MARYLAND DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ADMINISTRATION

MODIFIED INDEFINITE-DELIVERY/ INDEFINITE-QUANTITY TIME AND MATERIAL CONTRACTING METHOD

2022 ANNUAL REPORT JUNE 1, 2021 – June 30, 2022 FOR SEP-14 CONTRACTS

OFFICE OF STRUCTURES

EXECUTIVE SUMMARY

PURPOSE

This report documents Maryland Department of Transportation State Highway Administration (MDOT SHA) Office of Structures second year experiences with Federal Highway Administration (FHWA) experimental SEP-14 program using a Modified Indefinite-Delivery/ Indefinite-Quantity "Time and Material" Contracting Method (ID/IQ T&M). This method is summarized in Appendix A. This report actually covers a 13-month period to include the end of several of these contracts.

CRITERIA

As stated in Appendix A, MDOT SHA is tasked to analyze the measures below and documented them in this annual report:

- Reaction of contractors and industry to the use of this method on Federal-aid contracts.
- Compare the original engineer's task cost to actual contract task invoices.
- Quality of work through the final inspection process.
- Lessons learned and suggestions for improvements on future contracts.

CONTRACTORS AND INDUSTRY REACTION

MDOT SHA procured on 4 contracts in 2020 and all but one of these contracts ended in June 2022. A new set of SEP-14 contracts was procured in 2022. The first of these contracts had no bidding anomalies and the second was slightly over the expected engineer's estimate. This was due to an overall unexpected increase in wage rates. Despite the minor abnormalities in the bidding of these contracts, MDOT SHA believes that the construction industry is becoming accustom to and even welcomes this type of contracting.

ANALYSIS OF COMPLETED FEDERAL PROJECTS

All Federally funded tasks in these contracts were completed with a high quality of work. Since these contracts are based on paying the contractor for only the exact time and the actual materials used, the Office of Structure's inspectors require the highest quality materials and workmanship. In contrast, on traditional low bid type contracts, the contractor might meet only the minimum quality standard for materials and workmanship to increase their profit.
This high quality of the repairs helps to reduce the chance of repairing the same areas multiple times. This conforms to the Office of Structures motto: "Get in, get out, and stay out."

The high-quality repairs that these contracts produce can come at a higher cost. When comparing the engineer's estimate to the final cost, some tasks were completed within the engineer's estimate while others needed more funds. There were several reasons to justify these cost overruns. Some of these issues were related to a change in scope of work. In these cases, the needed repairs could not be fully designed until after they were started, and the extent of deterioration was discovered to be much greater than expected. The engineering team had to assess the findings and change the scope of repairs to address the full extent of the defect found. Other overruns were due to unforeseen weather conditions which resulted in flooding of worksites, redoing stream diversions, and/or causing delays in work schedules. In other cases, crews had to be moved off some jobs to address state funded emergencies at other locations leaving state funded charges for idle rented equipment onsite. While these overruns in the cost of these tasks appear high, MDOT SHA believes that they are still below what would have been paid on other more traditional contracts. Any of these

unexpected issues are much easier to negotiate with the contractor than when confronted with the same issues on a traditional contract.

LESSONS LEARNED

From June 1, 2021 to June 30 2022, MDOT SHA the many challenges from the previous year of these contracts have gotten better. The previous budget issues improved over the course of these contracts, the designers became more accustom to creating Federalized tasks for these contracts, and thus, the number of Federally completed tasks increased greatly toward the end of the original contracts.

While some conditions did improve, MDOT SHA's ability to complete all tasks with Federal funds continued to be reduced by several other factors. Several tasks were emergencies where Federal funds could not be used. State funds were also used on task where the scope (maintenance or design activities) or roadway classification prohibited Federal funds. Since the original set of contracts could not be extended, other tasks were started using Federally funds and needed to be completed under different contracts and tasks using states funds.
Lastly, there were many small dollar tasks that were considered priority tasks (not emergencies) where going through the process of obtaining Federal funds did not seem worth the effort. It is these tasks where MDOT SHA Office of Structures would like to seek an improvement in the process for Federal funds.

While all tasks went through the NEPA approval process, the biggest challenge remains obtaining Federal charge numbers for projects through the Plans, Specifications, and Estimate (PSE) submission to the Federal Aid Division postponed getting projects to construction and the subsequent process to obtain a Federal charge number. MDOT SHA found this process rather lengthy particularly in obtaining the charge numbers. The Office of Structures looks forward to continuing to improve this process to have more flexibility in these contracts as priorities change and new tasks are created.

INTRODUCTION

The Modified Indefinite-Delivery/ Indefinite-Quantity "Time and Material" Contracting Method (ID/IQ T&M) has now completed the second year of contracts. The two initial contracts that were procured and given Notice to Proceed in 2020 along with an additional contract with a Notice to Proceed in 2021 have now ended. Only one of the original four contracts is still active and will be ending in December 2022. To coincide with the ending of the first three contracts, this report documents a 13-month period from June 1, 2021 through June 30, 2022. A summary of the contract original four schedules is provided in the table below.

Table 1 – Original Contract Schedules

Milestone	Contract Number and Location			
	XX1635Q80 District 6 only	XX1635P80 Statewide	XX1635R80 Statewide & Drawbridges	XX1635S80 Statewide
Advertisement	02/18/2020	03/03/2020	09/22/2020	10/20/2020
Bid Opening	03/26/2020	04/09/2020	10/29/2020	12/03/2020
Notice to Proceed	06/01/2020	07/01/2020*	01/04/2021	4/21/2021*
Contract End Date	6/30/2022	06/30/2022	06/30/2022	12/31/2022

* The Notice to Proceed for these contracts were delayed due to budget constraints explained in the previous report.

As part of the original FHWA approved work plan for the ID/IQ T&M contracts, MDOT SHA has analyzed the measures below and documented them in this annual report:

- Reaction of contractors and industry to the use of this method on Federal-aid contracts.
- Compare the original engineer's task cost to actual contract task invoices.
- Quality of work through the final inspection process.
- Lessons learned and suggestions for improvements on future contracts.

In 2021, MDOT SHA in partnership with FHWA created a new SEP-14 work plan, and three additional contracts were or are being procured under it. A summary of these new contract schedules is provided in the table below.

Table 2 – New Contract Schedules

Milestone	Contract Number and Location		
	XX1635T80 Statewide	XX1635V80 District 6	XX1635W80 Statewide
Advertisement	03/08/2022	03/15/2022	08/30/2022*
Bid Opening	04/14/2022	04/21/2022	10/06/2022*
Notice to Proceed	06/21/2022	06/06/2022	12/12/2022*
Contract End Date	06/30/2024	06/30/2024	12/31/2024

* These are anticipated dates,

CONTRACTORS AND INDUSTRY REACTION

Overall, the Contractors and Industry reaction to this alternate contracting method was well received. The bidding history of the original four contracts was well documented in the 2021 annual report. Thus, this section will only focus on the bidding history of the two newest contracts that have received bids.

The number of responsive bidders received for each contract are listed below: XX1635T80 – 3 Bidders (Concrete General, M.D. Miller Marksmen Company, PDI-Sheetz) XX1635V80 – 2 Bidders (Harbel, Concrete General)

The table below shows the engineers estimate, low bidder amount, and the percent difference between these values for each contract.

Table 3 – Contract Bidding Amounts

	Contract Number and Location	
	XX1635T80 Statewide	XX1635V80 District 6
Engineers Estimate	$14,486,600.00	$3,782,650
Low Bid Amount	$14,085,947.80	$4,595,400
% Difference	2.77%	21.49%

When Contract XX1635T80 opened bids, there were no bidding anomalies as can be seen in the table above. The low bidder, Concrete General, was awarded the contract without any justification needed. MDOT SHA believes that this is a continuing sign that the industry is becoming accustom to and even welcomes this type of contract.

When contract XX1635V80 opened bids, the low bidder was over 20% above the engineer's estimate as can be seen in the table above. From discussions with the low bidder, Harbel, MDOT SHA discovered that the contractor wanted to increase their profit margin. They added that they were barely covering the costs in their current ID/IQ T&M contract XX1635Q80 and thus increased their bids for both skilled labor and foreman hourly rates. There were also some minor changes with items incidental to the labor items that led to higher-than-expected increases in cost. These changes were made to correct issues from the previous contracts.

Since these contracts (XX1635T80, XX1635V80, and XX1635W80) are under the new SEP-14 program, have not had more than a month or two of production, and have not completed a single task, they will not be further discussed in this report. These new SEP-14 contracts could not be possible without the dedicated staff at FHWA, and MDOT SHA is grateful for this dedication and the ability to continue to test this alternate contract method in partnership with FHWA.

CONTRACT BUDGET ISSUES

The 13 months documented in this report progressed much better than the first year of these contracts. By late 2021 and early 2022, many of the economic, environmental, and operational issues documented in the previous year's report started to become partial or fully resolved.

MDOT SHA is again extremely grateful for the partnership that was maintained with FHWA on these contracts.

While MDOT SHA expected to have 5 crews on each of the statewide contracts (XX1635P80, XX1635R80, and XX1635S80) and 2 crews on the District 6 contract (XX1635Q80), MDOT SHA had to reduce the number of crews at the beginning of each contract due to funding and budgeting issues caused by the COVID-19 pandemic. While not fully at the expected 5 crews at the end of each contract, the number of crews did increase over time. The reason the full 5 crews could not be achieved was due to the lack of available projects from slower than normal design efforts and lack of available employees in both the contracting and inspection side of construction. The list below shows how the number of crew grew from the start to the end of each contract.

XX1635Q80 – 1 crew in 2020 and up to 3 crews by 2022 XX1635P80 – 4 crews in 2020 and throughout most of the contract XX1635R80 – 2 crews in 2020 and up to 4 crews by 2022

XX1635S80 – 1 crew in 2021 and up to 4 crews by 2022

As of June 30, 2022, the overall status of the contracts is listed below. As can be seen in the chart below 2 of the 4 contracts were grossly behind in spending their allotted budget. This is because of budget constraints, issues related to creating Federal project in a timely manner, and overall personnel hiring issues both on the inspection and contractor side. The other contracts eventually caught up with the lotted time to get close to their spending limit. This state funded emergencies helped speed up their spending rates tremendously.

Table 4 – Contract Amounts on June 30, 2022

Costs	Contract Number and Location			
	XX1635Q80 District 6 only	XX1635P80 Statewide	XX1635R80 Statewide & Drawbridges	XX1635S80 Statewide
Total Bid Amount	$3,965,550	$14,219,757	$13,574,480	$14,070,570
Total Amount Spent	$3,735,518	$14,077,786	$5,866,647	$5,078,261
Percentage Spent	94.20%	99.00%	43.22%	36.09%
Total Calendar Days	730	730	564	620
Calendar Days Elapsed	730	730	564	469
Percentage of Time	100%	100%	100%	75.65%

STATE FUNDED EMERGENICES

From June 1, 2021 to June 30, 2022, MDOT SHA experienced several emergency projects where roads and/or lanes were closed (from auto accidents, storm damage, etc.) and needed to be reopened as soon as possible. Other emergencies include situations where public safety is major concern, and the necessary repairs cannot wait through a complete design process. In accordance with FHWA guidelines, these projects could not be completed with Federal funds. The table below shows all the 100% state funded emergency tasks.

