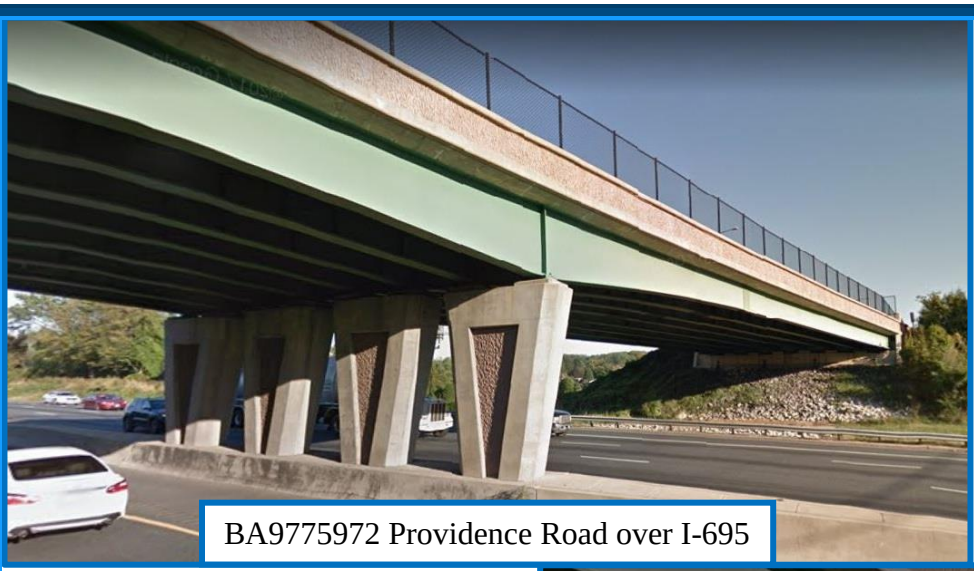


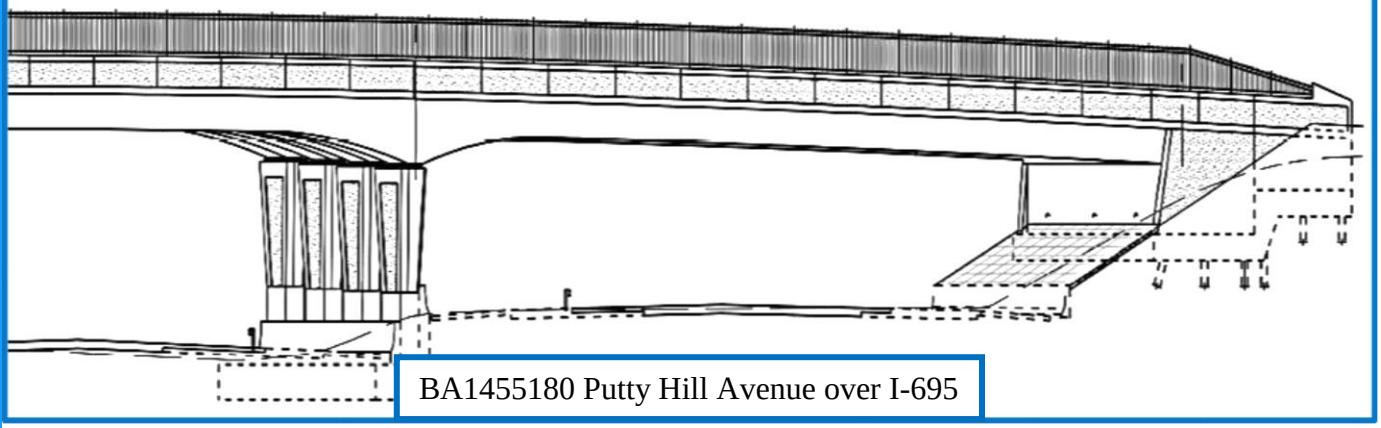
BA9775972 Providence Road over I-695

MARYLAND DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ADMINISTRATION

THE SIX-M COMPANY, INC.
P.O. BOX 309 15 MATTLIN LANE
DELTA, PA 17314
PH. 717-456-7602
FAX 717-456-7054

BA4585172 Old Harford Road over I-695



BA1455180 Putty Hill Avenue over I-695

Technical Proposal

April 3, 2018

Contract No. BA1455180
Construction Management at Risk (CMAR)
Bridge Replacement
Steel Girder Bridge No. 0317400 on Putty Hill Avenue over I-695
Baltimore County

Copy

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Michael Randow - Project Manager and Construction Manager

Years with Six M : 32

Certifications, Registrations and Specialized Training: Temporary Traffic Control Manager's Training Course, E&S Control Certification (White and Yellow Card), ATSSA Certified Flagger, Competent Person for Trench Safety, Silica Certifications

Mr. Randow acts in a dual role as our project manager and construction manager on large scale projects, particularly those involving construction over, on or adjacent to I-695. His entire career has been spent working on bridge and highway projects in the Baltimore area, so he is very familiar with doing business with MDOT SHA and partnering with them to complete projects. He manages all aspects of the project from post-award through project completion, notably the bridge/roadway/highway construction, subcontractor coordination, estimates and project scheduling. On large projects, Mr. Randow uses his vast experience in roadway, earthwork, utilities, maintenance of traffic and structures to assist the company's estimators in preparing the most competitive bid. Mr. Randow has also managed several high profile, award winning projects, particularly the MdQI Partnering Construction Gold Award for the I-695 From MD 41 (Perring Parkway) to MD 147 (Harford Road) Widening project and the MdQI Project of the Year Over $5 Million for the Interchange Reconstruction, I-695 at Charles Street (MD 139) Phase I project.

Project Manager and Construction Manager Experience:

I-695 From MD 41 (Perring Parkway) to MD 147 (Harford Road) Widening, Baltimore County, MD, MDOT SHA, $22M Replacement of Bridge No. 0316800 on Old Harford Road over I-695. The major work consisted of removing the existing bridge and replacing it with a new two span steel girder bridge structure. Construction of two MSE retaining walls, which were founded on ground that was improved through the process of an impact pier support system. Widening and resurfacing of I-695 along with drainage and storm water management improvements along I-695, ramps at the Harford Road interchange, Old Harford Road and Harford Road. Several major subcontractors were key to this project, namely the paving and utility subcontractors. Mr. Randow scheduled, coordinated and worked with them to complete the project in a timely fashion while minimizing impacts to the travelling public and project schedule.

Interchange Reconstruction, I-695 at Charles Street (MD 139) Phase I, Baltimore County, MD, MDOT SHA, $38M The major work consisted of removing the existing bridge over I-695 and replacing it with a new two span steel girder bridge structure. Rehabilitation of Bridge No. 03159 on I-695 over Light Rail. Construction of two MSE retaining walls and the construction of two cast in place retaining walls. Widening and resurfacing of I-695 Outer Loop and reconstruction of the ramps to and from I-695 at Charles Street along with storm water management facilities. Reconstruction of Charles Street and Bellona Avenue from south of Kenilworth Drive to north of Othoridge Road. This major project required several large subcontractors, most notably the paving and utility subcontractors. Throughout the duration of the project, Mr. Randow continuously scheduled, coordinated and worked with them to complete the project and while doing so, minimize impacts to the travelling public and project schedule.

Mr. Randow also served as the Project Manager and Construction Manager on the following bridge projects involving major roadways in the Baltimore area:

- I-695 over MD 372 (Wilkens Ave.)
- Providence Road over I-695
- Dual I-83 Bridges over NCR Trail
- I-695 Interchange at Dulaney Valley Rd
- MD 137 (Mt Carmel Rd) over I-83
- Rt 439 and York Road over I-83

Thomas Mattlin Jr. - Cost Estimator and President

Years with Six M : 38

Mr. Mattlin is the chief estimator on every project bid by The Six M Company. He has 30 plus years of estimating experience on projects of every size and nature, including large scale projects involving major highways. Over the past 20 years, Mr. Mattlin has been responsible for the successful bidding of over $250M in projects around the Baltimore area. Having worked in the area for the length of time that he has, Mr. Mattlin has developed a working relationship with the regions clients, including but not limited to MDOT SHA, Maryland Transportation Authority and county public works departments. He manages all aspects of the bidding phase from developing take-off quantities, estimating the required man-hours and production rates, developing unit costs and pricing, and coordination with subcontractors and suppliers. Utilizing his vast experience in the region's construction market, Mr. Mattlin is able to easily identify risks and determine means and methods to mitigate those risks during construction.

Similar to the Putty Hill project, the two example projects below involved phased construction of the bridge, which required the estimation of support of excavation and the risks associated along with it. Utility relocations were also a major part of these projects. Coordination with numerous utility subcontractors was necessary during the bidding phase. Mr. Mattlin used his experience working on the I-695 roadway and similar roadways in the Baltimore area to estimate the required maintenance of traffic. The MOT and pedestrian movements were a significant part of both projects and numerous other large projects the company has constructed. These were especially critical on the below projects due to the extensive amount of work on and over I-695.

Notable Cost Estimator Experience:

I-695 From MD 41 (Perring Parkway) to MD 147 (Harford Road) Widening, Baltimore County, MD, MDOT SHA, $22M Replacement of Bridge No. 0316800 on Old Harford Road over I-695. The major relevant work consisted of removing the existing bridge and replacing it with a new two span steel girder bridge structure. Drainage and storm water management improvements along I-695, ramps at the Harford Road interchange, Old Harford Road and Harford Road.

Interchange Reconstruction, I-695 at Charles Street (MD 139) Phase I, Baltimore County, MD, MDOT SHA, $38M The major relevant work consisted of removing the existing bridge over I-695 and replacing it with a new two span steel girder bridge structure. Construction of several storm water management facilities. Reconstruction of Charles Street and Bellona Avenue from south of Kenilworth Drive to north of Othoridge Road.

Mr. Mattlin served as the Chief Estimator on the following projects constructed by The Six M Company. These projects had similar requirements and scope as the Putty Hill project:

- I-695 from MD 41 (Perring Parkway) to MD 147 (Harford Road) Widening, $22M
- Deck Replacement of I-895 Bridges over Patapsco, Potee and Hanover Street, $10M
- Interchange Reconstruction, I-695 at Charles Street (MD 139) Phase I, $38M
- I-895 Bridges over Herring Run, $7M
- Rossville Boulevard over I-95, $11M
- MD 32 Patuxent Freeway, $13M
- I-695 Interchange at Dulaney Valley Rd, $8M
- I-695 over MD 372 (Wilkens Ave.), $13M
- Dual I-83 Bridges over NCR Trail, $10M
- MD 32 in Howard County, $28M

Michael Mattlin, PE – Assistant Preconstruction Project Manager

Years with Six M : 3 Years with other firms : 12

Education: Pennsylvania State University, State College, PA
BS in Civil Engineering (BSCE), Concentration in Structural Engineering, 2002

Certifications, Registrations and Specialized Training: Registered Professional Engineer, State of Maryland, No. 35482, Registered Professional Engineer, State of Pennsylvania, No. PE074296

Mr. Mattlin currently works as a Project Engineer and estimator for The Six M Company. He previously worked for Johnson, Mirmiran and Thompson (JMT) as a structural engineer where he had 12 years of experience in structure design, preparing construction plans and contract documents, and working with contractors on Design-Builds for various bridge replacement and bridge preservation projects. While at JMT, Mr. Mattlin also did the engineering on multiple contractor temporary works, such as but not limited to deck and bridge demolition, truss removal, girder erection, support of excavation, spreader beam design and bridge jacking. As an engineer and coupled with his construction background, he was often tasked with reviewing contract plans for constructability, contractor designed alternates and temporary works.

As Assistant Preconstruction Project Manager, Mr. Mattlin will be responsible for working with MDOT SHA, the project stakeholders and the designers in a collaborative manner throughout the life of the contract. Having worked as an engineer on several constructed Design-Build projects and numerous Design-Build pursuits, and also his experience as a construction estimator, Mr. Mattlin brings with him the knowledge required to intelligently discuss design issues and how they will affect construction and project costs.

Engineering Highlights:

Concrete Bridge Barrier Design-Build, SR 0022-000, Dauphin County, PA, $5M Project Structural Engineer/Assistant Project Manager for this design-build project that involved the retrofitting of the existing precast bridge barriers at 11 bridge sites and 2 retaining wall sites. Duties included the preparation of bridge barrier structure plans, specifications and the coordination between traffic control narratives/plans, the roadway plans and structure plans.

I-95 Express Toll Lanes/I-695 Interchange, Baltimore County, MD, $220M Structural Designer for several bridges within the interchange, including the curved, ten span steel, 2008' Ramp GI Bridge and the curved, six span steel, 1410' Ramp MD Bridge. Duties included the design of straight and curved steel girders, P/S concrete beams, abutments, piers and integral pier caps.

I-95/I-495 Retaining Wall S5, Prince Georges County, MD Structural Designer for the contractor designed alternate of a secant wall to a C.I.P. concrete retaining wall ranging in height up to a maximum of 27'. Multiple wall heights were designed, which included pile footings and stem design.

PPL Holtwood, LLC Power Plant Expansion Project, Lancaster County, PA, $440M Project Manager and Engineer for the design of 9 cofferdams, several miscellaneous support of excavations and numerous other engineering tasks for the construction of a new hydroelectric powerhouse, enhancements to the existing fish lifts, construction of a new skimmer wall bridge and bridge over Norfolk Southern, and the installation of inflatable flashboards on the existing spillway. Cofferdam designs included cellular and braced cofferdams retaining up to 50’ of the Susquehanna River.

