



### The Opsis Commitment

In 2013, Opsis signed on to the AIA's 2030 Commitment which provides a platform to track predicted building performance to measure progress toward the 2030 carbon neutral goals. It allows us to participate in dialogue with others in our profession and contribute to a collection of data with a common metric.

Desired outcomes of the AIA's 2030 Commitment include: improving architectural knowledge of energy efficiency strategies by incorporating energy analysis early in the design process and then continually as the design develops; providing increased client value through lower operational costs; and, of course, meeting the 2030 Challenge reduction targets.

# Opsis sustainability action plan

# light, beauty, delight

## **The scale of human influence on earth is immense**

Since the advent of the Industrial Revolution, we have rapidly become a big world on a small planet, altering the carbon, water and nitrogen cycles while permanently changing the chemistry of our oceans. Today we have lost 38 percent of the planet's forests triggering a mass wave of extinctions. While the industrial revolution has propelled human progress to extraordinary levels, it has come at an extraordinary cost to our environment and ultimately to the health of all living things.

The places where we live, work, and play have contributed to some of the greatest ecological impacts on our planet. We are still growing, with more than 60 percent of the area projected to be urban in 2030 yet to be built. Have we outgrown our natural ecosystem? We believe the answer does not have to be 'yes' - growth, development, and prosperity are possible within our existing support systems on Earth.

## **What if we could reconnect to our biosphere, while allowing all communities to prosper?**

We envision a place where our lives and livelihoods can thrive together with healthy and productive ecosystems. We understand the urgency to exercise leadership in creating the built environment. We are altering current practices, to not only reduce the depletion of natural resources, non-renewable energy sources, and waste, but to regenerate natural resources and healthy environments. This is our obligation.



# A PATH TOWARDS SUSTAINABILITY

Opsis , Founded

1999

USGBC  
LEED v1.0



First LEED certified student recreation center

2002



AIA Sustainable Design Merit Award  
Grand Award for Engineering ACEC  
LEED Gold Certification

2004

Lovejoy Office Bldg



AIA Sustainable Design Award  
AIA Merit Award  
Community Pride Award  
ASHRAE Technology Award  
LEED Gold Certification

Living Building  
Challenge v1.0

2006

Firstenburg Comm Ctr



First LEED Platinum CI in Oregon

2008

United Fund Advisors  
WWU AIC



Largest naturally ventilated academic building in the U.S.  
AIA Viewer's Choice Merit Award  
AIA Civic Design Honor Award

2010

Hood River Middle School



First public school to earn LBC Net-Zero Energy Bldg Certification  
National AIA COTE Top 10 Award  
LEED Schools Platinum Certification  
35 kW PV array producing 35,000 kW/yr

Pringle Creek Painters Hall

Opsis becomes  
2030 Challenge Signatories

2012



Earth Advantage Gold Certified  
USITT Architecture Merit Award  
AIA Pacific Region Design Citation

Reed College Performing Arts



Place by Design Resilience, SXSW Eco Award

Global CO2  
> 400 ppm

2014

Gonzaga JJ Hemmingson Ctr



Pursuing Net-Zero Energy  
Bird-Friendly Design  
Backyard Habitat Certification  
208kW PV array producing 204,000 kW/yr  
ETO Path to Net-Zero Program

The Redd

2016

Oregon Zoo Education Ctr

CCC ITC

Woodburn Success HS



Pursuing Net-Zero Energy  
50 kW PV array, 150 kW targeted



Pursuing Net-Zero Energy

BEYOND

# creating culture

## A home for collaboration

Our studio—built without walls—knits us together into a cohesive team. We encourage active community involvement within the studio and throughout the greater Portland area and Pacific Northwest Region. As a studio we grow and learn from one another through project collaboration sessions, community service, studio-wide meetings, continuing education sessions, webinars, lunch presentations, conferences, and impromptu ping pong matches. We reach out to the greater community by volunteering our time at a number of local organizations, as well as providing pro-bono design support for nonprofits, schools, and cultural institutions. Our 920 Gallery provides free exhibition space for local artists and community events. We strive to foster a culture of:

- > Team-based practice with open design discourse
- > Exploration and innovation balanced by feasibility
- > Individualized staff development
- > Outreach beyond the studio to achieve diversity and develop collaborative partnerships
- > Supporting civic engagement that enriches the quality of life within our community

Whether it is working to solve Portland's homeless problem or addressing the regional food economy, the various missions of our local clients have often become our passions. We respond by embracing educational outreach and advocacy within the community.



*Opsis ping pong tournament*



*Sustainability charrette for Build a Burger*



*Opsis Food Bank volunteers*



*Celebrate: Mike begins PCT and Jennie's baby on the way*

# studio for innovation

## Field study

Sustainable practices are integral to our design work and our studio environment. We renovated the Lovejoy Building—constructed in 1910 as stables for the historic Marshall-Wells Hardware Company—to provide ground floor retail space and a second floor to house the Opsis studio. The building serves as an ongoing field study, putting sustainable strategies into practice while improving our understanding of the applications, design, and optimization of systems.

Awarded LEED Gold certification, the 19,500 square foot building embodies sustainability. Daylighting and passive ventilation reduce demands on the building systems. We were early-adopters of the radiant heating and cooling slab a system that provides superior thermal comfort while consuming substantially less energy than conventional systems. Windows and 14 skylights allow natural light to reach the depths of the building. Roof ventilators with dampers located opposite the operable windows promote a stack-effect exhaust of hot air and improve ventilation. Automated night-air-flushing minimizes the need to mechanically cool the building. Brick and concrete surfaces provide ample thermal mass moderating temperature swing, holding in the daytime heat of the winter and nighttime cool of the summer. Roof top solar panels power workstations.



## Taking sustainability to the heart

Following its renovation in 2004, the building was selected by the Northwest Energy Efficiency Alliance and New Buildings Institute to take part in a national study. After providing five years of energy performance for analysis, it was found that the Lovejoy Studio outperformed its design energy model by 38 percent, and outperformed the code compliant, baseline comparison building by 57 percent. Later the project received 92 out of 100 from the US EPA's Energy Star Program.