Table 5 – State Funded Completed Emergencies

Contract	**Bridge No./ Job No.**	**Location Scope**	**Eng.'s Estimate (E) Final Amount (C)**	**Start Date (S) End Date (E)**
XX1635P80	1802400/ 17336	MD 244/POPLAR HILL CREEK Scour Repairs	$60,000(E) $64,498(C)	6/1/2021(S) 7/1/2021(E)
XX1635P80	1614406/ 24412	IS 95 OL/MD 450 Joint Repairs	$50,000(E) $49,215(C)	12/12/2021(S) 12/15/2021(E)
XX1635P80	12210X0/ 24804	Private drive @ MD161 Invert paving	$90,000(E) $63,814(C)	7/14/2021(S) 7/22/2021(E)
XX1635P80	N/A 24888	MD 274/DRAINAGE DITCH Invert paving	$60,000(E) $73,685(C)	11/2/2021(S) 11/11/2021(E)
XX1635P80	13154X0/ 24891	US 40/TRIB OF HUDSON BR Pipe Repairs	$35,000(E) $34,565(C)	11/4/2021(S) 11/16/2021(E)

Contract	Bridge No./ Job No.	Location Scope	Eng.'s Estimate (E) Final Amount (C)	Start Date (S) End Date (E)
XX1635P80	1614306/ 24975	IS 95 OL/GOOD LUCK RD Fatigue Cracks	$10,000(E) $3,453(C)	2/24/2022(S) 2/24/2022(E)
XX1635Q80	1101503/ 24826	IS 68 EBR/ YOUGHIOGHENY R Joint Repairs	$7,000(E) $2,866(C)	8/3/2021(S) 8/3/2021(E)
XX1635Q80	1103803/ 24858	IS 68 EBR / MAPLE ST & BEAR CR Bridge Approach Repairs	$6,000(E) $7,566(C)	10/14/2021(S) 10/18/2021(E)
XX1635Q80	2112703/ 24944	IS 70 EB/BEAVER CREEK Joint Repairs	$10,000(E) $3,781(C)	1/27/2022(S) 1/27/2022(E)
XX1635Q80	111504/ 24984	IS 68 WBR/MD 55 MOT for Design Activates	$5,000(E) $3,156(C)	2/23/2022(S) 2/23/2022(E)
XX1635Q80	111504/ 25039	IS 68 WBR/MD 55 Install Fencing on Parapets	$350,000(E) $161,249(C)	4/4/2022(S) 7/14/2022(E)*
XX1635Q80	111503/ 25038	IS 68 EBR/MD RTE 55 Install Fencing on Parapets	$330,000(E) $254,983(C)	4/4/2022(S) 7/14/2022(E)*
XX1635Q80	01108R0/ 25080	MD-36/NBR NEW HOPE ROAD Retaining Wall repair	$10,000(E) $11,213(C)	4/7/2022(S) 4/11/2022(E)
XX1635R80	14044X0/ 20339	MD 290/DRAINAGE @ MP 0.15 Partial Pipe Replacement	$64,000(E) $145,372(C)	9/9/2021(S) 9/29/2021(E)
XX1635R80	07100X0/ 24800	MD 222/TR OF SUSQUEHANNA Clean pipe	$10,000(E) $17,353(C)	7/27/2021(S) 7/28/2021(E)
XX1635R80	1514200/ 24862	IS 495 RAMP/ CLARA BARTON PY Joint Repairs	$15,000(E) $7,414(C)	11/4/2021(S) 5/13/2022(E)
XX1635R80	2302100/ 25073	RT 90/ASSAWOMAN Railing Repairs	$5,000(E) $2,100(C)	3/29/2022(S) 3/29/2022(E)
XX1635S80	324301/ 24720	IS95/ CSX, PATAPSCO, RIVER RD Joint Repairs	$56,000(E) $71,892(C)	5/3/2021(S) 5/17/2021(E)
XX1635S80	324302/ 24721	IS95/CSX, PATAPSCO, RIVER RD Joint Repairs	$80,000(E) $95,027(C)	5/17/2021(S) 6/14/2021(E)
XX1635S80	207500/ 24812	MD 174/AMTRAK Deck Overlay	$40,000(E) $92,351(C)	8/9/2021(S) 8/23/2021(E)
XX1635S80	208504/ 24848	MD 100 WBR/OAKWOOD ROAD Slope & Misc. Repairs	$10,000(E) $12,659(C)	9/21/2021(S) 9/23/2021(E)
XX1635S80	701804/ 24917	US 40 WBR/LITTLE ELK CREEK Concrete and Joint Repairs	$26,000(E) $36,187(C)	2/2/2022(S) 3/1/2022(E)
XX1635S80	201802/ 24945	MD 295 /AMTRAK & STONY RUN Bearing Repairs	$5,000(E) $2,769(C)	1/21/2022(S) 1/21/2022(E)
XX1635S80	1309400/ 24961	MD 94/IS 70 Remove loose Debris	$12,000(E) $20,382(C)	2/8/2022(S) 2/14/2022(E)
XX1635S80	1616100/ 25001	FORESTVILLE RD/IS 95 Fatigue Cracks	$10,000(E) $10,156(C)	3/9/2022(S) 3/10/2022(E)
XX1635S80	311400/ 25077	IS 695/AMTRAK,US 1,LEEDS AVE Joint Repairs	$18,000(E) $19,869(C)	4/1/2022(S) 4/2/2022(E)

*These two projects finished after the close of contract XX1635R80 and were paid under a separate state funded task on a newer contract. These issue of completing tasks under different contacts is further explained in this report.

It is important to note, when comparing the engineer's estimate to the actual money spent for 100% state funded emergency projects, there might be a wide difference in the cost. Since the tasks are created only a day or two after the emergency occurred, these types of projects are not fully designed when construction starts. Thus, the initial estimate is just an educated guess until the entire extent of the damages can be realized and designed.

Typically, for these type of emergency projects, the contractors are not asked for estimate and schedules, and the designers do not re-evaluate their initial estimate. The work is unknown at the start of construction, and the contractor focus their attention obtaining the necessary equipment and materials needed to open the roadway as quickly as possible. Likewise, the designers are focused mostly on getting the roadways open to traffic as well. Estimates are only re-evaluated on projects that last more than three or four months, and the durations of these emergencies are normally less.

OTHER STATE FUNDED PROJECTS

There were other priority tasks (not emergencies) that were state funded because MDOT SHA wanted them completed before Federal funds could be approved. These types of tasks generally had a low cost (generally under $25,000) associated with them and were not completely developed through the FHWA process to save time to start the work as soon as possible. The timing issues with obtaining Federal funds versus using 100% state funds is further discussed in the "Lessons Learned" section of this report. If the process for obtaining Federal charge numbers for these tasks is not improved, these smaller type projects could potentially be completed under 100% state funded contracts in the future. Since MDOT SHA did not have any 100% state funded contracts between June 2020 and April 2022, there was no other contract available to complete this priority work.

Table 6 – State Funded Completed Priority Projects

Contract	Bridge No./ Job No.	Location Scope	Eng.'s Estimate (E) Final Amount (C)	Start Date (S) End Date (E)
XX1635P80	1012704/ 24483	IS 70 WBR/HOLLOW ROAD Steel Repairs	$5,000(E) $2,501(C)	12/7/2021(S) 12/7/2021(E)
XX1635P80	1011700/ 24517	ST MARKS RD/US 340 Steel Repairs	$10,000(E) $6,493(C)	12/21/2021(S) 1/4/2022(E)
XX1635P80	1304802/ 24785	US 29 SBR/IS 70 Concrete Repairs	$15,000(E) $8,643(C)	5/27/2021(S) 6/2/2021(E)
XX1635P80	1614405/ 24854	IS 95 IL/MD 450 Joint Repairs	$15,000(E) $8,297(C)	12/15/2021(S) 12/17/2021(E)
XX1635P80	600200/ 24861	MD 26/LIBERTY RESERVOIR Steel Repairs	$7,500(E) $3,478(C)	10/22/2021(S) 10/22/2021(E)
XX1635Q80	110600/ 23834	IS 68/MD 658 Fatigue Cracks	$10,000(E) $2,312(C)	12/9/2020(S) 12/9/2020(E)
XX1635Q80	2104300/ 24500	US 522/POTOMAC,WM RR,MU 30 Fatigue Cracks	$10,000(E) $5,881(C)	12/13/2021(S) 12/13/2021(E)
XX1635Q80	2111004/ 24755	IS 70 WBR/CSX TRANSPORTATION Fatigue Cracks	$5,000(E) $6,212(C)	12/11/2021(S) 12/11/2021(E)

Contract	Bridge No./ Job No.	Location Scope	Eng.'s Estimate (E) Final Amount (C)	Start Date (S) End Date (E)
XX1635Q80	2111003/ 24756	IS 70 EBR/CSX TRANSPORTATION Fatigue Cracks	$10,000(E) $3,766(C)	12/11/2021(S) 12/11/2021(E)
XX1635Q80	104700/ 24813	MD 51/TOWN CREEK Steel Repairs	$12,000(E) $11,424(C)	7/28/2021(S) 8/3/2021(E)
XX1635Q80	2110004/ 25086	IS 70 WBR/ASHTON ROAD Fatigue Cracks	$10,000(E) $992(C)	6/21/2022(S) 6/22/2022(E)
XX1635R80	14083X0/ 20954	MD 298/BR OF VRIEVILLE LAKE Invert paving	$20,000(E) $8,902(C)	5/1/2021(S) 5/26/2021(E)
XX1635R80	1701000/ 23789	US 50/US 301 Leak Repair	$5,000(E) $3,877(C)	9/15/2021(S) 9/15/2021(E)
XX1635R80	02170XO/ 24308	MD 170/BR OF STONEY RUN Pipe repairs	$10,000(E) $680(C)	10/15/2021(S) 10/15/2021(E)
XX1635R80	1510100/ 24404	IS 495/CLARA BARTON PKWY EBR Joint Repairs	$30,000(E) $36,101(C)	5/1/2022(S) 5/12/2022(E)
XX1635R80	336500/ 24681	MD 157/BEAR CREEK Movable Bridge Repairs	$10,000(E) $56,848(C)	4/26/2021(S) 5/18/2021(E)
XX1635R80	20042X0/ 24682	MD 328/Branch of Turkey Creek Concrete Pipe Repairs	$7,500(E) $4,108(C)	5/19/2021(S) 6/16/2021(E)
XX1635R80	204500/ 24683	MD 173/STONEY CREEK Movable Bridge Repairs	$10,000(E) $9,747(C)	5/18/2021(S) 5/21/2021(E)
XX1635R80	23052X0/ 24723	MD 12/Drainage Ditch Pipe repairs	$10,000(E) $10,738(C)	9/28/2021(S) 9/30/2021(E)
XX1635R80	900100/ 24803	MD 14/MARSHYHOPE CREEK Navigation Lighting	$25,000(E) $26,617(C)	1/21/2022(S) 4/7/2022(E)
XX1635R80	336500/ 24914	MD 157/BEAR CREEK Scupper Repairs	$10,000(E) $11,898(C)	1/6/2022(S) 1/6/2022(E)
XX1635R80	324301/ 24973	IS 95 NB/CSX PATAPSCO RVR RD Joint Repairs	$14,000(E) $17,645(C)	4/21/2022(S) 4/25/2022(E)
XX1635R80	324302/ 24974	IS 95 SB/CSX PATAPSCO RVR RD Joint Repairs	$20,000(E) $20,185(C)	4/21/2022(S) 4/25/2022(E)
XX1635S80	06145X0/ 22512	MD 832/TRIB OF MEADOW BR Pipe repairs	$20,000(E) $12,757(C)	10/8/2021(S) 10/13/2021(E)
XX1635S80	314900/ 24289	IS-695/GREENSPRING AVE Fatigue Cracks	$2,500(E) $3,519(C)	11/16/2021(S) 11/16/2021(E)
XX1635S80	1007602/ 24614	IS 270 SBR/BAKER VALLEY RD Fatigue Cracks	$5,000(E) $3,697(C)	11/12/2021(S) 11/12/2021(E)
XX1635S80	16181X0/ 24748	MD-373/BR OF MATTAWOMAN CR Pipe repairs	$7,000(E) $16,157(C)	11/2/2021(S) 11/8/2021(E)
XX1635S80	327605/ 24926	MD 695 IL/AMTRAK Scupper Repairs	$25,000(E) $10,197(C)	1/27/2022(S) 1/28/2022(E)

Since all tasks were under $200,000 and took less than 3 months to complete, the contractor did not submit an estimate and schedule, nor did the designers re-evaluate their estimates.

