

# Seismic Testing of Anchor Failures on Unreinforced Masonry Buildings

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# Recent Progress

- This week progress was made on both the Anchor Testing as well as the photo evidence projects
- For the Anchor testing research project, another building was tested this week- concerning 20 existing anchors in a URM building in Auckland. These results will be part of the overall data collected from Christchurch and Whanganui that will altogether be analyzed once testing is completed.
- The testing device to test the existing plate anchors in Whanganui is in the process of being designed. After some basic structural analysis, we have calculated the forces and geometry that needed to be taken into account and have been referencing the New Zealand Safety Code for accurate measurements. Drawings of the device are shown below.
- A MATLAB program has been created to help organize and plot the results collected so far from Christchurch and Whanganui.
- Out of the 110 blocks in Christchurch, we have reviewed approximately 20 so far, with hopes to complete the project by the end of next week. These observations have been inputted and organized into a Database chart that will be useful in finding similarities among the Christchurch failures.

# Future Goals

The goals for the next week are as follows:

- To perfect the MATLAB code used to analyze our data, then apply this program to the new data collected from the Auckland testing this week. Along with this, presentation format should also be established- a way in which all these results will be shown in a clear and simple manner.
- To finalize the designs for the testing device that will be used in Whanganui, submitting the designs to the machine shop in hopes of starting to build the device sometime in the following week.
- To reach 75% completion on the photo sorting project, which will be about 80 blocks, about 400 buildings observed total.

# Successes and Road Blocks

- In this process, we have encountered a fair amount of road blocks in our research..
- Testing in the field is always a “trial-and-error” ordeal where you don’t exactly know what to expect until you actually get on site. This was clear in Whanganui when we arrived at the site and found the lack of lighting a prominent issue for testing. After running around the town, we managed to hire some flood lights for the week as well as a generator to power them!
- Overall the biggest predicament we came across in Whanganui was how to saturate the masonry enough before we installed the grout anchors. After trying a “squirtgun” technique, we opted to make our own watering device, composed of 8 separate tubes connected to a hose, which allowed us to plug up 8 different anchor holes with water at one time.
- Another prominent roadblock, that is more of a speedbump, is the difference in units in NZ compared to the States-imperial vs metric. It is just another step trying to remember to convert everything into meters rather than inches!
- Lastly, when designing the testing device, we had to refer to a different set of Construction Safety Codes, which was not difficult to find, but just another step in the design process that would not be needed in the States. It's been quite the experience designing according to a different country's safety factors.

# CULTURE!

Picnic in Albert Park

Spent a day in NewMarket exploring the various markets during the day and listening to some live jazz in the evening.

Bought tickets to see Kimbra, (an famous international singer, but originally from New Zealand) in concert!

Did some sketching in a café, where I chatted with a nice local (Henry)



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