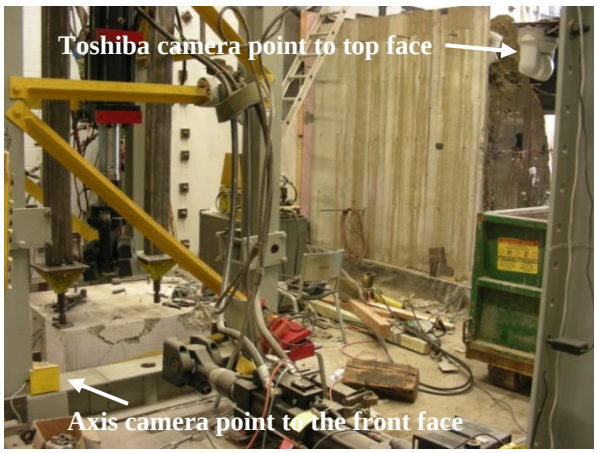
UWM EQUIPMENT AND FACILITIES

Structural Laboratory at the University of Wisconsin at Milwaukee (UWM): The MUST-SIM facility is not deemed optimal for the planned tests of single bars (anchors) and two-bar (two–anchor) groups because they require frequent reposition of the LBCB, which can greatly lengthen the test time; therefore, these tests will be conducted locally at UWM. Hydraulic actuators, data acquisition system, loading frames, and a small-scale remote participation system are available for the proposed research. Both Dr. Zhao and Dr. Thompson will have access to the UWM resources.

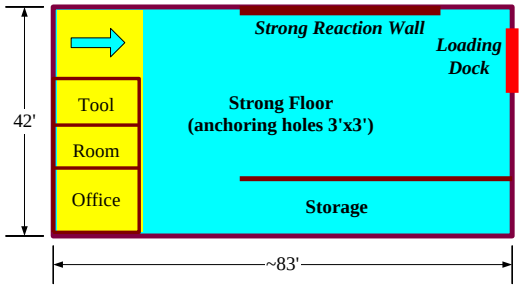
The Structural Laboratory

The University of Wisconsin-Milwaukee offers the latest state-of-the-art equipment and facilities to allow successful completion of all tasks of the proposed study. Extensive structural testing equipment and capabilities exist within the Structural Laboratory of the Department of Civil Engineering and Mechanics at UWM. The equipment is available for conducting the required experimental investigations with regards to load and durability testing of structures.



Structural Laboratory at the University of Wisconsin-Milwaukee

The Structural Laboratory at UWM, occupying 3,500 square feet, has a main structural test area 60 feet long and 40 feet wide, served by two overhead 10-ton-capacity cranes. Tie-down locations are provided at 3-ft spacing throughout the structural floor area. A load of 100,000 lbs. (tension or compression) can be applied at each tie-down point. The facility also includes a large reaction wall for application of horizontal loads. The necessary infrastructure is available for conducting a wide variety of complex research programs and/or structural and material tests, including a machine shop, a wood shop, an electronic shop, computer facilities, and experienced technicians. The Structural Laboratory at UWM began its activities in the 1970s.



A comprehensive range of static and fatigue-rated hydraulic actuators (up to 120 kip MTS), pumps (up to 70 GPM), universal testing machines (including Baldwin, Instron, and one 110 kip MTS), and servo-hydraulic test controllers allows the application of static, dynamic and fatigue loadings on specimens ranging from small test coupons to 60-ft-long bridge beams. One 110-kip and two 55-kip MTS servo-hydraulic actuators can be used for the proposed tests. Various types of sensors are available to measure structural response parameters. High-speed computer-controlled data acquisition systems are utilized to carry out tests. The facility is also equipped with other instrumentation such as oscilloscopes, signal generators, integrated circuits and electronics, as well as test specimen construction areas.

Concrete Laboratory

The Concrete Laboratory at UWM has been newly upgraded to offer testing equipment and capabilities for conducting the required experimental investigations with regards to high-strength/high-performance concrete. The 450-kips compression testing system with rapid-change platen mounting system allows the operator to mount a wide range of accessories to the frame for cylinder, cube, beam, and block specimen testing in full compliance with ASTM and AASHTO specifications. The automatic loading cycle of the machine is controlled by a closed-loop, microprocessor hydraulic system enclosed in the side mounted control and display console. A large backlit liquid crystal display system will provide the operator with a clear indication of the load being applied to the sample throughout the test cycle. This system will be equipped with platen assemblies to accommodate different specimens, distance pieces and will be connected to a computer for data acquisition and display of the results. Other concrete testing facilities include:

- *A 22.5kip flexural frame* to be attached to the hydraulic system of compression testing system.
- *Concrete preparation and a fresh properties test set* comprising of a pan mixer (for quality mixing, applicable to wide range of concrete mixtures. including fiber-reinforced and high strength/performance); a set of molds; a vibrating table; an electronic scale; slump and consistency apparatuses; appropriate handling tools; and safety glassware.
- *A cement testing set* comprising ASTM Vicat apparatus, Hobart mixer, molds for cube and prism specimens, autoclave, humidity cabinet, compression/flexural jig assemblies, electronic top loading balance, appropriate tools, and glassware.
- *An aggregates testing set* comprising buoyancy balance, sieve shaker with ASTM aggregate sieves, drying oven, muffle, electronic scale, appropriate tools, and glassware.

Other equipment available in the UWM Concrete Laboratory includes a 400-kip compression machine, rapid freezing and thawing machine, freezer room, frequency analysis machine, abrasion machine, chloride ion permeability test equipment, half-cell potential equipment, Figg water and air permeability test equipment, L.A. abrasive machine, laboratory bench mixer, 1/3 yd concrete mixer, and curing facilities.

Library Services

The Golda Meir Library at UWM provides an organized and accessible collection of relevant research and instructional materials, access to remote sources of information and data, and the physical and human resources required to satisfy the information needs of the university and urban communities, in support of the mission of the University of Wisconsin-Milwaukee as a Doctoral/Research University--Extensive. Total holdings have grown from 114,000 volumes in 1956 to over 4.5 million cataloged items today. Direct faculty participation in selecting materials has enhanced the growth of library collections. The strength of the holdings parallels the campus' doctoral programs in anthropology, biological sciences, chemistry, economics, education, engineering, English, geography, geosciences, management science, mathematics, nursing, physics, political science, psychology, urban education, and urban social institutions.