



Ambient Energy, Inc.

MSU Denver Aerospace and Sciences Engineering Building, Denver, CO



Client:
Ambient Energy
Owner:
Ambient Energy
Architect:
Anderson Mason Dale /
Eric Bartczak Architects
Contractor:
GH Phipps

Services Provided:
WELL Facilitation and
Documentation
Service Period: April
2017 to June 2019
Project Size: 3,400 sf
Certification: WELL
v1.0 Silver (currently
pursuing)

Building Project Team



Ambient Energy Headquarters

Ambient Energy's Denver Headquarters is a leased office space in Metropolitan State University of Denver's, LEED Gold Accredited, Aerospace Engineering and Sciences building on the Auraria Higher Education Center campus in downtown Denver. The office is pursuing WELL for New and Existing Interiors certification, a rating system developed by the International Well Building Institute (IWBI) focused on occupant health and wellness. Ambient Energy's tenant space includes an open office area, three conference rooms, two private telephone rooms, reception area, storage and IT closets, and a break room with a small kitchenette and game room area.

Ambient Energy facilitated the WELL certification process and conducted occupant surveys before and after moving into the new WELL Silver certified space and found that employees rated the new office better than the previous office and the national benchmark in every category surveyed. This confirms that employees are more comfortable, happier, healthier, and therefore more productive.

Wellness strategies include a living wall and plants throughout, natural materials (beetle kill pine walls and reception desk), ample natural daylight, standing desks for 100% of staff, treadmill desk, healthy food and beverage options, locally sourced salvaged wood conference table, top/down bottom/up glare control shades, sound masking system, continuous IAQ monitoring, bike storage, and occupant comfort and lighting controls. Sustainability features in the building include evaporative cooling, access to numerous light rail and bus lines, and an impressive rainwater retention and treatment system under the building's main plaza.



Public Private Partnership Floor



AndersonMasonDale Architects
 Metropolitan State University of Denver
 800 Aurora Parkway
 Denver, CO 80202
 T: 303-556-6000
 F: 303-556-6006

Architect
 AndersonMasonDale Architects, P.C.
 5180 Speer Boulevard
 Denver, CO 80201
 T: 303-291-4943
 F: 303-291-4792

Structural Engineer
 H2A Structural Engineers, Inc.
 1475 Lawrence Street, Suite 700
 Denver, CO 80202
 T: 303-775-9710
 F: 303-775-9515

Electrical Engineer
 BECI Electrical
 8430 West Road
 Aurora, CO 80016
 T: 303-432-7400
 F: 303-432-7400

Technology/Security
 Bionical Group, a BECI Group
 5807 New England Drive, Suite 400
 Colorado Springs, CO 80901
 T: 719-533-1112
 F: 719-533-1113

Code Consultant
 Advanced Consulting Engineers
 5405 S. Wadsworth Unit 500
 Lakewood, CO 80108
 T: 726-881-4100
 F: 726-881-0044

Cost Estimating
 Curran Group
 8601 E. Foothill Suite 501
 Littleton, CO 80120
 T: 303-979-8442

Energy Modeling
 West Group
 1831 13th St #100
 Denver, CO 80202
 T: 303-479-8399

Signage
 Signage Creation
 5415 S. Bayaud Ave
 Denver, CO 80209
 T: 303-881-9094

SEA
 802-011
 608-988

SEA
 802-011
 608-988

Date
 26 June 2019
 4/18/2017

Aerospace Engineering Sciences Building
 Metropolitan State University of Denver
 14-021.00

Project Number: 14-021.00
 Drawn By: Author
 Reviewed By: Checker
 Approved By: Approver

Laboratory
 Research Facilities Design
 3685 19th Avenue, Suite 400
 San Diego, CA 92108-3182
 T: 619-594-6134
 F: 619-594-4281

Mechanical/Plumbing
 Clark, Burns & Associates
 8807 York Street
 Lakewood, CO 80101
 T: 303-233-6000
 F: 303-233-3011

