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RAINIER BEACH CLINIC

AN AIA COTE TOP 10 CASE STUDY

The Rainier Beach Clinic leverages biophilic design strategies, distraction therapy for pain management, evidence-based practice for innovation, and biomorphic design strategies to boost patient health, wellness and lower morbidity and mortality rates. This LEED Silver green building project has been open for over a year and delivers one of the best restorative and innovative healthcare services in Seattle, Washington. Before we move ahead and discuss the various sustainable measures and standards used to review the green building project, let's credit everyone involved.

"Image Source: www.mahlum.com"

Project title	**Rainier Beach Clinic**
LEED Status	**LEED Silver**
Awards/Credits	**2021 AIA COTE Top Ten**
Architect	**Mahlum**
Owner	**Northwest Kidney Centers**
Location	**Seattle, Washington**
Project site	**Previously developed land**
Building program type	**Healthcare Clinic**
Year of design completion	**2018**
Year of substantial project completion	**2019**
Gross conditioned floor area	**12,073 sq. ft.**
Number of stories	**1**
Project climate zone	**ASHRAE 4C**
Annual hours of operation	**5720**
Site area	**1,430,273 sq. ft.**
Project site context/setting	**Urban**
Cost of construction, excluding furnishing	**$7,190,983**
Number of residents, occupants, visitors	**26,600**

The engineers, architects, interior designers, consultants, and contractors had a significant role in completing this massive single-home green building project. Here's the list of teams involved in the successful completion of Rainier Beach Clinic.

- Commissioning Agent: Coffman Engineers
- Consultant (Acoustical): A3 Acoustics
- Energy Modeler: Madison
- Engineer (Civil): LPD Engineering
- Engineer (Electrical): Northstar Electrical
- Engineer (Geotech): PANGEO Incorporated
- Engineer (MEP Design Consultant): Coffman Engineers
- Engineer (Mechanical): Emerald Aire
- Engineer (Plumbing): Strirrett Johnsen
- Engineer (Structural): PCS Structural Solutions
- Engineering Research Partner: University of Washington's Integrated Design Lab
- Envelope Consultant: RDH Building Science
- Fire Protection Consultant: Fire Sprinklers Inc.
- General Contractor / Construction Manager: Aldrich + Associates
- Landscape Architect: Brumbaugh and Associates

The project was judged rigorously by a jury of five. We have Erica Cochran Hameen (Associate AIA) from Carnegie Mellon University, Lynn Simon (FAIA) from Google, Marlon Blackwell (FAIA) from Marlon Blackwell Architects, Michelle Amt (AIA) from VMDO Architects, and Renee Cheng (FAIA) from the University of Washington.

TEN STANDARDS OF AIA COTE TOP TEN AWARDS PROGRAM

The AIA COTE (Committee on the Environment) Top Ten Awards are given each year to the ten most innovative green building projects that set the standards in design and sustainability. It is one of the industry's most prestigious awards programs that reward sustainability and sustainable design excellence. The committee evaluates the green building projects using ten standards/measures which it has developed over time.

1. **Integration** (to ensure a thoughtful process that delivers both beauty and function)
2. **Equitable communities** (to ensure the solutions positively impact future occupants and the larger community)
3. **Ecosystems** (to ensure the solution mutually benefits human and nonhuman inhabitants)
4. **Water** (to ensure proper improvement in the quality and conservation of water)
5. **Economy** (to ensure the design adds value for the owners, occupants, community, and the planet)
6. **Energy** (to ensure the design eliminates dependence on fossil fuels without compromising the project's function)
7. **Well-being** (to ensure the design supports health and well-being for all people)
8. **Resources** (to ensure the design counts on sustainable and informed material and resource selection)
9. **Change** (to ensure the solution addresses the future risk and vulnerabilities)
10. **Discovery** (to ensure the project has lessons to learn for future designers, users, and operators)

Now that we are well-acquainted with the frameworks and standards of the AIA COTE Top Ten Awards program, let's use them to evaluate the performance of the "Rainier Beach Clinic" project.

