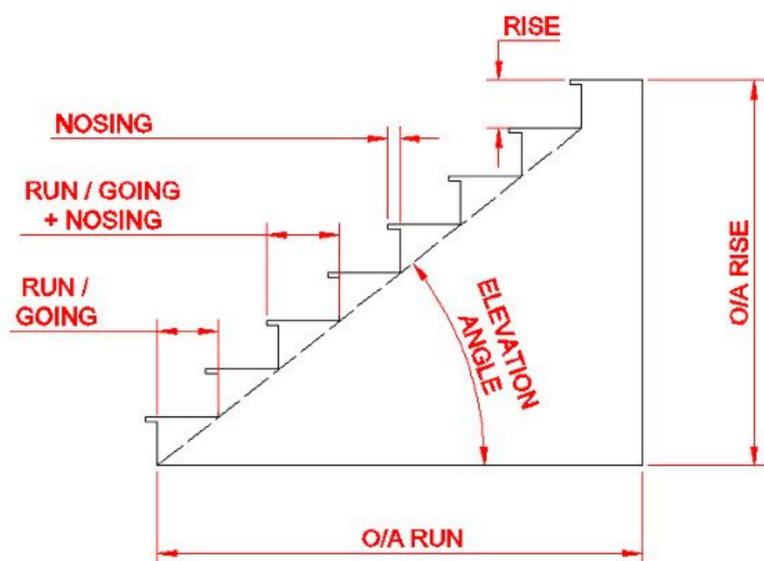# Modular Continuous Rail Stairlift

Project Description

- Mountain West Stairlifts currently uses surveying technology owned by Stannah Stairlifts. This survey method is tedious and can take over an hour to perform.
- To retrofit stairlifts, a new surveying method is needed. The survey must be accurate, simple, and reliable.
- There are three components of our deliverable: (1) Survey Instruments, (2) Survey Method, and (3) Python Code.

Design Description

- The survey stands consist of a sender, a receiver, and measuring instruments.
- The survey process is a detailed step-by-step guide of how to correctly use the survey stands.
- The code uses measurements obtained during the survey to calculate the average rise and run, elevation angle, and length of the staircase.

Performance Review

- After testing our survey method we found our survey accurately measured:
  - The length of the staircase within +/- 1%.
  - The elevation angle of the staircase within +/- 1°.
  - The average rise and run of the staircase within +/- 0.25".
- Time to survey straight staircases took an average of 10 minutes.
- The base of the survey stands are 9". This falls within the minimum stair tread depth of 9.5" per OSHA regulations.

Conclusion

The survey method drastically decreases the time it takes to obtain the measurements needed to retrofit stairlifts. The survey gives accurate measurements and Mountain West Stairlifts now has their own surveying technology.

Lessons Learned: Creating a prototype early on and improving upon the design iterations led to a better product. Communication within the group and with the client is critical for the success of the product.

Future Work: The next step is improving the code and adding filters to find suitable pieces of track in MWS' inventory. This will help streamline the retrofitting process.

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