Civil Engineer
 Mark & Mark
 11060 E. Colfax Ave.
 Lakewood, CO 80115
 T: 303-841-4100
 F: 303-858-4920

Landscape Architect
 Galus
 3200 Broadway St.
 Denver, CO 80204
 T: 303-871-0800
 F: 303-858-6504

Acoustics/Audio Visual
 K2 Audio
 4400 Pearl East Circle, Suite 201E
 Boulder, CO 80501
 T: 303-440-8800
 F: 303-440-8504

Sustainability Consultant
 Praxis Sustainability Solutions
 885 S. Chestnut St.
 Littleton, CO 80120
 T: 303-979-8885

Furniture
 Galus Design
 1400 Market Street,
 Suite 301
 Denver, CO 80202
 T: 303-433-8910

Level 4 Space Plan
Z-104

MSUD Aerospace & Engineering Sciences Building

LEED BD+C: New Construction (v2009)

1000055151, Denver, CO

MSUD Aerospace Engineering Sciences Bldg



LEED BD+C: New Construction (v2009)

GOLD, AWARDED MAR 2019



SUSTAINABLE SITES

AWARDED: 23 / 26

Code	Description	Status
SSp1	Construction activity pollution prevention	REQUIRED
SSc1	Site selection	1 / 1
SSc2	Development density and community connectivity	5 / 5
SSc3	Brownfield redevelopment	1 / 1
SSc4.1	Alternative transportation - public transportation access	6 / 6
SSc4.2	Alternative transportation - bicycle storage and changing rooms	1 / 1
SSc4.3	Alternative transportation - low-emitting and fuel-efficient vehicles	3 / 3
SSc4.4	Alternative transportation - parking capacity	2 / 2
SSc5.1	Site development - protect or restore habitat	0 / 1
SSc5.2	Site development - maximize open space	0 / 1
SSc6.1	Stormwater design - quantity control	1 / 1
SSc6.2	Stormwater design - quality control	0 / 1
SSc7.1	Heat island effect - nonroof	1 / 1
SSc7.2	Heat island effect - roof	1 / 1
SSc8	Light pollution reduction	1 / 1



WATER EFFICIENCY

AWARDED: 6 / 10

Code	Description	Status
WEp1	Water use reduction	REQUIRED
WEc1	Water efficient landscaping	2 / 4
WEc2	Innovative wastewater technologies	0 / 2
WEc3	Water use reduction	4 / 4



ENERGY & ATMOSPHERE

AWARDED: 11 / 35

Code	Description	Status
EAp1	Fundamental commissioning of building energy systems	REQUIRED
EAp2	Minimum energy performance	REQUIRED
EAp3	Fundamental refrigerant Mgmt	REQUIRED
EAc1	Optimize energy performance	4 / 19
EAc2	On-site renewable energy	0 / 7
EAc3	Enhanced commissioning	2 / 2
EAc4	Enhanced refrigerant Mgmt	2 / 2
EAc5	Measurement and verification	3 / 3
EAc6	Green power	0 / 2



MATERIAL & RESOURCES

AWARDED: 4 / 14

Code	Description	Status
MRp1	Storage and collection of recyclables	REQUIRED
MRc1.1	Building reuse - maintain existing walls, floors and roof	0 / 3
MRc1.2	Building reuse - maintain interior nonstructural elements	0 / 1
MRc2	Construction waste Mgmt	1 / 2
MRc3	Materials reuse	0 / 2
MRc4	Recycled content	2 / 2



MATERIAL & RESOURCES

CONTINUED

Code	Description	Status
MRc5	Regional materials	0 / 2
MRc6	Rapidly renewable materials	0 / 1
MRc7	Certified wood	1 / 1