Fairfax County Parkway Design-Build, Fairfax County, VA, $112M Structural Engineer for the design of two 420’ steel girder bridges carrying the Fairfax County Parkway over Boudinot Drive and Accotink Creek. Duties included overseeing all aspects of the structure design (girders, abutments, piers).

Kenneth Mattlin Jr, PE – Assistant Preconstruction Project Manager

Years with Six M : 2 Years with other firms : 12

Education: Pennsylvania State University, State College, PA
BS in Civil Engineering (BSCE), Concentration in Structural Engineering, 2003

Certifications, Registrations and Specialized Training: Registered Professional Engineer, State of Maryland, No. 44297, Registered Professional Engineer, State of Pennsylvania, No. PE079487, Project Manager Training (JMT), "Site Specific" Fall Protection Course (START Rescue Training, Inc.), 2013 FHWA-NHI-130053 Bridge Inspection Refresher Training, 2013 FHWA-NHI-130078 Fracture Critical Inspection Techniques for Steel Bridges, 2013 FHWA-NHI-130087 Inspection and Maintenance of Ancillary Highway Structures

Mr. Mattlin currently works as a Project Engineer and estimator for The Six M Company. He previously worked for Johnson, Mirmiran and Thompson (JMT) as a structural engineer where he had 12 years of experience in bridge inspection, structure design, contract plan and document preparation, and working with contractors on both Design-Bid-Build and Design-Builds for various bridge replacement and bridge preservation projects.

Mr. Mattlin served as a Team Leader on numerous bridge inspections and deck condition evaluations. He was responsible for doing hands-on inspections and providing the Owner with the results of his findings so as a team, they could appropriately decide on the correct course of remediation. Mr. Mattlin served as the lead Structural Engineer through design and construction of these projects.

Working as a consultant engineer for 12 years, Mr. Mattlin gained valuable experience in building relationships with stakeholders. He attended countless meetings with stakeholders, such as park agencies, emergency responders, local governments and authorities, residents and utility companies. Mr. Mattlin was responsible for incorporating the stakeholder's ideas into the project where the Owner deemed appropriate.

As Assistant Preconstruction Project Manager, Mr. Mattlin will be responsible for working with MDOT SHA, the project stakeholders and the designers in a collaborative manner throughout the life of the contract. Mr. Mattlin will utilize past lessons learned and experiences in dealing with stakeholders to better serve the project needs.

Engineering Highlights:

Deck Condition Survey Inspection, MD Team leader for the inspection and report preparation for numerous bridges ranging in size from 5,000 sf to 110,000 sf. Responsibilities included coordinating lane closure permits, overseeing all inspection field work and report preparation.

MD 195 over Sligo Creek, Takoma Park, MD, $10M Structural Engineer for the replacement of the columns and superstructure for the three-span concrete arch bridge. Responsibilities included performing a hands-on inspection of the bridge, overseeing the layout for a temporary pedestrian bridge, attending stakeholder meetings and providing final design documents to the MDOT SHA.

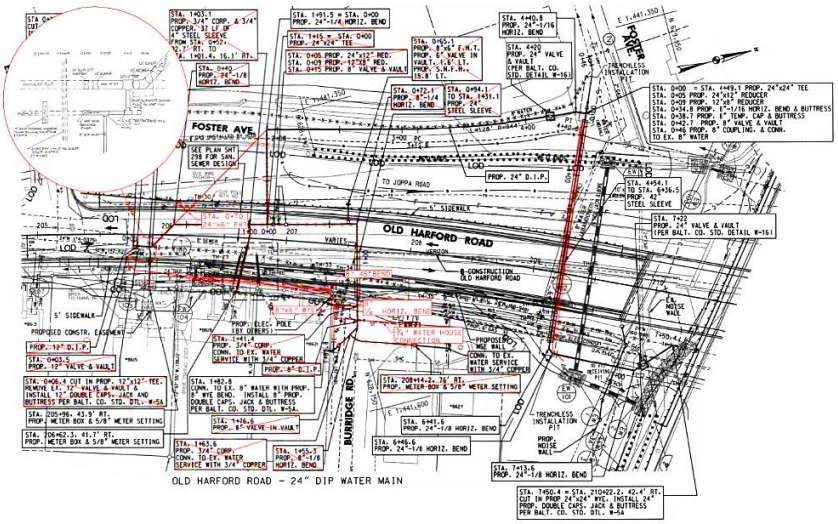
US 13 over the Pocomoke River, Pocomoke City, MD $16M Structural Engineer for the LMC Overlay and Deck Replacement of the twenty-six span dual bridges carrying Northbound and Southbound US13 over the Pocomoke River. Responsibilities included performing an inspection of the superstructure and substructure, attending stakeholder meetings and providing final design documents to the MDOT SHA.

Owner/Client: MDOT, State Highway Administration	
Address: 707 N. Calvert Street, Baltimore, MD 21202	
Point of Contact: Mr. Jesse Free, A.D.E.	**Number:** 410-229-2421
Project Name and Location	Contract No. BA4585172 I-695 From MD 41 (Perring Parkway) to MD 147 (Harford Road) Widening Baltimore County
Awards: 2018 MdQI Partnering Construction Gold Award, 2018 Excellence in Concrete MD ACI	
Project/Construction Manager: Mike Randow	**Cost Estimator:** Tom Mattlin, Jr.
Project Delivery Method: Design-Bid-Build	
Initial Contract Value: $22,371,148.77	**Final Contract Value:** $23,734,803.00
Reason for Difference: Owner approved Red Line Revisions and Change Orders	
Initial Completion Date: May 3, 2017 per IFB	**Final Completion Date:** November 28, 2017
Reason for Difference: Delayed due to relocation of existing utilities, which forced some paving and landscaping out of originally intended seasons, redline revisions also caused project time to extend	

Project Description: Replacement of Bridge No. 0316800 on Old Harford Road over I-695. The work consisted of removing the existing four span steel beam bridge and replacing it with a new structure that is a two span steel girder bridge with a length of 277'-6" and a width of 58'-11½". Construction of the MSE retaining wall No. 03577R0 on Old Harford South of I-695. The new retaining wall is 318'-10" long and 11'-8" high, on average. Construction of MSE retaining wall No. 03578R0 on Old Harford North of I-695. The new retaining wall is 193'-8" long and 11'-9" high, on average. Both MSE walls were founded on ground that was improved through the process of an impact pier support system. Construction of noise wall No. 03134NO on the east side of Old Harford south of I-695. The new noise wall is 80'-0" long and 13'-0" high, on average. Widening and resurfacing of I-695 for approximately 0.96 miles to accommodate 12-foot median shoulders, three general purpose lanes, a continuous auxiliary lane and paved outside shoulders from Perring Parkway to Harford Road. Resurfacing, wedge and leveling, and cross slope correction along I-695. Removing and replacing approximately 4,550 LF of existing I-695 median barrier with new 42" F-shaped concrete traffic barrier. Realigning the horizontal and vertical alignment of Old Harford Road for approximately 0.28 miles. Drainage and storm water management improvements along I-695, ramps at the Harford Road interchange, Old Harford Road and Harford Road. Installing new partial interchange lighting at the Perring Parkway and Harford Road interchanges and removing existing interchange and mainline lighting.

Maintenance of traffic and maintenance of pedestrian traffic comprised a significant portion of this project. Being over I-695 greatly limited the work hours permitted due to lane closure restrictions. Most

of the major construction tasks, such as bridge demolition and girder erection, had to occur at night. With the amount of work on the project, I-695 was constantly being shifted, lanes being closed and temporary closures for erection. The experience gained on this project will be invaluable when it comes to the required maintenance of traffic required on the Putty Hill project.



The project included numerous utilities that had to be relocated. A 24" water main was placed under Old Harford Road by jack and boring a 42" steel sleeve. During construction, a field change was made to re-route the location of a 24" water line to avoid placing 8" water lines under the proposed MSE retaining wall. The water lines would've interfered with the construction of the impact pier support system, which supports the MSE wall. The as-built 8" water line now runs parallel to the MSE wall with house tie-ins made along its length. The utility experience gained on this project will be invaluable when evaluating the relocation options for all affected utilities on the Putty Hill Avenue project.

Phasing was a very important aspect of this project, as it is for the Putty Hill project. The original contract showed the existing structure being removed in two phases. Our in-house engineers determined that it would be feasible to modify the sequencing to allow a single phase removal of the existing structure. To accomplish this, lane widths on the proposed structure were reduced, the location of the closure pour was changed, two champagne piers were constructed instead of the three shown in the contract plans and one less girder was erected in phases 2 & 3 construction. In the end, the changes greatly reduced the impact to the neighboring community by eliminating an entire phase of demolition noise during nighttime hours and reducing the amount of maintenance of traffic disturbances on I-695.

Similar to the Putty Hill project, construction of this project occurred in close proximity to housing. Excessive noise was a constant concern, especially during the nighttime hours. Structure demolition, pile driving and other noisy tasks were performed as expeditiously as possible. To avoid possible damage and claims during tasks that create ground vibration, monitoring of the homes was performed through the use of pre- and post-construction surveys. Along with all of this, access to the homes had to be maintained at all times during construction.

Owner/Client: MDOT, State Highway Administration	
Address: 707 N. Calvert Street, Baltimore, MD 21202	
Point of Contact: Mr. Jesse Free, A.D.E.	**Number:** 410-229-2421
Project Name and Location	Contract No. BA9775A72 Interchange Reconstruction, I-695 at Charles Street (MD 139) Phase I Baltimore County
Awards: 2013 MdQI Project of the Year Over $5 Million, 2013 MdQI Award of Excellence, State Highway Administration Modal Award (Over $5 Million), 2013 Excellence in Concrete Award, Maryland Chapter ACI	
Project/Construction Manager: Mike Randow	**Cost Estimator:** Tom Mattlin, Jr.
Project Delivery Method: Design-Bid-Build	
Initial Contract Value: $37,941,156.50	**Final Contract Value:** $44,576,680.00
Reason for Difference: Owner approved Red Line Revisions and Change Orders	
Initial Completion Date: November 18, 2011 per IFB	**Final Completion Date:** December 2012
Reason for Difference: Delayed notice to proceed forced majority of paving out of originally intended seasons, redline revisions also caused project time to extend	

Project Description: Reconstruction of Charles Street and Bellona Avenue from south of Kenilworth Drive to north of Othoridge Road. The work consisted of removing the existing four span steel beam bridge over I-695 and replacing it with a new structure that is a two span steel girder bridge with a length of 321'-9" and a width of 114'-4". Rehabilitation of Bridge No. 03159 on I-695 over Light Rail. Construction of the MSE retaining wall No. 03588R0 on MD 139 SB South of I-695. The new retaining wall is 952'-4" long and 21'-0" high, on average. Construction of MSE retaining wall No. 03589R0 on MD 139 NB South of I-695. The new retaining wall is 754'-3" long and 13'-0" high, on average. Construction of the CIP retaining wall No. 03590R0 between Ramp 1 and Bellona Avenue. The new retaining wall is 240'-8" long and 10'-9" high, on average. Construction of the CIP retaining wall No. 03591R0 on I-695 Outer Loop west of MD 139. The new retaining wall is 550'-3" long and 3'-6" high, on average. Reconstruction of 114' of an existing historic stone wall. Widening and resurfacing of I-695 Outer Loop between the York Road interchange and Charles Street to provide an auxiliary lane. Reconstruction of the ramps to and from I-695 at Charles Street and reconstruction of Clark Avenue and Bellona Avenue. Installation of new drainage systems and modifications to the

existing drainage systems along with the construction of stormwater management facilities. Demolition of the existing and installation of new roadway signing, traffic signals and ITS facilities.

The scale and vast scope of this project required close coordination between Six M, MDOT SHA and the community. There were several meetings held throughout construction with the local community to keep them informed of the current and upcoming construction that could disrupt the area. Partnership with SHA was pivotal in keeping the project moving in the right direction and keeping open lines of communication with all stakeholders.

Maintenance of traffic comprised a significant portion of this project. Being over I-695 greatly limited the work hours permitted due to lane closure restrictions. Most of the major construction tasks, such as bridge demolition and girder erection, had to occur at night. With the amount of work on the project, I-695 was constantly being shifted, lanes being closed and temporary closures for erection. The experience gained on this project will be invaluable when it comes to the required maintenance of traffic required on the Putty Hill project.

As with the proposed Putty Hill bridge, staged construction of the structure required significant shoring at the abutments between the construction phases. Soldier piles and lagging were utilized along with tie backs due to the depth of retained material. Coupled with this was the restricted work area at the pier. The pier was located between the I-695 Inner Loop and Outer Loop and squeezed down by the limited median width in the area. Construction had to occur in a linear fashion with the bearing piles being driven starting at the far end and backing the crane up to gain access to the near end.

Construction of this project occurred in close proximity to a developed area in a residential neighborhood. Excessive noise was a constant concern, especially during the nighttime hours. Structure demolition, pile driving and other noisy tasks were performed as expeditiously as possible. To avoid possible damage and claims during tasks that create ground vibration, monitoring of the homes was performed through the use of pre- and post-construction surveys. Along with all of this, pedestrian traffic and access to the homes had to be maintained at all times during construction.

Other key aspects of this project that will be similar to the Putty Hill project are the construction of several stormwater management facilities, storm drain crossings and numerous utility relocations.

