

MD 4 (PENNSYLVANIA AVE) AT SUITLAND PARKWAY INTERCHANGE IMPROVEMENTS PRINCE GEORGE'S COUNTY

**CONTRACT NO. PG6185470
TECHNICAL PROPOSAL
JUNE 30, 2021**



STATE HIGHWAY
ADMINISTRATION

**MD 4 (PENNSYLVANIA AVE) AT SUITLAND
PARKWAY INTERCHANGE IMPROVEMENTS
PRINCE GEORGE'S COUNTY**

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**CAPABILITY OF
THE PROPOSER**



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B. Capability of the Proposer

MIKE HIGGINS, PE | PROJECT MANAGER

Education: BS – 1986 – Civil Engineering; **Years of Experience:** 35

Registrations/Certifications/Training: PA Professional Engineer (#PE044299E); MD Transportation Builders & Materials Association Officer (Chairman), SHA/MTBMA Leadership Council, SHA/MDTA/MTBMA/ACEC Alternate Project Delivery, SHA/MTBMA Specifications Clearinghouse, SHA/ACPA/MRMCA Concrete Pavement Leadership Team, MDOT/FHWA/MTBMA/AGC Industry Workforce Development.

Summary: Mr. Higgins has more than 35 years of experience in the construction industry managing preconstruction, roadway/highway construction, bridge and utility construction, cost controls, schedule compliance, procurement and corporate resources. He has a proven track record delivering complex, traffic-intensive projects, on-time and on-budget for MDOT SHA and MDTA.

Relevant Experience:

MD 210 Livingston Road/Kerby Hill Road Interchange Design-Build – MDOT SHA – Howard County, MD: Design-Build Project Manager (DBPM) responsible for replacing at-grade intersection of Livingston Road/Kerby Hill Road at MD 210 with a new grade-separated interchange including the widening of 1.9 miles of MD 210 to provide safety improvements and congestion relief. The project includes realignment of Livingston and Kerby Hill Road, 3 bridge structures, 7 retaining walls, 10,000 LF of noise walls, 2 box culverts extensions, roadway drainage, new pavement, existing pavement rehabilitation, environmental site design/structural SWM facilities, signing, interchange and intersection lighting, extensive multi-phase MOT, and major utility relocations/coordination (gas, sewer and water). **WRA** is the lead designer on this project. Mike was the primary contact, had direct oversight of designer, project management, constructability reviews, allocation of all labor and equipment resources, stakeholder coordination, utility coordination, scheduling, public outreach, public meetings, coordinating quarterly and weekly project updates to the public, and financial and regulatory requirements to meet contractual obligations. Project Cost: \$89M.

Reconfigure I-95 from Moravia Road to the Fort McHenry Tunnel (FT-3003) – MDTA – Baltimore, MD: General Manager (GM) responsible for the reconfiguration of I-95 in Baltimore City to provide for four continuous mainline NB/SB lanes for approximately 4 miles. The project included shoulder reconstruction, replacement of concrete median traffic barrier, and reconstruction of portions of existing bridge decks and concrete bridge parapets. This work was performed under traffic which required extensive night-time and weekend operations along with coordination with MDTA for public outreach and information of lane closures and switches. CGI kept continual open communication with all impacted business to inform them on upcoming work schedules to minimize impacts. As GM, Mike was the primary contact, had direct project management oversight, ensuring allocation of all labor and equipment resources, scheduling, financial and regulatory requirements to meet contractual obligations and expectations. Project Cost: \$49M.

I-270 Innovative Congestion Management Progressive Design-Build – MDOT SHA – Montgomery County, MD: DBPM responsible for the implementation of improvements along the I-270 corridor from I-495 to Frederick to reduce congestion and improve travel time. *The project delivery method for this project is very similar to the MD 4 at Suitland Parkway Interchange with the contractor part of the Integrated Project Team working collaboratively with the MDOT SHA and Designer to meet the project goals.* The project includes geometric improvements at multiple interchanges to increase capacity, lessen specific congestion and traffic incident locations, implement ramp metering to increase vehicle throughput, reduce delay and increase travel time reliability. Mike was the primary contact, had direct oversight of all designers and all construction activities, relocation coordination with 3rd party utilities, project management of the overall contract and oversight of development of costs and price negotiations, OPCC, risk assessment, value analysis proposals, constructability reviews, open-book estimating for each of the 17 corridor improvement projects, and ensuring financial and regulatory compliance to meet contractual obligations and expectations. Project Cost: \$119M.

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B. Capability of the Proposer | Continued

STEVE BECKLEY | CONSTRUCTION MANAGER

Education: High school graduate; college coursework in civil engineering; **Years of Experience:** 37

Summary: Mr. Beckley has over 37 years in the construction industry, focusing on heavy highway and site work. He has extensive experience in all aspects of highway construction including managing, planning, coordinating, and scheduling construction activities for highway projects. His design-build experience includes MD 210 Livingston Road/Kerby Hill Road Interchange, MD 32 at Linden Church Road, MD 355 at Montrose Rd/Randolph Road, MD 124, and US 29 at Briggs Chaney Road projects.

Relevant Experience:

MD 210-Livingston Road/Kerby Hill Road Interchange (Design-Build) – MDOT SHA – Prince Georges County, MD: Project Manager for this project consisting of grade-separated interchange at the MD 210 intersection with Livingston Road/Kerby Hill Road. The project includes realignment of Livingston and Kerby Hill Road, major utility relocation and coordination, 3 bridge structures, 7 retaining walls, 10,000 LF of noise walls, and extensive maintenance of traffic including detours. **WRA** is the lead designer on this project. Steve helped lead the utility coordination effort which was implemented early in the design stages. Monthly meetings were held with the various utility designers and Steve incorporated the information obtained from these meeting into the project schedule to develop a sequence of construction to minimize utility impacts. Steve's other responsibilities included planning, tracking and managing construction activities with the site superintendent, submission of shop drawings and source of supply, and correspondence with the owner. Project Cost: \$89M

Replacement and Widening of Dual Bridge Nos. 1616205 and 1616206 on I-95/I-495 (Capital Beltway) over Suitland Road– MDOT SHA – Prince George's County, MD: Project Manager for this project which involved staged replacement of dual bridges carrying I-95/I-495 over Suitland Road. Steve's responsibilities included development of the project construction schedule, utility coordination, submission of shop drawings, pricing of change orders, and correspondence with the owner. Steve submitted a VECP for this project which eliminated one of the MOT phases which saved time and money. Project Cost: \$29M

MD 355 at Montrose Road/Randolph Road from "Old" Old Georgetown Road to Maple/Chapman Avenue Design-Build– MDOT SHA – Montgomery County, MD: Utility Coordinator, Scheduler, and Document Controls Specialist for this project which involved design and construction of a grade-separated interchange for MD 355 and Montrose Parkway with a major detour of an eight-lane MDOT SHA roadway. Steve's responsibilities included development of the construction schedule, utility coordination, and correspondence with the owner. He successfully coordinated the design and construction of new and relocated utility facilities resulting in an on-time and on-budget project. The utility companies' relocation schedules were incorporated into the project schedule. Portions of the project absent of utility conflicts were identified and scheduled early in the sequence of construction which minimized the utility impact. Project Cost: \$25M

I-95/I-895 Interchange, MDTA, Baltimore County, MD: Scheduler and Project Manager for this project which involved a realignment of the I-95/I-895 Interchange. This project included a large fly-over bridge to carry southbound I-95 over I-895. Steve's responsibilities included development and maintenance of the project construction schedule, submission of shop drawings, and document control. Project Cost: \$88M

MD 124 South of Airpark Road to Rosewood Manor Lane Design-Build – MDOT SHA – Gaithersburg, MD: Utility Coordinator for this project which involved the six-lane widening of 1.6 miles of MD 124 to improve congestion, safety, and pedestrian access along this commercial and residential corridor. This project included reconfiguring multiple existing and new traffic signalizations and working around the power company's already relocated poles. Steve was successful in coordinating the design and construction of the new and relocated overhead and underground utility facilities resulting in an on time and within budget project. Project Cost: \$29M

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B. Capability of the Proposer | Continued

MARK MILLER | COST ESTIMATOR

Education: High School Graduate; College Coursework in Construction; **Years of Experience:** 28

Registrations/Certifications/Training: NUCA Competent Person, ARTBA Management Academy, Award-Best Horizontal Contractor for MBE by MDWMCA and Recognition by Senator Benjamin Cardin & Baltimore County.

Summary: Mr. Miller brings more than 28 years of experience as a Cost Estimator for MDOT SHA projects, including experience with negotiating CAPs, to successfully preparing and negotiating OPCCs and CAPs for large projects. Mr. Miller is responsible for the overall business procurement for CGI. His responsibilities include project identification and selection, oversight of detailed engineering requirements, detailed quantity take-offs, developing cost estimating and final pricing, DBE and Subcontractor plans, and project risk assessment and associated pricing. Mr. Miller is responsible for developing cost, price, and risk strategies and assessing cost effectiveness, solving complex constructability issues, developing and quantifying items of work and identifying and mitigating risk items.

Relevant Experience:

I-95/I-895 Interchange – MDTA – Baltimore, MD: Cost Estimator for this award-winning project to realign the I-95/I-895 interchange and the construction of a large fly-over bridge to carry SB I-95 over I-895. Mark was responsible for quantifying all components, identifying and mitigating project risk. A key feature and major risk item was the MOT and traffic phasing. The project's access and work areas were limited, so Mark coordinated with contractors on several adjacent projects being constructed to establish access to work areas. Mark successfully implemented the DBE plan which included over 15 companies and developed an outreach program to identify opportunities for interested subcontractors and suppliers. This resulted in achieving a DBE percentage of 35.26%, far exceeding the project goal of 25%. Project Cost \$88M

I-695 Inner Loop Bridge Replacement at US 1 – MDOT SHA – Baltimore, MD: Cost Estimator for this interchange reconstruction project. Mark was responsible development of the cost and price estimate including "takeoff" quantities along with identifying and mitigating the project risk such as steel escalation. Mark developed and implemented an outreach program to identify opportunities for interested subcontractors and suppliers. He was responsible for establishing and maintaining original contract and subcontract amounts with a final DBE amount of 22.63% exceeding the 20% goal. Responsible for developing, managing, and meeting the OJT requirements goal for the project. Project Cost \$37M

MD 210-Livingston Road/Kirby Hill Road Design-Build – MDOT SHA – Prince Georges County, MD: Chief Estimator for this project consisting of new grade-separated interchange at the MD 210 intersection with Livingston Road/Kerby Hill Road to provide 1.9 miles of safety improvements and congestion relief for this area. The project includes realignment of Livingston and Kerby Hill Road, major utility relocation and coordination, 3 bridge structures, 7 retaining walls, 10,000 LF of noise walls and extensive maintenance of traffic including detours. Mark was responsible for quantifying all components for all disciplines on the project along with identifying and mitigating project risks, responsible for the development, implementation, and monitoring of both DBE plan and OJT plan. Responsible for the collaboration, coordination, and communication between all team members during the planning/bid proposal phase and has carried this during the design and construction periods. Project Cost \$89M

I-270 Innovative Congestion Management Progressive Design-Build – MDOT SHA – Montgomery County, MD: Cost Estimator for this project focusing on reducing congestion and improving travel time along the I-270 corridor. *The project delivery method for this project is very similar to the MD 4 at Suitland Parkway Interchange with the contractor part of the Integrated Project Team working collaboratively with the MDOT SHA and Designer to meet the project goals.* Mark was responsible for the pricing, developing quantities, developing OPPC estimates, identifying and mitigating project risks, providing cost models and assumptions along with reconciling with ICE for agreed upon CAPs. Project Cost \$119M

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B. Capability of the Proposer | Continued

I-270 INNOVATIVE CONGESTION MANAGEMENT PROGRESSIVE DESIGN-BUILD | MONTGOMERY AND FREDERICK COUNTIES, MARYLAND

Project Owner: MDOT SHA

Project Owner's Contract No.: MO0695172

Project Point-of-Contact: Sean Campion | **Phone:** 410-545-8863 | **Email:** SCampion@mdot.maryland.gov

Project Delivery Method: Progressive Design-Build

Overall Construction Cost: Initial Contract Value: \$100,000,000 | Final Contract Value: \$118,996,810

Reason(s) for Difference: Additional work was added to the contract by MDOT SHA including design and construction of additional ramp metering for the southbound spur ramps and all northbound ramps.

Overall Schedule Performance: Initial Completion Date: 12/2020 | Final Completion Date: 12/2021

Reason(s) for Difference: Additional time was added to complete the work added to the contract by MDOT SHA for the additional ramp metering locations for the southbound spur ramps and all northbound ramps.

Project Description:

This project, located in Montgomery and Frederick Counties, reduces the recurring and non-recurring congestion, improves safety, and is adaptable to future improvements along the full length of I-270 between I-495 and I-70, one of the most congested corridors in Maryland. CGI worked with MDOT SHA's Innovative Contracting Division through the Progressive Design-Build (DB) approach to achieve the project goals by maximizing benefits within the fixed project budget. MDOT SHA did not develop any preferred solutions prior to the solicitation process. The Design-Builder was responsible for the design and construction of roadway and innovative technology improvements across 12 discrete projects to increase vehicle throughput, reduce delay and increase travel time reliability within budget and as quickly as possible. CGI interacted collaboratively with an Independent Cost Estimator hired by MDOT SHA to develop a Guaranteed Maximum Price (GMP) utilizing similar, if not identical, steps as outlined in the MD 4 at Suitland Parkway Interchange RFP and deliver these improvements within budget. All projects are opened for beneficial use of the traveling public.

The CGI Team's services include roadway design and analysis for each proposed capacity improvement project; pavement analysis and design for widening and placing traffic on existing shoulders; traffic analysis and VISSIM modeling; maintenance of traffic design and traffic management plan development; analysis of existing sign structures' capacity to support proposed signs; signing and marking; noise analysis; NEPA/MEPA analysis and support for MDOT SHA; IAPA development and FHWA coordination; lighting design and analysis for newly configured ramps and impacted poles; supplemental surveys; utility designation and test pits to identify conflicts; stormwater management/erosion and sediment control/drainage analysis and design; intelligent transportation system (ITS) design; development of complete contract bid documents; obtaining permits for design and construction of each individual roadway and technology project; and permitting assistance (e.g., PRD and NEPA/MEPA.) *The I-270 ICM project includes the first deployment of adaptive ramp metering in Maryland.* The adaptive ramp metering manages congestion by managing the flow of vehicles that enter I-270 at each ramp throughout the system.

The CGI Team's services for the ITS/electrical development included architecture drawings and CONOPS system engineering documents for ramp metering and active traffic management (ATM) systems. The technology improvements are anticipated to support MDOT SHA's mobility, safety, and operations goals through decreased congestion, increased reliability, and reduced crashes. CGI worked hand-in-hand with MDOT SHA in the selection of the software vendor for ramp metering and ATM, including deployment of local and central software modules. The CGI Team is working closely with CHART to determine how deployment of these new ramp metering and ATM systems will change their business rules. The ATM systems were eliminated by MDOT SHA due to potential conflict with the up-coming American Legion Bridge I-495/

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B. Capability of the Proposer | Continued

I-270 to I-370 Traffic Relief Plan.

Successful Methods, Approaches and Innovations

Many project elements are relevant for the MD 4 at Suitland Parkway Interchange: evaluation of solutions to achieve project goals and maximize benefits; reconfiguration of roadway without acquiring new right-of-way; lengthening of acceleration/deceleration lanes without impacts to existing structures; collaboration with MDOT SHA during design and construction to major systems and operational changes; improving safety and relieve congestion; coordination with MDOT SHA for stormwater management and erosion and sediment control; analysis and preparation of design exceptions, environmental documentation, and permits; construction within constrained work zones on one of the most highly traveled and congested roads in Maryland; and collaboration with MDOT SHA during constructability reviews and negotiation of Guaranteed Maximum Price.