There were several other state funded projects that completed work between June 1, 2021 and June 30, 2022. Many of these projects were not eligible for Federal funds because the scope of work was for a maintenance

or design and not eligible for Federal funds as a rehabilitation or preventative maintenance activity. Other structures were located on a roadway whose classification was not Federal eligible.

The table below shows all completed non-emergency projects where state funds were used.

Table 7 – Other Completed State Funded Tasks

Contract	Bridge No./ Job No.	Location Scope	Eng.'s Estimate (E) Final Amount (C)	Start Date (S) End Date (E)
XX1635S80	1002504/ 24871	MD 26 WBR/MONOCACY RIVER MOT for Design Activities**	$2,500(E) $3,216(C)	10/29/2021(S) 10/29/2021(E)
XX1635S80	1501100/ 25088	MD 97/HAWLINGS RIVER Deck Cores**	$3,000(E) $3,033(C)	5/16/2022(S) 5/16/2022(E)
XX1635R80	1402700/ 24775	MD 213/CHESTER RIVER Tender house repairs**	$88,000(E) $75,563(C)	4/25/2022(S) 4/28/2022(E)
XX1635R80	314600/ 24835	MD 140/IS 695 Bridge Sign Installation**	$6,000(E) $6,709(C)	11/3/2021(S) 11/4/2021(E)
XX1635R80	1617305/ 24875	I-495/I-95 IL/POTOMAC RIVER WWB Maintenance**	N/A $411,084(C)	N/A
XX1635R80	1617306/ 24876	I-495/I-95 OL/POTOMAC RIVER WWB Maintenance**	N/A $385,080(C)	N/A
XX1635R80	208100/ 23916	MD 436/WEEMS CREEK Movable Bridge Maintenance**	N/A $69,558(C)	N/A
XX1635P80	21090X0/ 11741	MD 144/TRIB OF POTOMAC RIVER Invert paving^	$170,000(E) $144,398(C)	12/22/2021(S) 2/21/2022(E)
XX1635P80	329006/ 23561	MD 695 OL/NS RR, MORSE LANE Steel Repairs***	$40,000(E) $29,721(C)	3/5/2020(S) 4/13/2020(E)
XX1635P80	329005/ 23600	MD 695 IL/NS RR, MORSE LANE Steel Repairs***	$40,000(E) $29,721(C)	3/4/2020(S) 4/13/2020(E)
XX1635Q80	1101700/ 22898	MD 135/CSX TRANSPORTATION Concrete & Steel Repairs***	$450,000(E) $182,139(C)	2/5/2021(S) 5/21/2021(E)
XX1635P80	06053X0/ 24757	MD 852/Turkeyfoot Run Headwall Repairs*	$145,000(E) $153,202(C)	11/23/2021(S) 1/14/2022(E)
XX1635R80	1401300/ 19555	MD 290/CHESTER RIVER Steel Repairs*	$144,040(E) $151,463(C)	11/4/2021(S) 3/24/2022(E)
XX1635R80	14079XO/ 21307	MD 445/BRANCH OF SWAN CREEK Pipe Replacement*	$265,000(E) $253,692(C)	11/12/2021(S) 12/21/2021(E)
XX1635R80	1802600/ 23875	MD 249/ST GEORGES CREEK Pile Jackets*	$846,000(E) $795,260(C)	11/23/2021(S) 6/9/2022(E)
XX1635R80	N/A/ 21223	Material Surplus Cost^^	N/A $14,556(C)	N/A
XX1635S80	N/A/ 21223	Material Surplus Cost^^	N/A $19,260(C)	N/A
XX1635P80	N/A/ 21223	Material Surplus Cost^^	N/A $84,047(C)	N/A

*These bridges are not eligible for Federal funds due to the roadway classification. As can be seen in the chart above, 2 of the 4 tasks in this category went overbudget.

**Tasks are not eligible for Federal funds due to the scope of work (design/maintenance activities). While it is very rare that certain design activities were included in these contracts, similar future design type tasks will most likely occur under 100% state funded contracts.

Since MDOT SHA did not have any 100% state funded contracts between June 2020 and April 2022, there was no other contract available to complete this work. It should also be noted that maintenance activities typically do not include an engineer's estimates or start and end dates because the work is ongoing throughout the duration of the contract.

Two task of note in this category were for maintenance of the I-495/95 bridges over the Potomac River, better known as the Woodrow Wilson Bridge (WWB). In the Fall of 2021, the contractor maintaining the WWB under a different maintenance contract went out of business. The only contract with a movable bridge repair scope and enough funding to take over this task in this emergency situation was contract XX1635R80. Thus, it was used with state funds until a new contractor could be provided by the bonding company of the maintenance contact.

*** These tasks were started with state funds and then switched to another task for Federal funds. The reason they were started with Federal funds at the beginning of the task was to keep the crews working. See explanation in the lessons learned about keeping crews busy with fulltime work.

^ This task was completed with state funds because there were right-of-way issues that prevented Federal funds from being used. See section about Right-of-way issues in the lessons learned section of this report.

^^ These tasks are not for Federal funds due to the scope of work. Each of the statewide contracts has a task to store surplus materials that are purchased for particular task but are deemed leftover and not needed. MDOT SHA collects and stores these materials at their maintenance shops for use on future tasks. The state funded item is also used to inventory and clean up the maintenance shops of this material. It should also be noted that these activities typically do not include an engineer's estimate or start and end dates because the work is ongoing throughout the duration of the contract.

For instance, the contractor may only need 52 linear feet a stabilization matting but is required by the manufacturer to buy an entire standard roll that comes in 60-foot lengths. The contractor most likely can't return the unused material to the manufacturer for a partial refund. In a traditional design-bid-build contract, the contractor would probably keep or discard this material on their own and MDOT would not be involved. Additionally, the contractor would account for the extra purchased material in their bid cost for the stabilization matting. However, the stabilization matting material is paid under the general material item in the ID/IQ T&M contracts. Since the contractor cannot account for it before they submit their bids, MDOT SHA is required to pay the contractor for the entire roll when it is purchased.

Thus, MDOT SHA keeps the surplus material for the use on future projects since they now own the material. This also has the benefit of reducing costs for this material on future tasks.

FEDERAL FUNDED PROJECTS

As stated previously, MDOT SHA is very grateful to FHWA for the opportunity to demonstrate the ID/IQ T&M contracts using Federal funds. As opposed to the issues reported in the 2021 report, MDOT SHA designers have fully adjusted their design processes to secure Federal funds for various tasks in these open-ended contracts. This adjustment, along with the improved economy and budget, has led to far more Federal projects being completed than the first year of these contracts.

The completed Federally funded tasks are summarized below. A task with only one estimate means that the estimate was never revised throughout the duration of the task. If there are two engineer's estimates, the one

with the asterisk (E*) is the initial estimate when the task was initially created and the one without the asterisk (E) is the final estimate after it was revised during the construction of the task.

Table 8 – Completed Federally Funded Tasks

Contract	Bridge No./ Job No.	Location Scope	Eng.'s Estimate (E) Final Amount (C)	Start Date (S) End Date (E)
			$42,000(E*)	
	12115X0/	MD 24/JACK'S RUN	$75,000(E)	9/13/2021(S)
XX1635P80	3299	Pipe repairs	$45,086(C)	9/27/2021(E)
	315000/	IS 695/SLAUGHTERHOUSE BR	$46,000(E)	6/14/2021(S)
XX1635P80	7663	Scour & Concrete Repairs	$56,360(C)	7/13/2021(E)
			$150,000(E*)	
	02165X0/	MD 170/BR OF STONEY RUN	$259,300(E)	10/19/2021(S)
XX1635P80	11536	Invert paving	$270,458(C)	2/11/2022(E)
	03187X0/	MD 146/SPRING BRANCH	$141,000(E)	7/6/2021(S)
XX1635P80	13356	Scour Repairs	$202,684(C)	9/14/2021(E)
	12093X0/	MD 543/TRIB OF BROAD CREEK	$143,200(E)	1/18/2022(S)
XX1635P80	17368	Invert paving	$199,685(C)	3/3/2022(E)
	1303600/	MD 94/CABIN BRANCH	$140,000(E)	7/8/2021(S)
XX1635P80	18141	Concrete & Scour Repairs	$170,170(C)	12/9/2021(E)
	03035X0/	MD 130/Trib of Jones Falls	$87,000(E)	5/17/2021(S)
XX1635P80	20327	Invert paving	$84,425(C)	6/14/2021(E)
	303800/	US 40/CSX TRANSPORTATION	$97,000(E)	2/14/2022(S)
XX1635P80	20769	Slope & Misc. Repairs	$91,847(C)	3/15/2022(E)
	16111X0/	US 50/Tributary Beaver Dam Cr	$233,000(E)	6/15/2021(S)
XX1635P80	22782	Invert paving	$227,344(C)	9/10/2021(E)
	13025X0/	MD 108 / TRIB OF L PATUXENT R	$97,025(E)	10/5/2021(S)
XX1635P80	22986	Scour Repairs	$64,079(C)	10/26/2021(E)
	15406X0/	MD 355/TRIB TO ROCK CREEK	$15,000(E)	12/8/2021(S)
XX1635P80	23872	Masonry Repair	$6,580(C)	12/20/2021(E)
	1620003/	MD 198 EBR/IS 95	$10,000(E)	10/21/2021(S)
XX1635P80	24350	Joint Repairs	$5,463(C)	10/22/2021(E)
	1504800/	MD 28/IS 270	$74,000(E)	9/20/2021(S)
XX1635P80	24418	Concrete Repairs	$92,278(C)	10/15/2021(E)
	12151X0/	US 40/TRIB. TO GASHEYS CREEK	$170,000(E)	7/12/2021(S)
XX1635P80	24549	Scour & Concrete Repairs	$256,480(C)	10/15/2021(E)
	329005/	MD 695 IL NS RR, MORSE LANE	$85,000(E)	10/28/2021(S)
XX1635P80	24568	Steel Repairs	$53,270(C)	11/22/2021(E)
	329006/	MD 695 OL/NS RR, MORSE LANE	$85,000(E)	9/27/2021(S)
XX1635P80	24569	Steel Repairs	$106,608(C)	11/11/2021(E)
	1801300/	MD 6/PERSIMMON CREEK	$2,398,880(E)	2/24/2021(S)
XX1635P80	24701	Bridge Replacement**	$3,397,895(C)	7/1/2021(E)
	209205/	I-695 IL/MD 170, MTA, Holly Cr	$45,000(E)	8/1/2021(S)
XX1635P80	24745	Concrete and Joint Repairs	$55,713(C)	8/4/2021(E)
			$281,000(E*)	
	2109800/	BIG SPRING RD/IS 70	$530,000(E)	1/11/2022(S)
XX1635Q80	13352	Concrete & Bearing Repairs	$672,788(C)	6/30/2022(E)
	21176X0/	MD 494/Br of Rockdale Run	$30,000(E)	4/5/2022(S)
XX1635Q80	18270	Headwall Repairs	$34,613(C)	4/26/2022(E)

