The Bridges of Indian Hill Club

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Aaron Becker, *Indain Hill Club*

As we enter the fall season at Indian Hill Club in Winnetka, Illinois, we welcome the opportunity to change pace. Crew members have taken on unique and specialized jobs to improve the golf course.

This past fall's mild weather and ground conditions provided the opportunity to take on two bridge reconstructions. These are bridges that provide access not only for carts on the course, but also for equipment we use throughout the golf season. In years past, during off season, we have replaced other bridges like these. In addition to providing a more stable and secure structure, we've also been able to use the same building materials and design, creating a uniform series of bridges throughout the golf course.

This past fall we replaced two bridges made of older, aged wood that was losing its integrity and stability. Both cross Indian Hill's main drainage ditch, which runs along or crosses seven different holes on the course. The new bridges were constructed of rough-edged white stones for the sidewalls. A galvanized steel pipe, six-feet in diameter, allows water to flow through. The galvanized steel pipe was ordered in lengths of 10 and 12 feet . The other materials included rough edged white stones (8-10" in width, varying lengths, and 3-4" in height), white masonry cement, concrete, and 2x6" lumber for the forms. We rented a mini excavator to dig the footers and for assistance with pipe placement

IHC rented a mini excavator to dig footers and properly place the pipes within the ditch.

The plywood in the forefront was used to temporarily damn the water. As the water rose, pumps were used to transer water to the low side of the ditch.

First, we had to temporarily slow and reduce the flow of water in the ditch. Thankfully, this year, the water level in the ditch didn't present a huge problem. We used sheets of plywood and steel stakes to dam any water that was present. The water that backed up against the dam was frequently pumped to the other side of the second dam to create a dry workspace. Our second step was to properly locate the bridge within the ditch. The first bridge was designed to be 10 feet wide. On each side of the ditch, we marked the width and set up string lines to ensure proper placement. Once we had the location painted, we also measured out three feet beyond the 10-foot mark on all four sides and marked that area. Our goal was to widen the bridge footers on the outside and inside of the stone sidewall to allow for a better working space. The only measurements left were to set up a level string-line across the ditch from the ground on each

side. We used this to determine how deep to excavate the ditch base to allow proper placement of the six-foot diameter pipe.

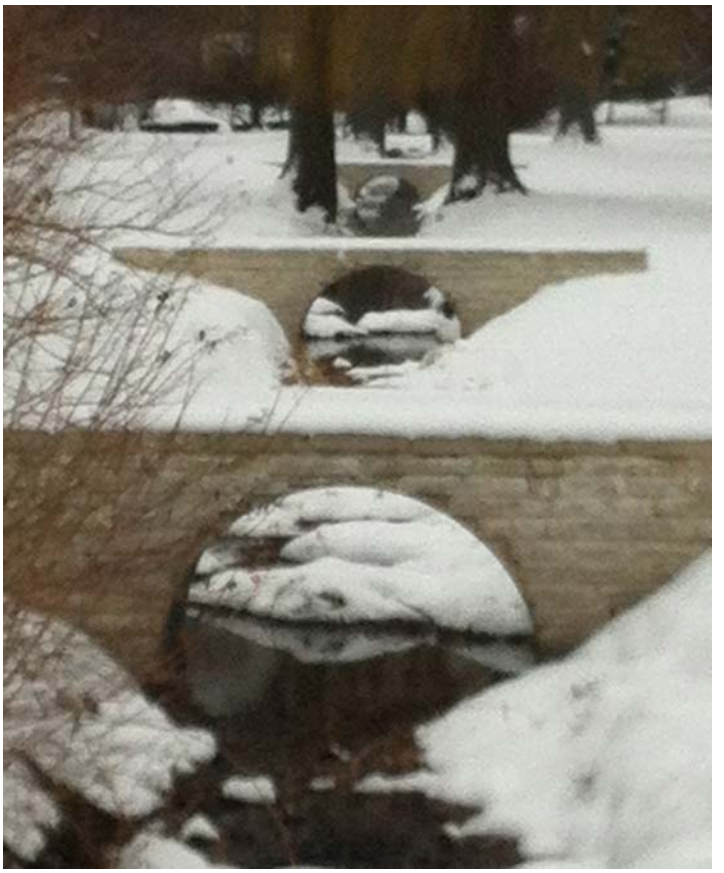
At this point, we were ready to begin digging. First, we excavated the ditch base. With the aid of a laser level, we removed enough soil along the ten-foot width where the pipe would sit. Once we had the pipe's location complete, we began digging each footer. Each footer was about five feet wide, which allowed enough room for workers to lay the stones into place. The bottom of each footer was excavated to the same level, which was established with the laser. This was the end of the major excavating. The next step was to place the pipe. The key here was to locate the pipe as accurately as possible on the side of the ditch. Once the pipe was set down, we measured off the ends to make sure we had our footers dug properly. The extra three feet dug beyond the ten foot length was also verified. Three workers pushed the pipe down the bank of the ditch into its final resting spot. Then, we set our string line up once again to make sure the pipe was at the correct depth in relation to both sides of the ditch. We also checked the pipe to ensure it was sitting level in the ditch.

After the pipe was set in the ditch and footers were poured, skilled staff members at Indian Hill Club began the stonework.

Next, we concentrated on each of the four footer regions. The fact that we were working below the grade of the ditch made for a messy workspace. To help create a solid and stable base, we added crushed gravel to the footers. Again, using the laser, we made sure all four footers were level, and we graded the gravel evenly. We were at the point where we could construct our forms from 2x6s. Concrete was poured into the forms to provide a base for the white stone.

After each bridge complete and backfilled, staff finished off the grade with crushed red stone to match the existing path work at IHC.

We allowed the concrete to dry overnight. We then removed the wood forms and began masonry work. At Indian Hill, we're fortunate to have several crew members who have brick-laying and stonework skills. Random-length white stones were put into place on one side of the bridge with two workers in each footer. At ground level, two additional men were preparing masonry cement and handing stones down. They worked efficiently, and the bridge took shape very quickly. Once the stones reached the correct level, the crew repeated the process and constructed the opposite side of the bridge.



With both sides of the stone bridge completed, the excavation was backfilled –both inside and outside the bridge walls. The soil was graded and compacted to match the ditch bank slope on the outside of the walls. The inside of the bridge was filled in around the pipe and graded to provide a subtle rise in the middle of the bridge, allowing proper runoff from rainfall. Crushed gravel was laid on top of the soil to establish near-finish grade. Once thoroughly compacted, we added crushed red rock material to finish and match our other bridge/cart path surfaces.

The bridge construction process at Indian Hill Club gives a uniform and attractive look to all of our crossings. The planning and labor are enjoyable components of our off-season. The feedback tells us that when course duties and weather slow down, taking on a task such as a stone bridge is quite rewarding. We're proud to share our story and our successes with in-house-managed off-season projects.