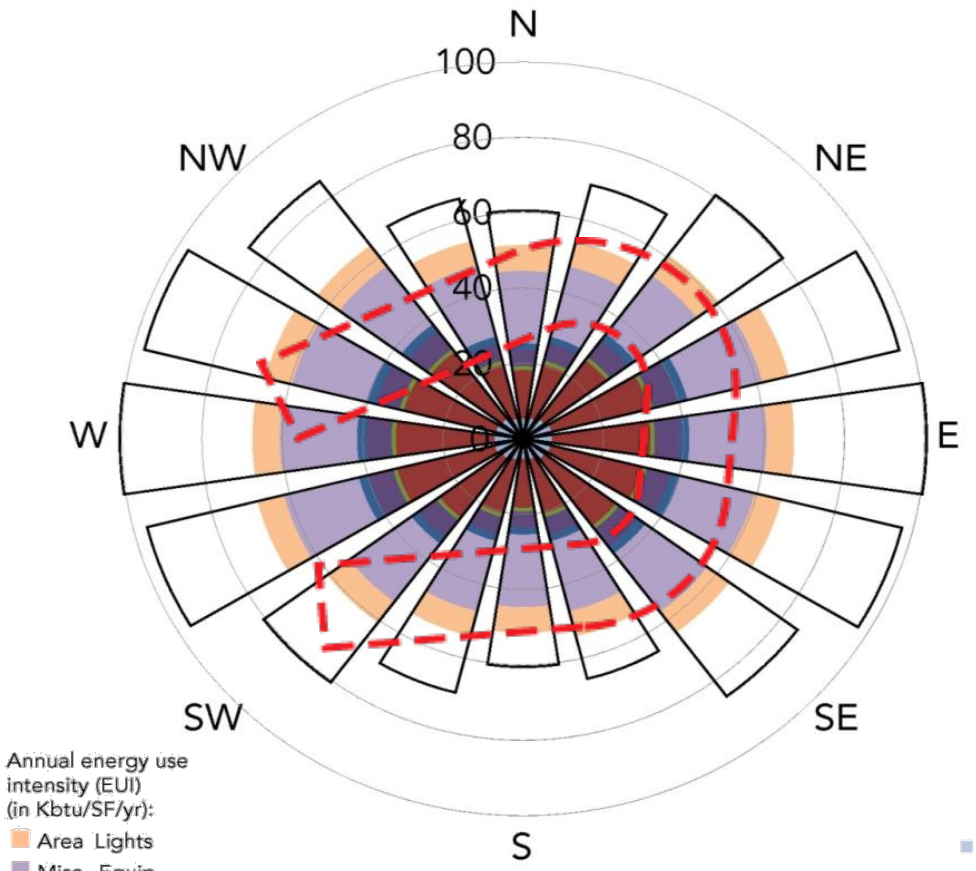
FINAL OXBOW STUDY



3 STORY STUDY

OXBOW STUDIES

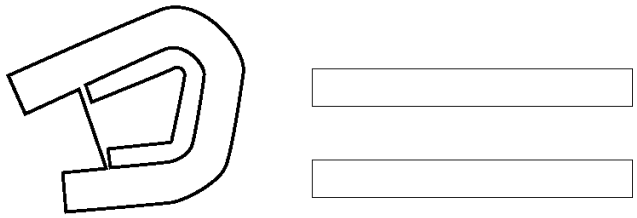
Orientation

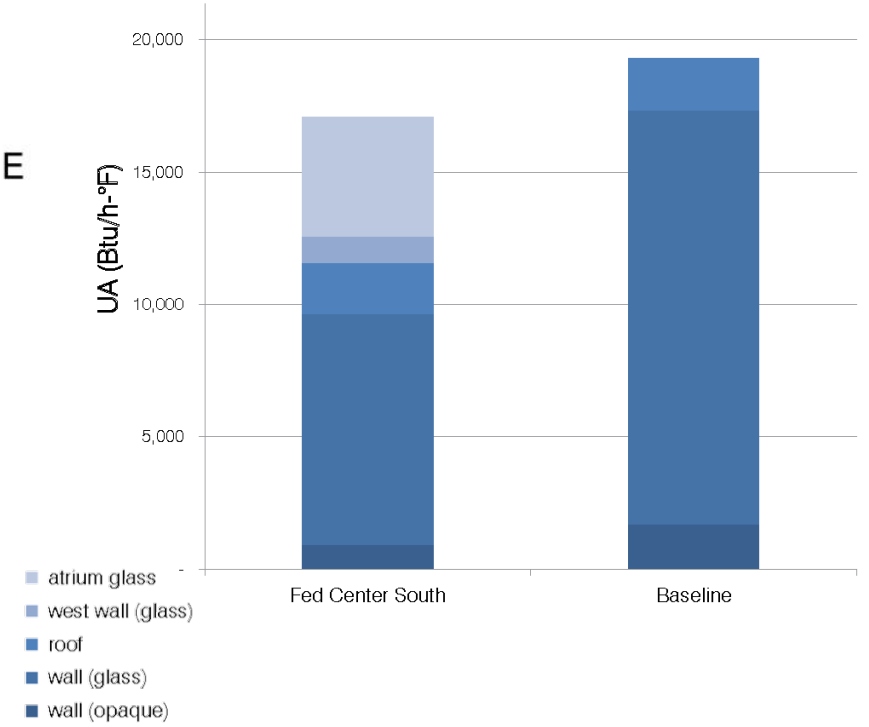


Annual energy use intensity (EUI) (in Kbtu/SF/yr):

- Area Lights
- Misc. Equip.
- Pumps & Aux.
- Vent. Fans
- Hot Water
- Space Heat
- Space Cool

☐ Relative peak hour energy use





3 Story Configuration

Optimizes site available for security setbacks

Maximizes open campus green space

Provides storm water management opportunities

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The Collaborative Workplace

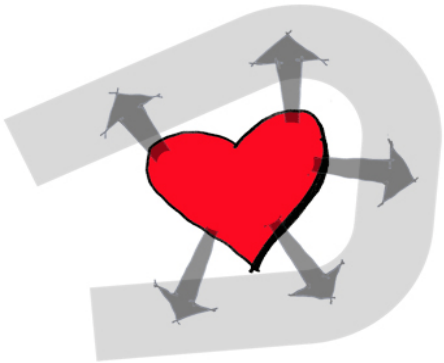
Flexibility. Efficiency. Daylight.
Unified. Open.

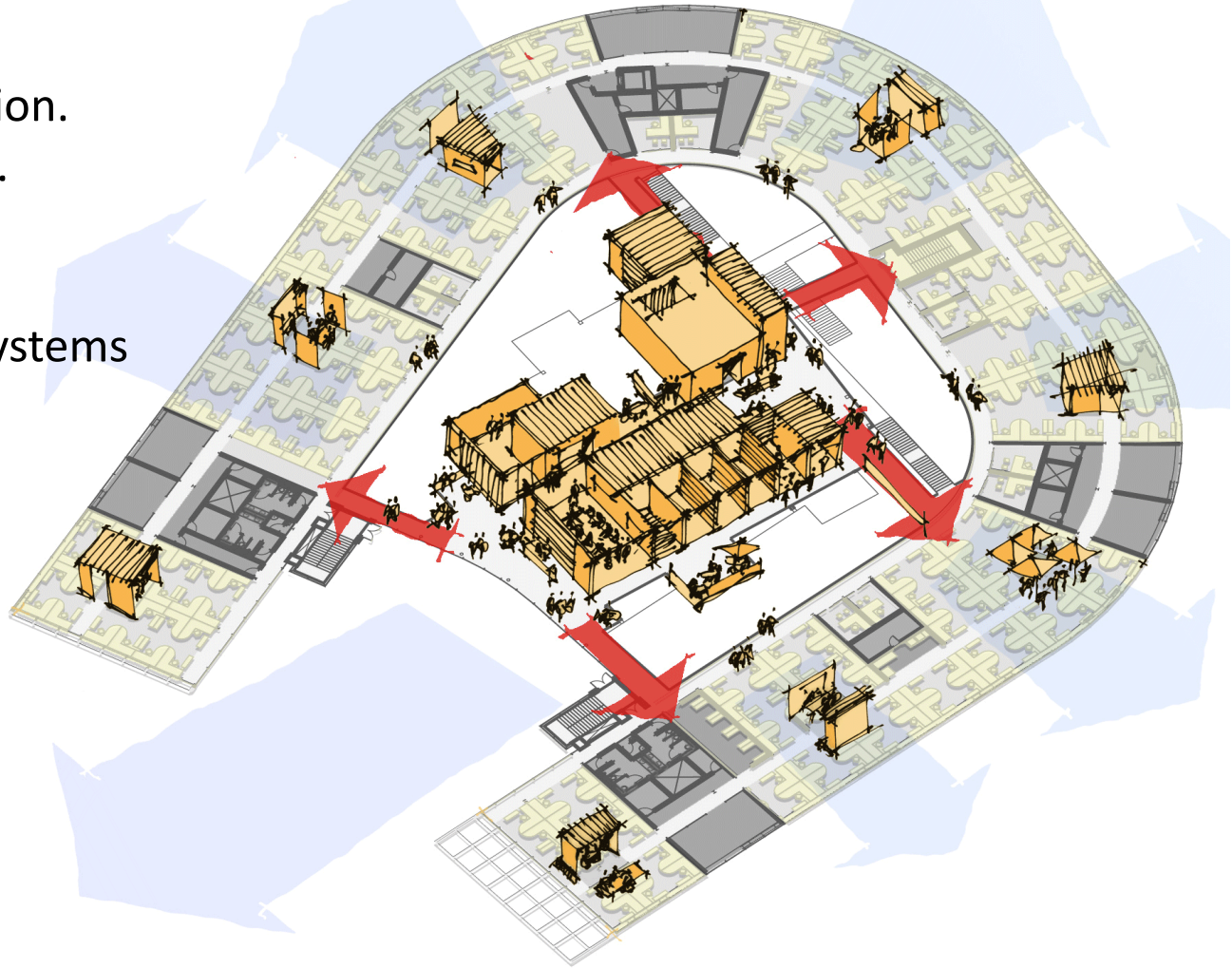
Interaction. Collaboration.
Central and convenient.

No “Silos”.

