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Holistic Approach

by Marc Margulies, AIA, LEED AP
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Sustainable design and construction has become the norm rather than the exception in commercial real estate, with new construction and existing buildings alike striving for LEED certification. The key to approaching a sustainable project, especially one going for LEED Gold, is to look at the entire project from a holistic point of view and consider every aspect of design and construction as a piece of the "sustainability puzzle."

That was the approach taken by Boston-based Margulies Perruzzi Architects during the design of 175-185 Wyman Street, a 330,000-square-foot Class-A office space project consisting of two buildings in Waltham, Mass., that is being considered for LEED Gold and Innovation in Design credits. Working with the developer/owner, Hobbs Brook Management LLC, and the builder, Columbia Construction, the team utilized many green aspects in building the new office complex on spec. Here are some suggestions based on their experience.

color Site plan by John G. Crowe Associates, Inc.

THOUGHTFUL SITE PREP AND WATER MOVEMENT

Approximately one-half of the property is located within the watershed of the Cambridge Reservoir, a public drinking water supply. The other half is tributary to an adjacent wetland. Both the reservoir and the wetland ultimately drain to the Lower Basin of the Charles River. The quality of stormwater runoff from this property is critical to the regional water supply and resources.

According to design team member John G. Crowe Associates, the basic site planning of the project was a positive response to the stormwater challenge. An uncommon component of suburban office developments, parking garages have been incorporated under the new buildings. Besides being a convenient amenity, these parking structures are an important aspect of the environmental response because less paved surfaces receiving precipitation mean not as much polluted stormwater finds its way into the watershed.

The landscape design also contributes to environmental protection. Drought-resistant plant materials, indigenous to the region, minimize the need for irrigation water. Additionally, a large 200,000-gallon underground vault used previously for fire protection water storage has been retrofitted for use as an irrigation water supply, reducing demand for water from municipal sources. The vault is filled by stormwater from the roofs of the new buildings.

The stormwater drainage system was carefully designed to collect and clean stormwater prior to release from the site toward the reservoir, or its release into the ground via infiltration. All of the stormwater that falls on paved surfaces is captured and put through multiple steps of treatment. State-of-the-art drainage system components such as new catch basins are the first guard. The catch basins are equipped with 4-foot sumps to collect large granular sediments and with outlet hoods to trap floatable petroleum pollutants normally associated with pavement stormwater runoff.

Stormwater is piped from the catch basins to stormwater treatment structures that are specifically designed to separate finer pollutant-laden sediments from the water before the water is released to infiltration structures, recharge groundwater, or released to an attractive six-foot-deep wet pond. The wet pond "polishes" the water using naturally occurring biological processes before the water is released toward the Cambridge Reservoir.

RECYCLE WISELY

In addition to extensive site prep, stormwater drainage and landscaping work, materials recycling played a huge part in the construction of the new buildings. The original building on the site, a former computer manufacturing facility, was constructed

175-185 Wyman Street office Rendering by Neoscape, courtesy of Margulies Perruzzi Architects.

almost entirely of concrete and masonry block, providing an ideal project in which to recycle so much material. The average reuse on a project like this is about 75 percent. The Wyman Street project recycled more than 95 percent of the former building, which is helping the project achieve LEED points both for recycling and an Innovation in Design Credit.

Another 2,000 tons of steel was sent offsite, recycled and the equivalent re-purchased for reuse in the new buildings. The remaining 2,000 tons of glass and other fine debris was crushed and transported offsite to serve as a fine-particulate cap to a landfill. The result of recycling these 63,000 tons of material onsite resulted in the prevention of 2,100 trips by truck to disposal facilities and a cost savings of nearly $500,000. In addition to the elimination of fuel pollution, carbon emissions, noise pollution, waste management and the obvious public safety savings of not having 2,100 trucks on area highways, the project savings were recognized in budget and scheduling surpluses.

GET CREATIVE WITH MATERIALS

Hobbs Brook Management requested that the design team develop an exterior wall system that could be prefabricated in large panels to allow the contractor to make the building weather tight very quickly. In addition, the buildings were to obtain LEED Gold certification, be easily maintained, cost-effective and although contemporary looking, still appealing to tenants who may appreciate a more traditional Boston aesthetic. After researching precast and thin-brick construction, the design team discovered the TERRART Rainscreen, a terra cotta rainscreen system manufactured by NBK Ceramic. It not only met all the criteria, but also utilized "the rainscreen principle" which was an added benefit to Hobbs Brook Management. This technology utilizes the exterior cladding as a screen against water intrusion and provides airspace behind the skin for drainage and venting. The terra cotta rainscreen was installed in a local contracting shop on prefabricated structurally insulated panels. This local assembly, as well as the recycled metal clips used to attach the terra cotta, contributed to the achievement of LEED points. In terms of maintenance, the terra cotta panels can be power washed, removed for access to the cavity or replaced should there be any damage to the panels. Finally, from an aesthetic perspective, the use of terra cotta provided the design team the ability to customize the texture of the cladding in a way that reinforced the overall design intent.

By taking a holistic approach to sustainable commercial buildings, owners, designers and builders can incorporate a multitude of green aspects in the final design. The end result is a cleaner, more sustainable building for the long-term.