As noted previously, the I-270 ICM project was the first time that adaptive ramp metering has been deployed in Maryland and on one of the most significantly congested highways in the state. Special attention was given to stakeholder involvement; specifically, CGI worked closely with MDOT SHA to keep the Montgomery County Council well informed of the highway improvements. This included preparing simulation videos and actively participating in working sessions with the Council throughout the project duration to address concerns/questions from them as well as their constituents. **Relevancy:** Minimizing impacts to the traveling public and stakeholder coordination are important project goals that have been set by MDOT SHA for the MD 4 at Suitland Parkway Interchange project. Coordination with the National Park Service, Joint Base Andrews, the Prince George's County Police Department, surrounding community, and utility companies will be critical to the success and CGI brings that experience from working on other high-profile projects. CGI will evaluate ways to minimize impacts to the traveling public and optimize design and construction techniques to facilitate the flow of traffic through the MD 4 and Suitland Parkway interchange.

Erosion and sediment control and stormwater management was particularly challenging on I-270 given the constrained right-of-way along a major interstate within an urban area. CGI worked collaboratively with MDOT SHA to establish bioswales and stormwater management facilities to facilitate the permitting process and gain approvals from permitting agencies. **Relevancy:** Although some stormwater management has been done as part of the previous construction contract, MDOT SHA has stated that modifications will be necessary. CGI is fully prepared to work collaboratively with the State and their Designer to address the E&SC and construction phasing and make modifications to existing facilities where necessary in order to have a permissible project.

As part of the I-270 ICM, CGI developed cost estimates in conjunction with MDOT SHA's Independent Cost Estimator (ICE) to come to an agreed upon GPM. CGI provided a cost model, a detailed breakdown, generally provided in spreadsheet format, showing the line items to be used along with a framework showing what is included in each line item, as well as how all of the cost components would be accounted for on the project. A Work Breakdown Structure and estimating cost model based on MDOT SHA Standard format and specification bid items was created and agreed upon. The cost model included all direct costs (labor, equipment, materials, subcontract), indirect costs, overhead and profit, risk allowances, and project allowances. CGI provided a level of detail, along with our design and constructability recommendations and project schedule management, to enable MDOT SHA to make sound financial decisions that will minimize project delivery time, impacts on the environment, and impacts on the traveling public. CGI developed, proposed, and tracked potential innovations and alternative designs for incorporation into the project. Value analysis of alternative designs, systems and materials were provided so that each alternative can be evaluated based on cost, construction schedules, availability of labor, equipment and materials, construction feasibility, and durability/life cycle cost. **Relevancy:** The process of utilizing a GMP and coordinating with the ICE under the Progressive DB is very similar to the CMAR process used for the MD 4 at Suitland Parkway Interchange.

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B. Capability of the Proposer | Continued

I-95/I-895 INTERCHANGE (I-95 EXPRESS TOLL LANES) | BALTIMORE CITY AND BALTIMORE COUNTY, MARYLAND

Project Owner: Maryland Transportation Authority (MDTA)

Project Owner's Contract No.: KH1502-000-006

Project Point-of-Contact: Joe Jachelski | **Phone:** 410-931-0808 | **Email:** jjachelski@mdta.maryland.gov

Project Delivery Method: Design-Bid-Build

Overall Construction Cost: Initial Contract Value: \$85,200,000 | Final Contract Value: \$87,900,000

Reason(s) for Difference: Additional work was added to the contract by MDTA including asphalt paving, overhead and ground mounted signs, high mast lighting, water collection systems and improvements to the stormwater management systems as well as subgrade stabilization due to poor subgrade conditions. MDTA chose CGI to perform additional work that MDTA needed to open the Express Toll Lanes. Even with the additional work to the contract, the total payments to CGI were less than the adjusted contract cost with the change orders included.

Overall Schedule Performance: Initial Completion Date: 11/2011 | Final Completion Date: 11/2011

Reason(s) for Difference: The project was substantially complete within the original contract calendar day duration with traffic in its final configuration even with the additional work added to the contract by MDTA.

Project Description:

This \$88 million project was for the widening and reconstruction of I-95 to provide Express Toll Lanes in both the northbound (NB) and southbound (SB) directions of I-95 from south of the I-895 interchange to south of Chesaco Avenue along with the widening and reconstruction of I-895 to provide one Express Toll Lane in each direction of I-895 from south of the Moravia Road interchange to the I-95 interchange. The project consisted of the construction of two new 1,900 foot long curved steel girder bridges, one new bridge carrying NB and SB I-895 Managed Lanes onto Moravia Road and approaching retaining walls and one new bridge carrying SB I-895 general purpose lanes over Moores Run, along with retaining walls, maintenance of traffic, full depth pavement construction, grinding, new storm drain improvements, new stormwater management facilities, landscaping, signing, marking, bearing pile, caissons, sign structures, lighting (high mast and low level), significant intelligent transportation system (ITS), and utility relocations.

Successful Methods, Approaches, Innovations:

One major issue on the project was maintaining traffic during staging/traffic pattern shifts at the I-95/I-895 split. The NB portion of I-895, the southern end of SB I-95 and the northern portion of NB and SB I-95 are adjacent to proposed travel lanes that were under construction by others in separate contracts. CGI engaged with MDTA's General Engineering Consultant, the I-95 GEC Partners, who assisted in coordinating construction issues between the various contracts. CGI partnered with the other contractors in reviews, analysis, and coordination of all major planned contractor operations, resolved construction and schedule coordination issues such as haul routes and contractor access issues, public access issues, utility relocations and new utility services, lane closure schedules, environmental permit compliance, traffic switch coordination, scheduling and implementation, and opportunities for collaboration to minimize impacts to the traveling public and complete the projects on time. **Relevancy:** Partnering is an extremely effective tool which facilitates creativity, builds trust and long-term relationships, and motivates consensus building, resulting in high-quality projects. Partnering is a key tenant of MDOT SHA's business model and CGI has actively participated in and supports MDOT SHA's commitment to Partnering.

A specific example of this collaborative environment included an adjacent contractor responsible for the removal and construction of one noise wall, construction of a soil nail wall and retaining walls, overhead sign structures and paving operations on the overlapping areas of the two projects. Working in conjunction with

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B. Capability of the Proposer | Continued

MDTA/GEC personnel, CGI was able to ensure a seamless transition between the overlapping construction work while minimizing impacts to the MDTA, traveling public and both contractors. This was accomplished by utilizing shared-lane closures, daily on-site construction coordination meetings, weekly Partnering meetings, utilization of shared lane-closures, sequencing of material and equipment deliveries, and scheduling of shared subcontract resources.

The ITS/dynamic message signs required coordination between CGI, MDTA/GEC, MDTA Police, the equipment manufacturer, and multiple subcontractors as well as the other ongoing projects in the area during activation. In partnership with MDTA and the GEC, CGI collaborated with multiple project stakeholders to ensure successful implementation of the ITS/dynamic message signs. **Relevancy:** MD 4 has multiple project stakeholders such as National Park Service, Joint Base Andrews and surrounding developers that all have different requirements and concerns that will need to be addressed collaboratively to ensure the MD 4 at Suitland Parkway Interchange project is designed and constructed as effectively and efficiently as possible. CGI's coordination of the I-95/895 stakeholders for the ITS/dynamic message signs activation provides a good example of CGI's experience with effective Partnering.

I-95/I-895 has an average daily traffic volume of approximately 248,000 vehicles and is classified as an interstate. This project was constructed working day and night under MOT lane closures and numerous traffic switches through the duration of the project. CGI was able to minimize impacts to commuter/traveling public while maintaining a tight schedule and working on multiple bridge and retaining wall structures simultaneously. Bridge demolition of the existing interstate bridges was accomplished while maintaining traffic flow through the demolition work areas. The new bridge structural steel was placed over I-95 by using slow-rolls/traffic drags in coordination with MDTA Police and scheduled for non-peak travel times to minimize impacts to the traveling public. **Relevancy:** A key issue of the MD 4 at Suitland Parkway Interchange project is for safe and efficient maintenance of traffic and minimizing impacts to the traveling public and surrounding communities. CGI has significant experience delivering large, complex highway projects with challenging MOT. The I-95/I-895 is a clear example of CGI's ability to address and deliver these same results on the MD 4 project.

Another major feature on this project was erosion and sediment control (E&SC), particularly at the bridge pier foundations. Working in conjunction with MDTA's GEC, CGI designed the environmentally safe pumping system to handle both rain events and the high-water table during bridge pier foundation work. Due to pre-existing on-site soil contamination, this water was not permitted for release into either on-site sediment traps or ditches. The system consisted of pumping water into a series of five portable sediment tanks through discharge hoses and dewatering bags which cleaned the water allowing for discharge on site. This system was developed in coordination with MDE to obtain their approval. **Relevancy:** A key project issue for MD 4 is to develop a sequence of construction to maximize productivity. This includes a flexible E&SC plan. Key CGI staff members, Mike Higgins and Steve Beckley, have been working with MDOT SHA personnel from OED/HHD/PRD/OOC in an ongoing collaborative effort to address E&SC issues, including the sequence of construction, modifications to the sequence, inspections and stormwater as-built drawings.

CGI provided a dedicated on-site safety person to conduct daily construction inspections, weekly toolbox talks and provide continual oversight of the overall project safety for all stakeholders. The dedicated on-site Safety Director worked hand-in-hand with the MDTA/GEC safety staff to ensure compliance with all local, state, and federal guidelines during the life of the project. **Relevancy:** Safety is MDOT SHA's number one priority on and along its highways. CGI is committed to meeting this expectation by maintaining a safe work zones for its employees and the traveling public.

B. Capability of the Proposer | Continued

REPLACEMENT OF BRIDGE NO. 0311305 ON I-695 INNER LOOP OVER BENSON AVENUE, AND BRIDGE NO. 0311405 ON I-695 INNER LOOP RAMP 8 BRIDGE NO. 03116 FROM US 1 OVER LEEDS AVENUE AND US 1 FROM KNECHT AVENUE TO LINDEN AVENUE | BALTIMORE COUNTY, MARYLAND

Project Owner: MDOT SHA

Project Owner's Contract No.: BA3665170

Project Point-of-Contact: Wendy Wolcott, District Engineer | **Phone:** 899-988-0367 | **Email:** wwolcott@mdot.maryland.gov

Project Delivery Method: Design-Bid-Build

Overall Construction Cost: Initial Contract Value: \$37,136,684 | Final Contract Value: \$35,814,747

Reason(s) for Difference: Many contract items underran the original contract quantities, including bearing piles, asphalt paving, grading and storm drain. The cost savings included CGI 's proposed use of asphalt millings and existing riprap.

Overall Schedule Performance: Initial Completion Date: 8/31/2017 | Final Completion Date: 1/3/2018

Reason(s) for Difference: The project was delayed at the start due to conflicts between the Maintenance of Traffic (MOT) and Erosion & Sediment Control (E&SC) sequences of work. One storm drainage line had to be jacked and bored under the roadway in the initial stage of work for the project. The MOT sequence of work allowed for this work to be done but the E&SC sequence of work did not, which was a direct contradiction in the contract documents. Working collaboratively with MDOT SHA in a Partnering atmosphere, CGI developed a change in sequence to allow for this work to be performed earlier. CGI and MDOT SHA engaged MDE for their approval to revise the E&SC Sequence of Construction and allow for the jack and boring of the storm drainage line earlier than originally scheduled. The time required for MDE's review and approval of the revision to the sequence delayed the start of the project as the jack and bore operation was an early activity. The MDE review and approval time required an extension of the completion date. CGI reduced the overall impact to the completion date from the later project start date by being proactive and re-scheduling other work activities to reduce both cost and time impacts. We find a way to "Go" in order to complete the work on time and on budget.

Project Description:

CGI was awarded this \$35M project to construct bridge replacements (urban interstate above multiple urban roadways and CSXT) of I-695 IL over Benson Avenue, US 1 and CSXT railroad lines which included a new 124' single span bridge, a new 627' four-span bridge and a new 174' two-span bridge. The project scope included the base widening for maintenance of traffic purposes of an approximately 41.5' wide section for approximately 3,000' along I-695 with full depth pavement. Tasks included grading, constructing reinforced stabilized slope, paving, striping, relocating and replacing roadway signs and placing F-shaped concrete barriers. Construction included a 1,189-foot long MSE type retaining wall and a 353-foot long precast noise wall along Ramp 8, as well as converting the existing four-lane section of US 1 to a two-lane section with a median bioswale. The resurfacing of US 1 and I-95 ramp included asphalt wedge and level to correct the super elevation and F-shape concrete traffic barriers to reduce the slope impacts along the southbound side of US 1. The work also included reconstruction prepared by CGI of sidewalks, complete removal of the existing bridges and partial removal the existing noise wall. CGI's responsibilities also included the storm drain, stormwater management facilities, landscaping, lighting in I-695 and under bridge lighting. **Relevancy:** The I-695 bridge replacement project and MD 4 at Suitland Parkway Interchange project have similar aspects including: coordination with third parties, roadway approach work, maintenance of traffic phasing, utility relocations, collaboration with MDOT SHA and local stakeholders, support of excavation for phased construction, aesthetic

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treatments for bridges and retaining walls, minimized environmental impact, stormwater management, minimized inconvenience and impacts to the traveling public, provided safe and efficient maintenance of traffic, minimized construction cost, minimized project delivery time, provided tie-ins to proposed vertical profile to phased construction and side streets, construction activities minimized, access to local residents maintained.