Evaluating green building project performance using AIA COTE Measures

1.Integration

Studies suggest that some 500,000 Americans suffer from chronic kidney disease and have to spend an average of 16 hours eerie week undergoing dialysis. The situation worsens when you know that dialysis clinics are painfully outpatient and feel chaotic, crowded, and institutional.

The project successfully addresses the dehumanizing experience and intends to revolutionize dialysis care with a patient-centric alternative. The project team underwent rigorous plan studies and conducted full-scale mock-ups in their quest to reinvent the clinic environment - positioning the patients with direct views to nature. Biophilic design strategies such as biodiverse, seasonal plantings lower stress.

Meanwhile, bird habitats within pollinator-friendly plantings encourage distraction therapy for pain management. The Rainier Beach Clinic achieved significant reductions in water usage, operational carbon, and embodied carbon as it strived towards restoring the local ecosystems. It successfully restored innovative care into the community.

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"Image Source: www.mahlum.com"

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THE CLINIC BRINGS QUALITY CARE DIRECTLY TO NEARLY 100 PATIENTS LIVING IN THE RAINIER BEACH COMMUNITY, A NEIGHBORHOOD DISPROPORTIONATELY AND NEGATIVELY AFFECTED BY SOCIAL HEALTH DETERMINANTS.

"Image Source: www.aia.org"

2.Equitable Communities

The project is a prime example of how health clinics can foster partnerships between health workers and a local community advocacy group. The new clinic intends to bring critical care to nearly 100 kidney dialysis patients living within one mile of the project site. This prevented the patients from commuting up to an hour each way to the closest kidney dialysis center in downtown Seattle.

Designed to be an amenity to the surrounding Rainier Beach community, the clinic has sent out informational flyers to residences within a one-mile radius, conducted informative programs and events at the local community center. It even held an open house after project completion.

Ensuring direct views to garden spaces with diverse, native plantings and pollinator habitats helps patients be a part of a calming and therapeutic treatment environment.

■ Mental restoration

Ensuring direct views to garden spaces with diverse, native plantings and pollinator habitats helps patients be a part of a calming and therapeutic treatment environment.

■ Physical activity

The project provides a staff shower, bike storage positioned directly adjacent to the Chief Sealth Trail, encouraging people to exercise and choose alternate modes of transportation.

Social connection

The Rainier Beach Clinic design prioritizes community and patient support and dedicates a guest seating area adjacent to the courtyard gardens across from each patient station.