## Optimizing a high performance building

Office-wide energy is monitored using a real-time Energy Detective system. Information gathered includes energy expenditures and offsets from the rooftop solar array. Individual energy use is tracked in two-week increments through plug load monitors installed at workstations. Our internal Green Team then analyzes the data for trends. By comparing weather patterns, exterior temperatures, staff working hours, and other parameters, we can more effectively predict our office energy use and identify opportunities for enhancing operational performance and efficiency.



## Liquid conservation

Using our studio as a testing laboratory, we have studied the performance of a variety of water-saving appliances and equipment over an extended period of time. Each restroom offers different low-flow toilets, faucets, and urinals for comparison of quality and user-experience in addition to water savings. In the kitchen, a high-efficiency two-drawer dishwasher uses only two gallons of water for each cycle. The building also offers a convenient shower for staff, equipped with a low-flow shower head.

# sustainable workplace



## Waste not

Our comprehensive waste reduction plan sets the goal of eliminating internally generated waste from the landfill. We compost our food scraps to upcycle would-be-waste into a resource. We embrace digital methods of sharing information, but when printing is required our staff is encouraged to print in black and white, double-sided, or on single-side reuse paper. We recycle batteries, printer cartridges, and even the metal rings from old product binders, in addition to more common materials. Each workstation is outfitted with a recycling container in lieu of trash receptacles, motivating individual waste reduction and raising our collective awareness of the waste not mentality at Opsis.



## Opsis apiary + sustainable food sourcing

Maintaining an active hive has long since been a unique show of the studio's commitment to natural systems. In the fall, the office hosts a Honey Harvest gathering where employees and family members are invited to help with the harvest and enjoy fresh honey. Keeping with tradition, Opsis offers new clients an opportunity to dip into the rewards of the rooftop guests with a jar of their own Opsis honey.

Our Catering and Food Purchasing policy favors family-style shared meals and the use of locally-sourced and organic ingredients in order to reduce food waste, support local economic growth and promote sustainable food systems.



## Alternative transportation

Opsis recognizes team members who choose alternative methods of transportation and support a carbon neutral vision. Ample secure bike storage, a shower and changing room, and a repair kit are all available to cyclists.

Opsis provides incentives in various ways to employees who commute in more sustainable ways. To encourage use of bus, MAX, and streetcar transportation, Opsis reimburses employees 50 percent of a monthly TriMet or C-Tran pass. We reward those who bike or walk to work 80 percent or more of the time with a Commute Bonus.



## Bike more challenge

We enthusiastically look forward to participating in the annual Bike More Challenge, striving to outdo ourselves from the year before. Together the studio logs daily commute miles and competes against other design firms in what has become an added challenge, "The Belluschi Cup."

In 2015 Opsis hit the following marks:

- > 1,964 miles biked in 247 trips
- > 1625 cubic pounds of CO<sub>2</sub> saved
- > 96,240 calories burned



Opsis bicycle storage

# design philosophy

## Integrated design - the process

Sustainable thinking is an integral part of how we think, create, and plan each project. While we utilize the most current metrics and tools, we don't rely solely on them to shape design. Our decision making is based on an understanding of the client's goals, program, local climate, ecological conditions of a site, and the available resources from the site, community and region.

A collaborative and integrated team process fosters the design of the most sustainable projects. We organize boundary-breaking visioning workshops where we listen, question, and work together with the owners, users, engineers, landscape architects, lighting designers, and other disciplines to understand the big pictures early in the project. Through this process we discover integrated solutions that resolve dynamic problems.

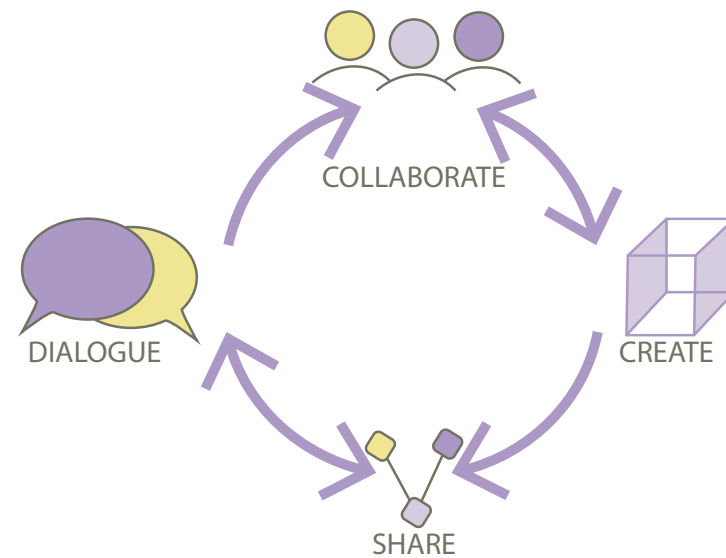
### 01 / Integrative process

Utilize the Integrative Process ANSI Consensus National Standard Guide 2.0 to assess our current integrated design activities and identify areas for refinement and enhancement.

