**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:** | **83%** |
| **Total budget:** | **$**805,000 | **% of budget expended to date:** | **84%** |
| **Draft report due:** | **9/30/2023** | **Final report due:** | **12/1/2023** | |

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

*Use* [*additional notes section*](#bookmark=id.1t3h5sf) *if you need to provide more information.*

***Task 2. Experimental testing of bridge girders subjected to lateral impacts:***

* The 7th and 8th girders were tested. Both girders were tested with intermediate diaphragms

***Task 3. Determine the residual flexural and shear strengths of the damaged bridge girders***

* Girders 2 through 4 were tested under four pint bending. The girders are as follows:

G2: Sustained only minor impact damage and served as the baseline for comparison.

G3: Suffered severe mid-span damage, losing 3 of its 12 strands due to the impact.

G4: Experienced even more significant damage, with half of its strands (6 out of 12) severed.

***Task 5: Repair Evaluation:***

* Girders 5 and 6 are being repaired and prepared for flexural testing. Girder 5 are being repaired using strand splice and 6 using CFRP

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

*Use* [*additional notes section*](#bookmark=id.1t3h5sf) *if you need to provide more information.*

***Task 2. Experimental testing of bridge girders subjected to lateral impacts***

|  |  |
| --- | --- |
| A large metal beam in a warehouse  Description automatically generated | A large metal structure in a factory  Description automatically generated |
| Impact side | Back side |

Fig. 1. Testing girders 7 and 8 with intermediate diaphragm

***Task 3. Determine the residual flexural and shear strengths of the damaged bridge girders***

* The residual capacity of the damaged girders were determined using four point testing.

Table 1. Summary of damaged girders

|  |  |  |  |
| --- | --- | --- | --- |
| Girder | Number of severed strands | Level of damage | Damage classification per NCHRP 20-07/Task 307 |
| 2 | 0 | 0% | Minor |
| 3 | 3 | 25% | Severe III |
| 4 | 6 | 50% | Severe IV |

|  |
| --- |
| A black line drawing of a bench  Description automatically generated with medium confidence |
| A diagram of a machine  Description automatically generated  Hydraulic jack  Load cell |

*Fig. 2. Experimental test setup*

|  |
| --- |
| A large room with a large metal structure  Description automatically generated with medium confidence |
| A large metal machine in a factory  Description automatically generated |

*Fig.3 Testing of girder 2*

|  |
| --- |
| A person standing next to a large white wall  Description automatically generated |

Fig.4. Failure of girder 2

|  |  |
| --- | --- |
| A black and white drawing of a triangle  Description automatically generated | A large hole in a wall  Description automatically generated |
| Cross section showing loss of strands | Section along the girder showing strand loss (before flexural test) |

*Fig.5 Girder 3 with 25% strand loss*

|  |  |
| --- | --- |
| A broken concrete wall in a building  Description automatically generated | A yellow caution tape on a concrete wall  Description automatically generated |
| *Fig. 6. Failure of girder 3* | |

|  |  |
| --- | --- |
| A black and white image of a smoker  Description automatically generated | A hole in a wall  Description automatically generated |
| Cross section showing loss of strands | Section along the girder showing strand loss (before flexural test) |

|  |  |
| --- | --- |
| A large metal structure in a building  Description automatically generated | A large concrete beam in a building  Description automatically generated |
| *Fig.7. Failure of girder 4 at 72kips* | |