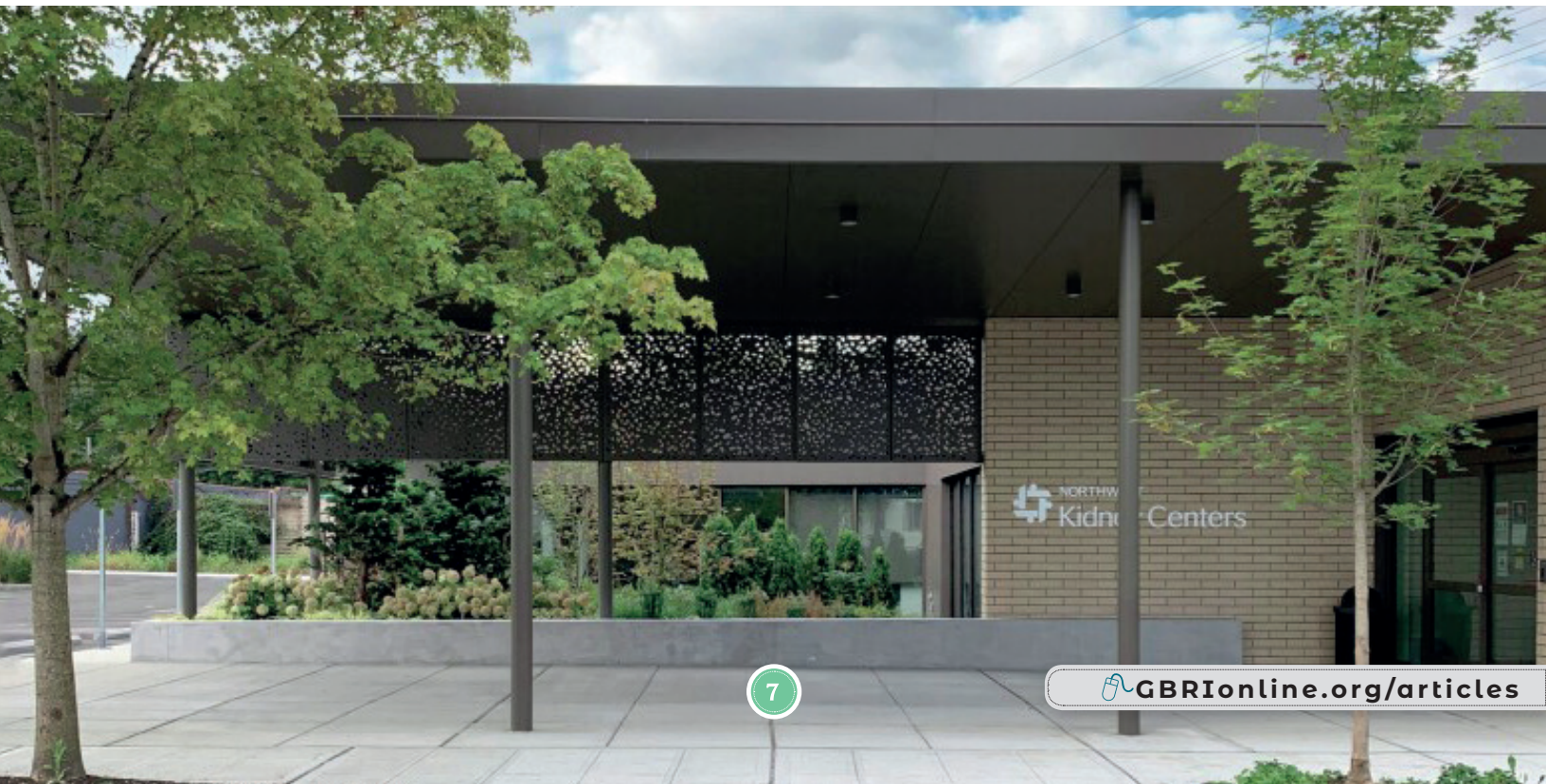
Cultural understanding

The Rainier Beach community has a diverse population which makes it important to address language as a major communication barrier. The project team ensured that the staff could communicate through an on-demand interpreter service technology in over eight languages.

MANDATORY METRIC	SCORE
Walk	77
Transit	78
Bike	63
Number of parking spaces	20
Number of parking spaces required by local zoning code	0
Bike storage	Yes

ENCOURAGED METRIC	SCORE
Percentage of building occupants who commute via alternative transportation	60
Number of showers per occupant	16
Community access to the project	Partial
On-site food production	No

"Image Source: www.mahlum.com"