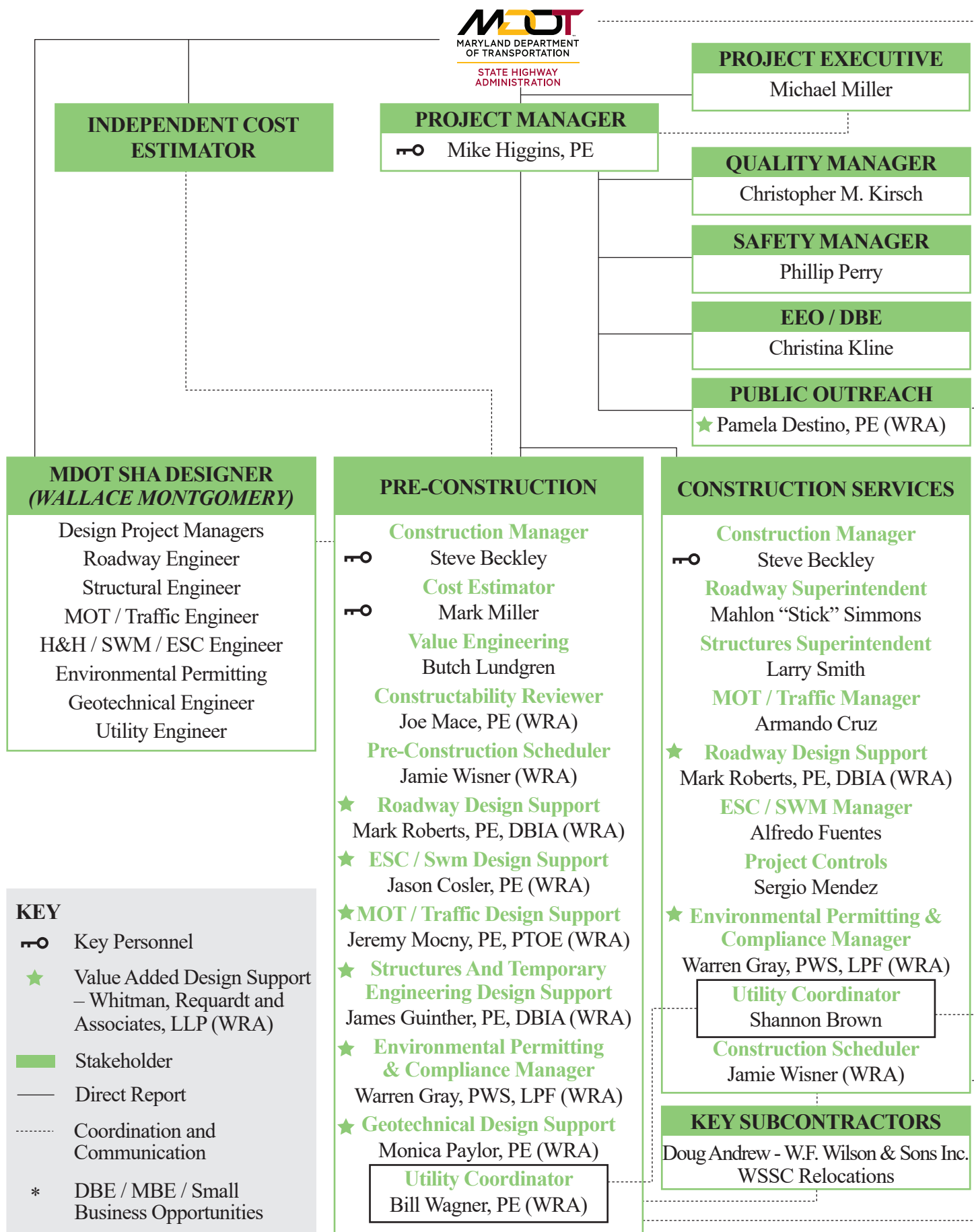
Successful Methods, Approaches, Innovations:

A major concern of this project was the I-95 access ramps to I-695 within the project limits and all traffic movements had to be maintained during construction. Having to maintain sufficient lanes on I-695 to accommodate the heavy traffic volumes resulted in restricted workspace particularly during the second phase. Extensive shoring was required for the support of excavation/backfill at both the abutments and the piers to allow for the phased construction. CGI was responsible for the design of the shoring and engaged the services of a design subconsultant to help with this task. **Relevancy:** Similar issues during construction will be faced on MD 4 at Suitland Parkway Interchange project with maintaining the heavy commuter traffic between these two roadways during construction including the need for multiple stages of construction along with giving special attention to support of excavation/backfill to provide support and global stability in cut and fill considering groundwater and poor soil conditions within the project limits. Minimizing inconvenience and impacts to the traveling public is one of the project goals of the MD 4 project and CGI is committed to meeting this goal.

The I-695 bridge replacement project required CGI to successfully coordinate and work around utility relocations with Verizon, Comcast, BGE, AT&T, Level 3, and Baltimore County's ICBN. CGI has extensive experience coordinating with utility owners during design (on their alternative delivery projects) and during construction and can navigate utility owner procedures and resolve issues quickly. CGI strives to develop strategies to minimize/eliminate utility relocations. We engage all utility owners early and will work with owners and MDOT SHA staff to present recommendations/solutions. We will set schedule milestones for utility relocation decisions as part of our early startup and rapid ramp-up of our design schedule and coordination efforts to provide as much float in the project schedule as possible. Our baseline schedule will include tasks for coordination and utility relocation design and construction showing each potential utility relocation as a separate task in the work breakdown structure. **Relevancy:** Utility relocations occurred as part of the previous MD 4 construction contract; as such, CGI will work diligently to coordinate with these companies (Comcast, PEPCO, Verizon, Washington Gas, Nustar, and Zayo) to avoid or minimize impacts to the maximum extent practical. Furthermore, CGI understands that WSSC relocations are still necessary as part of this re-advertised contract and we will work in collaboration with them to address completion of the relocated 36", 12" and 16" water mains to mutually resolve those issues is a key project goal to deliver a successful project on the MD 4 project.

During the erection of the fabricated structural steel members, CGI developed a staging plan that provided for the tractor trailers hauling the bridge girders to be temporarily staged behind MOT devices for an existing temporary shoulder closure. This allowed for the structural steel members to be set in a quicker time frame to minimize impacts to the traveling public. **Relevancy:** Similar issues with access and tight working conditions are to be expected on the MD 4 at Suitland Parkway Interchange project.

The E&SC sequence conflicted with the MOT sequence of construction. CGI worked with MDOT SHA and MDE to revise the sequence of construction to allow for work concurrently so impacts to the project were minimized. **Relevancy:** An important aspect of the MD 4 project will be for the contractor to evaluate the constructability of the design plans and make recommendations for innovative approaches to meet the project goals. CGI's key staff is experienced in performing constructability reviews and will provide this expertise during the preconstruction phase of the project. Furthermore, we understand that a complete redesign and resequencing of the E&SC is expected on this project. CGI will work collaboratively with MDOT SHA and the Designer to address constructability and phasing sequencing in concert with the E&SC, MDOT SHA and the Designer.



KEY

- Key Personnel
- Value Added Design Support – Whitman, Requardt and Associates, LLP (WRA)
- Stakeholder
- Direct Report
- Coordination and Communication
- DBE / MBE / Small Business Opportunities

MD 4 CMAR STAKEHOLDERS

Agencies

- MDOT SHA – ICD, HCD, HHD, District 3, OOS, OED, OMT
- MDOT Communications and Community Liaison
- National Park Service
- Federal Highway Administration
- MDOT SHA - Plan Review Division (PRD)
- Stormwater Management and Erosion & Sediment Control
- Maryland Department of the Environment (MDE) - Water and Science Administration
- Wetland and Waterways
- U.S. Army Corps of Engineers
- Wetland and Waterways
- Maryland Department of Natural Resources
- Reforestation
- Federal Aviation Administration
- Department of Defense
- Joint Base Andrews Naval Air Facility
- Air Force
- Navy

Local Businesses

- Police Federal Credit Union
- Penn Belt Industrial Area
- Forestville Plaza Shopping Center
- WMATA Andrews Federal Center Bus Garage
- Melwood Professional Center

Local Governments

- Prince George's County, MD
- Morningside, MD

Emergency Services

- Maryland State Police
- Prince George's County Fire and Emergency Medical Services Department
- Morningside Volunteer Fire Department
- Prince George's County Police Department Headquarters
- Morningside Police Department
- Prince George's County Office of Homeland Security (OHS)

Churches

- Pleasant Grove Baptist Church
- Ministry of Love Church
- New Hope Baptist Church
- Higher Place of Praise
- Faith City MD
- International Church of Worshippers

Schools & Childcare Centers

- Morningside Elementary School
- Kingdom Christian Academy
- CMIT South Elementary School
- CMIT Academy South Middle / High School
- Longfields Elementary School
- Central High School
- Spaulding Junior High School
- Benjamin Foulois Creative and Performing Arts K-8 School
- Child World Early Learning Center
- Precious Little Ones Daycare
- Creation Learning and Aftercare Center
- Forestville Early Learning Center
- Greater Christian Community Daycare Center

Local Residents/developments

- Armstrong Village
- Ryan Homes
- Parkside Westphalia
- Dan Ryan Builders
- Stanley Martin Homes
- Haverford Homes
- Mid-Atlantic Builders
- Elevate Homes
- Wood Property
- Smith Farm Home
- Homeowners' Associations

| Key Staff Member | Title | Hours Per Week During Pre-construction (Avg) | Hours Per Week During Construction (Avg) |
|------------------|----------------------|--|--|
| Mike Higgins, PE | CMAR Project Manager | 10 to 15 | 20 to 24 |
| Steve Beckley | Construction Manager | 20 | 40+ |
| Mark Miller | Cost Estimator | 20 to 25 | 0 to 10 |

*** POTENTIAL SUBCONTRACTORS**

| | | | |
|---------------------|------------------------|-----------------|----------|
| ESC Control Devices | Utility Relocations | Electrical | Steel |
| Clearing & Grubbing | Pavement Markings | Permanent Signs | Trucking |
| Concrete Curbs | Traffic Barrier W Beam | Painting | |
| Landscaping | Asphalt Paving | Rebar | |



STATE HIGHWAY
ADMINISTRATION

MD 4 (PENNSYLVANIA AVE) AT SUITLAND PARKWAY INTERCHANGE IMPROVEMENTS PRINCE GEORGE'S COUNTY

CONTRACT NO. PG6185470 | TECHNICAL PROPOSAL

PROJECT APPROACH



PROJECT APPROACH

C. Project Approach

C.1 PRECONSTRUCTION APPROACH

C.1.a COLLABORATION

A key element in Concrete General, Inc.'s (CGI) success is the integration of Partnering within the daily workflow of design and construction. Through our team's collective experience of working on many Design-Bid-Build and Alternative Delivery projects, we understand the importance of fostering continuous collaboration, coordination, and communication between all team members throughout the project timeline to ensure sound and timely decisions are made. This communication, coordination, and collaboration begins upon receipt of the RFP and extends through the end of construction. This continual interaction fosters a deep understanding of each team member's approach toward design and construction, such that decisions on project elements and issues are mutually developed while ensuring the project design meets all contract requirements and environmental commitments and best fits construction means, methods, practices, and products. In addition to the internal integration of our team members, communication and collaboration between CGI, MDOT SHA, the Designer, regulatory/resource agencies, utility companies, and other project stakeholders will be critical to the overall success of this project. Partnering will be utilized as the framework for ongoing coordination and communication with MDOT SHA and other project stakeholders. CGI is currently utilizing similar CMAR collaboration techniques and principles, i.e., ICE and GMP coordination, on the I-270 Innovative Congestion Management Progressive Design-Build project.

CGI regularly integrates the participation of the team's construction and design elements and facilitates the concept of joint involvement by providing "Construction Input during Design" and "Design Input during Construction." This integration starts with our CMAR Project Manager, Mike Higgins, PE. Mike will have full responsibility for compliance with all project requirements, quality, overall project management, and contract administration. He will ensure the team is fully integrated and that the project meets or exceeds the schedule milestones and stays within budget while meeting all contract requirements. Mike will be supported by our management team consisting of our Construction Manager, Steve Beckley and our Cost Estimating Lead, Mark Miller. Steve will work with MDOT SHA and their Designer, Wallace Montgomery, to ensure full collaboration of design and construction staff and leverage the collaboration afforded through the CMAR process. Steve will report directly to Mike, and his sole responsibility will be to ensure the collaboration between design and construction staff starts early during the design phases and is sustained throughout the construction phase. CGI has added Whitman, Requardt and Associates, LLP as an extension of their staff to provide value added through review of all design submittals, providing utility coordination, constructability review coordination, and scheduling services. Not only have CGI and WRA had success in our extensive history of Design-Build experience, the strong contractor-designer relationship that CGI and WRA have forged goes well beyond alternative delivery projects. CGI and WRA have worked together on numerous projects including the Bridge Management and Repair Plan Development project (Howard County DPW), Montgomery County Engineering Services for Transportation Facilities – Emergency Structural Repairs project (MCDOT), 26th Street Emergency Response and Retaining Wall Reconstruction and Streetscape project (BDCOT), and Poffenberger Road Slope Failure project (Frederick County). CGI routinely engages WRA's expertise during the bidding and construction of traditional Bid-Build projects, while WRA leverages CGI's construction expertise to improve the constructability and cost-effectiveness of WRA designs. This cohesive and collaborative relationship was on display with the design and construction of the 26th Street Emergency Response and Retaining Wall Reconstruction and Streetscape project in Baltimore City, as well as for three recent emergency structural repairs in Montgomery County. On all projects, CGI and WRA worked collaboratively, with the owner's consent and support in a quasi CMAR relationship, to develop and obtain approval of innovative and cost-effective solutions that could be completed safely and expeditiously using means and methods available to CGI and their subcontractors based on WRA's knowledge of their skillsets.

We understand the principles that the CMAR process is based on collaboration, cooperation and trust between MDOT SHA, the Design Team and the Contractor. CGI's approach during preconstruction will mirror our approach outlined above. We are not new to the project type, project area or the CMAR process itself and

C. Project Approach | Continued

we understand what it takes to provide to MDOT SHA a successful roadway and bridge project. CGI's goal is to deliver a successful, *well-managed project*. We will include all of the CMAR Team along with key stakeholders, noted in Figure 6, in our normal work process, communications and meetings. We recognize the logistical factors involved in such a complicated endeavor, and we are experienced in creating and maintaining consistent communications through a variety of delivery methods thereby creating a collaborative environment.

Neither design nor construction activities can occur independent of each other – and all issues are important to prepare for early on, in the preconstruction phase. There will be continual communication between MDOT SHA's representatives, the Design Team and CGI's Project Manager, Cost Estimator and the Construction Manager. Through weekly meetings with input from all discipline leads, a well thought out project plan and schedule will be developed that integrates the reasonable time frame for all activities by the CMAR Team, to complete this project in the most efficient manner possible while meeting the requirements of the contract and the goals of the project. As we have all experienced during the pandemic, telephone calls, MS Teams, email correspondence, video conferencing will provide rapid responses to any items or issues that arise requiring immediate attention allowing for the status of plans, outstanding issues and issue resolutions will be tracked and updated at the weekly meetings.

Our support of MDOT SHA in involvement with stakeholders (see Figure 6) during the preconstruction phase includes the following:

- Proactively identify stakeholders along with potential concerns
- Participate in any project stakeholder kick-off meeting and subsequent follow-up meetings
- Provide input to gain understanding of concerns and to establish relationships

All 3 of the team's goals for stakeholders can be achieved through a variety of means:

- Internet/website/social media notifications
- Printed flyers and information distributed throughout the project area
- Public meetings with in-person presentations and Q&A sessions
- Dissemination of the meeting notes and opportunities to comment
- Individual meetings with key stakeholders, as needed

We will also support the Administration in meeting these additional goals for stakeholders.

We understand the impact that a construction project can have on a community and are committed to working with all stakeholders to minimize any impacts and deliver a successful project.

C.1.b DESIGN AND CONSTRUCTABILITY REVIEW

CGI will use its knowledge gained from constructing more than 900 projects and over 2 dozen Alternative Delivery Projects and the challenges that have occurred on these projects, to provide input from the Contractor's perspective to the CMAR Team, along with lessons learned from our experiences. *Our construction and Design-Build experience help streamline the design process, reduce errors and omissions, improve constructability and quality, reduce the cost of construction to ensure it is within budget and optimize the project delivery schedule.*

CGI's approach to accomplishing these objectives on this project include:

- Identify key staff from MDOT SHA and the Design Team who will help lead the CMAR Team with CGI's key staff. As shown in our proposed technical concepts in C.1.d, CGI has dug into this project to look for ways to provide innovation, cost savings, and optimization of the project while still achieving the project goals as outlined in the RFP. This type of leadership and drive will continue throughout the project.
- Develop a strong CMAR Team comprised of MDOT SHA, the Designer, Contractor representatives along with pertinent stakeholders such as permitting agencies and utility companies who are fully vested in the success of the project and bring discipline expertise to the CMAR Team.
- Utilize MDOT SHA/MdQI's Partnering process with the entire CMAR Team and pertinent

C. Project Approach | Continued

stakeholders to instill the values and attributes necessary for a successful project. These values and attributes include trust, teamwork, communication, motivation, empowerment and issue resolution.