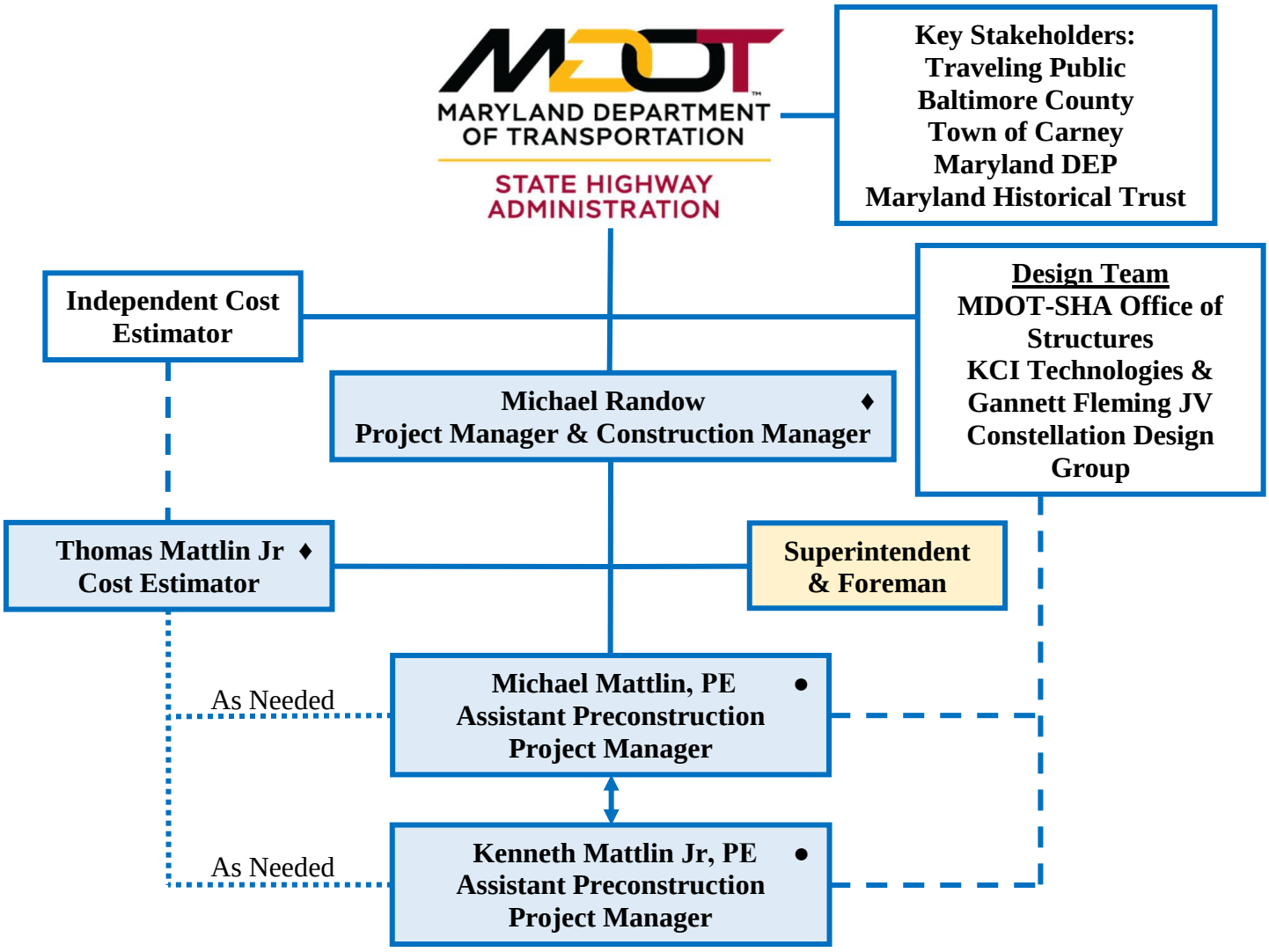
Owner/Client: MDOT, State Highway Administration		
Address: 707 N. Calvert Street, Baltimore, MD 21202		
Point of Contact: Mr. Jesse Free, A.D.E.		**Number:** 410-229-2421
Project Name and Location	Contract No. BA6015180	
	Replacement of Bridge No. 311905 on I-695 IL over MD 372 (Wilkens Ave)	
	Baltimore County	
Project/Construction Manager: Mike Randow		**Cost Estimator:** Tom Mattlin, Jr.
Project Delivery Method: Design-Bid-Build		
Initial Contract Value: $12,920,669.95		**Final Contract Value:** $12,962,344.00
Reason for Difference: Owner approved Red Line Revisions and Change Orders		
Initial Completion Date: July 31, 2013 per IFB		**Final Completion Date:** November 2013
Reason for Difference: Delayed due to obtaining power to signals and median lighting issues		

Project Description: Replacement of Bridge No. 0311905 on I-695 Inner Loop over MD 372 (Wilkens Avenue). The I-695 Inner Loop was raised up to a maximum of 3'-0" to provide 16'-9" clearance under the new bridge. The work consisted of removing the existing four span steel beam I-695 IL bridge and replacing it with a new structure that is a two span steel girder bridge that is approximately 37' wider than the existing bridge. Reconstruction of the interchange ramps to tie into the raised I-695 profile and bridge approach widening. Widening of the MD 372 approach and under the I-695 bridge to add bicycle compatibility. Replacing the existing lighting impacted by the project and replacing/upgrading existing signs approaching the interchange and within the interchange. Resurfacing I-695 IL, MD 372 and ramps within the project limits.

Maintenance of traffic comprised a significant portion of this project. Being on I-695 greatly limited the work hours permitted due to lane closure restrictions. Most of the major construction tasks that would affect the adjacent I-695 traffic, such as bridge demolition and girder erection, had to occur at night. Not only was vehicular traffic high in the area, pedestrian traffic was also high because of the proximity of the project to the University of Maryland – Baltimore County.

Other aspects of the project that are similar to the Putty Hill project:

- Working on I-695
- Staged bridge construction
- Similar pier construction
- Installation of a temporary signal
- Construction of storm water management facilities



♦ Key Staff
● Value Added Staff

Staff Member	Title	Hours per week during Preconstruction (±)	Hours per week during Construction (±)
Michael Randow	Project Manager & Construction Manager	20	40
Thomas Mattlin Jr	Cost Estimator	15	0 to 5
Michael Mattlin, PE	Assistant Preconstruction Project Manager	20	5 to 10
Kenneth Mattlin Jr, PE	Assistant Preconstruction Project Manager	20	5 to 10

The Six M Company is no stranger to collaboration, cooperation and trust when working with MDOT SHA and design teams. Six-M has been partnering with SHA since 1996 on major bridge and highway projects. During this process, Six M has worked closely with SHA personnel to present and resolve issues, including presenting various alternate and value engineering designs to expedite the schedule, provide a better product and reduce costs. Six M will use these same principles of communication, trust and cooperation to help SHA achieve their goals during the design and construction of this project.

Six M has completed four I-695 overpass projects within 7 miles of this proposed project; Old Harford Road, Providence Road, Dulaney Valley Road and Charles Street. Two of these structures have nearly identical piers, abutments, barriers and typical sections as is proposed on the Putty Hill project. See below for pictures of Old Harford Road and Providence Road. Based on this, SHA can trust that Six M will have the knowledge, experience and cost history to intelligently talk about and discuss the project and proposed bridge construction. With this history, we'll be able to put together a thorough Quality Control Plan that SHA can trust will lead to a quality product.

BA4585172 Old Harford Road over I-695

BA9775972 Providence Road over I-695

The most recent example of collaboration is receiving the MdQI Partnering Construction Gold Award for the $22M BA4585172 I-695 From MD 41 (Perring Parkway) to MD 147 (Harford Road) Widening project. This project involved the replacement of Bridge No. 0316800 on Old Harford Road over I-695 and was less than 2 miles from the Putty Hill project. Six M, SHA, the design engineers and all stakeholders were able to meet and freely discuss and resolve issues in a timely manner. Without the ability to have open discussions on the Old Harford Road project, issues would have lingered on without a clearly defined ending or goal. It was to the benefit of everyone to be able to leave the progress meetings knowing the direction the project was heading and who was responsible for what task.

As was evidenced on the award winning Old Harford Road project, communication is key when trying to establish collaboration and trust on a project. From the very early stages, open and free communication through meetings, workshops, conference call, etc. will bring all parties together and allow them to work

together towards accomplishing a common goal; successfully designing and constructing the Putty Hill project. At the very minimum, monthly progress meetings will be held to assemble everyone in a common location to be able to discuss issues and progress in a face to face environment. The frequency of these meetings will be increased, as necessary, depending on the stage of design or cost development and also the need for additional discussions of specialty items.

Beyond the monthly progress meetings, specialty meetings will be scheduled to discuss the design and constructability of the project. One driving factor that can greatly affect this project is utility coordination. It will be too late to coordinate with the utilities once construction is set to begin. The utility companies must be involved in the project from the very first meeting. Utilities have notoriously long lead times once a project commences, however, inviting them into the process at the beginning stages will allow them to properly schedule and expedite their work once construction NTP is granted.

Six M also brings to the table the design experience of two structural engineers, Michael Mattlin, PE and Kenneth Mattlin, Jr, PE. Each of these engineers has over 12 years of experience in the design of heavy highway structures, including bridges. Being able to intelligently discuss bridge design issues with the design team, while simultaneously incorporating constructability knowledge, will be a great asset to the entire team. This is accomplished by knowing the effort involved in making a design change and being able to weigh that against the possible cost savings in construction.

Not only does Kenneth Mattlin, Jr. bring bridge design experience to the table, but he also has valuable experience in stakeholder coordination. For the MDOT SHA MD 195 over Sligo Creek project in Takoma Park, MD, he attended many meetings with stakeholders, such as Maryland-National Capital Park and Planning Commission, City of Takoma Park and utility companies. Mr. Mattlin then incorporated the stakeholder's ideas into the project where MDOT SHA deemed appropriate.

As Assistant Preconstruction Project Manager, Kenneth Mattlin will be responsible for working with MDOT SHA, the project stakeholders and the designers in a collaborative manner throughout the life of the contract. Leaning on his past lessons learned and experiences in dealing with stakeholders, he'll be able to pull all parties together to work towards the common goal of better serving the project needs. Public and private meetings will be scheduled and all stakeholders will be invited to discuss the project and how it can be improved to better suit the needs of everyone. The results of these meetings will be discussed with the entire CMAR team and as appropriate, ideas and concepts will be incorporated into the project.

Some of the biggest causes of change orders and redline revisions can be traced back to design and constructability issues, whether they be from actual design issues or omissions on the contract plans. Generally, design issues aren't discovered during the bidding phase of a project, because the estimators don't necessarily dig as deep into the contract plans as the construction staff do. This is where the CMAR process comes into play. By actively engaging the contractor through the design process, the design team can mitigate and resolve many of these issues before the construction phase even begins.

Throughout the design process, Six M will be actively engaged in the process by participating in formal reviews of the design package. Relying on the design experience of the company's in-house engineers, the design reviews will be able to mesh the actual design to the cost and construction aspects. In-depth reviews of the plans will greatly reduce the errors and omissions that may occur, which will in turn, eliminate any change order or redline that would've been associated with it.

Utilizing their structural engineering background, Six M's in-house engineers have the skills and knowledge to identify potential design risks and associated financial risks. With a background that includes numerous high profile bridge designs, the in-house engineers have the experience to provide valuable input in mitigating the design and financial risks. Couple this experience with the experience of Six M's Project and Construction Manager, constructability will be easily coordinated with SHA and the design team. The construction experience that Michael Randow, our Project and Construction Manager, brings to the table allows us to know what has to be done to reduce the cost of construction. From a contractor standpoint, the number one goal of any project is to construct it faster and cheaper. The collaborative approach required of a CMAR means the goal of all members of the team is the same, design and construct the project in a manner that produces the same product, but at a cheaper cost and shorter duration. This is where having a team that trusts one another becomes a big benefit. SHA has to trust that Six M will produce the product they are looking for and at the same time, reduce the cost of construction to ensure it is within budget. The Proposed Technical Concepts, outline later in this proposal, show that Six M is committed to a time and cost savings approach to this project.

With experience comes the ability to use gut feel when discussing the cost and schedule impacts of a constructability issue. As design and constructability meetings, and value analysis workshops are held, Six M will be able to very easily determine how an issue will affect the OPCC or how the issue can adversely affect the schedule due to capacities of material, labor, and equipment. This approach can eliminate ideas that are not worth the time and effort to pursue further, which in turn will save design and review costs by not having to look at something that clearly has no possibility of becoming reality.

During our reviews, the issues we discover will be logged and tracked in a similar fashion as the risks identified. All potential issues will be added to a design and constructability review comment spreadsheet and reports. This tracking mechanism will be utilized to assign individuals or entities responsible for the next step in the process, whether it be investigating farther or resolving the issue. As contractors, Six M prefers things to happen in a timely and organized manner with everyone knowing exactly what their role is. To accomplish this, a due date will be assigned to each review comment discussed with the team. The due date can be very aggressive or more lenient, depending on the stage of design the issue is discovered. This will be a point of discussion with the team during the design and constructability review meetings and value analysis workshops, so all parties agree on the due date and can assign the appropriate resources to hit that date.

The number one goal of any project is to efficiently and quickly design and construct a project while minimizing the amount of risk absorbed. The last thing any member of the team wants to do is accept more risk than is necessary. This holds true for MDOT SHA, the design team and Six M. By identifying as many risks as possible at the earliest stage in the process as possible, those risks can be fully mitigated or at the very least, prepared for.

As is discussed in the Collaboration portion of this proposal, communication is key when trying to establish collaboration and trust on a project. This also rings true for risk management. From the very early stages, open and free communication through meetings, workshops, conference calls, etc. will bring to the forefront the risks associated with all aspects of the project. Without the ability to have open discussions, issues and risks will linger on without a clearly defined ending or goal.

