

Sediment Removed from Motor Mill by Larry A. Stone, CCCB Secretary



Photo by David Beck - Former Motor Mill intern Kiley Johansen examines the newly exposed bedrock in the Mill basement.

Visitors to Motor Mill, southeast of Elkader along the Turkey River, this fall will get a whole new perspective on the 150-year-old landmark. For the first time in a century, you can look into the cavernous basement to see the massive

stone footings, and wooden posts and beams that support the seven-story, limestone structure.

Workers from C. J. Moyna and Sons Construction, assisted by volunteers, recently toiled more than two weeks removing 50-plus truckloads of sediment that had accumulated in the building from years of Turkey River

flooding. In the process, they discovered the original four turbines that powered the gristmill from 1870 to 1883.



Motor Mill volunteer Chris Schoen and C. J. Moyna employee Andy Koehn admire one of four turbines unearthed from the Mill basement.

Earlier this year, when Motor Mill Foundation president John Nikolai asked John Moyna for

advice, Moyna concluded that this was no job for just amateur volunteers. Thus, he donated the time of his staff, and the use of his equipment, to help complete a project that the Motor Mill Foundation had only dreamed about.

To access the basement, Moyna supervisor Andy Koehn and assistant Bryan Willson first had to build a lane down from the adjacent Galaxy Road to the basement arches on the upstream side of Motor Mill. And once they began digging inside the mill, water seeped in from the Turkey River, requiring them to regularly add more rock to keep their machines from sinking into the mud.

Koehn used a mini-excavator to scoop up sediments, and to deftly scrape these materials away from the walls, bedrock ledge, and footings. But his work periodically was interrupted, as he had to wait for volunteers to use hand tools to scrape cross-sections of the 9-foot-deep sediments to record and photograph the deposits.

Chris Schoen of Garnavillo, a retired archeologist, documented the process. Schoen recorded the depth of

sediment, the size and location of the stone footings, the position of the turbines, the depth to bedrock, and the soil profiles of the complex layers of clay, silt and sand.

As Koehn peeled away sediments from the interior, Willson moved the material out of the building with a skid loader, then used a track hoe to scoop it into trucks furnished by the Clayton County Secondary Roads Department. When county trucks were not available, Moyna Materials workers came to the rescue. The material was dumped alongside the road to build up the shoulder north of the Motor Mill Historic Site. Koehn and Willson agreed that the challenge and



C. J. Moyna employees use a mini-excavator and skid loader inside the Motor Mill basement to remove sediment.



C. J. Moyna employee Bryan Willson digging in the mud to allow the removal of a turbine from the basement.

discoveries made the sediment removal more than just a routine earth-moving job. Like a sculptor, Koehn bit-by-bit chipped at the seemingly formless piles of dirt until he revealed the hidden post footings and turbine shafts.

Schoen said the project “was an opportunity to uncover information about how the basement foundation interfaced with the bedrock, the size and construction of the post footings . . . and the location of the turbines. The most significant results have been the discovery of four turbines,” he said.

The wooden turbines had 12-foot-tall hexagonal iron shafts. “The drum-shaped turbine heads are fashioned of wooden segments held together with wooden pegs, bands of metal, and iron bolts and nuts,” Schoen said.

Sediment Removed from Motor Mill (continued)

“They may represent some of the earliest turbine designs in the United States.”

Schoen previously had augured a series of test holes down into the sediments to assess the depth and character of the deposits and to search – unsuccessfully - for buried artifacts. Thus, finding the turbines now was a surprise. Motor historian David Beck of Elkader concluded from a search of diaries by Motor Mill co-owner James Crosby that they were Leffel turbines.

To power the turbines, water impounded by the mill dam, which was 100 feet upstream, flowed down a flume and through the archway into the mill, then dropped down into wooden cylinders around the drums, passed through and spun the turbines, then exited back into the river through vents under the mill wall. Each turbine sat on a spherical bearing, allowing it to turn freely.



Chris Schoen watches C. J. Moyna employees enter the basement arches to begin removing sediment from the Motor Mill Basement.

The workers were able to remove the first two turbines they found, despite them being buried in mud. The bed of the Turkey River apparently has gotten higher since the turbines were installed 150 years ago. Thus, water seeping in from the river constantly had to be pumped out to expose the turbine drum so a chain could be attached to



Retired archeologist Chris Schoen measures the sediment profile and the stone footings in the Motor Mill basement. Note exposed turbine shaft on right.

pull it from the mud with the track hoe.

One turbine, apparently intact, was left in the mill basement to show visitors where the turbines sat. Another turbine apparently was damaged long ago, leaving the shaft disconnected from the turbine drum. Only the shaft was removed, while the drum probably is buried under several feet of sediment.

The two turbines that were removed are temporarily being soaked in stock tanks of water to keep them from drying out and deteriorating after more than a century of being submerged in Turkey River mud and water. The goal is to stabilize the wooden drums so they can be exhibited. Motor Mill Foundation volunteers are constructing a viewing platform, which will be accessible from a stairway down from the main floor of the mill, so visitors can get a better feel for the construction and immensity of the structure. The Motor Mill Historic Site will be open for public tours from noon to 5 p.m. on Saturday, October 10.

For details, visit www.motormill.org. To arrange a group tour, call 563-245-1516.



Motor Mill Digital Photo Contest

Get outside and take some beautiful photos to enter in this year’s photography contest! There is plenty of time to get some amazing shots. The contest runs until January 19.

For details, visit www.ClaytonCountyConservation.org/News

Questions please email aharkrader@claytoncountyia.gov or call 563-245-1516