

Senior Design Project Description

Company Name	<i>Lowe's Companies</i>	Date Submitted	<i>07/15/2020</i>
Project Title	<i>Design and Build of a Test Certification Station</i> (LOWES STATION)	Planned Starting Semester	Fall 2020

Personnel

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project.

Please provide your estimate of staffing in the below table. The Senior Design Committee will adjust as appropriate based on scope and discipline skills:

Discipline	Number	Discipline	Number
Mechanical	2	Electrical	2
Computer	1	Systems	
Other ()			

Company and Project Overview:

Lowe's Companies, Inc. (NYSE: LOW) is a FORTUNE® 50 home improvement company serving more than 18 million customers a week in the United States and Canada. With fiscal year 2019 sales of \$72.1 billion, Lowe's and its related businesses operate or service more than 2,200 home improvement and hardware stores and employ approximately 300,000 associates. This project is being requested by the Quality Assurance department of Lowe's. QA is responsible for several things including product compliance, performance, and safety, ethical sourcing, reducing product return rates, and customer satisfaction.

This project will design and build a test apparatus for evaluating furniture durability per UL.

Project Requirements:

As part of product design, testing and evaluation, Lowes Engineering and Quality Assurance labs need to test a variety of products that are sold in Lowes stores. This is especially important when it comes to Lowe's Private Brands and Patio Furniture.

During this project, the team will design and construct a PLC based cycle test apparatus capable of testing a swivel patio chair to BIFMA (Business + Institutional Furniture Manufacturers Association) standards for backrest durability. It will need to record force applied to the chair as well as chair displacement per cycle. A system that can perform seating durability to BIFMA standard while also recording seat displacement and adjusting the drop height as needed.

In addition to testing patio chairs it should also be reconfigurable so that it can be used as a large



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scale cycle tester so that other products can be evaluated including: folding mower handles, operating snow throwers, opening/closing cabinets, etc.

Expected Deliverables/Results:

- A cycle testing apparatus that is capable of backrest durability and seating durability
- A system that can record force applied and total displacement while performing backrest durability
- A system that can determine seating level displacement during the seating durability test and respond accordingly.
- Instruction manuals for use of the apparatus
- Troubleshooting/repair guide
- Complete parts list

Disposition of Deliverables at the End of the Project:

Equipment built as part of this project will be demonstrated at Expo, then returned to Lowe's at the conclusion.

List here any specific skills, requirements, specific courses, knowledge needed or suggested (If none please state none):

- Interest in PLC's, controls, feedback, displays, sensors and data logging.