AIAOC Design Awards Performance Data Worksheet

1. BRIEF STATEMENT

In the space below list the energy efficiency and environmental performance goals for the project. These could be as simple as to comply with code minimum or as ambitious as to achieve zero net energy and/or eliminate all materials on the Living Building Challenge Red List. You are encouraged to describe environmental strategies throughout your design awards submittal materials . California Nonresidential Projects that complied with 2013 Title 24 can use the energy goals included in form **NRCC-CXR-01-E – Certificate of Compliance – Cx Design Review Kickoff.**

The building is one of the few net-positive healthcare buildings in North America. Energy reduction strategies include an efficient envelope design, domestic water heating, natural lighting strategies and equipment cooling. The placement of a solar PV array on an adjacent parking structure generates enough energy to power the building with energy to spare. Extra energy is harnessed to power infrastructure on the greater campus.

2. ENERGY EFFICIENCY

Projects in California (Complete section A *or* B. Complete C & D only if applicable.)

A. Modeled Performance for California Projects (If you complied with Title 24, Part 6 using a computer model.)

Enter Energy Use Intensity (EUI) information from the Title 24 Building Energy Standards compliance report below. If you complied under 2013 Title 24, refer to form CF-1R-PERF for Residential Bldgs and NRCC-PRF for Nonresidential & Highrise Residential Bldgs. See section 6 below for reference information on EUI.

Year of Title 24 Standard Used	Energy Budget of Baseline Bldg (Code Min) in kBtu/sf/yr	Modeled Performance Of Your Design in kBtu/sf/yr	Percent Savings Beyond Code Minimum
ASHRAE 90.1-2007	105.9 kBtu/sf/yr	85 kBtu/sf/yr	19.8% beyond code minimum

B. Prescriptive Compliance for California Projects (If you did NOT comply using a computer model.)

Year of Title 24 Standard Used	In the *prescriptive compliance path* , individual building components meet minimum requirements. If your project complied prescriptively, but your goal was to exceed minimum performance, enter the year of standard at left and briefly describe your energy efficiency strategy below.

C. Measured Performance for California Projects (If Available)

If you have actual energy used for 12 months from utility bills, enter it below as Energy Use Intensity (EUI) in kBtu/sf/year.

78 in kBtu/sf/year

D. Other Energy Modeling used, if any - Please state the software tool used and the predicted EUI

If your project team employed energy modeling as a design tool and have a whole building EUI for the final design, enter it below. If you did not do energy modeling other than for Title 24 compliance documentation, leave this blank.

Ecotect

3. RENEWABLE ENERGY & NET ENERGY USE (If Applicable)

If the project includes renewable energy, either on-site or through a purchase of off-site renewable energy, provide information on source, annual output, and net energy consumption.

Renewable Source	Annual Renewable Energy Production	Net Energy Consumption	Modeled or Actual Data
Project has offset 122.19% of the total energy costs through renewable energy generated on-site. Kaiser Permanente has allocated the energy generation of the solar PV array on the adjacent parking structure to the radiation therapy building.	Unknown	Unknown	Actual data

4. WATER EFFICIENCY, REUSE, AND MANAGEMENT (If Applicable)

California water efficiency standards are part of Title 24, Part 11, typically referred to as CalGreen. If your project achieved performance significantly beyond CalGreen minimum requirements, or incorporates innovative water efficiency, reuse, and management strategies and/or equipment, concisely describe them below.

Vegetated swales capture and remove suspended solids from stormwater runoff. Climate-appropriate plantings and efficient irrigation contribute to low site-water consumption. Inside the building, ultra-low-flush toilets and urinals, and low-flow lavatories, sinks and showers ensure maximum water efficiency.

