Concrete curvature dam: This type of project measures the structural health and seasonal movement in a concrete curvature dam. An automated monitoring system was necessary due to the safety and structural health concerns of the dam structure and the length of the project (greater than five years). Daily measurements for multiple points over long distances were required and even though communications posed a challenge, an automated system was preferred to ensure repeatability of measurements over the lifetime of the structure and real-time alarming and notifications of movement.

1. Site size is 500m x 500m with 200+ points to be monitored
2. Permitting and time windows to access the site is limited.
3. Power and connectivity can be accessed from local dam infrastructure operations.
4. The expected movement is millimeter-level, but alarms should be raised when centimeter level movement is detected.
5. Measurements are required once per hour.
6. Movement is occurring from seasonal change causing stress in the dam structure.
7. The expected movement is millimeter-level per day or week.
8. The site provides a large footprint to install the proper targets and instruments for reliable measurements.
9. Data is required within a day of measurement for proper analysis.

No matter the project size, most construction sites will benefit from either a manual or automated monitoring system. Determine the ROI potential and discuss these options with a monitoring service subcontractor to help implement the right system for the project. If anything, the construction crew will be happy to have another layer of safety added to protect both them and the project.

STORMWATER DRAINAGE FOR EMERGENCY FIELD HOSPITAL CONSTRUCTION

AS PART OF NEW YORK STATE'S PLAN to add hospital beds to care for both non-coronavirus patients and those infected with COVID-19, the U.S. Army Corps of Engineers, along with local construction firms, erected temporary field hospitals using the campuses of two Long Island, New York colleges. At Stony Brook University, a $155 million, 255,700-square-foot, 1,038-bed facility built by Turner Construction Company is ready. Just 15 miles to the west is the completed 207,000-square-foot, $118 million, 1,022-bed unit at the State University at Old Westbury built by AECOM Technical Services, Inc. Work on each took three weeks. Both field hospitals were built on turf that would easily flood from roof runoff during even a medium rain event, making the stormwater control system a critical component.

"In order to accommodate the massive flow requirements for stormwater from the tent roofs, we used 12-inch double wall corrugated pipe to set up a drainage system from the gutters that we attached to the roof of each of the buildings," explained Josh Merrick, construction project manager for EAI, Inc. Environmental Management Services (Jersey City, NJ) at the Stony Brook site. "The majority of the pipe needed to be run under newly built ambulance roadways and into underground swales that were dug to handle the heavy stormwater flow without flooding the surrounding landscape. The system was designed to handle 1,230 gallons a minute."

The field hospital at Stony Brook University was completed in record time.
Photo: U.S. Army Corps of Engineers

More than 600 feet of pipe was used at each job. Runoff goes into several swales that contain the water and allows it to percolate into the ground.

The five buildings at Stony Brook are actually tents constructed of heavy-gauge vinyl that is stretched tight over the frame, which makes rain cascade faster. The largest is 140 feet by 300 feet long.

"We selected ADS N-12® pipe because we needed to handle more than 1,000 gallons a minute for our original design, which was to run all the pipes above ground as part of the gutter system to capture the flow of the entire roof's water. Due to the fast paced "design-on-the-fly" style urgency of the project, we ended up having to change the layout to accommodate the equipment of other trades. We had to completely redesign what we were building out there to make it all work together.

ADS N-12 pipe was used to convey rain water from the roofs of the field hospitals at Stony Brook and SUNY Old Westbury, New York.

Rain water is conveyed from the roof to gutters then to ADS N-12 pipe where it drains into swells.

The pipe gave us the flexibility to do that in the field, this system also gave us the ability to make above ground 90-degree connections to help route the piping around any obstacles around the tents."

According to Advanced Drainage Systems, Inc. (ADS) (NYSE: WMS), its N-12 pipe is certified to meet CAN/CSA Standard B182.8, BNQ 3624-120 plus AASHTO Load Resistance Factor Design (LRFD) specifications. ADS N-12 WT IB pipe meets ASTM watertight standards.

Because it is lightweight, ADS corrugated pipe can be easily handled with minimal equipment by a one or two-person crew. This benefit also allowed it to be installed differently than normal – a lot of runs basically used zip-ties to attach the pipe to the sides of the buildings. Some runs were 90-degree connections above ground. Due to the pipe's strength and its light weight, these methods were practical and successful.

Named for its excellent Manning's "n" rating of 0.012, the N-12 pipe was designed in 1987 by ADS specifically for culverts, storm sewers, highways, airports and other civil design construction and has been used in these applications ever since. ADS pipe is available in diameters from four to 60 inches.

"Speed and time were critical," commented William Maher, U. S. Army Corps of Engineers New York District's mission manager overseeing the project and coordinating with federal, state and local partners. "We met the challenge of building high-quality patient care facilities in a very short period of time."

"Everything came together fairly easily," Merrick stated. "The hardest part was coordinating with all the other trades because there was so much going on at one time. There were thousands of workers out there. We had about 30 guys doing the gutters and storm drainage and some other jobs that they fed us during the week we were there."

"The importance of having local, stocking dealers in the area to provide N-12 pipe cannot be stressed enough," stated Mike Kennedy, ADS sales representative for New York City and Long Island. "This is one of the quickest, fast-tracked jobs I've ever been involved with during my decades at ADS. These two field hospitals had to be started immediately and finished quickly. This was an emergency situation."

The ADS N-12 stormwater drainage pipe was run under roads and parking areas at the U.S. Army Corps of Engineers' Long Island, New York field hospitals.

Both field hospitals were fully operational in late April and are ready to accept patients if needed.

About the Company

Advanced Drainage Systems is a leading provider of innovative water management solutions in the stormwater and on-site septic wastewater industries, providing superior drainage solutions for use in the construction and agriculture marketplace. For over 50 years, the Company has been manufacturing a variety of innovative and environmentally friendly alternatives to traditional materials. Its innovative products are used across a broad range of end markets and applications, including non-residential, residential, infrastructure and agriculture applications. The Company has established a leading position in many of these end markets by leveraging its national sales and distribution platform, overall product breadth and scale and manufacturing excellence. Founded in 1966, the Company operates a global network of 63 manufacturing plants and 32 distribution centers. To learn more about the ADS, please visit the Company's website at www.ads-pipe.com.

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