SIDEBAR: 175-185 WYMAN STREET

- Class-A office space project
- Size: two buildings, 330,000 square feet
- Location: Waltham, Mass.
- Under consideration for LEED Gold and Innovation in Design credits
- Visit the Hobbs Brook Management web site for a virtual reality movie on the 175-185 Wyman Street project at hobbsbrook.com/locations-waltham-175-wyman-video.htm

PROJECT TEAM

- Owner: Hobbs Brook Management, LLC
- Leasing Agent: Wyman Street Advisors
- Architect: Margulies Perruzzi Architects
- Construction Manager: Columbia Construction Corp.
- M/E/P: AHA Consulting Engineers
- Landscape architecture, site planning, environmental permitting and civil engineering: John G. Crowe Associates, Inc.
- Geotechnical Engineer: Haley & Aldrich
- Transportation Engineer: VHB
- Structural Engineer: Goldstein-Milano
- Cafeteria Architect: Colburn & Guyette
- LEED Consultant: Richard Moore Environmental Consulting
- Lighting Design: Lisa Zidel Lighting Design
- Elevator Consultant: Lerch Bates & Associates
- Specifications Writer: Kalin & Associates, Inc

DOCUMENTED IN THE LEED-CS 2.0 CERTIFICATION SUBMITTAL TEMPLATE

- Indoor Adhesives, Sealants and Sealant Primer Products
- U.S. Gypsum: acoustical sealant
- Dow Corp.: acoustical sealant
- International Cellular Corp.: spray fireproofing
- Hilti Corp.: firestopping
- Design Polymetrics: duct sealant
- Johnsonite: floor tile adhesive
- Armstrong: flooring adhesive
- Shaw Industries: flooring adhesive
- Dow Corning: sealant
- Henkel Corp.: polyurethane adhesive

INDOOR PAINT & COATING PRODUCTS

- Sherwin-Williams: (Harmony) interior latex paint, primer and others

REGIONAL MATERIALS

- PPG: sand component of glass
- Tresca Bros. Concrete: concrete ready mix
- Aggregate Industries: bituminous top coat and binder coat
- Nucor Steel: reinforcing steel in precast panels
- Mittal Steel: wire mesh in precast panels
- Gerdau Steel and Nucor Steel: reinforcing steel
- Precast Specialties: precast concrete wall panels and light-pole bases
- Phoenix Precast: precast concrete drainage structures
- Canam Corp.: metal floor and roof deck
- Dietrich Corp: light-gauge framing
- WR Grace: spray fireproofing
- McNamara Corp.: reused crushed concrete/masonry
- Carlisle Syntec: roofing insulation
- Armstrong Corp.: acoustical ceiling grid
- State Road Cement Block: concrete masonry units
- Fletcher Granite Company: granite curbing
- Specialty Foundry Co.: cast-iron frames, grates, covers
- Concrete Systems Inc.: Vortech tanks
- Aggregate Industries: crushed stone
- Rinker Industries: water quality structures
- U.S. Gypsum: gypsum board
- Roxul Inch: insulation

CERTIFIED WOOD MATERIALS

- Marshfield: particle core (FSC content), composite lumber core and mineral core (recycled content)
- Columbia Forest Products: architectural millwork and core stock.
- Sterritt: wood blocking, plywood
- Rex Lumber: fire-rated blocking, solid cherry

RECYCLED CONTENT

- Oldcastle: aluminum curtain wall and storefront framing
- PPG Corp.: glass
- Dow Corp.: foundation insulation
- J Drain Ent.: foundation drain
- Tresca Corp.: concrete material mix
- Gerdau Ameristeel: reinforcing steel
- Aggregate Industries: bituminous paving asphalt binder and top coat
- Golden Aluminum: aluminum extrusions
- Centria Corp.: corrugated roof screen panels
- Nucor Corp.: reinforcing steel
- Mittal Corp.: wire mesh
- Precast Specialties: precast concrete wall panels
- BASF: Walltite spray foam insulation
- Canatal Corp.: structural steel beams and columns
- Canam Corp.: metal floor and roof decking
- Hong Jia Aluminum Co.: aluminum extrusions (support terra-cotta veneer)
- NBK Keramik GmbH & Co. KG: terra-cotta veneer tiles
- Dietrich Industries: light-guage steel framing behind veneer
- WR Grace: spray fireproofing
- Carlisle Corp./Syntec and Owens Corning: roof insulation
- Carlisle Corp. and Georgia Pacific: Dens Deck roof substrate
- Carlisle Syntec: roof insulation/substrate fasteners, roof membrane
- All Metals Corp.: Z furring at aluminum wall panels
- Alcoa Architectural: aluminum composite exterior wall panels
- Armstrong Corp.: acoustical ceiling grid and tile products (Ultima and Ceramaguard)
- Fontaine Inc.: hallow metal doors and frames
- Marshfield Door: wood doors
- Bobrick Washroom Acc.: bathroom accessories
- BASF Chemical Co.: Walltite foam insulation
- Specialty Foundry Co.: cast-iron grates and covers
- Ryan Iron Works: misc. metals package
- Concrete Systems Inc.: Vortech precast concrete
- Rinker Materials Corp.: water quality structures
- U.S. Gypsums: gypsum board
- Roxul Inc.: insulation
- Clark Western Building Systems: light-gauge steel structural framing
- Georgia Pacific: Dens Deck gypsum products.