5. MATERIAL USE & SELECTION FOR RESOURCE EFFICIENCY & HEALTH (If Applicable)

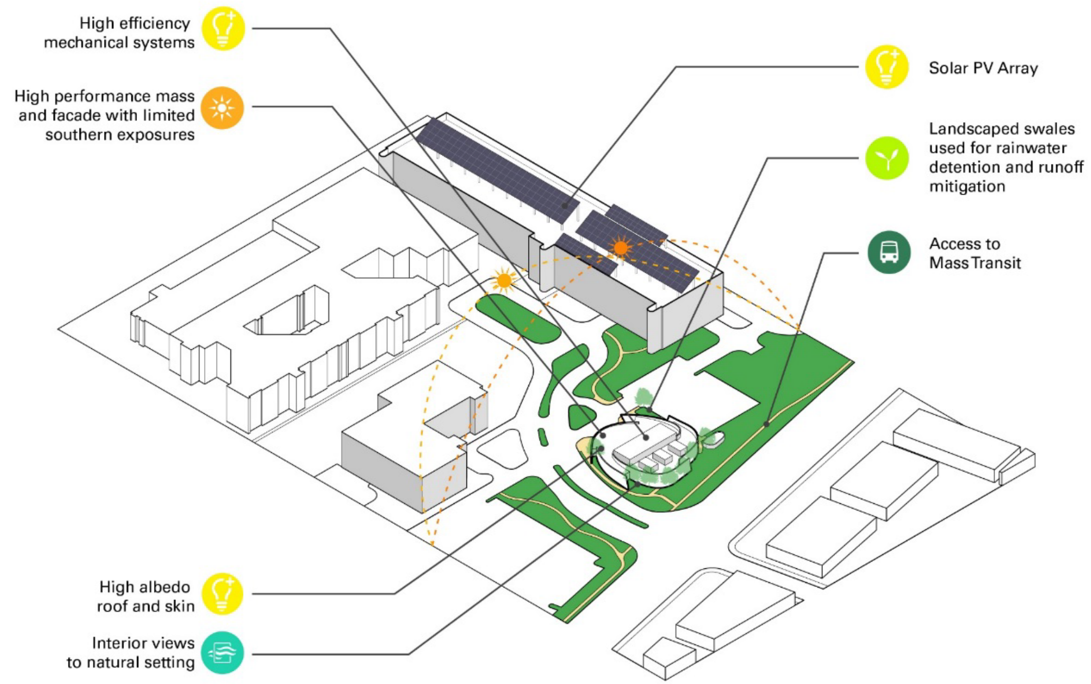
Briefly describe *exemplary* steps you took related to material use and selection. Examples might include exemplary performance in use reduction or reuse, incorporation of life cycle assessment and environmental product declarations, occupant and environmental health criteria & avoidance of chemical hazards, embodied energy and carbon, among many others.

Material Impact: 78% of construction waste was diverted from landfill disposal. 14.7% of building materials, by value, were manufactured with recycled content. 18% of building materials, by value, were extracted and manufactured within 500 miles of the project. 99.7% of wood-based building materials are certified in accordance with the principles and criteria of the Forest Stewardship Council. Third-party commissioning of energy-consuming building systems was employed to ensure that design intent and owner requirements for systems functionality carried through into operations.