3.Ecosystems

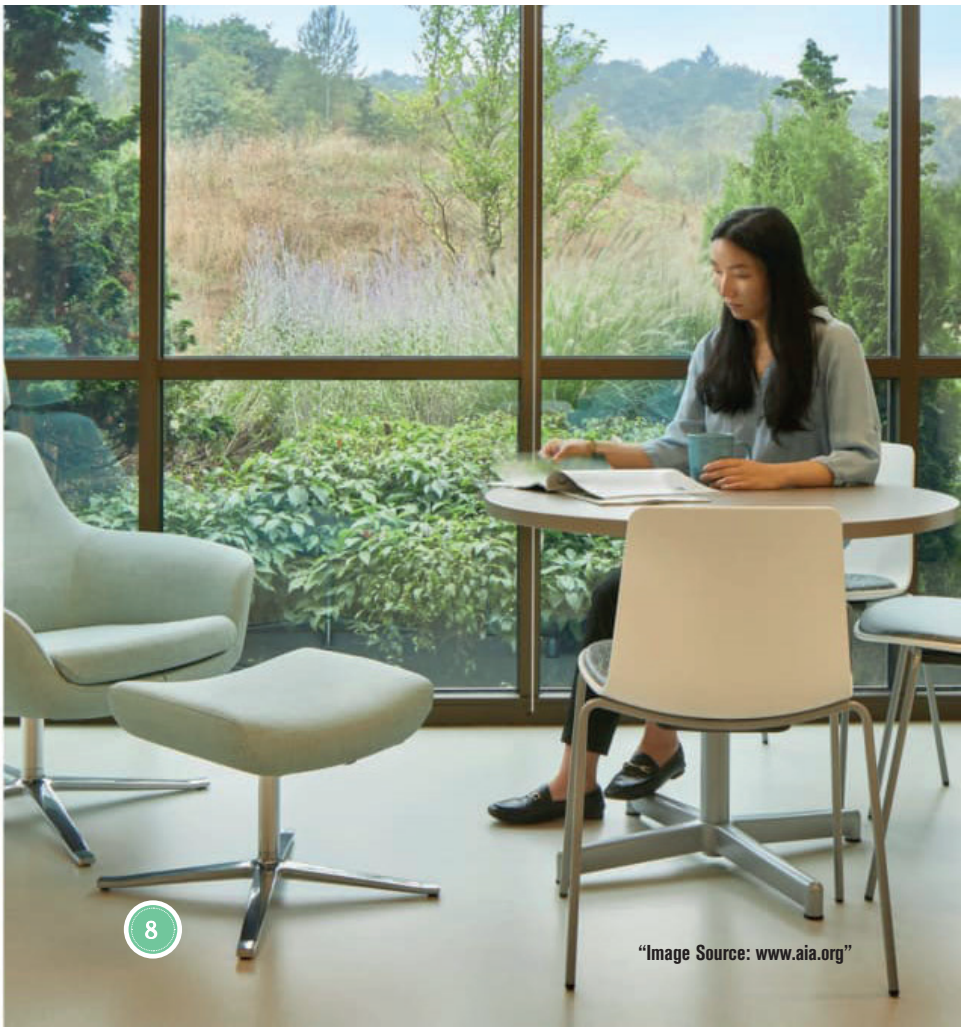
The Rainier Beach Clinic project brought rapid change and development to the community. It effectively transformed what was an urban site used as a storage yard for tires and industrial scrap into a restorative environment for building occupants, community members, and the ecosystem.

The biophilic design strategies helped the project team restore and protect native ecosystems without compromising the well-being of the building occupants and surrounding community. The prominent public-facing garden spaces and biodiverse vegetation provide a lush habitat for local pollinators and songbirds.

The project has a balanced mix of perennial and evergreen plantations that help manage the stormwater. The plantings not only ensure a dynamic, layered landscape but also help provide a sense of privacy and enclosure. The team used international design strategies like biodiversity, dark skiers, bird safety, habitat conservation, flora/fauna conservation, and more.

"Image Source: www.mahlum.com"

BIOPHILIC DESIGN STRATEGIES WERE USED TO INFORM THE DESIGN OF THE GARDEN SPACES, FEATURING SEASONAL VARIETY AND BIRD AND POLLINATOR HABITATS FOR DISTRACTION THERAPY.