The review process undertaken by Six M, whether it be of the design or for constructability, will identify all of the risks associated with the construction of the project. Risk reviews will be performed by the Project and Construction Manager Michael Randow, along with the assistance of the President and Cost Estimator, Thomas Mattlin, Jr and in-house engineers Michael Mattlin, PE and Kenneth Mattlin, Jr, PE. With over 32 years of experience with Six M on large scale projects, particularly over, on or adjacent to I-695, Michael Randow has encountered just about every risk situation that a contractor can encounter.

During our reviews, the risks we discover will be logged and tracked in a spreadsheet, called a Risk Register. Any potential solutions or innovations that we feel could resolve the issue or risk will also be added to an innovation tracking and performance report. These registers and reports will be utilized to assign individuals or entities responsible for the next step in the process, whether it be investigating farther or resolving the issue. As contractors, Six M likes to have issues resolved as quickly as possible, therefore a due date will also be assigned to each risk discussed with the team. The due date can be very aggressive or more lenient, depending on the stage in design or construction the risk is discovered. This will be a point of discussion with the team during risk assessment meetings and mitigation workshops, so that all parties agree on the due date and can assign the appropriate resources to hit that date.

For Six M, the next step would be to put a price to the risk, which will allow SHA and the designers to determine if it is a risk they are willing to accept, via higher construction costs, or if a designed solution would better suit the situation. At this stage, Six M will be able to compare the cost of the risk to the cost of any potential innovative technique to mitigate the risk. If there's one thing contractors like to do, it's develop cost saving innovations. Throughout the duration of any project, we are constantly thinking and looking for cost saving measures, whether they be a value engineered proposal, contractor designed alternate, or a faster, better way of constructing the project. One perfect example of this was the use of an impact pier support system to stiffen underlying soft soils below MSE walls on the BA4585172 I-695 From MD 41 (Perring Parkway) to MD 147 (Harford Road) Widening project. The contract plans called for stone columns with a load transfer mattress under the walls, however, discussing this with the industry, we determined that there was a better, more innovative way of constructing this piece of work. We were able to eliminate the load transfer mattress and utilize an impact pier support system. This innovative option saved time and money which equated to a shorter construction duration.

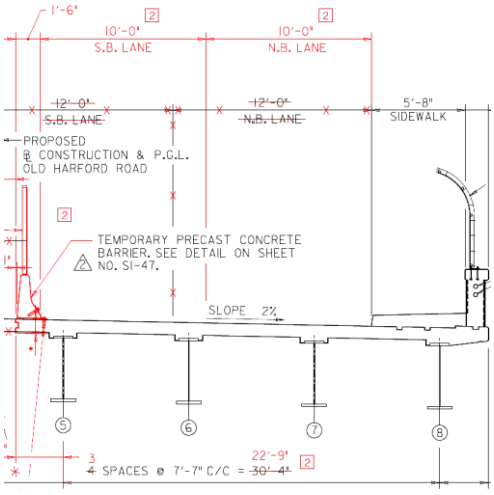
Initial Risk Matrix

Note: the below risks are in no particular order of importance. They are simply listed as they were identified by Six M.

Risks	Potential Impacts	Mitigation Strategy
Utilities	1. Construction Delays if Incorrectly Located	Test pitting will be performed to determine the exact location of all marked utilities. Since the project is located in a neighborhood, it can be anticipated that numerous utilities will be encountered, including ones that are not known. To the best of everyone's abilities, all utilities must be marked and if being relocated, planned to be completed prior to bridge construction.
	2. Increased Scheduling	Based on the contract plans, there are a minimum of 6 utilities that are scheduled to be relocated prior to construction. These must be coordinated and relocated prior to NTP of the bridge construction or delays will be incurred. Since they are known in the early stages of the project, there should be ample time to work with the utilities to schedule and perform the work.
	3. Subcontractor Coordination	There is a 2" gas line and a 24" Baltimore County water main to be relocated. This work will be performed by a subcontractor, so they'll be brought on board early in the construction process to give their input. Often times, the best way to perform the work isn't determined until the work is under way and can be visualized by all parties.
Steel Tariffs	Increased Material Costs	On projects Six M currently has, we are hearing from material suppliers that the proposed tariffs are causing steel prices to trend steeply upward. Large steel items such as rebar and structural steel need to be tied down early to avoid potential cost increases in construction.
Deteriorated Deck Not Suitable for Structure Mounted Barrier	Construction Delays, Additional Construction Costs	Perform deck survey and concrete cores prior to construction to verify condition and capacity. Once in construction, it will be too late to quickly make a design change on the method of temporary barrier attachment.
Limited Access for Pier Construction Adjacent to I-695	1. Increases Construction Duration	Shift LOD and temporary concrete traffic barrier to the edge of travel lanes. This increases the work zone size and greatly increases material storage capacity and crane access for pile driving and pier construction.
	2. Increased need for SOE	Shift LOD and temporary concrete traffic barrier to the edge of travel lanes. This increases the work zone size and reduces the need for Support of Excavation. The final determination will be made once the final bottom of footing elevation is known.

Risks	Potential Impacts	Mitigation Strategy
Maintaining Access to Residences	1. Temporary Restrictions to Driveway	Coordination with homeowners to occur very early in the design and construction process. Notify homeowners when access may be temporary restricted due to construction activities, including final paving.
	2. Homeowners Driving in Work Zone	Again, coordination will be key. For the safety of the workers, the travelling public can't be driving in the work zones, however, due to access issues, it may be beneficial to set up a temporary access road for the residences to access their homes.
Pedestrian Safety	Dangerous Pedestrian Access on Bridge	The temporary traffic lanes are immediately adjacent to the sidewalk and pedestrians without a shoulder buffer or barrier. Place a single face traffic barrier along the gutter line of the sidewalk to protect pedestrians on the sidewalk.
Lead Paint and Asbestos in Houses to be Removed	Additional Construction Costs	Determine prior to construction and GMP negotiations. If there is no lead or asbestos containing material, then the GMP price will be reduced.
Asbestos Material in Existing Bridge Conduit and Approach Conduit	Additional Construction Costs ($25,000.00 on BA4585172)	Determine prior to construction and GMP negotiations if asbestos material exists. This structure was built in the same timeframe as the original Old Harford Road bridge (BA4585172). That bridge contained Transite pipe in the sidewalk and approaches. Transite is an asbestos-cement product that has to be dealt with accordingly. If there is no asbestos containing material, then the GMP price will be reduced.
Public Outcry over Single Lane Traffic Restrictions	Construction Delays	Coordination with the travelling public has to occur very early in the design and construction process to notify them of the upcoming traffic restrictions. Investigate alternatives to the single lane options, such as detouring one direction of traffic, constructing sidewalk in a later stage to gain width for two lanes of traffic, temporary pedestrian bridge, etc.
Temporary Pier Support	Construction Delays if Inadequate	Constant monitoring will be required to inspect for cracks and distress of the overall system. Perform design early in the process to be able to openly discuss with the entire team. Possibly have the design team do the design, since they are part of the team from the beginning stages.
Temporary SOE at Abutments Under Travel Lanes	Layout Will Not Work as Shown	Change the abutment staged construction joints to be parallel to the skew so the SOE will be at the outside edge of the temporary barrier.

1. During the Stage 1 Removal phase, remove the existing sidewalk on the portion of the existing structure that is to remain. Also, shift the removal line so that existing beam 4 remains in place. These changes will increase the available roadway width by approximately 10.0’ on the portion of the structure that remains. This will allow two 10’ travel lanes during the Stage 1 Construction phase. This change will affect the quality of the project from the travelling public’s point of view. Note that 10’ travel lanes have previously been approved by Baltimore County on our recently completed BA4585172 I-695 From MD 41 (Perring Parkway) to MD 147 (Harford Road) Widening project. Right: Typical Section from that project.

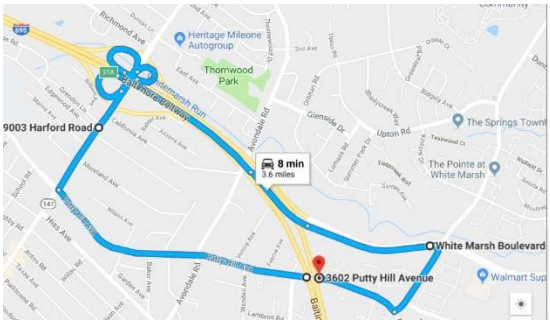


2. In conjunction with number 1, shift the sidewalk to the outside of the structure. This is accomplished by hanging a walkway platform on the exterior of the parapet. The final result is maintaining two 10’ lanes of traffic while also maintaining pedestrian traffic throughout the duration of stage 1. This change will affect the quality of the project from the travelling public’s point of view, including pedestrians. Six M utilized this exact concept on our BA9775972 Replacement of Bridge No. 3163 on Providence Road over I-695 project. Left: Elevation view from that project.

3. In conjunction with number 1, leaving existing beam 4 in place will require additional pier support under that beam. With the extra counterbalance provided by the weight of beam 4, it may be possible to eliminate the concrete pier temporary support shown in the contract plans. However, support would still be required under existing beam 4. This can be accomplished by either construction a temporary concrete footer and supporting beam 4 off of that or installing temporary piling adjacent to the pier cap and supporting beam 4 off of those. As with numbers 1 and 2 above, this change will affect the quality of the project from the travelling public’s point of view by allowing two 10’ lanes of traffic during the Stage 1 Construction phase. Six M constructed a similar piling support option on our BA9775972 Replacement of Bridge No. 3163 on Providence Road over I-695 project. Right: Temporary piling supporting existing beam from that project.

4. When constructing the proposed structure during Stage 1 Construction, do not pour the sidewalk as shown. Cast inserts into the deck and parapet to allow the sidewalk to be poured at a later date. The provided clear roadway would be just over 20', which allows for two 10' lanes of traffic during the Stage 2. As is stated in number 1, 10' travel lanes have previously been approved by Baltimore County on our recently completed BA4585172 I-695 From MD 41 (Perring Parkway) to MD 147 (Harford Road) Widening project. This change will affect the quality of the project from the travelling public's point of view.

5. Install a detour for through traffic around the project site by using Putty Hill Avenue – MD 147 Harford Road – I-695 – MD 43 White Marsh Boulevard – Walther Boulevard – Putty Hill Avenue. The full, round trip detour route is approximately 8 minutes in duration and 3.6 miles in length. A second option, which eliminates the need to travel through three cloverleaves at the MD 147 Harford Road – I-695 interchange is to run the detour route from I-695 – US 1 Belair Road – Rossville Boulevard – Putty Hill Avenue. This options allows traffic to get on I-695 from MD 147 Harford Road by simply using the on ramp. The greatest benefit of a detour on this project is time. By eliminating the phased construction, the construction schedule will be substantially reduced. Also, the cost will be reduced, because everybody in construction knows, time is money.



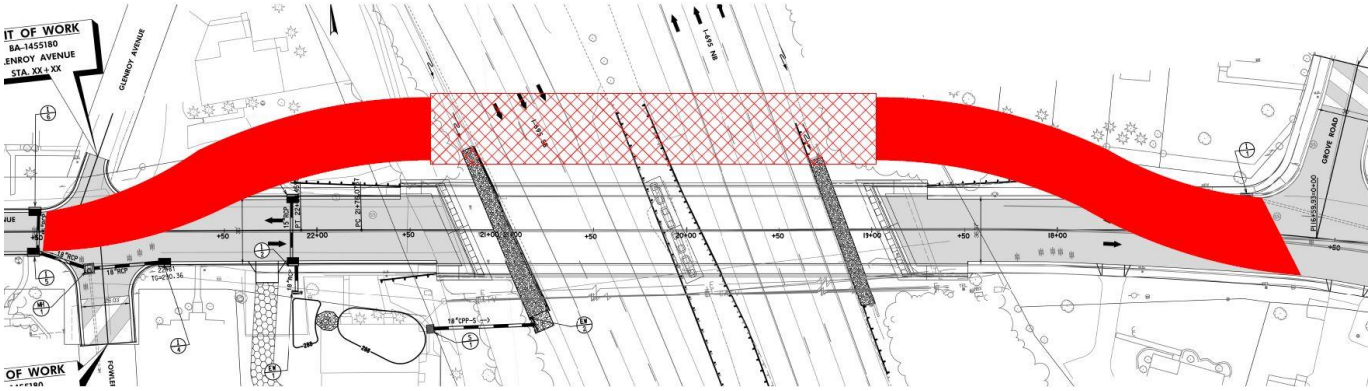
6. In conjunction with number 5, to maintain pedestrian traffic, a simple temporary bridge can be erected adjacent to the work site. A pedestrian only temporary bridge can be assembled and erected in a relatively short amount of time and for a small percentage of the overall project costs. On the MD 195 over Sligo Creek project, which Kenneth Mattlin, Jr was part of the design team, MDOT SHA implemented the use of a temporary pedestrian only bridge. Since this project was located near a hospital and in a residential area, the temporary pedestrian bridge satisfied the project need to keep pedestrian access open and free flowing at all times. Utilizing this option would improve the quality of the project from a pedestrian point of view.