- Engage the entire CMAR Team to develop best practices and a mutually agreed upon set of processes and procedures to meet the project objectives.
- Attend and participate in a kick-off workshop with the CMAR Team to ensure a clear understanding of prior construction activities, utility relocations, permitting, and materials already acquired/fabricated and stored for use.
- Utilize Bluebeam for Design and Constructability Reviews to track changes, save comments, export a summary log, and provide integrated/simultaneous review capabilities within a seamless platform to check for changes, conflicts, and collaboration of review viewpoints.
- Look for ways to reduce maintenance of traffic stages to improve constructability and reduce risk to the CMAR Team and the travelling public. GET IN, GET OUT, and GET DONE!
- Implement weekly meetings with MDOT SHA and the Design Team to collaborate, coordinate, and provide status updates on design, constructability, and project progress. These meetings should include all discipline leads from the Design Team in order to provide accurate, up-to-date information. These meetings will also provide a forum for coordination between different design areas to streamline the design process and reduce errors.
- Review site conditions, as-builts, and conceptual designs at the earliest stages of design development, and provide detailed reports with thorough review comments in a timely manner. Utilize Bluebeam and other tracking logs to ensure changes, decisions and reasons are documented.
- Hold separate constructability and cost savings review meetings with the CMAR Team to further identify areas to minimize cost and facilitate the construction schedule.
- Identify project risks and mitigation measures early in the preconstruction process. Maintain open communication with all team members throughout the preconstruction process and ensure risks are being mitigated. Encourage CMAR Team to bring any possible issues or proposed solutions/improvements to the team, as well as participate in “over-the-shoulder” meetings.
- Prepare an integrated project schedule using Primavera P6 immediately upon award with WBS for all milestones, design activities, reviews, meetings, utility relocations, permits submissions, and baseline the agreed upon schedule to track improvements with innovations.

C.1.c RISK MANAGEMENT

The CGI Team will collaborate with the project team to develop a risk management plan, perform risk assessments, prepare a risk register and provide input on accelerated construction techniques and innovative cost savings. In addition to the key staff, our Environmental Compliance Manager, MOT Manager and Utility Coordinator, Project Controls and Safety Manager will assist the CMAR Team in developing and evaluating innovative, alternative designs, systems and materials.

Through the CMAR method of contract delivery, construction quality and completeness of the design should improve and impact to the schedule and budget should be minimized. Working side by side with MDOT SHA and the Designer, CGI will use its experience to analyze costs and review plans for constructability and other issues as well as share this information collaboratively. During review of the plans, our team will provide CGI’s Cost Estimator, Mark Miller, with information needed to identify potential cost and time risks and document these risks on our Project Risk Register. Mark will also identify and track cost impacts during each design review. CGI will also share the Project Risk Register along with any assumptions the CMAR Team made during the review, even those assumptions that a contractor would normally make if they were contracted to do the work in a Bid-Build procurement. The advantage MDOT SHA gains is the benefit of having the opportunity to incorporate a contractor’s perspective and input to planning and design decisions in addition to the ability to fast-track early construction components prior to design completion.

C. Project Approach | Continued

The same Risk Register model is used to track and report innovative savings. CGI will work alongside the CMAR Team to collaborate on innovative ideas to save time and money. Innovative solutions with the most impact on the project will be identified and investigated including solutions such as alternative ways to construct portions of the project sooner, use of alternative materials, reducing cut and review of alternative phasing options to save time, which leads to cost savings. The CMAR collaborative project delivery method allows for outstanding team innovations, saving the project time and money while adding value.

CGI has proven experience working with MDOT SHA to provide favorable cost solutions through communication, coordination and collaboration. We have performed both Bid-Build and Design-Build projects with MDOT SHA as well as providing rehabilitation and systems preservation services and performing emergency repair projects when the situation is warranted. MDOT SHA needs an experienced contractor who can work collaboratively and deliver a quality solution in an expedient manner. CGI is the local contractor who, day after day, gives MDOT SHA the best value and best quality with its experienced workforce and proactive, problem-solving management approach. CGI is headquartered in Gaithersburg, Maryland, and has performed multiple projects in the area such as the I-95/I-495 Suitland Road and the MD 210 Livingston Road/Kirby Hill Road Design-Build.

Mark Miller will provide cost estimates of the alternatives to be evaluated that shall include industry standard operating and maintenance costs when appropriate to evaluate life-cycle costs of the alternatives. CGI will develop the Opinion of Probable Construction Cost (OPCC) on the design prepared by the Designer at the completion of any agreed upon milestone.

CGI key staff will evaluate the alternatives on the basis of costs, construction schedules, availability of labor, equipment, and materials, and construction feasibility in the form of constructability reports. They will prepare written procurement reviews for materials that could be procured by MDOT SHA or CGI ahead of any construction phase, prepare written reports at the end of any design milestone summarizing the value analysis activities accomplished and any recommendations developed within each phase.

If the OPCCs and/or prices received for the work contained in any work package cause the anticipated cost of the work to exceed the then current OPCC, any long lead time procurement (LLTP) Guaranteed Maximum Price (GMP), or any construction GMP, CGI will at no additional cost to the Administration, unless caused by an increase in CGI's work requested by the Administration, provide additional value analysis services in conjunction with any and all appropriate items in the OPCC, any LLTP GMP, or any construction GMP for the work.

CGI key staff will lead value analysis workshop(s) at agreed-upon milestones to coordinate estimating tasks, bring multidiscipline cost/construction experts to evaluate alternative designs, systems and materials. This work includes the submittal and ongoing evaluation of the value analysis proposal. They will collaborate with the project team to develop an innovative tracking and performance report and coordinate with MDOT SHA and the Designer throughout the preconstruction phase through a combination of on-site meetings, design meetings, conference calls and workshops.

The CGI Team, headed by Mike Higgins, Steve Beckley and Mark Miller, will work together during the preconstruction and construction phases and will work collaboratively with both MDOT SHA and the Designer in a partnership that does all things possible to achieve the stated project goals in the project development phase as well as during the construction phase.

Relevant Risks – Potential Impacts – Mitigation Strategy:

Based on the RFP documents, early site investigations, evaluations of the geology and site conditions, and our knowledge and experience, we have provided an example of the most relevant risks, their impacts, and mitigation strategies on the following page (Figure 1).

Figure 1

| Most Relevant Risks | Potential Impacts | Responsible Parties | Mitigation Strategy |
|--|-------------------|--------------------------------------|--|
| Environmental Permitting and Approvals | Schedule | CGI/Designer/MDOT SHA | Organize a permit task force and partner with MDOT SHA, the Design Team, and regulatory/resource agencies; hold regular coordination meetings; incorporate permitting into the project schedule to prioritize review efforts; and, submit quality design and permits meeting applicable procedures and requirements to minimize review time frames. |
| SWM/E&SC Approvals | Schedule | CGI/Designer/MDOT SHA | Coordinate with the review authority (MDE and MDOT SHA PRD) to determine applicable permitting requirements for the project; submit quality design and reports meeting applicable procedures and requirements to minimize review timeframes, schedule regular meetings with the review authority after all major reviews to discuss comments and to ensure all parties are in agreement prior to making resubmittals. Ensure designs are compliant with NPDES permit requirements. The project spans the Washington Met and Patuxent River Watersheds based on GIS information, the break being along Suitland Parkway at the overpass to the base entrance. No SWM is currently proposed in the Washington Met watershed with this project. Needs to be evaluated. |
| Sequence of Construction | Schedule/Cost | CGI/Designer/MDOT SHA | Coordinate with all parties to prepare a flexible sequence of construction (SOC) consistent with the project schedule that meets permit requirements while accommodating CGI's specific construction operations. The SOC will designate specific work areas, will allow for concurrent work within specific work areas and across multiple work areas, and will include multiple general notes with the goal of minimizing Toolkit or Greenline modifications, thereby minimizing the potential for delays associated with modification approvals. Ensure SOC incorporates all permit requirements and work restriction periods. |
| Adjacent Developer Coordination | Schedule/Cost | CGI/Designer/MDOT SHA | Create a point of contact with the developer(s) to develop open communication and to establish a coordination/issue resolution process including reoccurring meetings as needed. Request current development plans and that all development plan updates be sent to MDOT SHA. Review adjacent development plans for compatibility with the proposed project design. Revise design to accommodate development as feasible and where conflicts exist coordinate with developers to resolve conflicts while maintaining the MDOT SHA's goals as well as the developer's goals. |
| Utility Relocated Incorrectly | Schedule/Cost | CGI/Designer/MDOT SHA/Utility Owners | Overlay all designs received from utilities on MDOT designs and vice versa to confirm conflicts eliminated, have contractor stake out relocations for utilities, have contractor as-build relocations prior to performing his work and perform test pits for confirmation. See below for our review of potential conflicts: <ul style="list-style-type: none"> • Possible conflict with existing 12" water line near Structure I-3 on Central Park Drive drainage pipe run. • Possible conflict with existing 12" sanitary and existing 12" water line on Pres. Parkway (Sta. 2045+75) drainage pipe run. • Possible conflict with existing 15" storm drain (SD) on Suitland (Sta. 2030+80, Lt) drainage pipe run. • Possible conflict with existing 36" water line on MD-4 Sta. (56+50) drainage pipe run between MH-17 and MH-18. |
| Incomplete Previous Construction | Schedule/Cost | CGI/Designer/MDOT SHA | CGI will inspect all unfinished construction including drainage pipe/structures and stormwater management ponds to ensure these facilities are functioning as designed. Any required remedial action will be coordinated with the design team for inclusion in the design plans and permitting (as applicable). |
| Slope stability of cut and fill slopes | Schedule/Cost | CGI/Designer/MDOT SHA | Prince George's County is prone to landslide susceptibility; however, based on the Landslide Susceptibility Map of Prince George's County, MD (2003), the project is expected to be in an area with low landslide susceptibility. However, due to the soft soils and high groundwater conditions, it is expected to be difficult to provide the required safety factor against cut slope instability without the use of flattened slopes, benches and slope drainage blankets. The use of flattened slopes and benches may require more ROW than is available. If this is the case, additional retaining walls may need to be considered to provide the required stability. Work with the CMAR Team to develop a supplemental subsurface investigation plan or additional testing on any cut/fill slopes. |
| Groundwater | Schedule/Cost | CGI/Designer/MDOT SHA | The project includes up to 25' of cuts that are expected to extend below groundwater and into soft silty clays in some areas. The contract documents indicate that a slope drainage blanket will be used. The purpose of the slope drainage blanket is to intercept groundwater seepage through the face of the slopes that extend below the existing groundwater elevations. During construction, it is anticipated that deep sumps and well points will be used to draw down the groundwater and construct the slopes. Additional information is needed to determine potential impacts of the unloading of the soft, silty clay layer. It is anticipated that slope instability (movement) may occur if the soft clay is exposed at the toe of slope. It will be desirable to install the slope drainage blanket and the finished slope materials as soon as possible to confine any soft layers that are exposed. The impact (potential settlement) on existing utilities caused by drawing down the groundwater should be evaluated. This is mitigated through schedule, sequencing and thorough evaluation of the design and adjacent utility construction. Wait (quarantine) periods for compression due to settlement of soft silty clays may be an issue especially at Central Park Drive Sta 2036+00 to Sta 2042+00. Need to verify that secondary compression is within acceptable limits. |
| Project Scheduling/Work Sequencing | Schedule/Cost | CGI/ICE | Prepare a project schedule that accounts for all design, permitting/approval, and construction activities, specifically items on the critical path; ensure that the sequence of construction is synced with design approvals, permitting, work restriction periods, ROW clearances, etc. Take into account compression of soft clays and need for surcharge and wick drains. |
| Coordination with JBA | Schedule | CGI | Need to coordinate with Joint Base Andrews and establish equipment and construction restraints and requirements with regards to time of day of allowable construction activities, including activities involving crane use, and the requirements of maximum crane boom height, and other precautions as they relate to construction and airspace zones of influence from the adjacent airfield. This is important with crane leads for piles in excess of 100 ft. in length for bridge. |

C. Project Approach | Continued

Additional risk from CGI's work history in the area include:

Poor or Unsuitable Subgrade Material – CGI has built many projects in this area including several for the National Park Service on Suitland Parkway. Historically, soils in this area have not provided for a good subgrade. **Potential impacts** include increased costs for implementing subgrade stabilization or performing undercut/backfill operations and the time required perform the selected stabilization method. **Mitigation strategies** include identifying the locations and selecting the method of stabilization prior to uncovering and exposing the subgrade.

Existing Concrete Pavement at Subgrade – Much of the original pavement for Suitland Parkway was Reinforced Portland Cement Concrete Pavement (RPCCP) and may be encountered during construction. On previous projects, the proposed method of incorporating the RPCCP was rubblizing the existing concrete pavement when the RPCCP was at or near subgrade. The **potential impact** from using this method with poor subgrade conditions was pumping or sinking issues during the compaction efforts after the concrete pavement was rubblized. The **mitigation strategy** CGI has used on previous projects was to crack and seat the existing concrete pavement which allowed for drainage while providing better support between the slabs and the subbase layer. This method worked to minimize the subgrade issues resulting from the contract-specified rubblization method.

Stakeholder Coordination – National Park Service and Joint Base Andrews (JBA) – There are multiple key stakeholders for this project including: Prince George's County, developers (Wood Property, Westphalia Developer and Smith Farm House), permitting agencies (Maryland Department of Environment, Corps of Engineers), utility companies (Washington Suburban Sanitary Commission), National Park Service and Joint Base Andrews. **Potential impacts** to the project include delays to both design and construction from either requests or requirements of the key stakeholders. A successful **mitigation strategy** includes early contact and ongoing communication and coordination with all key stakeholders. CGI has extensive experience working with the National Park Service and Eastern Federal Lands Highway Division of FHWA on both Suitland Parkway and the Baltimore-Washington Parkway. CGI is familiar with working at Joint Base Andrews and the occasional unscheduled closings due to various security issues, such as POTUS and other officials/dignitaries' travel/flights in and out of JBA.

C.1.d PROPOSED TECHNICAL CONCEPTS

CGI has already begun researching **innovative ideas and technical concepts** that could increase the likelihood of success and help balance the project goals. These ideas and concepts are described below, including how they may further improve reaching project goals including **impacts on time, cost, and quality**. CGI has developed proposed technical concepts that will assist in attaining the project goals. We will continue to coordinate changes to the project with the CMAR Team and key stakeholders during the CMAR process.

Technical Concept 1 – Raised MD 4 Profile (Figure 2):

The MD 4 mainline profile included in the advertised plans includes a significant amount of excavation below the water table and a low point elevation close to the water table. This will decrease constructability and will require the addition of measures to drain the subgrade. The profile also allows for excess clearance under the Suitland Parkway bridge. The technical concept is to raise this profile as much as possible while still providing the required clearance plus an additional small margin. The low point is therefore raised by 3 feet.

- **Advantages**
 - Reduces excavation.
 - Raises the low point elevation thereby reducing the amount of roadway below the water table for increased constructability, global stability and decreased requirements for subgrade drainage.
 - Reduces cost, schedule, and maintenance of traffic burden associated with the additional flyover ramp contract.
 - Does not require any major changes to current MOT concept.

C. Project Approach | Continued

- **Disadvantages**
 - Will require revisions to the adjacent ramp profiles.
 - Will require revisions to the proposed drainage, stormwater management, and erosion and sediment control design.

MEETS PROJECT GOALS:

- ☒ Minimize project costs by reducing proposed cut and height of structures.
- ☒ Minimize project delivery time by reducing waste cut from the project.
- ☒ Utilize structure steel bridge, sign structures, lighting and signalization already order and stockpiled.
- ☒ Use stockpiled materials and bridge structure.
- ☒ Improve safety and relieves congestion.

Technical Concept 2 – Double Lane Loop Ramp (Figure 3):

The double lane loop ramp option partially modifies the current diamond interchange, by removing the MD 4 northbound to Suitland Parkway westbound flyover ramp and replacing it with a free-flowing double lane loop ramp in the northeast quadrant of the interchange. To make space for the double lane loop ramp, Ramp H and the service road will be slightly realigned to the east. With traffic now on the double lane loop ramp, left turns from Ramp C can be eliminated and the ramp will be reduced to a single lane off ramp to Suitland Parkway eastbound. To accommodate the traffic from the double lane loop ramp, the bridge on Suitland Parkway over MD 4 will be required to be widened by one lane. There is excess clearance for the proposed bridge over MD 4, therefore adding an additional lane will work with the current bridge type and configuration.