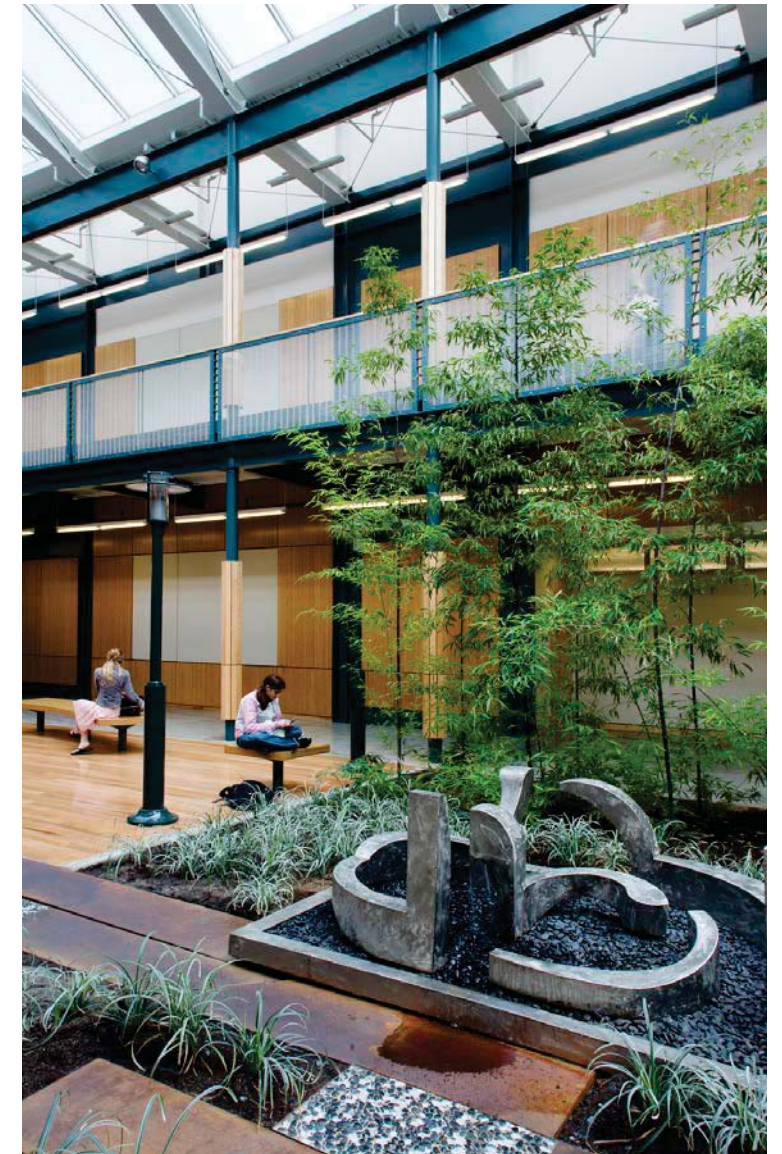
### 02 / Setting quantifiable goals

Set quantifiable sustainable design goals for each project based on established programs and tools, even when a project is not pursuing certification.

Integrated design is an iterative process that follows the the span of a project, from predesign through operation. During conceptual design, each client is encouraged to begin with a discovery phase goal-setting workshop. All key stakeholders participate in order to establish initial principles, metrics, benchmarks, and performance targets in four fundamental categories: habitat, water, energy, and healthy indoor environment. Progress towards meeting these goals is periodically reviewed and evaluated. In this manner, we proceed from a whole building system strategies, working through increasing levels of specificity, to realize more optimally integrated solutions.



During the design of the Reed PAB, design team members and Reed staff worked side by side (above)  
Collaborative design lead to the beloved winter garden at PCC (right).



# energy sustains life

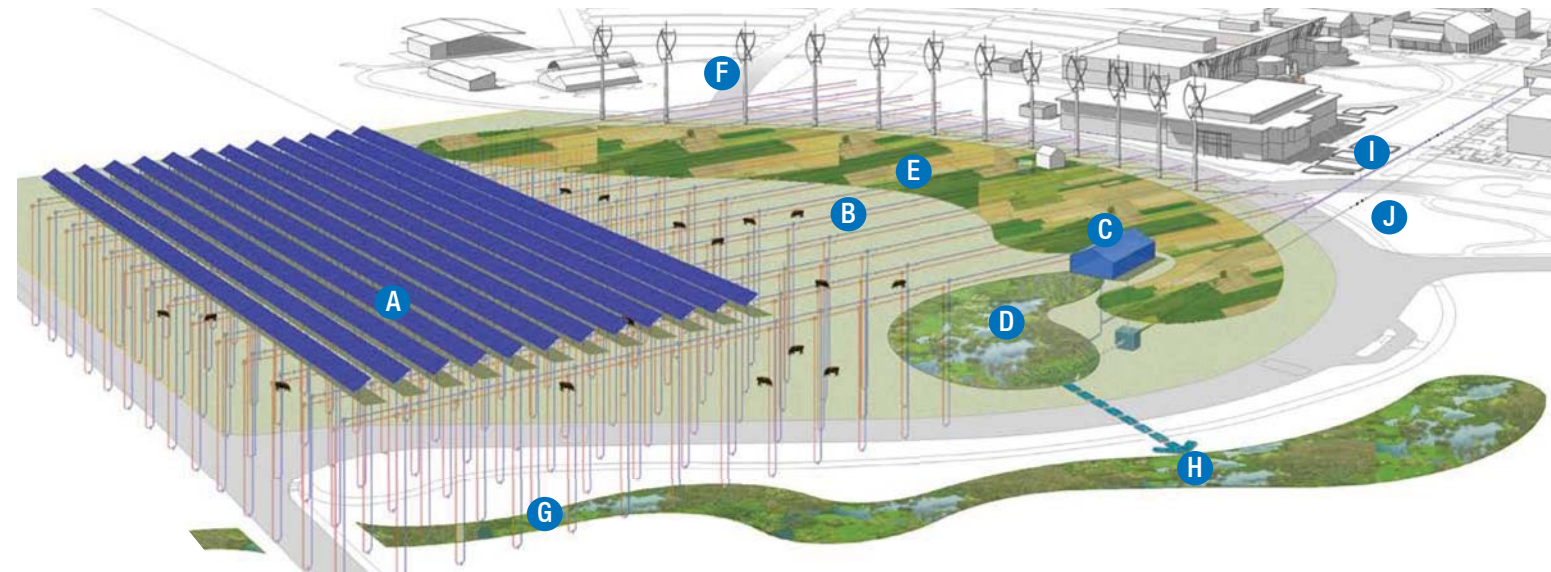
## Rising to the challenge

Opsis is committed to meeting the energy reduction targets of the 2030 Challenge in effort to reduce energy consumption and greenhouse gas emissions. The first step in energy reduction is through conceptual planning and passive design strategies, followed by improved material selection, building envelope design and detailing, thoughtful daylight design, and efficient lighting, equipment, and appliances. After the demands of the building have been curtailed, the energy demands are met by using on-site and community-scale renewable energy technologies. Occupant behavior and the operations and maintenance of the building are also crucial considerations for achieving high-performance results.



