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Energy-Saving, Moisture-Resistant XPS Insulation



Vegetative Roof Assembly

 **AUSTECH**



INNOVATIONS FOR LIVING®

Vegetative Roof Assemblies (VRA) are sprouting up all over and the U.S. Coast Guard Headquarters 300,000 sq. ft. VRA in Washington, DC, is a prime example. Clark Construction is leading the design/build effort in conjunction with PPSI, WDG Architecture as the architect of record for the roofing and HOK for the roofing vegetative components. PPSI was the sales representative for the roofing system including the Hanover® concrete unit pavers and Emseal expansion joints. The project includes an eleven-story office building which will provide 1.2 million sq. ft. for 3,860 employees, a separate central utility plant and two seven-story parking garages. The whole project is built into a hillside and the elevation changes 120 feet on the 176 acre site. The project is targeting a LEED® Gold certification.



This VRA project is targeting LEED® Gold certification.

The waterproofing/roofing system is 215 mils of the Henry Companies, 790-11, hot rubberized asphalt. According to William Pegues of WDG, "Hot rubberized asphalt is our preferred roofing membrane; it is a tried and true system that we did not have to think twice about." The original spec for the VRA included a single-source warranty by the primary waterproofing/roofing manufacturer. The project team decided to have the primary waterproofing/roofing manufacturer be responsible for the waterproofing system, and the roofing contractor be responsible for the vegetative components.



Crews installing hot rubberized asphalt.

Gordon Contracting of Capitol Heights, MD, is the roofing contractor on the project. Gordon Contracting has experience in self-performing the installation of the vegetative components on several other large projects, but on this project, they sub-contracted the supply and installation of the vegetative roof plants to the Tilson Group of Vienna, VA.

FOAMULAR® 404 & 604 extruded polystyrene (XPS) insulations were both used at the U.S. Coast Guard Headquarters and are specially designed for use in Protected Roof Membrane Assemblies (PRMA), where the insulation is placed directly over the membrane. The water resistance and compressive strength of FOAMULAR® XPS insulation provided the integrity needed for long-term roof performance at this building site.



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Media was pneumatically conveyed and blown on the roof in the 1st phase.

The VRA is being completed in three phases, the first phase was completed in late Fall of 2011. Due to the variety of plants ranging from shrubs, to grasses, to sedum mats, there are four different soil blends on the project. “The growing media”, or “engineered soil” specification was adjusted in order to reduce the loads to within the structural tolerances for the roof structure. Roofmeadow provided assistance in modifying the specification. While maintaining the intent of the design to support plants that demand a range of pH, moisture, organic matter and nutrient levels, Roofmeadow influenced the specification in order to conform with materials and methods familiar to the green roof industry. Most of the growing media is being hoisted by crane. However, because some of Gordon’s own crane schedule conflicts, the media was pneumatically conveyed and blown on the roof for the first phase.

The plants themselves provided two separate challenges. First, due to the large areas that need to be covered, it was difficult to complete the installation because of the prescribed planting installation seasons. Ed Snodgrass of Emory Knoll Farms was an instrumental consultant to HOK with the plant selection. Brandon Hartz of HOK explained that Ed’s expertise helped in two ways. First, Ed assessed and adjusted the vast plantings specified in the RFP. In doing so, HOK reduced the plant list by 1/3, removing plants that would not thrive on the roof. Secondly, with Ed’s knowledge of nurseries and nurserymen, HOK was able to select plants that could actually be grown and supplied to such an extensive roof.

The second challenge was the hot DC summers and ensuring the plants receive sufficient water during their establishment period. Gordon hired an irrigation contractor to install the specified drip irrigation and a comprehensive overhead irrigation system of their own design. Gordon did not feel that the drip system would be sufficient to protect the plants during the summer heat. The drip system utilizes gray water from a storm water wet pond, which, according to Brandon Hartz, was primarily intended to provide long-term water for the grasses, and shrubs planted in the deeps soils (12”-18”). Brandon explained further that the overhead sprinkler system is only intended to be used during the plants establishment period and will be removed 12 months after substantial completion in order to be in compliance with LEED®, since it uses potable water.



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Since the building is terraced into the hillside, it provided unique challenges and appealing solutions. HOK's landscape design intent was to allow all the offices that look over the DC skyline, to enjoy this view unobstructed by distractions such as mechanical equipment, and to be able to enjoy the vegetative roof. Hardy sedum mats are planted around the perimeter of most of the roofs. The effect of the sedum mats at the roof perimeter, provide a neat and tidy edge to the wilder grasses and shrubs in the mounded areas in the middle.

The long-term maintenance was given considerable thought. In addition to the very sustainable drip irrigation system utilizing on-site water, HOK worked with Clark to determine which parts of the roof would be least accessible, and thus most difficult to maintain. These roofs were planted exclusively with pre-grown sedum mats supplied by Sempergreen of Stevensburg, VA.



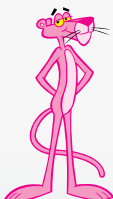
Sedum mats on the roof perimeter.



Roof planted exclusively with pre-grown sedum mats.

The project is scheduled to be complete in Q1 of 2013. Once complete, the 300,000 sq. ft. VRA will not only look great, but will also retain storm water that would otherwise combine with waste water that may bypass the Blue Plains Wastewater plant. Additionally, this VRA will help the project reach a LEED® Gold certification status.

Between this project and the City Center project, also in DC, the Henry Company has close to one million sq. ft. of VRA under construction in the DC market alone. VRA's have become a permanent part of the landscape and are certainly a growth niche in the industry. You can see more on the project at: <http://www.uscgproject.com/>.



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