

2019 City of Alexandria Green Building Forum
**Alexandria Renew Enterprises
Environmental Center**



RUST | ORLING
ARCHITECTURE

VANDERWEIL



AlexRenew Environmental Center

Project Overview

88 LEED Platinum®
Points
for LEED-NC v2009

Sustainable Sites	23 / 26
Water Efficiency	9 / 10
Energy and Atmosphere	32 / 35
Materials and Resources	6 / 14
Indoor Environmental Quality	10 / 15
Innovation in Design	4 / 6
Regional Priority	4 / 4



The Environmental Center is the new main administrative facility for Alexandria Renew Enterprises (AlexRenew), one of the most advanced wastewater reclamation facilities in the United States. AlexRenew is now a showcase and resource for the community with its new sustainable administration building and 18 million gallon nutrient management facility topped with an athletic field for the City of Alexandria Parks and Recreation.

AlexRenew Environmental Center

Technology & Sustainable Design

- Solar panels shade southern façade
- Solar panels at three sides of the mechanical penthouse and on the roof
- 97% reduction in potable water consumption
- 46% reduction in energy cost
- Optimized daylighting design and controls
- Heat recovery chiller preheats domestic hot water



Solar Panels on Mechanical Penthouse



AlexRenew Environmental Center

Technology & Sustainable Design

- The design is projected to **reduce CO2 emissions by nearly 55 metric tons**, and **reduce energy cost by 46%**. This is enough energy savings to **power 35 typical Virginia homes**.
- Use of reclaimed water for toilets, cooling tower, irrigation, and architectural fountain result in over **97 percent potable water use reduction**.
- **138 kW solar panel array** on shading devices and penthouse facades.
- A **16 ton heat recovery chiller** makes use of rejected building heat for free pre-heating of the domestic hot water.



AlexRenew Environmental Center

Sustainable Design & Community

- A **Living Wall** in the lobby, watered by reclaimed water from the wastewater treatment plant, is tied to a ventilation system that **delivers oxygen to the public spaces** on the first two floors of the building.
- An **Educational Lobby** featuring a 6,000 gallon Aquarium containing Reclaimed Water from Alex Renew with Fish indigenous to the Potomac River



Educational Lobby

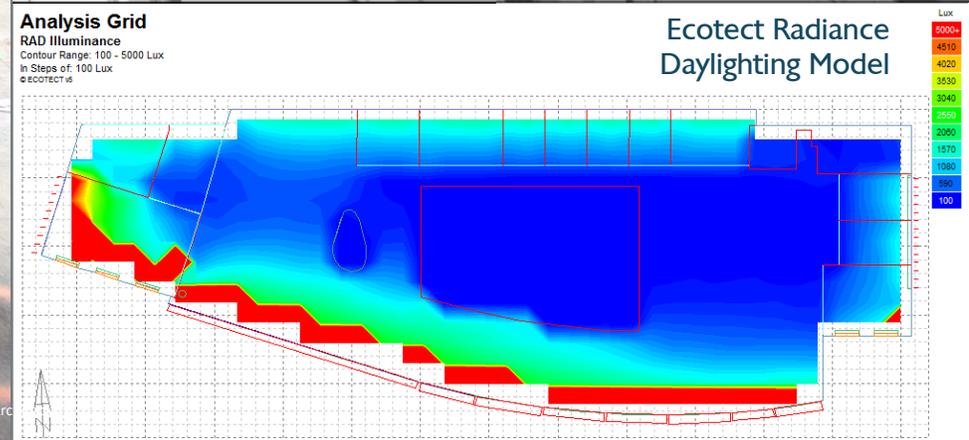
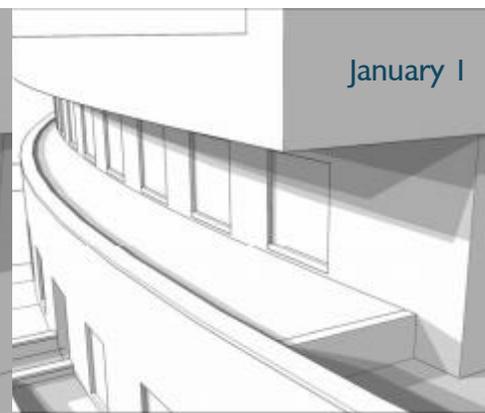
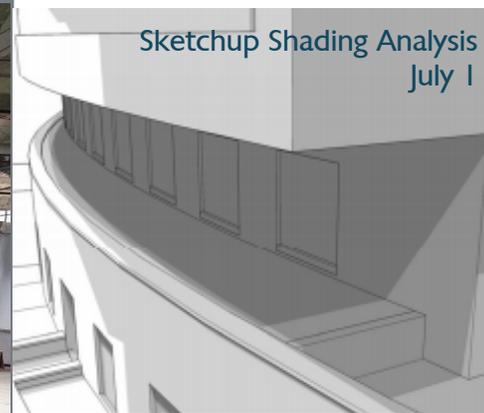
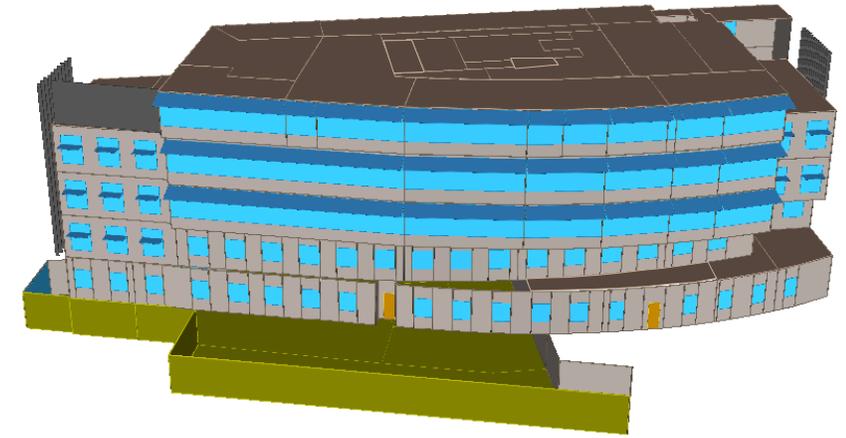


