

WAYLAND HALL

JAMES MADISON UNIVERSITY'S NEWLY RENOVATED RESIDENCE HALL

"We must undertake a journey to model the way, to cut a path, to make it easier for others to select the same course. This is about sharing everything we learn and know. After all, we are educators."

President Rose
James Madison University

WAYLAND HALL SUMMARY

Project	Wayland Hall, Residence Hall Renovation
Location	Harrisonburg, Virginia
Construction Completed	July 2011
Building Area	41,000 sf
# Beds	161 total (singles, doubles, & triples)
Construction Cost	\$11,560,000
LEED Certification	Platinum
A/E Team	VMDO Architects/LPA, Inc. Engineers

OVERVIEW

The renovation of Wayland Hall transforms the 41,000 square foot residence hall into an innovative new living-learning community dedicated to the visual and performing arts. With carefully-selected materials and design strategies attuned to conservation, the renovated Wayland Hall embodies James Madison University's stalwart commitment to environmental stewardship.

ENVIRONMENTAL MISSION STATEMENT

Environmental stewardship is one of a handful of characteristics that officially defines JMU's community: "The university will be an environmentally literate community whose members think critically and act, individually and collectively, as model stewards of the natural world."

According to the stated goals for campus stewardship of the natural world, this commitment means making "personal and professional choices" to:

1. minimize material impacts, emissions, toxins, solid waste, and consumption.
2. conserve, steward, and restore natural systems.
3. advance environmental stewardship through research, education, and community programs.

Wayland Hall's embodiment of the above characteristics has been widely celebrated internally and shared with the greater community. The renovation has served as a model for sustainable building and as a framework for rethinking how human actions affect the environment. Sharing the Wayland Hall story is one element of a large, strategic effort to engage James Madison University citizens in environmental stewardship.

Internally, the commitment to environmental stewardship:

- is being rigorously pursued through the policies and literacy learning objectives adopted by the university.
- has been a key subject of three annual presidential addresses.
- is coordinated across the divisions of the university by the Institute for Stewardship of the Natural World, which reports directly to the Office of the President.

Externally, environmental stewardship has been communicated through conference presentations, prominent features in external publications, and external recognition.

VMDO ARCHITECTS

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SUSTAINABLE DESIGN

The renovation strategy at James Madison University's Wayland Residence Hall pursues the highest levels of sustainable design. The renovation ties innovative design strategies such as ground source heat exchange and rainwater harvesting to the university's standard building systems.

