Reaching Beyond Formula: How Every Contractor Should Contribute to Sustainability

ROBINS & MORTON
BUILDING WITH PURPOSE.

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Sustainable design and construction practices are widely used today on behalf of the project owner to conserve natural resources, provide healthy work environments, and reduce operating costs. As these green practices evolve, there is still opportunity within the domain of the construction manager to achieve even greater outcomes by committing to healthier and more efficient jobsite practices.

With the world's oil reserves depleting and the effects of climate change looming, sustainable construction has gained momentum over the last three decades to become a movement transforming not only the way a building is constructed, but also the thinking of individuals who own, design, construct, and occupy the space. Interest in sustainability has never been higher. Building end users – tenants, customers, patients, students, and employees – increasingly expect that environmental responsibility will be a top priority for the building owner and project team.

These expectations are part of a universal demand for sustainable products, services, and practices. A recent global survey on corporate social responsibility by Nielsen Company polled 30,000 people in 60 countries.[1] More than half of the respondents, 55 percent, are willing to pay extra for products and services from companies that are committed to positive social and environmental impact – an increase from 50 percent in the 2012 survey and 45 percent in 2011. This increase reflects an overall expectation that investments in sustainable practices will continue to be a core part of business models and decisions.

There are many definitions for sustainable construction or green building. In general, green building principals aim to minimize the environmental impact of the built environment and improve the efficiency of high-performing buildings during design, construction, operations, and maintenance. Typical focus areas for sustainable construction include minimizing energy usage, conserving water, selecting healthy building materials, and protecting air quality. Balancing these environmental improvements with social and economic issues, known as Triple Bottom Line approach, has proven to be a successful business approach for many corporations.

Many contributions have forwarded the success of the green building movement; of these contributions, innovative design systems and strategies seem to have played a primary role in advancing progress. Highly efficient HVAC equipment and systems, efficient lighting and sensor systems, smart building management systems, and use of photovoltaic panels, geothermal, and wind systems to generate renewable energy have minimized energy usage. Rainwater harvesting, grey water reuse systems, composting toilets, and water efficient appliances have conserved water. Reuse of existing buildings and materials, low-emitting material use, modular and adaptive design, and use of reusable and durable products have improved the characteristics of building materials and the quality of indoor air.

The majority of these sustainable strategies develop and are decided during project design. As the project moves into the construction phase, a few key construction efforts – such as erosion and pollution control, waste management, and indoor air quality management – are typically anticipated and implemented. However, the innovative brainstorming process typically ceases as design is completed.

When it comes to sustainable practices during the construction phase, many project teams are not yet accustomed to exploring all of the opportunities available. This could be said to be a direct result of the Leadership in Energy and Environmental Design (LEED) Rating Systems and the breakdown of team members' responsibilities to achieve certification. Rightfully so, the majority of the credits available within LEED Building Design and Construction (BD+C) rating systems are the responsibility of the building owner and design team. Unfortunately, that leaves the contractor only a small portion of credit responsibility and consequently a small percentage of opportunities where they can directly control and achieve sustainability success.

As the LEED rating systems are the most commonly pursued green building certification in the United States, teams have focused their sustainability efforts on satisfying LEED credits. Most likely contractors are doing the same and following the formulas for managing sustainability in line with prescribed LEED credits. The result: a typically limited and narrowly

focused sustainability effort on the construction site. Rarely will construction teams go beyond LEED credits and the associated go-to green formulas to enhance the sustainable characteristics of a project into the construction phase.

Site Opportunities Examined

The environmental impact of buildings is well documented; studies show the built environment consumes 40-54 percent of the nation's energy, 13 percent of water, and is the source of 39 percent of CO_2 emissions.[2] Less is known, however, about the impact of construction and demolition activities, the actual process of putting the built environment in place.

Studies have estimated that construction and demolition activities are responsible for 26 percent of the non-industrial waste stream.[2] Add this excessive waste generation to air quality issues, stormwater pollution, noise pollution, erosion, and excessive fuel consumption, and the urgency of improving construction practices and the range of opportunities for improvement becomes evident.