View toward the Living Wall

AlexRenew Environmental Center

Technology & Sustainable Design

Collaborative design process and analysis between architect and engineer informed the strategic design, orientation, and shading of glazing systems that optimize day lighting while reducing heating and cooling equipment capacities, cost, and energy consumption; and maximize insulation.



AlexRenew Environmental Center

Sustainable Design in Lighting

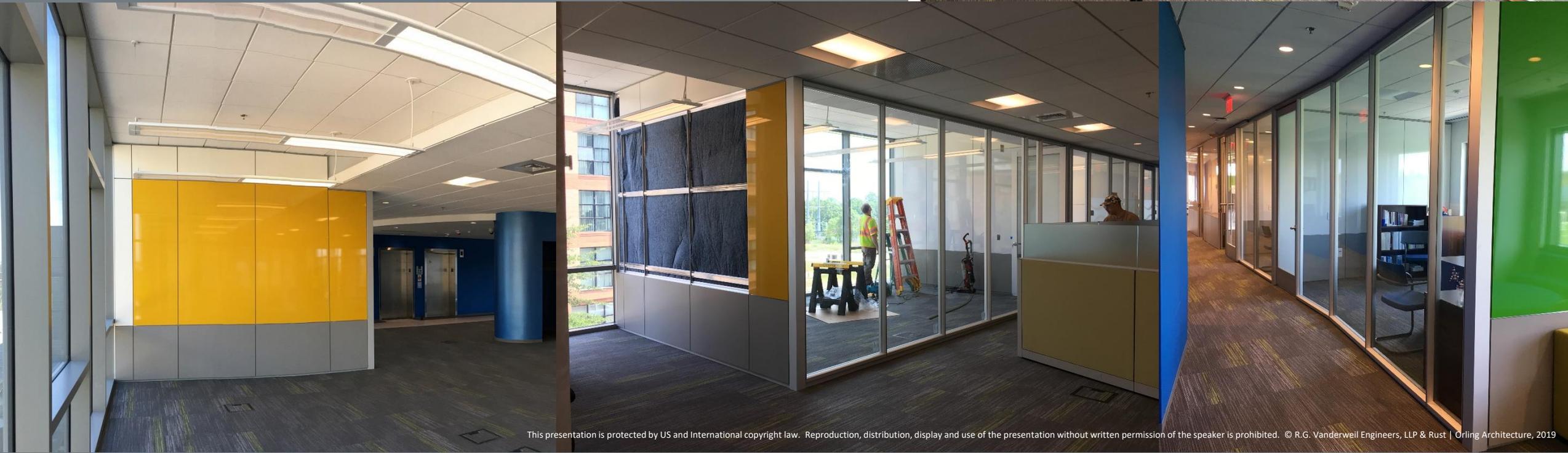
- Philosophy of **minimizing energy consumption** with the maximization of daylighting strategies and the **incorporation of energy-efficient light fixtures**
- Daylight modeling informed a **stepped ceiling design**, allowing **pendant lighting** and taller exterior glass facades for **greater daylight penetration** to the floor plate.
- **Daylight modeling informed the façade design**. Interior partitions are glass to allow natural light to penetrate the floor plate.
- **LED lighting** controlled with **daylight dimming control** and occupancy sensors reduced lighting power density to **30%**, and overall lighting power consumption by **49%** below ASHRAE 90.1-2007.



AlexRenew Environmental Center

Sustainable Design in Future Renovation

- Movable wall system that can be revised as the organization changes
- Movable walls are **floor-to-ceiling partitions** that can be **repositioned without creating construction dust or material waste**.
- **Light fixtures** are designed to **easily be relocated** along with office reconfiguration



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