At PCC Rock Creek sheep graze along side PV array powering the campus

- A Photovoltaic array
- B Grazing animals
- C Living Machine
- D Structured wetlands
- E Learning garden
- F Wind turbines
- G Geothermal loop
- H Treated wetlands
- I Renewable electricity
- J Ground source heating/cooling water



**01 / The 2030 challenge**  
 Exceed targets of the 2030 Challenge: Reduce the amount of fossil-fuel based energy:

- 2015: 70% reduction
- 2020: 80% reduction
- 2025: 90% reduction
- 2030: Carbon Neutral

**02 / Net-positive energy**  
 Assess every project for the possibility of meeting the Living Building Challenge criterion for net-positive energy.

**03 / Performance modeling**  
 Perform Energy Modeling on:

- 75% of projects by 2015
- 100% of projects by 2020



Hood River Middle School learning garden, green house and rooftop PV array



# 2030 Challenge

100% carbon neutral

2025 reduction target

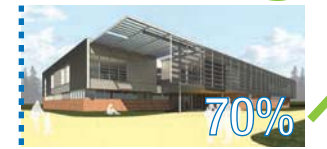
2020 reduction target

2015 reduction target

2010 reduction target

2005 reduction target

OR Energy Code



70



Lovejoy Bldg + Opsi Studio  
PEUI: 40

Firstenburg  
PEUI: 149

UO Ford Alumni Center  
PEUI: 48

Hood River Middle School  
PEUI: 0

College of Southern Idaho  
PEUI: 64

Coyote Center  
PEUI: 48

Gonzaga JJ Hemmingson Ctr  
PEUI: 44

PC Arts & Allied Health  
PEUI: 41.5

PCC Rock Creek Bldg 7  
PEUI: 20

OSU SEC  
PEUI: 48

Reed Performing Arts  
PEUI: 40

Bend Simpson Pavilion  
PEUI: 20

UO PSC Library  
PEUI: 36

4J ATA / Jefferson  
PEUI: 22

PCC Rock Creek Bldg 5  
PEUI: 24.4

Oregon Zoo Education Ctr  
PEUI: 0

Woodburn Alternative HS  
PEUI: 0

CCC ITC  
PEUI: 36

60

90

80

70

60

50

40

30

20

10

# precious water

## We are committed to conserving water

Water is a finite resource. Too often, water is thought of as a waste product, an 'issue' to be dealt with as quickly as possible. We wish to challenge that perception of water; to work with, not against, the natural water flows of the site and its surroundings. The ultimate goal is to meet the carrying capacity of the site's natural water systems to supply all of the water for the building and site; and to clean and return the water to its natural system once it has served its purpose.

### 01 / Net positive water

Assess the potential of every project for achieving net-positive water according to the Living Building Challenge criteria for quantifying water input and output from the building and site

### 02 / Liquid conservation

Establish a water use reduction target for every project. At minimum each project should achieve LEEDv4 Water Efficiency prerequisites

### 03 / Applied strategies

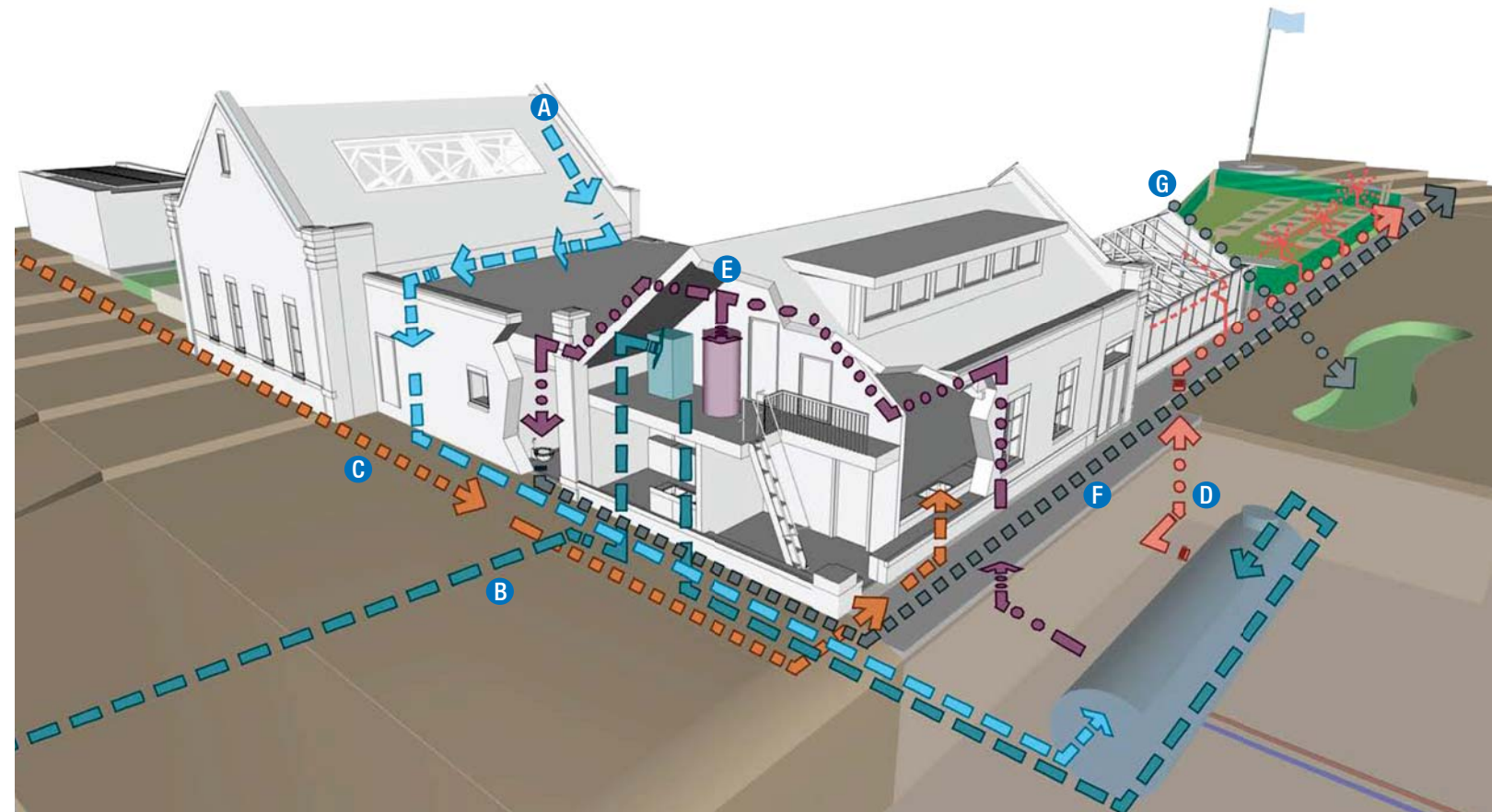
Reduce the amount of potable water used in all projects through a combination of strategies