As a solution, construction manager Robins & Morton has developed an internal program to examine opportunities to green every jobsite, beyond those recommended by LEED rating systems. The method used to develop the program and the implementation of additional sustainable strategies is proving to be successful. The construction manager's ideas, strategies, and program format are shared here in hopes other contractors will implement similar plans.

This article will review specific actions and initiatives that the contractor, construction manager, or anyone overseeing the construction process can mirror to:

1. *Generate a list of feasible and cost-appropriate activities to reduce environmental impact and carbon footprint during the construction process*
2. *Enhance the project's success by demonstrating a deep commitment to sustainability on the project site*

These standards can also be used by building owners to guide sustainable decision making and efforts during construction on future projects. Furthermore, this article will shed light on what a building owner should expect from their construction partner and what a contractor should commit to and provide during construction. With the right people, process, and commitment, every contractor can implement a sustainable jobsite program; all working collectively to minimize the environmental impact of construction and demolition.

Getting Started: Create Standards

In 2011, Robins and Morton set a goal to be sustainable during construction of every project, every time; regardless of the pursuit of LEED certification. In order to fulfill this goal, the construction manager had to create a consistent program; a company-wide policy to guide project teams and streamline the process. The company's sustainability group knew that the success of the policy hinged on 1) developing an appropriate policy structure, 2) requiring realistic and feasible activities, and 3) creating buy-in and accountability.

To set the foundation for the policy, a focus group of respected superintendents and project managers was asked to attend a workshop. This focus group was selected for a few key reasons. These individuals worked on project sites full time and were therefore best suited to determine where jobsite opportunities are available and which would result in the greatest impact. These employees were also familiar with current sustainable efforts being implemented in the field. Additionally, these superintendents and project managers possessed the necessary experience to determine if newly proposed ideas were feasible. Last, and perhaps most importantly, these focus group members were leaders within the company, were respected by others, and would oversee sustainability onsite. This would be essential in securing the buy-in from others that would be necessary to implement the policy and support the new ideas behind it.

The workshop began with an overview of the general principals of sustainability and strategies involved with environmental design and construction. This discussion refreshed the attendees' knowledge of the subject and initiated the brainstorming process. The focus group then discussed the importance of narrowing in on the contractor's

responsibilities for a construction project. It was emphasized that the company would have the most impact and success if the focus was placed on areas in which the contractor makes decisions without extensive input or commitment from the owner or design team. By focusing the effort on the contractor-controlled responsibilities, program standards would be easier to adopt and would avoid any ambiguity from other project team members' roles and opinions.

The group brainstormed opportunities to be more sustainable within day-to-day construction activities, task-specific construction responsibilities, and within the jobsite office. Working within four subgroups, attendees generated a list of activities or actions within the contractor's responsibilities that would 1) minimize water usage, 2) save power or minimize fuel usage, 3) protect air quality or enhance human health, and 4) conserve natural resources or select healthier materials.

The subgroup sessions resulted in innovative and inspiring ideas that would protect and even regenerate the environment. However, in order to ensure these goals were feasible, the next step was to analyze each idea not only by environmental benefit, but by the idea's impact on other project constraints. The subgroups performed feasibility analyses and collectively discussed possible impacts to a project's budget, schedule, safety, site utilization, labor, or equipment requirements that could result from implementing each idea.

Activities or ideas that were determined to be cost-neutral, have no impact on safety or schedule, and have minimal impact on site utilization, labor, and equipment requirements were designated as mandatory items for implementation on every project. Activities or ideas in which the environmental benefits outweighed the minimal impact on other project requirements were designated to be optional activities. Optional activities were to be reviewed by each project team for possible implementation. Any activities or ideas that required a large cost or impact to other project requirements were removed from the list.

The policy drafted by the focus group organized the activities around key distinctions:

- by area of environmental impact: water, energy, human health, or materials
- by requirement: optional or mandatory
- by location: the construction site or the jobsite office

Additionally, the group developed requirements for the project team to report to senior managers at construction start-up, at 50 percent construction completion, and at project close out. This ensured accountability and consistency.

A final section dedicated to education was added to the policy. The focus group felt it was important to educate all individuals involved in the construction process about sustainability and the efforts that would be implemented onsite.