"Image Source: www.aia.org"

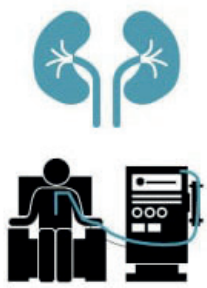
4.Water

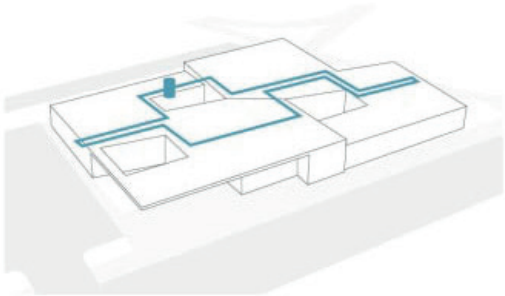
A dialysis care clinic requires a constant water supply since it is critical to fuel the clinic's reverse osmosis equipment. Water is pumped to each patient's dialysis machine, which helps clean the patient's kidneys during the treatment. Since the process equipment represents over 95 percent of the water usage in the facility, the team had to consider sustainable solutions for water usage reduction.

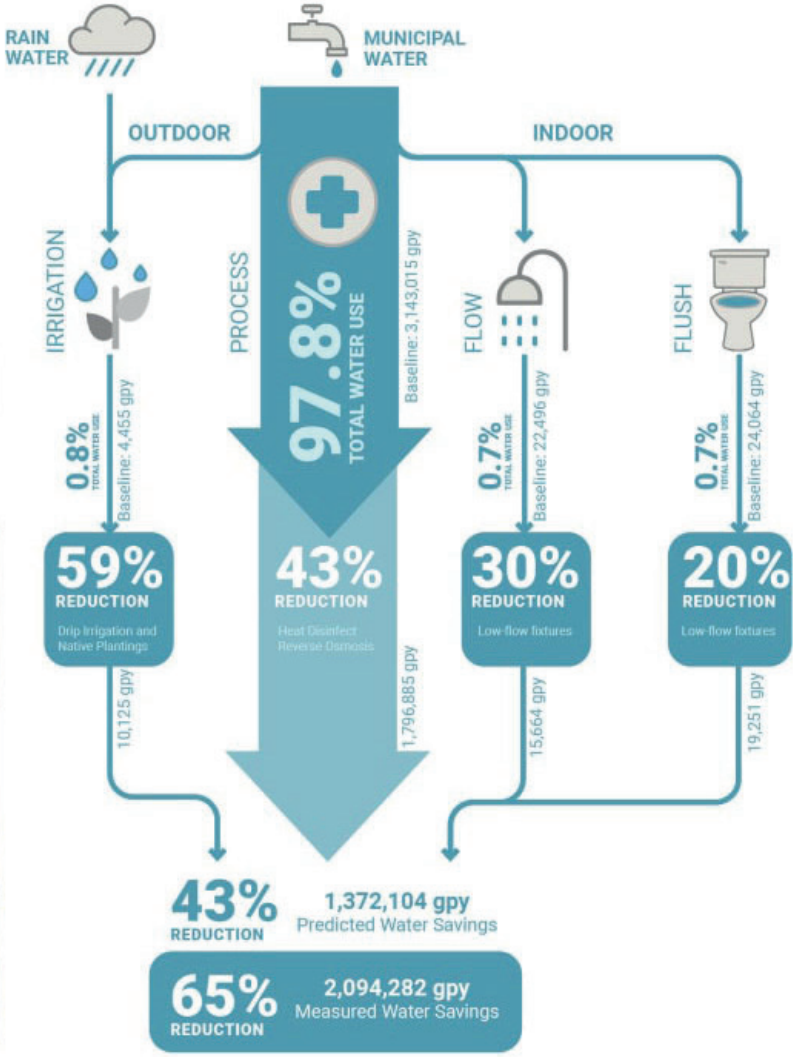
The team switched from a chemical sterilization system to a heat disinfection system that cleaned and recycled processed water. This step allowed the team to save nearly 1.4 million gallons of water per year.

Firstly, the team switched from a chemical sterilization system to a heat disinfection system that cleaned and recycled processed water. This step allowed the team to save nearly 1.4 million gallons of water per year. This 42.68 percent overall water usage reduction served other water conservation strategies as well.