- > on-site sourcing: graywater, rainwater, and condensate
- > independently certified, low-flow fixtures
- > reduction of water usage for irrigation
- > equipment cooling systems and specialty equipment



Hood River Middle School students surveying the water capture system

- A Rainwater
- B Stream water
- C City water
- D Irrigation water
- E Waste water
- F Blackwater
- G Stormwater



At Hood River Middle School, water moves through a cycle of evaporation, condensation and precipitation. The multiple looped systems includes rainwater, stream water, stormwater, irrigation water, waste water and drinking water.

# healthy buildings

## We are committed to using healthy materials and systems

Opsis shares the vision of the Living Building Challenge: we envision a future where all materials in the built environment are regenerative and have no negative impact on human or ecosystem health. The first step in reaching that vision is to increase consumer demand for better products. We support this movement by demanding public data that is presented in a fair and consistent format for building materials and products an important step for supporting better informed purchasing decisions. To this end, Opsis has issued a letter to our product manufacturers asking for transparency in their materials via a Health Product Declaration (HPD) and/or an Environmental Product Declaration (EPD).

### 01 / Transparent ingredient reporting

Utilize HPDs, Declare Labels, and EPDs to inform material and product selection

### 02 / Material selection

Phase out products with chemicals of concern from in-house material library

### 03 / Red list

Remove Red List materials from all projects by 2020

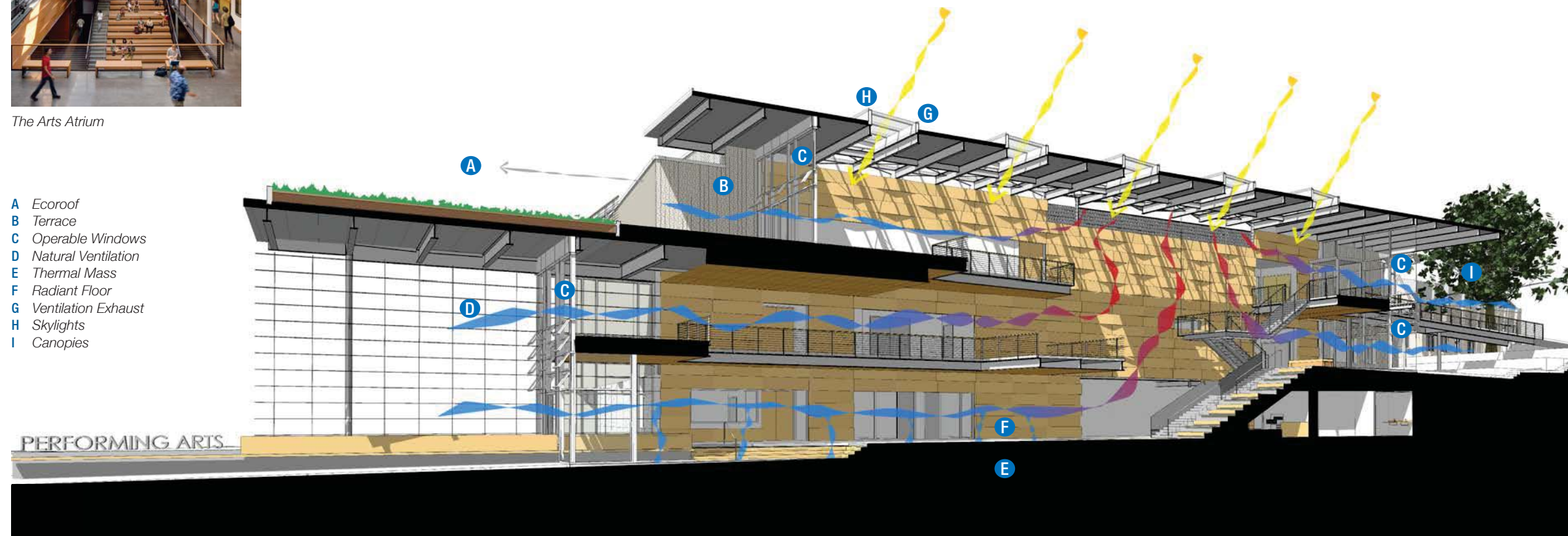
### 04 / Life cycle analysis

Perform whole-building life cycle analysis (LCA) based on the LEED v4 credit requirements



The Arts Atrium

- A Ecoroof
- B Terrace
- C Operable Windows
- D Natural Ventilation
- E Thermal Mass
- F Radiant Floor
- G Ventilation Exhaust
- H Skylights
- I Canopies



Conditioned completely by natural ventilation and a radiant floor, the three level light-filled Reed College Performing Arts Building Atrium embraces the campus while providing lobby, informal learning, and performance space.