7. Maintaining access to the residences within the work zone will be nearly impossible utilizing the Maintenance of Traffic scheme shown in the plans. For example, as it is shown in the MOT Phase 2 plan, the local residents would have to traverse through the work zone to gain access to their driveways. This is not ideal and dangerous for the contractor's personnel and the residents alike. The temporary barrier precludes the residents from simply driving straight out of their driveways, across the work zone and onto the open portion of the roadway. The temporary barrier creates dangerous limited site distances along with grade change issue between the two phases. Based on the experience

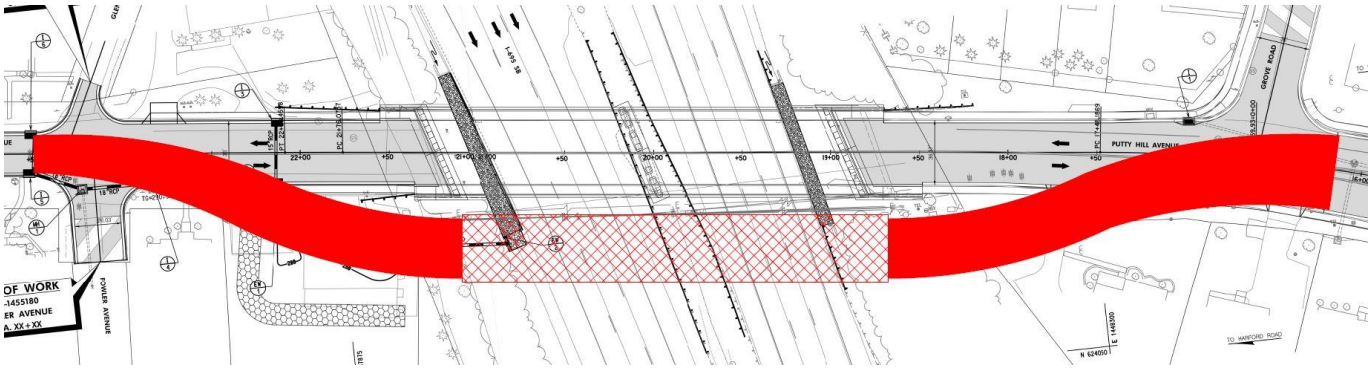
of Michael Randow, Six M's Project and Construction Manager for the project, the best way to solve this issue is to shift the end of the temporary barrier towards the abutments and just past the last driveway at each abutment. From that point up to the bridge, the approach pavement will have to ramped up to the structure to make the grades meet. The low speed limit imposed by the single lane of traffic restriction should make this feasible. The last stages of construction will be to flag and/or detour traffic as necessary to fill and wedge & level the approaches up to proposed grade and make the appropriate tie-ins. At that time, the inlets can be built up to the proposed grades and final curb and gutter work completed. This will reduce the available work zone area at the abutments, but in return, it will vastly improve the safety of the residents entering and exiting their homes. Overall, the project schedule and cost will be minimally impacted by this option.

8. Extend the LOD at the abutments and pier out and place temporary concrete traffic barrier at the edge of the I-695 travel lanes. This will provide additional work area, which greatly increases material storage capacity and crane access for pile driving, pier construction and fabricated structural steel erection. Material deliveries will be much safer, because trucks will be able to pull in behind the barrier wall and enter the work zone without having to sit immediately adjacent to flowing traffic. Fabricated structural steel can be stockpiled and assembled on the shoulders of I-695 in preparation for erection. The protection provided by the temporary concrete barrier is priceless when considering the safety of the construction workers.

9. It may be possible to squeeze in a temporary bridge on either the north side or south side of the existing structure. If the geometrics can be made to work, the proposed structure could be built in a single phase. With a reduced speed limit, the approach horizontal geometry can be tightened up to fit in the curves tying into the existing roadway. Six M is currently constructing a project that utilizes a temporary bridge, BA0805180 Bridge No. 0305000 on MD 137 (Mt Carmel Road) Over I-83 (see inset picture) and on a past project, BA3095180 Replacement of Dual Bridges on I-83 over NCR Trail and Little Falls. On the BA0805180 Mt Carmel Road project, there is also tight horizontal approaches that had to fit into the existing interchange layout. The greatest benefit of this option is the same as that gained with a detour, time. However, a detour would provide the biggest cost savings. By eliminating the phased construction of the bridge, the construction schedule will be greatly reduced. A second, similar option is utilizing a single lane temporary bridge. A single lane option would require less roadway width thus making it easier to fit into the area. In stage 1, a lane of traffic would be maintained on the temporary bridge while pedestrians and a lane are maintained on the existing structure. For stage 2, a lane of traffic would be maintained on the temporary bridge while pedestrians and a lane are maintained on the constructed stage 1 structure. This change will affect the quality of the project from the travelling public's point of view. See the following page for two temporary bridge location options.



Temporary Bridge to the North of Putty Hill



Temporary Bridge to the South of Putty Hill

The sequencing of this project is very similar to that of our past I-695 overpass projects, particularly Old Harford Road and Providence Road. As with the Putty Hill project, each of these structures had either intersections or exit/entrance ramps close to the structure which had to be accommodated with the maintenance of traffic scheme. For Putty Hill, once the initial phase of utility relocation work is completed, traffic will be shifted to the phase 1 location as depicted in the Maintenance of Traffic plans. Phase 1 is the construction of approximately half the width of the proposed structure. Within this phase is the relocation of the 24" Baltimore County water main and 2" BGE gas line. At the completion of this phase of bridge construction, the approach roadway will be ramped up to meet the deck elevations and allow for traffic to be maintained on the newly constructed portion of the structure.

Phase 2 is the construction of the second half of the proposed structure. Traffic will be shifted to the newly constructed structure as depicted on the Maintenance of Traffic Phase 2 plan. When the bridge structure is completed, the approach roadways will be brought up to the final grade and the final tie-ins will be made. To facilitate this stage of construction, flagging operations will be setup to direct traffic around the work zones.

In conjunction with the phase 2 approach construction, a final phase will construct the final curb and gutter work along with driveway tie-ins and surface course paving. Due to the grade differences and the need to maintain access to the local residences, the final approach work is best suited to be constructed at the end of the project. This will make maintaining access to the local residences much easier than trying to complete all tie-ins and approach work within each phase.

Maintenance of Traffic

- Once the long term MOT setup in each phase is completed on Putty Hill Avenue, there won't be much need for additional MOT during bridge construction. There will be some temporary flagging operations for material delivery and other day to day tasks. When the final paving and tie-ins are made, there will be up to several weeks of traffic disruptions via daily flagging operations, lane shifts, etc.

- Due to the grade difference between phases, a temporary mechanically stabilized earth wall will be constructed using wire baskets. This will allow traffic to continue travelling adjacent to the work zone while the up to 4' grade difference is maintained. See picture for example of temporary wire basket wall.

- MOT on I-695 will consist mainly of a temporary concrete traffic barrier placed along the edge of the shoulder and roadway. When work activities occur over travel lanes, lane closures will be used to prevent debris from falling and striking the travelling public. Such activities include, but are not limited to, demo operations, overhang bracket installation, deck pans install, deck pours, etc. Stoppages and drags will be used

during activities with work occurring over several travel lanes. Such activities include, but are not limited to, existing beam removal, proposed girder erection, etc.

Utility Relocation and Staging

- The initial utility relocations must be completed as the first order of work. They must be scheduled, coordinated and completed prior to beginning the structure work. With them being immediately beside the first stage of bridge construction, if they are still in place then there will be no crane access for bridge removal operations.

- During the bridge construction, the subcontractor responsible for constructing the relocated 24" Baltimore County water main and BGE 2" gas line will have to be an integral part of the team and be coordinated as such. They will know from the get go where their work falls into the schedule and what dates and milestones they have to reach to keep the project moving forward.

Construction Phasing

- After the initial utility relocation work is completed, this project consists of three main phases. Stage 1 is ahead station right bridge construction and approach base and stage 2 is ahead station left bridge construction and approach base. The third stage is the final project surface course paving and tie-ins.

Independent Work Packages

- The most obvious independent work package would be the utilities. The initial relocation work can be easily separated from the project, since it will be the first phase of construction. To facilitate the utility relocation work, clearing and grubbing could be completed ahead of the projects notice to proceed. The trees and shrubs would be removed to give the utility companies better access to their facilities.

- Another work package that can be broke out at the onset of the project is the installation of the Erosion and Sediment Controls. With controls installed early, Six M can hit the ground running when ready to mobilize to the project.

- Existing building structures have to be removed as part of this contract. This is normally specialty work, especially if lead paint or asbestos containing material is found. By breaking this work out separately, the staging and stockpile area can be available on the first day Six M mobilizes to the project. This will be a valuable asset for the initial delivery of excavators, cranes, tool & parts trailers, etc. Note that the current Sediment Control Plan Phase 1 does not show the LOD around the stockpile area. The LOD is not shown around this area until phase 2. This will have to be corrected to give the contractor access to the staging and stockpile area at the onset of the project.

After reviewing the provided preliminary plans and RFP coupled with our experience in constructing staged structures over I-695, it is anticipated that the project will be approximately 23 months in duration. This is consistent with our experience constructing phased structures over I-695 and is also based on receiving a Notice to Proceed on June 1, 2019 for Six M's start of physical work. The critical path early in the project will be utility relocations and after those are completed, the bridge will be the critical path. The last step is the final asphalt surface course over the entire project limits.

The first and most important step in getting this project up and running and maintaining the planned schedule is having the utility companies on board from the get go. They must be willing to commit to the schedule and have the resources available when they are needed. As was evidenced on two of our Team Past Performance projects, a delay due to the relocation of existing utilities or in obtaining signal power can force some paving and landscaping items out of originally intended seasons. When this happens, equitable adjustments by the contractor are a result, which is exactly what the CMAR process is trying to prevent. (Reference: BA4585172 I-695 From MD 41 (Perring Parkway) to MD 147 (Harford Road) Widening, BA6015180 Replacement of Bridge No. 311905 on I-695 IL over MD 372 (Wilkens Ave))

A second problem is a delayed Notice to Proceed. The same problems can arise from a delayed NTP as with delayed utility relocations. The CMAR process should be able to avoid this issue, because everyone should be on board from the beginning and all required right of way, permits, etc. should be obtained by the time Six M is ready to go to work. (Reference: BA9775A72 Interchange Reconstruction, I-695 at Charles Street (MD 139) Phase I)

<u>Factors that could affect the schedule:</u>

Outside Constraints – Utility Relocations

It is well known at the onset of this project that utilities will be playing a major role in schedule. They must be coordinated and scheduled early to avoid potential impacts and delays that could push work items into seasons when they can't be constructed. Even if the utility companies are prepared and scheduled to do the work, an outside event such as a major snow storm, hurricane, etc. could pull their resources away from this project to focus on rebuilding storm damaged utilities. This would be a situation that is out of the control of everyone involved in this project; MDOT SHA, Six M and the design team. See Seasonal Work below.

Seasonal Work

Being a two phased construction project, seasonal work will become an issue at some point. Items of work such as deck pours and approach paving cannot be reliably scheduled for the winter months. If the project extends into a winter, then these tasks must be shifted in the schedule towards the following spring when weather and temperatures are more favorable. This can also be an issue for landscaping items that are controlled by planting seasons.

Work Areas

The pier construction is the most critical work area. Since it is bound by I-695 on both sides, material deliveries and labor access is restricted. This could reduce the production rates of activities occurring in this area.

Materials

Materials should not be a driving factor for this project. Based on the current plans, all material required is as would be expected on any other regional heavy highway project. The only caveat is how the proposed

steel tariffs affect the market. On projects Six M currently has, we are hearing from material suppliers that the proposed tariffs are causing steel prices to trend steeply upward. Large steel items such as rebar and structural steel need to be tied down early to avoid potential cost increases in construction.

Equipment

This project does not involve any aspects that will require specialized equipment. Standard equipment that would be used on this project include a crawler crane, rough terrain crane, excavator, etc.

Labor Availability

Obtaining the required labor force for this project is not projected to be an issue. Up to two carpenter crews, one pipe/dirt crew and one MOT crew are anticipated to be the maximum required at any given time.

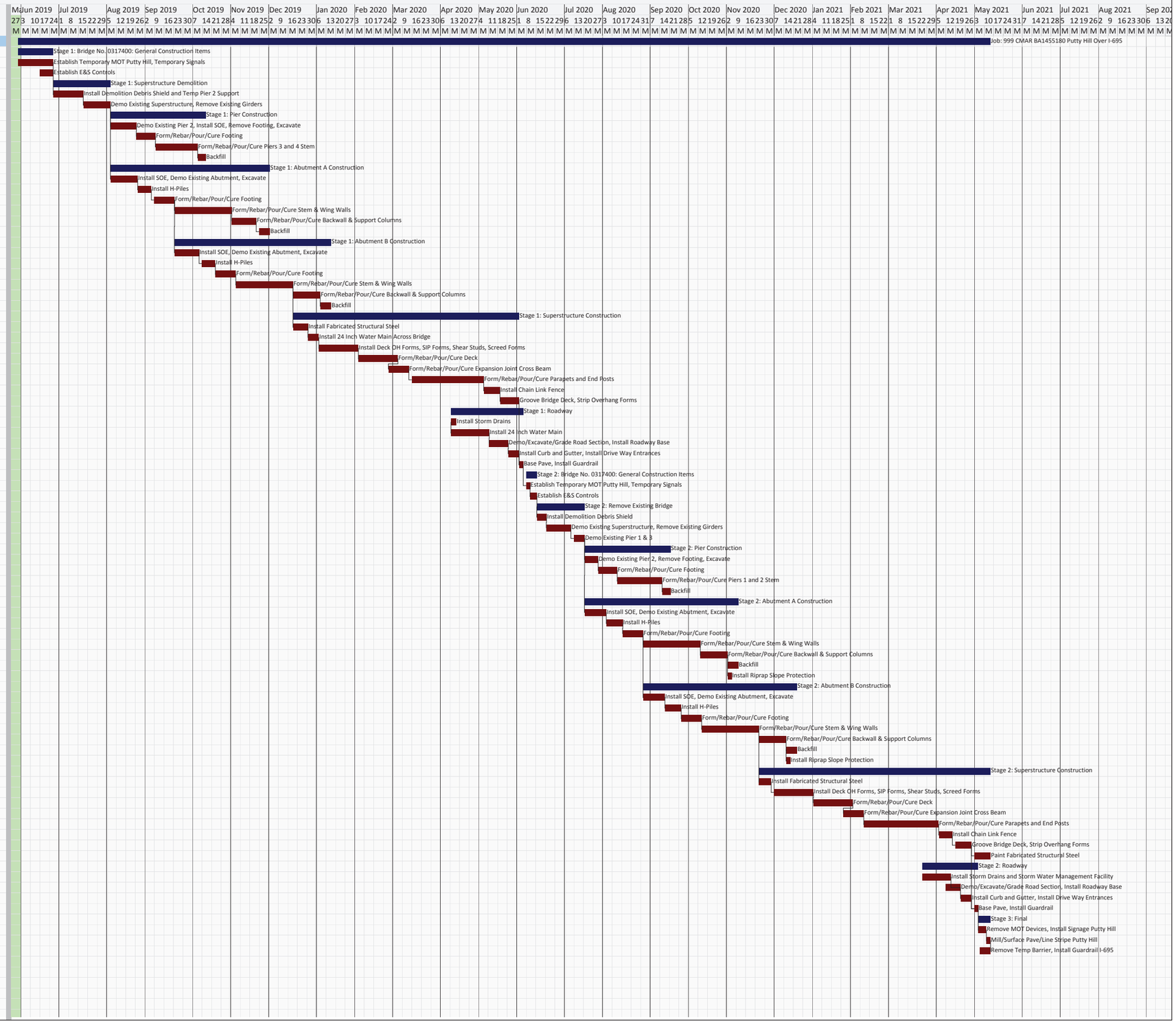
See the following pages for a preliminary schedule outlining the major items of work.