- **Advantages**
 - Does not impact relocated utilities.
 - Minimizes footprint for pavement as much as possible.
 - Eliminates structures, tall fills and benches, drainage features, and pavement associated with the flyover ramp.
 - Reduces pile driving disturbance to adjacent neighbors.
 - Reduces cost, schedule, and maintenance of traffic burden associated with the additional flyover ramp contract.
 - Eliminates future maintenance associated with the three flyover bridges as well as the additional pavement for the separated ramp.
 - Minimal impact to proposed drainage
 - The service road will be closer to the relocated utilities and therefore will be more easily maintained by the utility companies.
 - Can utilize existing materials already procured for the project and may require additional bridge width to accommodate an additional lane.
- **Disadvantages**
 - Due to lack of space, the loop ramp can only be sized for 25 mph.
 - May require retaining walls between ramps. At a minimum the ramps and service road will require barrier separation.
 - Two additional lanes under the Suitland Parkway bridge along MD 4 northbound may impact open section ditch and abutment grading. A concrete barrier may be required under the bridge.
 - May increase the amount of temporary pavement required during MOT.
 - Will require modification of current MOT concept.
 - Will require environmental impact reevaluation, which will be necessary as part of the existing
 - Will require traffic modeling reevaluation.

C. Project Approach | Continued

MEETS PROJECT GOALS:

- ☒ Minimize project costs by reducing the number of structures, cuts, fills, pavement and drainage.
- ☒ Minimize project delivery time by reducing amount of required construction.
- ☒ Utilize temporary pipes and drainage structures already ordered and stockpiled.
- ☒ Utilize structure steel bridge, sign structures, lighting and signalization already order and stockpiled.
- ☒ Use stockpiled materials and bridge structure.
- ☒ Improve safety and relieve congestion.
- ☒ Minimize inconvenience/impacts to traveling public by reducing duration.

Technical Concept 3 – Diverging Diamond Interchange (Figure 4):

The Diverging Diamond Interchange option replaces the current Diamond Interchange with a Diverging Diamond Interchange. All on and off ramps will remain in their current proposed locations, but the configuration of the interchange allows free-flowing left turns from Suitland Parkway to the MD 4 on ramps and from the MD 4 off ramps to Suitland Parkway.

- **Advantages**

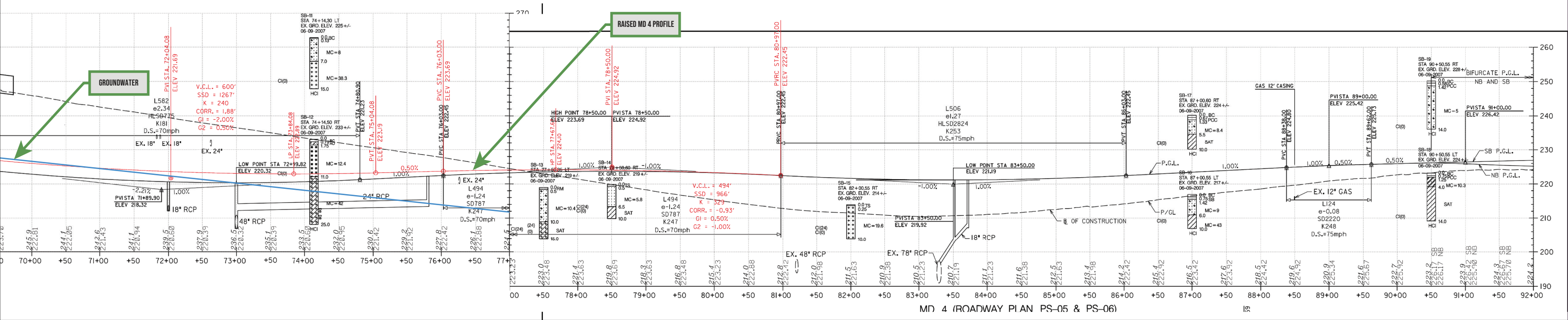
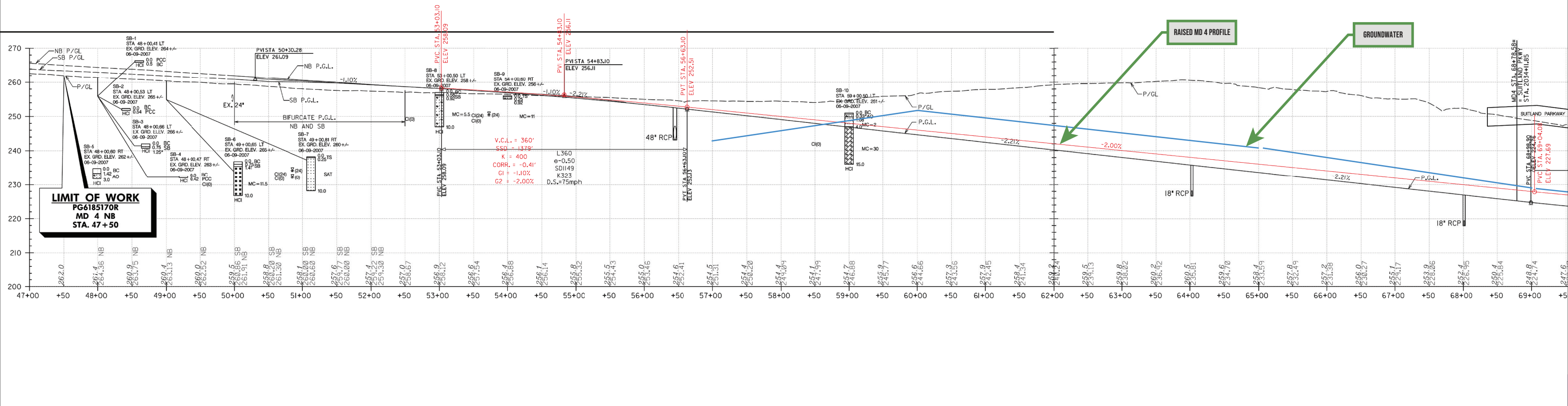
- Does not impact relocated utilities.
- Minimizes footprint for pavement as much as possible.
- The concept fits within the footprint of the current proposed interchange and bridge.
- Eliminates structures, tall fills and benches, drainage features, and pavement associated with the flyover ramp.
- Reduces pile driving disturbance to adjacent neighbors.
- Reduces cost, schedule, and MOT burden associated with the additional flyover ramp contract.
- Eliminates future maintenance associated with the three flyover bridges as well as the additional pavement for the separated ramp.
- Can potentially reduce bridge width.
- Can consider two smaller independent bridges.
- Minimal impact to proposed drainage.
- Does not require any major changes to current MOT concept.

- **Disadvantages**

- Maintenance of traffic for future bridge redecking is potentially more difficult.
- May require public information campaign to educate drivers on using diverging diamond interchanges to help eliminate and reduce driver confusion.
- Will require environmental impact reevaluation.
- Will require traffic modeling reevaluation.
- Future Ramp O proposed connection with Old Marlboro Pike will no longer be viable due to no through movement across the MD 4 southbound ramp being possible with a DDI. This movement will require reevaluation.

MEETS PROJECT GOALS:

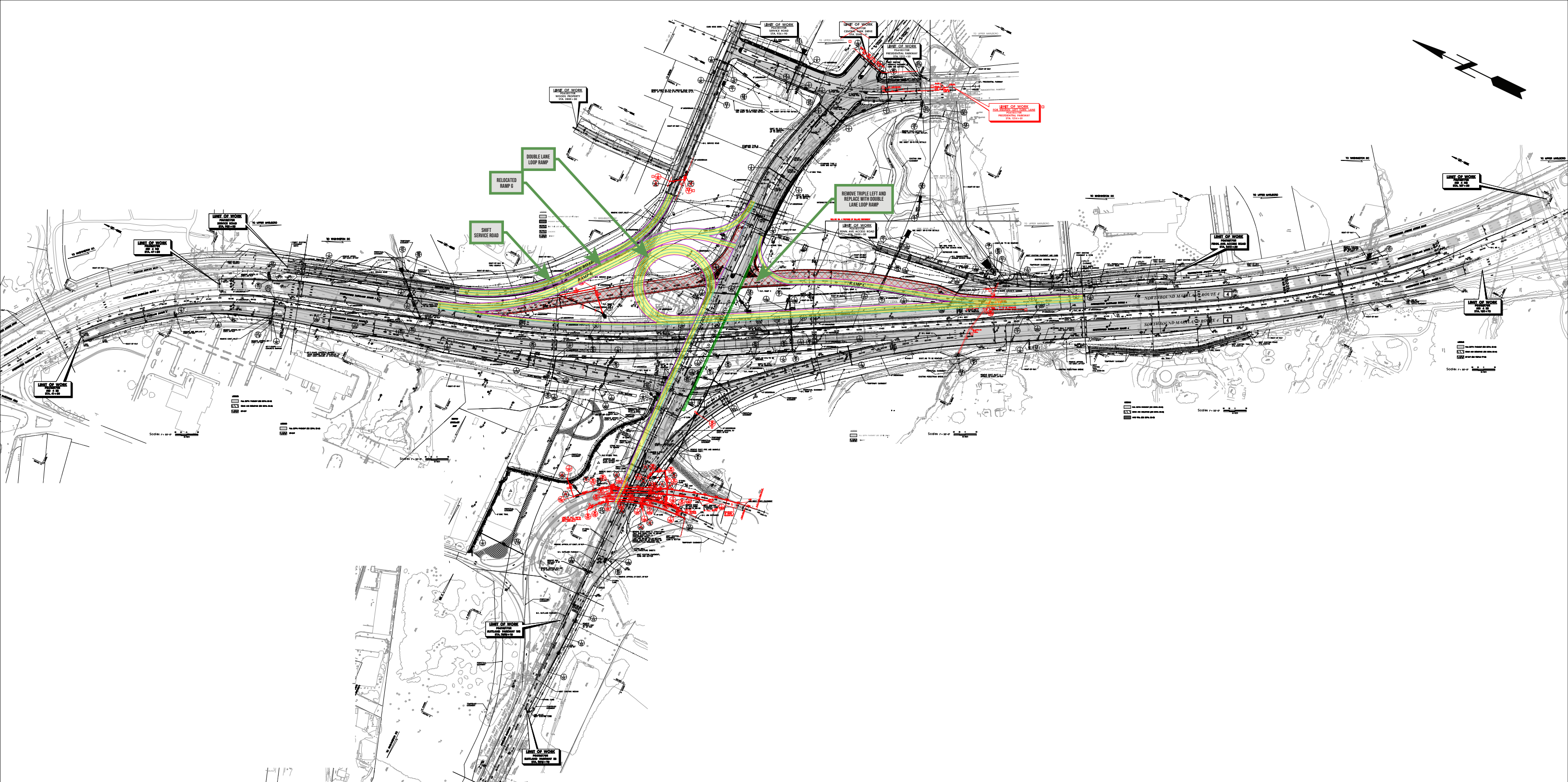
- ☒ Minimize project costs by reducing the number of structures, cuts, fills, pavement and drainage.
- ☒ Minimize project delivery time by reducing amount of required construction.
- ☒ Utilize temporary pipes and drainage structures already ordered and stockpiled.
- ☒ Utilize structure steel bridge, sign structures, lighting and signalization already order and stockpiled.
- ☒ Use stockpiled materials and bridge structure.
- ☒ Improve safety and relieve congestion.
- ☒ Minimize inconvenience/impacts to traveling public by reducing duration.



TECHNICAL CONCEPT 1

RAISED MD 4 PROFILE





TECHNICAL CONCEPT 2

DOUBLE LANE LOOP RAMP



TECHNICAL CONCEPT 3

DIVERGING DIAMOND INTERCHANGE

C.2 CONSTRUCTION APPROACH

C.2.a CONSTRUCTION SEQUENCING

CGI's construction sequencing includes a comprehensive overview of the construction activities required from notice to proceed through completion, including major milestones and critical schedule dates, such as the Administration's Spring 2023 target construction start date. These construction activities will include, but not be limited to, maintenance of traffic, utility relocation and staging, construction phasing, and will be based on the information provided in the independent work packages. Our schedule will be formatted to outline milestones and construction tasks for the entire project.

After reviewing the Concept Plans and scope of work, it is likely that this contract will require six main phases of construction to maintain traffic and complete the work. We have also identified sub-phases within Phases 1 and 2 to handle the traffic switches needed. Enhancements can be made to further improve the plan, but we feel that by focusing on the following elements we can determine the best approach for construction. These elements include: long-lead third party utility relocations, potential weather impact days during the different seasons, minimizing impacts to the local community and traveling public as well as limiting the locations of disturbance at any given time. Construction Work Packages may be broken out to allow for phased approvals. This will accelerate overall plan development and allow us to begin work earlier on different packages.

As an example, Construction Work Packages could be separated as follows: E&S Controls, Maintenance of Traffic, Mass Grading, Structures/Bridges, Drainage, Utility Relocations, Signals & Lighting, Subgrade/Paving, Stormwater Management, and Signage. Developing the plans in this manner will preclude packages from holding each other up. For instance, bridge construction could begin following Bridge, E&SC, and MOT plan approvals, prior to completion of the Roadway package.

The major phases of work are the following:

- Phase 1A – Presidential Parkway/Detour Prep/Temporary Connections
- Phase 1B – Presidential Parkway/Service Road/Ramps D,J,O/WB Suitland Widening
- Phase 2A – Central Park Drive/Ramps C,G,I,K/MD 4/EB Suitland Widening/JBA Entrance
- Phase 2B – Ramp D/MD 4 North Crossover
- Phase 3 – MD 4/Central Park Drive/Ramps I,K/EB Suitland Parkway
- Phase 4 – MD 4/Ramps H,N,O,K/PEPCO Storage Lot/JBA Trails
- Phase 5 – MD 4/Ramps D,N,O/Suitland Parkway
- Phase 6 – MD 4/Central Park Drive/Ramps G,C/Surface Paving

Based on the drafts plans provided, we anticipate that the critical path will run through the construction of the bridges associated with the project. The bridge construction will extend through several of the phases noted above.