Contract	Bridge No./ Job No.	Location Scope	Eng.'s Estimate (E) Final Amount (C)	Start Date (S) End Date (E)
XX1635Q80	2101700/ 21331	US 40/Little Beaver Creek Concrete & Scour Repairs	$90,000(E) $80,682(C)	9/7/2021(S) 10/15/2021(E)
XX1635Q80	11057X0/ 21459	MD 560/Tributary of Glade Run Invert paving	$133,500(E*) $183,500(E) $185,580(C)	5/20/2021(S) 1/12/2022(E)
XX1635Q80	2113103/ 21528	IS 70 EBR/MD 66 Concrete & Steel Repairs	$190,000(E) $100,564(C)	12/13/2021(S) 4/4/2022(E)
XX1635Q80	21016X0/ 23431	MD 58/Tributary to Troup Run Invert paving	$119,000(E) $107,583(C)	1/20/2022(S) 2/24/2022(E)
XX1635Q80	2105301/ 23731	IS 81 NBR/MAUGANS AVE Steel & Bearing Repairs	$66,260(E) $17,332(C)	11/16/2021(S) 12/13/2021(E)
XX1635Q80	2100300/ 23823	MD 34/ANTIETAM CREEK Joint Repairs	$18,000(E) $23,403(C)	5/10/2022(S) 5/12/2022(E)
XX1635Q80	11007X0/ 24039	US 40 ALT/TWO MILE RUN Invert paving	$149,000(E) $120,234(C)	5/16/2022(S) 6/14/2022(E)
XX1635Q80	111703/ 24168	IS 68 EBR/MD 53 Joint & Concrete Repairs	$38,000(E) $61,424(C)	10/26/2021(S) 12/8/2021(E)
XX1635Q80	111704/ 24169	IS 68 WBR/MD 53 Joint & Concrete Repairs	$33,000(E) $52,854(C)	11/3/2021(S) 12/10/2021(E)
XX1635Q80	2111703/ 24327	IS 70 EBR/NORFOLK SOUTHERN R Joint Repairs	$34,000(E) $23,750(C)	3/22/2022(S) 6/30/2022(E)
XX1635Q80	2105302/ 24490	IS 81 SBR/MAUGANS AVE Bearing & Steel Repairs	$63,560(E) $14,388(C)	11/16/2021(S) 12/14/2021(E)
XX1635Q80	1101700/ 24787	MD 135/CSX Transportation Concrete & Steel Repairs	$300,000(E) $340,029(C)	6/14/2021(S) 10/14/2021(E)
XX1635R80	1207700/ 4192	MD 543/IS 95 Joint Seals & Slope Repairs	$63,750(E) $58,595(C)	11/4/2021(S) 5/31/2022(E)
XX1635R80	207100/ 7947	MD 450/COLLEGE CREEK Joint Seals	$25,000(E) $27,329(C)	6/13/2022(S) 6/17/2022(E)
XX1635R80	214100/ 15299	MD 3C/IS 97 Joint Repairs	$38,100(E) $33,302(C)	11/4/2021(S) 6/9/2022(E)
XX1635R80	07114X0/ 16159	US 1/TRIB OF SUSQUEHANNA R Scour Repairs	$34,000(E) $18,551(C)	9/24/2021(S) 9/30/2021(E)
XX1635R80	07124X0/ 17242	MD 276/TRIB OF BASIN RUN Invert paving	$301,000(E) $294,825(C)	8/16/2021(S) 9/14/2021(E)
XX1635R80	2203301/ 17402	US 13 NBR/US 50 Bearing Repairs	$61,000(E) $38,971(C)	11/19/2021(S) 2/23/2022(E)
XX1635R80	14072X0/ 18147	MD 298/BR OF FAIRLEE CRK Invert paving	$47,000(E) $75,352(C)	10/8/2021(S) 11/1/2021(E)
XX1635R80	17071X0/ 19154	MD544@MP9/TRIB CHESTER RVR Scour Repairs	$37,000(E) $12,470(C)	2/14/2022(S) 2/15/2022(E)
XX1635R80	19006X0/ 19155	MD 363/TRIB OF HALL BRANCH Invert paving	$95,000(E*) $155,000(E) $163,652(C)	9/7/2021(S) 9/23/2021(E)
XX1635R80	2200103/ 20704	US 50 EBR/POCOMOKE RIVER Steel Repairs	$325,000(E) $188,032(C)	1/14/2022(S) 6/30/2022(E)

Contract	Bridge No./ Job No.	Location Scope	Eng.'s Estimate (E) Final Amount (C)	Start Date (S) End Date (E)
XX1635R80	07133X0/ 22934	MD 279/Persimmons Run Invert paving	$106,100(E*) $171,100(E) $206,118(C)	12/8/2021(S) 2/4/2022(E)
XX1635R80	17030XO/ 23432	MD 544 @ MP 1.5/ROSIN CREEK Invert paving	$170,000(E*) $210,000(E) $218,557(C)	1/11/2022(S) 2/28/2002(E)
XX1635R80	703100/ 23698	MD 267/AMTRAK Joint Repairs	$40,000(E) $25,192(C)	8/6/2021(S) 9/17/2021(E)
XX1635R80	07099X0/ 23744	MD-222/Trib of Susquehanna R Masonry Repair	$20,000(E) $12,925(C)	8/2/2021(S) 8/5/2021(E)
XX1635R80	17001X0/ 23747	US 50/301 /THOMPSON CK Pipe repairs	$13,000(E) $9,174(C)	10/4/2021(S) 10/5/2021(E)
XX1635R80	400900/ 24087	MD 260/HALL CREEK Barrier Repair	$12,100(E) $8,138(C)	1/28/2022(S) 1/28/2022(E)
XX1635R80	336600/ 24089	PED/TRIB TO JENNIFER BRANCH Scour Repairs	$35,000(E) $14,334(C)	8/30/2021(S) 9/2/2021(E)
XX1635R80	201300/ 24120	HAMMONDS FERRY RD/MD 295 Concrete & Steel Repairs	$48,500(E) $63,271(C)	11/11/2021(S) 4/14/2022(E)
XX1635R80	325705/ 24492	MD 695 IL/CHESACO AVENUE Concrete Repairs	$115,000(E) $33,893(C)	2/28/2002(S) 3/11/2022(E)
XX1635R80	704100/ 24627	MD RTE 273/LITTLE N.E. CREEK Concrete Repairs	$27,000(E) $21,745(C)	10/1/2021(S) 10/7/2021(E)
XX1635R80	2300700/ 24674	US 50/SINEPUXENT BAY Deck Repairs	$70,000(E) $38,240(C)	1/13/2022(S) 5/11/2022(E)
XX1635R80	803700/ 24675	MD 234/ALLENS FRESH RUN Scour Repairs	$105,000(E*) $135,000(E) $135,750(C)	8/23/2021(S) 8/27/2021(E)
XX1635R80	200100/ 24691	IS 695/PATAPSCO RIVER Bearing & Steel Repairs	$140,500(E*) $250,000(E) $254,561(C)	4/2/2021(S) 8/11/2021(E)
XX1635R80	2200900/ 24765	MD 991/WICOMICO RIVER Sidewalk Replacement	$30,000(E) $55,168(C)	9/23/2021(S) 10/4/2021(E)
XX1635R80	2300200/ 24766	MD 12/POCOMOKE RIVER Tender house repairs	$40,000(E) $37,354(C)	8/9/2021(S) 8/17/2021(E)
XX1635R80	2300400/ 24856	US 13 BUS/POCOMOKE RIVER Sidewalk Replacement	$31,000(E) $37,939(C)	12/8/2021(S) 12/17/2021(E)
XX1635S80	1014700/ 9016	US 40/Rock Creek Scour Repairs	$29,000(E) $35,698(C)	6/15/2021(S) 6/25/2021(E)
XX1635S80	218603/ 13777	MD 100 EBR/STONY RUN Joint Repairs	$10,000(E) $11,251(C)	12/13/2021(S) 12/14/2021(E)
XX1635S80	1018400/ 18373	LINGANORE RD/IS 70 Bridge Approach Repairs	$21,000(E) $9,162(C)	3/22/2022(S) 3/25/2022(E)
XX1635S80	1009300/ 21975	MD 550/MONOCACY RIVER Joint Repairs	$34,500(E) $28,039(C)	12/2/2021(S) 12/10/2021(E)
XX1635S80	1504200/ 22497	I-270/Middlebrook Rd. Steel Repairs	$3,500(E) $3,864(C)	12/19/2021(S) 12/20/2021(E)

