



## Case Study

**application** | Site Drainage  
**location** | Philadelphia, PA  
**product** | Mirafi® G200N (52,000 sf)

**job owner**  
**engineer**  
**contractor**  
**date of installation**

**Children's Hospital of Philadelphia (CHOP)**  
**Terry Brennan, DPW Director**  
**EDA**  
**March 2012**

TenCate™ develops and produces materials that function to increase performance, reduce costs and deliver measurable results by working with our customers to provide advanced solutions.

### THE CHALLENGE

The Children's Hospital of Philadelphia (CHOP) is one of largest and oldest children's hospitals in the world and is ranked as the best children's hospital in the United States. As part of a major expansion, CHOP's newest facility, the Ambulatory Care Center, was being constructed at the west side of Schuylkill River at 34th St. and Civic Center Blvd. This is the old site of the Philadelphia Civic Center. When completed, the expansion will include a 5 story below grade parking garage with an ambulatory care center with outpatient services.

Because the new facility was being built within the footprint of the old Civic Center, the challenge was to maximize the available space while accounting for water seepage due to the high water table of the adjacent Schuylkill River.

### THE DESIGN

In order to accommodate the parking garage, a tied back wall was designed using steel H-piles and wood lagging to hold back the soil. The steel piles were spaced vertically at approximately 8' centers with wood lagging placed horizontally in between the piles. At lower depths the excavating contractor (EDA) encountered ledge. In order to create a smooth surface to attach TenCate Mirafi® G200N drainage composite, shotcrete was placed against the ledge.



Placing Mirafi® G-Series drainage composite against lagging.



Mirafi® G200N placed over shotcrete.

**THE CONSTRUCTION**

Once the steel piles were driven and the shotcrete was placed, EDA began installing Mirafi® G200N drainage composite. Starting at the bottom, with one man on the ground and two men on a scissor lift, Mirafi® G200N drainage composite was attached to the shotcrete and wood lagging using a pneumatic nail gun, placing concrete nails at 3' centers. Adjacent drainage panels were overlapped several inches.

After the drainage composite was attached, a rebar mat approximately 3" thick was placed over Mirafi® G200N. Then, the whole interior wall received a layer of shotcrete to create the interior walls of the parking garage.

**THE PERFORMANCE**

By incorporating Mirafi® G200N drainage composite, considerable amounts of space and construction time were saved compared to typical stone chimney drains. EDA Contractors was very pleased with the ease of installation and labor. The installation was flawless and it allowed EDA to finish their contract earlier than originally anticipated.



Placement of rebar mat to receive shotcrete.



Excavation for walls.



Placing shotcrete.

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