INDOOR ENVIRONMENTAL QUALITY

AWARDED: 10 / 15

Code	Description	Status
EQp1	Minimum IAQ performance	REQUIRED
EQp2	Environmental Tobacco Smoke (ETS) control	REQUIRED
EQc1	Outdoor air delivery monitoring	1 / 1
EQc2	Increased ventilation	1 / 1
EQc3.1	Construction IAQ Mgmt plan - during construction	1 / 1
EQc3.2	Construction IAQ Mgmt plan - before occupancy	1 / 1
EQc4.1	Low-emitting materials - adhesives and sealants	1 / 1
EQc4.2	Low-emitting materials - paints and coatings	1 / 1
EQc4.3	Low-emitting materials - flooring systems	0 / 1
EQc4.4	Low-emitting materials - composite wood and agrifiber products	1 / 1
EQc5	Indoor chemical and pollutant source control	1 / 1
EQc6.1	Controllability of systems - lighting	0 / 1
EQc6.2	Controllability of systems - thermal comfort	0 / 1
EQc7.1	Thermal comfort - design	1 / 1
EQc7.2	Thermal comfort - verification	1 / 1
EQc8.1	Daylight and views - daylight	0 / 1
EQc8.2	Daylight and views - views	0 / 1



INNOVATION

AWARDED: 4 / 6

Code	Description	Status
IDc1	Innovation in design	3 / 5
IDc2	LEED Accredited Professional	1 / 1



REGIONAL PRIORITY

AWARDED: 3 / 4

Code	Description	Status
EAc1	Optimize energy performance	0 / 1
SSc2	Development density and community connectivity	1 / 1
SSc6.1	Stormwater design - quantity control	1 / 1
WEc1	Water efficient landscaping	0 / 1
WEc3	Water use reduction	1 / 1

TOTAL

61 / 110

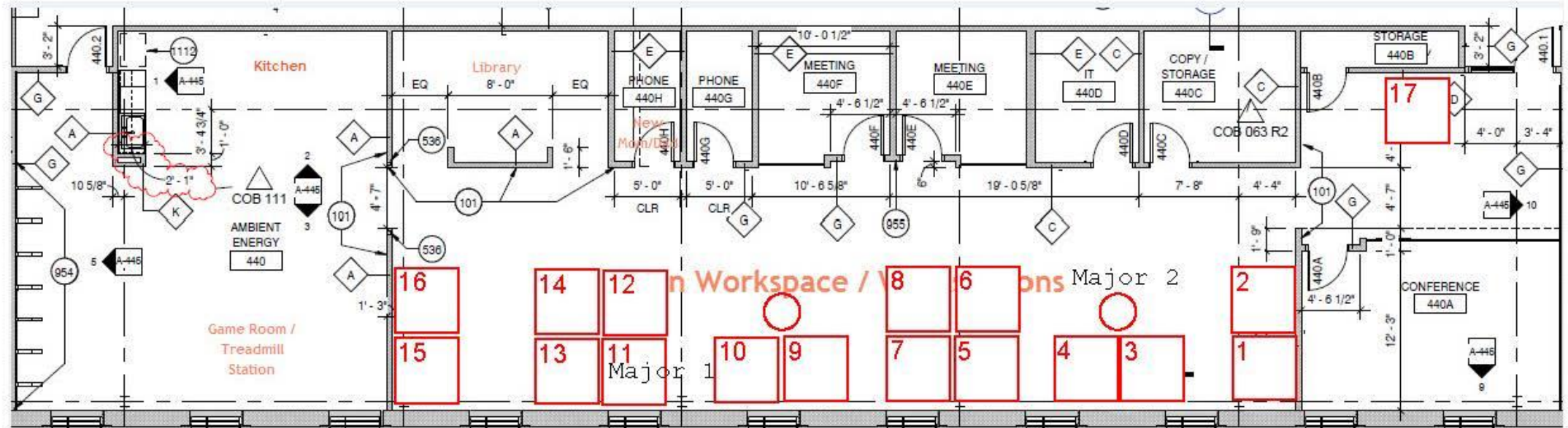
40-49 Points
CERTIFIED

50-59 Points
SILVER

60-79 Points
GOLD

80+ Points
PLATINUM

Ambient Energy Office Layout



WELL Building Features

Active design treadmill desk • under desk bike • 4 flights of stairs

Biophilic design table selections • landscape pictures • living wall • plants • daylighting • city and green roof views

