U.S. General Services Administration
FEDERAL CENTER SOUTH BUILDING 1202
U.S. Army Corps of Engineers Seattle District Headquarters
U.S. General Services Administration

FEDERAL CENTER SOUTH BUILDING 1202
U.S. Army Corps of Engineers Seattle District Headquarters

SIZE: Three-story, 209,000 SF office building

PROJECT COST: $72 million

LOCATION: Seattle, Washington

CONSTRUCTION START DATE: July 2010

COMPLETION DATE: October 2012

TENANT: U.S. Army Corps of Engineers

OWNER: U.S. General Services Administration

GREEN CERTIFICATION: Will achieve LEED Gold at minimum. Project is on track for LEED Platinum certification from the U.S. Green Building Council. Will meet the requirements of the 2030 Challenge and perform 40 percent better than ASHRAE 2007 benchmarks

ENERGY USE INDEX (EUI): 20.3 kBtu/SF/year

ENERGY STAR SCORE: 100
SUSTAINABLE
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**
High Performance Green Building
3 Story Configuration

Optimizes site available for security setbacks
Maximizes open campus green space
Provides storm water management opportunities
AESTHETIC
Exterior Elements

- Exposed diagrid structure exemplifies USACE and “Building Strong”
- Stainless steel shingle meets project’s aesthetic, performance and budget requirements
- Exterior shading elements contribute detail and precision
- All design elements are modular and systematic
Interior Atrium “Commons”

- Landscape connects to site
- Workspace open to daylight and views
- Efficient envelope ratio
- Ventilation pathways
PRODUCTIVE / HEALTHY
The Collaborative Workplace

Flexibility. Efficiency. Daylight.
Unified. Open.


No “Silos”.

Optimize Mechanical Systems

Builds Community
Workplace Amenities

- Continuous horizontal windows for views
- Exposed structure allows maximum daylight and access to views
- Overhead skylight at atrium and at level 3
- 100% outdoor air filtered to assure air quality
- Underfloor air distribution for displacement ventilation
- Passive chilled sails provide thermal comfort
21st Century Workplace

- Create a sense of place
- Enhance collaboration and identity
- Reduce silos
- Provide connectivity
- Support generational work styles
- Daylight and connection to nature
View Obstruction Analysis

As Designed
42” Perpendicular, 42” Parallel
0.5% Obscured Outdoor View

Hybrid
42” Perpendicular, 60” Parallel
2.5% Obscured Outdoor View

Past Practice
66” Perpendicular, 66” Parallel
43.6% Obscured Outdoor View
INTEGRATED DESIGN
Integrated Building Performance

Conservation first
Reduce loads
Passive systems
Efficient active systems
Geothermal

EXCEED 2007 ASHRAE 90.1
BY 40%

OVERALL EUI OF 20.3 KBTU/SF/YR

LEED GOLD CERTIFICATION

HEALTHY BUILDING WORK ENVIRONMENT

BUILDING STRONG

HIGH PERFORMANCE GREEN BUILDING

ELIMINATE AT LEAST 61% OF WATER BASELINE DEMAND

STORMWATER MANAGEMENT

HIGH-PERFORMANCE HVAC SYSTEM UTILIZES 100% OUTDOOR AIR

200,000 FT² OF REUSED TIMBER FROM A DECOMMISSIONED WAREHOUSE

FROM 100% IMPERVIOUS TO 50% PERVIOUS

GSA ZGF Sellen

National Institute of BUILDING SCIENCES

An Authority Source of Innovative Solutions for the Built Environment
Energy Use of Federal Center South Design

- 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
Thermal Storage: Phase Change Material
Energy Piles: A Realized Opportunity
Passive Chilled Sails Prototype

AIR DUCT

WATER PIPE

Flow Cross Section Ratio
Air Duct
Water Pipe
1 : 327

Passive Chilled Sails Prototype

AIR DUCT

WATER PIPE
INNOVATION
Materials Timber Reuse

Warehouse

Modeling

Mock-up

Under Construction
Twist, Crook, and Bow
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.
Composite Beam Testing/Lag Screws and Conduit in Slab

- Reduced structural material needs by 20-30%
- First use of composite wood beams in the United States
Systems Integration Mock-up – R&D Lab

- Structural Steel Beam
- Chilled Beams
- Painted Steel Deck
- Photo-Control Lighting
- Daylighting

Data & Power
Underfloor Air
ENERGY & ENVIRONMENTAL CONSIDERATIONS
Water Flow

1. Gather and Store Rainwater
2. Utilize for Landscaping
3. Capture Runoff into Retention Pond
4. Treated Runoff Released Back into Duwamish River

- Filter Strip for Water Quality
- Site Grading
- Rain Gardens
- Porous Pavement
- Rain Garden Filtration Zone
- Compost Amended Soils for Landscaping and Rainfall Retention
- Retention Pond
- Existing Outfall
- Duwamish River

LANDSCAPE: Building and Hardscape ➔ Native and Adaptive Landscaping ➔ River Ecosystem
Water Harvesting

Water Use Reduction Strategies
Calculations based on a 25,000gal Rainwater Storage Tank

- Unнал
- Water Closet
- Lavatory Faucet
- Showers
- Kitchenette

A graph showing annual usage (in gal) with the following breakdown:

- Baseline
- EPA WaterSense Fixtures
- EPA WaterSense Fixtures + Rain Water Capture

44% Savings
69% Savings

Diagram showing water harvesting systems including:
- roof drains
- fluid cooler
- toilets
- source stone features
- cistern

Irrigation system connected to the cistern.
M + V Tracking Tool
# PROJECT TEAM

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<th>General Contractor:</th>
<th>Design Consultants:</th>
<th>Key Subcontractors:</th>
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<td>KPFF CONSULTING ENGINEERS, INC.</td>
<td>THE G.R. PLUME COMPANY</td>
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<td>Architect:</td>
<td>WSP FLACK + KURTZ/BUILT ECOLOGY</td>
<td>UNIVERSITY MECHANICAL CONTRACTORS</td>
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<td>ZGF ARCHITECTS LLP</td>
<td>SITE WORKSHOP LLC</td>
<td>SEQUOYAH ELECTRIC, LLC</td>
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<td>Sustainability Lead:</td>
<td>STUDIO SC</td>
<td>PATRIOT FIRE PROTECTION</td>
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<td>SELLEN SUSTAINABILITY</td>
<td>LERCH BATES</td>
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<td>OTTO ROSENAU &amp; ASSOCIATES, INC.</td>
<td>DEAMOR GLASS SKYLIGHTS</td>
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**AN Integrated Team ACHIEVES Performance + Time + Cost + Quality**
Design-Build Team Collaboration
Why Design Build

Accelerated Schedule

Optimized handoffs between designers and contractors eliminates waste

Leverage team to optimize the building systems

Continuous improvement from start to finish

Increased value delivered
Questions?