

The Bullitt Center
LIVING PROOF:

HOW HIGH PERFORMANCE
TEAMS CREATE HIGH
PERFORMANCE
BUILDINGS









HIGHLY MOTIVATED CLIENT

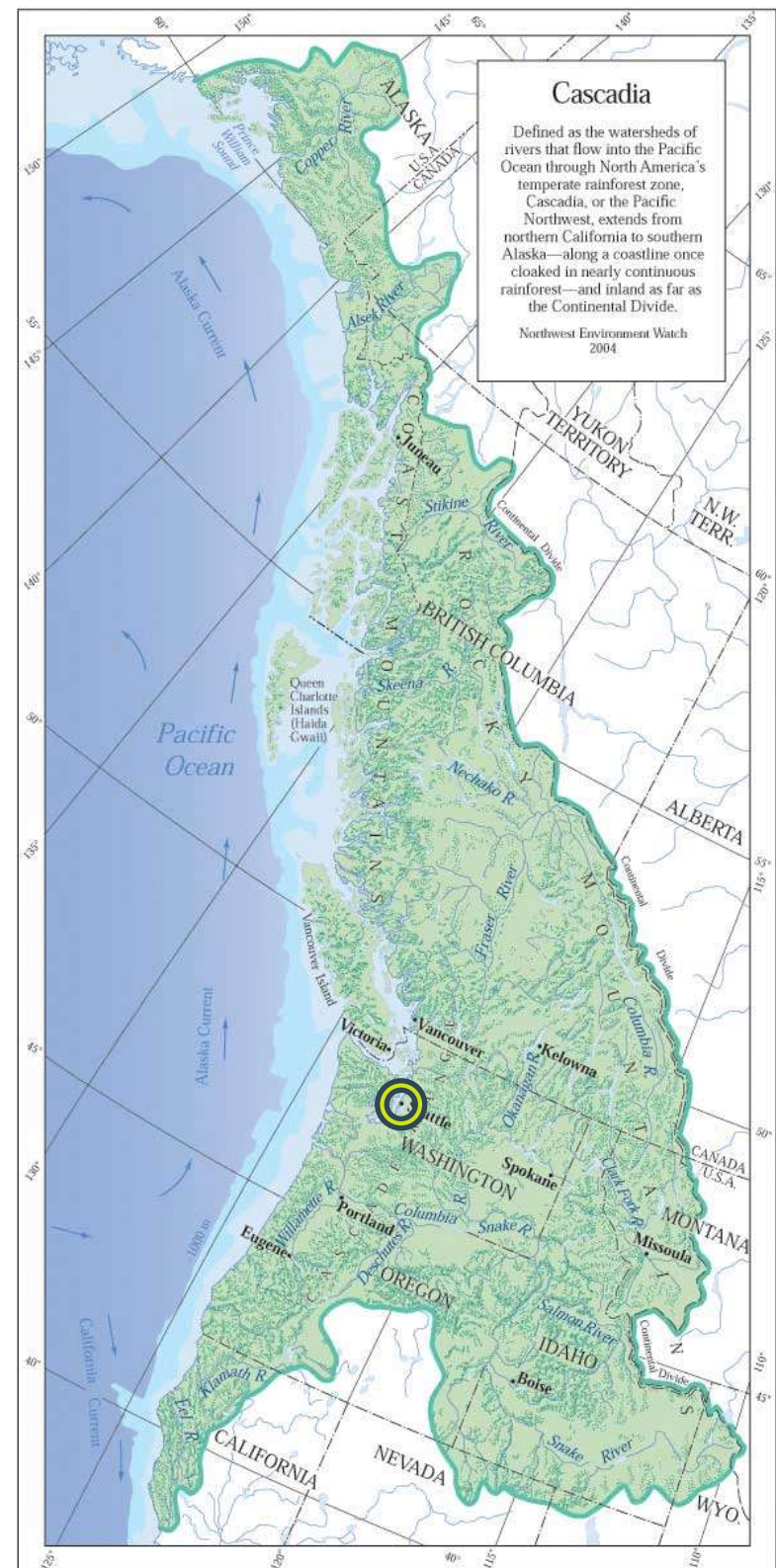
The Bullitt Foundation

“There is not a single office building in the United States that is truly designed to meet the needs of today’s environment, much less tomorrow’s, so we set out to build one. Our goal was to design and construct the greenest commercial building in the world.” – Denis Hayes



