Special Experimental Project No. 14 (SEP-14)
Programmatic Use of Type 1 and Type 2 Fixed Price Variable Scope Contracting on Capital Preventative Maintenance Projects
Calendar Year 2014 Annual Evaluation Report
January 25, 2015

Introduction

The Michigan Department of Transportation (MDOT) received programmatic approval to utilize Fixed Price Variable Scope (FPVS) contracting on Capital Preventative Maintenance (CPM) Projects. The purpose of FPVS contracting is to construct the greatest amount of work with the available project budget and gain more value for the dollar by using this innovative contracting method.

This annual report covers Type 1 and Type 2 FPVS CPM projects let in calendar year 2014.

Type 1 and 2 FPVS Contracting Overview

MDOT has developed two types of FPVS procurements requiring approval through this SEP-14 Work Plan. This Work Plan only applies to CPM projects using Type 1 and 2 procurements. Non-CPM projects using a Type 1 or 2 procurements require a separate approval unless otherwise directed by the FHWA.

Type 1: Type 1 FPVS projects receive bids by a unit of work that can be completed for a stated fixed price. The selected contractor is the bidder that proposes the most units of work for the given fixed price. For example, a HMA crack sealing project would be bid by the lane miles a contractor can complete based on the fixed price provided in the contract. In the event of a tie, bidders will be required to submit a revised price for the amount of work originally bid, and the bidder with the lowest price would be the selected contractor.

MDOT has used Type 1 FPVS procurements for multiple crack sealing and one chip sealing CPM projects.

Type 2: Type 2 FPVS projects receive bids by a unit of work that can be completed for a maximum fixed price. Contractors also bid a price for the work that is below the maximum price. The work that will be completed is identified at the time of the bid. The selected contractor is first determined by the bidder that proposes the most units of work for the price they bid. If two or more contractors propose the same amount of work, then the successful bidder is determined by which contractor proposed the lowest maximum price. For example, the single Type 2 project MDOT has let received bids based on the square yards of epoxy overlay that can be completed and a price to complete the work included in the bid. The square yards bid had to place an epoxy overlay over an entire bridge deck (a partial bridge deck was not acceptable), and the price bid had to be below the maximum price. In the event of a tie, bidders will be required to submit a revised price for the amount of work originally bid, and the bidder with the lowest price would be the selected contractor.

Project Development Considerations

MDOT's CPM FPVS projects were classified as a categorical exclusion. Each project needs to be cleared through the environmental process and all permits obtained for the entire project and

not just what is estimated to be constructed. Work cannot exceed what is environmentally cleared.

The projects were approved in the State Transportation Improvement Plan (STIP) as part of the General Program Account (GPA) for capital preventative maintenance projects. The portions of the project that were not constructed will be included in future projects.

FPVS contracting can modify how projects are bid, inspected, constructed and paid. Contract documents are included, when necessary, to provide clear bidding instruction, and to modify MDOT's typical process on design-bid-build (DBB) projects. This is done to conform to the intent of the FPVS contracting method while meeting state and federal requirements. FHWA Michigan staff reviewed and approved new contract language prior to advertising the initial FPVS projects.

The Project Manager on each FPVS project also determined when a bid would be considered for rejection. On traditional DBB projects, this occurs when the low bid is greater than 10% of engineer's price estimate. On Type 1 and Type 2 FPVS projects, rejection of a bid would be considered if the bid would perform 10% less work than the engineer estimated

Bid Process and Results

MDOT receives bids electronically on all DBB projects. However, MDOT's system cannot accommodate the bidding process of Type 1 and Type 2 FPVS projects, and a hand delivered paper bid is required. Appendix A contains the bidding results for each type of FPVS, and includes the scope of work, dollar value, number of bidders, the bids from all bidders, and the engineer's estimate of work.

In 2014, MDOT did not let any Type 2 FPVS projects, and let eight Type 1 projects. Five of the eight Type 1 projects performed more work than originally estimated by MDOT. The average increase in the work is 2.7%, and represents an additional 61.9 lane miles of CPM work on MDOT's system. Seven of the projects were HMA crack sealing, and one project was a chip sealing project.

The engineer's estimate of work on FPVS projects is based on historical average unit prices from a geographic area. The 2014 letting results from the Type 1 FPVS projects indicate that the FPVS contracting method is cost effective, and that more work is being performed to preserve MDOT's roads than would have through conventional Design-Bid-Build contracts..

Industry Coordination and Reaction

When MDOT began using FPVS in 2012, MDOT met with representatives from Industry to discuss the innovative contracting methods being used on a project, and required mandatory pre-bid meetings. MDOT has used Type 1 FPVS on crack sealing several times, and no longer has pre-bid meetings on these projects.

The Michigan Road Preservation Association (MRPA) represents contractors that perform preservation work including HMA crack sealing and chip seals. MRPA has indicated that its

members are supportive of the use of FPVS, and feels this method keeps funding in their niche industry that is typically moved from their industry's work if there are bid savings on projects.

