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As sunlight rose across the Potomac River on September 23, 2011 it did not trace the typical blades of grass and ball fields in West Potomac Park that lay there seven days earlier. Instead the Sun unveiled the future of residential production through 19 fully constructed, functioning and sustainable houses. These houses were built by universities from around the world, and included designs from China, Belgium, New Zealand, Canada, Purdue, Ohio State, Tennessee and Appalachian State. Each university chosen had 20 months to fully design a house, acquire materials, construct it at a location close to the school, deconstruct the building, transport it, reconstruct in Washington, DC and have it fully functioning for a ten day non-stop competition. The competition, lasting September 23 – October 2, 2011, required each team to keep a precise comfort zone within the house, deliver hot water from fixtures at required temperatures, and have fully functioning appliances and home entertainment technology while having an appropriate balance of energy production from solar panels. Subjectively judged contests were on architecture, market appeal, engineering systems, communications and affordability. Overall these ten contests helped evaluate the practicality of each house, while showing new technologies and designs that help enhance the function, and reduce the environmental impact. This was all done while the public toured the homes each day. More than 350,000 individuals toured the houses over the course of the competition, and 21,000 of them visited Maryland's house. Maryland was the most experienced team during the year's 5th Solar Decathlon competition, with 4 previous entries.

Before any design work started, the team had to decide what the "message" would be; what information would be presented to the public surrounding the inspiration and purpose of the house. With the rising importance and awareness of the Chesapeake Bay given the impact of the surrounding population on the waterways; we decided our message would be focused on water use and conservation. The team progressed with this idea and designed systems to make them more efficient in their use and disposal of water, while achieving net zero energy consumption. The team chose the name WaterShed for the design.

The design process for WaterShed allowed for an interdisciplinary collaboration across campus from the very beginning, allowing for a stronger, more well-rounded message. The College of Architecture Planning & Preservation, Clark School of Engineering, and College of Agriculture & Natural Resources were all strongly dedicated to making this project a success. Over the course of the 22 month long project the design was refined, materials & products were procured, and the house was built and transported to Washington, DC for the official competition.

The overall house design integrated many engineered and architecturally designed features to increase the overall efficiency of the house. An example of this included the overhang of the roof, which allowed for reduced sun exposure throughout the day, decreasing the amount of energy needed to condition the space inside. Students from the respective fields worked closely to determine appropriate sizing through built mock-ups and computer modeling. WaterShed's design connected the homeowner to the surrounding environment physically and visually through the central water feature running through the axis of the house. This water feature had two main purposes, consisting of a treatment wetland that treated greywater used inside the house, and a stormwater catchment system for roof runoff. This allowed the natural cycle of water to be conserved and to have a secondary purpose through irrigation, unlike traditional practices. WaterShed's multi-scale ecosystem contributing to energy and water

management consisted of a vegetated green roof, vertical gardens (green wall), an edible garden, and the use of native plants for landscaping. Plants are more than landscaping, they are part of the house's living systems, which produce food and store, purify, and manage water. All of the house's living systems combined with the engineering systems and architectural design helped promote our message of water reuse and conservation. WaterShed mimics the cyclic nature of the Chesapeake Bay ecosystem, showing the public how the integration of these systems can improve efficiency and reduce the amount of resources needed.

This project has offered abundant learning opportunities for students all across campus. The team was able to incorporate material that they learned in class into an integrated physical application that was built and shown to the world through our finished working product. Going through this process of design and construction has opened numerous opportunities due to the interdisciplinary work and refinement of team work. WaterShed's victory in the 2011 Solar Decathlon showed not only each student's dedication to winning the competition, but also their commitment to improving the way we build our future. This learning experience gave myself and every other student working on this project knowledge we will use in future careers and memories we will never forget.

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