For simplicity, submittals, submittal review and material procurement are not shown. These activities would occur between notice to proceed for construction and the first activity shown on the preliminary schedule. It is assumed that the utility relocations would be completed prior to the start of Six M's physical work. Note that the BGE 2" gas line is not accounted for in the schedule, because the plans do not depict where it is to be relocated to. Also, holidays and weather days were not incorporated into the schedule. The overall durations shown would still be valid if these days were added.

The preliminary schedule shows the stage 1 and stage 2 deck pours occurring in February and January, respectively. Once the final plans have been completed and the schedule can be further refined, the deck pours will be scheduled for a more advantageous time of the year.

JOB: 999 CMAR BA1455180 Putty Hill Over I-695

S	M	Phase	Cat	Description	Start Date	Finish Date	Days
◆				CMAR BA1455180 Putty Hill Over I-695	6/1	5/14	510
◆		200		Stage 1: Bridge No. 0317400: General Construction Items	6/1	6/26	18
		200	05	Establish Temporary MOT Putty Hill, Temporary Signals	6/1	6/26	18
		200	10	Establish E&S Controls	6/17	6/26	8
◆		201		Stage 1: Superstructure Demolition	6/27	8/7	30
		201	05	Install Demolition Debris Shield and Temp Pier 2 Support	6/27	7/18	16
		201	10	Demo Existing Superstructure, Remove Existing Girders	7/19	8/7	14
◆		202		Stage 1: Pier Construction	8/8	10/16	50
		202	05	Demo Existing Pier 2, Install SOE, Remove Footing, Excavate	8/8	8/26	13
		202	10	Form/Rebar/Pour/Cure Footing	8/27	9/9	10
		202	15	Form/Rebar/Pour/Cure Piers 3 and 4 Stem	9/10	10/10	23
		202	20	Backfill	10/11	10/16	4
◆		203		Stage 1: Abutment A Construction	8/8	12/2	83
		203	05	Install SOE, Demo Existing Abutment, Excavate	8/8	8/27	14
		203	10	Install H-Piles	8/28	9/6	8
		203	15	Form/Rebar/Pour/Cure Footing	9/9	9/23	11
		203	20	Form/Rebar/Pour/Cure Stem & Wing Walls	9/24	11/4	30
		203	25	Form/Rebar/Pour/Cure Backwall & Support Columns	11/5	11/22	14
		203	30	Backfill	11/25	12/2	6
◆		204		Stage 1: Abutment B Construction	9/24	1/16	83
		204	05	Install SOE, Demo Existing Abutment, Excavate	9/24	10/11	14
		204	10	Install H-Piles	10/14	10/23	8
		204	15	Form/Rebar/Pour/Cure Footing	10/24	11/7	11
		204	20	Form/Rebar/Pour/Cure Stem & Wing Walls	11/8	12/19	30
		204	25	Form/Rebar/Pour/Cure Backwall & Support Columns	12/20	1/8	14
		204	30	Backfill	1/9	1/16	6
◆		205		Stage 1: Superstructure Construction	12/20	6/2	118
		205	05	Install Fabricated Structural Steel	12/20	12/30	7
		205	10	Install 24 Inch Water Main Across Bridge	12/31	1/7	6
		205	15	Install Deck OH Forms, SIP Forms, Shear Studs, Screed Forms	1/8	2/5	21
		205	20	Form/Rebar/Pour/Cure Deck	2/6	3/5	21
		205	25	Form/Rebar/Pour/Cure Expansion Joint Cross Beam	2/28	3/13	11
		205	30	Form/Rebar/Pour/Cure Parapets and End Posts	3/16	5/7	39
		205	35	Install Chain Link Fence	5/8	5/19	8
		205	40	Groove Bridge Deck, Strip Overhang Forms	5/20	6/2	10
◆		206		Stage 1: Roadway	4/14	6/5	39
		206	05	Install Storm Drains	4/14	4/17	4
		206	10	Install 24 Inch Water Main	4/14	5/11	20
		206	15	Demo/Excavate/Grade Road Section, Install Roadway Base	5/12	5/25	10
		206	20	Install Curb and Gutter, Install Drive Way Entrances	5/26	6/2	6
		206	25	Base Pave, Install Guardrail	6/3	6/5	3
◆		300		Stage 2: Bridge No. 0317400: General Construction Items	6/8	6/15	6
		300	05	Establish Temporary MOT Putty Hill, Temporary Signals	6/8	6/10	3
		300	10	Establish E&S Controls	6/11	6/15	3
◆		301		Stage 2: Remove Existing Bridge	6/16	7/20	25
		301	05	Install Demolition Debris Shield	6/16	6/22	5
		301	10	Demo Existing Superstructure, Remove Existing Girders	6/23	7/10	14
		301	15	Demo Existing Pier 1 & 3	7/13	7/20	6
◆		302		Stage 2: Pier Construction	7/21	9/21	45
		302	05	Demo Existing Pier 2, Remove Footing, Excavate	7/21	7/30	8
		302	10	Form/Rebar/Pour/Cure Footing	7/31	8/13	10
		302	15	Form/Rebar/Pour/Cure Piers 1 and 2 Stem	8/14	9/15	23
		302	20	Backfill	9/16	9/21	4
◆		303		Stage 2: Abutment A Construction	7/21	11/10	81
		303	05	Install SOE, Demo Existing Abutment, Excavate	7/21	8/5	12
		303	10	Install H-Piles	8/6	8/17	8
		303	15	Form/Rebar/Pour/Cure Footing	8/18	9/1	11
		303	20	Form/Rebar/Pour/Cure Stem & Wing Walls	9/2	10/13	30
		303	25	Form/Rebar/Pour/Cure Backwall & Support Columns	10/14	11/2	14
		303	30	Backfill	11/3	11/10	6
		303	35	Install Riprap Slope Protection	11/3	11/5	3
◆		304		Stage 2: Abutment B Construction	9/2	12/23	81
		304	05	Install SOE, Demo Existing Abutment, Excavate	9/2	9/17	12
		304	10	Install H-Piles	9/18	9/29	8
		304	15	Form/Rebar/Pour/Cure Footing	9/30	10/14	11
		304	20	Form/Rebar/Pour/Cure Stem & Wing Walls	10/15	11/25	30
		304	25	Form/Rebar/Pour/Cure Backwall & Support Columns	11/26	12/15	14
		304	30	Backfill	12/16	12/23	6
		304	35	Install Riprap Slope Protection	12/16	12/18	3
◆		305		Stage 2: Superstructure Construction	11/26	5/14	122
		305	05	Install Fabricated Structural Steel	11/26	12/4	7
		305	10	Install Deck OH Forms, SIP Forms, Shear Studs, Screed Forms	12/7	1/4	21
		305	15	Form/Rebar/Pour/Cure Deck	1/5	2/2	21
		305	20	Form/Rebar/Pour/Cure Expansion Joint Cross Beam	1/27	2/10	11
		305	25	Form/Rebar/Pour/Cure Parapets and End Posts	2/11	4/6	39
		305	30	Install Chain Link Fence	4/7	4/16	8
		305	35	Groove Bridge Deck, Strip Overhang Forms	4/19	4/30	10
		305	40	Paint Fabricated Structural Steel	5/3	5/14	10
◆		306		Stage 2: Roadway	3/26	5/5	29
		306	05	Install Storm Drains and Storm Water Management Facility	3/26	4/15	15
		306	10	Demo/Excavate/Grade Road Section, Install Roadway Base	4/12	4/22	9
		306	15	Install Curb and Gutter, Install Drive Way Entrances	4/23	4/30	6
		306	20	Base Pave, Install Guardrail	5/3	5/5	3
◆		400		Stage 3: Final	5/6	5/14	7
		400	05	Remove MOT Devices, Install Signage Putty Hill	5/6	5/11	4
		400	10	Mill/Surface Pave/Line Stripe Putty Hill	5/12	5/14	3
		400	15	Remove Temp Barrier, Install Guardrail I-695	5/7	5/14	6



Once Six M sets up the maintenance of traffic, phase 1 barrier wall across the existing structure and begins the demolition operation, there will be no turning back. The structure will be restricted to a single lane from that point forward until final completion. This must and will be made perfectly clear to all stakeholders and they must understand the ramifications of this MOT restriction on their daily operations.

As Assistant Preconstruction Project Manager, Kenneth Mattlin, Jr will be responsible for working with MDOT SHA, the project stakeholders and the designers in a collaborative manner throughout the life of the contract. Leaning on his past lessons learned and experiences in dealing with stakeholders on the MD 195 over Sligo Creek project, he'll be able to pull all the below listed entities together to work towards the common goal of better serving the community and project needs.

<u>Key stakeholders identified in the contract</u>

- Baltimore County
- Town of Carney
- Maryland Department of the Environment
- Maryland Historical Trust

<u>Other stakeholders affected by the project</u>

- Traveling Public
- Emergency Responders
- Local Governments and Authorities
- Local Schools
- Residents
- Utility Companies
- Public Transit, if applicable

Six M has worked hand in hand with Baltimore County on past projects, including the relocation of a 24" water main and temporary lane widths on our recently completed BA4585172 I-695 From MD 41 (Perring Parkway) to MD 147 (Harford Road) Widening project. Because of our past history with the county on not only the mentioned project, but all projects we have constructed in Baltimore County, we will be able to easily coordinate our work with them and involve them in the preconstruction and construction process. The same goes for the Maryland Department of the Environment. Six M has routine communications and meetings with MDE on all of our projects and this one would be no different. We take E&S very seriously, so involving MDE throughout preconstruction and construction process will be almost second nature to us. Note that per the Programmatic Categorical Exclusion (PCE), there are no significant environmental impacts anticipated and also no historical properties affected.

The major stakeholders listed above are important to the project, but of more importance for construction is communicating and coordinating with the more local stakeholders. The maintenance of traffic scheme outlined in the plans show traffic being restricted to a single lane in each direction. For emergency responders and local schools, this can create a major headache. With the amount of traffic on this road, during peak times it is anticipated that traffic could be very congested in and around the temporary signals. Providing plenty of heads up to emergency responders and local schools will give them ample time to plan the routes they will have to take to avoid a congested area.

The same open and free communication and collaboration that Six M will use towards MDOT SHA and the design team will also be used with the stakeholders. Six M will build a relationship with all the stakeholders through personal contact and public and private meetings, as necessary. The stakeholders, including SHA and the design team, will be invited to openly discuss the project and how it can be improved to better suit the needs of everyone. The discussed topics from the stakeholders will then be incorporated into the project where SHA and the design team deem it appropriate with the help of Six M determining the constructability and cost.

Approach to providing an open and transparent estimating environment that will assure MDOT SHA is receiving a fair price for the work:

The number one goal of bidding any project is putting together a competitive price, while ensuring the actual cost to do the work is covered and the financial goals of the company are met. The Six M Company has successfully applied this approach for nearly 40 years in the Baltimore area and to some high profile projects. Leading the effort as chief estimator on every project bid by the company is Thomas Mattlin Jr. He has 30 plus years of estimating experience on projects of every size and nature, including large scale projects involving major highways.

The biggest known to all parties involved at the onset of any estimate is the bid item quantities. Assembling a comprehensive and correct list of bid items and quantities is critical to assuring all parties involved are comparing 'apples to apples' when compiling the OPCC's and the GMP. Six M will pull together the bid item list using its vast experience in the regions construction industry and also through the experience of its in-house engineers. Mr. Thomas Mattlin will rely on his experience as well as his project manager, Michael Randow. Mr. Randow has managed numerous SHA projects and will easily be able to itemize every piece of work required on the project from the 1000's through the 8000's. Mr. Thomas Mattlin will also rely the company's two in-house engineers. Michael Mattlin, PE and Kenneth Mattlin Jr, PE both worked at Johnson, Mirmiran and Thompson (JMT) for more than ten years as structural engineers where they were responsible for preparing contract bid documents, including bid item lists and takeoff quantities.