As sustainable construction is an ever-advancing discipline, the focus group wanted to be sure a process was in place to update the policy. The group generated a plan to review the activities within the policy and the structure of the program annually. This would ensure the policy evolved over time with sustainability advancements and technologies.

To guide other construction managers in development of similar standards for sustainable project site management, five key actions are recommended to assist with long-term success:

- Focus on areas in which the contractor can make the most impact; select areas in which the contractor can make decisions without extensive input or commitment from the owner or design team
- Utilize key employees within the company who will have the experience and leadership necessary for analysis and implementation
- Encourage the team to brainstorm without limitations; this will assist with identifying creative approaches and unique ideas
- Develop analysis criteria that will minimize conflict or obstacles during the implementation process
- Generate a plan to continuously review the program for improvement

Implementation: Core Areas for Environmental Performance on the Project Site

1. Water

Though about 70 percent of the Earth's surface is water, less than one percent is available for human consumption.[3] Water conservation efforts have become a major topic of concern in recent years. Water management officials in 40 out of the 50 U.S. states expect water shortages in portions of their state over the next decade.[3]

Actual building strategies, such as wet-curing and pressurizing fire protection systems, require water usage during construction. Additionally, temporary activities such as maintaining a clean jobsite, hydrating workers and cleaning of equipment and tools utilize water during construction.

There are a variety of water conservation activities that can be implemented during construction. These range from actions with no added cost to those requiring a significant initial expense. Narrowing in on low-cost or cost-neutral activities is the easiest way to initiate changes and convince others to make an effort as well.

Any individual that has visited construction sites has likely seen water connections and hoses constantly leaking or left running. This is a direct example of the construction manager's opportunity to improve construction practices and make a positive impact. Monitoring and correcting something this simple can result in minimizing water consumption and provide a monetary savings for the project owner. Providing a closeable nozzle for each hose onsite would result in a small added cost, but would eliminate the excessive running of water that happens on construction jobsites every day.

Another water saving strategy is to assign a field employee to inspect water connections and hoses each day. This would be a cost-neutral or low-cost activity. The activity requires no additional materials and the individual assigned would simply be responsible for checking water connections and hoses, to be sure there are no holes or leaks, and taking necessary action. The activity would take place at the end of each day and as they walk past connections throughout their responsibilities during the day.

Another best practice to for consideration involves implementation of Stormwater Pollution Prevention Plan (SWPPP). Typically, construction projects disturbing a significant area of soil are subject to enforce a SWPPP. These plans aim to minimize water runoff from the project site to protect nearby communities and water supplies from any pollutants created during onsite activities. The preparation of the plan and installation of control techniques may result in added cost. However, the implementation of a SWPPP provides a large environmental benefit. A SWPPP, or selecting appropriate control techniques from a typical SWPPP, should be considered for all projects regardless of size.

Where feasible, and possibly for sites that do not yet have temporary water sources, a rainwater collection and reuse initiative can yield measureable results. Use of simple techniques such as rain barrels for collection will provide water that can be used elsewhere on site; possibly as a tool or boot cleaning station. More sophisticated collection systems, providing the ability to store and pump water, are available. Though these systems could be costly, they might be beneficial on larger projects that require temporary irrigation or "dusting-down" of the project site to protect air quality.

2. Energy

In 2013, the U.S. energy consumption was 97.5 quadrillion Btu.[4] This usage is nearly 19 percent of the world's energy consumption, though the U.S. comprises less than five percent of the total world population.[4] America's consumption of petroleum, natural gas, coal, and other energy sources has resulted in air emissions, water pollution, generation of solid waste, and high economic costs.

For these reasons, minimizing energy usage is typically the highest priority in sustainable construction. The opportunities are significant. The U.S. EPA estimates that 30 percent of the energy used within our built environment is inefficiently used or unnecessarily wasted[5]. Improving the energy efficiency of commercial and industrial buildings by 10 percent would result in a savings of $20 billion and would prevent emissions equal to those generated by 30 million vehicles.[6&7]

As it relates to jobsites, construction activities consume energy before and after connection to the local electricity grid. Fueling generators to provide temporary power, powering a jobsite trailer, temporary lighting of the site and building,

fueling earth moving equipment, powering hand tools, and the testing of building equipment are a few of the many activities consuming fuel or electricity during construction.