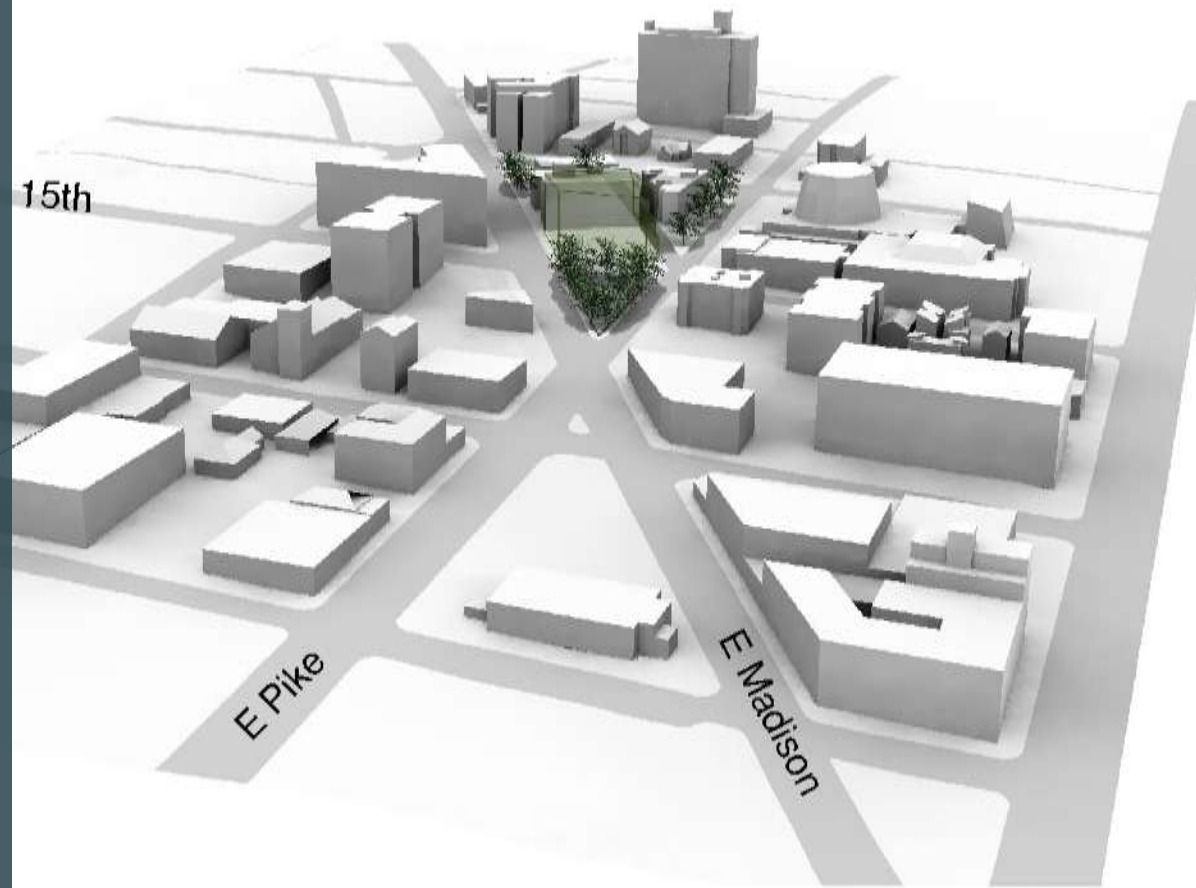
WHY CASCADIA?

Cascadia is emerging as ground zero for sustainable development.



WHY SEATTLE?

The City's adoption of a Living Building Ordinance paved the way to make this possible.



The Selection Process

Visit 22 Architects and 7 Engineers
between Vancouver BC and
Portland, OR

Shortlist 11 firms to respond to
request for Proposal

Shortlist four firms to interview and
spend the day with

Send four firms to overtime, double
overtime, and triple overtime

Work with selected architect to
choose consultants



Site Resources | Energy

Energy Requirement at 15 EUI	208,760 kWh/yr
Solar Array Required	190kW
Maximum Solar Envelope	
Roof	-76 kW
SE Wall	-42 kW
S Wall	-20 kW
W wall	<u>-22 kW</u>
Deficit	30 kw

Strategies

Passive Strategies

- Building/Program Orientation
- Daylighting
- Natural ventilation
- Thermal mass
- Trombe walls?

