Specifier Q&A:

Carol Ruiz, P.E., MSCE

This issue, *Precast Solutions* hears from Carol Ruiz, P.E., MSCE, Principal and Project Manager at Gibbs & Olson.

What's your background and area of expertise?

I am a professional engineer specializing in transportation, site design and stormwater management. I graduated from Washington State University with a Bachelor of Science in Civil Engineering, followed two years later by a Master of Science in Civil Engineering. I began my career with a small firm in South Carolina that focused on transportation and site design, which became my area of design focus.

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What types of projects do you typically oversee?

My work includes projects for both private sector clients and public agencies. These projects typically involve site grading, utility service and stormwater design. Stormwater design elements include watershed analysis, closed system design and stormwater management. As a project manager, I regularly assist our clients with public involvement, utility design, franchise utility coordination and permitting, as well as provide state and federal funding assistance for local agencies.

I work on projects as small as a half-acre to larger watershed analysis projects involving hundreds of square miles. Many of the site development and transportation projects in Washington State must address stormwater requirements for treatment and detention. Washington State has some of the most stringent stormwater requirements in the country, and many municipalities have specific stormwater management codes

Gibbs & Olson chose a modular precast concrete stormwater detention system for a project in Vancouver, Wash. Precast overcame the site's challenges and stringent stormwater requirements.

for their communities to meet the state's requirements. This requires a unique approach for every project to address both water quality and flow control requirements, often with little available area on site to provide infrastructure to comply with these regulations.

What are some unique or noteworthy projects on which you specified precast concrete?

The ability to meet the requirements for flow control can be very challenging, particularly on site development projects in urban areas. Not only are we competing with available onsite area for treatment and detention, but often high groundwater and little elevation change for connecting to downstream discharge locations are additional challenges. For a recent housing project in the City of Vancouver, we were tasked with providing stormwater management for a 1.8-acre site that converted two-thirds of the site from undeveloped land into impervious surface. The remainder of the site was converted to landscaping, but the change in land use created a significant increase in runoff that required onsite stormwater storage.

The project included a three-story, 40-unit apartment complex with a significant area identified for parking and an entrance road, but also promised an area designated for residential gardening. These design elements left no room to provide treatment and detention in above-ground facilities, such as swales and detention ponds. Additionally, the site was identified as sensitive to ground movement, and therefore, infiltration of the runoff was not recommended for this site.

To address the stormwater treatment requirements for the site, runoff was directed to catch basins with specially designed filter media, before being conveyed to the underground detention facility. A concrete modular system was selected to provide the underground detention of the stormwater to meet the flow control requirements for the site. The facility is comprised of 92 modules (each module is 7-feet-wide-by-15-feet-long-by-3-feet-high) providing 31,000 cubic feet of storage.

How did precast concrete make that project a success?

The concrete modular block system provided an adaptable method to detain stormwater onsite given the multiple site constraints. These constraints included:

1) Providing a shallow detention system to accommodate discharge to the existing outlet elevation. The depth between the asphalt surface elevation and the top of detention facility is approximately 12-inches.
2) The area identified for underground detention was irregular in shape. The detention facility configuration needed to be variable to fit within the area available, wrapping around the proposed building foundation.
3) The installed system needed to withstand HS-20 traffic loading as a portion of the facility was located under the designated fire department turnaround area.

The installed precast concrete modular block system met all the above site constraints while still meeting stormwater detention requirements. Because the detention system was comprised of precast concrete units, the system was installed within two days. Additionally, the system allowed for connection to the treatment structures and the roof downspout drainpipe at any location along the perimeter of the structure.

How do you see precast concrete advancing as a building material?

Redevelopment continues to occur in urban settings, with little room for addressing the ever-increasing stormwater management requirements. Implementing underground detention facilities with precast structures provides a strong, accommodating and efficient method to meet local agency requirements for stormwater management. PS