# enhancing habitat

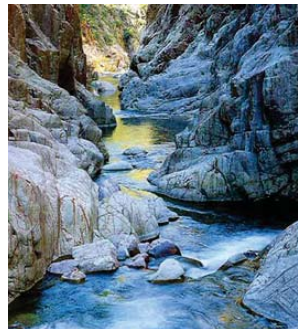
## Biophilic environment

Preserving habitats is our obligation not only to other species with whom we share our planet but also to ourselves. We think of ourselves as a part of nature, not apart from nature. We recognize that access to nature is a basic human need; architecture has the ability to evoke the sensory rich qualities of nature that elevate our spirits and inspire us to preserve and conserve the world around us.

resilience



motion



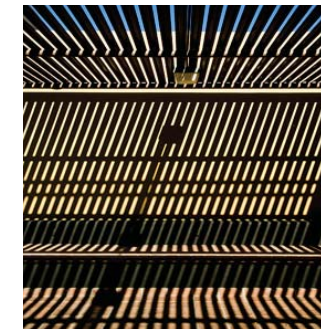
serendipity



variations



sensory



refuge



## 01 / Biophilia

Allow the seven "attributes of nature" to guide and inspire our design

## 02 / Bird-friendly design

Utilize the *Portland Resource Guide for Bird-Friendly Building Design* to incorporate strategies that reduce the probability of bird collisions

## 03 / Site assessment

For every project site, perform a preliminary site analysis for water quality and opportunities for beneficial water and nutrient exchange and reduced impervious cover

## 04 / Sustainable Sites Initiative

Use the SSI as a framework for guiding site development and design



*Woven into the Sonoran Desert of Arizona, the Coyote Center utilizes building forms, earth mounding, and native desert planting to create shaded places for people and enhanced habitats for the surrounding desert species.*

# resiliency

## Systems, communities and buildings

Resiliency is the capacity of ecosystems, communities and buildings to adapt and regain vitality in the face of disturbance. From climate change and food security to natural disasters, we live in a dynamic and challenging world. By addressing resilience through a broad lens, we endeavor to prepare for social, economic, and environmental changes and stresses at a variety of scales, from the immediate to the long-term.



## Oregon Zoo Education Center

The Education Center supports the Zoo's mission to inspire respect for animals and action on behalf of the natural world. The theme "Small Things Matter" guides the visitor through exhibits that demonstrate how our daily actions make a difference in the legacy of a healthy planet - advancing the highest level of animal welfare, environmental literacy, and conservation science. A variety of interactive outdoor spaces - native planting, stormwater bioswales, a nature play area, and a contemplative forest zone - are complimented by the bird-friendly design of the building's exterior. Hands-on classes in the Backyard Habitat demonstrate how homeowners can participate in habitat recovery through the Audubon Society's certification program. The Education Center is designed for

net zero annual energy use, with an extensive roof top solar array, an eco-roof, passive ventilation cooling strategies, and aggressive energy efficiency targets. By using a combination of low flow fixtures and captured rainwater, the use of potable city water is reduced by 55 percent.

Resilient Design Principles:

- > Foster strong community education programs to build understanding of natural resource systems.
- > Optimize use of on-site renewable energy.
- > Rely on annually replenished water resources.
- > Promote strategies that protect the natural environment to enhance resilience for all living systems.



## The Redd on Salmon Street

The Redd, an urban food hub located in a restored 1918 ironworks in Portland's Central Eastside, is helping the institutional buyers who feed our most vulnerable - school districts and hospitals - make the shift to nutrient-dense, locally-grown food. By enabling a farm-to-table web, the Redd is creating jobs and restoring land, water, and habitat while mitigating climate change.

Resilient Design Principles:

- > Deliver food security through regional food systems
- > Mitigate climate change
- > Support land/water/habitat restoration

## 01 / Resilient Design Institute

Allow the *Resilient Design Principles* to guide and inspire every project

## 02 / LEED Pilot Credits

Utilize the suite of LEED pilot credits on resilience design for:

- > Assessment and Planning for resilience
- > Design for Enhanced Resilience
- > Design for Passive Survivability

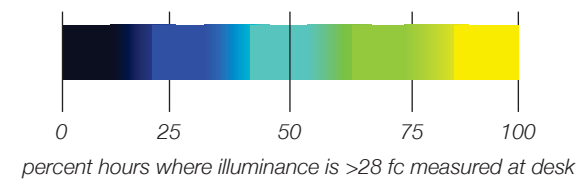
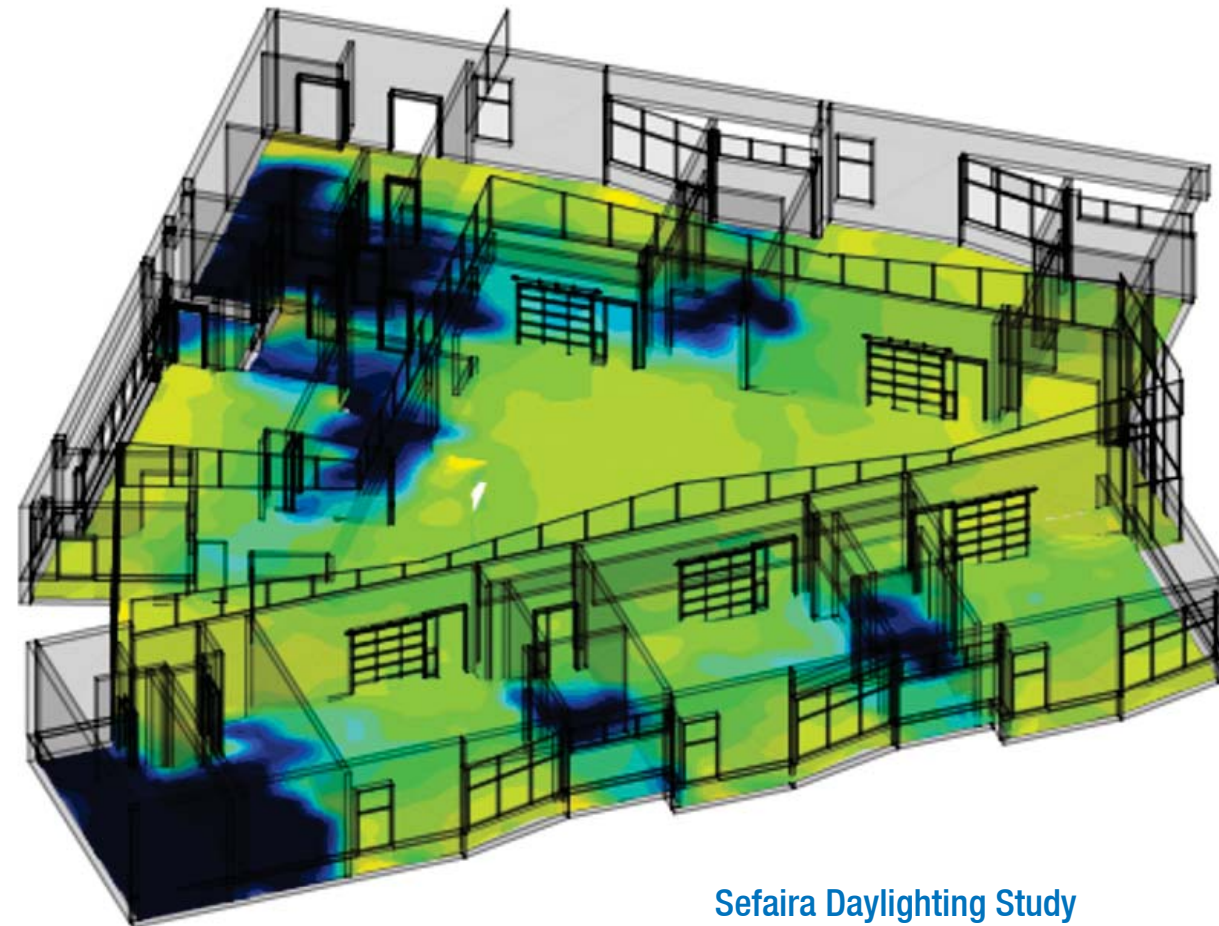
# advanced tools