Efficiency & Technology

- R-10 Windows in a highly efficient envelope
- Radiant floors with ground-source heat pump
- Night flush of radiant floors
- Dedicated outside air ventilation with heat recovery
- Lighting and controls
- Below-grade resources
- Tenant energy budgets
- DC loop for DC appliances 40% more efficient

Renewable Energy

- Photovoltaics
- Photovoltaic Scale Jumping
- Solar Thermal
- Wind?
- Biomass?

2 Day Charette Participants

The Bullitt Foundation

Point32 – Developers

Miller Hull

PAE Engineers – MEP

Solar Design Associates

DCI Engineers – Structural

SVR – Civil/Landscape

Haley & Aldrich - Geotech

Schuchart Construction

Natural Systems International

New Buildings Institute

Rocky Mountain institute

World Changing

Jason McLennan – ILFI

UW Integrated Design Lab

City of Seattle



NET-ZERO ENERGY

ACHIEVING ENERGY INDEPENDENCE

Cost AND Performance Goals:

Demonstrate Feasibility

Educate Transparently

Create Replicability

Move The Industry



SET AGGRESSIVE GOALS



REDUCE ENERGY USE



Bullitt Foundation

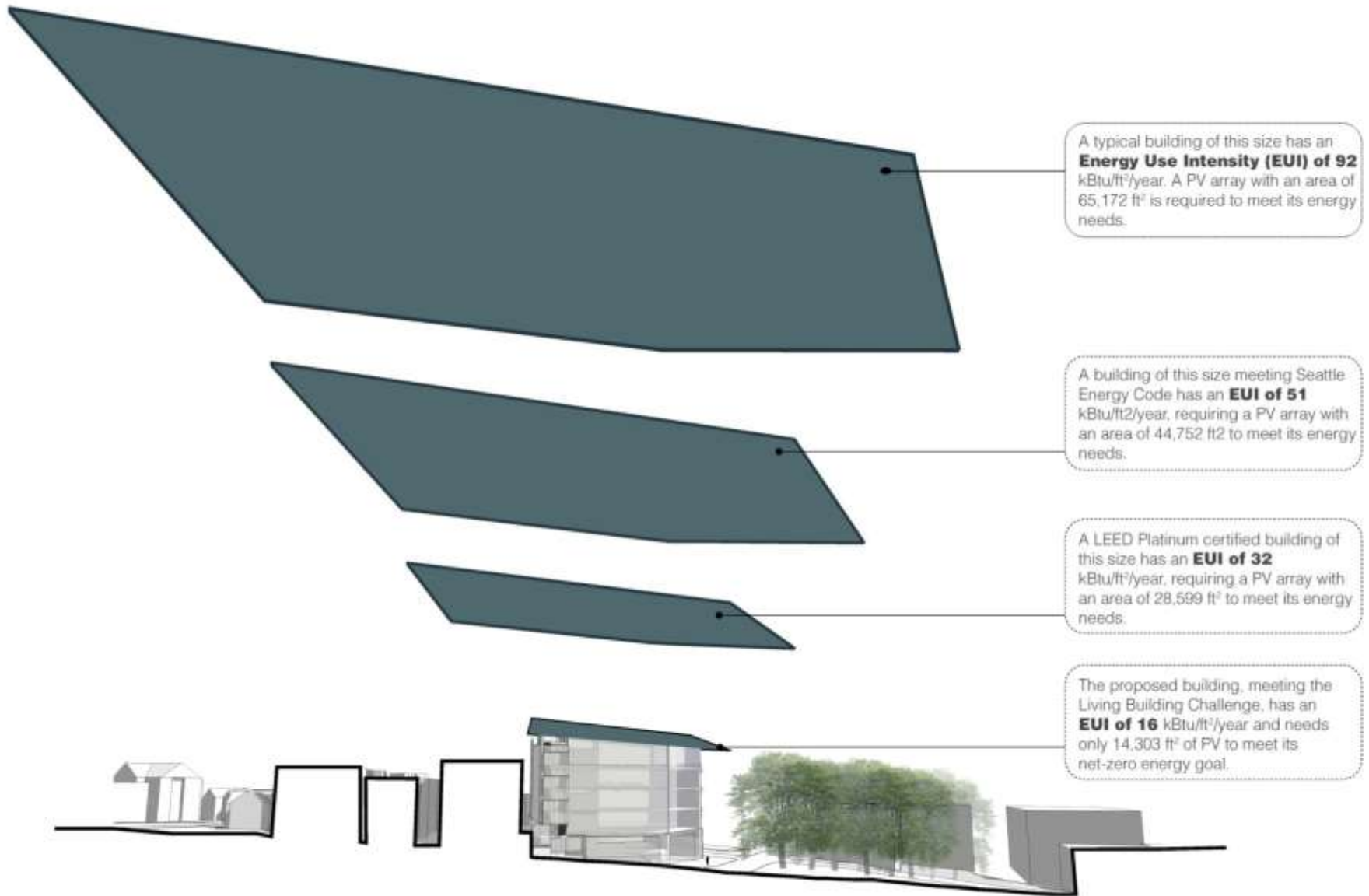


Typical Seattle Office Building

USE EFFICIENT EQUIPMENT



USE RENEWABLE ENERGY



Relative sizes of PV array based on EUI

USE RENEWABLE ENERGY



Third Party Reviews:

Pacific Northwest Labs

City of Seattle
Technical Advisory Group

City of Seattle
Neighborhood Design Review

Passivhaus USA



Main

57.50 ° Outside Air Temp
71.00 Outside Air %RH
48.27 ° Outside Air Dewpoint

Fire Alarm Inactive

Mechanical Systems

Mechanical Schematic
Load Loop Pumps
Source Loop Pumps
WWHP-1 Heat Recovery
WWHP-2 thru 4 Load Loop
WWHP-5 Domestic HW

Water Systems

Rainwater System
Disinfectant System
Rainwater Pumps
Greywater System
Welland System

Zones

Floor Plans	Quick Views
Basement	Basement
1st Floor	1st Floor
2nd Floor	2nd Floor
3rd Floor	3rd Floor
4th Floor	4th Floor
5th Floor	5th Floor
6th Floor	6th Floor

Exhaust Fans

EF-1 Bicycle Area
