

# BATTLING WIND AND WATER

By Jodie Carter

**A** savvy contractor uses soil stabilization products to transform a useless bog into a tiered patio with amazing lakeside views.

Jim Hartwell, owner of Franklin Outdoor Services (FOS), a successful Burnsville, Minn. landscape contractor, prepared to bid on a high-end residential landscape project in Lakeville, Minnesota. Behind the home a steep slope dropped down to a private lake. Beautiful views of the lake could be had from the interior windows of the home, but the owners could not maximize use of their back yard for most of the year because the slope leading down to the lake was steep, and the soil closer to the lake was a saturated, marshy bog.

The homeowner wanted to create an outdoor patio space where they could sit outside, view the lake, and have access to walk down to the water. The main concern was water and wind erosion from the nearby lakeshore. Without sufficient reinforcement, native soils like these found in a marshy area will not “hold up” a patio and retaining walls, and both would certainly fail.

When this type of site condition exists, a soil stabilization fabric is typically chosen as a stable foundation for the base material. “We chose the SRW Products’ SS5 Soil Stabilization Fabric to create a stable base,” says Dale Wolf,



This patio area was previously a steep embankment leading down to a muddy lakeside bog. The new block patio allows this Minnesota homeowner to enjoy an up-close view of the lake with steps and a stone path leading almost down to the water's edge. The retaining walls utilize geogrid between each course of retaining wall block. The face of the blocks are glued to keep small debris from leaking through the space between blocks. Copper landscape lighting highlights the planting beds.

a supervisor at FOS. “We knew the bog would pose a big compaction problem; you couldn't even walk on it without your feet sinking in. There's no way to compact soil like that without reinforcement.”

## How Geogrids Work

Geogrids are composed of high molecular weight polyester yarns protected by a PVC coating. These yarns are woven into a stable interlocking grid that is resistant to biological

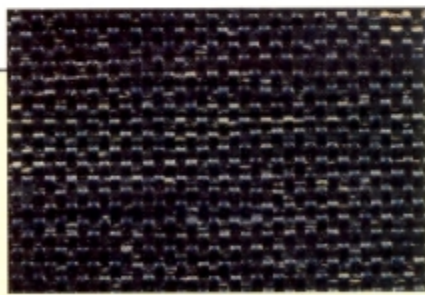
degradation and natural alkalais and acids found in soil. The product works by allowing interaction between the soil above and below the geogrid. The soil locks together and helps to develop strong pull-out resistance, increasing the stability of the wall. This makes geogrid the perfect soil reinforcement for patios, driveways, sidewalks, or roadways. In retaining wall stabilization it works because the geogrid won't plug up with fines and create a layer where water can collect.

## Building Blocks

**1 to 1 1/2:** Inches, the ideal thickness of the bed of course sands and fine screenings for use on paver projects.

**90:** Degrees to each other, the ideal placement of pavers to fit properly in a walkway or driveway project.

Source: Cap Brick



Right: A sample of the “SRW 5 Series” Geogrid used on the project. Left: A sample of the “SRW SS5” soil stabilization fabric (also known as a “200 lb. Woven Silt Film” in the industry).

Proper installation of geogrid on a curved block wall requires that one section of geogrid should never overlap another. For full coverage, stagger the placement of the geogrid on the next courses so that the few inches of gap not covered by the previous geogrid never line up with the gap allowed in subsequent layers.



**LEFT:** At the rear entry of a residence, contractors for Franklin Outdoor Services placed SRW Geogrid between each vertical section of block. A corrugated drainage channel surrounded by gravel ensures proper water drainage at the base of the wall. The geogrid is spread flat and runs the entire length and width of the wall.



**RIGHT:** When unrolled, SRW Geogrid spreads easily, and will not bind, allowing one person to spread and cut to fit. One laborer can spread and tamp each lift of base course using a gas-powered tamp. The base course is tamped before and after the geogrid is placed. The surface of the backfill should always be graded to direct water away from the wall. Drainage channels adjacent to the wall can also be used to intercept and divert surface water.

### Installing the Soil Stabilization Fabric

To transform the bog into a solid patio, Dale Wolf, the Franklin Outdoor Services supervisor on the project, prepped the site by clearing brush to level and smooth out the subgrade, removing any sharp objects, such as tree branches or large rocks, that could puncture the soil stabilization fabric. Next he placed SRW SS5 fabric over the entire area to be compacted. The fabric was pulled taut and secured with fabric staples, and where more than one piece of fabric is needed it overlaps by 18 inches to three feet. Class-five dirt was brought in as additional base material and compacted in two-inch lifts until the site was back up to grade. Bedding sand was spread to support the patio blocks.

### Installing the Geogrid

The next challenge was to create a double tier of six-foot retaining wall that would hold back soil from the steep slope leading up to the house. To prepare a base soil for the geogrid, Wolf removed all debris, including sticks and rocks, and the soil was

groomed with no dips or potholes. The geogrid was then laid horizontally back into the soil, measured it to fit the area, and cut to the desired length with a utility knife. Wolf made sure the geogrid was laid out smoothly without any folds. Folds become a problem when compacting a higher course of base material. The base pushes down on the folded geogrid causing tension, which helps hold soils in place. But folds in previous courses can allow the geogrid room to move, which gives the wall room to move as well. Wolf compacted the backfill soil to 95 percent standard proctor after each course as he completed vertical construction of the six-foot retaining wall.

The finished product exceeded the homeowner's expectations. Each retaining wall was planted with native plants, which assist with additional erosion control. Copper landscape down lights were placed to highlight the plantings on each wall. Where there was previously a boggy area, now there is a perfectly level patio with a small stone fire pit that offers the perfect space for outdoor leisure. The tiered retaining walls blend the gap perfectly between the natural surroundings of the lake and the vertical architecture of the home. **LCN**

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## Geogrid Installation Guidelines

1. Compact base soil to 95 percent standard proctor after each course. The compacted soil must be flat and level with the top of the retaining wall block. All heavy compacting machinery must be kept at least three feet away from the back of the retaining wall block.
2. Position the geogrid to the front of the block and over any type of connector. When working with walls over ten feet high, it's likely you will be using single-directional geogrid that needs to be placed with the strongest direction of the geogrid perpendicular to the wall facing. The geogrid should butt together at the edges. Make sure to not overlap one layer directly on top of another layer of geogrid because this will cause the geogrid to slide because it has no base material to hold onto. Staple the grid securely to the soil. If you are creating a curved wall, lay down the first geogrid, then cover it with at least two inches of sand, then lay the corner piece on top of the sand. Staple the grid securely to the soil. The sand will keep the geogrid from slipping.
3. Install the next course of block, then fill the cores of the block with crushed rock (if it applies to your retaining wall block).
4. When placing the backfill soil make sure to leave a void just behind the block for crushed rock. Then compact the backfill soil to 95 percent standard proctor. Always keep an adequate cushion of soil between the geogrid and equipment to avoid damaging the geogrid.
5. Place crushed rock for drainage in the 6 to 12-inch void between the block and compacted backfill soil. If the retaining wall requires more than one layer of geogrid, repeat steps one through five.