Administrative Consideration

One of the goals of using FPVS is to reduce the amount of work required by staff to manage MDOT's program. A project with a constrained budget reduces the burden on staff to reallocate funds from projects if the cost estimate is exceeded or reduced. By using a fixed amount of funds, MDOT did not have to search for additional projects to allocate any bid savings to, or conversely find additional funds from un-let projects. The FPVS process saves the Department staff time and effort.

Additional Comments and Recommendations

Based on MDOT's experience in 2014, MDOT has the following recommendations:

1. The maximum limits of the work should exceed the estimated amount of work. Bidding history should be reviewed for the type of work being contracted to estimate the normal variations in bids on DBB projects. This is done to estimate the minimum amount of work that should be included in the project beyond the estimated amount of work.

2. Coordination with all stakeholders, including internal MDOT staff, industry, and federal highways is important and should be done early in the programs development. MDOT personnel that are critical to coordinate with are from the environmental, planning, contracting, design, construction and technical subject matter experts.

3. If using a new bidding process, provide examples of bids that are acceptable and bids that contain errors. MDOT has provided this information at pre-bid meetings and in a project's Reference Information Documents.

Contract Information

Specific FPVS contracts can be found by looking up each project on MDOT's e-Proposal website (http://mdotcf.state.mi.us/public/eprop/login/index.cfm). Once registered, enter the e-Proposal website by typing in the user's email address and password. Instructions for registering new users are on the left side of this page. Select the letting date from the "Lettings" area on the left side of the page, and then select the item number from the pull down menu. The project proposal and any addenda will be available for downloading from this location.

MDOT has also developed a guide of the development of FPVS projects. This guide is expected to be incorporated as an appendix to MDOT's Innovative Construction Contracting Guide in early 2015. This guide will be publicly posted on MDOT's website.

Unique contract items or traditional contract items modified by MDOT on the 2014 FPVS projects are listed below.

- Schedule of Items*
- Special Provision for Hot Mix Asphalt Crack Treatment on Fixed Price Variable Scope Projects**

- Special Provision for Warranty Work requirements for Hot Mix Asphalt Crack Treatment, Special on Fixed Price Variable Scope Projects **
- Special Provision for the Preparation of Bid and Delivery of Bid ***
- Special Provision for Capital Preventative Maintenance Work on Fixed Price Variable Scope Projects **

* The Schedule of Items of modified to reflect FPVS contracting and how the project is bid

** Special Provisions are modified to reflect changes needed for FPVS contracting

*** The Special Provision for the Preparation of Bid and Delivery of Bid provides instruction on how to submit a paper bid on a project.

Appendix A: Bid Letting Results

2014 Type 1 FPVS Projects

Type	Job No.	Region	Project Scope	Project Limits	Fixed/Max. Cost	Letting Data	No. of Bidders	Max. Bid (Lane Miles)	Winning Bid (Lane Miles)	Eng. Est of Work (Lane Miles)	Bid Price per Lane Mile	Gain/Loss (Percent)	Other Bids	Other Bids
1	119097	Bay	Chip Seal	M-25, M-142, M-138	$1,723,000	Item 602, 2/12/14	3	59.46	44.745	43.8	$38,507.10	2.16%	44.47	34.92
						Total	3	59.46	44.745	43.8	$38,507.10	2.16%		
1	119963	Bay	HMA Crack Treatment	Various locations in Mt. Pleasant and Bay City TSC	$175,800	Item 602, 4/9/14	3	116.4	94.4	101.3	$1,862.29	-6.81%	71	64.5
1	118126 113528	Grand	HMA Crack Treatment	Various Locations within the Grand Region's jurisdiction	$240,000	Item 601, 3/19/14	3	96.62	69.16	79	$3,470.21	-12.46%	63.16	63.16
1	123996	Metro	HMA Crack	Various Locations	$768,100	10/8/2014 #601	3	381.99	294.67	245	$2,606.64	20.27%	155.76	143.56
1	120375	Superior	HMA Crack Treatment	Various Locations within the Superior Region's jurisdiction	$1,200,000	Item 601, 5/7/11 letting	2	877.82	647.7	637.952	$1,852.71	1.53%	541.65	NA
1	120183	University	HMA Crack Treatment	Various Locations within the TSC's jurisdiction	$373,831	Item 602 3/19/2014	2	199.63	162.85	161	$2,295.55	1.15%	160.65	NA
1	120312	University	HMA Crack Treatment	Various Locations within the TSC's jurisdiction	$342,000	Item 601 4/9/14	2	208.73	165.52	169.24	$2,066.22	-2.20%	123.29	NA
1	120356	Bay	HMA Crack	Various Locations	$495,000	Item 603 2/12/14	3	141.5	141.5	120.4	$3,498.23	17.52%	133.7	125.1
						Total	18	2022.69	1575.8	1513.892	$17,652	19.01%		
						Average	2.57	288.96	225.11	216.27	$2,522	2.72%		