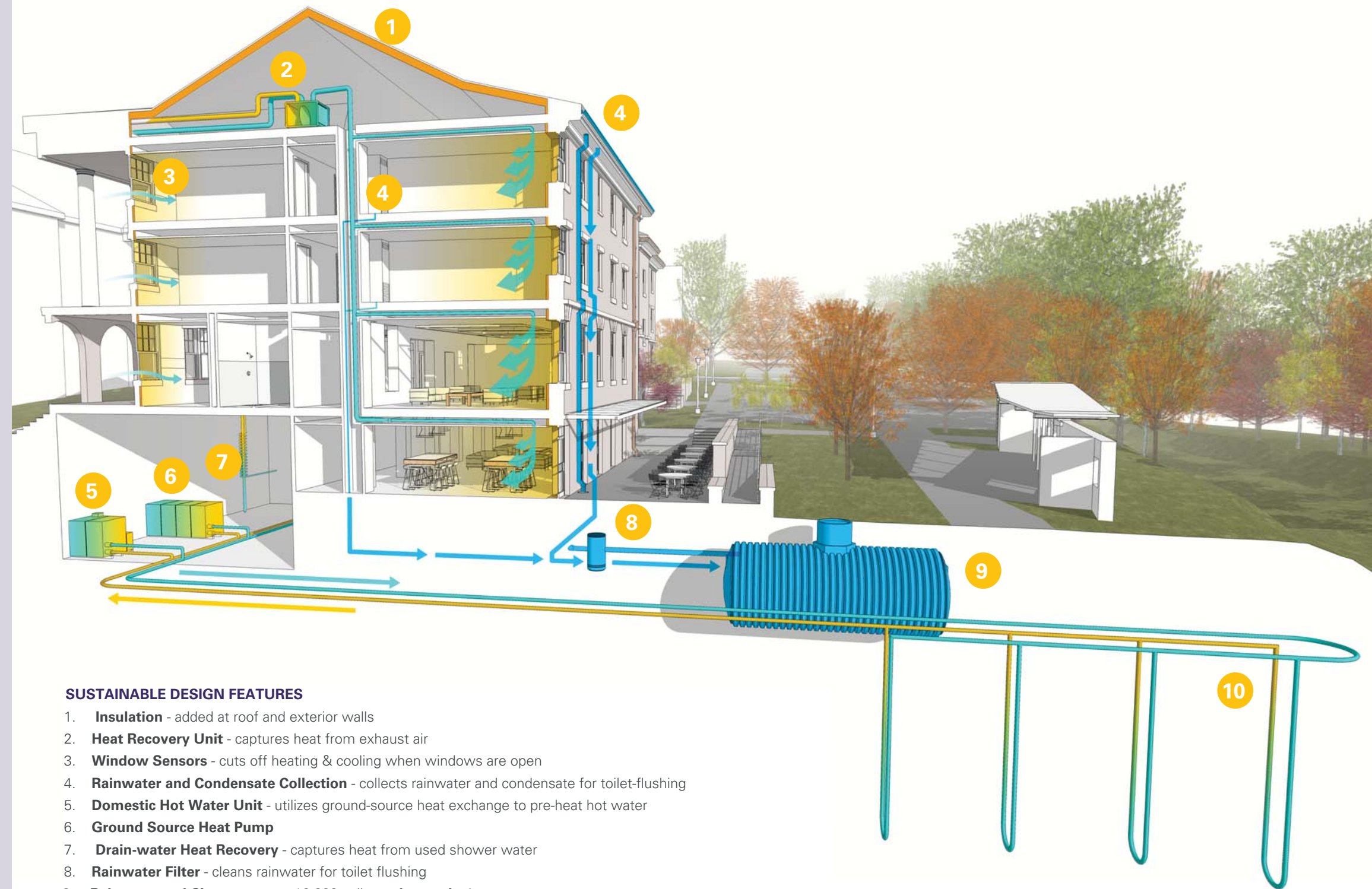
Energy Conservation efforts are projected to save the University over 4.2 million kBtUs annually, enough energy to provide electricity to 105 homes for one year. It also represents a reduction in the equivalent carbon dioxide released to the atmosphere by approximately 839 metric tons (according to the EPA's Greenhouse Gas Equivalencies Calculator). Strategies for achieving these savings include:

- Reduced lighting power densities
- Reduced domestic hot water use
- Ground source heat exchange for heating and cooling
- Ground source system tied to domestic hot water
- Variable speed pumping for the geo-thermal system
- Ventilation air energy recovery
- R-16 spray applied insulation on the roof deck
- 1 1/2" - 2" inches average insulation on the exterior wall
- Low-E glazing
- Shower drain heat recovery
- Demand control ventilation in public spaces

Water Conservation efforts are designed to minimize reliance on treated, potable water for non-drinking uses. Conservation strategies are expected to save .5 million gallons annually - almost enough water to fill an Olympic-sized swimming pool. Savings are achieved through:

- 10,000 Gallon cistern used for toilet-flushing fed by rainwater and condensate recovery, expected to collect 300,000 gallons of water each year
- 1.5 gpm shower heads, dual-flush toilets, and pint-flush urinals
- Low-flow lavatories and sinks
- Irrigation-free plantings

Material Conservation strategies are showcased through the finishes selected for student bedrooms. The wall paneling provides a warmth to the room and displays the textured surface of wheatboard (a material that can be re-generated quickly through natural processes) and the smooth finish of wood paneling (created from the bedroom doors used in Wayland Hall prior to the renovation). These efforts contribute to material conservation strategies throughout the building - 21% of the renovation materials from recycled sources, 6% are from rapidly renewable sources, 53% of the wood is certified by the Forest Stewardship Council. In the renovation process, 1,306 tons of waste (96% of total construction waste) was diverted from landfill for recycling.