Community campus restaurants, coffee shop & brewery • shared on-floor kitchen, conference rooms, training room, lounge areas

Daylighting south side recessed glazing • top up and bottom down shades • glazing selection • photosensors

Ergonomic design keyboards • mouse • sit/stand

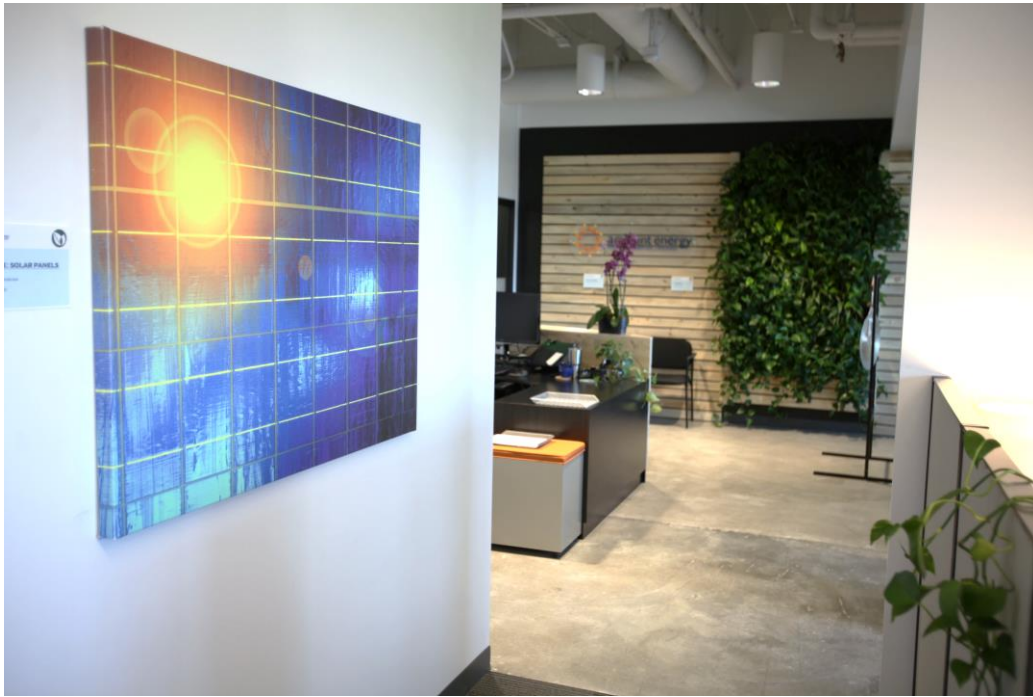
Health and wellness snacks • health posters • wellness library • low/no VOC products • indoor air quality • green cleaning • sink dimensions • water quality • noise control

High performance lighting Encelium lighting system • all LED • occupancy and photosensors • circadian task lighting • low mercury lighting

Mind EcoPass • yoga classes • subsidized gym fees • integrative process • thermal comfort • post occupancy surveys • beauty and design

Transit bus • showers • light rail • interior bike wall • exterior bike racks • shared bikes





Energy Usage and Cost Summary: Aerospace and Engineering Sciences Building, Metro State University Denver