Possible Factors that could affect the schedule include the following:

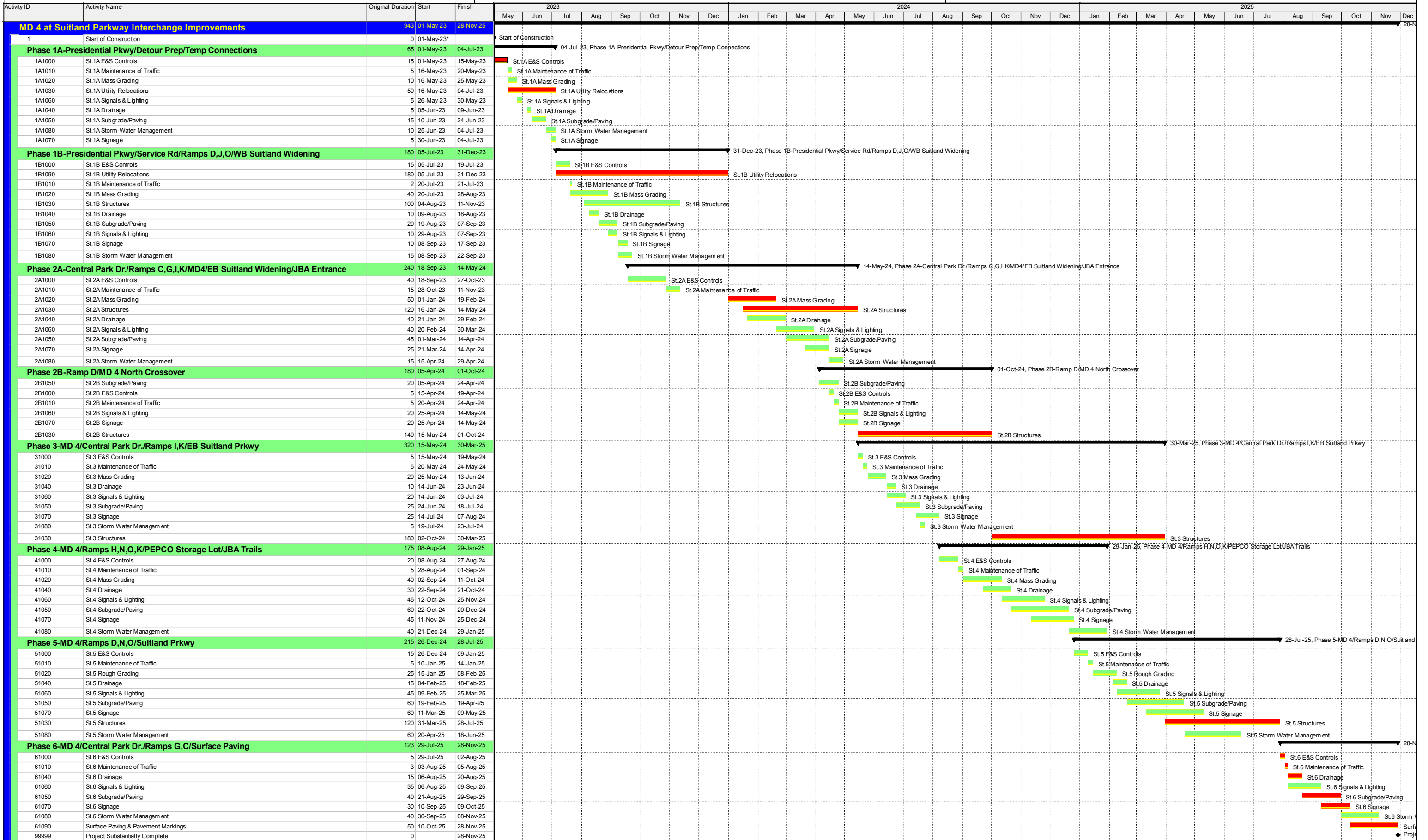
- Outside Constraints: Utility Relocations – WSSC and Nustar relocations as well as previously relocated utilities performed by third parties are potential issues that could affect schedule. While CGI has added W.F. Wilson and Sons, Inc., a WSSC contractor who previously worked on the project, to perform the WSSC relocations, there are known coordination issues that must be resolved. In addition, those utilities previously relocated must be verified to be outside of future construction conflict. CGI will confirm utility impacts early on during design and consider opportunities to minimize them. We will include utility stakeholders during design to ensure accuracy of the relocation plans and approach to construction. We will obtain relocation schedules from the stakeholders and incorporate them into the CPM. Overlay all designs received from utilities on MDOT designs and vice versa to confirm conflicts eliminated. Have contractor stake out relocations for utilities and as-build relocations prior to performing work to verify conflict resolution.

C. Project Approach | Continued

- Groundwater – The project includes up to 25’ of cuts that are expected to extend below groundwater and into soft silty clays in some areas. The contract documents indicate that a slope drainage blanket will be used. The purpose of the slope drainage blanket is to intercept groundwater seepage through the face of the slopes that extend below the existing groundwater elevations. During construction, it is anticipated that deep sumps and well points will be used to draw down the groundwater and construct the slopes. Additional information is needed to determine potential impacts of the unloading of the soft, silty clay layer. It is anticipated that slope instability (movement) may occur if the soft clay is exposed at the toe of slope. It will be desirable to install the slope drainage blanket and the finished slope materials as soon as possible to confine any soft layers that are exposed. The impact (potential settlement) on existing utilities caused by drawing down the groundwater needs to be evaluated and is a concern.
- For Widening of Bridge on Suitland Parkway over Andrews Air Force Base Entrance/Exist Ramps – May want to consider larger piles and pile points for piles driven near existing timber piles. The HP 12 x 53 piles are small and may be overstressed if they hit an obstruction during pile driving causing delays to material already ordered and purchased and construction solutions for unforeseen conditions.
- Crane Use with Joint Base Andrews – We need to have a better understanding of what they will require for restrictions on work hours and equipment use (especially cranes) within the vicinity of the base due to all the structure work, especially the long piling (100+ ft. in length) to be driven for the bridges which will require long leads for the crane. CGI is familiar with the notification/permitting process for working near JB Andrews having performed work requiring the use of cranes for bridge/pile construction on both our MD 210 Livingston Road/Kerby Hill Road Interchange Improvement Design-Build and I-495 Suitland Road Bid-Build Projects which both required permits from JB Andrews.
- Seasonal Work – Effort will be made to schedule the completion of milestone MOT shifts prior to winter, allowing less weather sensitive work to continue through the winter season. Structural steel girders, that have been fabricated and stored on-site, will adhere to applying paint Coats II and III will be with calendar restrictions from December 15 to April 15. The biggest seasonal risk to the project is the surface paving activity which are temperature dependent. Any schedule delay to the project could push paving operations to the end of the project where temperatures will be out of our control.
- Materials – Material availability has been an issue since the pandemic. It will be important to identify material needs early and confirm their availability. Early procurement and requests for payment of stored materials may minimize material shortages and material escalation costs.
- Labor Availability – CGI has a work force of 300+ Craft Labor that are located entirely in the Maryland region. Our current force is sufficient to complete the project on-schedule. We do not currently believe that this will be a schedule risk for the project.
- Changes to Design during the CMAR Process – It is important to have flexibility in the schedule early on to allow implementation of design changes that occur. The schedule developed for this proposal lacks the normal level of detail expected in a CPM for this reason.

C.2.b CONSTRUCTION SCHEDULE

Our schedule (Figure 5) has been developed based on the conceptual plans. We anticipate construction to take approximately 30 months to complete. Regarding weather, we will have limitations during the winter with pouring concrete along with the final surface course for the asphalt pavement. To mitigate impacts to placing concrete in the winter months, piers and abutments can be heated. It will be more difficult to properly heat the bridge decks since these are located over other roadways. We will attempt to schedule the bridge deck pours to occur outside of the colder periods.



Project Baseline Bar
 Remaining Work
 Milestone
 Actual Work
 Critical Remaining Work
 Summary

C. Project Approach | Continued

C.2.c STAKEHOLDER COORDINATION

Coordination and communication between MDOT SHA, CGI, the Designer, resource agencies, utility companies (WSSC) and other project stakeholders (Prince George’s County, National Park Service, Joint Base Andrews, and adjacent developers) are critical to the overall success of the project. Partnering as promoted by MDOT SHA will be utilized as the framework for ongoing coordination and communication. The CGI team is committed to working as an integrated team with MDOT SHA, the Designer and project stakeholders to successfully deliver this project on time and within budget. All key staff and key support staff of the CGI preconstruction and construction teams will actively participate with MDOT SHA and project stakeholders in the initial Partnering workshop, monthly Partnering meetings and other needed stakeholder meetings. CGI has done their homework and has identified the following MD 4 stakeholders that would be affected by this project:

| MD 4 CMAR STAKEHOLDERS | | |
|---|---|---|
| <p>AGENCIES</p> <p>MDOT SHA – ICD, HCD, HHD, District 3, OOS, OED, OMT</p> <p>MDOT Communications and Community Liaison</p> <p>National Park Service</p> <p>Federal Highway Administration</p> <p>MDOT SHA – Plan Review Division (PRD)</p> <p><i>Stormwater Management and Erosion & Sediment Control</i></p> <p>Maryland Department of the Environment (MDE) – Water and Science Administration</p> <p><i>Wetland and Waterways</i></p> <p>U.S. Army Corps of Engineers</p> <p><i>Wetland and Waterways</i></p> <p>Maryland Department of Natural Resources</p> <p><i>Reforestation</i></p> <p>Federal Aviation Administration</p> <p>Department of Defense</p> <p><i>Joint Base Andrews Naval Air Facility Air Force Navy</i></p> | <p>LOCAL BUSINESSES</p> <p>Police Federal Credit Union</p> <p>Penn Belt Industrial Area</p> <p>Forestville Plaza Shopping Center</p> <p>WMATA Andrews Federal Center Bus Garage</p> <p>Melwood Professional Center</p> | <p>SCHOOLS & CHILDCARE CENTERS</p> <p>Morningside Elementary School</p> <p>Kingdom Christian Academy</p> <p>CMIT South Elementary School</p> <p>CMIT Academy South Middle/High School</p> <p>Longfields Elementary School</p> <p>Central High School</p> <p>Spaulding Junior High School</p> <p>Benjamin Foulois Creative and Performing Arts K-8 School</p> <p>Child World Early Learning Center</p> <p>Precious Little Ones Daycare</p> <p>Creation Learning and Aftercare Center</p> <p>Forestville Early Learning Center</p> <p>Greater Christian Community Daycare Center</p> |
| | <p>LOCAL GOVERNMENTS</p> <p>Prince George’s County, MD</p> <p>Morningside, MD</p> | |
| | <p>EMERGENCY SERVICES</p> <p>Maryland State Police</p> <p>Prince George’s County Fire and Emergency Medical Services Department</p> <p>Morningside Volunteer Fire Department</p> <p>Prince George’s County Police Department Headquarters</p> <p>Morningside Police Department</p> <p>Prince George’s County Office of Homeland Security (OHS)</p> | |
| <p>UTILITIES</p> <p>Comcast</p> <p>Potomac Electric Power Company</p> <p>Verizon Communication</p> <p>Washington Gas</p> <p>Nustar</p> <p>Washington Suburban Sanitary Commission</p> <p>Zayo</p> | <p>CHURCHES</p> <p>Pleasant Grove Baptist Church</p> <p>Ministry of Love Church</p> <p>New Hope Baptist Church</p> <p>Higher Place of Praise</p> <p>Faith City MD</p> <p>International Church of Worshippers</p> | <p>LOCAL RESIDENTS/DEVELOPMENTS</p> <p>Armstrong Village</p> <p><i>Ryan Homes</i></p> <p>Parkside Westphalia</p> <p><i>Dan Ryan Builders Stanley Martin Homes Haverford Homes Mid-Atlantic Builders Elevate Homes</i></p> <p>Wood Property</p> <p>Smith Farm Home</p> <p>Homeowners’ Associations</p> |

Figure 6

C. Project Approach | Continued

CGI is sensitive to the role that good communication plays in helping to minimize the impact of the project, not only on the locality, but also on all road users (motorists, pedestrians, bicyclists, transit, emergency services, school buses, etc.) and will continue the philosophy established by MDOT SHA during the project's planning, previous construction and RFP development phases. Residents, businesses, local agencies, elected and community officials, the community, road users, the general public, and other interest groups impacted by the project will be kept informed, and their engagement throughout the design and construction process will remain critical to the project's successful completion. We will support and assist MDOT SHA and Wallace Montgomery in the development of an integrated communications plan including community participation/interaction activities. Our communications plan will support MDOT SHA in informing and engaging adjacent landowners, communities and other interested parties, as well as informing and updating road users and the general public, on the proposed project elements, MOT activities, construction progress, etc. The emphasis of our approach is to ensure that accurate and timely information flows from us, through MDOT SHA, to the local communities, traveling public, and all locally represented stakeholders. Our Public Relations Coordinator, Pam Destino, PE (WRA), will lead the communication efforts for CGI. She will work closely with MDOT SHA's Office of Communications, Highway Design Division, and District 3 staff for all public communication. All communication will come directly from MDOT SHA unless otherwise directed. Communications will include preconstruction and milestone notifications, including at least 14 days in advance of any traffic changes, as construction progresses. Public safety and maintaining preconstruction response times for emergency services is vital to the projects success. We will coordinate with these emergency services (Police/Fire/EMS), as identified in the stakeholder chart, to keep them informed of proposed maintenance of traffic patterns during design to confirm they work with their response plans. During construction we will keep them abreast of current traffic patterns and provide assistance as necessary for these responders throughout the project limits. We will develop a site-specific health and safety plan along with an emergency response plan.

For efforts involving adjacent property owners and communities directly impacted by the project, we will actively support MDOT SHA staff in meetings, preparation of materials, documentation of meeting minutes and other correspondence, and preparation of responses to inquiries and comments. We anticipate these types of support efforts to be individualized and focused primarily on site-specific design/construction elements and impacts; construction activities, schedules, and progress; and general communication to address site-specific suggestions, questions, or concerns. Our goal will be to support the active engagement of all affected and interested groups so that they become an integral part of the design and construction process. This support will be primarily provided by our Project Management team with the support of design and construction staff.

For efforts involving local agencies, elected officials, community leaders/members, road users, the general public, and other interest groups, we will actively support MDOT SHA staff with the preparation of information related to the project design/construction scope, MOT activities, construction progress, and general communication to address suggestions, questions, or concerns. We anticipate these types of support efforts to have a broader reach but may be topic-specific or site-specific as needed. This support will be primarily provided by Pam with the support of our project management team. We anticipate using the "Projects Page" on MDOT SHA's website for project updates and using existing MDOT SHA ITS systems, project-specific traffic control devices, mailers, etc. to inform the public of upcoming activities that may impact road users.

Based on our background research, we understand that there are a number of local schools, childcare centers and churches, that will be affected by construction and travel pattern changes throughout the construction. CGI will work with MDOT SHA to discuss any changes with these schools, childcare centers and churches to understand how this may affect their operations and their customers and help to develop informational materials for their use and posting.

We will work with MDOT SHA, the Designer and the entire CMAR Team in developing design and construction solutions to deliver a successful project.



STATE HIGHWAY
ADMINISTRATION

MD 4 (PENNSYLVANIA AVE) AT SUITLAND PARKWAY INTERCHANGE IMPROVEMENTS PRINCE GEORGE'S COUNTY

CONTRACT NO. PG6185470 | TECHNICAL PROPOSAL

APPROACH TO COST ESTIMATING



APPROACH TO COST ESTIMATING

D. Approach to Cost Estimating

D.1 ESTIMATING ENVIRONMENT

CGI's approach to providing an open and transparent estimating environment, one that will assure MDOT SHA is receiving a fair price for the project, starts with forming a partnership with MDOT SHA and the Designer to develop the CMAR Team. The goals for this partnership are to replace a structurally deficient bridge, minimize construction time and costs, minimize impacts to the environment, and minimize inconvenience and impacts to the traveling public. The uniqueness of having a partially built project along with materials that have been fabricated and stock piled speaks to the project goal of the need minimize the project costs while being innovative at utilizing these materials to deliver the project within the current budget. Our experience and expertise will help reduce errors in design, maximize the achievement of project goals, improve the overall constructability of the project and support the CMAR process.

This collaboration and partnership will include open communication with all team members about project risks and how they can be mitigated through risk sharing and/or design modifications. This partnership and open exchange of information will help the MDOT SHA decide which suggestions to incorporate into the project. Transparent estimating with the ICE team will be integrated into this decision making process.