Optimize Mechanical Systems

Builds Community





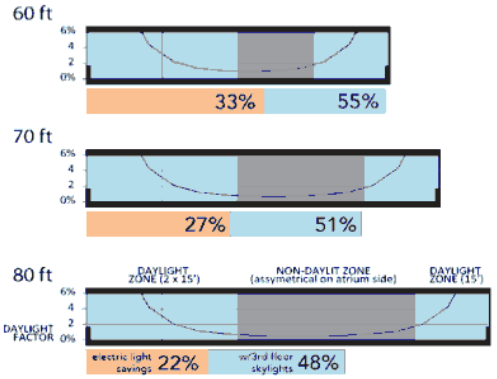
Building Block of Workplace Design

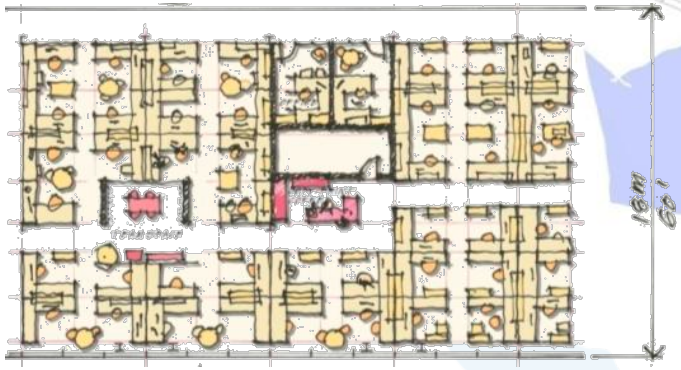
Allows Various Tenant Layouts

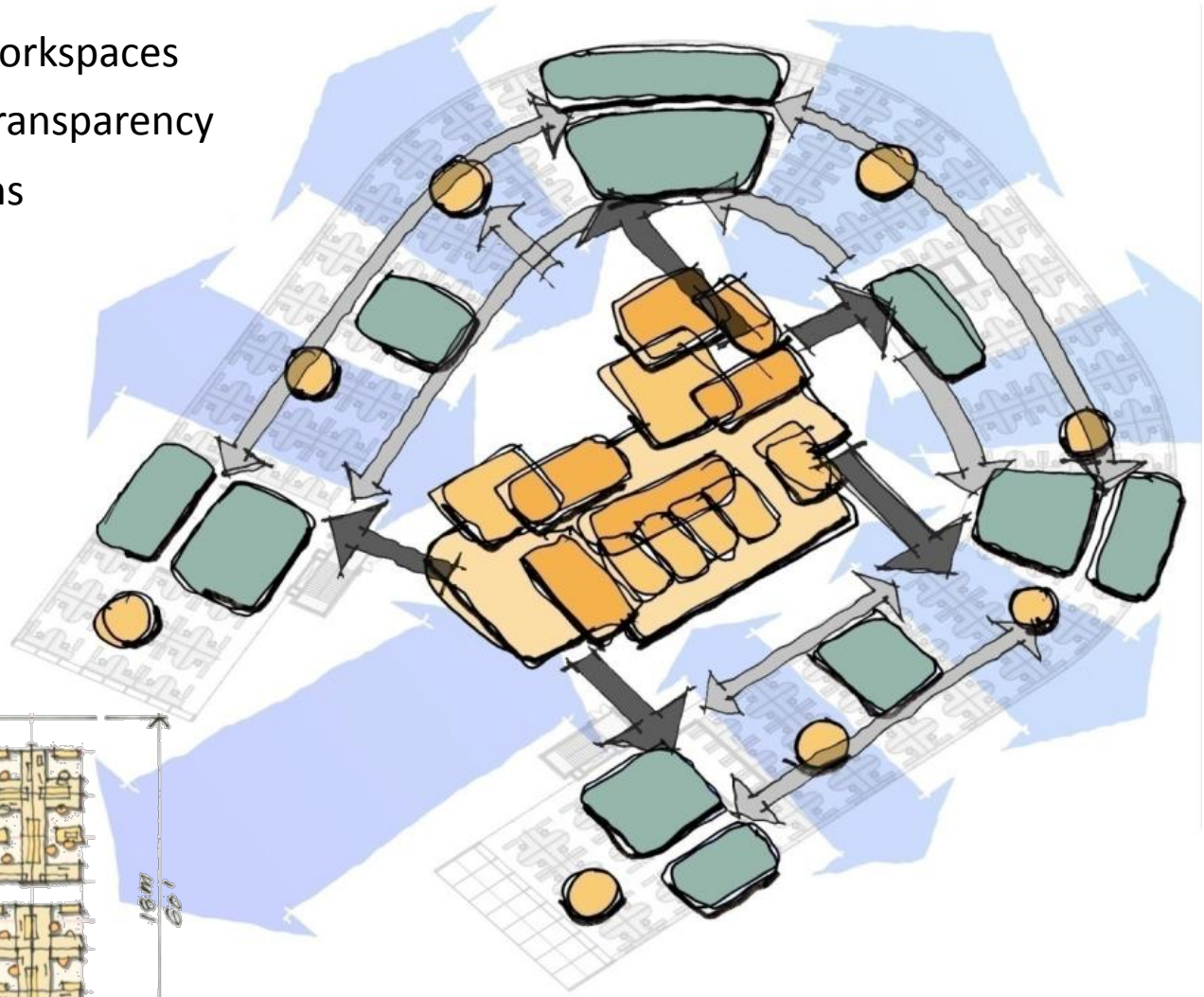
Maximizes Efficient 8 x 9 Workspaces

Optimize Daylighting and Transparency

Optimize Visual Connections







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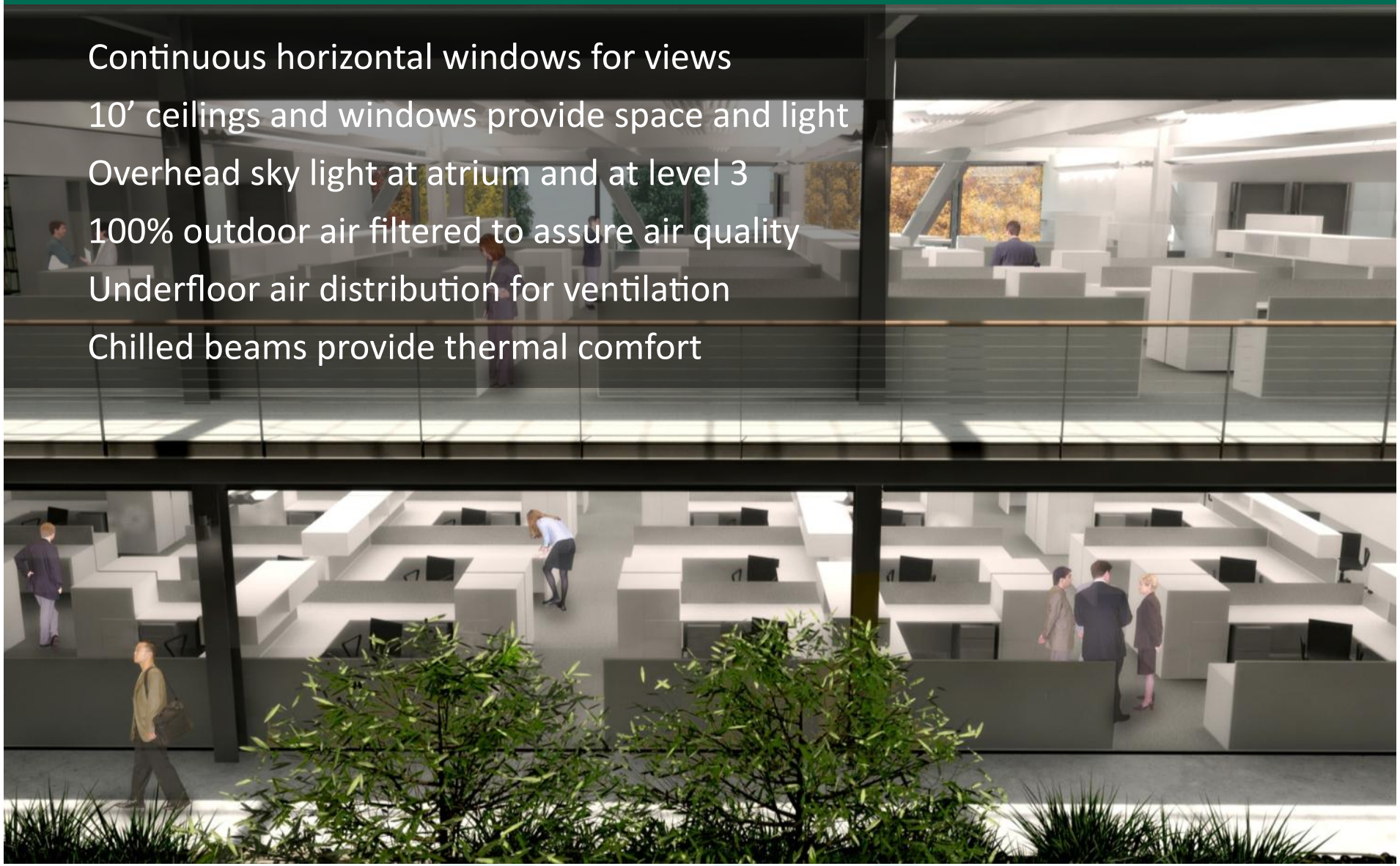
Workplace Amenities



Continuous horizontal windows for views

10’ ceilings and windows provide space and light

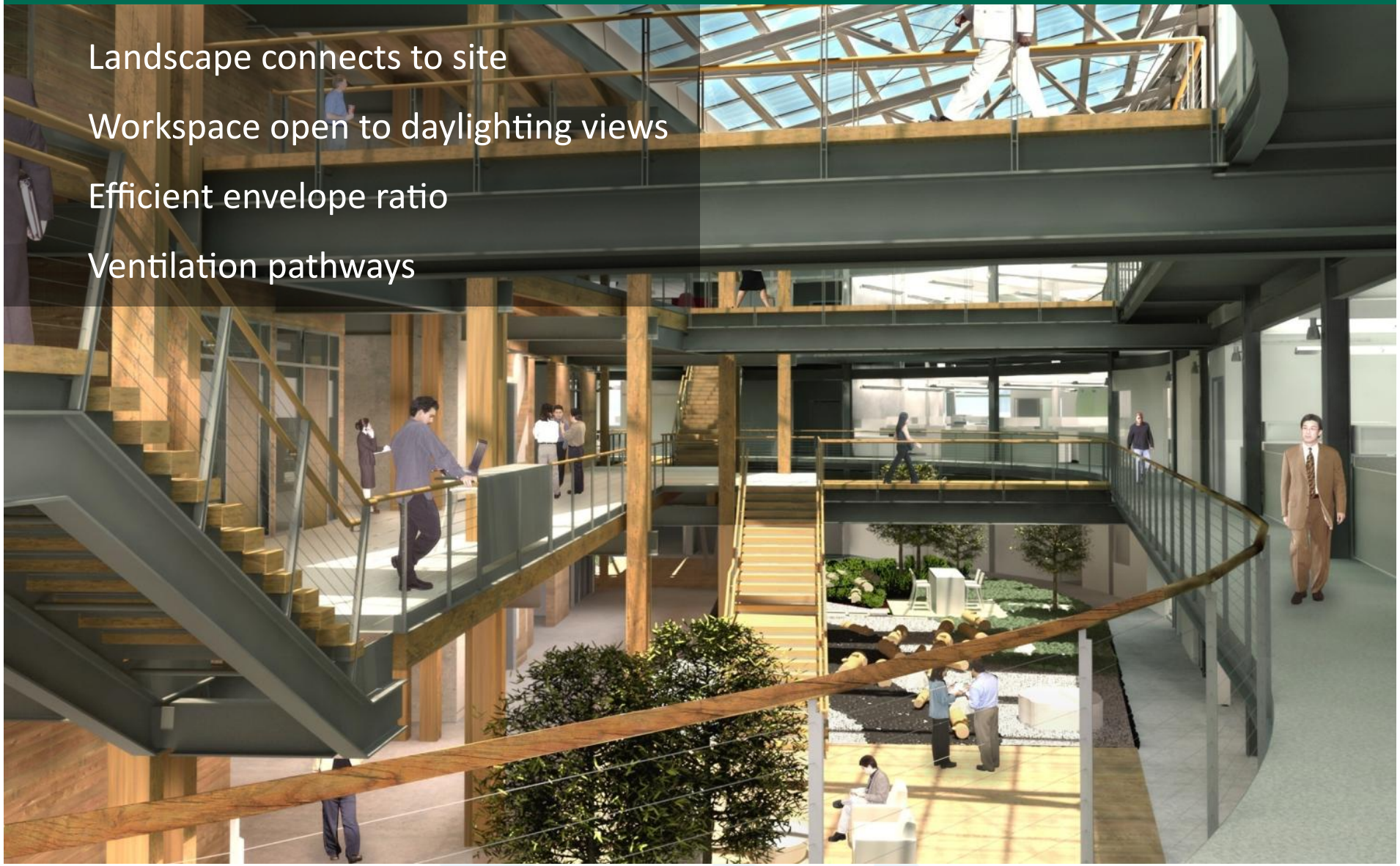
Overhead sky light at atrium and at level 3

100% outdoor air filtered to assure air quality

Underfloor air distribution for ventilation

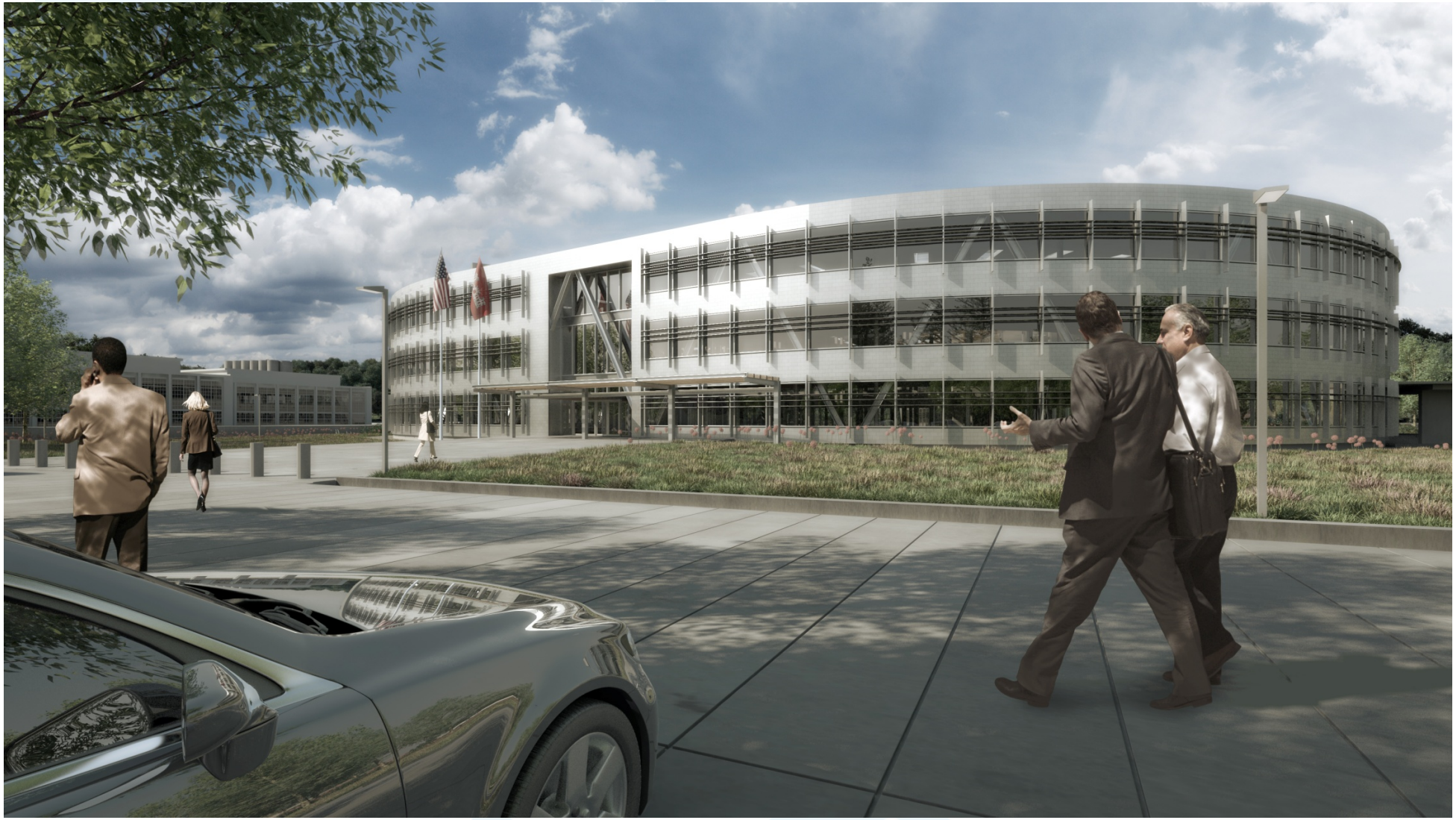
Chilled beams provide thermal comfort

Atrium Strategies



Interior Environment

Exterior Expression



Structural Design

Diagrid System

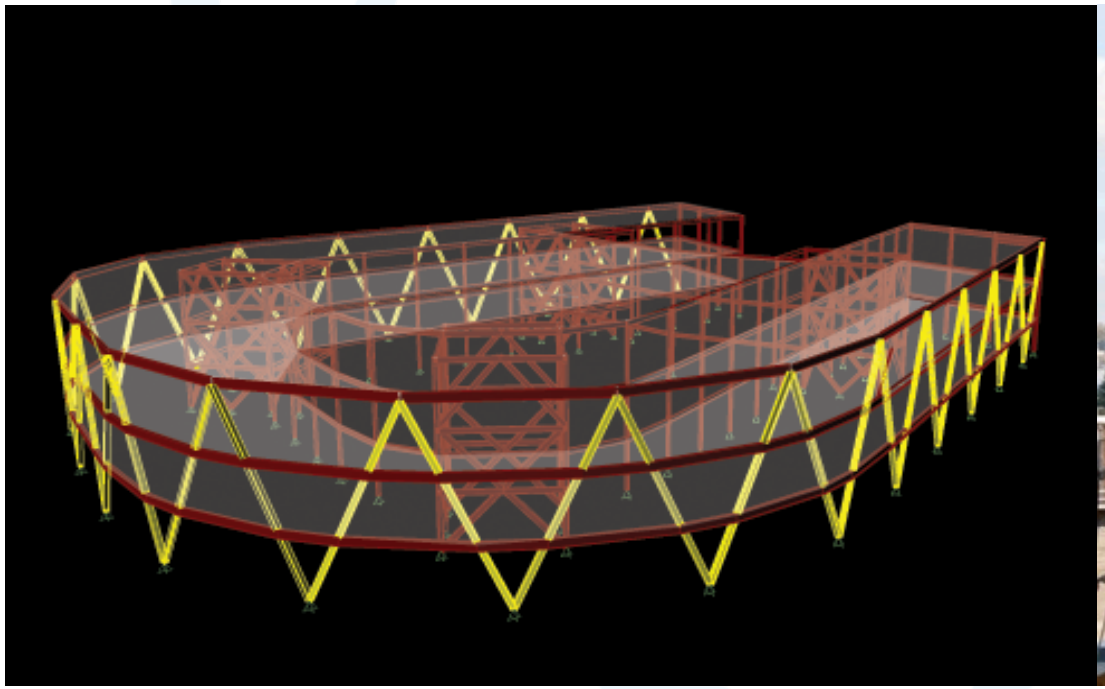
Carries gravity loads

Contributes to the lateral force resisting system

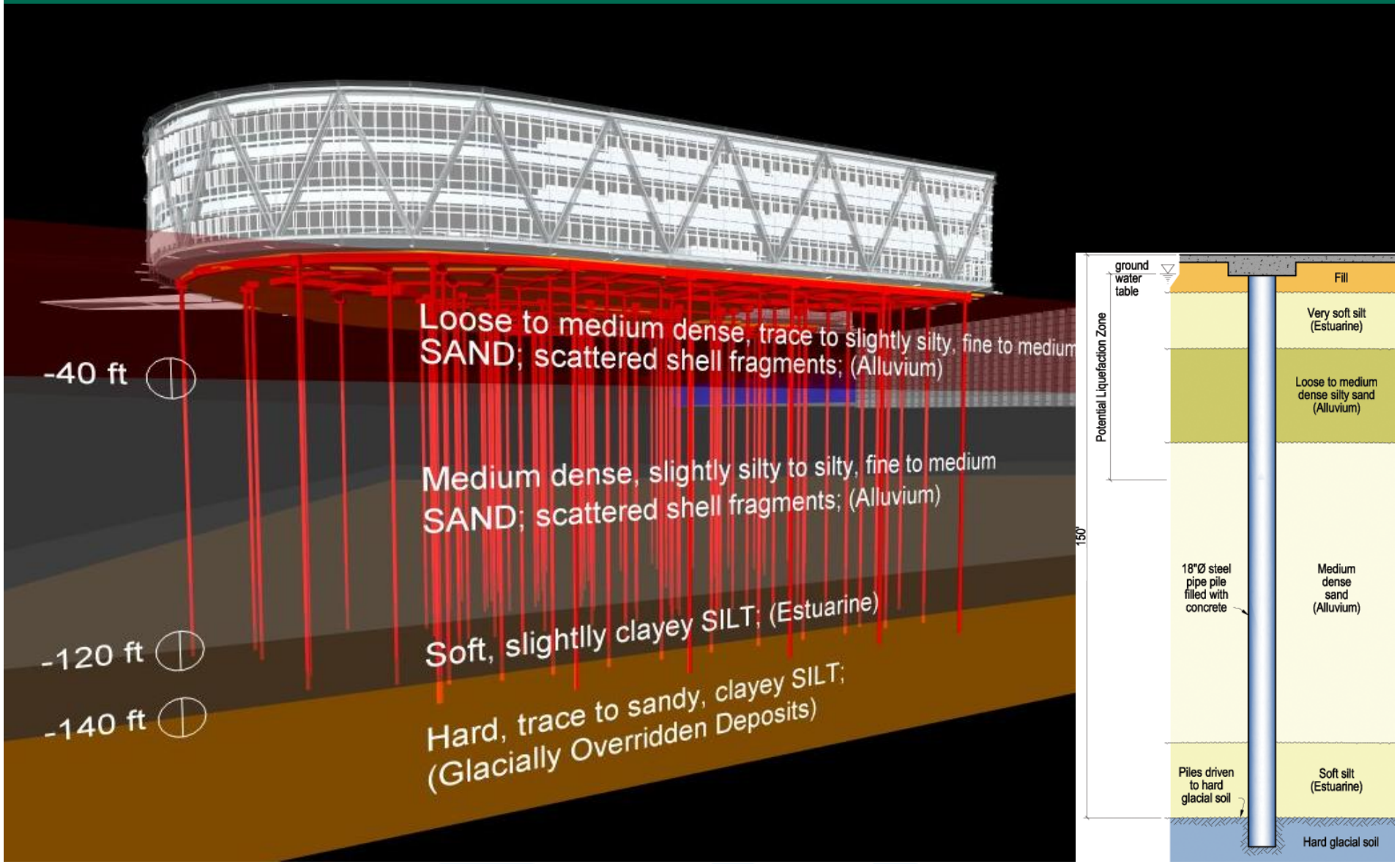
Serves as progressive collapse system → truss action