Contract	Bridge No./ Job No.	Location Scope	Eng.'s Estimate (E) Final Amount (C)	Start Date (S) End Date (E)
XX1635S80	1508900/ 22775	MD 390/CSX Transportation Steel Repairs	$24,143(E) $9,153(C)	11/1/2021(S) 11/1/2021(E)
XX1635S80	06163X0/ 22891	AIRPORT DRIVE/DRAINAGE Invert paving	$82,500(E) $112,590(C)	11/29/2021(S) 3/2/2022(E)
XX1635S80	1628600/ 22980	95/495 Ramp-7/95/495 Ramp-9 Slope & Misc. Repairs	$25,000(E*) $75,000(E) $83,491(C)	11/17/2021(S) 7/6/2022(E)
XX1635S80	218604/ 23344	MD 100 WBR/STONY RUN Joint Repairs	$10,000(E) $9,737(C)	12/15/2021(S) 12/16/2021(E)
XX1635S80	320300 / 23582	I83 Ramp 'C'/I695 & MTA Fatigue Cracks	$60,000(E) $20,247(C)	1/24/2022(S) 1/31/2022(E)
XX1635S80	802800/ 23813	MD 227/MATTAWOMAN CREEK Scour Repairs	$35,000(E) $92,385(C)	10/7/2021(S) 10/29/2021(E)
XX1635S80	1306103/ 23892	MD 175 EBR/IS 95 Substructure Coating	$120,000(E) $88,251(C)	7/8/2021(S) 10/13/2021(E)
XX1635S80	1306104/ 23893	MD 175 WBR/IS 95 Substructure Coating	$123,300(E) $88,054(C)	7/8/2021(S) 10/13/2021(E)
XX1635S80	1007802/ 23960	IS 270 SBR/MD 80 Deck Repairs	$15,000(E) $12,813(C)	12/20/2021(S) 1/6/2022(E)
XX1635S80	1616705/ 24194	IS 95 IL/MD 414 Steel Repairs	$46,000(E) $37,450(C)	4/11/2022(S) 4/22/2022(E)
XX1635S80	401900/ 24301	MD 4/Patuxent River Joint Repairs	$7,500(E) $31,015(C)	7/9/2021(S) 7/16/2021(E)
XX1635S80	1500100/ 24366	MD 28/LITTLE MONOCACY RIVER Headwall Repairs	$170,000(E) $117,857(C)	2/1/2022(S) 5/11/2022(E)
XX1635S80	324604/ 24399	MD 702 WBR/MACE AVENUE Fatigue Cracks	$20,000(E) $3,064(C)	6/29/2021(S) 6/29/2021(E)
XX1635S80	1014204/ 24403	IS 70 WBR/RAMP A Fatigue Cracks	$7,500(E) $4,094(C)	11/15/2021(S) 11/15/2021(E)
XX1635S80	309200/ 24539	MD 147/LONG GREEN CREEK Steel Repairs	$66,000(E) $65,548(C)	11/9/2021(S) 1/21/2022(E)
XX1635S80	1308100/ 24601	Sand Hill Road/IS 70 Steel Repairs	$80,000(E) $103,819(C)	6/18/2021(S) 10/6/2021(E)
XX1635S80	1308400/ 24670	W WATERSVILLE RD/IS 70 Steel Repairs	$84,000(E) $126,879(C)	11/9/2021(S) 2/25/2022(E)
XX1635S80	300700/ 24680	US 1/HERBERT RUN Concrete and Joint Repairs	$77,000(E) $77,848(C)	3/3/2022(S) 4/8/2022(E)

* Initial Engineer's estimate when the task was initially created. It was later revised after construction started on the task. These cost increases are typically due to unforeseen repairs that were needed after initially found deteriorated areas have been removed. A more detailed explanation about the reasons for budget increases is stated in the analysis section of this report.

**One task that was of particular interest (pictured on the cover of this report) was the complete replacement of Bridge No. 1801300 on MD 6 over Persimmons Creek. The existing bridge was damaged beyond repairs from a tropical storm in late summer of 2020. The design of the new bridge was completed by the winter of 2021. The project was added to contract XX1635P80 in the spring of 2021 and opened to traffic that summer,

less than a year after the storm. While these types of emergency projects are typically not eligible for Federal funds, MDOT SHA is seeking special emergency FEMA Federal funds for this project.

From the last annual report, MDOT SHA had requested that the original 4 contracts be extended with time and money to be able to further demonstrate the performance of these contracts. Since this request was not allowed, a few tasks few tasks could not be completed with the allowable time and money requirements. None of the tasks that started construction had the anticipated completion dates before the contract ended or budgets that exceeded the contract limits. However, unforeseen issues caused them to not be completed on time or within the contract budget. Since MDOT SHA still had "open wounds" on the structures that were under construction, they were finished under other contracts using 100% state funds. This issue is further explained in the lessons learned section of this report.

The table below shows all tasks that were started as Federally funded tasks and were completed under state contracts. The amounts spent only include the Federal funds used in the new contracts. It is important to note, when comparing the engineer's estimate to the actual money spent, the Engineer's estimate for the entire task is included and was not altered for the Federal portion of the task. Thus, the estimate for the remaining amount of work of these tasks in the Federal contract is not shown and was never calculated.

Table 9 –Federally Funded Tasks completed with state contracts

Contract	**Bridge No./ Job No.**	**Location Scope**	**Eng.'s Estimate (E) Final Amount (C)**	**Start Date (S) End Date (E)**
XX1635P80	18031X0/ 19965	MD 238/Trib to Manahowic Creek Concrete Repairs*	$190,000(E) $142,352(C)	1/4/2022(S) 4/21/2022(E)
XX1635Q80	1103803/ 24796	IS 68 EBR / MAPLE ST & BEAR CRK Concrete & Bearing Repairs**	$155,000(E) $343,481(C)	2/28/2022(S) 6/30/2022(E)
XX1635Q80	1103804/ 24797	IS 68 WBR / MAPLE ST & BEAR CR Concrete & Bearing Repairs**	$65,000(E) $278,973(C)	3/2/2022(S) 6/30/2022(E)
XX1635R80	1612300/ 1715	IS 95/IS 495 Concrete & Steel Repairs	$695,000(E) $218,642(C)	2/15/2022 (S) Not complete
XX1635R80	2200104/ 19807	US 50 WBR/POCOMOKE RIVER Steel Repairs	$362,000(E) $135,878(C)	1/17/2022 (S) Not complete
XX1635R80	502600/ 22563	MD 404/CHOPTANK RIVER Joint Repairs	$88,000(E) $123,868(C)	6/10/2022 (S) Not complete
XX1635R80	202600/ 23341	IS 595/PATUXENT RIVER Joint Repairs	$113,675(E) $24,142(C)	11/4/2021 (S) Not complete
XX1635R80	1602701/ 24722	MD 201 NBR/US 50 Concrete & Slope Repairs	$695,000(E) $382,845(C)	4/10/2022 (S) Not complete
XX1635Q80	104800/ 24786	MD 51/C&O CANAL Repair plaque***	N/A $1,069(C)	N/A

* While all other tasks on this table were not completed because of time constraints, this task was not completed because Contract XX1635P80 ran out of money. The engineer's estimate was less than the remaining amount of money at the start of the task, but unexpected overruns on other tasks ended up using up the overall budget of the contract.

**While most other tasks only had a small amount of work left for completion, these tasks had significantly more remediate repairs that was initially anticipated and designed. Thus, these particular tasks were closed at the end of contract XX1635Q80 and new tasks with a larger scope will be created for a future Federally funded contract. While the bridges are considered safe and stable, they are not considered to be completely repaired

at the time of this report.

***This task was support work for construction contract AL2635180 to complete a deck replacement. The task in contract XX1635Q80 was to remove, refurbish, and reset a plaque on the bridge. The cost spent in contract XX1635Q80 only includes the removal and refurbishing of the plaque. Since the construction of contract AL2635180 is not completed, the plaque cannot yet be reset on the bridge.

As a result of not being able to extend the original contracts, a few Federal tasks could not even be started even though Federal Funds were approved for them. At the time Federal funds were granted, it was anticipated that all projects could be completed within the allowed end date of the contracts. However, since other tasks experienced delays, these tasks listed below never started. They have been removed from the old series of contracts and have added or are in the process of being added to the either new Federal SEP-14 contracts or 100% state funded contracts. MDOT SHA believes that these actions should be allowed for all Federal open-ended contracts to allow for the greatest flexibility for state DOTs.

Table 10 –Federally Funded Tasks that Never Started Construction

Contract	Bridge No./ Job No.	Location Scope	Eng.'s Estimate (E)
XX1635P80	1308200/ 24718	MORGAN STATION RD/IS 70 Steel Repairs**	$244,000(E)
XX1635P80	800201/ 21292	MD 5 / Zekiah Swamp Concrete & Joint Repairs	$30,000(E)
XX1635P80	1614600/ 21981	US 50/IS 95 Joint Repairs*	$62,000(E)
XX1635P80	1515700/ 23478	IS 270/IS 370,RAMP 'B' Joint Repairs*	$100,600(E)
XX1635P80	1624600/ 24111	MD 410 / AMTRAK,WMATA,BEAVER CR Joint Repairs*	$46,000(E)
XX1635Q80	11087X0/ 21462	IS 68/RED RUN Invert paving*	$231,000(E)
XX1635Q80	21143x0/ 24344	IS 70 EBR/TRIB TO BLACK ROCK RUN Invert paving*	$175,100(E)
XX1635R80	315100/ 19109	MD 25/IS 695*** Joint Repairs	$61,000(E)
XX1635R80	05036X0/ 19114	MD 311/BR OF TIDY ISLAND CRK*** Scour Repairs	$49,000(E)
XX1635R80	1602701/ 23486	MD 201 NBR/US 50 *** Joint Repairs	$120,000(E)
XX1635R80	900100/ 23891	MD 14/MARSHYHOPE CREEK*** Deck Overlay	$230,000(E)
XX1635R80	1617305/ 24643	I-495/I-95 IL/POTOMAC RIVER*** Safety Chain	$6,000(E)
XX1635R80	1617306/ 24644	I-495/I-95 OL/POTOMAC RIVER*** Safety Chain	$6,000(E)
XX1635R80	201801/ 24646	MD 295 NBR/AMTRAK STONY RUN*** Steel Repairs	$15,000(E)

* These tasks have or will be added to the newer Federal contracts.

** This task was completed deleted. The MDOT SHA construction inspectors, area managers, and engineers

decided that the steel beams did not need to be repaired after the project was added into the XX1635P80 contract. The designers acknowledge that there was a mistake in creating this task.

*** These tasks were added to a 100% state funded contract.

Active Federal Projects are listed below. The amount spent only includes that amount through June 30, 2022. Since these tasks are not yet completed, no comparison can be made between the cost that was spent and the engineer's estimate. Also, completion dates are not included since the projects are still ongoing as of June 30, 2022.

Table 11 – Active Federally Funded Tasks

Contract	**Bridge No./ Job No.**	**Location Scope**	**Eng.'s Estimate (E) Final Amount (C)**	**Start Date (S) End Date (E)**
XX1635S80	209300/ 9382	MD 2/MD 695 Concrete & Steel Repairs	$564,145(E) $603,285(C)	10/28/2021(S) N/A
XX1635S80	315300/ 9863	IS 695/JONES FALLS&INT RAMP Concrete & Steel Repairs	$660,000(E) $131,493(C)	4/25/2022(S) N/A
XX1635S80	1308300/ 18413	WATERSVILLE ROAD/IS 70 Steel Repairs	$290,400(E) $29,106(C)	11/9/2021(S) N/A
XX1635S80	222800/ 22774	MD 198/Little Patuxent River Steel Repairs	$230,000(E) $13,310(C)	3/14/2022(S) N/A
XX1635S80	312400/ 24082	IS 695/US 40 Concrete and Joint Repairs	$781,000(E) $381,526(C)	3/3/2022(S) N/A
XX1635S80	1200100/ 24438	US 1/SUSQUEHANNA RIVER Concrete & Steel Repairs	$1800,000(E) $1698,402(C)	10/14/2021(S) N/A
XX1635S80	311100/ 24546	CSX TRANSPORTATION/IS 695 Concrete Repairs	$500,000(E) $430,756(C)	1/17/2022(S) N/A

ANALYSIS OF COMPLETED TASKS

All tasks were completed with a high quality of work which was confirmed through the inspection process. MDOT SHA's Office of Structures has their own team of construction inspectors who exclusively inspect the work on these open-ended structure repair projects. They specialize in inspecting only highway structures repairs to ensure they are completed correctly, and they will last a long time. Since these contracts are based on paying the contractor for the exact time and materials that are needed, there are little disputes about getting the highest quality materials and workmanship. The inspectors insist that that repairs are completed correctly even if this means using higher quality and more costly materials and labor practices over the minimum requirements in the specifications. This is the advantage of using this type of contracts over a traditional low bid type contract where the contractor might meet only the minimum quality standard for materials and workmanship to increase their profit. In contrast, the profit margin is fixed on these types of contracts and thus, the contractor can focus their attention on getting the repairs completed correctly.