Starting at project initiation, our construction staff will hold joint meetings on a weekly basis (if deemed necessary) with design staff to discuss and carefully evaluate all work activities on the project. Initial field investigations will be performed jointly in order to assess issues such as construction access, maintenance of traffic, environmental constraints, and utility impacts of the partially constructed project and discuss CGI's identified risks during this proposal development. This is a key collaboration technique that CGI feels strongly about before anyone begins design and estimating so they can understand what field conditions will drive the project. In the design phase, CGI will be heavily involved in design and constructability input in preparation of design submittals. Key construction inputs during design will include the following: 1) constructability reviews – review of scheduling, sequencing, means/methods, equipment, materials, etc.; 2) construction scheduling and development of work activities; 3) assisting with the development of innovative and cost-effective designs; 4) assessing utility impacts and relocation or avoidance measures; 5) assessing environmental impacts to identify/develop avoidance and minimization strategies; 6) over-the-shoulder reviews; and 7) cooperative efforts for shop drawing preparation. To ensure compliance with contract requirements and facilitate seamless and timely design package reviews, our design quality control staff will be engaged and consulted throughout the development of the design. The preconstruction phase consists of providing services that may include, but are not limited to, constructability analysis, value engineering, scheduling, project site assessment, risk analysis, and cost estimating. During the preconstruction phase, CGI will create construction details and provide them to the Designer/team for consideration and means and methods approach understanding as it will inform the estimate. It is CGI's anticipation that the Independent Cost Estimator (ICE) will attend the ongoing design collaboration meetings throughout the preconstruction phase in order to have knowledge of the project equal to that of CGI for purposes of preparing the cost estimate. This offers MDOT SHA better protection and later on a fair price and may eliminate an unnecessary CGI advantage during development of the Opinion of Probable Construction Cost (OPCC) estimates and cost negotiations. This information gathering process and interaction is the first order of business. At the first coordination meeting the team, CGI, MDOT SHA and the Designer should discuss risks they see with the job. The ICE or Designer, depending on the responsible party for the risk mitigation plan, would then consolidate the list and assign champion/co-champion for each risk. Risks should be tracked in a Retirement & Mitigation worksheet. Allowance items should be assigned for the risk elements; however, CGI will not build the risk into their prices but set them aside in a contingency pool. This will help to move the project toward zero change orders.

CGI's Cost Estimator, Mark Miller, will manage the overall estimating program to include providing construction cost models, construction quantities and cost estimates, value analyses and cost savings reviews.

MD 4 (Pennsylvania Ave.) at Suitland Parkway Interchange Improvements Prince George's County

D. Approach to Cost Estimating | Continued

The CMAR process outlined in the RFP document is similar to the current process that is being utilized on our I-270 Innovative Congestion Management (ICM) Progressive Design-Build Project. Mark is serving in a similar role on that project. CGI intends to follow the CMAR process as outlined in the RFP document during both preconstruction and construction phases. We also plan to utilize the early procurement process for long-lead time materials, such as the structural steel members, to better manage project risks like the potential for steel cost escalation.

CGI's approach to an open and transparent estimating environment begins with initial meetings with MDOT SHA and the ICE to agree to the rules of engagement during the CMAR process. We would anticipate this discussion to include the sharing of information for plans, design, quantities and cost estimates, the format for the presentation for activities and quantities of work, labor and equipment rates being utilized for the project, subcontractor and vendor quotes, etc. This approach is being successfully utilized during negotiations with MDOT SHA and their ICE representatives on the I-270 ICM project.

Mark will work with CMAR Team members to provide accurate scoping and pricing in conformance with the estimating model and defined scope of work. CGI uses the B2W software estimating program to develop cost estimates for its projects. Our approach will be to use B2W to develop cost estimates for this CMAR project. During preconstruction, Mark will oversee CGI staff providing the initial project construction schedule to ensure the cost estimates are reflected accurately in the construction schedules. We expect design changes to occur frequently during this phase and will incorporate updates from design changes on both cost and schedule using information provided by the CMAR Team. Mark will develop CGI's Cost Model which is a detailed breakdown, generally provided in spreadsheet format, showing the line items to be used along with a framework showing what is included in each line item, as well as how all of the cost components will be accounted for on the project. A Work Breakdown Structure and estimating Cost Model based on MDOT SHA Standard format and specification bid items will be created and agreed upon. The Cost Model will include all direct costs (labor, equipment, materials, subcontract), indirect costs, overhead and profit, risk allowances, and project allowances. The level of detail we will provide in our cost estimates, along with our design and constructability recommendations and project schedule management, will enable the Project Team to make sound financial decisions that will minimize project delivery time, impacts on the environment, and impacts on the traveling public. CGI will develop, propose, and track potential innovations and alternative designs for incorporation into the project. CGI will provide value analysis of alternative designs, systems and materials so that each alternative can be evaluated based on cost, construction schedules, availability of labor, equipment and materials, construction feasibility, and durability/life cycle cost. A value analysis proposal will be prepared for each alternative and incorporated into the Innovation Tracking and Performance Report held by CGI.

This process will allow the ***greatest number of choices and applications of cost saving measures throughout the duration of the Project:***

An initial Cost Model will be agreed upon during preconstruction to establish an initial OPCC.

- Throughout preconstruction, all costs will be tracked and estimates changed regularly, to reflect quantity changes, changes in material costs, etc.
- Adjustment of the current OPCC will be evaluated at regular, frequent intervals to allow the creation of an updated OPCC for the next milestone.
- Adjustments will be consistently and continually made from early in the process throughout construction, allowing the greatest number of choices and applications of cost saving measures throughout the duration of the Project.

As part of the overall estimate development, our approach includes a mutually agreed upon scope of work to accomplish the phase of the contract. The scope of work would be developed from the most current plans and specifications. Both parties will agree that the scope of work is clear and unambiguous. Both CGI and the ICE will independently finalize their list of quantities, i.e., line items. The CMAR Team will then meet to

D. Approach to Cost Estimating | Continued

reconcile and come to agreement on the actual quantity to be utilized for each line item, sometimes called the “Go To” quantity. This can take multiple sessions on a complex project such as the MD 4 interchange. This agreement is paramount such that comparison of the OPCC estimates at the predetermined intervals of the project design can be made in an “apples-to-apples” fashion. This comparison is completed in an open and transparent estimating environment as we eliminate variability in costs based on variations in estimated quantities, assuring that MDOT SHA is receiving a fair price for the work. Each OPCC will require adjustments to quantities and line items. In order to complete apples-to-apples OPCC estimates, CGI will share all material and subcontractor quotes with the ICE. After each OPCC submission to MDOT SHA, most often in spreadsheet format, the ICE will prepare a comparison spreadsheet to facilitate the review. A workshop will be held to review those items that have a dollar variance above or below a predetermined percentage, typically 10%. Both the ICE and CGI will discuss details about the items and develop action items to adjust or revisit line items to resolve discrepancies. If the price is not acceptable, we will enter into a process of risk identification that identifies price differences between our cost estimate and the MDOT SHA Independent Cost Estimate. Following the resolution of the risk issues, the work will be re-priced to reach an agreed upon price.

“Best Value” Cost Estimates and Time Impacts: In the GMP and the Design-Build methods we will provide experienced preconstruction value engineering services guaranteeing “Best Value.” The entire team will work to provide a constructible, practical design that exceeds the criteria while providing the greatest value to the stakeholders. Management and control of the cost of the project will continue during the finalization of the design by continuing the involvement of construction and design personnel side by side.

CGI will continue to control the construction cost of the project through a multiple input format for the procurement of all the required materials, services and subcontractors for the project. This process involves both estimating and project field staff independently scoping and acquiring prices for the materials, services and subcontractors necessary. Upon compilation of this information, the two groups will sit down, review and analyze the information and propose a best value subcontractor/vendor candidate recommendation for award.

Mike Higgins and Mark Miller will attend the project scoping/partnering workshop, project team meetings, milestone meetings, long lead time procurement (LLTP) GMP and Construction GMP reconciliation meetings with the rest of the CMAR Team as necessary. Both Mike and Mark bring their experience successfully working with MDOT SHA on the I-270 ICM Progressive Design Build Project in similar roles.

Risk mitigation will be a CMAR Team effort. Various risks will need to be evaluated and potential costs determined by the cost estimators. Through the use of effective Partnering, the significance of each risk can be evaluated to determine if it can be mitigated and/or eliminated through design. This will be tracked and documented by Mark using a mutually agreed upon record keeping system. Risks will be managed with input from all members of the CMAR Team. Collaboration within the CMAR Team to develop a risk management plan, perform risk assessments, prepare a Risk Register, provide input on accelerated construction techniques and innovative cost savings is a critical component for project success.

Through review of the plans and constructability, our team members will be able to provide Mark with information needed to determine and report risk mitigation. Mark will also track the cost impacts of each design review. CGI will also share its assumptions that the Contractor would normally make if they were contracted to do the work at the preconstruction phase. In addition, arrangements can be made regarding risk sharing and profit sharing if there are over-runs or under-runs in the GMP. MDOT SHA gains then has the benefit of incorporating a contractor’s perspective and input into planning and design decisions.

Value-added proposals and concepts will initially be evaluated by Mark with input from the designated members of the CMAR Team, i.e., pertinent discipline MDOT SHA and Design leads to make sure that the GMP will not be exceeded. Then, CMAR Team leaders will look at these proposals to check for any constructability, environmental issues, time impacts or other issues to determine whether or not to proceed with any value-added proposals or concepts.

D. Approach to Cost Estimating | Continued

The same model for tracking risk will be used to track and report innovative savings. CGI will work alongside MDOT SHA and their Designer to collaborate on innovative ideas to save money and time on this critical project. The innovative solutions with the most impact on the project will be to find alternative ways to construct portions of the project, using alternative materials, and reviewing alternative phasing options to save time which leads to saving money.

Mark will provide cost estimates of the alternatives to be evaluated that will include industry standard operating and maintenance costs when appropriate to evaluate life-cycle costs of the alternatives. CGI will develop the OPCC based on the design prepared by the Designer at the completion of any agreed upon milestone. Cost estimates using B2W construction estimating software will be utilized for all estimates.

This method of contract delivery, construction quality and completeness of design will ensure impacts to the schedule and budget will be minimized. CGI will use its experience in working side by side with MDOT SHA and the Designer to analyze costs and review plans for constructability and risks in a collaborative approach.

The CMAR collaborative project delivery method will lead to outstanding team innovations, saving the project money and time and adding value to the project. As part of the estimating process, risk-sharing opportunities should be identified. During the development and evaluation of the OPCC estimates, an important role of the ICE, as we see it, is identifying risk-sharing opportunities and advising the Owner accordingly. The OPCC evaluation period is an important time when, to a good Estimator, project risks become apparent and are discovered. Advising the Owner during the OPCC evaluation process of potential risk-sharing opportunities that are discussed between CGI/ICE/MDOT SHA can drastically lower costs. One example of risk sharing that we have identified is control of groundwater during excavation. Rather than have CGI account for this risk by adding money to its estimate, the MDOT SHA and CGI can agree to an allowance item with an agreed unit price, whereby CGI will be compensated when encountering groundwater and the Owner is not paying for work that may never materialize. Three (3) types of allowance items include:

Fixed Allowance: A fixed allowance establishes the upper limit that MDOT SHA will pay for the corresponding item of work. For example, if there is a fixed allowance for 1,000 linear feet of saw cutting, MDOT SHA will pay the CGI up to 1,000 linear feet of saw cutting above the quantity designated in the GMP Item Schedule for saw cutting.

Open Allowance: An open allowance designates that there is no upper quantity limit for the corresponding item of work. MDOT SHA will pay for all approved quantity increases for each corresponding item in excess of the GMP Item Schedule. For example, if there is an open allowance for geotextile and MDOT SHA directs CGI to place more geotextile than what is shown in the GMP Item Schedule, MDOT SHA will pay CGI for the full amount placed.

Provisional Allowance: A provisional allowance is for alternative work. For example, MDOT SHA has not completed an MOU with a local property owner to replace a chain link right-of-way fence. The quantities are known. The decision hasn't been made whether chain link, wrought iron or wood will be used. The Cost Model will include an item for chain link right-of-way fence but two provisional allowances are set up, one for each type of replacement. Another method would be to use the provisional allowances as a premium per foot for the selected upgrade.

D. Approach to Cost Estimating | Continued

D.2 SAMPLE ESTIMATE















































Cost Detail

| | |
|---|--|
| Project Name: MD4 At Suitland Parkway (2021)- CMAR | Customer: MDOT-State Highway Administration |
| Job Number: 2021-0529 Bid Number: PG6185470 | Billing Address: 7450 Traffic Drive |
| Bid As: General Contractor | Hanover, MD 21076 |
| Estimator: Mark Miller | Phone: 4435725235 |
| Project Address: MD4 At Suitland Parkway, MD | Contact: |
| Completion Date: | |

Pay Items

| Description | Quantity | UM | Unit Direct Cost | Total Direct Cost |
|---|-------------------|-----------|------------------|------------------------|
| D 2006 - 201030 - CLASS 1 EXCAVATION | 605,386.00 | CY | \$24.17 | \$14,631,256.92 |
| D C1 Excavation | 605,386.00 | CY | \$18.66 | \$11,294,376.92 |
| D C1 Exc -Backhoe Crew Cut-Fill | 109,068.00 | CY | \$20.62 | \$2,249,058.32 |
| C1 Exc -Backhoe Crew C-F (400.00 CY/DY, 272.67 DY) | 109,068.00 | CY | \$16.01 | \$1,745,862.19 |
| Pickup | 2,181.36 | HR | \$23.65 | \$51,589.16 |
| Backhoe - Track Cat235 | 2,181.36 | HR | \$186.53 | \$406,889.08 |
| Dozer - D3-D5 | 2,181.36 | HR | \$87.86 | \$191,654.29 |
| Loader - Track 953/963 | 2,181.36 | HR | \$121.35 | \$264,708.04 |
| Roller Ingersall | 2,181.36 | HR | \$55.68 | \$121,458.12 |
| Backhoe/Exc Operator | 2,181.36 | HR | \$54.34 | \$118,545.88 |
| Foreman | 272.67 | DY | \$640.00 | \$174,507.82 |
| Laborer | 2,181.36 | HR | \$32.11 | \$70,043.70 |
| Roller Operator | 2,181.36 | HR | \$50.14 | \$109,374.35 |
| Dozer Operator | 2,181.36 | HR | \$54.34 | \$118,545.88 |
| Loader Operator | 2,181.36 | HR | \$54.34 | \$118,545.88 |
| Trucking (272.67 DY, 2.00 Trucks, 50.00 CY/HR) | 109,068.00 | CY | \$4.61 | \$503,196.12 |
| D C1 Exc -Backhoe-Mass Crew C-F | 110,318.00 | CY | \$11.84 | \$1,306,675.05 |
| C1 Exc -Backhoe-Mass Crew C-F (1,000.00 CY/DY, 110.32 DY) | 110,318.00 | CY | \$7.23 | \$797,711.93 |
| Pickup | 882.54 | HR | \$23.65 | \$20,872.17 |
| Backhoe - Track Cat235 | 882.54 | HR | \$186.53 | \$164,620.93 |
| Dozer - D3-D5 | 882.54 | HR | \$87.86 | \$77,540.32 |
| Loader - Track 953/963 | 882.54 | HR | \$121.35 | \$107,096.71 |
| Roller Ingersall | 882.54 | HR | \$55.68 | \$49,140.05 |
| Foreman | 110.32 | DY | \$640.00 | \$70,603.12 |
| Backhoe/Exc Operator | 882.54 | HR | \$54.34 | \$47,961.80 |
| Dozer Operator | 882.54 | HR | \$54.34 | \$47,961.80 |
| Loader Operator | 882.54 | HR | \$54.34 | \$47,961.80 |
| Roller Operator | 882.54 | HR | \$50.14 | \$44,251.14 |
| Truck Driver [3] | 882.54 | HR | \$34.51 | \$91,363.50 |