With countless energy consuming activities on the jobsite, and with many construction projects running throughout nights and weekends to meet a schedule, the issue of energy use and monitoring becomes even more important - and the opportunities for savings greater. As each project site requires different energy using actions, an energy use analysis should be performed before construction begins to customize the project's approach and actions for conservation.

One of the larger energy consuming requirements during construction results from temporary lighting of the project site and building. Temporary lighting is necessary for work within the building until the electrical contractor has installed fixtures and bulbs; which is typically later in the project schedule. Those passing by a construction site at night might notice the excessive light pouring from the structure. Lighting is typically left on for safety and security measures in the evening.

In an effort to minimize the energy consumption of temporary lighting, a general contractor should work with the electrical subcontractor (or party providing temporary lighting) to ensure temporary lighting is hung to separate safety and egress lighting from all other temporary lighting. This task does not typically require extra cost, just extra thought and coordination. The result is that at the end of each work day the majority of the lighting can be turned off without affecting safety, egress, or security requirements. This can result in significant savings.

Another option to minimize the energy consumption of temporary lighting involves use of LED lamps in lieu of CFL or incandescent bulbs. The construction manager and electrical subcontractor (or party providing temporary lighting) should perform a cost analysis to determine if it is profitable to use LED lamps for temporary uses, knowing these lamps can be reused for future projects.

There are also opportunities to minimize energy usage within the temporary trailer or office on a construction site. The project team can implement operational strategies within the office onsite, just as should be done within any corporate office. Using Energy Star appliances and equipment, shutting down lights and computers at the end of the work day, using LED lamps, or installing programmable thermostats will minimize the energy consumption of the temporary office and drive down utility costs during construction. Additionally, some of the energy saving principles used to design a sustainable building should be considered for temporary trailers as well. Trailers can be positioned in shade in hotter climates or positioned to maximize solar gain in cooler climates. Trailers can also be oriented to maximize daylighting.

More innovative energy-saving considerations could become costly, but have also proved to be feasible on certain projects. Use of solar-powered equipment or tools, use of hybrid equipment, and use of renewable energy sources for temporary power should be reviewed for consideration and feasibility on a project-by-project basis.

3. Human Health

Energy consumption has impact beyond the use of natural resources discussed above. Power generation is a significant source of pollutants. The U.S. is responsible for the generation of 20 percent of global greenhouse gas emissions, though comprised of less than five percent of the total world population.[8] Of this 20 percent, the built environment is said to be responsible for 30 percent of emissions.[2] Emissions and pollutants, including sulfur dioxide (SO_2), nitrogen oxide (NOx) and mercury, can impair human health and the environment.[9]

A healthy work environment is essential to the well-being and productivity of employees. Providing quality air to breath, a safe and secure workplace, and protection from pollutants should be the responsibility of the employer to employees. Due to the nature of construction, providing these basic requirements to a worker can sometimes become challenging and lack the attention necessary, making it all the more urgent to find appropriate solutions. It is the construction manager's responsibility to support worker health by protecting jobsite air quality and enforcing healthy housekeeping standards.

Typical sources of air pollution, and possibly human health concerns, during construction include off-gassing of new building materials, dust and particulate creating activities, emissions from fuel-powered equipment, and toxic cleaning products. The simplest solution for mitigating these conditions is to develop an air quality plan for both indoor and

outside activities. Air quality plans are often addressed on LEED projects, but not in enough detail or with consistency for other projects. The air quality plan must be tailored for each unique project and can be developed to cost-neutral or low-cost and can implement a full range of protection and confirmation testing activities.