SUSTAINABLE DESIGN FEATURES

1. **Insulation** - added at roof and exterior walls
2. **Heat Recovery Unit** - captures heat from exhaust air
3. **Window Sensors** - cuts off heating & cooling when windows are open
4. **Rainwater and Condensate Collection** - collects rainwater and condensate for toilet-flushing
5. **Domestic Hot Water Unit** - utilizes ground-source heat exchange to pre-heat hot water
6. **Ground Source Heat Pump**
7. **Drain-water Heat Recovery** - captures heat from used shower water
8. **Rainwater Filter** - cleans rainwater for toilet flushing
9. **Below-ground Cistern** - stores 10,000 gallons of water for later use
10. **Ground-source Wellfield** - uses the earth to store and release heat for the heating & cooling system

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SUSTAINABLE SITE DESIGN

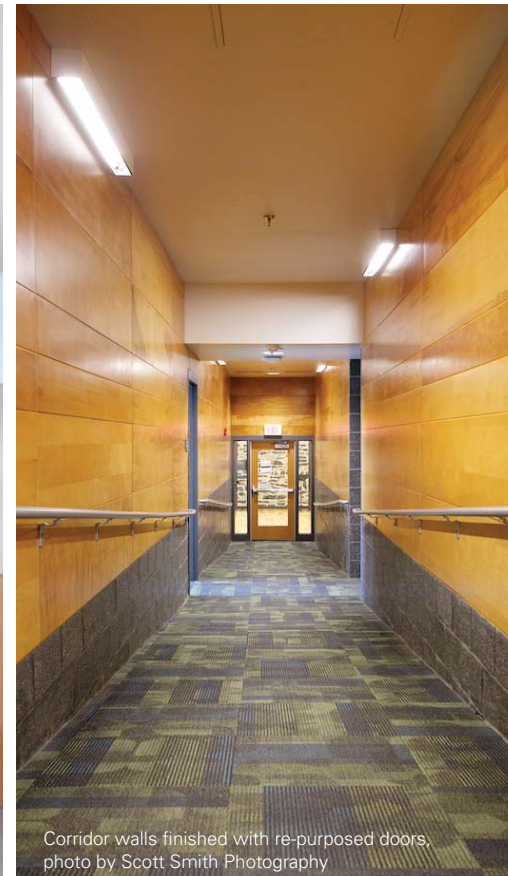
Whereas many renovations are limited to a building's interior, the Wayland Hall project addressed site design as a major component. A series of terraces, pathways, and native plantings replace 23 parking spaces to the building's immediate south. These new features establish a connection between key interior spaces and the outdoors, creating attractive places for students to relax and interact outdoors.

In addition to creating appealing spaces for students, the site includes the following:

- **Minimizing Stormwater Quantity** - By collecting stormwater from the roof and eliminating a 7,800 sf parking lot, the amount of stormwater entering storm sewers is reduced by 30.7%. This diverts 5200 gallons of water (enough to fill 132 bathtubs) from the storm sewers in a 2-year 24 hour storm event.
- **Maximizing the Quality of Stormwater** - A new biofiltration basin to the building's immediate west treats stormwater on site, removing 80% of the total suspended solids (TSS) and improving the quality of water returned to the local watershed.
- **Encouraging Alternative Transportation** - with covered bike racks for 30 bicycles, minimizing the number of vehicles in the campus center
- **Preserving an open space** - for the campus that is double the size of the building's footprint.
- **Providing native and adaptive native plantings** - that provide wildlife habitat and do not require irrigation.



Student bedroom, photo by Scott Smith Photography



Corridor walls finished with re-purposed doors, photo by Scott Smith Photography

INDOOR ENVIRONMENTAL QUALITY

Students spend far more time in their residence halls than any other building on campus. Therefore, efforts to provide a healthy, comfortable indoor environment are especially important here and include:

- Thermostats to provide temperature control to individual bedrooms
- Low-emitting materials that minimize exposure to Volatile Organic Compounds and eliminate urea-formaldehyde
- Green housekeeping practices
- "Smart" building controls that turn off the heat & air conditioning when the windows are open, providing access to fresh air year-round
- Stringent construction management plan to protect HVAC equipment, provide pollutant source control, and provide high housekeeping standards
- Verified indoor quality prior to occupancy with extensive testing throughout the building of formaldehyde, VOCs, particulates, carbon monoxide, and temperature



EXISTING SITE



The landscape behind Wayland Hall is designed to treat stormwater on site, foster native plantings, and create comfortable spaces for students to interact outdoors, photo by Scott Smith Photography



INNOVATION

Bedroom doors from the 1960s-era building were salvaged, trimmed down, and displayed as a wood paneling throughout the building. The wood paneling provides over 1900 square feet of finish material in the corridors, bedrooms and selected public spaces. Meanwhile, the rich textured surface serves as a palpable reminder of the building's history. Similarly, exposing the load-bearing bluestone walls in the new performance room celebrates the building's history and continued use.



