HP.ID / COTE TOP 10 MEASURES

Pacific Center Campus Development

RESEARCH AND DEVELOPMENT BUILDING
SAN DIEGO, CALIFORNIA

bnim

*COTE Top Ten is the industry's best-known awards program for sustainable design excellence. Each year, ten innovative projects are recognized for their integration of design excellence with environmental performance. COTE Top Ten Awards highlight the highest achievements in both design intent and actual performance across the triple bottom line of social, economic, and environmental value.

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Our work recognizes the opportunity for elevating human experiences within the intersections of high performance environments and interdisciplinary building design.

The Pacific Center Campus Development is a case study in helping our clients realize **transformative, collaborative, interdisciplinary** environments for research and work that elevate the mission of their organization. At BNIM we refer to our process as **Human Purposed Integrated Design** (HP.ID) and we embrace the opportunity to elevate human and organizational potential and building performance through mindful design.

In each project, we strive to do more with less in helping our clients more fully realize their goals and aspirations. This means helping researchers and investigators achieve more important findings and discoveries while working in an environment that is better for them, more responsible to natural systems, and fiscally responsible both with first-cost and operational costs.

HP.ID elevates the way we realize each project to achieve outcomes of efficiency, comfort, and durability. Achieving results for occupants requires challenging conventions and traditional practices of program, design, and construction.

Our process is collaborative and iterative. We collaborate with our clients to create solutions that achieve their goals for increased performance without additional expense. We have found that by crafting better envelopes, harvesting daylighting more effectively, accurately understanding electrical loads, and being smarter about ventilation we are able to allocate the budget to make buildings that are better connected to their environs and less dependent upon mechanical and electrical systems. In doing so, we shift dollars from things that use energy to things that save energy, while creating more comfortable and productive results.

This book uses the AIA's Top Ten Committee on the Environment* (COTE) award's ten measures as a framework to illustrate how HP.id was achieved in the Pacific Center Campus' Research and Development building in San Diego, California.

MEASURE 1 DESIGN FOR INTEGRATION

357,000 GSF
Completion in 2015
LEED Gold Certified

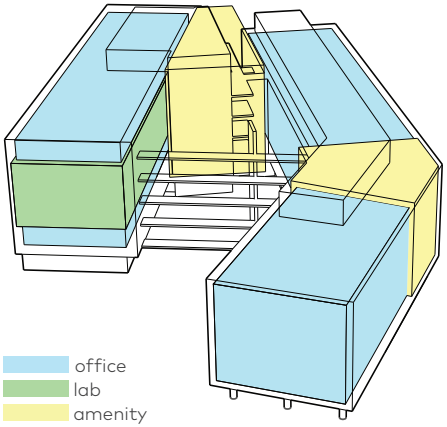
The Pacific Center Campus' Research and Development Building is designed around one notion: **connecting people with nature**. This model workplace and research lab represents transformational replication, which surpasses dated office buildings to provide an innovative workplace of the future for a Fortune 500 company that attracts and retains top talent. Embracing its San Diego location, the building implements passive design strategies that connect people with nature, and increase well-being and productivity.

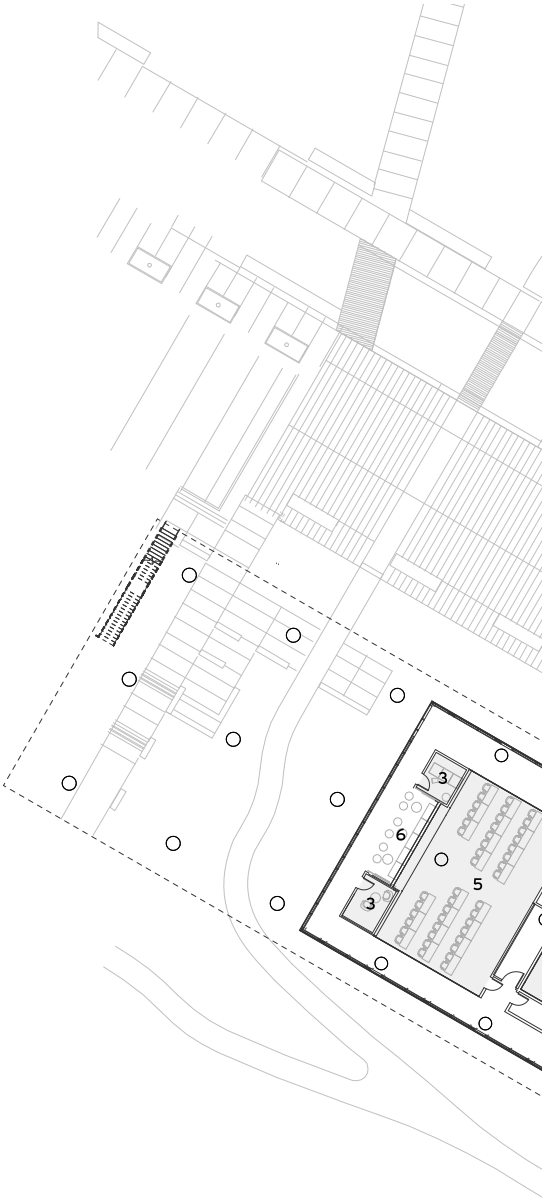
The 357,000 GSF building includes office and lab spaces in a single structure. A flexible, open workplace distributes horizontal circulation to inspire collaboration and encourages vertical circulation to simulate health and interaction, all goals of the project. The two narrow wing floorplates — laboratory in the north and workplace in the south — connect at a joint known as the knuckle, where collaboration spaces reside.