Level One Floor System

Grade Beams supported by piles assure stability in any soils condition



Geotechnical Design



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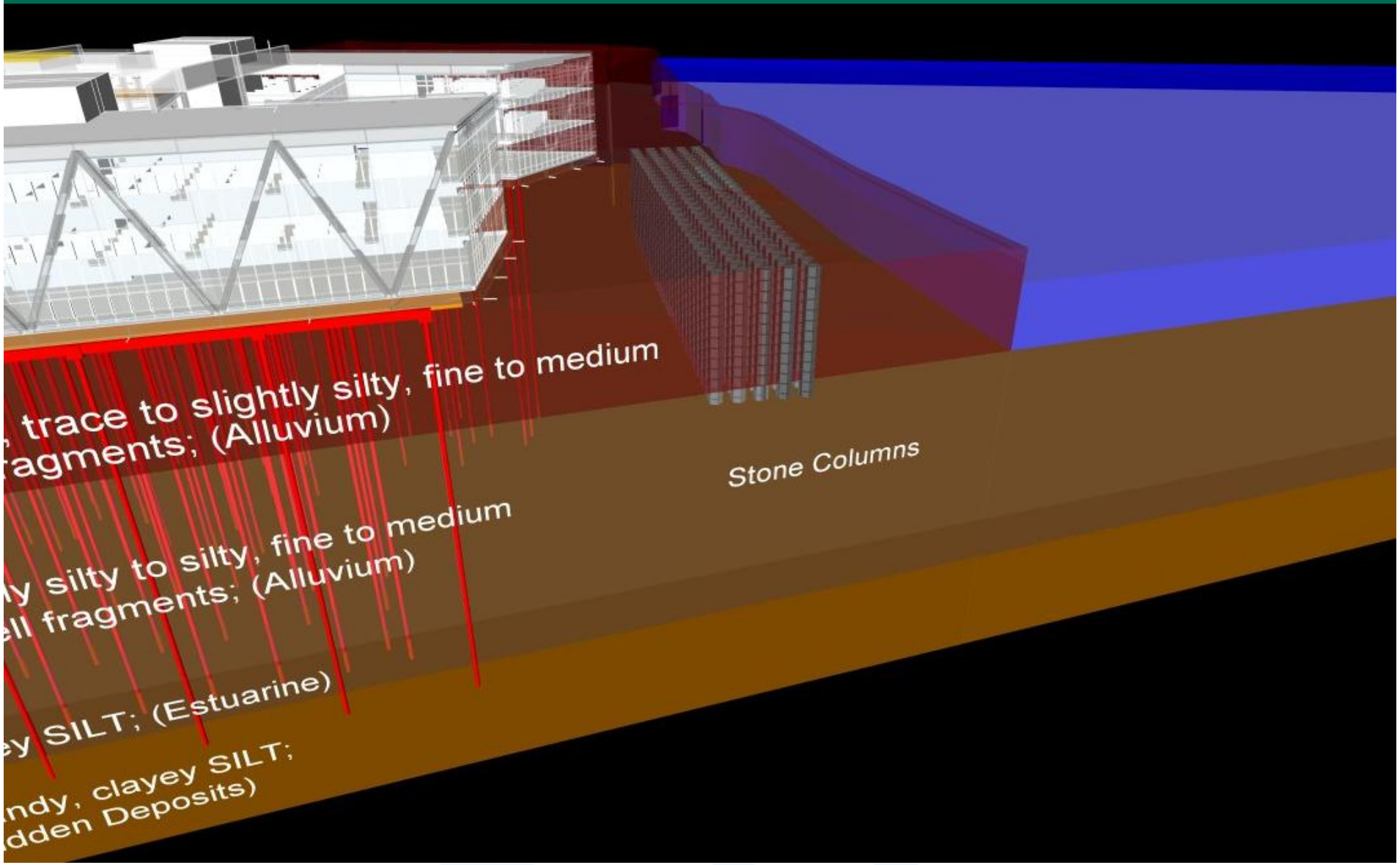
Geotechnical Design

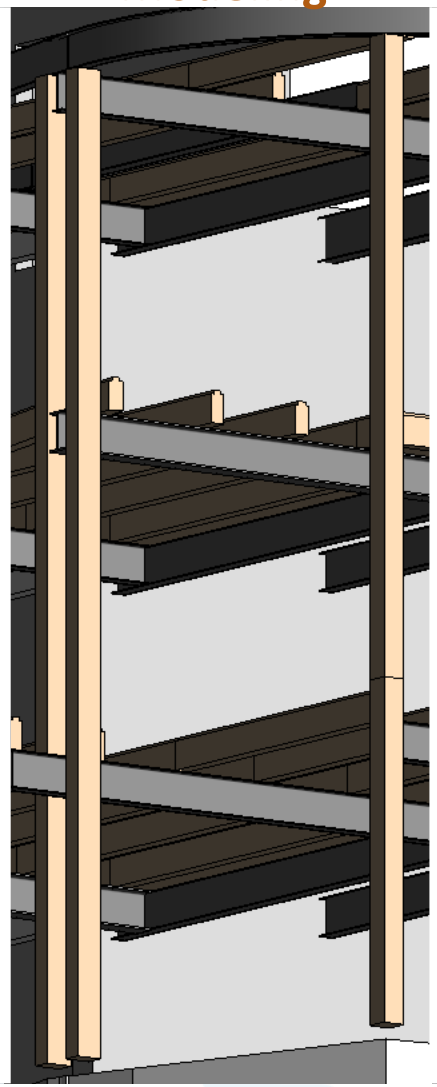


Energy Piles

Materials Reuse Timber

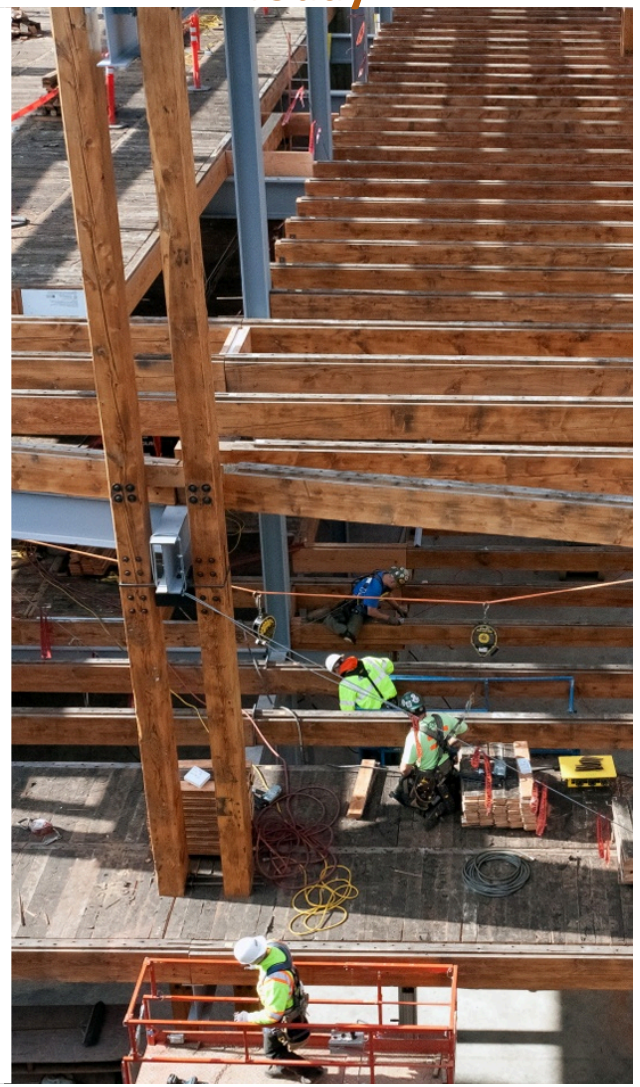
Warehouse

Modeling



Mock-up

Today



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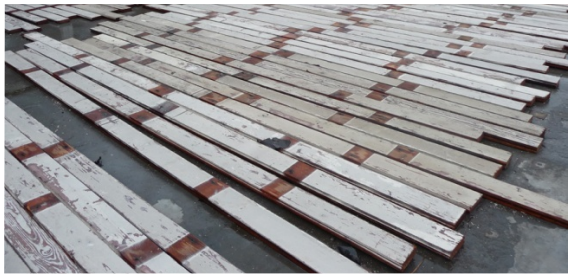
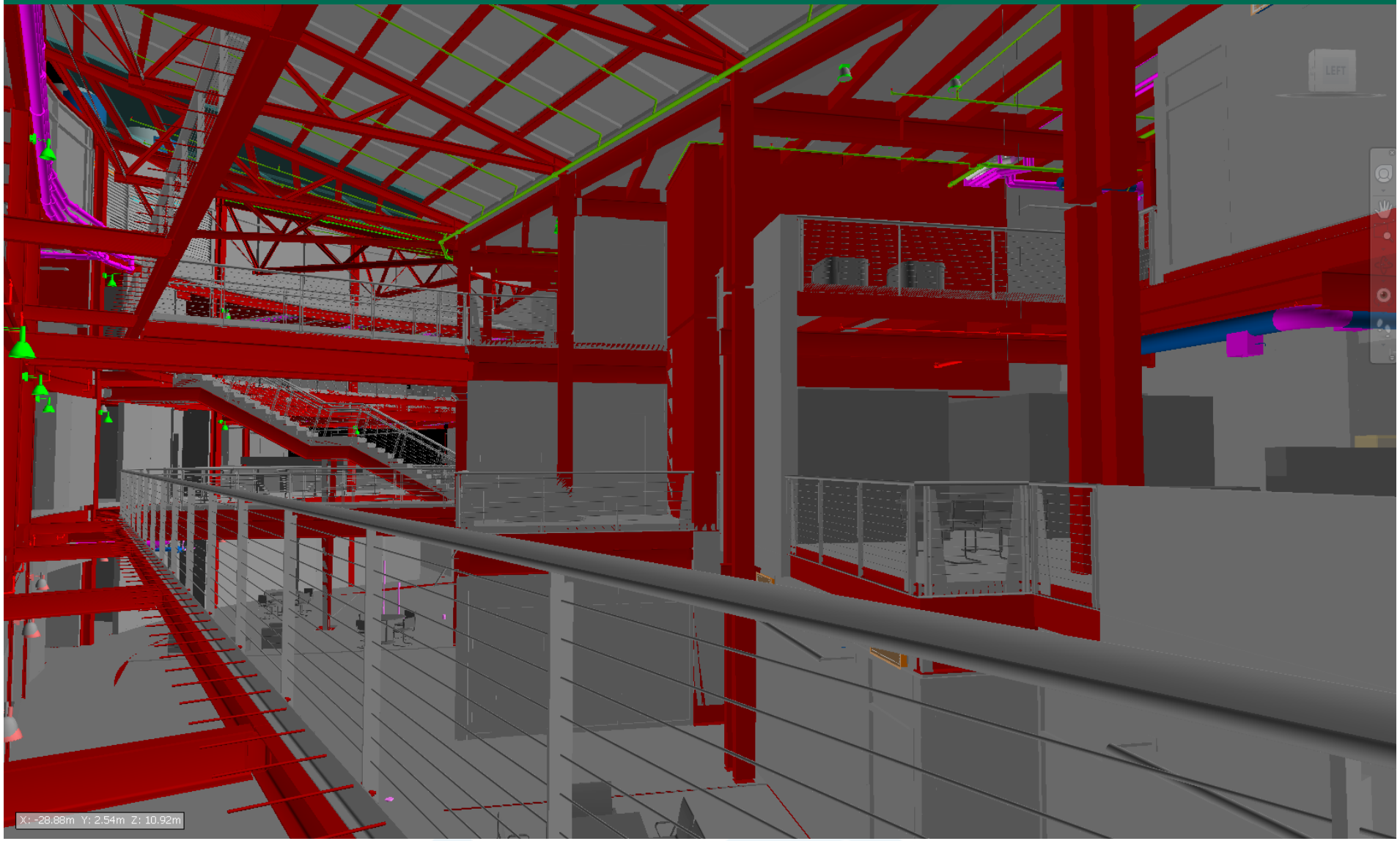
Reclamation Process



