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## **CALIBRATION AND APPLICATION OF MONTANA TECH SHAKE TABLE APPARATUS**

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In the field of geotechnical engineering, a key task when designing earth structures is preparation for seismically induced loads. To directly study the impacts of these loads upon geologic structures, models or samples of the structures are tested with a seismic shake table, an apparatus that precisely accelerates back and forth according to a specific pattern. Montana Tech recently acquired a high quality, unique shake table, and this project was the first use of it. Initially, the table was installed and a booklet outlining its use and specifications created. With the table in use, the efficacy of its ability to model acceleration-induced loads was tested by subjecting a number of rock joint samples to seismic loads of varying intensity. The critical acceleration value, the value at which static friction is overcome, will then be identified and compared to other methods of frictional analysis such as tilt tests. The critical acceleration can be implemented into a calculation to find static coefficient of friction, as can a friction angle acquired from tilt tests of the same samples, allowing for direct comparison. Furthermore, samples subjected to sinusoidal wave patterns can also be compared to dynamically loaded discrete element models for further verification. This project itself is preliminary, but with this relationship proven, the application of the shake table can proliferate to more complex simulations such as liquefaction, structural fundamental frequencies, and complex earthquake time histories.