## Energy and daylight modeling

While extremely important, traditional analysis tools used by engineers require a level of detail that is often unknown until the beginning of design development or construction document phase. As a result, we rely on years of experience to inform early design decisions that impact natural ventilation, daylighting, and solar orientation. Thanks to more recent developments of simulation software designed for architects, we now have the analysis tools to model comparative energy and daylight schemes during early conceptual design phases. Through early and often iterative modeling and sustainable analysis we are better able to identify gaps and improvement opportunities and connect energy performance directly to architecture design.

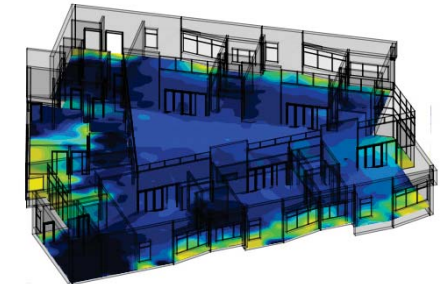
The analysis should start at the earliest stages of design to provide each project team relevant, iterative feedback while a design is still evolving, in order to optimize:

- > building envelope
- > orientation
- > form
- > shading and daylighting

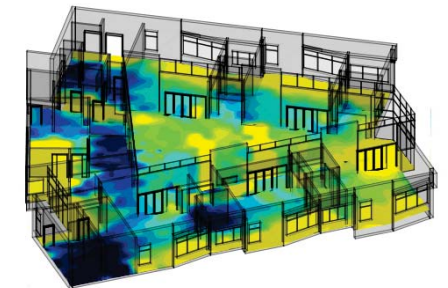


## Sefaira Daylighting Study

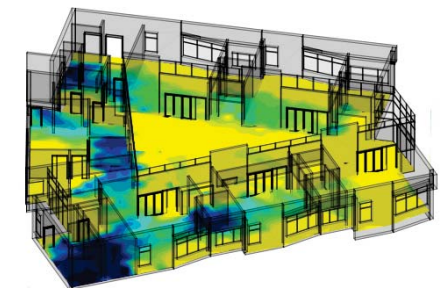
Opsis ran daylighting studies during early conceptual design for Woodburn Success High School. The seasonal equinoxes and solstices were analyzed together with annual averages for strategies that would achieve minimum light levels and visual balance while reducing glare. The analysis above shows the results of a footcandle study, one of several metrics used.



December 21st at 3:00pm  
modeling results: reduced daylight levels  
solution: optimize window location and sizing to capture low winter sun angles.



March 21st at 3:00pm  
modeling results: balanced light levels



June 21st at 3:00pm  
model results: overlit  
solution: implement shade and glare control measures

# measuring success

## Sustainability metrics

We utilize green building evaluation metrics whether the project is seeking certification or not. We give preference to consensus-based, proven programs that value transparency. As energy and green building codes become more rigorous, we continue to find value in programs that push well beyond the latest baseline, require third-party review for verification, and that provide a framework for achieving holistic sustainable design that addresses the triple bottom line.

## Performance evaluation

As active partners with our clients, our involvement in a project continues beyond occupancy. We seek to track and measure the performance of every project in order to verify an aggressive set of performance metrics. We have implemented a Post-Occupancy Evaluation (POE) into our design processes in order to gather and analyze energy, comfort and water use data amongst many other metrics. Through personal interviews and anonymous surveys, the POE also allows us to learn more about which features of the building are working well, what might have been done differently in retrospect, and if there are any opportunities to improve the building's function by making modifications. We can:

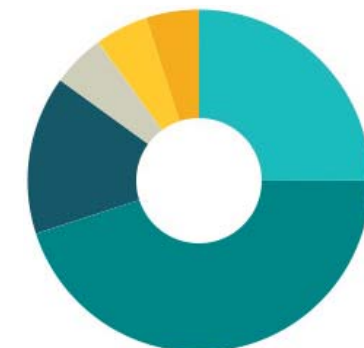
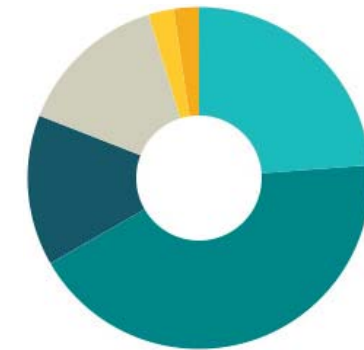
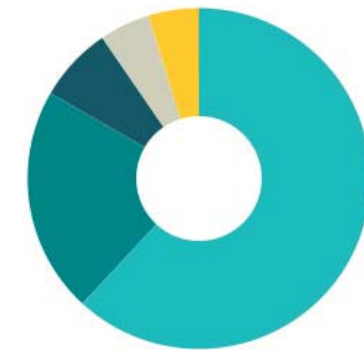
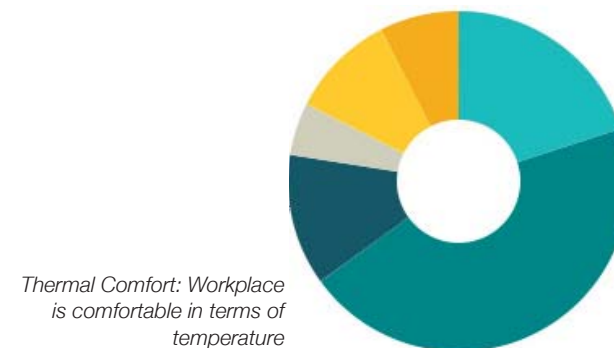
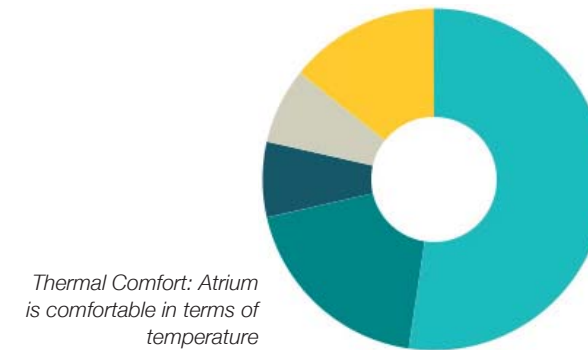
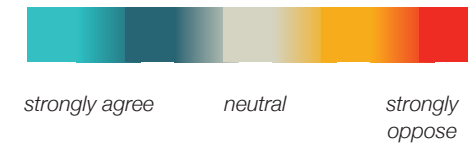
- > Identify areas for improvements to operations, maintenance, and training
- > Improve design guidelines and help inform owner on improvements for their own design guidelines
- > Educate ourselves and our consultants



Theatre performance in atrium

## Making it real

Opsis completed a POE on Reed Performing Arts Building in order to understand the effect of sustainable features implemented in the building on the building occupants and their creative processes.



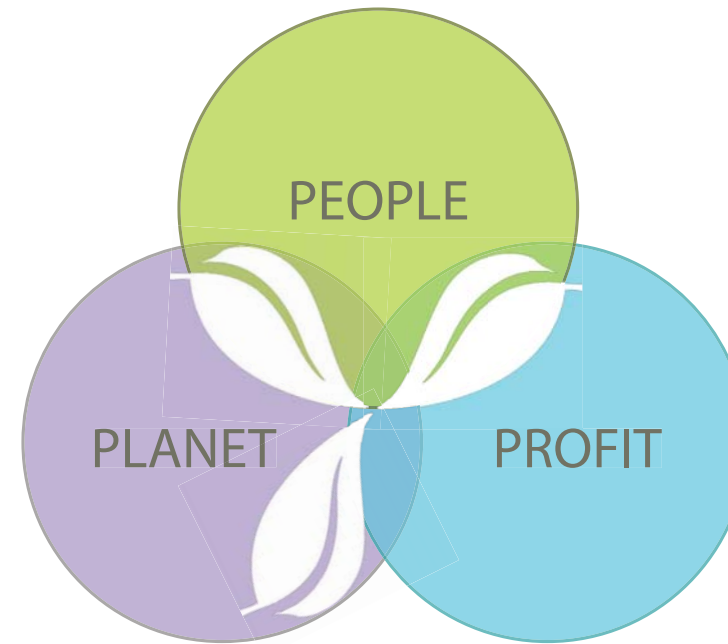
# long-range perspective

## Applying the 'triple bottom line'

We reject the notion that sustainability inherently involves sacrifice. Instead, we leverage the environmental, financial, and social synergies within each project to positively influence the triple bottom line for our clients. With this outlook we strive to be a trusted adviser, deepening our clients' understanding of the market drivers that make sustainability an important component in their business model. We facilitate a decision making process that recognizes the costs and benefits of various design options within the context of the overall cost of ownership, always seeking ways in which projects can be ecologically, economically, and socially profitable. With a holistic design approach, we enable our clients to make smart decisions that apply sustainable, high-performance design throughout all stages of their projects—design, construction, and operations.

## Renovation is the greenest building

Studies have shown that when comparing buildings of equivalent size and function, building reuse almost always offers environmental savings over demolition and new construction. Adaptive reuse or simple rejuvenation of an existing building stock can inspire the public to recognize the possibility and beauty in the overlooked or dilapidated patches of their community fabric. We recognize not only the intrinsic energy embodied in these tired or neglected structures, but also their inherent value as unique relics of a place and its culture; providing opportunities to reveal a community's past while strengthening its future. Using past and current projects as a guide, our studio's leadership will determine strategic targets for growth in renovation work that align with our 2030 goals.



## Socially JUST

We are making social equity and justice an integral part of our business. Opsis utilizes the JUST Program, a social justice evaluation tool and voluntary disclosure program created by the International Living Future Institute, as a process to help us measure our impact and learn where we can more effectively take action. Businesses are uniquely positioned to influence and advance social justice and equity issues within their communities. By embracing a relationship of reciprocal trust with our clients and workers in the building industry and beyond, we are helping pioneer better practices of transparency, fairness and equity within our own community.



We seek to position our studio as a leader in the effort to create communities, environments and buildings that embody the principles of a low-carbon, environmentally responsible, socially equitable method of development. The history of Opsis is one of exploration and commitment to sustainable environments. By being an early advocate for sustainable design, we have been able to learn from our initial green projects and propel the knowledge gained into more aggressively sustainable work, staying at the forefront of the design industry.