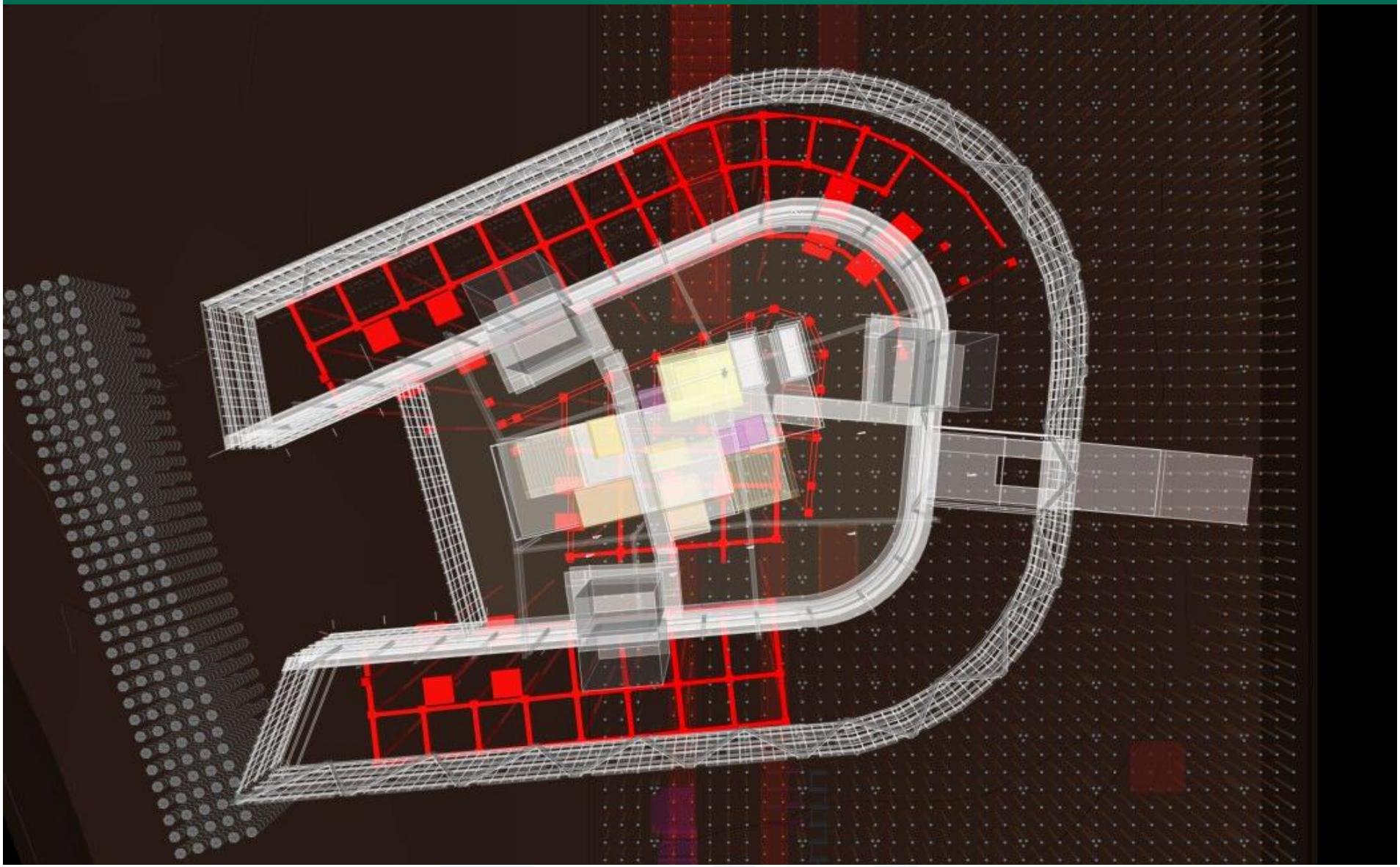
Materials Reuse

Materials Reuse



Materials Reuse

Materials Reuse



Systems Modeling

HVAC and envelope *Triple glazing, Exterior shading*

Phase Change, Ground Source and Cooling Tower

Daylight and Electrical Lighting

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Integrated Performance

Conservation first

Reduce loads

Passive systems

Efficient active systems

On-site renewable energy generation

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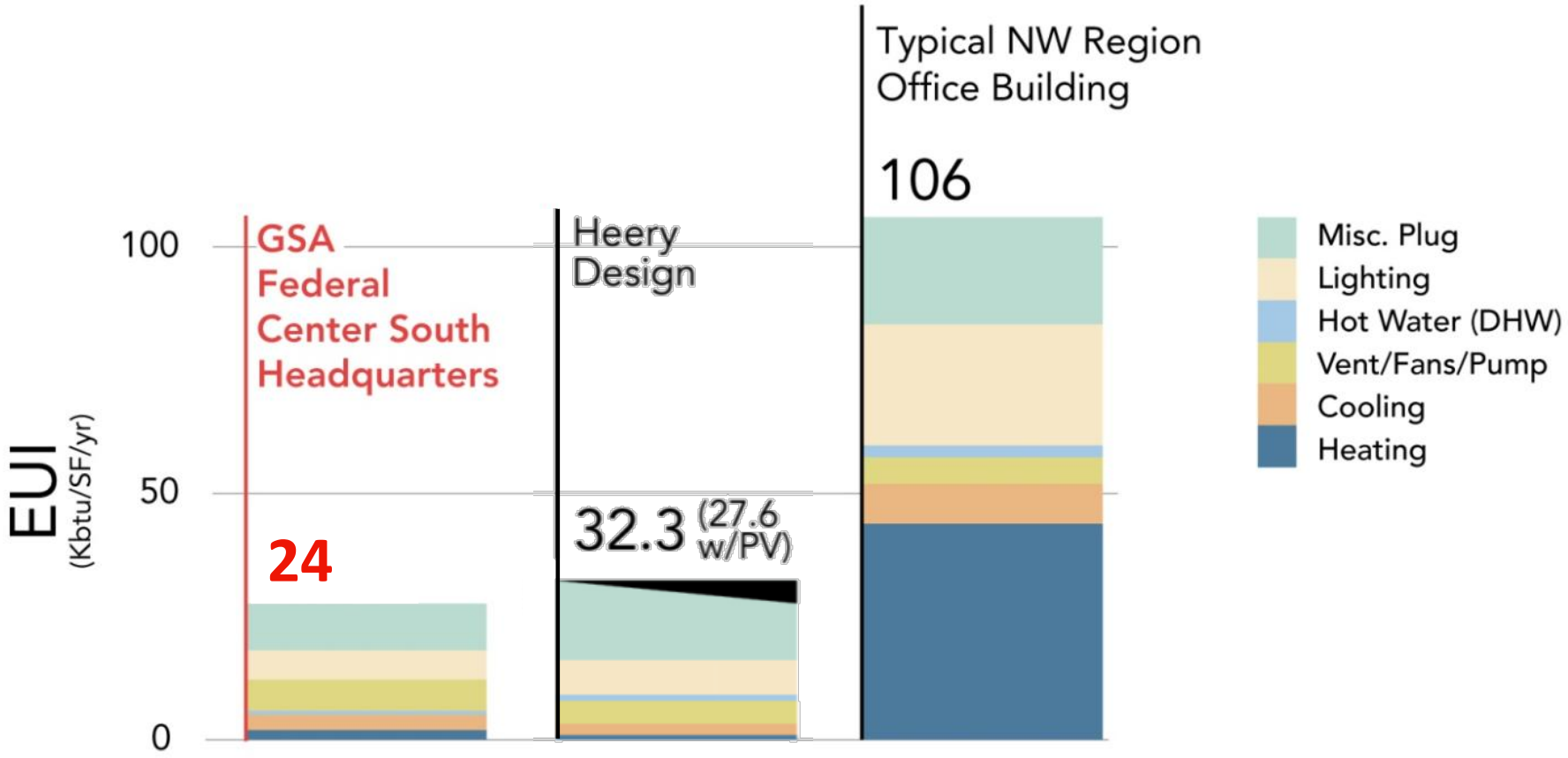
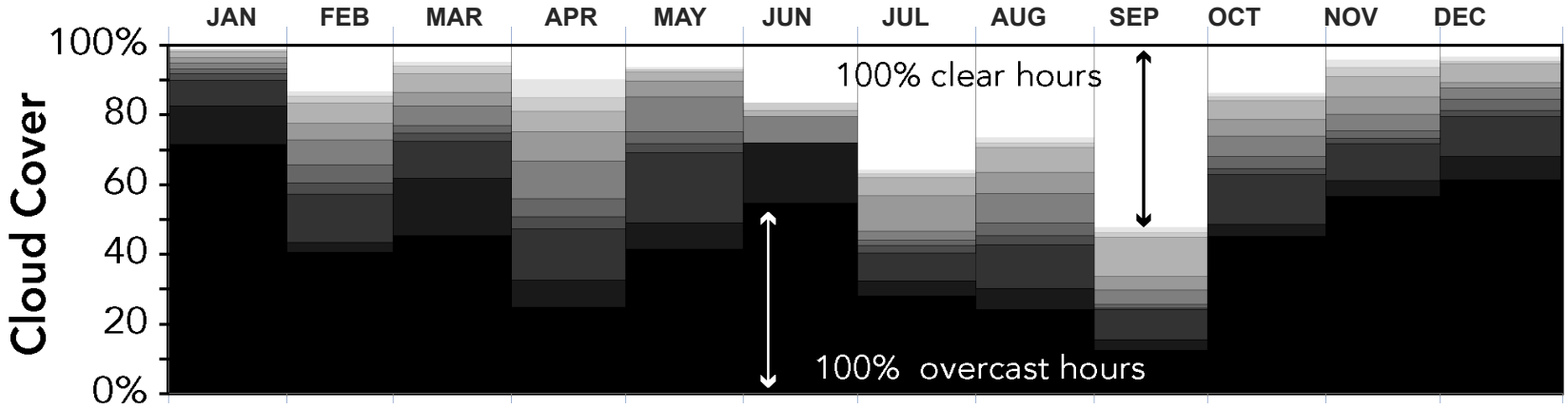
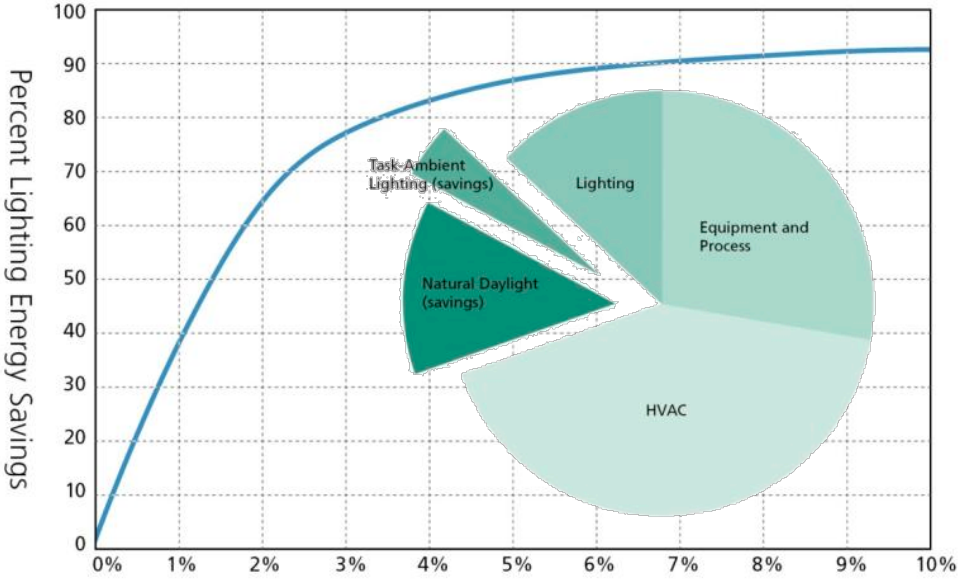
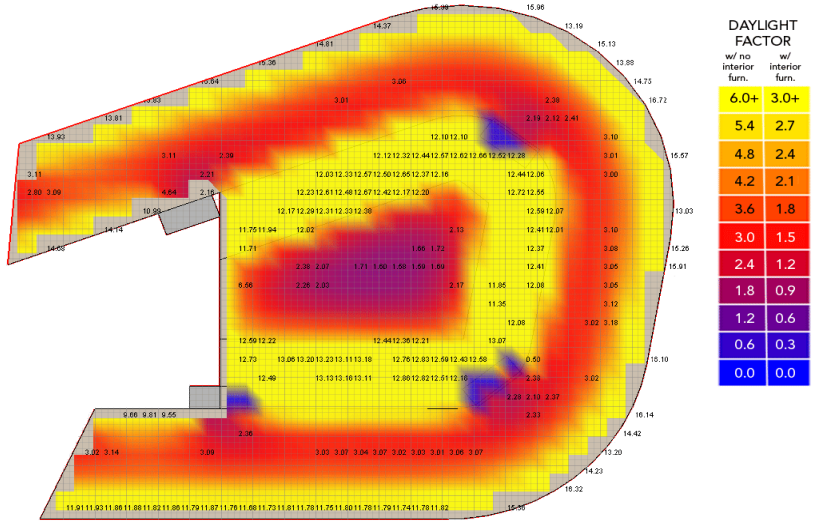
Current Energy Model Performance