Construction activities to protect air quality within the building could include:

- Utilizing temporary enclosures to isolate work areas and limit migration of dust and airborne materials
- Using environmentally-friendly cleaning products
- Utilizing a sweeping compound when necessary
- Encouraging workers to prefabricate or perform as much work on the exterior of the building as possible

Construction activities to protect air quality on the exterior of the building could include:

- Establishing a no-idling policy for operated equipment that requires equipment operators to shut off equipment that would normally idle for more than two minutes; saving fuel and limiting emissions
- Maintaining equipment and construction vehicles appropriately to reduce emissions
- Dusting-down or hardscaping pathways within the project site
- Enforcing a no-smoking policy

Other activities that can enhance human health and worker satisfaction, and are relatively simple to implement, include maintaining a clean and well organized site and providing a quality break area for workers onsite. For workers within the temporary office or trailer, activities such as inspecting and cleaning air filters and providing rugs at the office entrance are simple, inexpensive, and effective methods to support worker health and improve air quality.

Protecting air quality and supporting human health should align with the goals of construction safety programs. Any of the above activities that are determined to be cost-neutral or low-cost activities should be implemented, without hesitation. These activities should be a starting point for construction managers to consider and to generate other innovative ideas to protect air quality and improve human health onsite.

4. Materials

A typical construction project deals with a large quantity of concrete, metal, wood, drywall, finishes, and the packaging it is all delivered in. Each material has to be purchased, handled, stored, installed, or disposed of. The constant influx of materials and the differing characteristics and requirements of these materials make it challenging for a contractor to green the overall material handling process. Yet the variety and volume of materials provides a range of opportunities to make improvements.

The LEED rating systems detail strategies to sustainably source building materials. These ideas include utilizing reused materials, materials with recycled content, materials from within the project region, and materials with green certifications. These same ideas and philosophies should be considered and mirrored by the contractor when purchasing temporary materials for the project.

As mentioned, contractors have little control over the materials that will be a permanent part of the building. These materials are typically selected by the design team and the owner. However, the contractor does have the ability and responsibility to select materials that are used temporarily onsite, to aid building techniques, and for construction management. The contractor should review all materials that will be selected and purchased by the construction team to consider mirroring the LEED recommendations.

As an example, there are many materials purchased for construction techniques or as general requirements of the project. These materials might include temporary fencing, site signage, flooring or casework protection, or safety and scaffolding supplies. There are opportunities to sustainably select and use each of these materials. The contractor should consider utilizing reusable fencing in lieu of a one-time use fence. Signage should be designed to be reusable on future projects. Cardboard for flooring or casework protection should be ordered with 100 percent recycled content. Wood for scaffolding or safety barriers can be selected to be FSC certified. The contractor must work to determine which materials can be selected more sustainably and decide if there is an additional cost associated with the selection.

The contractor should purchase cost-neutral product alternatives and should review additional options with the owner to determine if there is an interest in paying a premium to select more sustainable construction materials.

The construction manager should also consider creating a plan to ensure appropriately timed material deliveries and suitable storing conditions for any materials onsite. Timing delivery of materials accurately minimizes the duration materials are onsite before installation. If materials must be stored, it is imperative they are kept clean, dry, and away from possible damage. These recommendations are cost-neutral practices that will prevent materials from becoming damaged and therefore becoming waste.

The contractor has additional opportunities to minimize the impact materials have on the environment during construction. As mentioned above, building-related construction and demolition (C&D) activities account for nearly 26 percent of non-industrial waste generation in the U.S; totaling approximately 160 million tons per year.[2] Although 20-30 percent of building-related C&D debris is recovered for processing and recycling, the opportunity exists to recover more than twice this percentage through better planning and management.[2]

A construction waste management plan provides a solution for this issue. The goal of a construction waste management plan is to minimize the waste generated onsite and to divert the waste that is generated away from landfills through reuse or recycling programs. Using waste management plans has become a best practice for LEED projects, but has yet to become a mandatory requirement for contractors on every project. This is another example of a contractor's opportunity to manage materials sustainably onsite and to make a significant impact on the environment.

Development and implementation of an appropriate waste management program can result in waste diversion upwards of 90 percent. Feasible diversion percentages rely heavily on the materials that will be used for the project, require a full commitment from onsite workers and waste haulers, and vary depending on the recycling and diversion options within the project region.

To create a successful program, the contractor should work before any construction activities begin to analyze the materials that will be used for the project and determine what types of material waste will be generated. The contractor can then locate local haulers and recyclers that can recycle the waste. Contractors should also consider which of the waste materials can be reused onsite. For example, excess concrete waste can be crushed and reused onsite as subbase or temporary roadways. Developing an appropriate plan for the anticipated waste and verifying haulers' and recyclers' diversion process before construction begins will facilitate easy coordination of the waste management plan and ensure the maximum diversion percentage.