The inspection team proceeds through a complete process from the start of the project through the final inspection. Prior to the start of construction, the engineering teams and construction inspectors review the tasks to make sure that all apparent repairs are included and accounted for in the estimate. Then a preconstruction meeting is conducted with the inspectors, area managers, and contractors to decide exactly what materials and equipment are needed on site. If the tasks are over $200,000, the contractor submits his version of the estimate just to make sure there are no additional or unexpected cost at the start of the task. The contractors then mobilize and work in the most efficient manner while paying close attention to the quality of the work. The inspectors remain on site for the duration of the work directing

and ensure the same high quality on all projects. Lastly a second team of inspectors completes a final inspection of the task to make sure that all items are completed, and the site has been properly cleaned up.

Of the 81 Federally funded tasks completed prior to June 30, 2022, 44 stayed within the original engineer's estimate and 35 exceeded the original estimate. This means that on average more tasks are completed within budget, and thus, the engineer's estimating procedures are accurately predicting these costs. A total of 10 tasks had engineer's estimates that increased after construction began. When comparing the original engineer's estimate to the final price of the project, it is important to note several factors that increase the costs.

One reason why construction cost increases is that the extent of repairs is greater than initially realized and/or not fully designed at the start of construction. At times, generalizations about the type of work to be completed is shown on the plans, but the exact locations are found in the field by the contractor and inspector partnering together. This innovative pseudo-design-build process is more efficient in that the designers, contractors, and inspectors can all discuss the work before and during construction to ensure that there is adequate limits of disturbance and other details to complete the task. Additionally, there are really no claims on these types of contracts since the contractor is involved in a portion of the design. The disadvantage of completing the design this way is that the designer may not be able to develop an accurate estimate. A few examples are provided below, but they can really apply to any type of repair:

- One example is with substructure concrete work. Instead of having all deteriorated and hollow sounding areas of concrete identified before construction, the designer's plans typically state to "repair hollow concrete on substructure units as needed". The exact locations are left to the inspector and contractor to figure in the field. The estimate is then based on the engineer's best guess as to how much of the substructure needs to be repaired based on the bi-annual inspection reports and photos as well as a short follow up visual inspection. The alternative design could be for the designer to spend several days with expense MOT and access equipment sounding out all areas of these substructure units and showing these locations on plan sheets. This would cost more since the engineer's investigation would add to the expense. Even with this method, once the contractor is mobilized and has scaffolding to provide full access to the bridge, additional areas in need of repair could be found.

- In another example, fatigue cracks in steel beams are sometimes left to the contractor and inspector to investigate. The issue is first reported in the inspection reports that there is a fatigue crack in a beam. Rather than have the designer travel to the site, set up MOT, set up access equipment, remove the paint from the steel, and then re-paint the area to evaluate the crack, the designer simply creates a job to repair the crack. The contractor then performs essentially the same activities that the designer would have had to perform to investigate the crack. The only difference is that the contractor has the capability to repair the crack at the same time. Thus, there may be some cases that where only the paint is cracked but not the beam. In this case, the contractor will repair the paint system only. Having the contractor go out only one time to investigate and repair fatigue cracks will spend far less money than having the designer investigate first.

Cost also increase when the existing plans don't match what is in the field or conditions worsen from the time the project is designed to when construction starts. Weather, flooding, and other natural forces also increase the cost of a task when the contractor needs to repair scaffolding and other temporary construction access.

Other issues with comparing the engineer's estimate with the final construction cost is how these engineer estimates are developed. When designers create a task, they do not know exactly how long it will take to complete the design and, thus, they do not create it for a particular contract. The contract to construct the task is not decided until the design is complete and being prepared for submission to the Federal Aid Division for funding. Thus, the designers would use generic items like unit days of MOT, cubic yards of concrete repairs, pounds of steel, linear feet of joints, etc. as if it were going to be advertised as a standalone contract. The costs included in these items would be for the labor, equipment, and materials used to install that type of material (concrete, steel, joint material, etc). The designers would calculate the quantities of the items and develop a generic unit price for each of the quantities developed based on past experience. However, the contractors are not paid for work in this manner. Instead, they are paid separately for hours of labor and

equipment and the actual materials themselves. The engineer's estimate does not contain any of the items in the open-ended contracts nor did they contain the low bid unit prices for these items.

When MDOT SHA was discussing this practice with FHWA at the beginning of these contacts, FHWA directed MDOT SHA that they needed to convert these generic estimates into ones with the bid items for the particular open-ended contract to include in the final package. This becomes very difficult for a designer to do since they do not know the exact material and equipment (and its cost) or exactly how much labor is needed to complete the work. For instance, it would be difficult for a designer to know the exact number of hours a contractor needs for an air compressor bid item to complete a joint repair. Likewise, it would be very difficult for anyone to compare the engineer's converted estimate line by line to the final construction cost. This is because field conditions might greatly change between the engineer's assumptions and the contractor's actual methods of construction. Even though MDOT SHA believes they have gotten much better with making the conversion throughout the 24-month duration of these new contracts, there remains great uncertainty in the entire estimating process.

Lastly, when contractors run out of work at a particular task or are given higher priority tasks, they are moved to different sites. Costs on the original task increase from additional rental fees from idle equipment. Since the rental fees for this equipment are typically charged on a monthly basis and the contractor typically returns within a month or two, the frequency and amount are relatively low (and sometimes negotiated even lower). In many cases, the schedule is not affected by more than a month and the cost are negligent. While MDOT SHA's construction staff try to avoid these issues as much as possible, these situations are sometimes unavoidable and are inherent to these types of contracts. The full explanation of why contractors move from one task to another without finishing the first task is further explained in the "Lessons Learned" section of this report.

While MDOT SHA recognizes that FHWA will not pay for idle equipment during construction, something similar like this typically occurs on traditional design-bid-build contracts. When the contractor of these traditional contracts cancels all scheduled work for that day, the inspectors may already be on the construction site. MDOT SHA believes that FHWA will still reimburse the State for inspection staff salary on days when the contractor is not working. In these innovative open-ended contracts, MDOT SHA wants to utilize the inspector's salary on days when the contractor cannot work at a particular site by moving both the inspector and contractor's crew to another location. The alternative is to have an inspector constantly returning to a project site where they are waiting for the contractor to resolve the delay in construction. The cost saving of having the inspector at these multiple locations far outweighs any costs to idle equipment left behind.

In traditional design-bid-build contracts, many of these cost overruns are not documented as they only reduce the contractor's profit margin when the contractor cannot justify the changes. In these SEP-14 contracts, any change in scope needs to be documented because the contractor's profit is a set percentage in the contract that cannot be renegotiated.

In summary, while FHWA wishes to evaluate the performance of these contracts from a comparison of the engineer's estimate to what is the final construction cost, MDOT SHA is not sure that this is the best measuring tool to use. Using the engineer's best guess estimate sometimes only provides a rough scale for the size of the work based on past projects. Since each project is unique, the estimates provided by the engineers may not fully detail all work that needs to be performed. These estimates are certainly not used in the payment to the contractor as they are paid only for the labor, equipment, and materials actually used on the site to complete the work as documented in the Inspector's Daily Reports. An example is provided in Appendix B. The engineer's estimate is only a tool used to decide if the scope of the work is within expectations.

Additionally, these jobs are all relatively small where the traditional design-bid-build contract type is not the best fit for this type of work. In some cases, the engineer's investigation, design, and procurement through traditional contracts would cost more than the construction itself. MDOT SHA is willing to do all it can to support FHWA's continuing effort to use these indefinite delivery /indefinite quantity contracts through their innovative contracting program which MDOT SHA sees as being very beneficial. These newer open-end indefinite delivery/indefinite quantity contracts take this innovative contracting method to the most efficient manner of providing MDOT SHA a way to complete these small

repair tasks.

LESSONS LEARNED

As several contracts ended in June 30, one big lesson that was learned was that tasks might not be able to be completed with the time or budget constraints of the overall contract.

Instead, these tasks might need to be completed and/or redesigned and packaged under newer contracts. Before Federal funds were used in the MDOT SHA OOS, the transferring of construction work from one state funded open ended contract to another was a very common practice. While this may seem strange in the construction phase of a project, a similar comparison can be made to design work. When MDOT SHA hires consultants to design projects, they are not always completed under the original contract or even the same firm that started the design. Many times, open ended consultant contracts run out of money and tasks are transferred to newer contracts. In other cases, many different firms may design many different aspects of a project. One firm can do the preliminary design and other firms can complete various aspects of the design (Highway, structures, landscaping, signing and marking, etc.) without any issues with this design practice. Since these innovative open-ended construction contracts are very similar to consultant contracts, MDOT SHA believes that starting a task with one contract/contractor and finishing it with a different contract/contractor should be an acceptable and common practice moving forward. However, since these types of contracts are new to FHWA, MDOT SHA believed it would be better to finish them as state funded tasks just to remain safer with the documentation for these experimental contracts.

Another lesson learned was with those tasks that involved structure that are not completely within MDOT SHA's property. Under the previously used state funded contracts, the contractors for these types of tasks would seek a right-of-entry agreement with the property owner to make repairs to the existing structure. Since the repairs are generally minor in nature and will generally improve the overall appearance of the property, the property owners typically enter these right-of-entry agreements with many instances of not asking for further compensation. However, when FHWA was presented with one of these types of projects, it appeared that they were requiring a full temporary or permanent easement be established.

This would have required a full metes and bounds survey of property lines, the development of a plat, appraisals of the property, and a final offer made to the property owner. This type of process would have likely cost the same or more than the construction cost of the project itself. Thus, MDOT SHA decided to state fund this project and complete it with the previous procedure of a right-of-entry agreement. For future tasks of this nature, MDOT SHA will complete these types of tasks under a contract that only has 100% state funds.

Another lesson learned was about keeping the number of tasks assigned to a contractor high. To keep the highest level of efficiency and quality of work for these open-ended contracts, it is important that the construction crews and inspectors have a constant 40+ hours of work every week. With the same construction crews and inspectors doing this type work frequently and consistently, the level of experience they have with having done numerous tasks is extremely valuable which ensures the work performed is done consistently, efficiently, and at the highest quality. If there is not a constant flow of work, it would be difficult for consultant companies and contractors to retain these experienced inspectors and construction crews available to do the projects. The result would be a loss of the experienced staff and having to retrain new personnel all the time. It could also result in contractors and consulting firms no longer finding it profitable to bid on these types of contracts.