CERTIFICATIONS: LEED Gold Certified

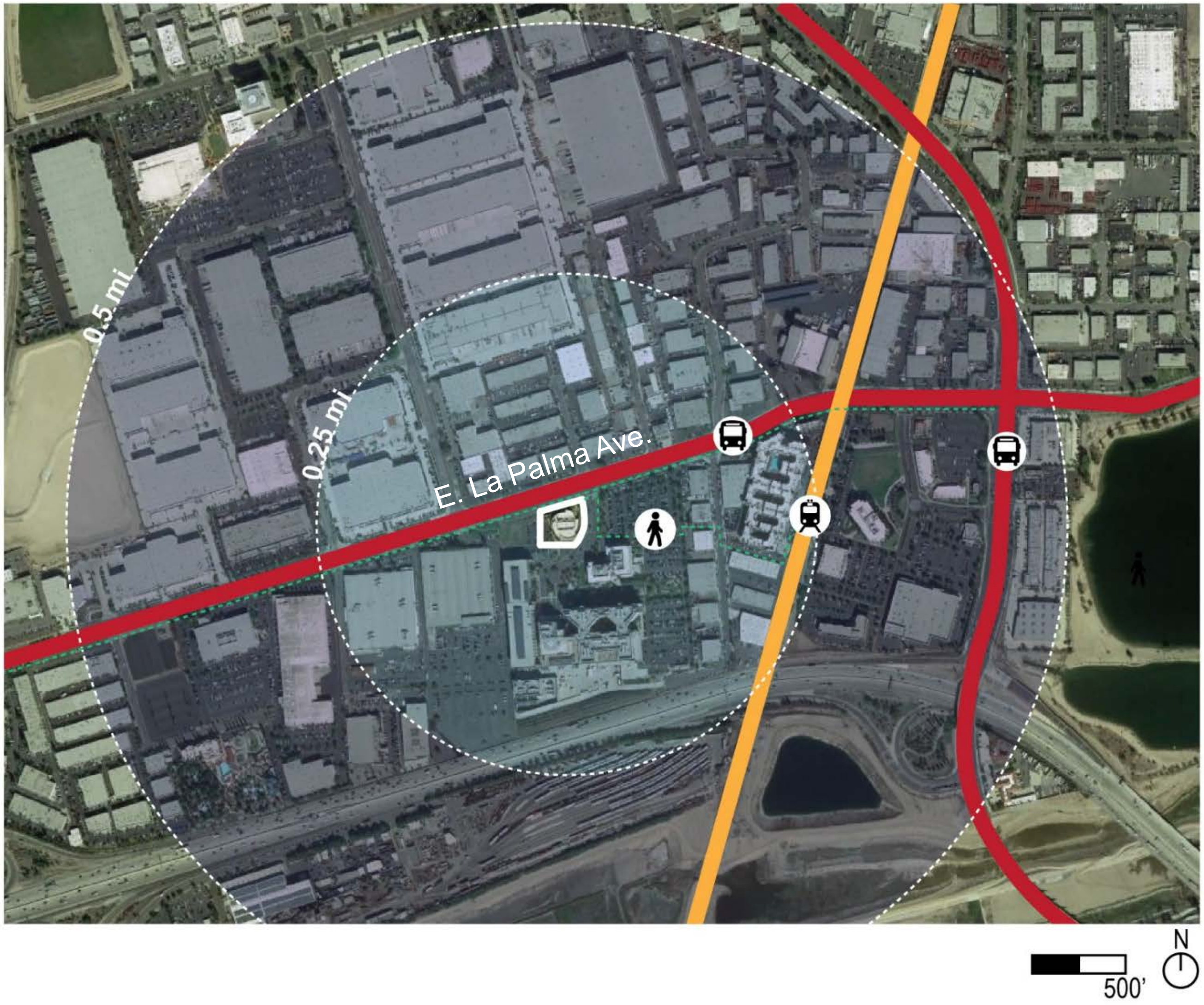
SUSTAINABILITY DESIGN INTENT:

This building is a result of a collaborative effort to fundamentally shift the paradigm of radiation cancer treatment and dramatically improve patient outcomes and experience in conjunction with a broader environmental mission. Kaiser Permanente has been an early advocate for greener and healthier hospitals and continues to lead the charge on issues such as climate change, pollution, waste and toxic chemicals. The integrative design process which was undertaken in this project was very much in line with their mission of environmental stewardship and high performance. The use of an Owners Project Requirements document at the very start provided a clear understanding of the goals for the project in areas such as building envelope, lighting, energy use, interior environmental health, water use and life cycle cost.



Design for Community

The placement of the Center on this corner of the campus creates a gateway to the new Anaheim Medical Campus and brings a human scale and natural setting to the frontage of East La Palma Avenue. While Anaheim as a city has low walk score, this project brings critical treatment services closer to East La Palma Avenue which is a significant public transit (bus) thoroughfare in the city. The site also features preferred parking for carpools as well as bicycle parking and the associated shower/changing rooms for the staff.