The outdoor spaces connect to the Lopez Canyon beyond, coming alive through human interaction. This softened landscape and pedestrian path in Sorrento Valley link multiple facilities into a singular campus. Color was employed to evoke various moods, reinforced by the spectrum to designate places of focus, collaboration, and social interaction. For example, places of focus use calming blue tones and active areas use bright, warm tones.

The project's high-performance façade, flexible interior spaces, and indoor-outdoor connections create a regionally sensitive building people will fight to preserve. Timeless materials like the pristine cast-in-place concrete moment frame structure paired with modular materials designed with the climate in mind — sourced locally, as available — such as aluminum metal cladding and louver shades, bring a human scale to the larger building elevations.

The interior program is coordinated with exterior fenestration to support daylighting and full natural ventilation strategies. This combination of passive and active systems provides a high-quality indoor environment that enhances building performance and reduces future operating cost.





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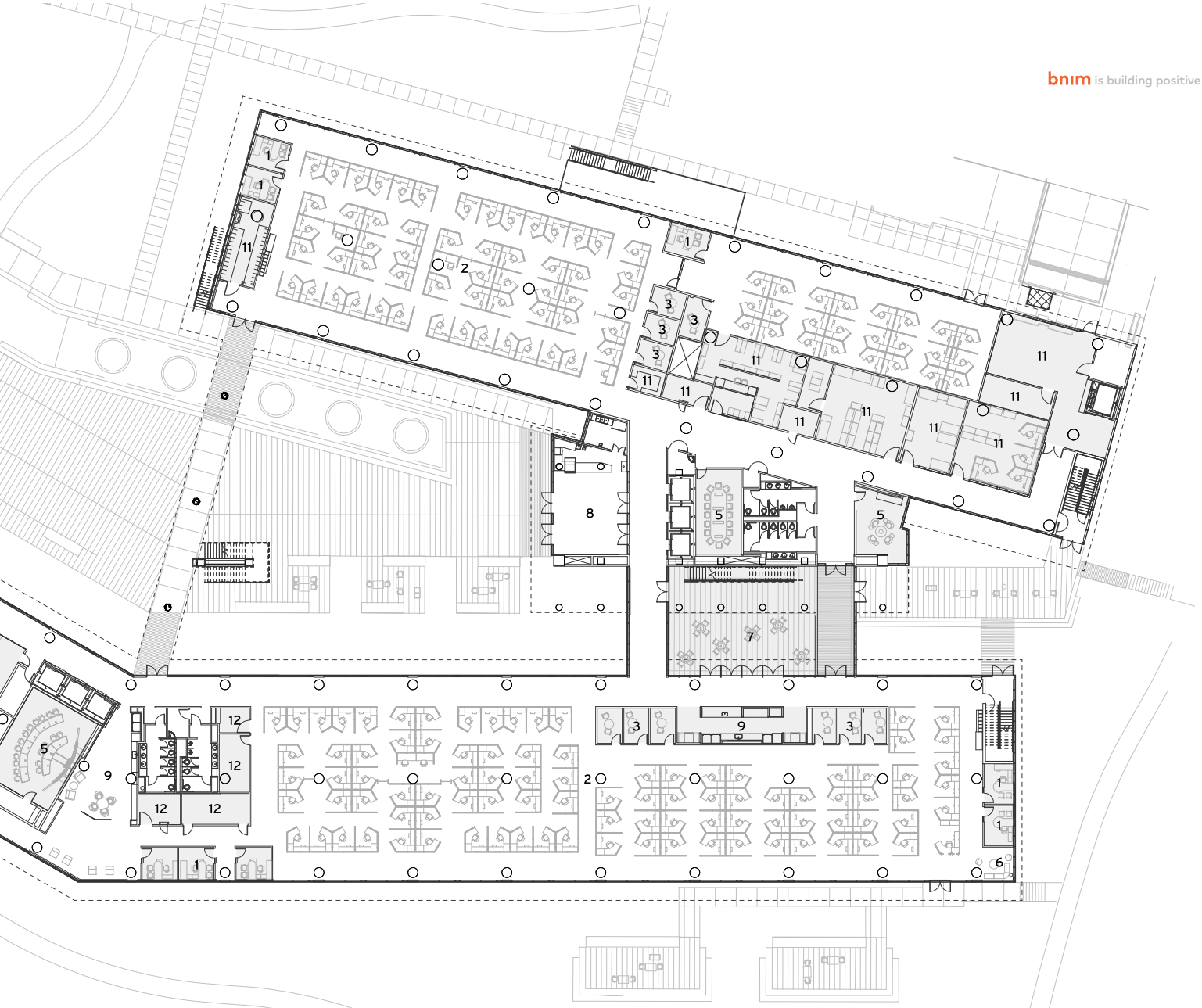
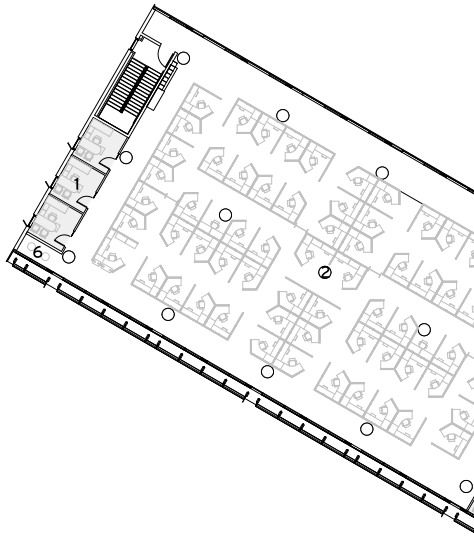
LEVEL 1

