

# A Hard Hat Tour of the Chesapeake Bay Foundation's Brock Environmental Center— Where the Design-Build Team is Taking Green Building to the Next Level With Net-Zero Water and Energy Use and Net-Zero Impact on the Environment

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*For this week's Guest Post Friday we welcome [Tara Chadbourn](#). Tara is a Principal of [PooleMahoney, PC](#), where she concentrates her practice in construction law, litigation and commercial litigation. Tara counsels contractors, subcontractors, owners and materials suppliers in various construction disputes. Tara has her LEED Green Associate credential and has worked over the past few years to incorporate sustainability issues into her construction law practice.*



I was fortunate to have the opportunity to attend a hard hat tour of the [Chesapeake Bay Foundation's Brock Environmental Center](#) ("Brock Center") two weeks ago as a guest of the [Virginia Beach Parks & Recreation Foundation](#) ("VBPRF"). The tour offered the City of Virginia Beach and VBPRF an opportunity to view progress at the site. The Brock Center construction site is located at the Pleasure House Point Natural Area, the last major undeveloped plot along the Lynnhaven River. Pleasure House Point was once slated for an 1,100 unit waterfront condominium development. Now, with the help of the Chesapeake Bay Foundation ("CBF"), the City of Virginia Beach, [The Trust for Public Land](#), VBPRF and many others, the site will host the most sustainable building in Virginia, if not the whole country. Upon completion this Fall, the Brock Center will serve as CBF's regional headquarters and house an educational facility and community meeting spaces.

The Brock Center is targeting LEED Platinum and Living Building Challenge Certification. This stimulating tour left me with some thoughts and questions for which I thank Musings for the opportunity to express.

Tour Overview: Christy Everett, CBF's Hampton Roads Director, Chris Brandt and Tyler Park of Hourigan Construction, and Billy Almond of WPL Site Design hosted the hard hat tour.

We toured the site following a brief presentation from CBF and the design-build team and a demonstration of the impressive 4-D Building Information Modeling ("BIM360") system.

In conformance with LEED's cradle-to-grave approach, the Brock Center site exhibits sustainability in all aspects of the construction phase. The tour began in the sustainably-operated construction site trailer. The trailer utilizes energy from solar panels and rainwater for the toilets. Likewise, equipment and tools onsite run on solar power. Through its heavy emphasis on BIM, the design-build team is making the project delivery as paperless as possible.

BIM Emphasis:

Hourigan Construction relies heavily upon BIM and requires its subcontractors to do the same. The contractors utilize onsite tablets to make field changes which are immediately incorporated into the 4-D BIM360 system. Similarly, as-built drawings are prepared digitally onsite and incorporated daily.

Hourigan goes a step further, however, with daily drone flights to record real-time data and images which are incorporated in the BIM system. With drones, the builder is not limited to images captured from a human photographer's vantage point. A drone can fly between girders, hover directly over areas of interest, and obtain much more data.

In the event a dispute ever arose as to defects in design or construction, there will be much more information available to the parties due to use of the 4-D BIM system than other design-build projects of the past.

During the tour, a member of the design-build team shared examples of how the BIM system has already caught gaps and field conflicts while they were still digital proposals, allowing the team to make design changes well before physical resources were committed. This results in cost-savings to all parties and minimizes or avoids schedule delays.

As an educational non-profit Owner, CBF also benefits from the use of BIM360 because it provides exciting material for use in environmental teaching programs and fundraising efforts necessary to pay for the facility. The owner will appreciate the BIM360 system even more during occupancy when it will help record data to ensure the building is performing optimally. The data can be used for submission for the Living Building Challenge certification after performance metrics are met for twelve consecutive months. The data can also be used when it comes time to re-certify for LEED Platinum years after completion.

Novel design-build issues :

The high level of collaboration among the design-build team was immediately apparent during the tour. This was probably because the team has been in the trenches together working through novel design-build issues. Despite a series of hurdles, the team spoke highly of its experiences with various City of Virginia Beach departments and other regulators in tackling issues that are not addressed, much less contemplated, in the existing building codes.