Secondly, the stormwater management system has two non-infiltrating bio-retention ponds with a combined capacity to hold 159,057 gallons of water. The water is filtered here and fed to the municipal storm sewer. The team has installed low-flow fixtures, native and drought-resistant plantings with drip-irrigation systems, Variable Refrigerant Flow (VRF) mechanical systems, and more to ensure water conservation.







THE PROJECT'S REVERSE OSMOSIS SYSTEM PLAYS AN ESSENTIAL ROLE IN PATIENT TREATMENT AND ITS USE HAS SAVED OVER 2 MILLION GALLONS OF WATER PER YEAR THROUGH PROCESS WATER REUSE.

"Image Source: www.aia.org"

5.Economy

The project team doubled down on the selection of sustainable utilities, cleaning, flexibility, adaptability, resilience, occupant health, and overall well-being. The team started with full-scale casework mock-ups to coordinate with the users and ensure everything involved in the project was right-sized. This helped lower first costs and achieve optimal performance.

Rainier Beach Clinic has a heath disinfection reverse osmosis system which helps save over two million gallons of water per year. Furthermore, the project saved $16,800 annually in water utility costs on top of the $6,500 projected saving in annual energy costs.

Material selection based on the project's budget, material health, biophilic design goals ensured that the project established cleaning standards and protocols to minimize operational costs. Rainier Beach Clinic has abundant daylighting, custom perforated screens, dappled light, and more - incorporating the biophilic design strategies.

"Image Source: www.bizjournals.com"

Material selection based on the project's budget, material health, biophilic design goals ensured that the project established cleaning standards and protocols to minimize operational costs.

6.Energy

Rainier Beach Clinic needed to be energy efficient to gain LEED and other certifications. The team had to overcome challenges like lack of daylighting, glare, energy leakages, and lack of an energy-efficient VRF system. All this is important to patient comfort and safety.

The team ensured equitable distribution of daylight across the clinic for all patients by including the two interior courtyards. This helped the rest of the space in the building, like offices, conference rooms, staff lounge, and private home-training rooms benefit from the views and adequate daylight.

Glare and solar heat gain were put in check by prioritizing north and south glazing. The team perfected the placement of sunshades and custom-perforated vertical screening elements. The building envelope complies with the 2015 Seattle Energy Code with R-38 continuous insulation at the roof, R-18 equivalent at exterior walls (R-10 continuous), and R-10 at slab/subgrade.

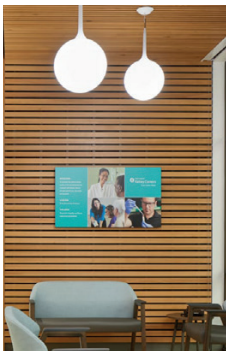
MANDATORY METRICS	SCORE
Predicted gross EUI	48 kBtu/sf/yr
Measured gross EUI	49 kBtu/sf/yr
Zero Tool-Percent energy reduction	35 percent
Measured LPD	0.39 W/sf
Percent LPD reduction from IECC 2006	68 percent
Percent window-wall ratio	29.5 percent
Operational emissions	104 mT CO_2/sf/yr

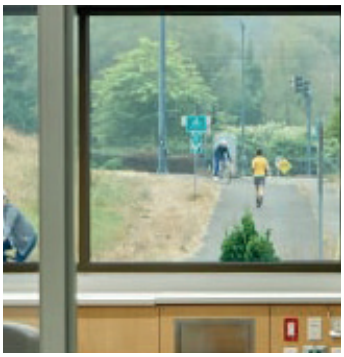
7.Well-being

The evidence-based design was a breakthrough for the project team as it helped the project contribute to the health and wellness of the building occupants. Coupled with biophilic design strategies, it created a restorative, calming facility that ensured high-quality patient treatment and staff satisfaction. The comparative occupant comfort survey shows that patients found the facility peaceful and one that reduces stress and tension.

Such feedbacks are a result of providing patients with equitable views into the native landscape, windows to view seasonally dynamic plantings, plentiful daylighting, and opportunities to observe the stochastic movement of birds and pollinators. Moreover, the warm material palettes help lower heart rates and give the clinic a welcoming feeling.

