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A Beginner's Handbook to

LEED v5 Building Operations and Maintenance Guidelines

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In the 2019 Beginner's Handbook to LEED Building Design & Construction Guidelines, I wrote: Sustainability isn't its own thing. It's not a list of special tasks from a unit price book. It's not simply using recycled raw materials. It's not even using a particular construction technique or a specific contractor. Sustainability boils down to how you design a project. And LEED specifications provide an excellent blueprint for sustainable building design and construction.

Little did I know that I would soon be leading off a 2024 Beginner's Handbook to LEED v5 with "LEED specifications provide an excellent blueprint for sustainable Operations and Maintenance." What changed, you may wonder? What circumstances led to this moment? How did we get from sustainable design and construction to sustainable operations?

At the Greenbuild conference in September 2023, the U.S. Green Building Council released a draft of LEED for Operations and Maintenance (O+M) Guidelines, also known as LEED v5. Most of 2024 was used as the Beta period for real-world testing and public comment to allow stakeholders to weigh in and influence the final version of the guidelines. It is anticipated that early 2025 will bring the official opening of LEED v5 for project registration.

In the pages that follow, we will project what construction managers, facilities directors, procurement professionals and organizational leaders can expect from LEED O+M.

Rather than recap all the prerequisites and sustainability credit criteria line-by-line, we'll review the highlights from each and point out where they might prove valuable. Our goal is to bring the main objective of each criterion to the forefront – adding practical recommendations where applicable – so you can more easily apply LEED sustainability principles to your projects.

Go forth and be sustainable.

John Timmerman, Product Marketing Manager (and Sustainability Nut) at Gordian

Overview

LEED v5 Building Operations + Maintenance Guidelines are expected to be published by the U.S. Green Building Council in early 2025. The Beta and public feedback window recently closed, leaving some clues as to what will appear in its final draft. Based on the Beta Version of the LEED v5 Rating System, here's what we are expecting the highlights to be.

LEED v5 is poised to be a transformative update that will significantly impact how buildings and spaces are designed, built and operated, with a strong emphasis on climate resilience, carbon reduction, social impact, quality of life and ecological stewardship.

Impact Areas:

- **Decarbonization**: LEED v5 is set to emphasize reducing carbon emissions across various aspects of the building lifecycle, including operational energy use, embodied carbon from construction materials, refrigerants and transportation emissions. This aligns with global efforts to combat climate change.
- **Quality of Life**: The focus on health, well-being, resilience and equity suggests that LEED v5 will prioritize not just environmental sustainability but also the social aspects of sustainability. This includes creating spaces that are beneficial for both people and the environment.
- **Ecological Conservation and Restoration**: The new version will likely reward strategies that limit environmental degradation and contribute to ecosystem restoration. This suggests a holistic approach to sustainability, where the built environment and natural ecosystems are considered interdependent.

Strategic Evolution:

- LEED O+M aims to create a comprehensive framework for a near-zero carbon reality that is both equitable and resilient.
- The new version will offer greater flexibility for projects, likely through a more dynamic and responsive set of requirements that can adapt to rapid market changes.
- The adoption of a five-year development cycle for LEED is intended to provide predictability and allow for more substantial updates that reflect technological and methodological advancements.
- LEED O+M seeks to ensure continuity across the building lifecycle, suggesting a seamless integration of design, construction, operations and maintenance with aligned performance indicators.

Location and Transportation

You're going to need a policy, a plan and a performance measurement system to encourage and track the adoption of more sustainable transportation options.

The Location and Transportation prerequisites in the LEED v4.1 BD&C guideline were initially focused on protecting sensitive land like prime farmland, floodplains, watersheds and habitats for endangered wildlife or plant life, from being leveled for highways and parking lots. The stated intent of this criterion was "to avoid development on inappropriate sites, reduce vehicle distance traveled, enhance livability and improve human health by encouraging daily physical activity." It made perfect sense to focus on location for new construction with transportation being a somewhat secondary pursuit.