To keep the crews busy, each crew would need to have 5 to 10 tasks ready to choose from at any given time. This avoids the shutdown of crews if there is any major issue on one particular task. Major issues that could affect a task's completion could be (but is not limited to): jobs running longer than expected and into in-

stream restriction dates, temperature and weather restrictions, long lead times for material fabrication, maintenance of traffic restrictions, additional work found after uncovering hidden elements, unexpected utility impacts, etc. In times where there are major issues that shut a task down, it is necessary to have extra tasks at other structures readily available to keep crews working. This means that crews might not stay at one site from start to finish of a task before starting another. The inspectors partner with the contractor to decide which jobs they start and finish and were they should have this crew on any day of the contract. This is the way that MDOT ensures that all jobs get completed in a timely manner.

One big example about having multiple jobs to complete is with steel retrofit repairs to beams. Before the contractor can order any steel material, they must first travel to the site and take refined measurements to develop shop drawings. While the plans show some general generic dimensions with a typical repair detail, the measurements the contractor needs are for each beam itself as they will not be perfectly identical and are not shown on the plans. In order to take these measurements, the contractor will likely need maintenance of traffic and other access equipment on site. Since MDOT SHA is required to pay labor and equipment costs any time a contractor is working in the field, the charges for the maintenance of traffic, access equipment, and labor to take the measurements is paid for at the beginning of the task. In a typical design-bid-build contract, this work is typically incidental to other items. The contractor will then need to wait several weeks or months for the retrofit plates to be fabricated. Within this time, the contractor can either be assigned a new task or completely shut down and not have any more work on the contract. Thus, it is more efficient for the contractor to work on multiple tasks in this manner.

Contractually, the contracts contain a clause that requires a contractor to provide a construction crew within 14 days of a request. If they do not provide this crew, they are assessed a disincentive amount of money for each day that they cannot provide this crew. However, this could mean that there could be a two-week shutdown of all work in between task assignments if they were completed one at a time. This does not include any delays created from the items mentioned in the paragraphs above.

While MDOT SHA recognizes that they do not contractually need to keep external contractors and consultant inspectors busy, it does help with the efficiency of the overall contract. In traditional design-bid-build contracts, MDOT SHA believes that it is a contractor's responsibility to have work for their staff. However, these types of contracts already contain all work expected from the contractor and generally have a much larger scope of items to complete. Thus, the contractors should be able to decide how much staff is need and the sequence in which they perform these tasks to complete the project and keep their staff working. On these open-ended contracts, the tasks have short durations (sometimes only a day or a week as can be seen in several tables in this report) and thus a contractor cannot always plan enough work on any one task to keep their staff constantly busy. Therefore, MDOT SHA provides them multiple tasks that they can work on them in a rotating fashion, if needed. It is important to keep in mind that these contracts are demonstrating innovative ways of contracting and traditional ideology may not apply to this type of work.

As previously discussed, the contractor may have additional rental fees associated with leaving idle equipment on construction sites that are put on hold. While MDOT SHA recognizes FHWA's reluctance to fund these fees, MDOT SHA hopes that FHWA will recognize idle equipment as a reimbursable expense on these innovative contracts. This is especially true when MDOT SHA directs the contractor to move to another project site, and the contractor is assessed this fee at no fault of their own.

Establishing the Federal tasks in a timely manner has been the biggest challenge that these contracts have faced. Submitting the Plans Specifications and Estimates to the MDOT SHA's Federal Aid Division and

obtaining individual charge numbers from MDOT SHA's Office of Finance for each task are additional steps that MDOT SHA OOS has not been completing in previous 100% state funded type contracts. While all jobs completed within these contracts have completed the NEPA process, only the Federally funded tasks are being submitted to the Federal Aid Division and Office of Finance for approval of Federal funds. This process started as having only a 1 to 2 week turnaround but has been gradually increasing in the amount of time to get approval as more tasks are being submitted. Although the designers of these tasks have greatly improved on their completion of this process, the Office of Structures is hoping that there could be a more streamlined approach.

After the Federal Aid Division approves the task, MODT SHA's Office of Finance is requiring each one of these tasks to have a separate State FMIS charge number as had been directed to them by FHWA in past areawide contracts. Applying for a single charge number could take more than 4 weeks to obtain. This combined with the 2+ week turnaround time for Federal Aid approvals is a fairly significant amount of time considering that many of these tasks only take a day or week to complete. One way that would help get Federal tasks established in a timelier manner would be to bundle them all into one or two statewide Federal charge numbers. To keep track of contractor's expenditures on a task-by-task basis, MDOT SHA Office of Structures is using the eMCMS computer program. Each task from the engineering division comes with a job number that is entered into the program and charges are tracked using this number. This one improvement would provide the greatest flexibility of scheduling work to the contracts.

APPENDIX A

Application for SEP 14
Indefinite Delivery/ Indefinite Quantity (ID/IQ) Contract

PURPOSE

For the last 20 or more years, the Maryland Department of Transportation State Highway Administration (MDOT SHA) routinely advertises $10 million contracts using 100% state funding for the repair, rehabilitation, replacement, or preservation activities of highway bridges, retaining walls, and other highway structures with spans less than 20'. These are procured through a specialized Design-Bid-Build method that MDOT SHA calls "time and material" contracts.

MDOT SHA is now requesting SEP-14 approval for the implementation using this modified Indefinite-Delivery/Indefinite-Quantity (ID/IQ) contracting "time and material" method. MDOT SHA uses these contracts to speed up the time it takes between identification of a defect on a highway structure to engineering a solution to completing a traditional Design-Bid-Build procurement process to address the defect. These contracts are also used to respond to emergency situations due to traffic impacts or weather-related damage such as scour (this will continue to use state funds). In some cases, a defect could have gotten much worst in the timeframe it would take to procure a traditional Design-Bid-Build contract and would result in large overruns of quantities and massive amounts of extra work. It is far better and easier to have on-call "time and material" contractors for preventive maintenance to remedy a defect within a day, week, or a few months of identification. MDOT SHA believes that there will be no issues with this delivery method based on the rich history of using this method in the past with 100% state funds.

SCOPE

Under the "time and material" method, a specifications booklet with some quantities (based on historical data) are advertised. There are no plans, tasks, or locations identified at the time of bidding, and just a general scope of the types of work is included in the project description. These contracts will include bridge preservation, rehabilitation, replacement, and emergency repair activities. There are items for commonly used Maintenance of Traffic equipment (Cones, Drums, Protection Vehicles, etc.), items for commonly used contractor equipment (Flatbed Truck, Air Compressor, Dump Truck, Concrete Mixer, etc.), and items for various types of labor (Skilled, Forman, Welder, etc.). These items are all measured and paid by the amount of time they are used (hourly, daily, monthly, etc.).

Since there are an unknown number of tasks and quantities at the time of bidding, there are four additional items that have pre-established prices to make sure that the contract has enough money in it to carry the contract through the two year duration of the contract. (If these items do not have pre-established prices, bidders would bid these items low, and then MDOT would have to constantly add money to the contract through hundreds or thousands of change orders every time these items are used.**)** These items, Materials for Structural Rehabilitation, Specialized Equipment for Structural Rehabilitation, Subcontracting for Structural Rehabilitation, and Travel Expenses handle all other miscellaneous expenses that are incurred. They are all paid based on receipts, invoices, rental agreements, and/or blue book rates for material and equipment that are actually used on the contract plus a pre-established markup. This markup is 10% for all materials, 5% for all rental equipment, 0% contractor owned equipment (paid at blue book rate), 5% for all subcontractor work, and 0% for travel expenses. These pre-established markup rates are stated within the Section TC-7.03 Force Account Work in the MDOT Standard Specifications for Construction and Materials and/or the Section 400 Specifications for these items within the Invitation for Bid Booklet. The receipts will be attached to the Inspector Daily Reports for each task assignment before payment will be made. For the materials item, the contractor is reimbursed for a permanent

and temporary material including consumables (gasoline, oxygen, etc.) based on the receipts and invoice submitted to the inspectors. For the specialized equipment item, the contractor is reimbursed the rental agreement price for the equipment based on the rental agreement or the blue book rate if the contractor owns the equipment. For the Subcontractor item, the contractor is required to submit prices from three or more subcontractors for any work that they plan on giving to a subcontractor. The prices include all labor, materials, and equipment for the subcontractor's task. The contractor is then required to select the lowest of the three subcontractors to complete the work. Lastly, for the travel expense item, MDOT will reimburse the contractor for hotels and meals as well as tolls if the contractor is required to travel long distances away from their central office. This increases safety and saves time on these statewide contracts. The contractor will have to supply receipts for these expenses, and MDOT will paid up to a maximum pre-establish limit.

Since the contractors are paid the exact amounts of money for work they complete on a month by month basis, the contractor has no way to front load the payment of items and will not likely abandon these types of contracts in the middle. Thus, MDOT SHA does not hold the standard retainage during the payment process like we would on other traditional contracts. As a consequence, a non-bid item (which the contractor never sees in the bidding process) has been created for all "liquidated damages". This item will be used to deduct any penalties incurred by the contractor on a month-by-month basis instead of MDOT's normal procedure of reducing the amount of retainage paid at the end of the contract. The penalties range from the Contractor not providing enough workers and crews, not removing lane closures on time, not conforming to the environmental regulations, and overall failure to maintain the project, etc.

Before the contract advertises, MDOT SHA's Structure Remedial Engineering Division (SIRED) will follow SHA's MDOT Programmatic Agreement procedures for processing Categorical Exclusion Actions and in this instance for Areawide or Statewide construction projects. A Programmatic Categorical Exclusion (PCE) is completed for construction without knowing the exact locations for the work. Then, prior to any task being provided to the contractor, SIRED submits individual locations with a scope of work and other environmental information to the MDOT SHA's Environmental Planning Division (EPLD) to ensure the scope is consistent with the previously approved PCE. EPLD will then complete the appropriate NEPA documentation based on the scope and impacts associated with the proposed action at the individual locations. This process is used when the Invitation for Bids doesn't include any specific locations. Currently, SIRED has a back-logged list of tasks that are being submitted now for all expected tasks to be on these contracts.

After award of the contract to the lowest bidder, a list of previously established task assignments is given to the contractor. Additional tasks can be added to the list as the contract progresses and more tasks are developed from the Structure Remedial Engineering Division. Each task assignment includes a location, scope of work, plans for the repairs, and material quantities for completing the work. For tasks over $200,000, the contractor is required to give their prices for the material quantities, the amount of labor and equipment needed, and a schedule to complete the task. This is to make sure that the Contractor understands all the work that is involved with a particular task. The contractor then proceeds with the work and provides invoices, receipts, and rental agreements for actual work spent as stated above per task. Task under $200,000 will be state funded but will also follow the procedures above except the contractor will not be asked to submit an estimate and schedule.

The scope of these assigned tasks can vary from the list below:

(a) Preservation and minor rehabilitation of piers, pier caps, and abutments.

(b) Jacking beams under traffic and restoring bearings or bearing pedestals on piers and abutments.

(c) Preservation and minor rehabilitation or replacement of deteriorated, damaged or cracked beams, girders, heat straightening and other structural steel including cleaning and painting of repaired or rehabilitated steel areas.

(d) Construct temporary bents and rehabilitate existing bents, piers, and abutments.

(e) Construct sheet pile end walls and wing walls. (state funded)

(f) Underpin of piers and abutment footings.

(g) Preservation and minor rehabilitation of damaged stringers.