Before estimating the project can begin, several costs have to be established and everyone must be in agreement of those costs or negotiating a final GMP will be nearly impossible. The costs in question include hourly labor rates and equipment costs. Labor makes up a substantial part of any bid, so those rates need to be nailed down at the very first estimate assembly. Six M will openly share the labor rates for all personnel, from the superintendent all the way down to common laborer. The same goes for equipment costs. The Rental Rate Blue Book will be used, where applicable, to establish hourly rental costs for all anticipated equipment on the project. By using industry recognized published data, disputes over the hourly equipment rental costs should be easily resolved.

The Six M Company utilizes a production rate based bidding philosophy. What this entails is looking at historical labor production rates for similar projects and tasks then applying the information to the estimate being prepared. For all of the major bridge structure items, an Excel spreadsheet is maintained containing information such as the project, the size of the element (footing sizes, abutment dimensions, deck dimensions, etc.), cubic yards of concrete, labor manhours and cubic yards per manhour. Also, Six M uses ComputerEase, the leading provider of construction accounting software for contractors. ComputerEase allows us to prepare Unit Productivity Reports for unit cost items on past projects. Unit productivity for similar items and past projects can be generated and applied in the current estimate. As part of an open and transparent estimating environment, the manhour and unit productivity information can be made available, as necessary, to SHA and the ICE estimator during GMP negotiations. Please note that if manhour and productivity information is shared with the team, it will be considered proprietary and must be destroyed when the issue is resolved.

Past projects that we will utilize on this project to estimate major bridge item costs and other big ticket items, such as maintenance of traffic, include but are not limited to:

- BA4585172 I-695 from MD 41 (Perring Parkway) to MD 147 (Harford Road) Widening [Old Harford Road bridge replacement]
- BA9775A72 Interchange Reconstruction, I-695 at Charles Street (MD 139) Phase I
- BA6015180 Replacement of Bridge No. 311905 on I-695 IL over MD 372 (Wilkens Ave)
- BA9775872 I-695 Interchange at Dulaney Valley Road (MD 146)
- BA9775972 Replacement of Bridge #3163 on Providence Road over I-695
- KH-966-000-006 Replacement of Rossville Boulevard Bridge over I-95.

Once the labor is determined, the material prices are the next piece of the puzzle. Six M will request material quotes from all suppliers that are needed on the project. Being one of the most respected contractors in the region, Six M will be able obtain the most competitive prices on material. If necessary, there is only one true way to agree on the material price of big ticket items and that is to openly share the material quotes. For example, Six M's, ICE estimator's and SHA's estimate for structural steel could easily vary by hundreds of thousands of dollars. The major difference in the estimate will more than likely be in the largest component of the item, the structural steel itself. This difference can be very quickly and easily resolved by openly sharing the estimates that Six M receives with all other parties involved. In a matter of minutes, a resolution can be reached and the price agreed upon.

The final costs that need to be considered in assembling the price is the subcontractor costs. From the first bid item list that is compiled for the project, it will be known what items and tasks of work Six M will be subcontracting. Some of the standard items that we subcontract include paving, guard rail, electrical and signing. Subcontractors for these items and all others requiring a subcontractor will be solicited from our master list of subcontractors. Quotes that are received will be evaluated to determine the best value for the project and who brings with them the experience of working on and around I-695. As with the material, due to Six M's reputation in the industry, there will be no shortage of subcontractors willing to quote the project. By openly sharing subcontractor quotes with SHA and the ICE estimator, disputes over subcontractor costs should be virtually nonexistent.

To formally assemble the bid, the Six M Company utilizes Heavy Construction Systems Specialists' HeavyBid software. All of the above costs are entered into HeavyBid, the desired markup applied and a final cost for all items is generated by the program. The following sample estimate outlines the process of putting together a bid and would be similar to the kinds of output and reports that could be generated to use during negotiations with SHA and the ICE estimator during the GMP process.

The Six M Company utilizes Heavy Construction Systems Specialists' HeavyBid software to put together estimates for all projects bid by the company. HeavyBid is the nation's leading bidding software for heavy highway construction. The program allows us to easily setup and estimate projects while utilizing our production and cost histories. HeavyBid is a construction crew and production based bidding system where the estimator enters a quantity for the task in question, then applies a production rate based on units/hour, manhours/unit, units/shift, shifts, etc. The below sample estimate walks through the process of assembling a bid for Maintenance of Traffic and Substructure Concrete items. All items on a project are bid in a similar fashion as what is shown.

Labor Rates:

One of the first steps in putting an estimate together is establishing the labor rates for the project. Generally, these rates are given in a wage determination provided by the project owner. For each labor class, the base rate is entered along with the fringe benefit rate. The Tax % column is where Six M's burden rate is entered along with other miscellaneous costs associated with every project we construct. For example, the Tax % also includes tools and supplies, miscellaneous expenses, services and engineering, and company owned equipment repair. The percentage entered is applied to the base labor rate only and is based on past financial history and changes yearly depending on the company's workload and total amount of base labor.

Labor >>	Description	Unit	Rate	Tax % >>	Fringe $ >>
CARPENTER	Carpenter	MH	25.00	90.00	10.000
IRON REINF	Ironworker: Reinforcing	MH	30.00	90.00	15.000
IRON STRUCT	Ironworker: Structural	MH	30.00	90.00	15.000
LAB COMMON	Labor: Common/Unskilled	MH	18.00	90.00	5.000
LAB FLAGGER	Labor: Flagger	MH	18.00	90.00	5.000
LAB PIPELAY	Labor: Pipelayer	MH	20.00	90.00	8.000

Equipment:

Equipment rental rates are entered into HeavyBid based on the Rental Rate Blue Book monthly rental rate with location and age factors applied. Also entered is the fuel consumption in gallons per hour and the cost of fuel per gallon. The estimating software breaks this information down into a total hourly rate, which is then used in the development of unit costs as each piece of equipment is added to labor crews and activities throughout the bid.

Equipment >>	Description	Unit	Rent Rate >>	Total EOE >>	Total Rate
8CRAT30	All Terrain 30T	HR	31.250	6.563	37.813
8TRPK	Pickup	HR	3.409	2.188	5.597
8TRST	Safety Truck	HR	4.545	2.188	6.733

Maintenance of Traffic, MOT Supplies:

For Maintenance of Traffic, we generally break up the bid item into several components for bidding purposes. The first is a material and supplies component to cover temporary items needed for MOT that are not included in other bid items. In this example, drums, cones, signs, sign stands and an arrow panel are shown. If drums for MOT is included in a bid item elsewhere in the bid, then this material would be deleted from the activity to avoid double counting it. The same goes for all materials listed in this example activity.

Activity:	1040205	MOT SUPPLIES					Quantity:	1		Unit:	LS
	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Beams	Haul&Truck	Write-in	Total
U. Cost	0.00	0.00	0.00	0.00	0.00	18,762.00	0.00	0.00	0.00	0.00	18,762.00
Total	0.00	0.00	0.00	0.00	0.00	18,762.00	0.00	0.00	0.00	0.00	18,762.00

Calendar: 40 5 - 8's Hrs/Shift: 8 WC: Code not found.

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
3MOT0010	Drums for MOT	1.00	100.00	EA	100.00	106.00	106.00	10,600.00
3MOT0030	Cones for MOT	1.00	50.00	EA	30.00	106.00	31.80	1,590.00
3MOT0040	MOT Signs	1.00	160.00	SF	20.00	106.00	21.20	3,392.00
3MOT0050	MOT Sign Stands	1.00	10.00	EA	150.00	106.00	159.00	1,590.00
3MOT0070	Arrow Panel	1.00	50.00	DAY	30.00	106.00	31.80	1,590.00

Additional MOT resources if not previously accounted for in bid items

Maintenance of Traffic, MOT 6M Crew:

To establish the amount of Six M labor required for maintenance of traffic, we will look at similar projects that we have completed in the past and use that information as a basis for estimating the required number of manhours for this project. Similar past projects that we will utilize on this project would be as follows: BA4585172 I-695 from MD 41 (Perring Parkway) to MD 147 (Harford Road) Widening [Old Harford Road bridge replacement]; BA9775A72 Interchange Reconstruction, I-695 at Charles Street (MD 139) Phase I; BA6015180 Replacement of Bridge No. 311905 on I-695 IL over MD 372 (Wilkens Ave); BA9775872 I-695 Interchange at Dulaney Valley Road (MD 146); BA9775972 Replacement of Bridge #3163 on Providence Road over I-695; KH-966-000-006 Replacement of Rossville Boulevard Bridge over I-95. Each listed project's MOT manhour history will be analyzed for similarities to this project and used as a basis for estimating this project. A standard MOT crew is added to the activity to get a range of wage rates for the purpose of establishing an average rate when the number of manhours is entered.

Activity:	1040210	MOT 6M CREW					Quantity:	1		Unit:	LS
	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Beams	Haul&Truck	Write-in	Total
U. Cost	105,000.00	119,500.00	224,500.00	22,408.75	0.00	6,360.00	0.00	0.00	0.00	0.00	253,268.75
Total	105,000.00	119,500.00	224,500.00	22,408.75	0.00	6,360.00	0.00	0.00	0.00	0.00	253,268.75

Crew $/Unit	Crew Hrs/Unit	Units/Crew Hr	$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	$/Shift
246,908.7500	1,250.0000	0.0008	202.6150	156.2500	0.0064	156.2500	1,620.9200

	Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
	5,000.0000	0.0002	5,000.0000	44.9000	105,000.0000

Manhours entered based on past projects

Calendar: 40 5 - 8's Hrs/Shift: 8 WC: Code not found.

Crew: MTSTD Standard MOT Crew Prod: MU 5000 Eff: 100.00 Crew Hrs: 1250.00 Labor Pcs: 4.00 Equipment Pcs: 3.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
3MOT0060	Flags, Vests, etc.	1.00	1.00	LS	5,000.00	106.00	5,300.00	5,300.00
3MOT0080	Communication Devices	1.00	1.00	LS	1,000.00	106.00	1,060.00	1,060.00
8TRPK	Pickup	2.00	2,500.00	HR	5.60	100.00	5.60	13,992.50
8TRST	Safety Truck	1.00	1,250.00	HR	6.73	100.00	6.73	8,416.25
LAB FLAGGER	Labor: Flagger	2.00	2,500.00	MH	18.00	100.00	39.20	98,000.00
MAN TRAFFIC	Management: Traffic	1.00	1,250.00	MH	30.00	100.00	62.00	77,500.00
TRUCK SAFETY	Truck Driver: Safety Truck	1.00	1,250.00	MH	18.00	100.00	39.20	49,000.00

MOT crew to establish average manhour rate

Substructure Concrete, Furnish Abutment Material:

Generating takeoff quantities is the first step in estimating an item like substructure concrete. Within the Lump Sum pay item, there are numerous materials that have to be accounted for in order to properly construct the abutments and piers. Once the material quantities are determined, they are entered into the bidding software. Material requiring takeoffs include, but are not limited to ready mix concrete, structure drainage, formwork, architectural treatment and stone backfill. For items with a nontaxable component, such as aggregate, two resources are included in the bid. One for the taxed material and one for the nontaxable hauling. When supplier quotes are received, they are then entered into the HeavyBid software and applied to the applicable material unit cost. Note, pier material would be handled in the same fashion.

Activity: 420012010 FURNISH ABUTMENT MATERIAL Quantity: 1 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Beams	Haul&Truck	Write-in	Total
U. Cost	0.00	0.00	0.00	0.00	62,819.00	22,260.00	0.00	0.00	1,250.00	0.00	86,329.00
Total	0.00	0.00	0.00	0.00	62,819.00	22,260.00	0.00	0.00	1,250.00	0.00	86,329.00

Calendar: 40 5 - 8's Hrs/Shift: 8 WC: Code not found.

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2B0057	# 57 (1-#4)	1.00	250.00	TON	15.00	106.00	15.90	3,975.00
2C0001	Mix 1 Concrete	1.05	25.00	CY	90.00	106.00	95.40	2,385.00
2C0003	Mix 3 Concrete	1.05	350.00	CY	95.00	106.00	100.70	35,245.00
2C00HAUL	Concrete Haul	1.05	375.00	CY	30.00	100.00	30.00	11,250.00
2DA1	Dampproofing	1.00	2,500.00	SF	1.00	106.00	1.06	2,650.00
2DR30006S	6" PVC - Structure Drainage	1.00	1.00	LS	6,000.00	106.00	6,360.00	6,360.00
2GEO10	Geotextile	1.00	400.00	SY	1.00	106.00	1.06	424.00
2MISC200	Steel Utility Sleeves	1.00	1.00	LS	500.00	106.00	530.00	530.00
3FABUT	Abutment Formwork	1.00	5,000.00	SF	3.00	106.00	3.18	15,900.00
3FARCH	Architectural Treatment	1.00	1,200.00	SF	5.00	106.00	5.30	6,360.00
6HAUL AGG	Aggregate Hauling per Ton	1.00	250.00	TON	5.00	100.00	5.00	1,250.00

Material & Supplies Takeoff Quantity Unit Cost

Substructure Concrete, Abutment Construction:

Similar to the Maintenance of Traffic item, we will look at similar projects that we have completed in the past and use that information as a basis for determining the required number of manhours per CY. The abutment height, thickness, length, etc. is compared to our job manhour history database and the historical information is narrowed down to the past projects that are the most applicable. From there, an estimated production rate is calculated and modified, as necessary, to more closely match the type of work being performed in the bid. The total amount of structural concrete is entered as the activity quantity and the calculated manhours per CY is entered for the production rate. The bidding software then uses this information to determine how many shifts are required to construct the abutment based on the crew that has been selected. In this case, it is a standard carpenter crew (crane, foreman's pickup, foreman, 2 carpenters, 2 common laborers, crane operator). Note, pier construction would be handled in the same fashion. Also similarly computed is other miscellaneous concrete, e.g. backwalls, cheekwalls, bearing pads, shear blocks, etc.