The indoor air quality was improved using a Dedicated Outside Air System (DOAS) for ventilation and MERV-14 air filtration. The rooms that store chemicals have sealed walls with self-closing doors. Additionally, they are negatively pressurized and continuously ventilated. The CO2 and Total Volatile Organic Compound (VOC) ratings were sufficiently below the 600 ppm CO2 and 300 ppb total VOC target ranges.





"Image Source: www.aia.org"

8.Resources

The project team has worked carefully to keep the project free of LBC Red List materials. To ensure continuous Life Cycle Assessments throughout the design, the team learned the cumulative effects of different material selections on embodied carbon, eutrophication potential, and other environmental impacts.

Rainier Beach Clinic collected environmental product declarations like product-specific LCA, industry-wide generic EPDs, product-specific Type III external EPDs, declare labels, C2C, and more. The construction waste was processed and sorted into designated containers.

The team separated and recycled 100 percent of all wood, metal, plastics, drywall, cardboard, and concrete materials. This helped the team achieve over 81 percent construction waste reduction. The project also achieved a more than 13 percent reduction in global warming potential above the original baseline assumptions.

"Image Source: www.aia.org"

THE LOBBY FEATURES WARM, NATURAL TEXTURES AND MATERIALS THAT WERE SELECTED WITH THE HEALTH OF BUILDING OCCUPANTS AND THE ENVIRONMENT IN MIND

9.Change

The Rainier Beach Clinic project was designed to allow flexibility in future use. It had to be developed to meet emergencies while providing continuous care for the patient. The building has an emergency kit on-site and a natural gas generator to overcome power outages. The generator can last for 48 hours.

The clinic is also designed with a demountable, panelized wall system at all 14 patient stations. The strategic location of the panelized wall systems gives room to four future stations and a third home training room. This will help the facility support 30 patients at a time.

The team addressed earthquakes, epidemics, social unrest, and utility disruption as the major local hazards. As a result, the building has also been designed to be operational during epidemics. It has air circulation systems, private dialysis rooms, and cleanable plastic separations between dialysis stations - obeying the COVID-19 protocols.

The building has an emergency kit on-site and a natural gas generator to overcome power outages. The generator can last for 48 hours.

"Image Source: www.architectmagazine.com"

THE USE OF PANELIZED WALL SYSTEMS, DEMOUNTABLE PARTITIONS AND ROUGH-INS FOR BUILDING SYSTEMS ALLOWS FOR THE EASE OF CLINICAL EXPANSION WITHOUT EXPANDING BUILDING AREA.

"Image Source: www.aia.org"

10.Discovery

The project was committed to achieving LEED Silver. Therefore, the integrated team of the Owner, Contractor, and Design Consultants established project goals to adopt the LEED framework and strategies. As a result, the project met sustainability goals and occupant well-being within the project budget.

The project underwent three rounds of full-scale, cardboard mock-ups while collaborating with end uses on design solutions. This allowed the team to evaluate clinic layouts, casework design, and headwall systems in real-time. The continuous monitoring of the building's performance helped the team learn important lessons.

The team learned that it could monitor building performance by the primary off-site facilities team through a common VRF controller. The orientation of patient stations has been changed to protect them from glare, improve acoustics, and reduce visual noise throughout the facility. The team conducted a preliminary post-occupancy evaluation (POE) upon project completion. The survey results were developed and translated into seven languages.

FINAL REMARKS

The Rainier Beach Clinic is a LEED Silver certified green building project that delivers top-class patient care, unlike other chaotic, crowded, and institutional health centers. It encourages community participation and distraction therapy for pain management by leveraging biophilic design and environmental psychology research. Recipient of the prestigious 2021 AIA COTE Top Ten Award, Rainier Beach Clinic perfectly balances refuge for patients with dynamic views and provides the facility with a warm, welcoming feel. To put it in simple words, the sustainability strategies woven throughout the clinic made the life of patients with chronic kidney disease much more manageable.