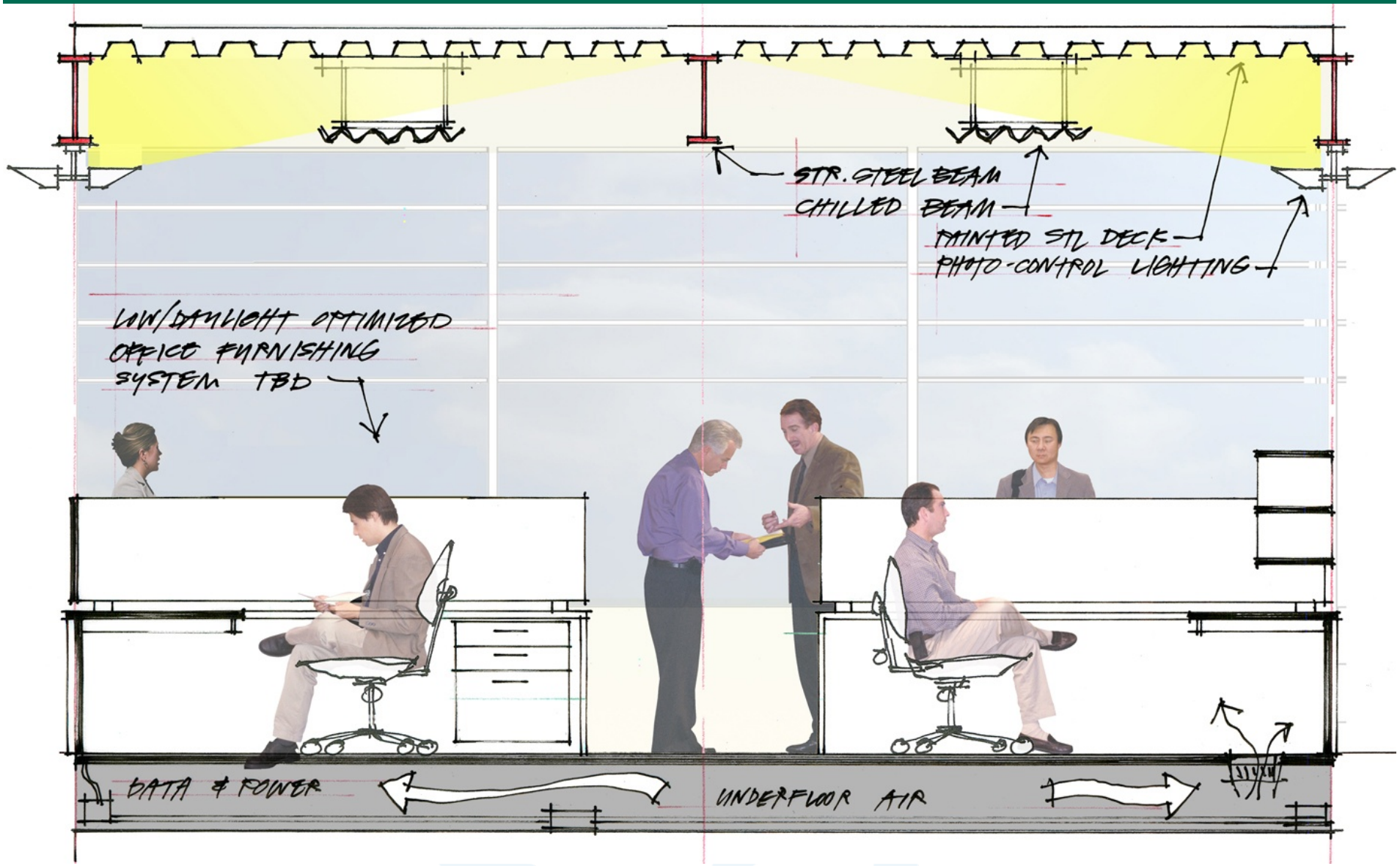
Daylight Performance



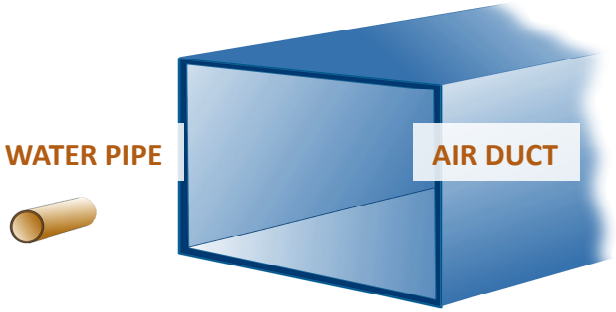


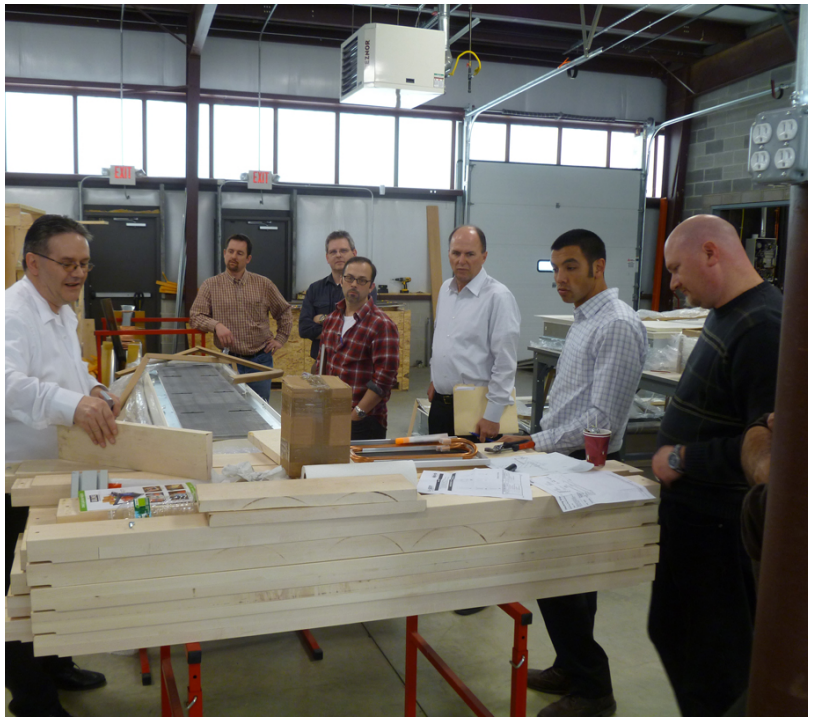


Workplace Lighting



Chilled Sails



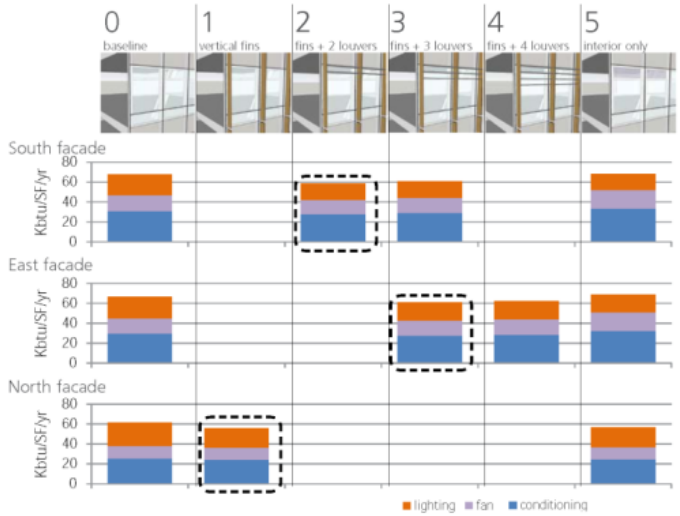


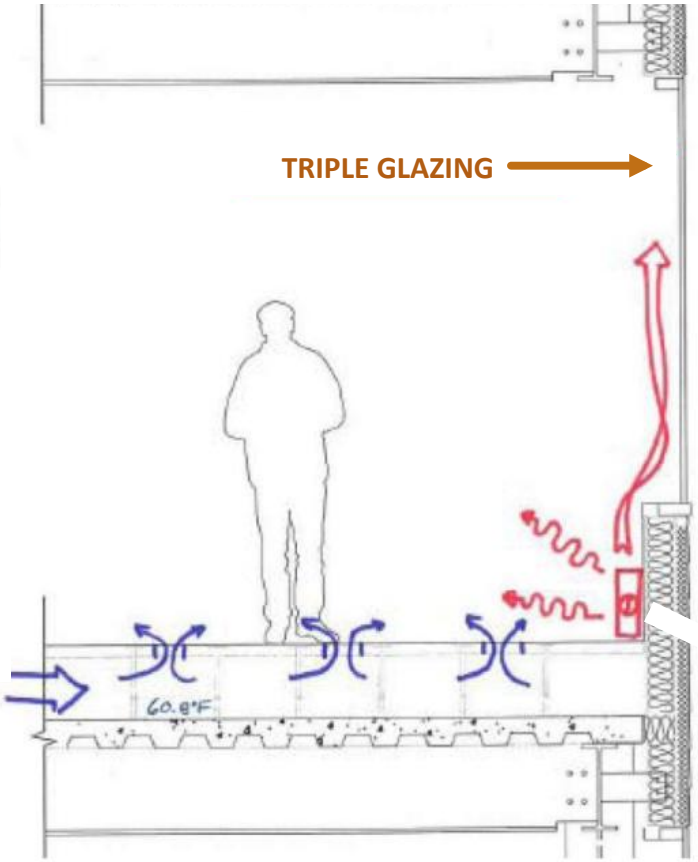
Orientation-Specific Envelope

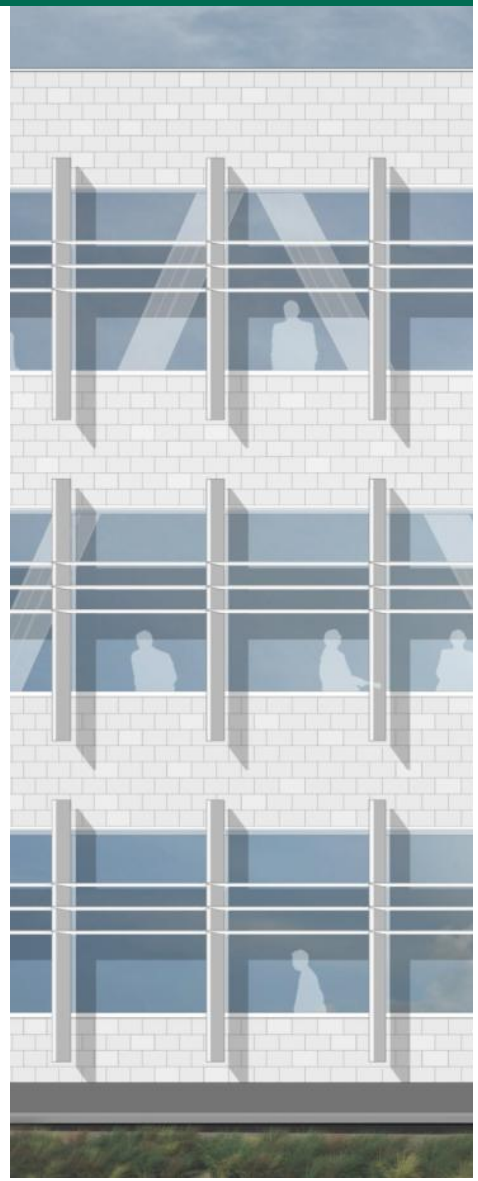
Daylight orientation

River orientation: natural

Campus orientation: formal

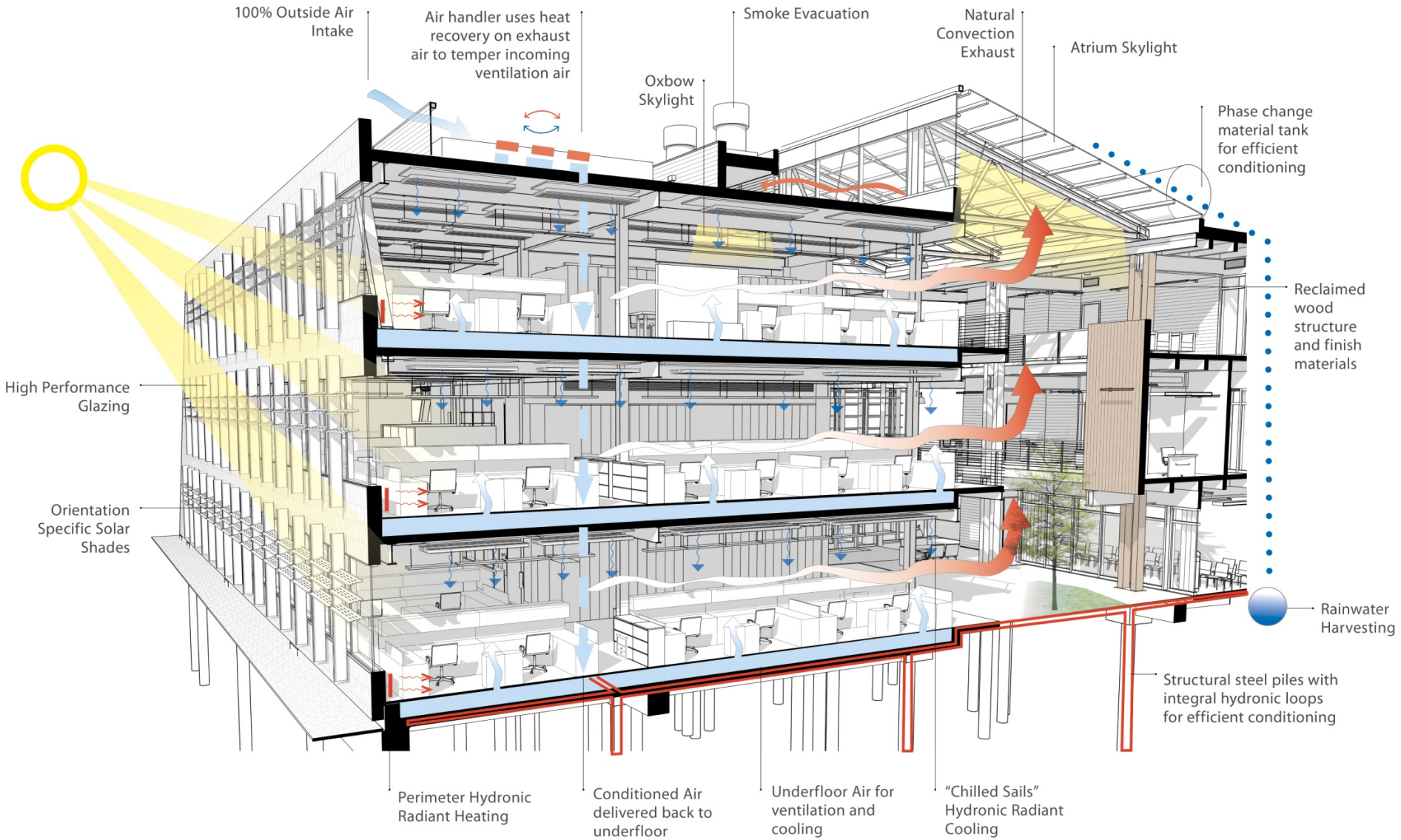






GSA ZGF Sellen AIA TAP FASTER FORWARD 2011

High Performance Green Building



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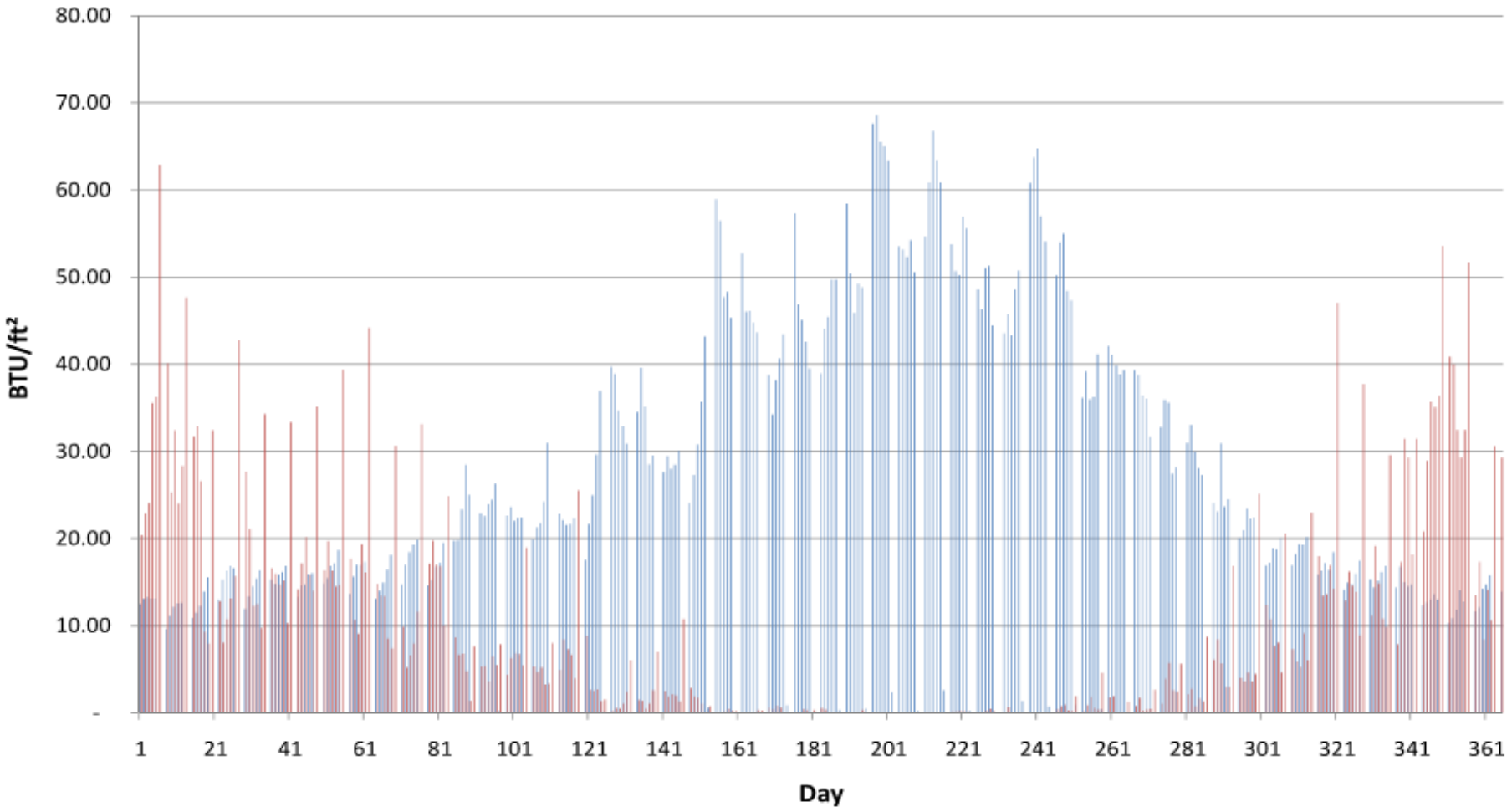
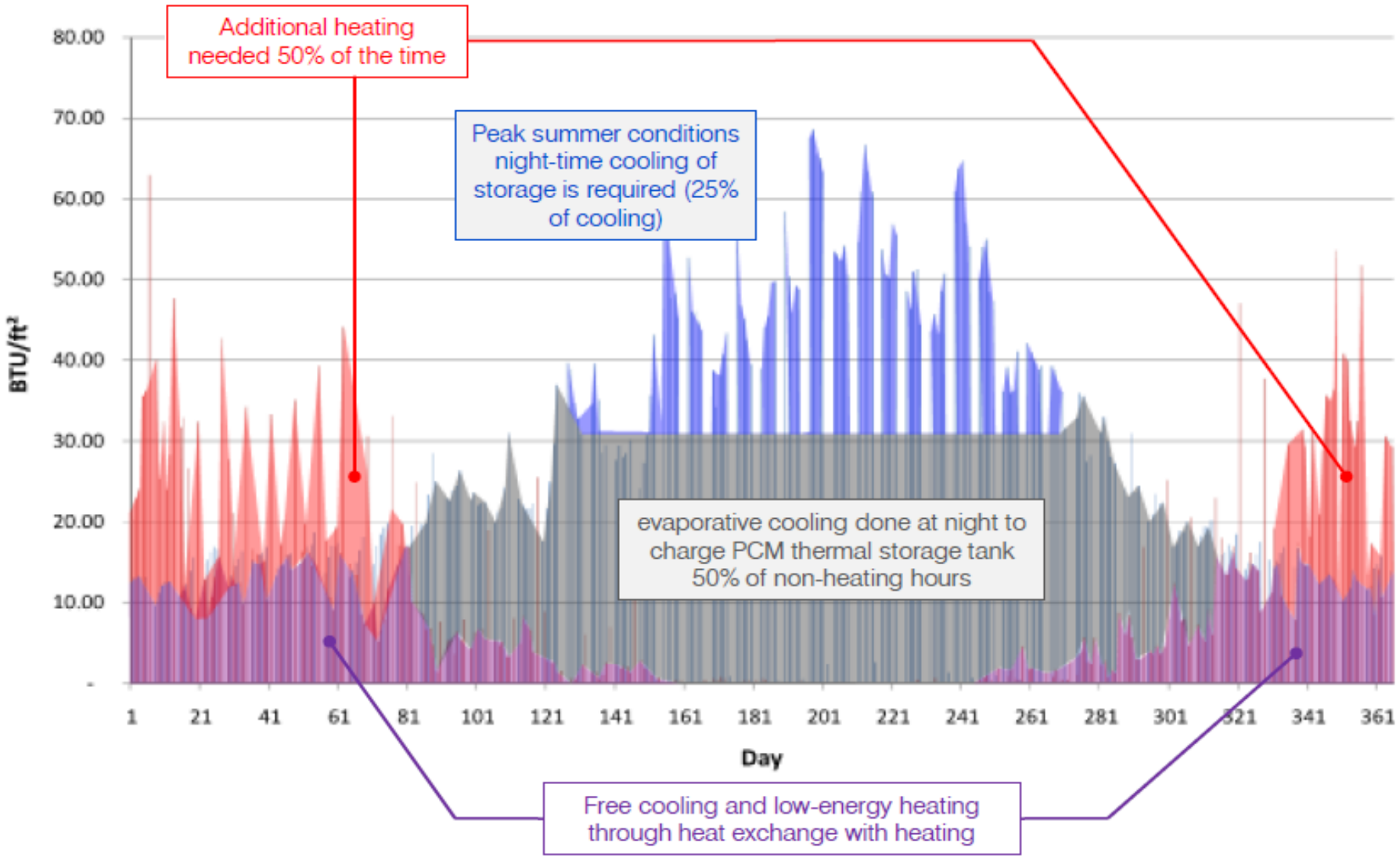
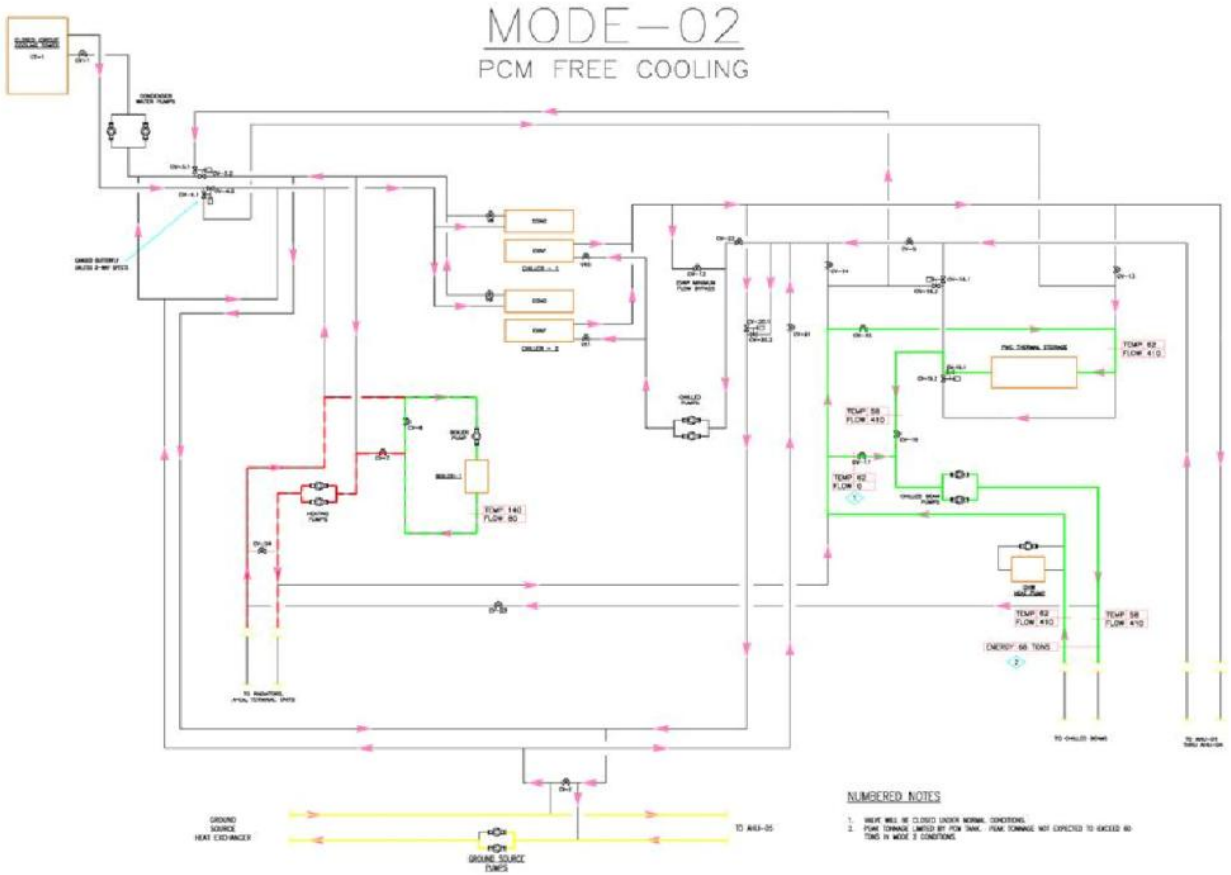
Energy