1 Private Office
2 Open Office
3 Private Room
4 Lab
5 Conference
6 Collaboration
7 Outdoor Collaboration
8 Lobby/Cafe
9 Tech Cave
10 Support
11 Service

bnim is building positive





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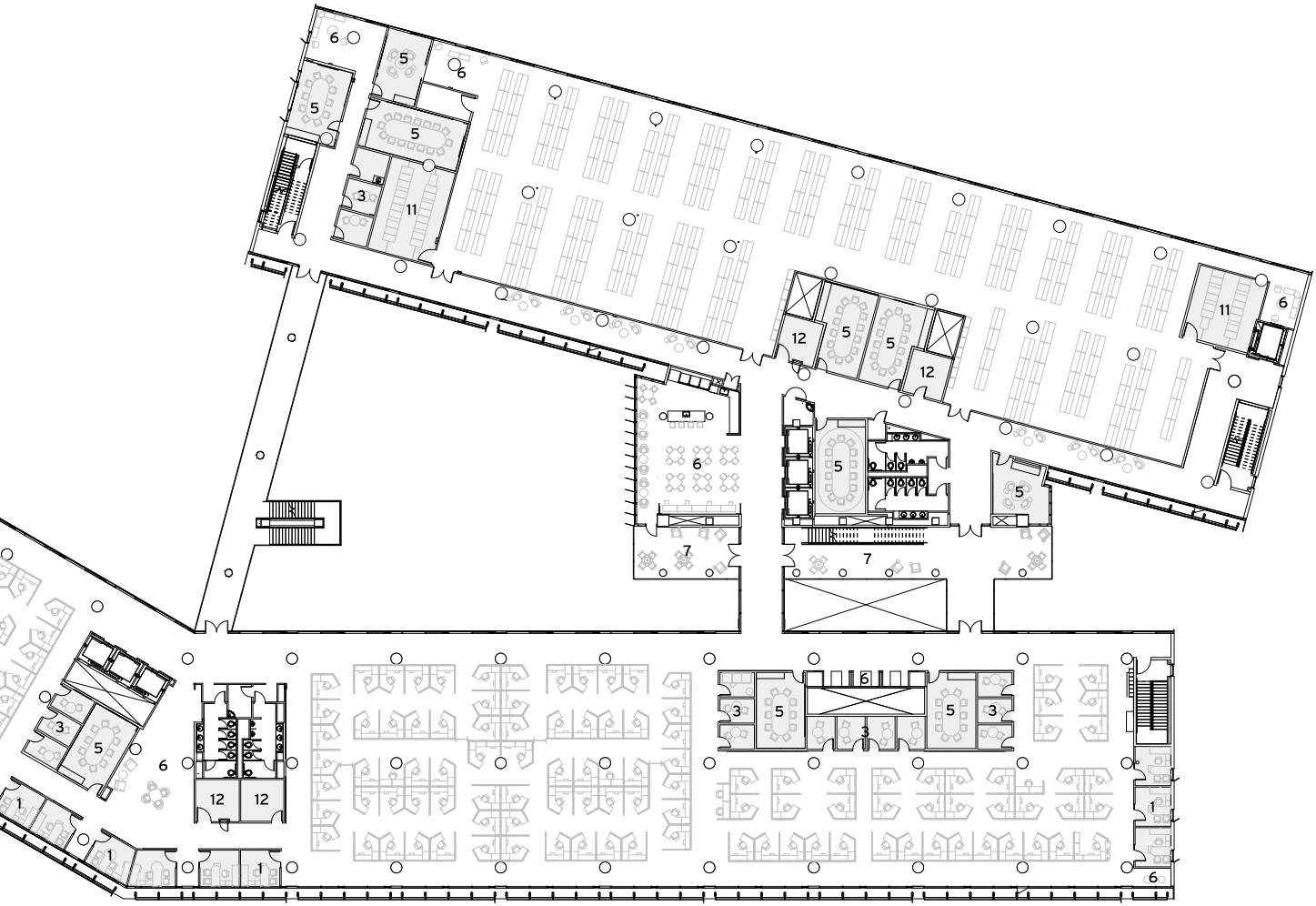
LEVEL 2 - 3

1 Private Office
2 Open Office
3 Private Room
4 Lab
5 Conference
6 Collaboration
7 Outdoor Collaboration
8 Lobby/Cafe
9 Tech Cave
10 Support
11 Data Rack Rooms
12 Service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MEASURE 2 DESIGN FOR COMMUNITY

The building transforms a suburban vehicle-oriented site into an active, pedestrian-focused campus that provides wellness opportunities and amenities to its surrounding community. The campus comes alive, promoting social equity by connecting a natural pedestrian trail to the adjacent Lopez Canyon. A new field adds open green space for community activities and infrastructure for popular campus games of soccer and cricket.