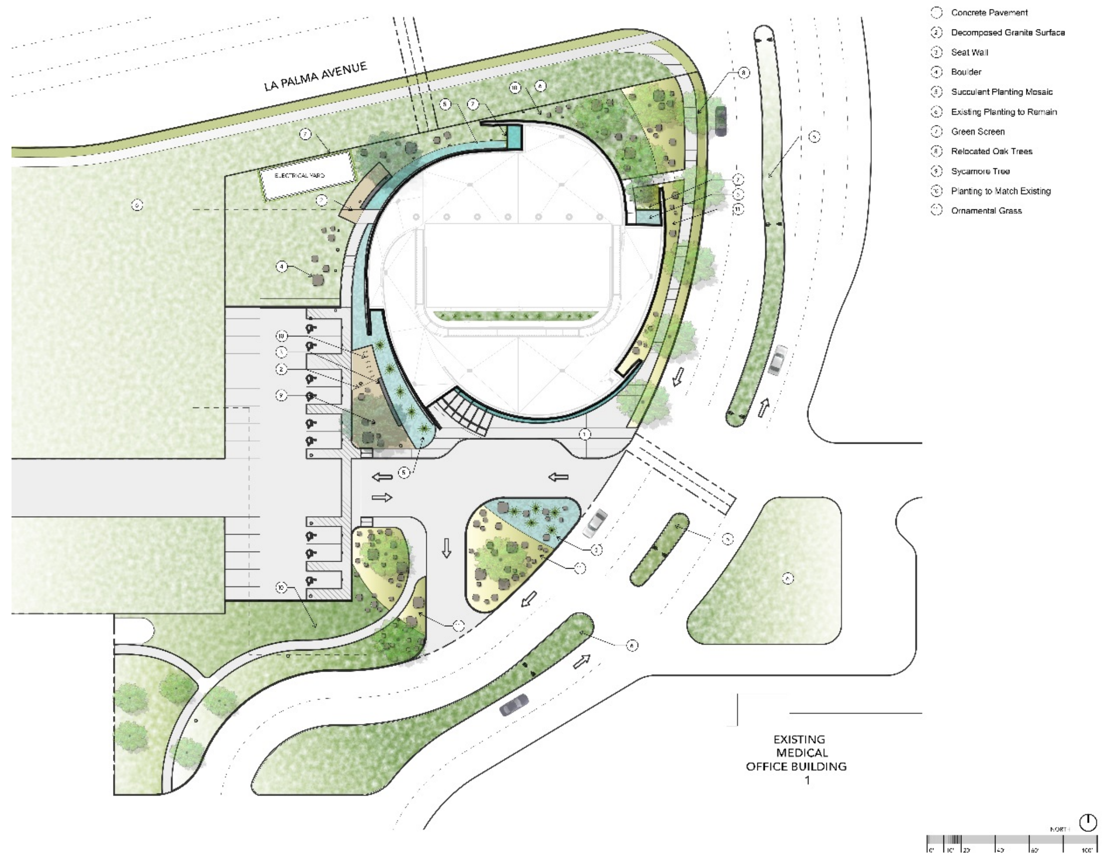


Design for Ecology

The strategy for creating a new type of healing environment places a heavy emphasis on biophilic design. In contrast to the heavily trafficked, asphalt-dominated, large-scaled surrounding areas, the field of wild grasses and drought-tolerant landscaping that surround the Oncology Center, provide a much needed change to the area to aid in all aspects of the healing process.

Within the center, an interior light well provides healing natural light to the treatment rooms, and sustains a vibrant green wall, bringing nature into the care process.

The site had been previously developed with the rest of the campus. Prior to the project start, a meandering walking path weaved its way through the unused area. That path was maintained in the site plan of the Oncology Center and is now part of a walking path through the campus. The portion of the path adjacent to the Oncology Center features two separate places of respite complete with benches and adjacent planting for staff and patients.



Design for Conservation

Since the project is located in southern California, smart water management is a crucial aspect of this project.

The site features vegetated swales to capture, detain and treat storm runoff. These swales are designed to remove the majority (85%) of suspended solids from site water prior to entering the local storm system. Climate-appropriate planting and minimal irrigation are key contributors to the projects low site-water consumption.

Inside the building, ultra-low-flush toilets, urinals, and low-flow lavatories, sinks and showers ensure maximum water efficiency.

Design for Economy

Healthcare construction costs tend to be much higher than standard commercial and institutional construction primarily due to medical equipment, associated HVAC, plumbing and electrical systems that support them. The linear accelerators that occupy the core of this building are no exception to that.