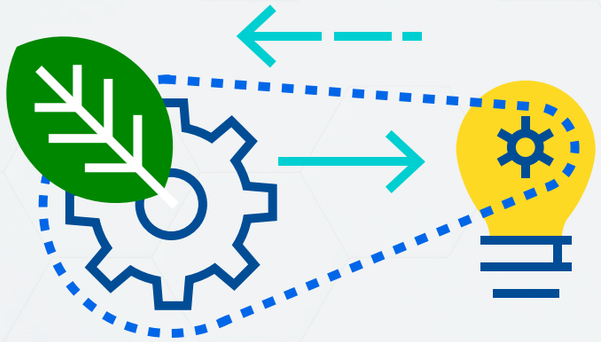
However, v5 is centered on Operations and Maintenance. To a large degree, location has already been determined. Thus, the stated intent of the Location and Transportation provision is to "promote transportation options that support human-centered mobility and reduce the negative **impacts of single-occupant vehicles on greenhouse gas emissions**, public health and safety, traffic congestion and land development."

LEED certification requires that a Sustainable Transportation Policy be implemented for managing how people travel to and from the project. Additionally, this policy should promote active, shared and electric transportation as attractive options for occupants, residents and visitors.

Certification credits are available for showing Sustainable Transportation Performance metrics for your project by conducting transportation surveys and calculating the total percentage of occupants who travel to the project by an active, shared or sustainable mode of transportation. Further motivation is provided for developing a comprehensive plan to encourage the adoption of sustainable transportation options, such as installing EV charging stations or encouraging the use of high-occupancy vehicles.

Sustainable Sites

Establish a Site Management Policy with specific provisions for Rainwater Management, Heat Island Reduction and Light Pollution Reduction.



While LEED v4.1 prescribed an Environmental Site Assessment to address possible environmental contamination as part of the construction process, LEED v5 shifts the focus to having a Site Management Policy to "preserve ecological integrity and encourage environmentally sensitive site management practices that provide a clean, well-maintained and safe building exterior while supporting high-performance building operations."

Many tenets of this provision point towards more effective waste management and water/irrigation management systems and the proliferation of cleaning materials/methods and maintenance practices that minimize environmental harm at the project site.

Additional credits for the Site Management Policy come in the form of specific plans to address Rainwater Management, Heat Island Reduction and Light Pollution Reduction.

Rainwater Management credits are available for reducing runoff volume and improving water quality "by replicating the natural hydrology and water balance of the site."

Heat Island Reduction credits are available for measures to "minimize effects on microclimates and human and wildlife habitats…by reducing heat islands and counteracting the intensifying heat caused by climate change."

Light Pollution Reduction credits are available for measures that "increase night sky access, improve nighttime visibility and reduce the consequences of development for wildlife and people."

Projects completed to improve rainwater management or reduce heat islands and light pollution are often as creative as they are eco-friendly. There is perhaps no better proof of this than the work completed at the Jacob Javits Convention Center in Manhattan. Winner of a LEED Silver award, the Javits Center used Gordian's Job Order Contracting (JOC) — an IDIQ delivery method that enables organizations to complete more projects in less time — to replace 6.75 acres of existing roof with a new green roof plus new mechanical and electrical systems to boost operational efficiency. The Center has achieved 77% rainwater retention, preventing almost seven million gallons of run-off per year, and has reduced annual energy consumption by over 26%.

Water Efficiency

While LEED v4.1 looked at outdoor and indoor water use equally, the v5 specifications are more intentional in the conservation of low-cost **potable** water resources and the promotion of effective water management while supporting high-performance building operations. The subtle shift to "potable" water management in building operations encourages the potential use of non-potable water for outdoor irrigation.

