**TRANSPORTATION POOLED FUND PROGRAM**

**QUARTERLY PROGRESS & FINAL REPORT**

Date: 02/23/2017

Lead Agency (FHWA or State DOT): FHWA HIBS-20

**INSTRUCTIONS:**

*Project Managers and/or research project investigators should complete a quarterly progress report for each calendar quarter during which the projects are active. Please provide a project schedule status of the research activities tied to each task that is defined in the proposal; a percentage completion of each task; a concise discussion (2 or 3 sentences) of the current status, including accomplishments and problems encountered, if any. List all tasks, even if no work was done during this period.*

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| **Transportation Pooled Fund Program Project #**  *(i.e, SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX))*  TPF-5(202) | | **Transportation Pooled Fund Program - Report Period:**  **X** Quarter 1 (January 1 – March 31)  □Quarter 2 (April 1 – June 30)  □Quarter 3 (July 1 – September 30)  □Quarter 4 (October 1 – December 31) | |
| **Project Title:**  HY-8 Culvert Analysis Program – Phase Three of Development Efforts | | | |
| **Name of Project Manager(s):**  Brian Beucler | **Phone Number:**  202-366-4598 | | **E-Mail:**  brian.beucler@dot.gov |
| **Lead Agency Project ID:**  TASK T10-B03 | **Other Project ID (i.e., contract #):**  DTFH61-06-D-00017 | | **Project Start Date:**  September 21, 2010 |
| **Original Project End Date:**  December 31, 2012 (Original Tasks 1 – 13) | **Current Project End Date:**  December 31, 2016  (Additional AOP Task) | | **Number of Extensions:**  1 |

Project schedule status:

**X** On schedule **(Completed)** □ On revised schedule □ Ahead of schedule □ Behind schedule

Overall Project Statistics:

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| **Total Project Budget** | **Total Cost to Date for Project** | **Percentage of Work**  **Completed to Date** |
| $160,000.00 | $160,000.00 | 100% completed (The contract is  closed out.) |

***Quarterly*** Project Statistics:

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| **Total Project Expenses**  **and Percentage This Quarter** | **Total Amount of Funds**  **Expended This Quarter** | **Total Percentage of**  **Time Used to Date** |
| $0 invoiced | $0 invoiced | 100% (The AOP project task was completed in December of 2016.) |

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| **Project Description:**  The objective of this research effort was to continue the phased development of HY-8. The effort was funded by  FHWA and State DOT contributors (PFP members).    The scope of work consisted of continued development efforts on the HY-8 software (Phase  Three of the on-going development effort).    The project consisted of the tasks described below. Where possible, the tasks were developed concurrently. Some  tasks required technical review and approval by the technical panel before programming efforts were initiated.    Task 1 – Project Meetings (COMPLETED)  Task 2 – Enhance Source Code Efficiencies (COMPLETED)  Task 3 – Hydrograph Routing (NOT UNDERTAKEN IN THIS EFFORT – MAY BE INCLUDED IN A FUTURE CONTRACT)  Task 4 – Implement Hydraulic Jump (COMPLETED)  Task 5 – Implement Broken Back Culvert (COMPLETED)  Task 6 – Discharge Values Modification (COMPLETED)  Task 7 – Horizontal Culvert Barrels (COMPLETED)  Task 8 – Adversely Sloped Barrels (COMPLETED)  Task 9 – Flared End Sections (NOT UNDERTAKEN IN THIS EFFORT – MAY BE INCLUDED IN A FUTURE CONTRACT)  Task 10 – Concrete Open-Bottom Arches (COMPLETED)  Task 11 – South Dakota's Prefabricated Reinforced Concrete Box Culverts (COMPLETED)  Task 12 – Generic Culvert Type/Material – Embedded Circular Culverts (COMPLETED)  Task 13 – Maintenance (COMPLETED)  Additional Task – Implement Aquatic Organism Passage (AOP) Methodology (COMPLETED) |

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| **Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):**  The contract for Phase Three development efforts has been completed and closed out. Work completed since the last  progress report includes the following:  o Additional Task – Implement Aquatic Organism Passage (AOP) Methodology  o Task 13 – Maintenance  o HY-8 Help Files –  Notes and documentation about HY-8 Version 7.3 can be found on the Wiki help site:  <http://www.xmswiki.com/xms/WMS:HY-8> |
| **Anticipated work next quarter**:  The contract for Phase Three development efforts, resulting in HY-8 Version 7.3, was successfully completed, and the  software can be downloaded here: <http://www.fhwa.dot.gov/engineering/hydraulics/software/hy8/>. |
| **Significant Results:**  HY-8 Version 7.3 has been successfully completed and deployed to the public via a memorandum from HIBT-20 and  posting to the FHWA Hydraulic Engineering website. |

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| **Circumstance affecting project or budget. (Please describe any challenges encountered or anticipated that**  **might affect the completion of the project within the time, scope and fiscal constraints set forth in the**  **agreement, along with recommended solutions to those problems).**  None. |

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| **Potential Implementation:**    HY-8 is posted to the FHWA Hydraulic Engineering website and is being successfully utilized in NHI Course 135056,  Culvert Design to complete design workshops. State DOTs and other federal, state, local, and private entities are  downloading and using the new software for culvert analysis and design applications. |