The site also includes a public, quarter-acre organic urban farm that supplies fresh produce to the dining center. The building celebrates the circulation experience, distributing horizontal circulation for collaboration; and encouraging vertical circulation to stimulate health, interaction, and reduce the use of the elevator. Open, exterior stairs serve as an active and oft-used building design element.

The design team held extensive programming and visioning sessions to elicit community feedback, including workshops, interviews, and employee surveys. The client is partnered with the nearby acclaimed Salk Institute for Biological Studies to conduct ongoing research, monitoring the building's continued impact on the health and well-being of occupants.

The campus promotes public transportation with multiple adjacent bus routes and close proximity to a train station. The building design also incorporates interior and exterior bike storage, and provides publicly accessible electric vehicle charging stations.

MEASURE 3 DESIGN FOR ECOLOGY

The building took a restorative landscape design approach to re-establish native plant and water systems, enhance human connection to nature, and weave the science of natural systems into the culture of daily life. The design maximizes the ratio of open vegetated spaces to mimic the site as it would function uninhabited, promoting biodiversity in the rapidly developing area. This urban form mimics the natural functions of the site within the programmatic demands of the city.

The design embraces the undulating canyon to provide an immersive, integrated indoor-outdoor experience for theworkplace, featuring quiet terraces with views, sloping rooftop prairies, gabion-shaped spaces, and outdoor rooms with walls of local plants and grasses. A central meadow serves as a giant pause of open space traversed by decomposed granite trails that connect the campus to the Lopez Canyon trail beyond.

Plantings were selected based on San Diego's arid climate, utilizing drought-tolerant, indigenous vegetation requiring minimal irrigation. Extensive bioswales and modular wetlands provide sustainable, pedagogical elements that both define public spaces and provide educational opportunities with interpretive signage.

Site lighting, all LED, is focused only on pedestrian paths to minimize light pollution. The south façade exhibits highly visible, white louvers to minimize bird collisions.

MEASURE 4 DESIGN FOR WATER

The building siting within a previously surface-parking-laden, corporate campus provided unique water challenges. Integrated stormwater management design strategies were incorporated to reduce potable water use — a regional issue — and eliminate runoff to improve San Diego's delicate watershed and coastline.

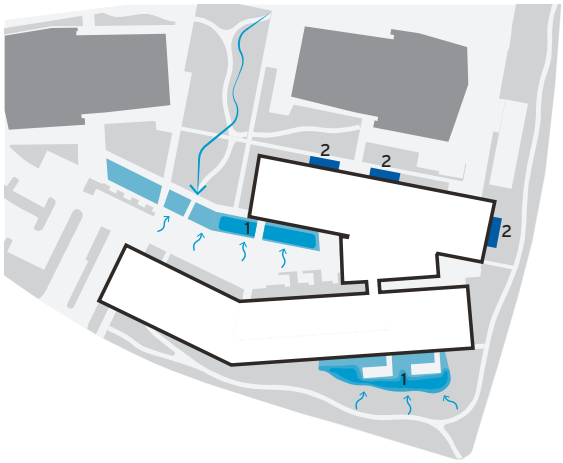
All roof stormwater is captured and treated by native-planted bioswales, varying in linear and organic design, and site runoff from adjacent paved surfaces is processed through modular wetlands. A stunning grade-change and visually rich planting palettes were specifically designed to support these functional features.