For Water Efficiency, LEED certification requires both a Water Management Policy and Water Metering system be in place. Certification credits come from the Water Performance of your project. The intent of the Water Performance credit is to "support water management, reduce potable water consumption and preserve no- and low-cost potable water resources."

Credits are available for demonstrated reductions in total potable water consumption and improvements in water efficiency over a 12-month period. Similar credits are available for increasing the percentage of recycled alternative water to meet the Process Water demand.

Water efficiency improvements may come from the implementation of low flush rate toilets and lower pressure faucets and fixtures. Such was the case when a severe California drought forced the state to call for a 25% reduction in potable water usage. To comply with the order, San Diego County implemented The Drought Response Action Plan (DRAP) which identified projects to cut water use. The DRAP discovered the North County Animal Shelter was wasting water on landscaping. Using Gordian's JOC to streamline project delivery, the county installed synthetic turf at the entrance of the facility, removed unnecessary sprinkler heads and replaced standard sprinkler heads with a more efficient rotary variety. A local contractor completed the work in under two months and the shelter decreased potable water usage by 35%.

Implement a water metering system, supported by a Water Management Policy, to prove performance relative to potable water reduction objectives.

Energy and Atmosphere

Easily the most extensive and exhaustive subject area in the LEED O+M Rating System, to say there's a lot to cover relative to Energy and Atmosphere would be an understatement. There are three prerequisites and five different credit categories.

Requirements for Energy and Atmosphere include an Energy and Carbon Management policy, a Refrigerant policy and proof of surpassing minimum Energy Performance thresholds. There must be an Energy Efficiency Policy in place for managing project energy consumption. This policy must address the current facilities requirements and Operations & Maintenance plans (including occupancy schedules, equipment run-time schedules, HVAC setpoints, setpoints for lighting levels, etc.). The Refrigerant Policy prerequisite is intended to reduce the emissions of refrigerants from existing equipment and establish a formal policy to govern the removal/disposal of refrigerant-containing equipment. Lastly, there must be a building energy metering/reporting system in place and the project's energy use for 12 months must achieve performance thresholds relative to similar buildings or historical baselines.

Energy and Atmosphere

Credits for Energy and Atmosphere come from Decarbonization and Efficiency Plans, Greenhouse gas (GHG) Emissions Reductions, Refrigerant Impact Reduction, Grid Harmonization and Energy Performance.

The Decarbonization plan is intended to support long-term reductions in GHG emissions from building energy and refrigerants through 2050. Additional credits are available in proportion to the percentage of GHG reductions beyond Combustion Emissions Targets and the conversion to more renewable energy sources or next-gen refrigerants with low global warming potential (GWP).

Grid Harmonization credits are available for practices that reduces stress on the energy grid. Alleviating this stress lowers GHG emissions (in reaction to generating energy to meet peak demand), increases grid reliability and ultimately makes energy generation and distribution more affordable and efficient. Lastly, credits are available for systematically measuring Building Energy Performance.

Look for energy efficient systems and appliances that reduce greenhouse gas emissions and track your energy performance.

Materials and Resources

As much as I enjoyed the LEED v4.1 focus on reducing waste material, I appreciate the way the v5 specifications focus on "responsible materials stewardship through reduction, reuse and recycling." What can I say? I shamelessly applaud thinking and acting creatively to avoid heaping more waste in a landfill or tossing another item in an incinerator.

Interestingly, the only prerequisite in this category is having a documented Materials Management Policy (or MPP). Granted, your policy shall address these areas: Environmentally Preferable Purchasing, Materials Storage and Collection, and Waste Prevention. For a prerequisite, that's a relatively light order.

