



Knowles Industrial Services Corporation



Knowles Industrial Services Corporation (Knowles) was established in 1971 after Arthur and Mary Ellen Knowles purchased Chick Construction, which was founded in 1924. During its early stages, Chick Construction specialized in stack and chimney repair in the pulp and paper industry, as well as church steeple rehabilitation. Since 1971, Knowles has become a known concrete repair and masonry restoration contractor in the Northeast. With operations located in Gorham, ME, Knowles serves the New

England region with a wide variety of specialty services such as shotcrete, concrete repair and waterproofing, masonry restoration, coatings and linings, pressure grouting, and resinous flooring.

KNOWLES TODAY

Knowles, now a 100% employee-owned company, was recognized as a pioneer of wet-mix shotcrete in New England in the early 1980s. With three professional engi-



Fig. 1: Dry-mix shotcrete repair on a paper mill stack (image from 1960s)



Fig. 3: In-house engineered structural reinforcement bar for a penstock shotcrete liner



Fig. 2: Scaffolding for Glory Hole Spillway



Fig. 4: Finished penstock shotcrete

neers and 13 ACI-certified nozzle men on staff, Knowles provides expertise for every project and takes pride in providing dry- and wet-mix shotcrete solutions for various applications. With a long history in stack rehabilitation and rigging, Knowles has the knowledge required to tackle hard-to-access projects with quality repair methods.

PORTFOLIO

Knowles has developed an extensive portfolio in repair and restoration of various structures, especially in the hydroelectric industry, including dams and spillways, penstocks, surge chambers, retaining walls and abutments, bridge piers, and culverts. Knowles has design-build capabilities for reinforced structural shotcrete liners for hydroelectric penstock rehabilitation. Reinforcing bar calculations and shotcrete mixture designs are catered to withstand all relevant hydrostatic pressures and shear/moment forces while promoting laminar flow and minimizing power generation losses from reduced cross-sectional areas.

STEVENSON DAM

In 2016, Knowles completed a 48,000 ft² (4500 m²) dry-mix shotcrete overlay on the spillway of Stevenson Dam, which is known as the largest dry-mix shotcrete project of its kind ever performed in New England. On this project, Knowles promoted the use of air-entrained dry-mix shotcrete in New England. Prior to the Stevenson Dam project, many New England-based engineering firms did not recognize the possibility of air-entrained dry-mix shotcrete. Knowles teamed up with various testing agencies to perform air void system (AVS) testing via ASTM C457/C457M to provide evidence of both air volume and consistency in air void spacing. After AVS testing was successfully completed and submitted, Knowles was awarded the contract for the work.

Beyond the requirement for air entrainment, Stevenson Dam presented several unique site challenges including long gunning distances, restricted access for ready mixed shotcrete, and elevated work on the 80 ft (24 m) spillway surface. Many placements were performed with a 2 in. (50 mm) shotcrete system at distances greater than 800 ft (240 m) from gunning operations. All elevated access was performed with a series of suspended scaffolding beds with integral electric cable climbers and skis that rode up and down the curved spillway surface (see Fig. 6).

KNOWLES TEAM

Knowles continues to be a leader in the shotcrete industry throughout New England, tackling projects of all sizes with a high level of knowledge and expertise. Knowles strives for 100% customer satisfaction and is always open to forming new working relationships and developing its work force with people who share these values. Knowles is also accepting applications for any nozzle men or gunmen interested in pursuing a shotcrete career in New England. Contact Knowles Industrial Services Corporation for more information.



Fig. 5: Dry-mix shotcrete application in hydro penstock



Fig. 6: Stevenson Dam Spillway resurfacing

KNOWLES INDUSTRIAL SERVICES CORPORATION

295 New Portland Road
Gorham, ME 04038

Phone: 207.854.1900

Fax: 207.854.4996

Website: www.knowlesindustrial.com

E-mail: broy@knowlesindustrial.com