The per Square Foot cost is just shy of $390 / sf this project achieves high economy without sacrificing good, sustainable design. This is due largely to the team's use of life cycle cost analysis at key project junctures. Through the analyzation of building envelope, lighting and HVAC system alternatives against long term costs, the team was able to select options which provided the best quality and sustained value for the project.

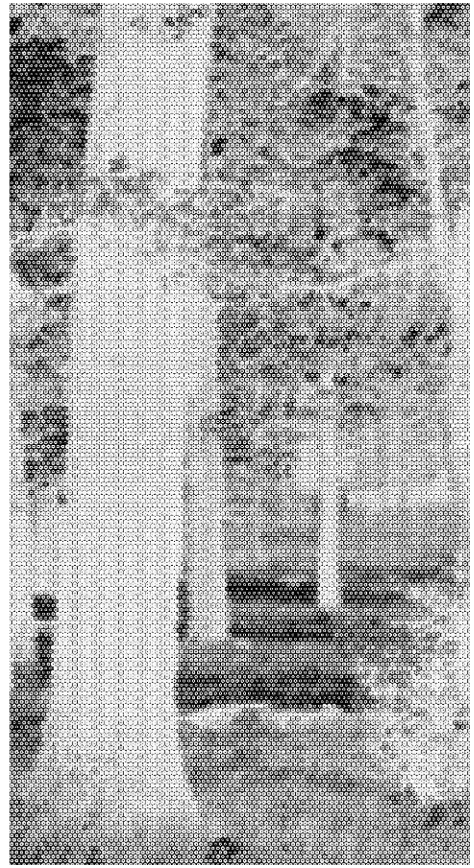
Design for Energy

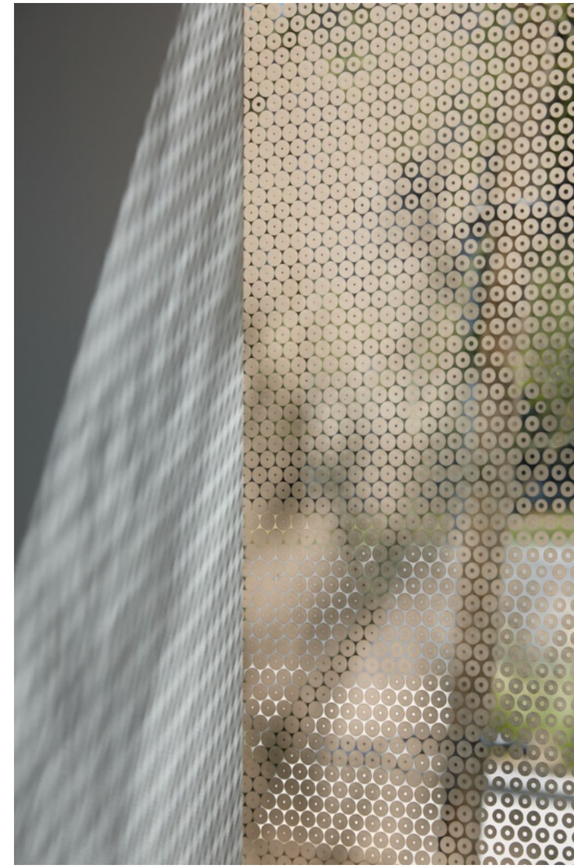
Radiation Oncology Centers are not traditionally associated with low energy design. Cooling loads for occupants and equipment tend to be high as are plug and lighting loads. These internal cooling loads coupled with the warm climate make solar exposure a key design driver. The orientation and massing of the building were driven by a desire to both diffuse light and deflect heat - therefore most of the vision glass is directed away from the south and the building's curved geometry and color scheme supports a high albedo, while avoiding a high reflectance.

High-efficiency mechanical systems were utilized to further reduce the buildings energy profile. A variable refrigerant flow system was selected equipment cooling as well as a high-efficiency domestic water heating and BAS control of all equipment.

Whole building energy modeling was used to evaluate schemes at a very early stage of the project and was used to confirm that the design was meeting the energy goals as the design was refined.

The power generated by the 910-panel PV array on the roof of the adjacent parking structure has been dedicated for use in the Oncology Center. As a result of the PV array, the project has achieved an energy cost savings of 118.25%, earning the maximum number of points for optimizing energy performance.





