

**Click here to enter Program or Project Title
Progress Report – Click here to enter a date.**

Title: Assessment and Repair of Prestressed Bridge Girders Subjected to Over-height Truck Impacts Pooled Fund Project

Project Number: TR202011

Principal Investigator (PI): Mohamed ElGawady PhD (PI)

Co-PI(s): William Schonberg PhD, PE (Co-PI)

Award date:	1/1/2021		
Scheduled completion date:	12/31/2023	% of project completed to date:	16%
Total budget:	\$755,000	% of budget expended to date:	12%
Draft report due:	3/31/2021	Final report due:	12/1/2023

Provide a short description of the **work currently underway**.

Use [additional notes section](#) if you need to provide more information.

Task 1: Literature review. More work was added to the literature review section regarding full-scale testing and modeling of prestressed bridges. That will allow the team to pick one bridge for further analysis under impact loads.

Task 2. Experimental testing of bridge girders subjected to lateral impacts: The design of the test setup is completed. Purchase and manufacturing of the test setup has been started.

Task 5: Develop finite element models for the beams. The FE is being developed. A summary of the progress in this task is presented at the end of this report.

Task 6: Develop design recommendations for assessment and repair of bridge girders subjected to over-height vehicle impacts. An analytical method to assess the lateral strength of prestressed girders under impact loads is being developed. A summary of the progress in this task is presented at the end of this report.

Provide a short description of the **noteworthy activities/accomplishments** during this reporting period.

Use [additional notes section](#) if you need to provide more information.

Task 1: Literature review. This task was 50% completed. A draft report is included at the end of this report.

Task 2. Experimental testing of bridge girders subjected to lateral impacts: The design of the test setup has been completed. Different designs were considered and the different parts are acquired. See a summary of the work done so far at the end of this report.

Task 5: Develop finite element models for the beams. The FE is being developed and 30% of this task is completed. A summary of the progress in this task is presented at the end of this report. This task focuses on developing numerical models for isolated bridge girders as well as full bridge performance under impact loads. The FE models were created using LS-DYNA software. The FE model was previously developed to simulate the pre-damaged girder AASHTO type III tested experimentally by Gangi et al. (2018) under static loads. The FE model was verified in terms of the selected material types. Then, the verified model was implemented to validate the experimental test results of impacted prestressed concrete girder (PCG) at the University of Tennessee – Knoxville by Mitchell et al. (2015).

The FE model's continued development of the other prestressed bridge girders exhibiting impact loads by the FE model still in progress. This will allow for accurate structural static and dynamic analysis and PCG assessment during the service life undergoing impact damage from over-height vehicles.

Identify **issues or problems** that need to be addressed.

Four graduate students were hired for the project. However, due to COVID-19, only one arrived to the US, one obtained his visa, and the other two still struggle to get their visa. However, so far the project is still going as scheduled.

Use [additional notes section](#) if you need to provide more information.

Due to COVID working in the laboratory is slower than usual due to social distance.

Provides dates for when the **next progress report or presentation** due:
9/30/2021