On site waste water treatment, green power generation, respect for the delicate surrounding environment, and a host of other progressive elements of this building required new approaches with regulatory bodies. The design-build team has one more hurdle before it which is obtaining Department of Health permit approval for its rain water capture and filtration system.

Sustainability Certification: Living Building Challenge and LEED Platinum:

Owner CBF wanted the project to not only achieve LEED Platinum certification, the highest rung in the LEED ladder, it also wanted a Living Building Challenge building.

The Living Building Challenge is the most advanced level of sustainability for the built environment. According to the design-build team, the Living Building Challenge is such a stringent certification that it makes LEED Platinum certification look (almost) easy. To be certified under the Living Building Challenge, projects must meet a series of seven ambitious performance requirements over a minimum of twelve (12) consecutive months of continuous occupancy. The certification is based upon actual performance and operations must be tracked and reported over the twelve-month period.

The certification requires that a building be so symbiotic with its site that it has a net-zero impact on the environment. The Center was designed to cause minimal site disturbance. The building's footprint will utilize about half an acre of the 118 acre Pleasure House Point natural area. Visitors and employees will

walk into the site to avoid use of impermeable materials at the site.

To meet the net-zero energy goal, the Center will be energy self-sufficient with solar panels and two (2) 10 kW wind turbines to generate all energy. The Center was designed and situated to take advantage of natural ventilation, daylighting and sunshading to further reduce energy demands. To satisfy the net-zero water usage requirement, there are large cisterns that collect rain which, after a complex filtration and treatment process, will satisfy all daily water usage for the site. All rainwater onsite is filtered and utilized. The stormwater system is designed to prevent any runoff into the adjacent creeks and the Chesapeake Bay. The building has only compost toilets to further reduce water demands.

Hearing Hourigan Construction's presentation, it appears the materials component of the Living Building Challenge is the most difficult. The building utilizes only recycled or sustainable and locally-sourced materials and resources. All lumber must be 100% Forest Stewardship Council certified. Per the Living Building Challenge certification, Hourigan Construction could not utilize any materials that contain components or chemicals that are on the "red list," which includes PVC, wood treatments containing Creosote, Arsenic or Pentachlorophenol, Chlorofluorocarbons (CFCs), Chloroprene (Neoprene), Formaldehyde (added), to name a few. As such, Hourigan Construction spends a lot of time researching and working through the materials requirement. Tyler Park, Quality Control Manager for Hourigan, stated he spends a lot of time specifically on addressing the "red list."

The stringency of the Living Building Challenge certification, atop of the LEED Platinum certification, raises interesting questions for contractual performance. The builder's major milestone for contractual performance is typically substantial completion. The builder's warranty obligations usually commence at that date. In the case of the Brock Center and other projects with lofty sustainability certification goals, what degree of responsibility might the builder have if the building fails to achieve a desired level of LEED certification? To what extent do subcontractors or material suppliers share such obligations through contractual pass-down clauses? What if the Owner has difficulty re-certifying the facility for LEED Platinum years later, when the warranty period has likely expired? The Living Building Challenge certification hinges upon the building meeting performance standards for twelve consecutive months after completion. The twelve month test period could have interesting implications on warranty periods and terms, and who is responsible if a month is missed or the building fails to attain certification. With an all-or-nothing certification like the Living Building Challenge, does a builder contractually guarantee certification or just agree to make best efforts? Does the owner receive recompense if Living Building certification is not attained?

I appreciate the unique opportunity CBF, Hourigan Construction, and other project members provided through the tour. It was a fascinating preview of cutting edge green design-build efforts in Virginia, including the need for forward-looking legal counsel on such projects.

Your comments on the above are welcome.

*As always, Tara and I welcome your comments below. Please [subscribe](#) to keep up with this and other [Guest Post Fridays](#) at [Construction Law Musings](#).*