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POLICIES & PROCESSES

As part of its commitment to environmental stewardship, James Madison has adopted ambitious policies for environmentally responsible procurement. These policies guide purchasing as it relates to Energy, Water, Toxins & Pollutants, Vehicles, Biobased Products, Forest Conservation, Recycling, Packaging, Green Building, and Landscaping. James Madison's Policy 1701, Sustainable Procurement, encourage purchasing and policies that will continue to conserve resources and maintain a healthy environment:

Energy

- All electrical products will meet the U.S. EPA Energy Star certification.
- Preference will be given to suppliers of equipment who take back equipment for reuse or environmentally safe recycling.
- Energy efficiency will be a primary characteristic of replacement fixtures and components.

Water

- The most water efficient appliances available must be purchased. When possible, those with the EPA WaterSense label will be selected.

Toxins and Pollutants

- Cleaning solvents should be biodegradable, phosphate free and citrus-based when their use will not compromise quality of service. All surfactants and detergents used will be readily biodegradable and will not contain phosphates.
- Industrial and institutional cleaning products that meet Green Seal certification standards (or environmental preferability and performance) will be used.
- Vacuum cleaners used in the building will meet the requirements of the Carpet and Rug Institute's "Green Label Testing Program-Vacuum Cleaner Criteria."
- Whenever possible, products and equipment should not contain lead or mercury.
- Pest control will be managed primarily through prevention—physical and mechanical—and through the purchase of environmentally friendly products.
- When maintaining buildings, products such as paint, carpeting, adhesives, furniture and casework with the lowest amount of volatile organic compounds (VOCs), highest recycled content, and low or no formaldehyde will be used when practicable.

Biobased Products

- Bags, film, food and beverage containers, and cutlery will be biodegradable and compostable biobased plastic.
- Paper, paper products and construction products made from nonwood, plant-based contents such as agricultural crops and residues will be used whenever feasible.

Forest Conservation

- Used or salvaged wood and wood products should be purchased whenever feasible.
- Paper, paper products and construction products made from non-wood, plant based contents such as agricultural crops and residues should be purchased whenever feasible. Chlorine free paper and Forest Stewardship Council certified paper products are preferred.



New terraced landscape replaces a parking lot behind Wayland Hall, photo by Scott Smith Photography

Recycling

- Thirty percent post-consumer waste recycled paper for all applications will be the standard when quality of service is not compromised nor the health and safety of employees jeopardized.
- Products that are durable, long lasting, reusable, or refillable are preferred whenever feasible.
- Remanufactured toner cartridges should be used in all copiers and printers whenever feasible.

Packaging

- Packaging that is reusable, recyclable or compostable is preferred, when suitable uses and programs exist, as is eliminating packaging or using the minimum amount necessary for product protection to the greatest extent practicable.

Landscape Maintenance

- Landscape maintenance programs will employ sustainable landscape management including integrated pest management, drip irrigation, composting, and use of regionally generated materials.

Furniture

- Furniture selection is not specifically named in Policy 1701. However, furniture selection honored the general procurement policy and was selected for low-emitting materials, certified wood, and durability.

COMMUNITY INVOLVEMENT & ENVIRONMENTAL AWARENESS

James Madison University is in the process of utilizing the Wayland Hall project as a tool for education and outreach. Consistent with the educational mission of the university, Wayland Hall is planned to be an important tool for learning. Professors are working with Facilities Engineering to utilize the building as a case study for student capstone projects. The university has also included the larger community.

Since the building opened in the fall of 2011, well over hundreds of visitors have toured the building, learning about the sustainable design features, and how existing buildings can be modified to become more efficient and environmentally responsible.

Highlights of specific efforts for education and outreach include:

- **Engineering Faculty** are exploring using data retrieved from Wayland Hall's Building Automation System to analyze building performance. Specific student / faculty projects using this data in engineering and the applied sciences are being considered;
- **Data & Presentations** on the building's energy and water use have begun being incorporated into General Education courses. Architects and engineers have presented for multiple courses;
- **Information** regarding the building's performance is planned for distribution online;
- **Multiple Courses** for students in the College of Visual and Performing Arts classes are taught in the building;
- **Annual Lectures and Tours** of Wayland Hall have been offered to students as credit towards for James Madison University's General Education Wellness Passport program;
- **Signage Package & Educational Art** is planned to explain sustainable design features and raise awareness among students, faculty, and community members;
- **Public Tours** of Wayland Hall are offered to the community twice every month.