



ETHOS

ETHOS Trip to Dominica Paige Lazar, Jason Levand, Caitlyn Ohradzansky Dominican Manufacturing Association

Abstract

This summer, the University of Dayton sent three engineering students to Dominica for ten weeks. The students partnered with Dominican Manufacturing Association and were assigned various projects based upon their major. One mechanical engineering student worked with Caribbean Agro Producers Company. A second mechanical engineering student worked with both Jolly's Manufacturing and Cape Tranto Coconut Products. And a civil engineering student worked with Carib Sand and Stone, government funded tropical storm relief housing project and McKenzie Architectural and Construction (MAC) Services Inc.



Figure 1: Students Exploring the Island with a Local Engineer

Introduction

Dominica is an island in the Caribbean, with a population of roughly 72,000. Roseau is the capital of Dominica and serves as the main hub for business and social interactions. In August 2016, Tropical Storm Erika struck Dominica which destroyed many factories, houses and roads. Because Dominica is a small island, there is limited access to affordable materials and resources needed to rebuild the island. Innovation, creativity and resourcefulness are vital in all aspects of the island's engineering and design.



Figure 2: Depiction of the Tropical Climate on the Island



Figure 3: Harvesting Coconuts for Coconut Oil Production

Projects & Results

Herb and Tea Drying
Ten weeks were spent at an herbal tea factory called Caribbean Argo Producers Co. Tasks included researching and developing designs for a small capacity high speed herb dryer, improving the efficiency of an existing high capacity herb dryer, and assisting in selecting and sourcing solar energy system components. The dryer designs and solar systems could not be assembled or tested during the immersion because of long shipping times for parts to reach the island. After the student left, the factory was positioned to assemble the solar energy system, install upgrades to the large capacity dryer and begin assembly of a low capacity dryer.



Figure 4: Caribbean Agro Producers Co. Employees

Manufacturing Quality
The first five weeks of the summer immersion was spent working in Jolly's Manufacturing, raising the factory's quality of production, writing technical reports, quality manuals, certificates of analysis and standard operating procedures and aided in the purchasing of a bottling machine to increase production efficiency. The second five weeks was spent working with coconut oil, experimenting with different production processes to measure what produces the highest yield.

Projects & Results

Anchor Design and Project Management
A preliminary concrete anchor system was designed for Carib Sand and Stone. Unfortunately, funding was not available for the proposed anchor project to proceed past the preliminary design. The role of project manager was observed for both the government funded housing project and MAC Services.



Figure 5: One of the Government Funded Tropical Storm Relief Housing Projects.

Recommendations

The students recommend future groups are assigned to a single project for the entire ten weeks. A group collaboration, focusing on one project, would produce higher quality results. Also, the island has a strong need for roadwork repair and waste management. There is a strong need for additional civil engineering work.

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