There are opportunities within the temporary office or jobsite trailer to improve material selection as well. The waste management plan for the project should also be followed within the office. In addition to the construction materials recycled onsite, batteries and electronics can be recycled within the office. The team may be able to salvage or reuse office furniture instead of purchasing new furniture. Installing a water filtration system within the trailer will minimize waste generated from numerous water bottles. Additionally, going paperless, or as paperless as possible, will save paper costs and minimize waste within the trailer and onsite. Fortunately, tablets in the field and the convenience of portable digital devices make this transition easier.

5. Education

The recommendations within the environmental categories above emphasize the contractor's responsibility to brainstorm, analyze, and strategize sustainable activities that are feasible and appropriate for each project. However, all of the time spent strategizing is little more than an optimistic exercise without a proper plan for implementation and execution.

Similar to a construction project's safety program, successful implementation and execution relies heavily on proper communication and education. The contractor's team, subcontractors, workers, building owner's staff, and possibly vendors and suppliers must be aware of the goals and must commit to making the applicable improvements.

It is no secret that resetting long-held construction practices and assumptions about green building presents a challenge within the construction industry. For this reason, it is strongly recommended that the contractor analyze the

brainstormed sustainability improvements by projecting the impact on project constraints (budget, schedule, plan, site utilization, safety, etc.) before finalizing the activities that will be selected for the project.

Selecting sustainable alternatives with minimal impact on those project constraints, combined with securing the initial buy-in from respected superintendents within the company, will facilitate easier persuasion and communication of goals and activities to be implemented. Employees and workers are more likely to implement new activities if the activities are already supported by their peers.

With multiple stakeholders to influence, it is critical a comprehensive orientation is delivered to all appropriate parties up front. This should be done by providing a list of the sustainable activities to be implemented, communicating the requirements and benefits of each activity, and requesting feedback and confirmation of understanding. Once all parties are introduced to the objectives and actions, individuals will begin to feel included in the sustainability process and will feel capable of contributing to the success of the initiative.

After initial communication of sustainability goals, the contractor must work to continuously educate about these goals. Continuous education and commitment can be accomplished by 1) posting a list of the project's sustainability rules in the break area or another prominent location, 2) reminding workers of the sustainability goals in weekly meetings, and 3) periodically announcing sustainability accomplishments and environmental benefits the project has achieved.

Finally, it is extremely beneficial to designate a team member to act as a champion of the initiative onsite. This individual should coordinate orientation and worker education and oversee implementation of the sustainable activities. The onsite coordinator should communicate up the chain as well. Monthly progress reports should be provided to the building owner, managers within the construction company, and possibly the community.

Reporting to management is critical to reinforce the commitment to sustainability within the company culture. It is also important to communicate developing sustainability trends or any gaps within the sustainability program. This communicating and education is crucial to keep abreast with the fluid and constantly-advancing sustainability movement - and for the future improvement of the program.

Summary

Though the green building movement is stronger than ever, there will always be opportunity for continuous improvement; particularly within construction process and accompanying building practices on the project site. Typical construction practices generate excessive waste generation, air quality issues, stormwater pollution, noise pollution, and power and water consumption. Consequently, construction jobsites present a range of areas for progress and environmental stewardship. To achieve this, contractors must move beyond prescriptive methods and practices required by LEED certification and into a commitment to develop a more dynamic program to green each jobsite.

Each contractor should work toward developing a customized program that targets sustainable opportunities within the responsibilities they manage onsite. They must consider project constraints including cost, schedule, site utilization, and safety, to determine sustainable alternatives that are feasible on a project-by-project basis. The contractor must then commit to implementing, educating, and continuously improving their efforts.

This holistic approach to sustainability on the project site is already producing a measureable reduction in the carbon footprint and environmental impacts of construction. It is also producing new benchmarks and replicable practices that can be shared across the industry. By documenting success and sharing knowledge, contractors can play a larger role in the green building movement. Construction managers have a significant opportunity to demonstrate an unyielding commitment to environmental responsibility, and to add considerable value for owners and team partners seeking solutions that exceed the limits of convention and formula.