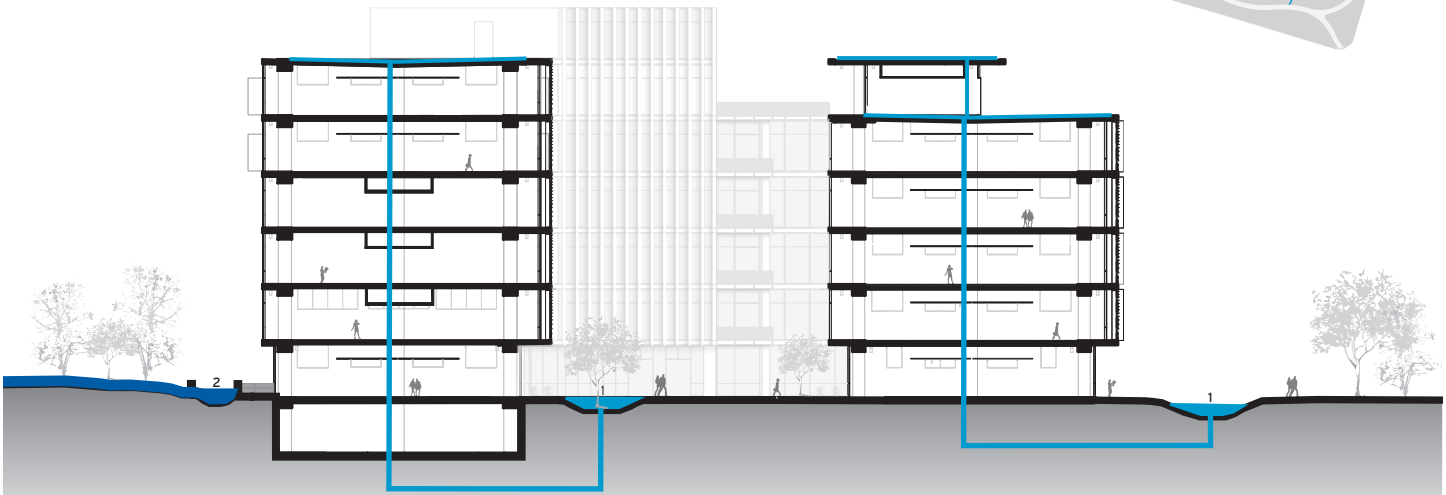
Adaptive and native planting varieties minimize irrigation requirements. This approach combined with a drip irrigation system with moisture sensor controllers resulted in an 81% reduction in potable water consumption for landscaping. Interior strategies of sensored faucets, low-flow dual-flush toilets, and low-flow urinals further reduced reliance on municipal water sources, resulting in a 36% reduction in indoor potable water use (baselines LEED 2009).

The project treats 100% stormwater onsite. Rainfall limitations, and local regulations to discharge within 48 hours without additional treatment, made it challenging to store water on site; however, for long-term flexibility, the irrigation system is plumbed with purple pipe to connect to the city's greywater source.

36%
reduction in potable water
(baselines LEED 2009)

81%
reduction in potable water
consumption for landscaping





1 Bioswale treats roof top water
2 Modular wet land treats site run off water

MEASURE 5 DESIGN FOR ECONOMY

The design process focused on developing an innovative, high-performance building within a standard developer budget. The notion of "office compression" defined the project, adding more program and blurring the boundaries between architecture and landscape. This necessitated more investment in open space and common areas, an untraditional strategy with office projects, but one that ultimately provides a richer understanding and appreciation of reuse and adaptation. It also minimized energy consumption by shifting 17.3% of the program and circulation systems from interior conditioned spaces to exterior open-air spaces.

The concrete materiality — unusual with San Diego's reliance on market-driven steel — also emerged as a cost-effective design solution that provided "more for less." It became the building's defining materiality and expression, reducing exterior skin by 12%, decreasing overall interior finishes by only utilizing 40% coverage of ceiling materials, employing concrete floor finish, and exposing columns.

These design choices shifted typical budget allocations to support other high-performance strategies, including the south façade louver system and mechanically controlled windows for natural ventilation. LCCA was used to study the natural ventilation system in terms of cost for mechanically operated windows and controls to provide the owner a payback period to inform their decision on implementation.

MEASURE 6 DESIGN FOR ENERGY

The building is a product of research seeking to understand the direct relationship between human health and time spent in nature. Located in San Diego's mild climate — an intersection of perennial sunlight and ocean breezes — the building provides immersive access to nature by embracing daylight, ventilation, and views.

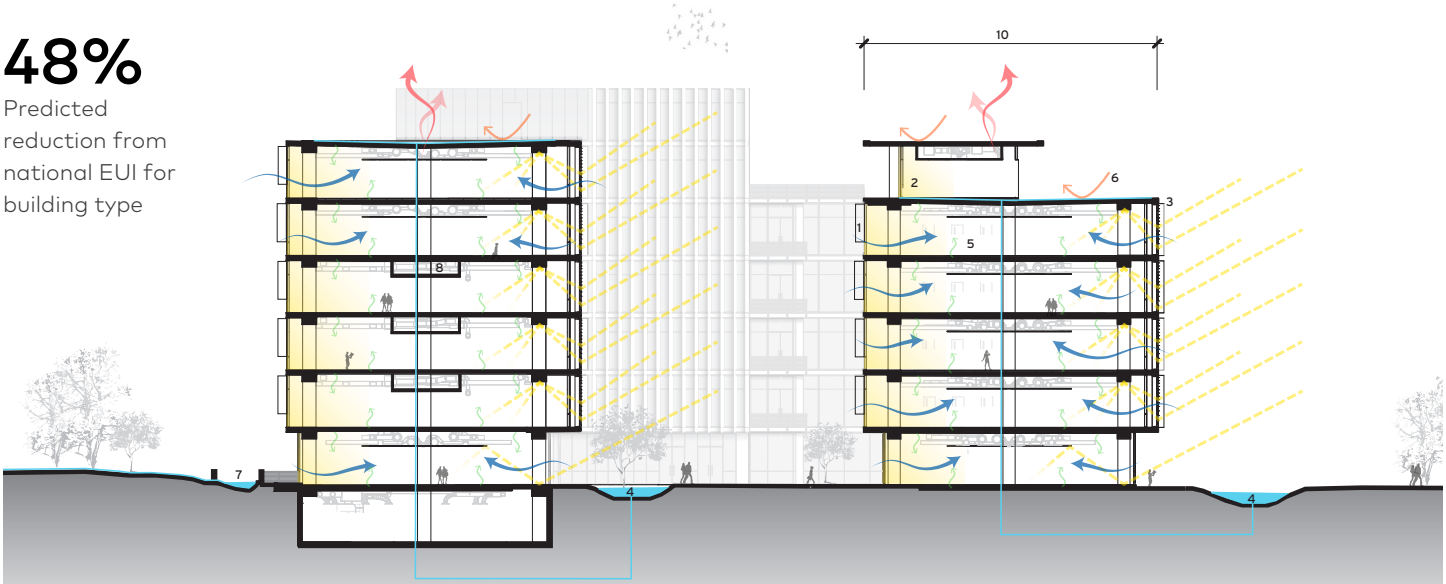
The project's purpose as a state-of-the-art research facility presented unique energy challenges. The client required 20 watts/SF energy intensity within research labs, also to be designed for future flexibility due to rapidly developing industry technology. The design team addressed this challenge in the programming phase by organizing all labs as north-facing. This strategy prevents east, west, and south solar exposures to minimize additional loads within these spaces for cooling.