80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
-
BTU/ft²
1
21
41
61
81
101
121
141
161
181
201
221
241
261
281
301
321
341
361
Day

Energy


Additional heating needed 50% of the time
Peak summer conditions night-time cooling of storage is required (25% of cooling)
evaporative cooling done at night to charge PCM thermal storage tank 50% of non-heating hours
Free cooling and low-energy heating through heat exchange with heating
BTU/ft²
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
-
1
21
41
61
81
101
121
141
161
181
201
221
241
261
281
301
321
341
361
Day

Thermal Storage



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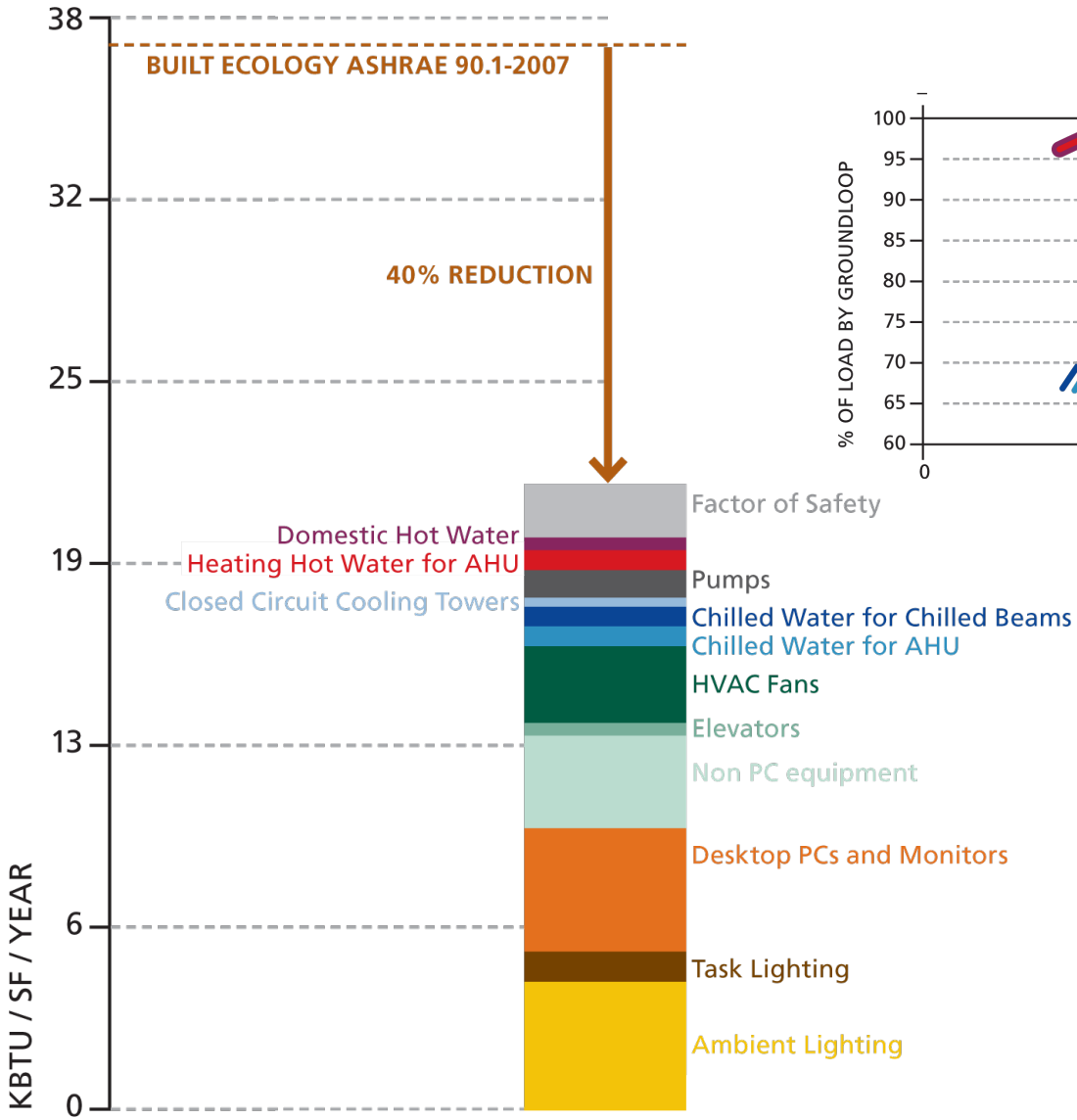
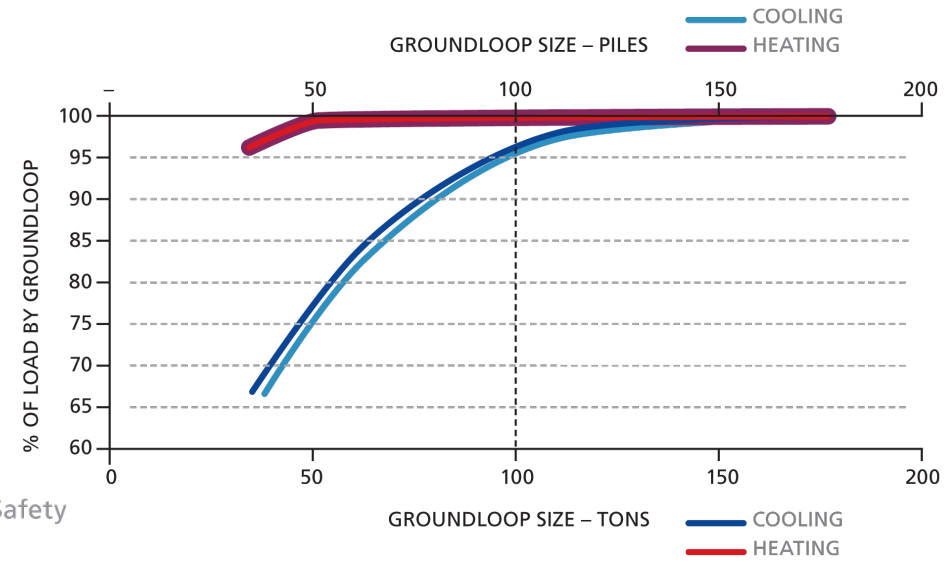
Ground Source





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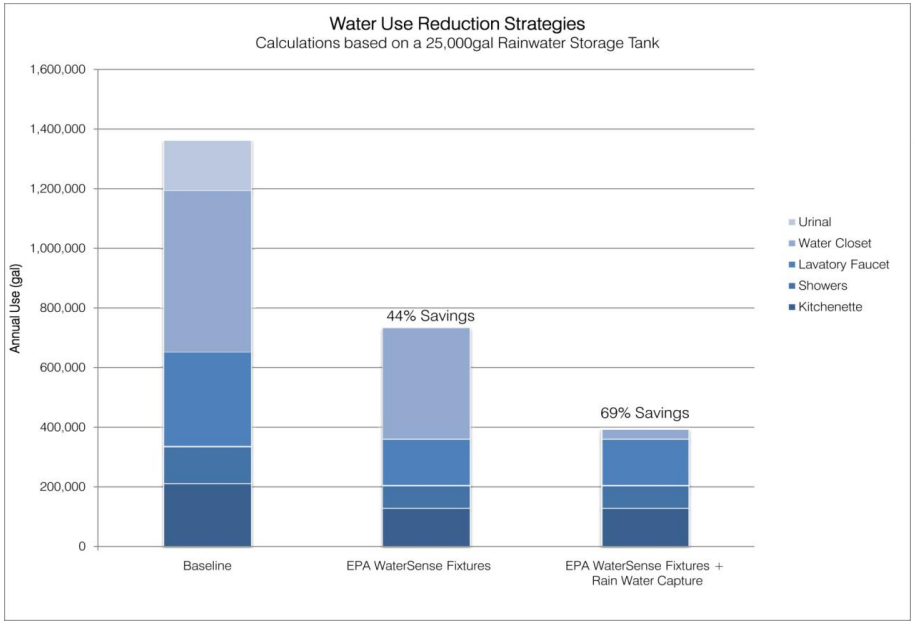
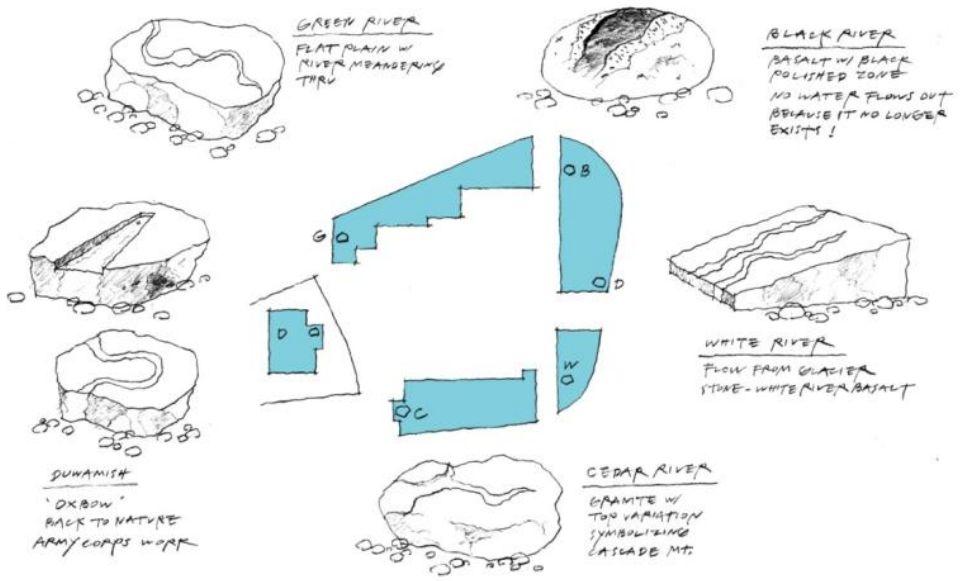
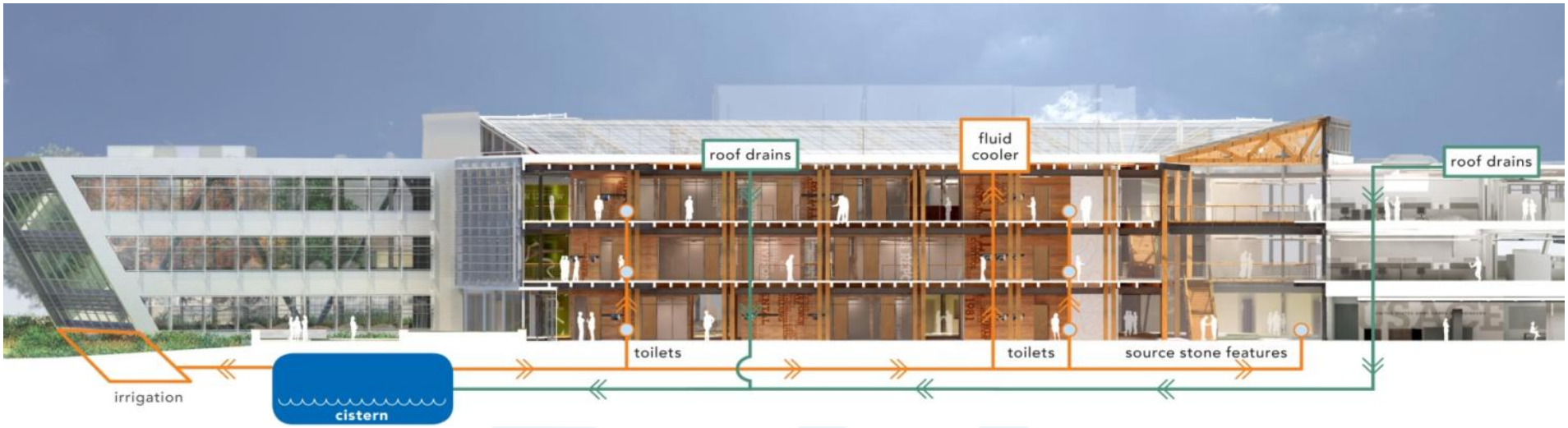
Water Harvesting

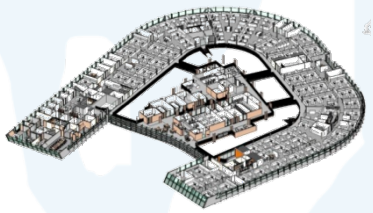
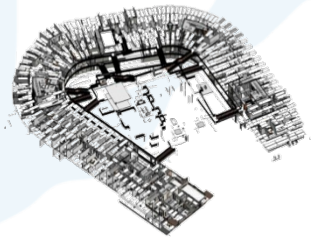


