This project was conducted to evaluate the environmental impact of use of Controlled Low Strength Materials (CLSM) incorporating industrial by-products (coal fly ash, and used foundry sand). CLSM reference mixtures were proportioned for strength levels in the range of 0.3 to 0.7 MPa (50 to 100 psi), at 28 days, using two sources of ASTM Class F fly ashes. For each reference mixture, other mixtures were proportioned using various by-products (e.g., foundry sand as a replacement of fly ash in the range of 30 to 85 percent).

The ingredients of the CLSM mixtures were tested for their physical and chemical properties, and leachate characteristics. The leachate results of the materials made with and without foundry sand were below the Enforcement Standard of the Wisconsin Department of Natural Resources (WDNR) Groundwater Quality Standard. They also met practically all the parameters of the Drinking Water Standards (DWS). The use of coal fly ash and used foundry sand in flowable CLSM mixtures provided favorable environmental impact in terms of maintaining drinking water and ground water quality standards. Addition of the foundry sand caused substantial reduction in concentration of the elements that are considered hazardous in accordance with WDNR Groundwater Quality Standard. Therefore, the use of by-products would provide favorable environmental impact.