The project optimizes passive design strategies of building orientation, narrow floor plates, and extensive use of exterior program spaces to minimize conditioned space — implementing a mixedmode ventilation system in all office spaces. It is one of the largest naturally ventilated buildings in the country.

Elegant horizontal louver shades animate the south façade, protect from solar heat gain, reflect daylight distribution evenly across the interior workspaces, and reduce glare — connecting people to nature, and creating opportunities for delight and well-being.

38
Predicted Net EUI

48%
Predicted reduction from national EUI for building type



1 Operable windows faciliate natural cross ventilation
2 Full glazing to maximize diffused north daylight
3 Horizontal louvers shade south daylight and reflect diffused daylight deep into the space
4 Bioswell treats roof top water
5 Concrete thermal mass structrue
6 Reflective roof designed for future pv
7 Modular wet land for site water runoff
8 Vav mechanical system
9 Drought tolerant plantings
10 Narrow floor plate to mazimize natural ventilation and daylight penetration

MEASURE 7 DESIGN FOR WELLNESS

Health and wellness guided the design team's human-purposed design process and the Salk Institute was engaged to advise on, and continually monitor, strategies for improving the health and well-being of future occupants.

An optimized building floorplate depth promotes daylighting. Louvered sunscreens with a parabolic profile reflect high-elevation summer sun off the curved portion and low winter sun angles off the flat portion of the louvers. This system also creates clear views and connections to the outdoors by positioning the 1/8" thick aluminum blades horizontally at eye level to not obstruct views.

Thermal comfort was achieved by utilizing the concrete thermal mass and a night purging cycle to change the structure with free cooling during the day. Over 95% of regularly occupied spaces have daylight and views due to the vast glazing at the northern and southern elevations, and all employees have access to operable windows. 100% of the workspaces employ natural ventilation to promote indoor air quality. These holistic strategies resulted in a 16–18% productivity increase.

The active building design provides outdoor terraces, bridges, stairs, and trails as highly visible design elements that encourage activity and exercise. A quarter-acre organic urban farm supplies fresh produce to the dining center.

MEASURE 8 DESIGN FOR RESOURCES

Designing with the philosophy of "structure as finish" minimized the use of materials. All interior materials comply with stringent LEED v3.0 for New Construction criteria. The building achieved 13 out of 15 possible indoor environmental quality credits by responsibly sourcing materials, implementing increased ventilation and low-emitting materials. Where needed, low-emitting materials were incorporated, including zero- and low-VOC paints, Green Seal carpet systems, Cradle to Cradle furniture systems, and NAUF composite wood products.

The entire façade system is constructed from aluminum material that can be easily recycled, including exterior sunshades and metal cladding, and unitized glazing mullions. The design team utilized local and/or reclaimed materials where possible, including reclaimed walnut slat ceiling, wall finishes, and collaboration booth tables. The entire exterior façade was sourced and locally manufactured in San Diego, which includes the unitized glazing, concrete structure, aluminum cladding, aluminum sunshades, and stainless steel guardrails.

Diverting materials from the waste stream was a priority. The following metrics also speak to this priority:

32%
Building materials with recycled content (by cost)

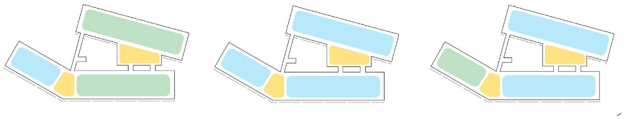
27%
Building materials with regional materials (by cost)

97%
Virgin wood products in the building that use FSC wood

76%
Construction waste diverted from local landfills

MEASURE 9 DESIGN FOR CHANGE

The building's program and systems were designed for flexibility and adaptability. The program clusters all enclosed spaces around vertical system distribution cores while providing clear open plans that can be flexibly reconfigured for the future. Office spaces were designed with raised access flooring to support workspace evolution and the conversion of power and data systems, and furniture configurations.