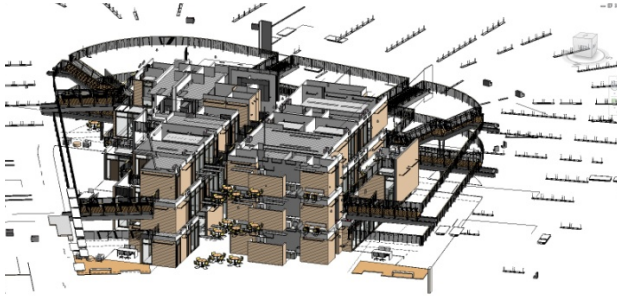




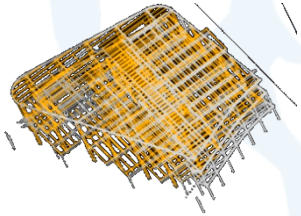
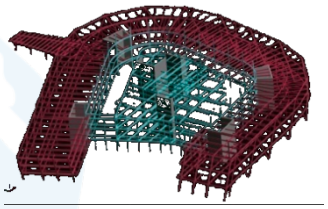
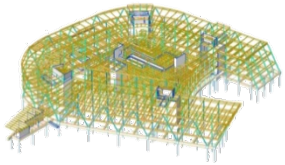
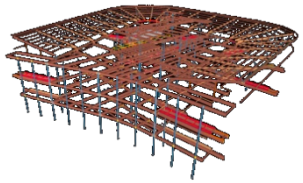
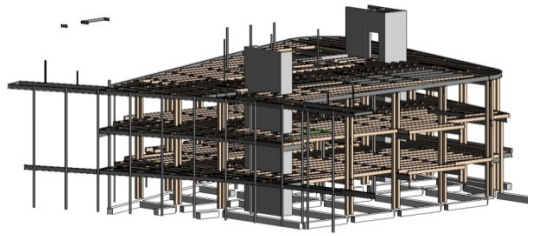
Model Integration Lessons

ARCHITECTURAL

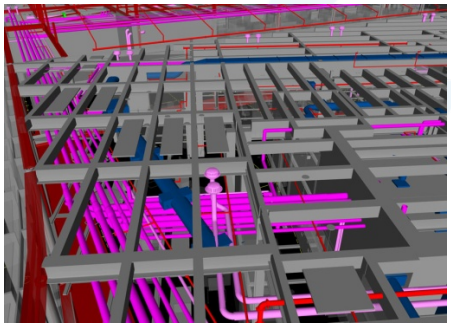
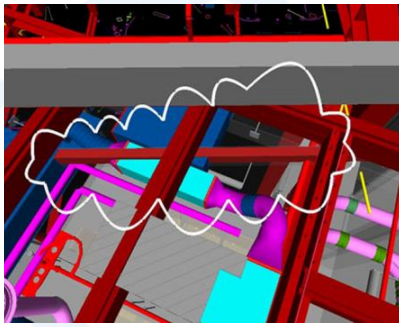
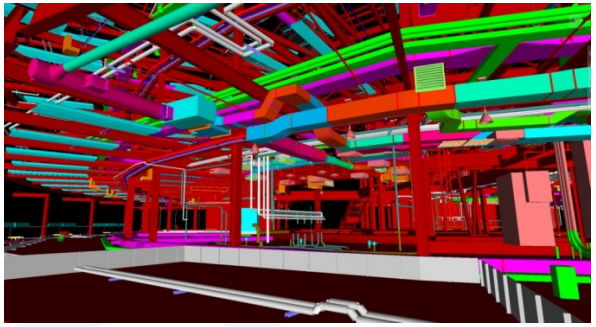
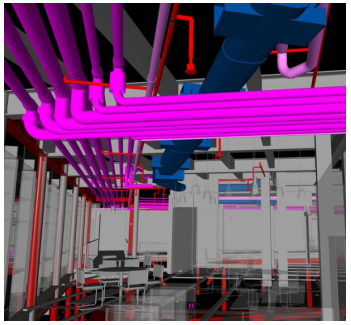





STRUCTURAL

MECHANICAL

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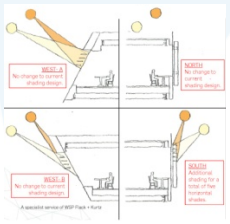
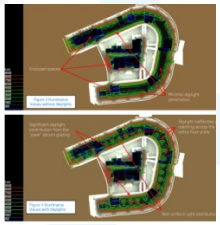
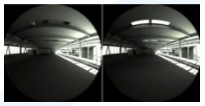
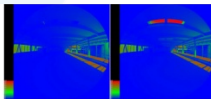
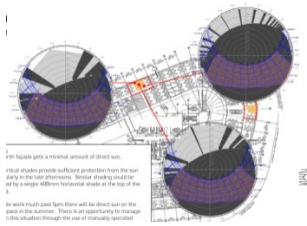
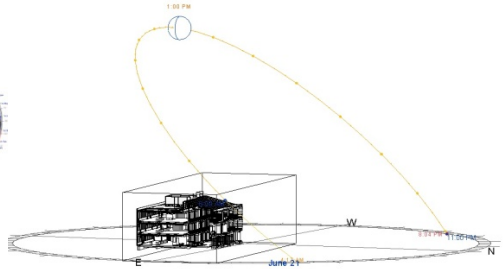
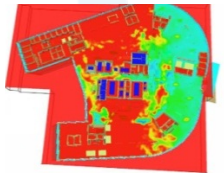
Model Integration Lessons

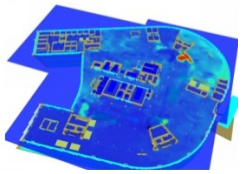
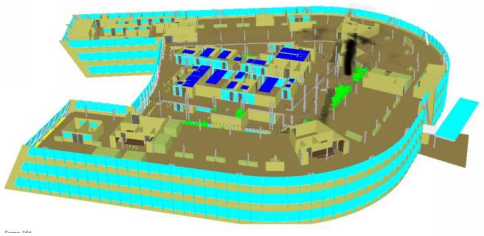
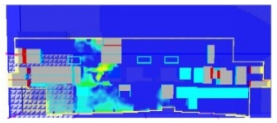
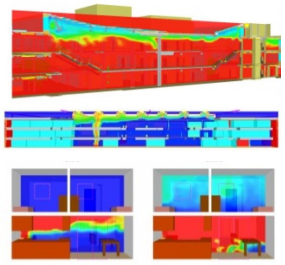
LIGHTING

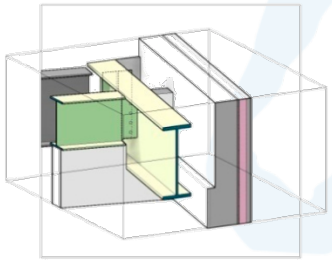
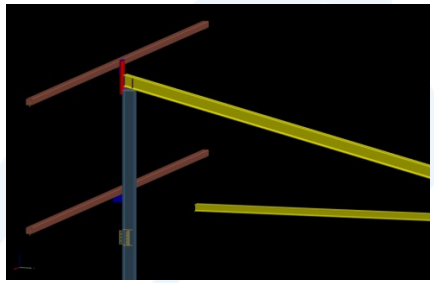



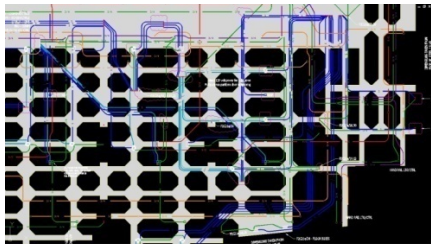
SMOKE / CFD ANALYSIS



DETAILING



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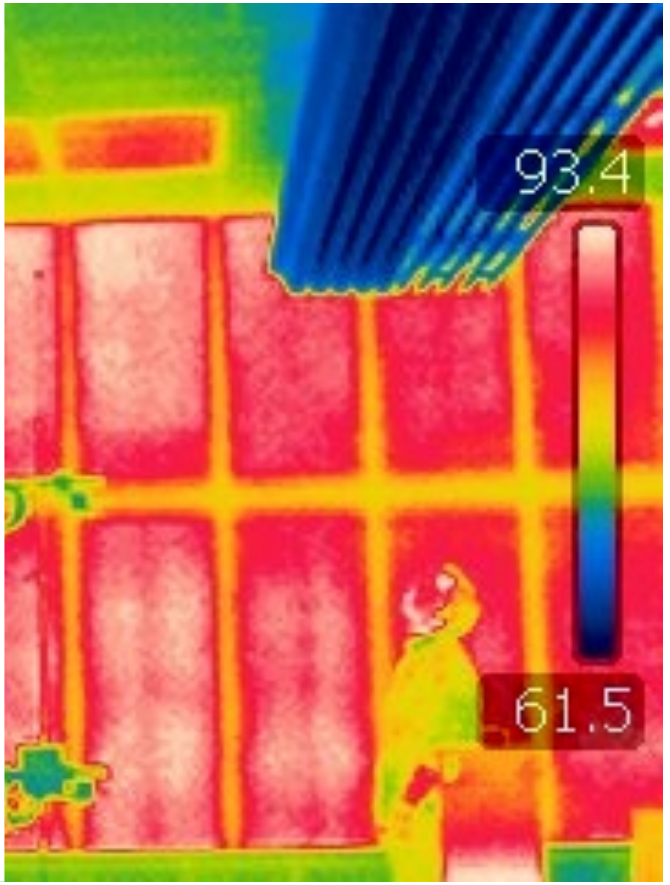
Create and Test New Products

Through collaborative efforts, the team created and tested three new sustainable products utilized in the building and ready for the market.

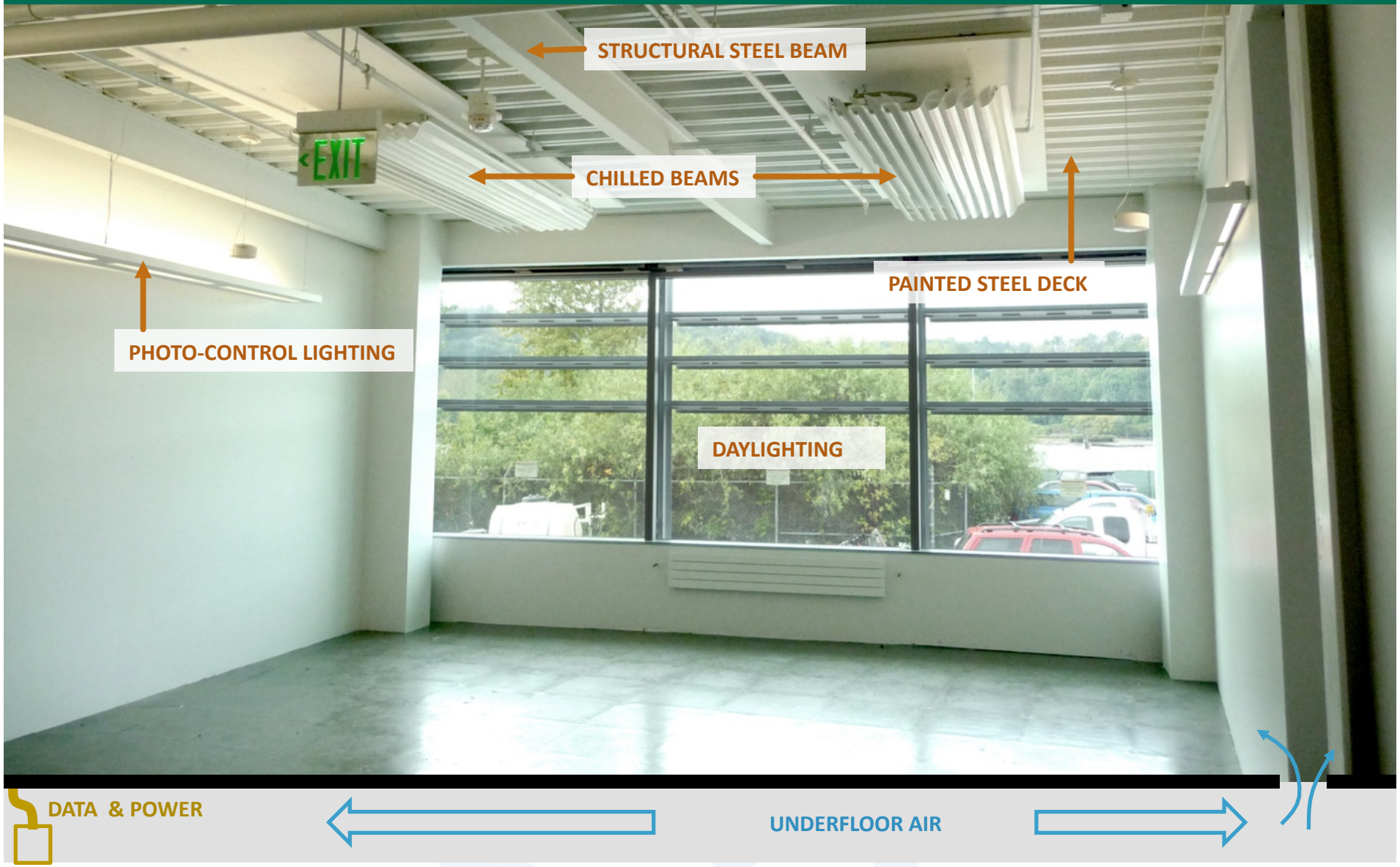
Steel Shingles

Composite Beams

Chilled Sails



Systems Integration Mock-up – R&D Lab



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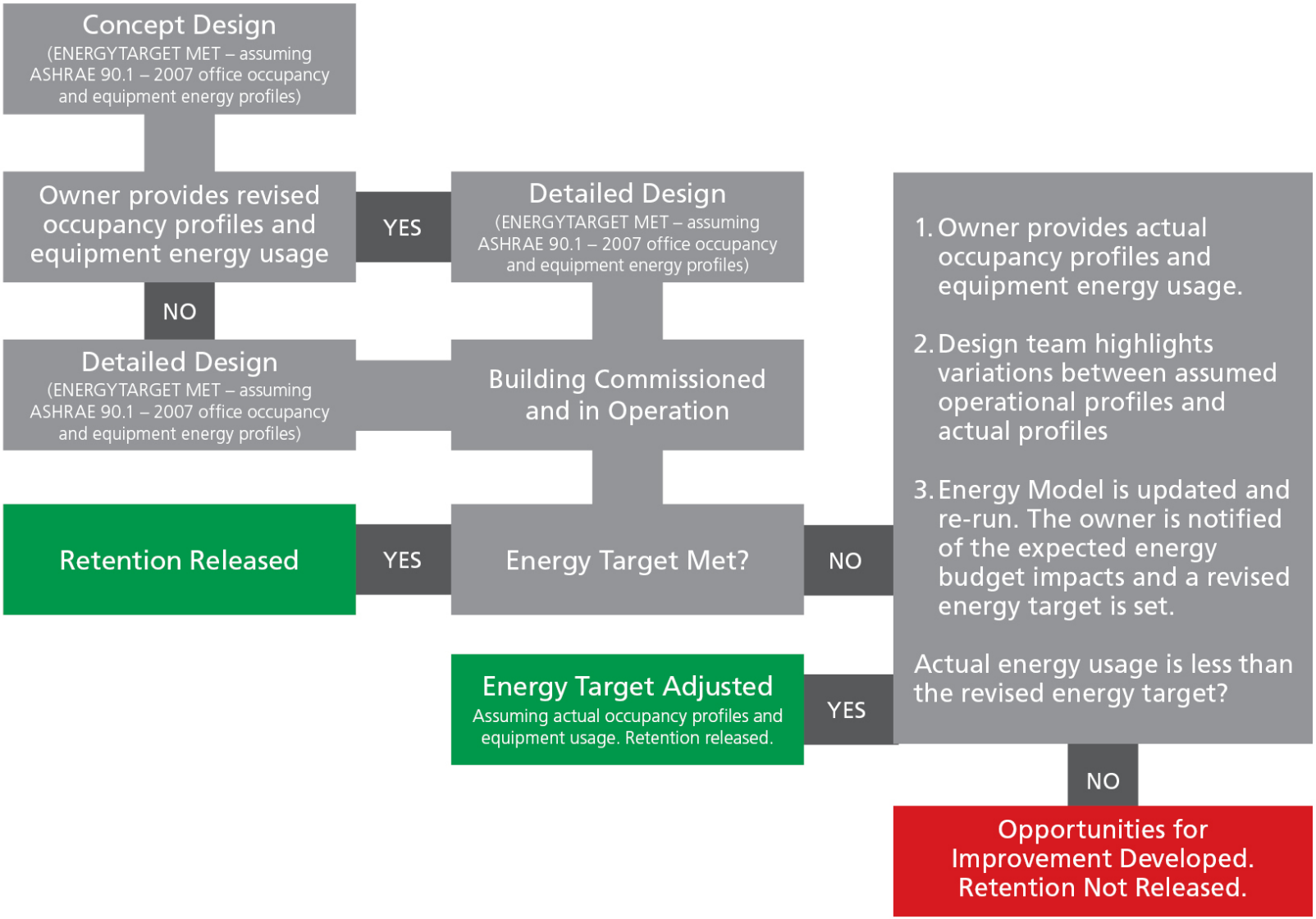
M&V Process


Concept Design
(ENERGYTARGET MET – assuming ASHRAE 90.1 – 2007 office occupancy and equipment energy profiles)
Owner provides revised occupancy profiles and equipment energy usage
YES
Detailed Design
(ENERGYTARGET MET – assuming ASHRAE 90.1 – 2007 office occupancy and equipment energy profiles)
NO
Detailed Design
(ENERGYTARGET MET – assuming ASHRAE 90.1 – 2007 office occupancy and equipment energy profiles)
Building Commissioned and in Operation
Retention Released
YES
Energy Target Met?
NO
1. Owner provides actual occupancy profiles and equipment energy usage.
2. Design team highlights variations between assumed operational profiles and actual profiles
3. Energy Model is updated and re-run. The owner is notified of the expected energy budget impacts and a revised energy target is set.
Actual energy usage is less than the revised energy target?
Energy Target Adjusted
Assuming actual occupancy profiles and equipment usage. Retention released.
YES
NO
Opportunities for Improvement Developed. Retention Not Released.