When comparing building materials, consider how each product went from its natural state to sitting on a shelf at the supply center. As you do, think about the process required to get to that end-state material along these five parameters:

1. **Pollution Prevention**: Is there something in the manufacturing process of the material that's potentially harmful to the environment and/or the health of workers or building occupants?
2. **Waste Prevention**: Is there something about the material manufacturing process that creates a lot of waste?
3. **Recycled Content**: Is there a way to make this material out of recycled post-industrial or post-consumer waste (wood, asphalt, plastic, aluminum, etc.)?
4. **Embodied Energy of a Material**: Does the collection of the raw material and its subsequent processing require a lot of energy, as with rare earth metals that must be mined and heavily refined for use?
5. **Natural Materials**: Is there a way to use a renewable natural element that requires less processing and causes less environmental damage or has lower toxicity than a man-made material?

Materials and Resources

Recover as much as you can from demolition, renovation, remodeling, expansion or reconfiguration projects. The more you recover, the less that must go to a landfill or incinerator.

Conversely, justifying the available credits for Waste Performance and Embodied Carbon may prove a bit more onerous.

There are credits available for diverting from a landfill those building materials that could be repurposed, reused or recycled. This reminds me of a project Gordian did several years ago with the New York City Department of Education to replace high-flush rate bathroom fixtures with more efficient models. Rather than sending the old toilets to a landfill, we repurposed them as eco-friendly bioswales to help manage rainwater and grow oyster beds in Jamaica Bay. All this work, both the replacement and the repurposing, was completed using our Job Order Contracting construction procurement solution.

Additional LEED credits are available for those that "improve the value of diverted materials." So, compared to the NYC DOE example where something was recycled, imagine something like using cooking oil as fuel for transportation or the composting of food-waste to generate methane. Adding value to a material that was "diverted" provides reuse opportunities without sending the material to landfill or incinerator.

When I was a Boy Scout, I had a leader that always preached "one piece trash," meaning there was no reason to create more trash than you absolutely needed to. The wisdom of this advice extends well beyond the Boy Scouts. From an efficiency perspective, it's easier to pick up one piece of trash than two. From an ecological perspective, the advantages of such a policy are obvious. That's where Waste Minimization comes in.

When I first read the description for the last Materials and Resources Credit ("embodied carbon of interior materials during renovations"), I'll admit, I had to read it twice. Fortunately, this isn't as confusing as it may sound. The primary intent here is to recover as much as you possibly can from an ongoing demolition, renovation, remodeling, expansion or reconfiguration. Recovering carpet, acoustical ceiling tile, furniture, gypsum-based wallboard (anything that's got embodied carbon content) can be used for credits in this area.

Indoor Environmental Quality

Comparable only to Energy and Atmosphere (EA), the section for Indoor Environmental Quality (EQ) is massive. EA has three prerequisites and five credit areas. EQ has four prerequisites and four credit areas.

From a prerequisite perspective, there will be requirements for an Occupant Needs Assessment, a policy for implementing green cleaning practices and policies, a hyper-intensive focus on air ventilation and filtration as well as a continued focus on secondary effects of tobacco smoke.

Let's go back to the "Occupant Needs Assessment" for a moment. This precept assumes that there has been an assessment to "promote a better understanding of who is in the building on a regular basis, if there are current population-specific or regionally specific health hazards." The result needs to be a policy that ensures accessibility to facilities and includes a baseline assessment of occupant accessibility needs, an identification of vulnerable populations and an outline of your accessibility measures and goals.

Beyond assessing needs, another prerequisite is developing a Green Cleaning Policy. This one is all about what cleaning products you're using and how eco-friendly they are. Keep a list so you're prepared to show your work.

The next prerequisite is around verification of ventilation and filtration. Basically, what they're looking for is the amount of outdoor air being delivered compared to your ventilation standards for indoor air quality. Lastly, the "Environmental Tobacco Smoke" provision is in place to prevent exposing building occupants to tobacco smoke as well as "smoke produced from the combustion of cannabis, controlled substances and the emissions produced by electronic smoking devices."

