Washington University in St. Louis
School of Medicine

Neuroscience Research Building

Sustainability Report

November 2020

Project Number: 181478

Construction Manager: McCarthy

Architect: CannonDesign/Perkins &

Will

Washington University in St. Louis
School of Medicine

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SECTION 1 – SUSTAINABILITY

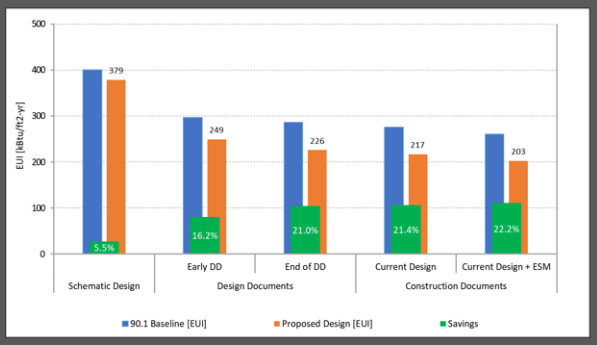
The project is pursuing two third party certifications of its sustainability. USGBC LEED is the primary program. It addresses sustainability for the NRB and, secondarily, for elements of the adjacent garage.

The project is registered with USGBC as a LEED V 4.0 BD+C (Building Design and Construction) project. Certification levels are Certified (40-49 points), Silver (50-59 points), Gold (60-79 points), and Platinum (80+points). The School of Medicine hopes to secure points in addition to those that are currently understood to be certain, perhaps realizing LEED Gold, which exceeds the university's expectation for new construction.

Project Sustainability Key Performance Indicators

University goals for new construction projects
- LEED Silver (minimum)
- 30% more efficient than ASHRAE 90.1-2010 energy efficiency standard

Project sustainability stakeholder sessions to date
- Prior to Schematic Design
- During Design Development
- During Construction Documentation



Neuroscience Research Building LEED 4.0 Performance Criteria	Anticipated Points
Integrative Process	1
Location and Transportation	14
Sustainable Sites	3
Water Efficiency	5
Energy and Atmosphere	12
Materials and Resources	6
Indoor Environment Quality	8
Innovation	6
Regional Priority	3
TOTAL (LEED Silver)	**58**

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Section 1 - Sustainability

The School of Medicine is pursuing Parksmart Certification for the new parking garage that is being constructed adjacent to the Neuroscience Research Building. This program's point system is comprehensive in providing points for sustainability in garage design and operations. The School of Medicine hopes to secure points in addition to those that are currently understood to be certain, perhaps realizing an additional 35 points to earn Parksmart Silver, the project's stretch goal.

The Project's Current Point Status

Component Category	Points Available	Able to Achieve	Potential Points
Management	90	52	18
Programs	64	34	12
Technology and Structure	88	33	23
Innovation	6	0	1
Total Points	**248**	**119**	**54**

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Section 2 - Appendix 1 Sustainability Briefing Document

Neuroscience Research Building Sustainability Briefing Document November 2020

This narrative memorializes Neuroscience Research Building (NRB) design progress on sustainability elements made in the fall of 2020 and constitutes an update to the WUSM presentation of July 2020. It summarizes a November 16, 2020 meeting of the project's sustainability stakeholders[1], the third in the series of such sessions.

1. **Building energy performance.** The NRB design is in the Construction Document phase, scheduled to be completed before February 1, 2021. The design's energy model calibrates an energy use intensity of 203 kBtu/sf/yr. A benchmark study of labs constructed for biotechnology or pharmaceutical industries and higher education clients during 2010-2020 and similar climate shows the NRB energy use intensity in the most efficient third of surveyed buildings.[2] On the WUSM campus, the NRB's program is most similar to the Specialized Interim Research Facility - East, the Specialized Interim Research Building, the Clinical Science Research Building-NTA, and East McDonnell. The modeled energy use intensity of the NRB is better than the actual performance of each of these.

This meeting continued dialogue about if the NRB design could achieve better energy performance. It is currently modeled at 22% better than ASHRAE 90.1 2010, whereas the institution's goal is to realize a 30% reduction. The design team reported that while it continues to look for opportunities, it does not expect the NRB energy savings to advance a measurable proportion. By way of explaining the constraints, they presented their study of energy drivers for different programs. It showed that animal research has the highest energy use intensity of all program types. This is driven by the need for tightly controlled temperature, stringent humidity requirements, and 100% outside air, safety safety-driven ventilation rates, - odor control, building use schedule, and high occupant load. Animal research has the most limitations on the energy-saving design features that it can accept. The animal research function is typically incompatible with total energy recovery, decoupled ventilation and thermal loads, supply air temperature reset, demand-controlled ventilation in lab space, pinch-off CAC boxes, occupancy-based temperature setbacks, occupancy-based HVAC control, and nighttime temperature setback.

The project complies with and exceeds the city's code standards.