(h) Preservation and minor rehabilitation or replacement of timber bridge components.

(i) Splicing of timber piles.

(j) Preservation and minor rehabilitation of piers in water and install pile protective devices.

(k) Placement of riprap and grout filled bag scour protection.

(l) Removal and replacement of various structures such as pipes, culverts and bridges. (state funded)

(m) Preservation and minor rehabilitation of retaining walls.

(n) Investigations such as test piles, utility test pits, checking bridge decks for shear reinforcement and any other tests required to determine existing unknown conditions. (state funded)

(o) Working in conjunction with engineering consultants, fabricators, and suppliers to design and construct major and complex upgrades to electrical and structural bridge components. (state funded)

(p) Destructive and non-destructive testing as necessary to determine existing condition of structures. (state funded)

(q) Wrapping pier columns with fiber reinforced polymer protective system.

(r) Applying a protective coating to concrete substructures as directed by the engineer.

(s) Paving or lining of pipe inverts for both bridges over 20 feet in length and pipe structures under 20 feet.

(t) Repairing pipe and culvert structures under 20 feet in length.

(u) Installing roadway joint seals.

(v) Installing waterproof membrane and new wearing surface on a deck.

(w) Preservation and minor rehabilitation or replacement of damaged fender systems and dolphins.

(x) Preservation and minor rehabilitation of movable bridge electrical systems.

(y) Preservation and minor rehabilitation of movable bridge mechanical and hydraulic machinery systems.

(z) Preservation and minor rehabilitation of movable bridge structural systems.

(aa) Emergency response to weather events, i.e. washout of structures or approach roadways. (state funded)

(bb) Emergency repairs to bridge superstructures and substructures due to traffic impacts. (state funded)

(cc) Emergency response to defects either found by bridge inspectors or discovered under traffic loading, i.e., broken roadway joint angles, loose concrete. (state funded)

As can be seen on the list above, there is a combination of preservation, rehabilitation, replacement, and emergency repair activities. Non-preservation and emergency activities will be state funded. These $10 million contracts will be created so that they can be used for preservation, rehabilitation, replacement, and emergency repair activities to highway bridges, retaining walls, and bridges with spans less than 20'. We refer to bridges with spans less than 20' as "small" structures. These contracts, including all task orders regardless of the scope, shall conform to all FHWA construction contracting requirements, including the FHWA-1273, 23 CFR 635 Subpart D (including Buy America), Davis Bacon wages, and MBE/DBE requirements.

SCHEDULE

All existing contracts end on June 30, 2020, so MDOT SHA will need to have new contracts started by July 1, 2020. Of the current five contracts, only two of them will be requesting Federal Funds under the SEP-14 program. One is for statewide tasks and the other is for tasks in District 6 only (Washington, Allegany, and Garrett Counties). MDOT SHA utilizes this other contract to reduce travel expenses to this remote part of the State of Maryland. Both contracts have a two-year duration and are scheduled to be completed by June 30, 2022. The milestone dates for each contract are listed in the chart below:

Milestone	Contract No.	
	XX1635Q80- District 6	XX1635P80- Statewide
Advertisement	**02/18/2020** TUESDAY	**03/03/2020** TUESDAY
Bid Opening	03/26/2020 THURSDAY	04/09/2020 THURSDAY
Notice to Proceed	06/01/2020 MONDAY	06/15/2020 MONDAY

MEASURES

MDOT SHA will analyze the measures below during the ID/IQ "time and material" contract:

- Reaction of contractors and industry to the use of this method on Federal-aid contracts.
- Compare the original engineer's task cost to actual contract task invoices.
- Quality of work through the final inspection process.
- Lessons learned and suggestions for improvements on future contracts.

REPORTING

MDOT SHA will provide annual reports to FHWA documenting the status of all contracts and providing information regarding evaluation measures.

Based on past history, MDOT SHA believes the procedures described above will result in very successful projects. MDOT SHA looks forward to collaborating with FHWA throughout the life of the contracts and providing FHWA and other DOTs the benefits of MDOT SHA's experience.

APPENDIX B

Example Inspector Daily Reports

Inspector's Daily Report

David Sarzynski **IDR #235D**

Thursday, August 05, 2021

Contract No.: XX1635R80 PRESERVATION AND MINOR REHABILITATION OF MOVABLE
Task.: 24691 0200100 IS 695/PATAPSCO RIVER COUNTY RD AA045C51
IDR Status: Approved on 8/9/2021 2:01:36 PM
Time: 7:00 am - 3:30 pm Worked 8.50 hrs Weather: Sunny
Wind: 5-10 Precipitation: 0 Temp. Min. 69 Max: 89

Remarks

Crews

Crew: M. Hartwick **Contractor: COVINGTON MACHINE & WELDING, INC.**

Work Activities

Activity ID	Activity/ Remark	Hours Worked	Pct. Complete
08	Retrofit Installation Pier#6,Span#7,Girder#7 Installing retrofit at Girder#?.	Retrofit Installation	Retrofit Installation

Labor

Labor Type	#	Hours	Remarks	Contractor
Foreman M. Harwlck 6898	1	8.50		
Sk. Labor D. Games 3400	1	8.50		
Sk. Labor D. Marshal 2753	1	8.50		
Sk. Labor D. Robinson 0787	1	8.50		
Sk. Labor Z. Smith 2127	1	8.50		

Equipment

Type / Remark	#	Worked	Idle	Idle Reason
Flatbed Trucks	1	8.50	0.00	

Pay Items

Item / Subitem	Quantity	Unit	Description / Location / Remark
4010.01C	8.50	HR	***Descr:.*** FLATBED TRUCK 18 TO 20 FT BED ***Remark:*** Flatbed Truck
4022.01C	8.50	HR	***Descr:*** BRIDGE REPAIR FOREMAN ***Remark:*** **M** Hartwick 6898
4024.01C	8.50	HR	***Descr:*** SKILLED LABOR ***Remark:*** D Robinson 0787
4024.01C	8.50	HR	***Descr:*** SKILLED LABOR ***Remark:*** D Games 3400
4024.01C	8.50	HR	***Descr:*** SKILLED LABOR ***Remark:*** Z Smith 2127
4024.01C	8.50	HR	***Descr:*** SKILLED LABOR ***Remark:*** D Marshall 2753

Materials

History

Status	Name	Role	Timestamp
Submitted	David Sarzynski	Lead Inspector	8/6/2021 6:15:54 AM
Approved	Casey Houck	Resident Engineer	8/9/2021 2 01 36 PM

Inspector's Daily Report

David Sarzynski

IDR #240D

Tuesday, August 10, 2021

Contract No.: XX1635R80 PRESERVATION AND MINOR REHABILITATION OF MOVABLE
Task.: 24691 0200100 IS 695/PATAPSCO RIVER COUNTY RD AA045C51
IDR Status: Approved on 88/13/2021 7:17:15 AM
Time: 7:00 am - 3:30 pm Worked 8.00 hrs
Weather: Partly Cloudy
Wind: 5-10 Precipitation: 0 Temp. Min. 77 Max: 95

Remarks

Crews

Crew: M. Hartwick **Contractor: COVINGTON MACHINE & WELDING, INC.**

Work Activities

Activity ID	Activity/ Remark	Hours Worked	Pct. Complete
07	Jacking	8.00	95%
	Pier#25,Span#25,Bearing#13 Painting mid coat at bearing		
	Pier#24,Span#24,Bearing#2 Painting mid coat at bearing.		
	Pier#1,Span2,Bearings#14,17,18 Paint top coat at bearing. Pier#6,Span#7,Bearing#8 Paint top coat at bearing. Pier#6,Span#7,Beam#7 Paint top coat at retrofit Pier#6,Span#7,Bearing#18 Paint top coat.		
	Pier#11,Span#11,Bearing#12,13 Paint top coat. Pier#13,Span#14,Bearing#14 Paint top coat.		

Labor

Labor Type	#	Hours	Remarks	Contractor
Foreman M. Harwlck 6898	1	8.00		
Sk. Labor D. Games 3400	1	8.00		
Sk. Labor D. Marshal 2753	1	8.00		
Sk. Labor D. Robinson 0787	1	8.00		
Sk. Labor Z. Smith 2127	1	8.50		

Equipment

Type / Remark	#	Worked	Idle	Idle Reason
Flatbed Trucks	1	8.00	0.00	

Pay Items

Item / Subitem	Quantity	Unit	Description / Location / Remark

Inspector's Daily Report — David Sarzynski — IDR #240D

Tuesday, August 10, 2021

Item / Subitem	Quantity	Uni	Description / Location / Remark
4002.01C	634.30	EA	***Descr:.*** MATERIAL FOR STRUCTURE PRESERVATION AND MINOR REHABILITATION 1 Attachment ***Remark:*** Wilton Corp Invoice#137116 Pay #576.64 + $57.66 (10% Mark up)= $634.30 Metal Filled Epoxy

Pay Item 4002 .01C Attachments

LOGO
WILTON CORP

Wilton Corporation
Post Office Box 248
2925 Industrial Park Drive
Finksburg, MD 21048
410-833-8500

INVOICE

Invoice To
Covington Machine, Inc.
2015 Renard Court
Annapolis, MD 21401

Invoice To
Covington Machine, Inc.
2925 Industrial Park Drive
Finksburg, MD 21048

Wilton Invoice No.137116
TERMS*Net 30*
DATE08/08/2021
DUE DATE09/07/2021

SHIP DATE
07/30/2021
CUSTOMER NAME/JOB
Covington Machine, Inc.: 1715
Coving06 XX1635R80

SHIP VIA
Customer Pick up
PURCHASE ORDER
11750-016 XXR

#24691

F.O.B.
Finksburg, MD 21048
DELIVERY TICKETS
DT-012545

JOB #
1716

QTY	ITEM	PRICE	AMOUNT
8	Metal Filled epoxy 1 # units	68.00	544.00T
	SUBTOTAL		544.00
	TAX		32.64
	TOTAL		576.64

XX1635R80
AA045C51
200100
24691
8/10/2021

Pay $576.64 + $57.66 (10% Mark up) = $634.30

1) 8/10/2021 10:0414 AM
Wilton Corp Invoice #137116
Pay $576.64 + $57.66 (10% Mark up) = $634.30
Metal Filled Epoxy

4010.01C	8.00	HR	***Descr:.*** FLATBED TRUCK 18 TO 20 FT BED ***Remark:*** Flatbed Truck
4022.01C	8.00	HR	***Descr:*** BRIDGE REPAIR FOREMAN ***Remark:*** **M** Hartwick 6898
4024.01C	8.00	HR	***Descr:*** SKILLED LABOR ***Remark:*** D Robinson 0787
4024.01C	8.00	HR	***Descr:*** SKILLED LABOR ***Remark:*** D Games 3400
4024.01C	8.00	HR	***Descr:*** SKILLED LABOR ***Remark:*** Z Smith 2127
4024.01C	8.00	HR	***Descr:*** SKILLED LABOR ***Remark:*** D Marshall 2753

Materials

History

Status	Name	Role	Timestamp
Submitted	David Sarzynski	Lead Inspector	8/11/2021 906:31 AM
Approved	Casey Houck	Resident Engineer	8/13/2021 7:17:15 AM