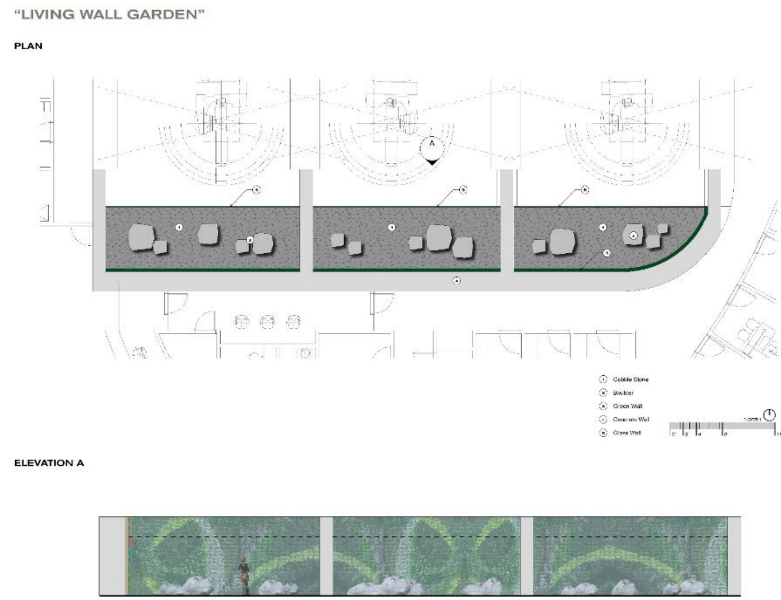
Design for Care

Prior to design, a significant amount of time was spent studying the cancer patient experience, which typically occurs five days a week for five to eight consecutive weeks. Careful consideration was given to every step in the patient journey, from parking and waiting, to interacting with staff, checking in, examination, undergoing treatment, and checking out. Because of the regularity of these patient visits, it was essential for the design to eliminate scenarios that could induce stress or anxiety.

The Oncology Center houses three linear accelerators, CT imaging, exam rooms, physician offices, and support spaces for caregivers and patients. Besides creating a good working environment, natural light and nature are crucial contributions to the healing process, both physically and psychologically. Using biophilic design principals, forest imagery was screened into the exterior glazing units to frame the actual landscape beyond as well as the vistas where walls flare out.

At the heart of the building are the three linear accelerator treatment rooms. The treatment rooms act as bunkers — surrounded by three-foot-thick concrete walls with secondary shielding to prevent any radiation transmittance. Even with all this protection, the rooms feel peaceful; the concrete walls are clad in FSC cherry wood and glass stretches across the footwall of each room, opening onto a lush garden that serves as a light well.

To augment the natural light that flows into most of spaces of the building, multi-mode and task lighting was used to ensure that occupants are able to adjust lighting to suit their needs.



Design for Health

In keeping with the client's commitment to material health and indoor environmental quality, only low-emitting materials (adhesives, sealants, paints, flooring and wood products) were selected for use in this building. A Construction Indoor Air Quality Management Plan was developed to detail cleaning, sequencing, air filtration, and materials management practices to support good indoor air quality during construction and beyond. Finally, an air flush-out was performed prior to occupancy.

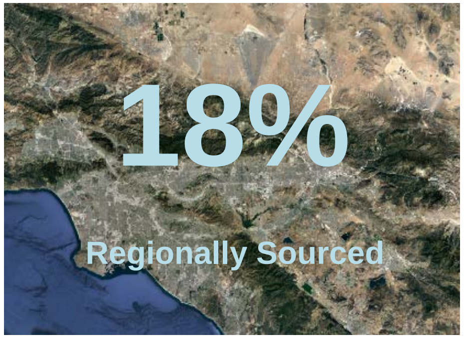
Some other key material resource statistics for this project include:

- 78% of the waste generated during construction was diverted from landfill disposal.

- 14.7% of building materials, by value, were manufactured with recycled content.