D. Approach to Cost Estimating | Continued

| Description | Quantity | UM | Unit Direct Cost | Total Direct Cost |
|--|------------|------|------------------|-------------------|
|  Laborer | 882.54 | HR | \$32.11 | \$28,338.58 |
|  Trucking (183.86 DY, 3.00 Trucks, 75.00 CY/HR) | 110,318.00 | CY | \$4.61 | \$508,963.12 |
|  CI1 Exc - Gradall Crew Cut-Waste | 4,844.00 | CY | \$37.72 | \$182,717.11 |
|  CI1 Exc - Gradall Crew Cut-Waste (150.00 CY/DY, 32.29 DY) | 4,844.00 | CY | \$26.19 | \$126,846.41 |
|  Pickup | 258.35 | HR | \$23.65 | \$6,109.90 |
|  Gradall | 258.35 | HR | \$161.55 | \$41,735.90 |
|  Roller Ingersall | 258.35 | HR | \$55.68 | \$14,384.74 |
|  Foreman | 32.29 | DY | \$640.00 | \$20,667.62 |
|  Gradall Operator | 258.35 | HR | \$55.75 | \$14,403.56 |
|  Laborer [2] | 258.35 | HR | \$32.11 | \$16,591.08 |
|  Roller Operator | 258.35 | HR | \$50.14 | \$12,953.62 |
|  Trucking (32.29 DY, 1.88 Trucks, 18.75 CY/HR) | 4,844.00 | CY | \$11.53 | \$55,870.70 |
|  CI1 Exc -Backhoe Crew C-W | 13,628.00 | CY | \$27.54 | \$375,330.09 |
|  CI1 Exc -Backhoe Crew C-W (400.00 CY/DY, 34.07 DY) | 13,628.00 | CY | \$16.01 | \$218,144.74 |
|  Pickup | 272.56 | HR | \$23.65 | \$6,446.04 |
|  Backhoe - Track Cat235 | 272.56 | HR | \$186.53 | \$50,840.62 |
|  Dozer - D3-D5 | 272.56 | HR | \$87.86 | \$23,947.12 |
|  Loader - Track 953/963 | 272.56 | HR | \$121.35 | \$33,075.16 |
|  Roller Ingersall | 272.56 | HR | \$55.68 | \$15,176.14 |
|  Foreman | 34.07 | DY | \$640.00 | \$21,804.68 |
|  Backhoe/Exc Operator | 272.56 | HR | \$54.34 | \$14,812.26 |
|  Laborer | 272.56 | HR | \$32.11 | \$8,751.93 |
|  Roller Operator | 272.56 | HR | \$50.14 | \$13,666.28 |
|  Dozer Operator | 272.56 | HR | \$54.34 | \$14,812.26 |
|  Loader Operator | 272.56 | HR | \$54.34 | \$14,812.26 |
|  Trucking (34.07 DY, 5.00 Trucks, 50.00 CY/HR) | 13,628.00 | CY | \$11.53 | \$157,185.35 |
|  CI1 Exc -Backhoe-Mass Crew C-W | 367,528.00 | CY | \$19.54 | \$7,180,596.36 |
|  CI1 Exc -Backhoe-Mass Crew C-W (800.00 CY/DY, 459.41 DY) | 367,528.00 | CY | \$8.00 | \$2,941,528.40 |
|  Pickup | 3,675.28 | HR | \$23.65 | \$86,920.37 |
|  Backhoe - Track Cat235 | 3,675.28 | HR | \$186.53 | \$685,549.98 |
|  Dozer - D3-D5 | 3,675.28 | HR | \$87.86 | \$322,910.10 |
|  Loader - Track 953/963 | 3,675.28 | HR | \$121.35 | \$445,995.23 |
|  Roller Ingersall | 3,675.28 | HR | \$55.68 | \$204,639.59 |
|  Foreman | 459.41 | DY | \$640.00 | \$294,020.74 |
|  Backhoe/Exc Operator | 3,675.28 | HR | \$54.34 | \$199,732.87 |
|  Laborer | 3,675.28 | HR | \$32.11 | \$118,013.62 |
|  Roller Operator | 3,675.28 | HR | \$50.14 | \$184,280.16 |
|  Dozer Operator | 3,675.28 | HR | \$54.34 | \$199,732.87 |
|  Loader Operator | 3,675.28 | HR | \$54.34 | \$199,732.87 |
|  Trucking (459.41 DY, 10.00 Trucks, 100.00 CY/HR) | 367,528.00 | CY | \$11.53 | \$4,239,067.95 |
|  Dump Fees - Earthwork Only | 356,000.00 | CY | \$8.48 | \$3,018,880.00 |
|  Dump Fee - Soil - Dry (ReAgg LLC) | 356,000.00 | CY | \$8.48 | \$3,018,880.00 |
|  Dump Fees - HMA/Concrete Only | 30,000.00 | CY | \$10.60 | \$318,000.00 |
|  Dump Fee - Concrete/HMA (Load) (ReAgg LLC) | 3,750.00 | LOAD | \$84.80 | \$318,000.00 |

D. Approach to Cost Estimating | Continued

| Direct Cost Totals | | |
|-----------------------------|-----------------|------------------------|
| | Amount | Percent of Direct Cost |
| Labor: | \$2,436,793.91 | 16.65% |
| Equipment Owned: | \$3,393,299.77 | 23.19% |
| Equipment Rented: | \$0.00 | 0.00% |
| Materials Owned: | \$0.00 | 0.00% |
| Materials Purchased: | \$3,336,880.00 | 22.81% |
| Subcontracted: | \$0.00 | 0.00% |
| Trucking Owned: | \$5,464,283.25 | 37.35% |
| Trucking Hired: | \$0.00 | 0.00% |
| Miscellaneous: | \$0.00 | 0.00% |
| Plug: | \$0.00 | 0.00% |
| Direct Cost: | \$14,631,256.92 | |

| Pay Item Summary | | |
|-----------------------------|-----------------|----------------------|
| | Amount | Percent of Bid Price |
| Total Direct Cost: | \$14,631,256.92 | 99.75% |
| Total DC Adds/Cuts: | \$0.00 | 0.00% |
| Total Indirect Cost: | \$36,578.14 | 0.25% |
| Total Bond: | \$0.00 | 0.00% |
| Total Overall Cost: | \$14,667,835.07 | 100.00% |
| Total Overhead: | \$0.00 | 0.00% |
| Total Profit: | \$667.71 | 0.00% |
| Total Margin: | \$667.71 | 0.00% |
| Total Bid Price: | \$14,668,502.78 | |

** FIXED PERCENT OF COST FOR SMALL TOOLS & SUPPLIES

D. Approach to Cost Estimating | Continued



Cost Detail

| | |
|---|--|
| Project Name: MD4 At Suitland Parkway (2021)- CMAR | Customer: MDOT-State Highway Administration |
| Job Number: 2021-0529 Bid Number: PG6185470 | Billing Address: 7450 Traffic Drive |
| Bid As: General Contractor | Hanover, MD 21076 |
| Estimator: Mark Miller | Phone: 4435725235 |
| Project Address: MD4 At Suitland Parkway, MD | Contact: |
| Completion Date: | |

Pay Items

| Description | Quantity | UM | Unit Direct Cost | Total Direct Cost |
|---|----------|------|------------------|-------------------|
| D 1020 - 120500 - MAINTENANCE OF TRAFFIC | 1.00 | LS | \$469,165.42 | \$469,165.42 |
| D Traffic Crew | 1.00 | LS | \$469,165.42 | \$469,165.42 |
| D TM & 2 Flag/Driver | 163.00 | UDAY | \$1,657.96 | \$270,247.45 |
| TM & 2 Flag/Driver (1.00 UDAY/DY, 163.00 DY) | 163.00 | UDAY | \$1,657.96 | \$270,247.45 |
| Traffic Manager | 163.00 | DY | \$635.56 | \$103,596.56 |
| Flagger [2] | 1,304.00 | HR | \$31.33 | \$81,721.37 |
| Pickup | 1,304.00 | HR | \$23.65 | \$30,839.60 |
| Flatbed | 1,304.00 | HR | \$41.48 | \$54,089.92 |
| D MOT-Traffic Manager | 150.00 | UDAY | \$824.76 | \$123,714.26 |
| MOT-Traffic Manager (1.00 UDAY/DY, 150.00 DY) | 150.00 | UDAY | \$824.76 | \$123,714.26 |
| Traffic Manager | 150.00 | DY | \$635.56 | \$95,334.26 |
| Pickup | 1,200.00 | HR | \$23.65 | \$28,380.00 |
| D 2 Flaggers | 150.00 | UDAY | \$501.36 | \$75,203.71 |
| MOT-Flaggers 2ea (1.00 UDAY/DY, 150.00 DY) | 150.00 | UDAY | \$501.36 | \$75,203.71 |
| Flagger [2] | 1,200.00 | HR | \$31.33 | \$75,203.71 |

Direct Cost Totals

| | Amount | Percent of Direct Cost |
|-----------------------------|--------------|------------------------|
| Labor: | \$355,855.90 | 75.85% |
| Equipment Owned: | \$113,309.52 | 24.15% |
| Equipment Rented: | \$0.00 | 0.00% |
| Materials Owned: | \$0.00 | 0.00% |
| Materials Purchased: | \$0.00 | 0.00% |
| Subcontracted: | \$0.00 | 0.00% |
| Trucking Owned: | \$0.00 | 0.00% |
| Trucking Hired: | \$0.00 | 0.00% |
| Miscellaneous: | \$0.00 | 0.00% |
| Plug: | \$0.00 | 0.00% |
| Direct Cost: | \$469,165.42 | |

D. Approach to Cost Estimating | Continued

| Pay Item Summary | | |
|----------------------------|---------------------|----------------------|
| | Amount | Percent of Bid Price |
| Total Direct Cost: | \$469,165.42 | 99.50% |
| Total DC Adds/Cuts: | \$0.00 | 0.00% |
| Total Indirect Cost: | \$2,345.83 | 0.50% |
| Total Bond: | \$0.00 | 0.00% |
| Total Overall Cost: | \$471,511.25 | 100.00% |
| Total Overhead: | \$0.00 | 0.00% |
| Total Profit: | \$0.00 | 0.00% |
| Total Margin: | \$0.00 | 0.00% |
| Total Bid Price: | \$471,511.25 | |

* Fixed Percent of Cost for Small Tools and Supplies

D.3 CONTRACTING PLAN

Time is Money – CGI has repeatedly demonstrated our ability to deliver projects not only on time, but often before the scheduled completion date. We accomplish this by partnering with all stakeholders to identify critical paths with input from key subcontractors, and by self-performing many major components of the work, allowing better control of project scheduling and overall progress. CGI will self-perform at least 50% of the work on this project consisting of, but not limited to, any combination of the following: maintenance of traffic, stakeout, excavation and grading, storm drainage and structures, culvert extension, environmental protection, patching, temporary and permanent stabilization, subgrade preparation, bridges, retaining walls, noise walls and miscellaneous structures that will be required on this project.

CGI has knowledgeable, experienced personnel and the needed equipment to perform these activities – we have done so on a significant number of MDOT SHA contracts. Recent completed examples include the following contracts: MD 32 Phase 1 Design-Build, MD 478 Bridge in Brunswick, MD 464 Bridge in Point of Rocks, MD 355 Little Bennett Creek Bridge in Hyattstown, MD 180 Roundabout at Mt. Zion Road, and MD 180 Bridge on MD 15 and Jefferson Pike.

The activities that may be subcontracted include erosion and sediment control devices, clearing and grubbing, concrete curbs and sidewalks, landscaping, utility relocations, pavement markings, traffic barrier w beam, asphalt paving, electrical and permanent signs. CGI will solicit subcontractors during the development of the OPCC estimates and GMP development process using its in-house data-based resources and the solicitation notices required by COMAR 21.05.10.05. During the OPCC, we will primarily be notifying subcontractors of upcoming opportunities for early work and for possible input during preconstruction if it is felt that their expertise will be beneficial to providing the best design and finished product possible. At a minimum, CGI will seek at least three (3) quotes for the different scopes of work to assure competitive quotes are received. CGI will review the quotes for the firm’s completeness of scope, capability, experience and work history. In addition, we are known for awarding the work to a subcontractor if they give us a low price at bid time. If a qualified subcontractor helps us to keep the price low, then they get the work. This reputation has assured us that competitive quotes from quality subcontractors are received. CGI also has a reputation for paying their bills on time without delays, which benefits us with a large selection of quality subcontractors to pull from. CGI will identify critical subcontractors to engage with during the MD 4 project to ensure that pricing is based on the actual site conditions and project needs and not average bid history. CGI has a history of bringing key subcontractors in early in their alternative delivery projects such as W.F. Wilson for the 16” waterline relocation on the MD 210 Livingston Road/Kerby Hill Road Interchange Design-Build project and

D. Approach to Cost Estimating | Continued

Terre Hill Concrete Products during bidding for the critical path precast box culverts for the MD 32 From MD 108 to North of Linden Church Road Design-Build project.

The team understands the importance of meeting the contract Disadvantaged Business Enterprise (DBE) participation goals and will work to achieve all DBE goals for subcontracting and work force development. We have a successful history of meeting and exceeding project goals. We recognize that the true purpose of the DBE program is not merely to meet goals, but ultimately to increase and cultivate business opportunities for the DBE contracting community. Mark will also work with MDOT SHA to help determine, develop and document a contracting plan to meet DBE contract goals on all construction phases including compliance with COMAR 21.05.10.05, including sending notice to the Governor's Office of Small, Minority & Women Business Affairs and publishing the notice in a newspaper of general circulation near the project and on Internet media at least 14 days before trade proposals are due. It is the policy of CGI to ensure that DBE firms have an equal opportunity to receive and participate in our projects. We work with DBE contractors to support them to address concerns and issues. Specific process and programs that we have effectively utilized on other projects which will be applied on this Project to ensure appropriate DBE involvement include:

1. Advertising to solicit DBE participation and raise awareness
2. Establish DBE business plan room
3. Pre-identify DBE bid packages
4. Provide for economically feasible DBE bid packages
5. Payment alternatives

CGI will utilize the services and resources of public and private entities to solicit interested DBE firms, incl.:

1. Maryland Minority Business Enterprises Program
2. MDOT MBE/DBE Directory
3. Existing company source lists

Also, CGI maintains a portal on our website – www.concretegeneral.com – where prospective subcontractors can request access to see what projects CGI is bidding on. Currently, over 100 DBE firms have requested and have access to this site.

CGI will search the MDOT Office of Minority Business Enterprise site for the directory of certified DBE firms that can perform work applicable to this project. We will send faxes to all appropriate firms with mail follow-up for faxes that do not go through. The bid request faxed to the DBE firms asks them to fax the form back to us indicating whether or not they are interested in bidding on the project, and gives them the company phone number as well as directing them to www.concretegeneral.com. For those firms who cannot download the appropriate information, we prepare copies and mail it to them. If any firm needs assistance, we either provide guidance over the phone or meet with them in person.

Mark is responsible for seeking out DBEs, assisting them in the bidding process and selecting them for inclusion in our bid. After the award of the bid, Mark prepares a subcontractor and supplier list by work item for use by the Construction Manager in order to ensure that the work contained in the Affirmative Action Plan is performed by the listed DBE firm. Christina Kline is the company EEO Officer and is responsible for monitoring the progress of the Affirmative Action Plan and ensuring compliance with the plan. She monitors the monthly billings by the DBE firms and works with Mark to seek out new firms if a DBE does not perform or if changes in the work cause a reduction in a DBE subcontract. Mark and Chrissey develop and implement policies to enable minority business and women to be considered fairly and equally in respect to consultation, personal services or supply services that CGI is in need of. CGI consistently finishes projects with higher DBE participation than is listed in the Affirmative Action Plan.

CGI has been involved with many minority outreach events with associations in the local area to seek services of minority firms to solidify relationships with and work along with them on contracting opportunities. CGI will achieve or exceed the DBE goal on this project.