SOURCES:

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3. https://www.architectmagazine.com/project-gallery/rainier-beach-clinic_o
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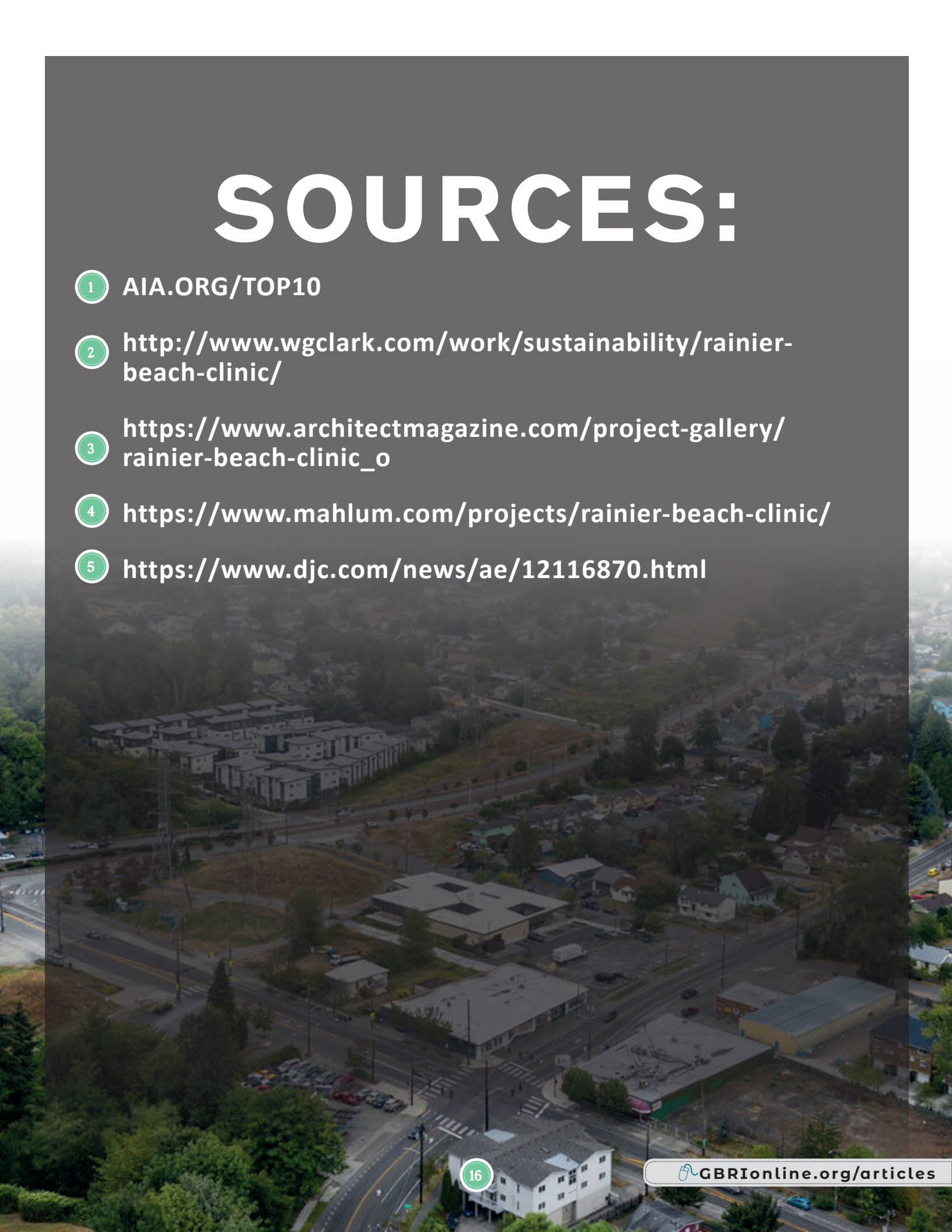

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