The concrete frame includes additional sleeves in each floor deck to provide additional flexibility for future system needs. Office space can easily be converted to additional research space with easy access to additional future rooftop equipment. A flexible approach extends to the support spaces, where conference areas were sized and designed to serve the entire campus.

The design addresses climate change over time by providing options for future energy production. The roof is designed to accommodate extensive PV systems that, when calculated with the garage top deck, will completely offset office space energy use. These systems can be added in the future to reduce the carbon footprint for this project and increase its resiliency. These strategies support passive survivability with complete daylighting and natural ventilation.

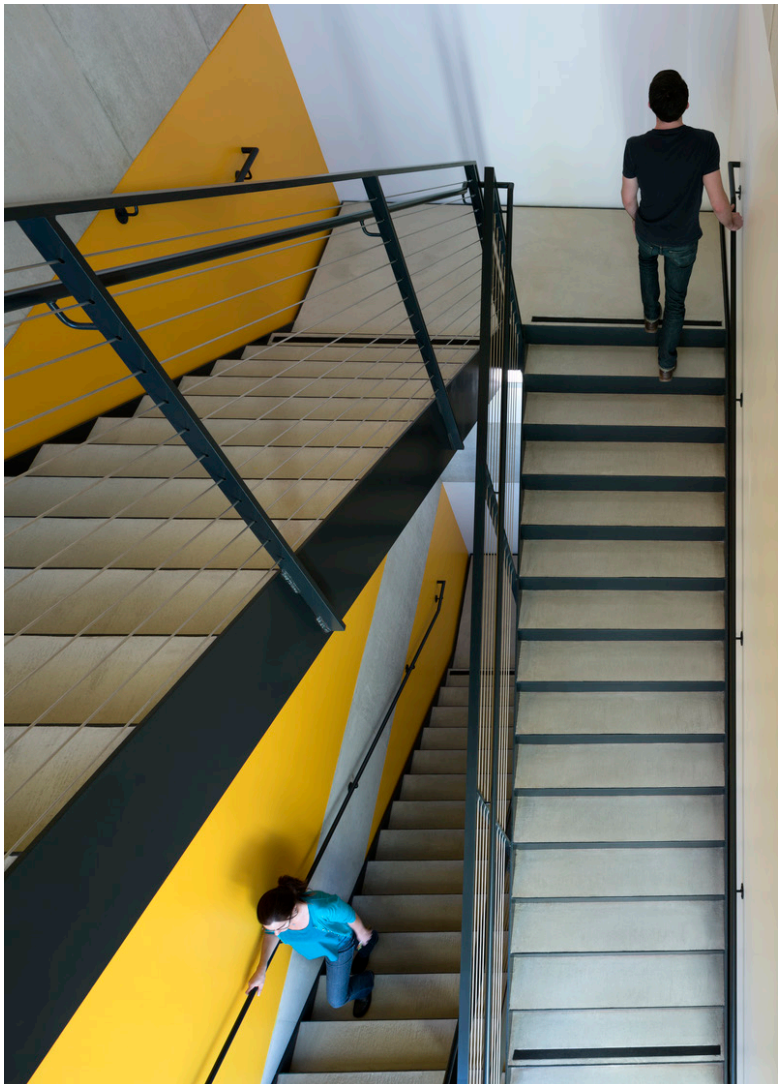
office
lab
amenity

Although occupant satisfaction survey data is withheld due to the company's stringent HR privacy policies, informally, the client has relayed that the building is performing better than modeled with a very high request rate for employee relocation to the new facility.

We have many lessons learned from this project that have influenced our design process on many of our projects. The deep understanding of LCCA and overall budget metrics to inform decisions and performance values has enhanced our designs on many projects. This project has been shared at many conferences throughout California and nationally to highlight how research-based, high-performance strategies are developed, analyzed, and implemented through an integrated design process.

This project has become a model for implementing a passive design approach in the San Diego climate and continues to influence projects within the region. It won the The Chicago Athenaeum Good Green award in 2017 and ENR's Best Project, Southern California, Office/Retail/Mixed Use in 2016.

We continue to have consistent communication with the clients which have been providing feedback from what they hear from the users directly which has benefitted from learning what has made the biggest impact to the users for future project consideration.