AES Building Square Footage: 118,653

	Electric					Gas					Totals	
	kWh	multiplier	kBTU	EUI	% EUI	therms	multiplier	kBTU	EUI	% EUI	kBTU	EUI
FY 18	1,880,848	3.41214	6,417,717	54.09	43%	83459	99.9761	8343905	70.32	57%	14,761,622	124.41
FY 19	1,749,739	3.41214	5,970,354	50.32	38%	98713	99.9761	9868941	83.17	62%	15,839,295	133.49
	Cost	ECI	% ECI			Cost	ECI	% ECI			Cost	ECI
FY 18	\$128,989.12	\$1.09	72%			\$ 50,578.18	\$0.43	28%			\$179,567.30	\$1.51
FY 19	\$152,464.87	\$1.28	75%			\$ 51,984.41	\$0.44	25%			\$204,443.28	\$1.72
Modeled	\$ 186,545.00	\$1.57	7628201	64.29	68%	\$ 22,789.00	\$0.19	3621290	30.52	32%	\$ 209,334.00	\$1.76
Variance: Modeled to 2019		82%		78%			228%		273%			98%
												141%

Modeled: 0.0833 per kWh
0.63 per therm

25% % actual natural gas cost to total cost
11% % modeled natural gas cost to total cost

Summary:

Comparing 2019 actual energy usage data to energy modeled data at the end of design:

- AES building is using 273% more natural gas and 228% more in natural gas cost than modeled

- AES building is using 78% of electricity and 82% of electricity cost compared to modeled

- Since electricity costs more than natural gas, and since 75% of total energy costs is from electricity, AES building is using 98% of annual total energy cost compared to modeled

AES Electric and Gas Billing Analysis



Biophilic



Beetle Kill Wood



Healthy food



Furniture



Employee Bikes

As a sustainability, energy, and green building consulting firm focused on helping our clients achieve their goals related to environmental performance and human health, we fully understand and celebrate the importance of incorporating biophilic design elements into the built environment. We are a growing firm, looking to attract and retain the brightest and most creative team members and want them to reap the benefits of an office space with biophilic design features. Our office's focus on human wellness and biophilic design is a significant indicator to our staff and clients that we are a progressive firm that cares about not only the environmental impacts of our office, but also our employees' health and wellbeing.

From the moment our employees and visitors enter the office, our commitment to biophilic design is clear. The lobby and reception area boasts a beautiful living wall, designed and built by local interior landscaping company City Plantscaping. Surrounding the living wall are Colorado sourced wood planks, harvested from trees killed by the mountain pine beetle epidemic, a major infestation of lodgepole pine trees that has affected over 1.5 million acres of forests in Colorado and Wyoming. The reception desk is also made of beetle kill pine. Visible from the lobby through a glass partition wall, our conference room is home to a custom-made conference table designed and built by local artisan Rustic Alchemy. The tabletop is made from slices of maple logs salvaged from a felled tree in Denver's City Park West neighborhood while the base is made from wood salvaged from a deck in Breckenridge, CO.

Natural daylight abounds in the open office plan, with controllable roller shades on all windows and daylight sensing overhead LED lighting to provide maximum controllability of lighting conditions. The glass partitions of the interior huddle rooms central to the office space allow our teams to gather privately in rooms while maintaining access to natural light. The overhead LED lighting system was designed in accordance with WELL requirements for circadian lighting design, ensuring that occupants are exposed to lighting levels and quality that helps everyone stay alert and in tune with the body's natural circadian cycle. Task lamps are provided to individual work stations that are fully controllable in terms of both lighting level and color. South facing windows are present in the conference room, each work station pod, and common area / kitchen, providing occupants great views of downtown Denver and the mountains from the office's fourth-floor vantage point.

In addition to the lobby's living wall, potted plants are spread throughout the office spaces and natural wood was used wherever possible for desks, tables, and doors. Artwork has also been included throughout the space, with an emphasis on imagery of beautiful landscapes in Colorado and California, providing a connection to Ambient Energy's two office locations.

We are fortunate that our office is located in a building on the Auraria Higher Education Center campus, the home of three universities in the heart of downtown Denver. Even for an urban campus, there are many potential encounters with nature in the surrounding area, including many large open spaces, a great outdoor seating area just outside our building, and close proximity to the Cherry Creek Bike Path, Denver's main bike thoroughfare into the city center. Our office suite includes storage spaces for employees' bikes and two office bikes available for all to use.

Occupancy Report