2. **Materials selection.** The design team introduced that their approach to materials selection starts with adhering to the observation that a simple design is the one that best lends itself to sustainability. They then summarized the large volume materials selections that rank well on durability issues, safety (appropriate to the animal research setting), promoting health in the indoor environment, and reducing impacts - to health and the environment – during manufacturing. The large volume purchases of environmentally superior products will include approximately 80,000 sf of carpet tile, 100,000 sf of flooring, 180,000 sf of acoustical ceiling tile, and zero-VOC paint in 80% of the building and low VOC paint in the remainder. The design team is still researching the options – cost, performance, and availability – for procuring two more large-volume materials: metal studs and gypsum board. Wood is used in the building for paneling, doors, casework, and lab casework. The design team will soon recommend environmentally superior product choices for these.

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[1] James Kolker (not in attendance at the November 16 meeting), Mary Ann Lazarus, Railesha Tiwari and Phil Valko.

[2] The source is the Labs 21 dataset and includes labs with proportion of lab area in the building ranging from about 10% to 100% and energy use intensity from under 100 to about 900 kBtu/sf/yr.

3. **USGBC LEED status.** The project LEED checklist has a credit score of 58. This ranks it as LEED Silver, the university's standard, but only two points shy of LEED Gold. The design team believes that there are 14 elements of the checklist that might be able to be converted from a maybe status to a certain point. Experience shows that the third-party review that is part of the LEED certification process typically strips a proponent of points, so the design team is endeavoring to enable up to 7 points from the maybe to the yes status. Of note, the checklist allows for 6 points for innovation, and this project intends to earn each of those.

4. **Incorporating climate change into WUSM campus designs.** This topic continues a dialogue of WUSM, the NRB design team, and the project's sustainability stakeholders. WUSM's perspective is that it is important to know if it should modify its campus plans and/or building designs to mitigate the impact of predicted climate change (gradual shifts in temperatures and precipitation and changed patterns of intensity and regularity of major weather events) and that the question is timely given the growth planned for the WUSM over the next decade. Still to be explored is the question of if WUSM embarks on this as a campus or if this is a whole-university exploration. WUSM's concept is that it will execute a climate analysis and campus vulnerability analysis. These documents will inform campus design standards and campus plans. Climate change will be incorporated into campus plans for revitalization, development, and expansion. Thresholds will be established for the scale of new construction and renovation that will address climate change. WUSM is contemplating using the planned renovation of the McMillan Building as a pilot project for incorporating climate change into the project design.

5. **Meeting with Green Building Certification, Inc. officials.** WUSTL/WUSM met with the Green Building Certification, Inc. (GBCI) officials more than a year ago. The university's exemplary performance in designing LEED buildings has earned great respect with the GBCI and generally. Because of this, the GBCI has a potential interest in a trusted partner relationship in which the university can provide GBCI with its insights about the USGBC programs, and the GBCI might offer the university some special consideration in the review of future LEED submissions. WUSM is proposing that a second meeting be organized to discuss market limitations in St. Louis that impact the universities ability to perform according to LEED credits. Specifically, the limited demand in St. Louis for electric vehicles and the introduction of cars with batteries that provide longer driving distances between charges make the LEED standard for installing electric vehicle charging stations impractical. In addition, the region has one construction and demolition debris recycling company, and its waste separation practices don't comport with those specified by the USGBC. For the NRB, WUSM wishes to share its approach to defining the project boundary for the LEED submission and its energy modeling. It also wants to share the limitations of energy optimization that are inherent to animal research facilities.

Washington University School of Medicine
4370 Duncan Research Facility
Senior Project Leadership at Construction Documents Development
Updated November 2020

Representative	Title	Company
Design Team		
James Walsh	Project Principal	Cannon Design
Mike Ness	Project Manager	Cannon Design
David Polzin	Design Principal	Cannon Design
Brian Hicks	Project Manager	Cannon Design
Trevor Calarco	Senior Vice President	Cannon Design
Joshua Medina	Lab Planner	Perkins + Will
Bryan Schabel	Design Principal	Perkins + Will
Bridget Lesniak	Management Principal	Perkins + Will
Ralph Bicknese	Principal	Hellmuth & Bicknese Architect
Willa Kuh	Director of Planning	Affiliated Engineers Inc
Construction Team		
Andrew Poirot	Project Executive	McCarthy
Mike Bax	Cost Estimator - Preconstruction Director	McCarthy
Fred Bakarich	Senior Project Manager	McCarthy
Mike Null	Senior Superintendent	McCarthy
Matt Sauer	Senior Project Manager	McCarthy
WUSM Project Team		
Melissa Hopkins	Project Executive - Asst VC/Asst Dean - Facilities	WUSM
Steven Sobo	Executive Project Manager - Senior Technical Director	WUSM
David Lott	Lab and Lab Support Design - Senior Project Manager	WUSM
Mitch Snyder	Construction Manager - Senior Project Manager	WUSM
Mariah Harris	Director of Space Planning - Utilization & 5-year space planning	WUSM
Hannah Jefferies	Senior Planner - Activation and Logistics	WUSM
Patrick Brinker	Senior Project Manager - Central Vivarium, Vertical Vivarium, NHP, DCM, MEP Systems	WUSM
Erika Wade	Equipment Planning - Senior Planner	WUSM
Alicia Hubert	Equipment Planning - Sustainability Coordinator	WUSM
Michelle Lewis	Project Communications & Support - Planner II	WUSM
Stephanie Simonic	Project Communications & Support - Program Coordinator	WUSM