Sustainability Success: Case Study

MaineGeneral Alfond Center for Health (Augusta, Maine)

The Alfond Center for Health is a 644,000-square-foot hospital that opened in November of 2013. The owner, MaineGeneral Medical Center, selected Robins & Morton to play an essential role and integral part of the Integrated Project Delivery Team (IPD). The project achieved the first LEED for Healthcare Gold certification in the northeast. Robins & Morton implemented their sustainable jobsite program on this project and it resulted in great success. Areas of achievement included:

Minimizing Water Usage During Construction

- Utilized stormwater for dust control onsite
- Installed low-flow toilets and aerators at sinks within jobsite trailer
- Implemented a detailed SWPPP to minimize water pollution and protect the neighboring community
- Collected rainwater for bootwash at project trailer

Minimizing Energy Usage During Construction

- Hung temporary lighting separate from safety and egress lighting so majority of lighting could be turned off at the end of each work day
- Used LED lamps for temporary site lighting
- Oriented the jobsite trailer to maximize daylighting
- Installed a programmable thermostat within the trailer

Maximizing Human Health and Improving Air Quality During Construction

- Maintained a clean and organized site
- Hardscaped temporary roads and pathways to minimize airborne dust
- Maintained a smoke-free jobsite
- Implemented a no-idling policy to reduce emissions resulting from operated equipment running while not in use
- Established a detailed indoor air quality plan that utilized sweeping compounds, temporary enclosures to isolate dust, and green cleaning products
- Located opportunities within the project to prefabricate: headwalls, exterior wall panels, and patient toilets

- Implemented a noise and vibration control plan to protect workers and nearby neighbors and buildings from disturbance or damage
- Stationed an EMT onsite to ensure quick response to any possible safety issues
- Provided a quality break area for workers

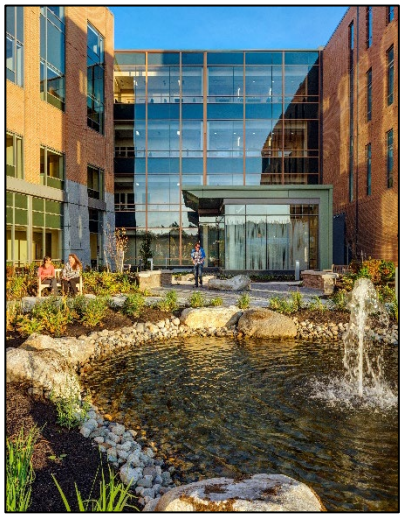
Improving Material Selection During Construction

- Selected cardboard product with recycled content for casework and flooring protection
- Used FSC certified wood for blocking and temporary uses
- Utilized reusable fencing onsite and reusable formwork for concrete structure
- Required vendors to reduce packaging for deliveries
- Implemented a detailed waste management plan that diverted more than 80 percent of the waste generated onsite
- Salvaged furniture for use within temporary onsite office
- Installed hand dryers within jobsite trailer to minimize use of paper towels
- Went paperless through use of tablet stored documents

Sustainability Education During Construction

- Onsite Robins & Morton employee posted policy requirements and educated workers in weekly jobsite meetings
- Encouraged the project owner to attend the weekly, sustainability staff meetings
- Provided signage throughout the jobsite to reiterate project goals and update workers on progress

Robins & Morton's efforts resulting in saved water, power, materials, and improved human health. Collectively, these efforts enhanced the sustainable characteristics of the project beyond typical LEED credits.



"Above and beyond the significant sustainable achievements with the buildings in our recent LEED Gold hospital, we were impressed with the vigilance our building team showed in creating a truly sustainable jobsite. From energy and water conservation to waste reduction through waste recycling, reuse of site materials and minimizing waste to landfills to protecting the surrounding Maine environment and water resources, Robins and Morton demonstrated an authentic and measureable commitment to our sustainability aspirations and goals, exceeding our expectations."

Rick Albert
Director of Plant Operations
MaineGeneral Medical Center

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