I-475 Reconstruction North Segment

Abstract:

In the capstone design course of University XXX's Department of Civil Engineering Bachelor of Science program, Civil Express proposes a reconfiguration of a 4,500 feet stretch of I-475 located in Flint, MI. The site will begin at the merge on and off E Stewart Avenue interchange lanes and extend to the E Pierson Road overpass. This proposal also encompasses the installation of a roundabout at the intersection between E Stewart Avenue and N Dort Highway. Another addition that the team proposes includes installing a community park space with a parking area and updated crosswalks on E Pierson Road near Horton Avenue. Lastly, this proposal incorporates the analysis, selection, and design of the I-475 overpass over N Dort Highway connecting to E Stewart Avenue.

This current I-475 location must be more robust and suitable for reduced community travel. By reducing lanes, I-475 will better match the overall level of service of the area and will lower future maintenance costs. With I-69 currently under construction, this project will maintain Michigan infrastructure improvements and create more job opportunities. A preliminary assessment of the infrastructure suggests that this stretch of I-475 has not seen any major reconstruction for at least a few decades.

This project's scope of work requires the expertise of all members of Civil Express, with sub-disciplinary focuses on construction, transportation, water resources, environmental, and structural engineering. The construction lead will develop the estimates, schedules, and project management plans. In addition, Civil Express's transportation lead will complete all traffic studies to help design the most efficient and safe designs. The structural lead will calculate all current and future loads when redesigning the North Dort Highway Overpass. Lastly, the environmental and water resources lead will complete all stormwater calculations to design the most efficient storm sewer systems and ensure that the current water central infrastructure and environments do not affect the highway reconfiguration.

Civil Express is proud to implement sustainability practices into every project component. The team will strive to reuse construction materials, reducing costs for waste and materials. In addition, the roundabout and park will both provide Low Impact Development to the environment.

The I-475 Reconstruction North Segment Project also focuses on the cultural impact, social impact, public health, safety, and welfare considerations for the Flint City area. The cultural identity for this I-475 Reconstruction Project is the City of Flint and its citizens. This project will impact the culture of Flint because it will help emphasize good social behaviors and activities.

The capstone design course students produced their projects under the supervision of eight (8) University XXX's faculty and licensed engineering professionals focused on engineering practices. Approximately twenty-seven (27) professionals have involved themselves in the capstone design course.

Civil Express student team members deliver engineering components while receiving professional criticism and further resources to enhance the overall project within the impacts of the Flint City area. The capstone design course has spanned two semesters. Major deliverables during this time include various presentations to faculty and engineering professionals, reports, meetings with student team members and faculty, and display board submittals that encourage engineering growth with students to produce professional academic work while earning valuable real-life knowledge in the Civil Engineering Field. Student members plan to expand further expertise by participating in the FE Exam the following year.