Project Scorecard

Current Point Total:
79 (Gold)

Sustainable Sites:
19 of 26

Water Efficiency:
8 of10

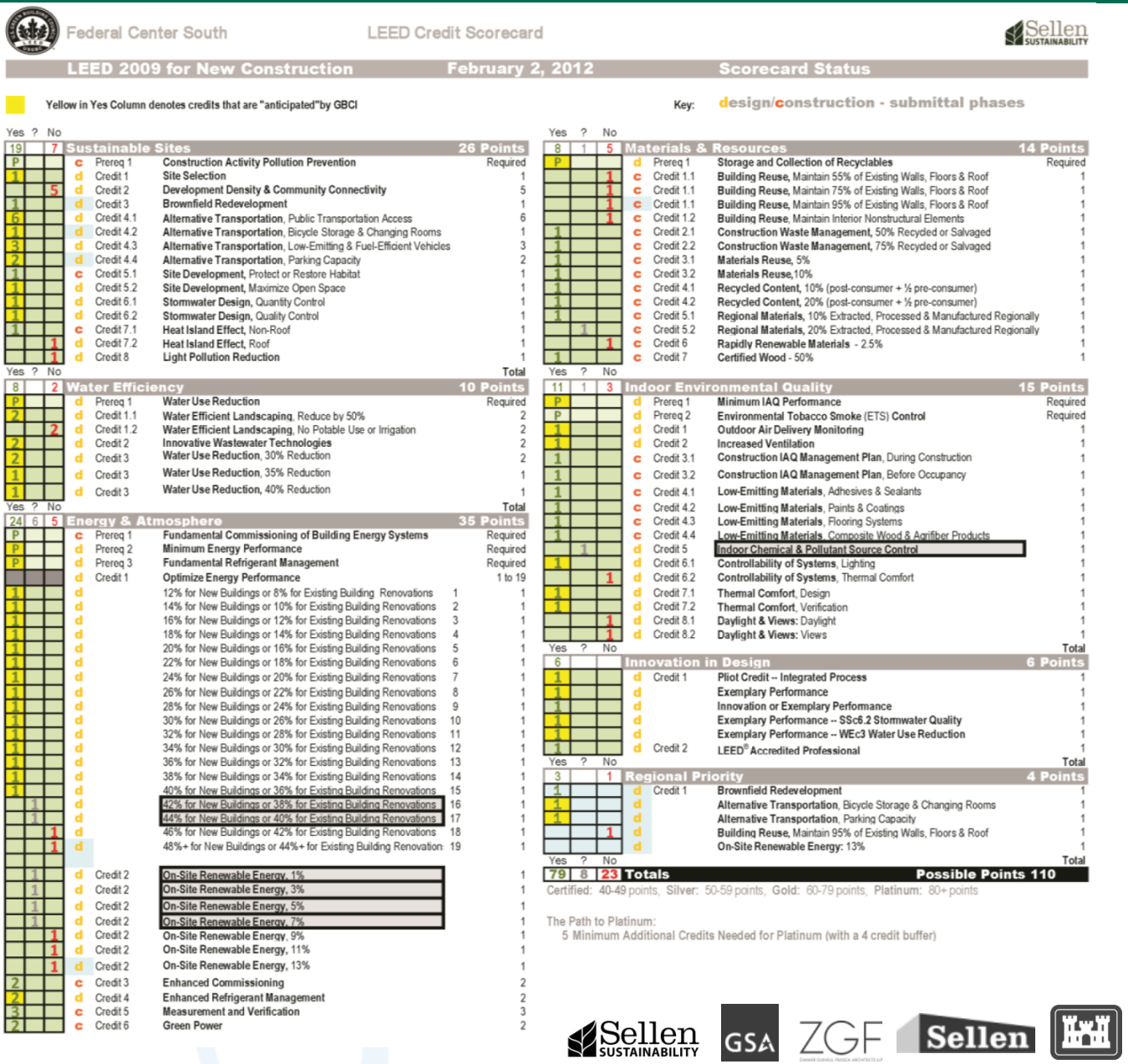
Energy & Atmosphere:
24 of 35

Materials & Resources:
8 of 14

IEQ:
11 of15

Innovation & Exemplary:
6 of 6

Regional Priority:
3 of 4



Federal Center South — LEED Credit Scorecard — Sellen SUSTAINABILITY

LEED 2009 for New Construction — February 2, 2012 — Scorecard Status

Yellow in Yes Column denotes credits that are "anticipated"by GBCI

Key: design/construction - submittal phases

Yes	?	No					
19		7	**Sustainable Sites**			**26 Points**	
P			c	Prereq 1	**Construction Activity Pollution Prevention**		Required
1			d	Credit 1	**Site Selection**		1
		5	d	Credit 2	**Development Density & Community Connectivity**		5
1			d	Credit 3	**Brownfield Redevelopment**		1
6			d	Credit 4.1	**Alternative Transportation**, Public Transportation Access		6
1			d	Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms		1
3			d	Credit 4.3	**Alternative Transportation**, Low-Emitting & Fuel-Efficient Vehicles		3
2			d	Credit 4.4	**Alternative Transportation**, Parking Capacity		2
1			c	Credit 5.1	**Site Development**, Protect or Restore Habitat		1
1			d	Credit 5.2	**Site Development**, Maximize Open Space		1
1			d	Credit 6.1	**Stormwater Design**, Quantity Control		1
1			d	Credit 6.2	**Stormwater Design**, Quality Control		1
1			c	Credit 7.1	**Heat Island Effect**, Non-Roof		1
		1	d	Credit 7.2	**Heat Island Effect**, Roof		1
		1	d	Credit 8	**Light Pollution Reduction**		1

Yes	?	No					
8		2	**Water Efficiency**			**10 Points**	
P			d	Prereq 1	**Water Use Reduction**		Required
2			d	Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%		2
		2	d	Credit 1.2	**Water Efficient Landscaping**, No Potable Use or Irrigation		2
2			d	Credit 2	**Innovative Wastewater Technologies**		2
2			d	Credit 3	**Water Use Reduction**, 30% Reduction		2
1			d	Credit 3	**Water Use Reduction**, 35% Reduction		1
1			d	Credit 3	**Water Use Reduction**, 40% Reduction		1

Yes	?	No					
24	6	5	**Energy & Atmosphere**			**35 Points**	
P			c	Prereq 1	**Fundamental Commissioning of Building Energy Systems**		Required
P			d	Prereq 2	**Minimum Energy Performance**		Required
P			d	Prereq 3	**Fundamental Refrigerant Management**		Required
			d	Credit 1	**Optimize Energy Performance**		1 to 19
1			d		12% for New Buildings or 8% for Existing Building Renovations	1	1
1			d		14% for New Buildings or 10% for Existing Building Renovations	2	1
1			d		16% for New Buildings or 12% for Existing Building Renovations	3	1
1			d		18% for New Buildings or 14% for Existing Building Renovations	4	1
1			d		20% for New Buildings or 16% for Existing Building Renovations	5	1
1			d		22% for New Buildings or 18% for Existing Building Renovations	6	1
1			d		24% for New Buildings or 20% for Existing Building Renovations	7	1
1			d		26% for New Buildings or 22% for Existing Building Renovations	8	1
1			d		28% for New Buildings or 24% for Existing Building Renovations	9	1
1			d		30% for New Buildings or 26% for Existing Building Renovations	10	1
1			d		32% for New Buildings or 28% for Existing Building Renovations	11	1
1			d		34% for New Buildings or 30% for Existing Building Renovations	12	1
1			d		36% for New Buildings or 32% for Existing Building Renovations	13	1
1			d		38% for New Buildings or 34% for Existing Building Renovations	14	1
1			d		40% for New Buildings or 36% for Existing Building Renovations	15	1
	1		d		42% for New Buildings or 38% for Existing Building Renovations	16	1
	1		d		44% for New Buildings or 40% for Existing Building Renovations	17	1
		1	d		46% for New Buildings or 42% for Existing Building Renovations	18	1
		1	d		48%+ for New Buildings or 44%+ for Existing Building Renovation	19	1
	1		d	Credit 2	On-Site Renewable Energy, 1%		1
	1		d	Credit 2	On-Site Renewable Energy, 3%		1
	1		d	Credit 2	On-Site Renewable Energy, 5%		1
	1		d	Credit 2	On-Site Renewable Energy, 7%		1
		1	d	Credit 2	**On-Site Renewable Energy**, 9%		1
		1	d	Credit 2	**On-Site Renewable Energy**, 11%		1
		1	d	Credit 2	**On-Site Renewable Energy**, 13%		1
2			c	Credit 3	**Enhanced Commissioning**		2
2			d	Credit 4	**Enhanced Refrigerant Management**		2
3			c	Credit 5	**Measurement and Verification**		3
2			c	Credit 6	**Green Power**		2

Yes	?	No					
8	1	5	**Materials & Resources**			**14 Points**	
P			d	Prereq 1	**Storage and Collection of Recyclables**		Required
		1	c	Credit 1.1	**Building Reuse**, Maintain 55% of Existing Walls, Floors & Roof		1
		1	c	Credit 1.1	**Building Reuse**, Maintain 75% of Existing Walls, Floors & Roof		1
		1	c	Credit 1.1	**Building Reuse**, Maintain 95% of Existing Walls, Floors & Roof		1
		1	c	Credit 1.2	**Building Reuse**, Maintain Interior Nonstructural Elements		1
1			c	Credit 2.1	**Construction Waste Management**, 50% Recycled or Salvaged		1
1			c	Credit 2.2	**Construction Waste Management**, 75% Recycled or Salvaged		1
1			c	Credit 3.1	**Materials Reuse**, 5%		1
1			c	Credit 3.2	**Materials Reuse**,10%		1
1			c	Credit 4.1	**Recycled Content**, 10% (post-consumer + ½ pre-consumer)		1
1			c	Credit 4.2	**Recycled Content**, 20% (post-consumer + ½ pre-consumer)		1
1			c	Credit 5.1	**Regional Materials**, 10% Extracted, Processed & Manufactured Regionally		1
	1		c	Credit 5.2	**Regional Materials**, 20% Extracted, Processed & Manufactured Regionally		1
		1	c	Credit 6	**Rapidly Renewable Materials** - 2.5%		1
1			c	Credit 7	**Certified Wood** - 50%		1

Yes	?	No					
11	1	3	**Indoor Environmental Quality**			**15 Points**	
P			d	Prereq 1	**Minimum IAQ Performance**		Required
P			d	Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**		Required
1			d	Credit 1	**Outdoor Air Delivery Monitoring**		1
1			d	Credit 2	**Increased Ventilation**		1
1			c	Credit 3.1	**Construction IAQ Management Plan**, During Construction		1
1			c	Credit 3.2	**Construction IAQ Management Plan**, Before Occupancy		1
1			c	Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants		1
1			c	Credit 4.2	**Low-Emitting Materials**, Paints & Coatings		1
1			c	Credit 4.3	**Low-Emitting Materials**, Flooring Systems		1
1			c	Credit 4.4	**Low-Emitting Materials**, Composite Wood & Agrifiber Products		1
	1		d	Credit 5	**Indoor Chemical & Pollutant Source Control**		1
1			d	Credit 6.1	**Controllability of Systems**, Lighting		1
	1		d	Credit 6.2	**Controllability of Systems**, Thermal Comfort		1
1			d	Credit 7.1	**Thermal Comfort**, Design		1
1			d	Credit 7.2	**Thermal Comfort**, Verification		1
		1	d	Credit 8.1	**Daylight & Views:** Daylight		1
		1	d	Credit 8.2	**Daylight & Views:** Views		1

Yes	?	No					
6			**Innovation in Design**			**6 Points**	
1			d	Credit 1	**Pliot Credit -- Integrated Process**		1
1			d		**Exemplary Performance**		1
1			d		**Innovation or Exemplary Performance**		1
1			d		**Exemplary Performance -- SSc6.2 Stormwater Quality**		1
1			d		**Exemplary Performance -- WEc3 Water Use Reduction**		1
1			d	Credit 2	**LEED® Accredited Professional**		1

Yes	?	No					
3		1	**Regional Priority**			**4 Points**	
1			d	Credit 1	**Brownfield Redevelopment**		1
1			d		**Alternative Transportation**, Bicycle Storage & Changing Rooms		1
1			d		**Alternative Transportation**, Parking Capacity		1
		1	d		**Building Reuse**, Maintain 95% of Existing Walls, Floors & Roof		1
			d		**On-Site Renewable Energy:** 13%		1

Yes	?	No			
79	8	23	**Totals**		**Possible Points 110**

Certified: 40-49 points, Silver: 50-59 points, Gold: 60-79 points, Platinum: 80+ points

The Path to Platinum:
5 Minimum Additional Credits Needed for Platinum (with a 4 credit buffer)

Sellen SUSTAINABILITY GSA ZGF Sellen

General Contractor:
SELLEN CONSTRUCTION COMPANY

Architect:
ZGF ARCHITECTS LLP

Sustainability Lead:
SELLEN SUSTAINABILITY

Design Consultants:
KPFF CONSULTING ENGINEERS, INC.
WSP FLACK + KURTZ/BUILT ECOLOGY
SITE WORKSHOP LLC
STUDIO SC
LERCH BATES
ROLF JENSEN & ASSOCIATES, INC.
HINMAN CONSULTING ENGINEERS, INC.
THE GREENBUSCH GROUP, INC.
TUAZON ENGINEERING
HART CROWSER & ASSOCIATES, INC.
LANE COBURN & ASSOCIATES, LLC
MCKINNEY ASSOCIATES
OTTO ROSENAU & ASSOCIATES, INC.

Key Subcontractors:
THE G.R. PLUME COMPANY
UNIVERSITY MECHANICAL CONTRACTORS
SEQUOYAH ELECTRIC, LLC
PATRIOT FIRE PROTECTION
MILLENNIUM TILES, LLC
NORTH SHORE SHEET METAL
WALTERS & WOLF
SESSLER
R.W. RHINE, INC.
BARCOL-AIR
LUTRON
LITECONTROL

AN Integrated Team
ACHIEVES
Performance +
Time + Cost + Quality

GSA ZGF Sellen AIA TAP FASTER FORWARD 2011

Good design
makes a difference™

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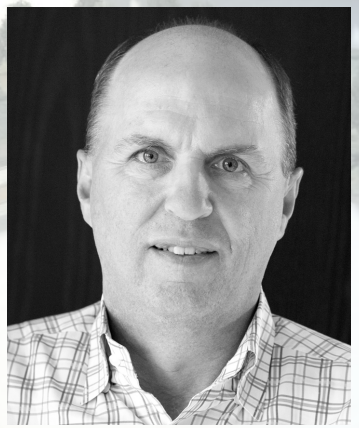

Jack Avery

Integrated Project Delivery/Design Project Manager

Sellen

Todd Stine

Design Project Manager

ZGF
ZIMMER GUNSUL FRASCA ARCHITECTS LLP

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makes a difference™

AIA

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Aggressive Performance Goals & IPD

The End.

THANK YOU!!

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