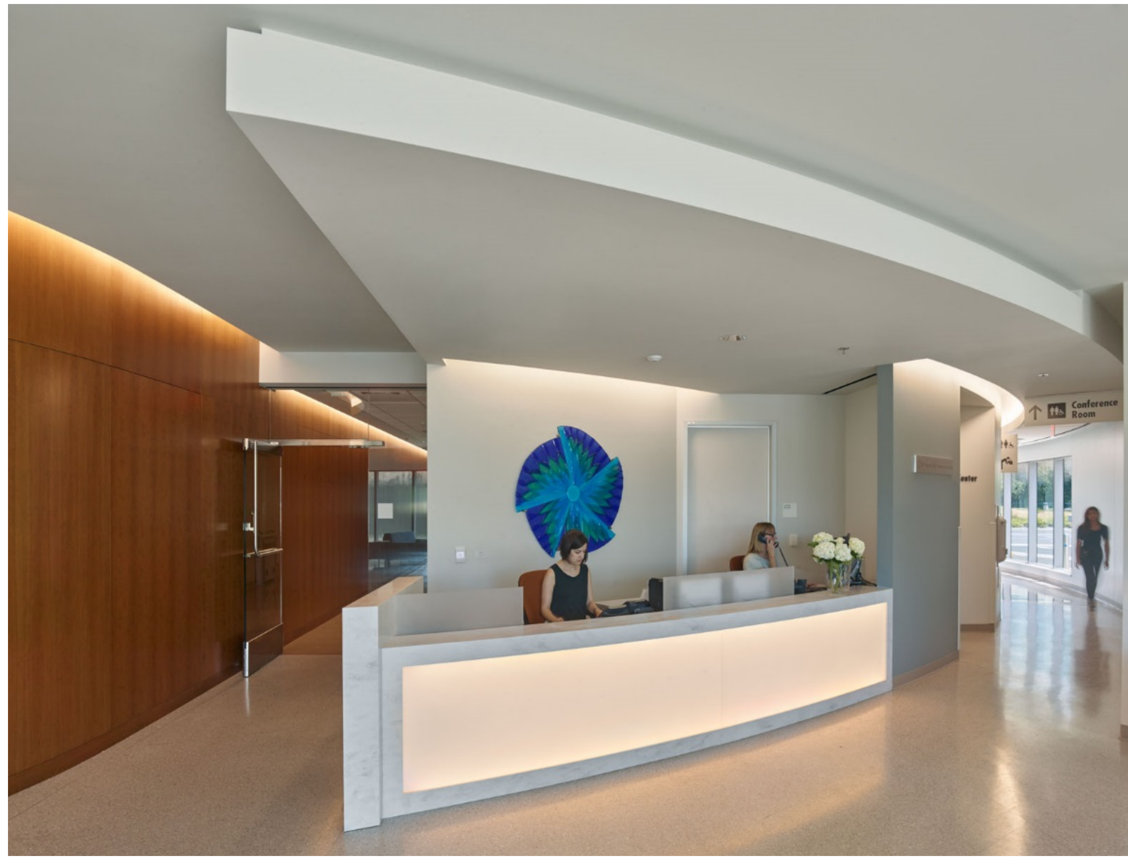
- 18% of building materials, by value, were extracted and manufactured within 500 miles of the project.

- 99.7% of wood-based building materials were certified in accordance with the principles and criteria of the Forest Stewardship Council.



Design for Adaptability

While the hot water system (for heating and domestic water) for this building does require natural gas for operation, the bulk of the building HVAC (cooling and ventilation) as well as lighting and power are all electric. The on-site solar array provides a significant amount of electric power in the event of a utility discontinuity. Therefore, the building has a decreased dependence on grid utilities that when coupled with more efficient envelope, lighting and water usage result in a design has an increased resistance to utility disruption or other disasters.



Design for Learning

This project was designed in 2012–2013 and constructed in 2014-2015. Since completion this project has won an AIA National Healthcare Design Award in recognition of the project's "conceptual strengths that solve aesthetic, civic, urban, and social concerns as well as the requisite functional and sustainability concerns of a hospital." Our plan is to use this project to further study the case for light and nature in treatment environments; distributed power generation in healthcare facilities; and natural interventions in mitigating urban sprawl.