Activity:	420012020	ABUTMENT CONSTRUCTION				Quantity:	350		Unit:	CY
	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Beams	Haul&Truck	Write-in	Total
U. Cost	260.00	317.33	577.33	72.35	0.00	0.00	0.00	0.00	0.00	0.00	649.68
Total	90,999.91	111,066.58	202,066.49	25,322.36	0.00	0.00	0.00	0.00	0.00	0.00	227,388.85

Crew $/Unit	Crew Hrs/Unit	Units/Crew Hr	$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	$/Shift
649.6824	1.6667	0.6000	389.8095	72.9167	4.8000	0.2083	3,118.4758

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
3,500.0000	0.1000	10.0000		

Manhours per CY entered based on job manhour history database of past projects

Calendar: 40 5 - 8's Hrs/Shift: 8 WC:

Crew: CCA122 1 AT Crane, 2 Carp, 2 Labor Prod: MU 10 Eff: 100.00 Crew Hrs: 583.33 Labor Pcs: 6.00 Equipment Pcs: 2.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
8CRAT30	All Terrain 30T	1.00	583.33	HR	37.81	100.00	37.81	22,057.46
8TRPK	Pickup	1.00	583.33	HR	5.60	100.00	5.60	3,264.90
CARPENTER	Carpenter	2.00	1,166.67	MH	25.00	100.00	57.50	67,083.53
LAB COMMON	Labor: Common/Unskilled	2.00	1,166.67	MH	18.00	100.00	39.20	45,733.46
MAN FOREMAN	Management: Foreman	1.00	583.33	MH	35.00	100.00	71.50	41,708.10
OP CRANE	Operator: Crane	1.00	583.33	MH	35.00	100.00	81.50	47,541.40

Substructure Concrete, Reinforcement Bars:

For subcontractor installed material, for instance, reinforcement bars, the quantity of material to be installed in entered as a quantity. When subcontractor quotes are received, the unit cost to install the rebar per ton is applied to the bid and the bidding software carries through all the correct multiplications. The material supplier will also provide a quote for the material itself. This is also entered into the HeavyBid software and applied to the correct bid items.

Tons to be installed by subcontractor

Activity:	421INSTALL	INSTALL REBAR TON				Quantity:	25		Unit:	TON

Calendar: 40 5 - 8's Hrs/Shift: 8 WC: Code not found.

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4REBAR TON	Install Rebar Ton	1.00	25.00	TON	1,200.00	100.00	1,200.00	30,000.00

Activity:	421SUB	SUBSTRUCTURE REBAR LS				Quantity:	1		Unit:	LS
	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Beams	Haul&Truck	Write-in	Total
U. Cost	0.00	0.00	0.00	0.00	37,100.00	0.00	0.00	0.00	0.00	0.00	37,100.00
Total	0.00	0.00	0.00	0.00	37,100.00	0.00	0.00	0.00	0.00	0.00	37,100.00

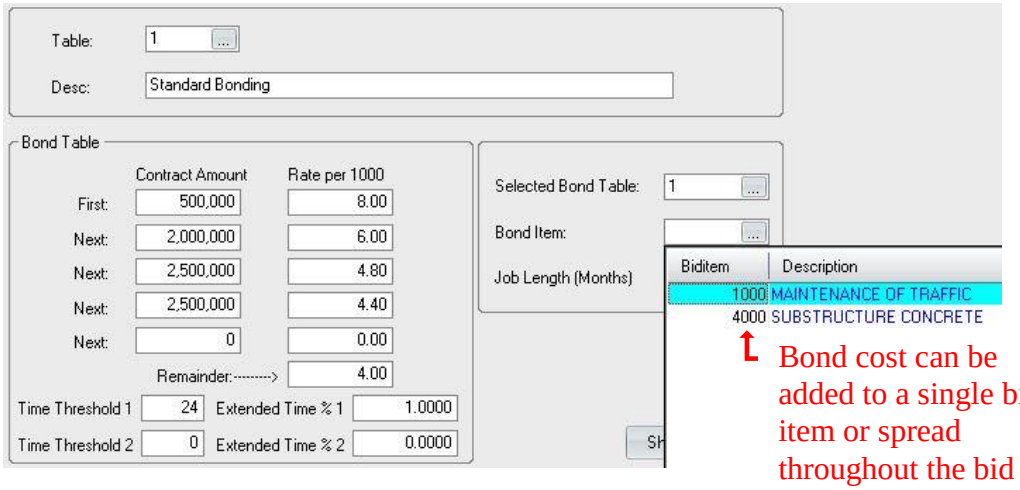
Calendar: 40 5 - 8's Hrs/Shift: 8 WC: Code not found.

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2REBSUBCPS1	S1 Substr Rebar Coupler LS	1.00	1.00	LS	5,000.00	106.00	5,300.00	5,300.00
2REBSUBS1	S1 Substructure Rebar LS	1.00	1.00	LS	30,000.00	106.00	31,800.00	31,800.00

Supplier provided material cost

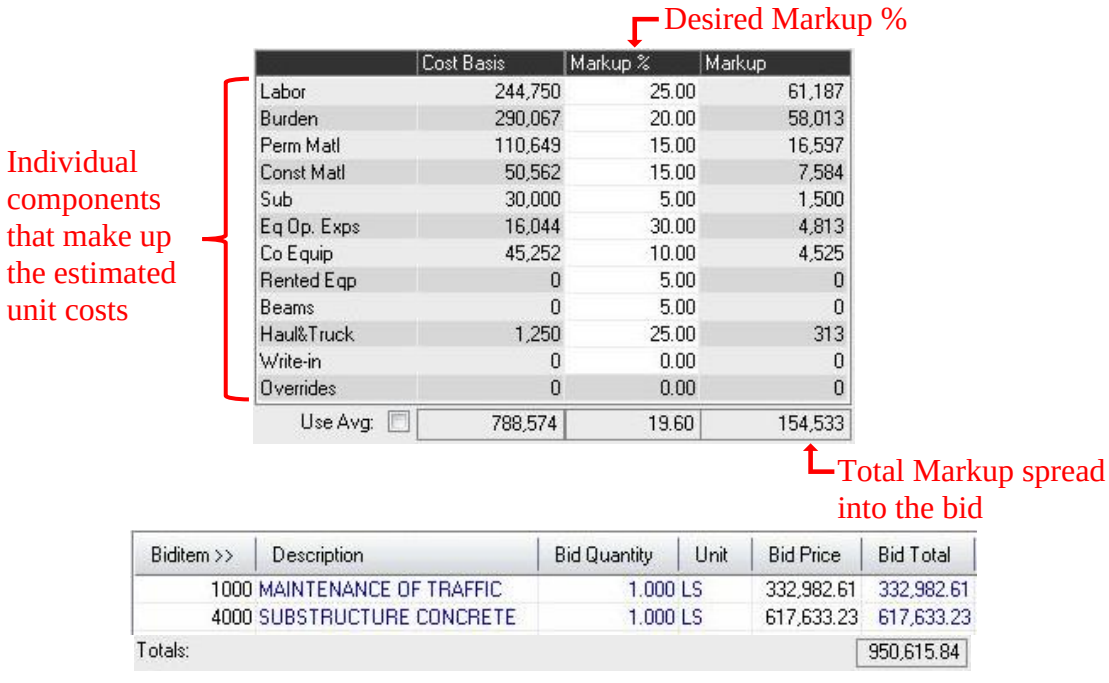
Payment & Performance Bonds:

The cost of the payment and performance bonding is calculation at the rates shown below in the HeavyBid bond table. The total bid amount is factored by the appropriate rates and the total bond cost is then applied to the bid. The bond cost can then be applied directly to a single bid item or spread throughout the bid to all items based on the ratio of labor, total cost or total cost less subs.



Estimate Markup:

Once all material takeoffs, labor productions, supplier quotes and subcontractor quotes have been entered into the estimate, the desired markup percentage can be applied. The magnitude of the markup varies depending on the amount of perceived risk associated with the project. HeavyBid allows up to eleven different markup rates to be applied to different aspects of the estimate. As shown below, a markup percentage can be applied to the base labor, which is different from permanent material, and so on. The desired markup percentage for each component is then spread to all bid items and the final desired bid price is calculated. The final desired bid prices are then submitted to the owner as part of our schedule of prices. For the Putty Hill project, the final desired bid prices would be part of the OPCC and later the GMP submittals.



From the beginning stages of the project, it will be known what items and tasks of work will be requiring subcontractor assistance to complete. Keeping in mind the requirement of self-performing at least 50% of the project (as is standard on all MDOT SHA projects), Six M will determine what disciplines are in need of a subcontractor and how their overall costs will fit into the allowable maximum subcontracting percentage and DBE participation goals. The following is a list of work tasks that The Six M Company does not regularly self-perform and will be available for subcontracting: dump truck services, installing reinforcing steel, superpave asphalt, line striping, guard rail, seeding, landscaping, electrical and signing.

As with the subcontractor work, the materials required will be known early on in the process. A material sourcing plan will be put into place, so SHA understands our material procurement procedures and can have input into the process. This plan will also be very beneficial when determining Long Lead Time Procurement options and when preparing written procurement reviews for materials that SHA or Six M could procure ahead of any construction phase.

Six M will use a procurement process that is in full compliance with COMAR 21.05.10.05, including the provisions set forth in the State's Nondiscrimination Clause as provided in the State Finance and Procurement Article, §13-219, Annotated Code of Maryland, and the Commercial Nondiscrimination Policy as provided in the State Finance and Procurement Article, Title 19, Annotated Code of Maryland. The following outlines the procedures that will be utilized to solicit and procure the contract, while also complying with the regulations contained in COMAR 21.05.10.05.

Six M maintains a very thorough master list of non-DBE and DBE suppliers and contractors. Each supplier/subcontractor entry states the service or product that they provide and their status as an MBE/DBE. When a project is ready to be solicited to the contracting community, the master lists are filtered for the services or products required on the project. From there, solicitations are sent to all selected suppliers and subcontractors a minimum of 14 days prior to the proposal due date. The solicitations contain all pertinent information of the project, including how to obtain the contract plans via eMaryland Marketplace or a file sharing site populated by Six M. The solicitation notice will also be sent to the Governor's Office of Small, Minority & Women Business Affairs. Being one of the most respected contractors in the region, Six M will be able obtain numerous competitive quotes for all material supply and subcontractor opportunities.

The easiest way to guarantee a competitive solicitation from quality subcontractors and suppliers is to receive more than one quote on any given task or material. If everyone knows from the start that they are in active competition for the work, their quotations will reflect that and their prices will be competitive. The prices will begin to creep up if a supplier or subcontractor knows or thinks they are a sole provider of the material or service. For several of the big ticket items like paving and structural steel, we anticipate receiving no less than three quotes each, so obtaining the most competitive price from the industry is almost guaranteed. If there is a circumstance where only a single quote is received for an item of work, then Six M will investigate the quotes based on historical data on past bids and projects constructed. If we feel the quotes are excessive, we'll contact the proposer to discuss the prices. There may be a perfectly reasonable explanation for the higher than normal quote, and that can only be determined through direct contact via email, phone or in person meetings at our office.

Quotes that are received will be evaluated to determine the best value for the project and more importantly, who brings with them the experience of working on and around I-695. Based on our experience with I-695, it is a roadway that is not to be taken lightly. Subcontractors who are experienced with the roadway know that generally things will take longer and their quotes will reflect this. For example, installing stay-in-place forms for the bridge deck concrete will require lane closures when over the travel lanes of I-695. Lane closures on this roadway are generally only allowed at night and between the hours of 9:00 pm and 5:00 am. A subcontractor that is experienced with this knows that it will take Six M anywhere from 30 minutes to 1 hour to setup and remove the lane closure. That leaves only 6 available hours of work time for installing the deck pans. If he has to guarantee his workers 8 hours per day, which is often the case for specialty work, then he will be required to pay his workers for 8 hours while only getting 6 hours of production. This additional cost with no production will be reflected in his quote. A subcontractor that is unfamiliar with this will assume he can get 8 full hours of production which will result in doing the work in a shorter amount of time and at a lower cost. If Six M does not recognize this omission at the quoting stage, then we will be the loser when we are billed for additional services not included in the subcontract agreement.

Six M is no stranger to meeting DBE participation goals on SHA projects. In fact, Six M has never had to request a waiver on an SHA project with a DBE/MBE goal, including those with subgoals, and we routinely complete projects with a higher DBE/MBE percentage that the minimum required in the contract documents. We have a strong working relationship with many DBE suppliers and subcontractors and they will be very eager to work with us on this project. We will solicit them and provide the exact same information and bidding time as is afforded to the non-DBE firms.

As required to meet DBE participation goals, DBE's may be solicited to furnish & install the reinforcing steel and/or furnish & install the structural steel. These two options are generally a last resort, because they result in a higher price paid for the material (and subsequent higher bid) due to the rebar installer or structural steel erector receiving an administrative fee of approximately 3% of the material cost. This is standard practice in the industry and will only be considered on the Putty Hill project if other means of meeting the DBE goals are exhausted.