CAMPUS
SITE PLAN

1 main courtyard
2 east courtyard
3 exterior meeting zones
4 interior courtyard
5 grand stair
6 exterior stair
7 bike storage
8 collaboration terrace
9 bioswale
10 modular wetlands
11 breakout meeting spaces
12 fountain
13 herb garden
14 north dining terrace
15 dining terrace
16 rooftop event space
17 green roof
18 athletic sports field
19 basketball court
20 campus composting station
21 urban garden
22 orchard
23 bocce court
24 central meadow
25 electric car charging station
26 tesla super charging stations
27 shuttle stop
28 trail
29 formal courtyard

AWARDS

2017 AMERICAN ARCHITECTURE AWARD
The Chicago Athenaeum: Museum of Architecture and Design and The European Centre for Architecture Art Design and Urban Studies

2017 SPECIAL MENTION
Architizer A+Awards

2017 GOLD AWARD, CORPORATE, LARGE
IIDA Mid-America Design Awards

2016 BEST PROJECT, SOUTHERN CALIFORNIA, OFFICE/RETAIL/MIXED USE
ENR California's Best Projects

2016 HONOR AWARD, EXCELLENCE IN ARCHITECTURE
AIA San Diego

2016 MERIT AWARD, EXCELLENCE IN ARCHITECTURE
AIA Iowa

2016 MERIT AWARD, EXCELLENCE IN ARCHITECTURE
AIA Kansas

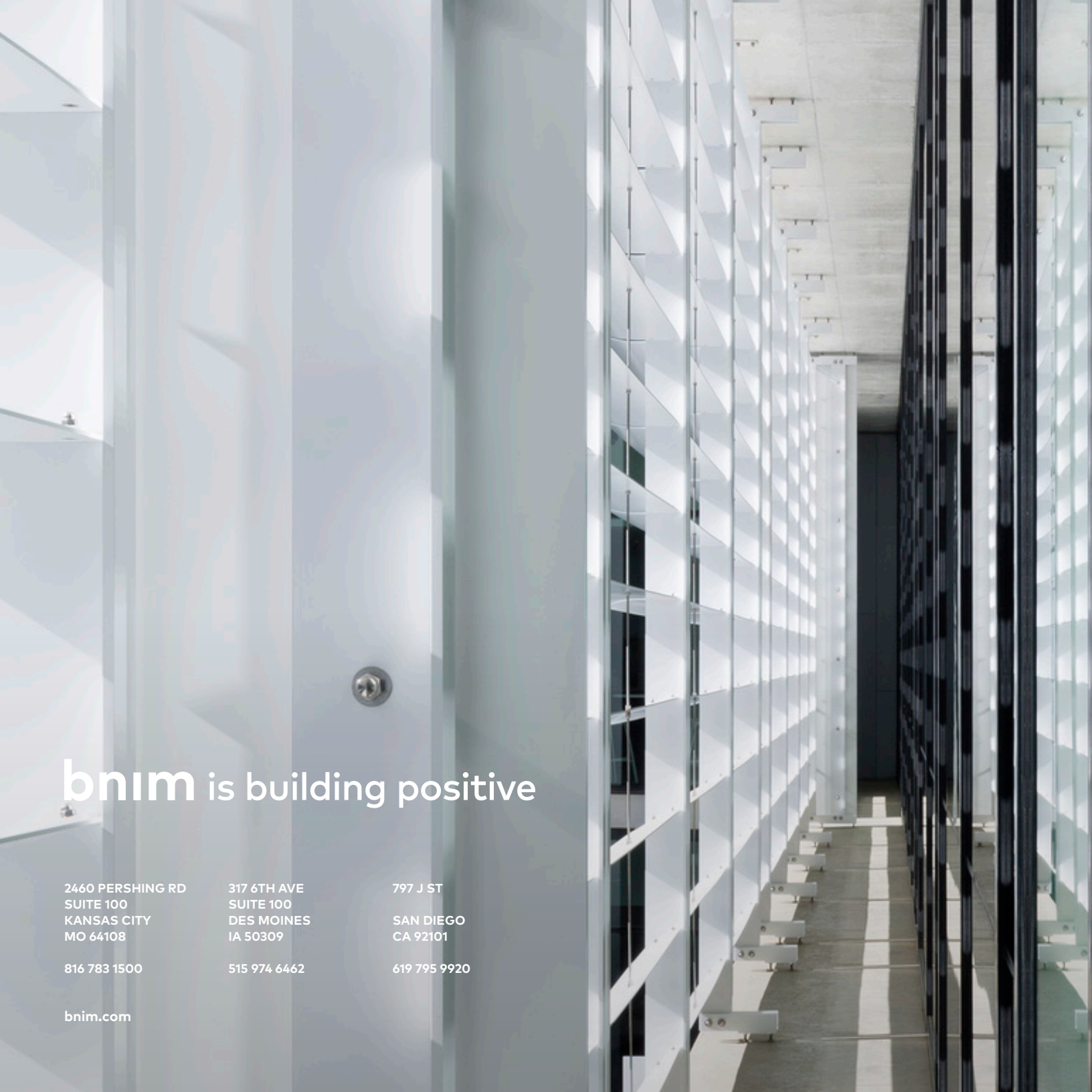
2016 MERIT AWARD, EXCELLENCE IN ARCHITECTURE
AIA Kansas City

2016 ORCHID AWARD, LANDSCAPE
Orchids and Onions

2015 EXCELLENCE IN STRUCTURAL ENGINEERING AWARD, NEW CONSTRUCTION
Research and Development Building
Structural Engineers Association of San Diego

2015 PEOPLE'S CHOICE AWARD
Structural Engineers Association of San Diego

2014 COMMERCIAL BUILDING AWARD
American Concrete Institute, San Diego International Chapter



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