Composters EF-3

Supply Fans

HRU-1
SF-1 & SF-2

Sump Pumps

Basement Sumps

Windows

Water Meters

Weather

64.16 ° Lowest Slab Temp
65.00 ° Highest Floor Dewpoint
32 # Zones in Deadband
0 # Zones in Heating
0 # Zones in Cooling

No Heating or Cooling Allowed
Loop Demand is Inactive

46.19 ° Ground Loop Return Temp
47.82 ° Ground Loop Supply Temp
74.01 ° Bldg Loop Supply Temp
74.10 ° Bldg Loop Return Temp
139.2 ° DOM HW Tank Temp

Realtime Ground Loop, Tons

10 Qualifications of High Performance Design Teams:

1. A firm desire to change the world
2. Willingness and ability to do research
3. Holistic/Systems thinkers
4. Risk Takers
5. Creative Collaborators
6. Commitment to design technology
7. Commitment to Integrated Design
8. Excellent process managers
9. Strong advocates for change
10. The love of the challenge





An aerial photograph of a large-scale solar farm. The foreground and middle ground are filled with rows of dark blue photovoltaic solar panels, each with a white grid pattern. The panels are laid out in a precise, repeating pattern that recedes into the distance. In the background, a city skyline is visible under a clear blue sky with wispy white clouds. The city includes several tall skyscrapers, a prominent bridge, and a body of water. The overall scene conveys a message of sustainable energy and urban development.

Design & Construction Team —

The Bullitt Foundation
The Miller Hull Partnership
PAE Engineers
Solar Design Associates
Luma Lighting Design
The Berger Partnership
Springline Design
DCI Engineers
2020 Engineering
Point32
Schuchart Construction

Client
Architecture
Mechanical & Electrical
Solar Array Consultant
Lighting
Landscape
Civil
Structural
Natural Waste Treatment Systems
Developer
General Contractor

Ron Rochon, AIA
The Miller Hull Partnership
www.millerhull.com



The Bullitt Center
Bullitt Foundation
www.bullittcenter.org

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