Indoor Environmental Quality

From a credits perspective, points are available for performance of Indoor Air Quality, Occupant Satisfaction, Green Cleaning and Pest Management. For Indoor Air Quality Performance, use your Indoor Air Quality Measurement System to prove your project is monitoring for CO2, PM2.5, TVOC, O3, PM10, NO2 and CH2O. Or, for laymen, Carbon Dioxide, Fine Particulate Matter (nasty stuff under 2.5 microns that we inhale like toxic dust into our lungs), Total Volatile Organic Compounds (Benzene, Naphthalene, Styrene, etc.), Particulate Matter (the nasty stuff between 2.5 and 10 microns that gets caught in your nose/throat but is too large to be ingested by your lungs), Nitrogen Dioxide and Formaldehyde.

From an Occupant Satisfaction perspective, survey occupants and receive points for the mean satisfaction level and percentage of occupants that are satisfied with the overall comfort of the space. If you implement surface testing protocols and Custodial Staffing Guidelines, you can receive additional credits for measuring the performance of your Green Cleaning Policy. The last chance for Indoor Environmental Quality credit comes from implementing an integrated pest management (IPM) plan that minimizes pest problems and exposure to pesticides.

Implement an organizational policy focusing on improving indoor air quality and occupant safety and comfort.

Extra Credit: Project Priorities and Innovation

The green building movement moves forward through innovation, so look for new ways to improve the environmental, economic and social benefit to affected occupants, visitors and surrounding communities.

There are no prerequisites for priorities and innovation, only opportunities for additional credit.

The intent of this final subject area is to promote projects that address geographically sensitive "environmental, social equity and public health priorities" and "to encourage projects to think creatively to test and accelerate new sustainable building practices and strategies." The USGBC maintains a **Credit Library** that gives project owners avenues for achieving additional credits.

The USGBC has identified projects that may have additional regional importance and that address unique needs for a given adaptation or building application. They will reward project performance "as going above and beyond" an existing LEED priority area. Lastly, points are available if your project can "achieve significant, measurable, environmental performance using a strategy not addressed in the LEED green building rating system."

You can also receive credit for simply having a LEED Accredited Professional (AP) on your project team, as the USGBC has found that the application and certification process is streamlined when done by a professional who "knows how LEED works." They are, therefore, willing to provide an additional point of project credit for this simple inclusion. It's an easy win, a freebie you can easily take advantage of.

General Conclusions

As we close the pages of this Beginner's Handbook and look ahead to the anticipated LEED v5 Building Operations + Maintenance Guidelines, it is clear that the future of sustainable building practices is upon us. With a steadfast focus on decarbonization, quality of life, and ecological conservation and restoration, LEED v5 is not merely an update to a rating system but a bold reimagining of how we interact with our built environment. The guidelines set forth a vision where buildings are not only efficient in their resource use but also serve as stewards of environmental integrity and promoters of human well-being.

The strategic evolution of LEED underscores a commitment to innovation and adaptability. This evolution ensures that as the market changes, so too will the ways we approach sustainability in our spaces. From the integration of sustainable transportation policies to the meticulous management of water and energy, LEED O+M encourages us to rethink our strategies and aim for a balance that benefits both the present occupants and the generations to come.

As we implement the practices outlined in this eBook, let us be mindful of the impact our choices have on the world. Let us embrace the challenge of LEED v5 with open arms, knowing that each step we take towards certification is a step towards a healthier planet. The journey towards sustainability is ongoing, and with LEED v5, we are equipped with the tools and knowledge to forge a path of environmental stewardship, social responsibility and economic viability. Together, we can transform our buildings into beacons of sustainability that stand the test of time and the seas of change.

Go forth and be sustainable!

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About Gordian

Gordian is the leading provider of Building Intelligence™ Solutions, delivering unrivaled insights, robust technology and comprehensive expertise that fuel customers' success during every phase of the building lifecycle. Gordian created Job Order Contracting (JOC) and the industry standard RSMeans™ Data. We empower organizations to optimize capital investments, improve project performance and minimize long-term operating expenses.