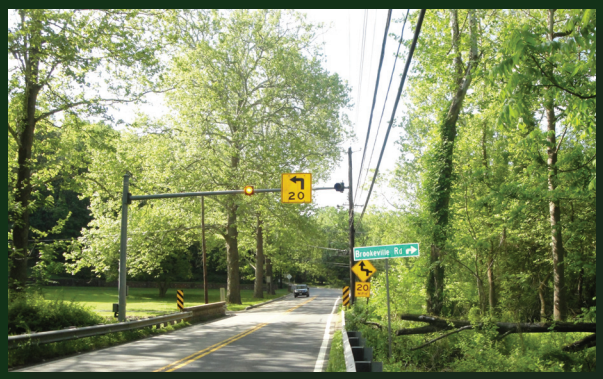
June 3, 2015

MD 97 - South of Brookeville to North of Brookeville
Montgomery County, Maryland

Contract No. MO7465171



Technical Proposal

Brookeville

CORMAN CONSTRUCTION

Prepared by:

CORMAN CONSTRUCTION

Original
Container 1 of 10

MD 97 - South of Brookeville to North of Brookeville
Contract No. MO7465171 - **Technical Proposal**

State Highway Administration
Maryland Department of Transportation

B. Project Management Team / Capability of the Proposer

CORMAN CONSTRUCTION

B. PROJECT MANAGEMENT TEAM / CAPABILITY OF THE PROPOSER

1. Project Management Team

Key to success of any project is the staff assigned—their experience in the anticipated work, their ability to work collectively, communicate, problem solve, and the drive toward high-quality performance. Construction Management, like Design Build, thrives when the project team (Owner / Contractor / Designer) share these attributes. Corman understands this and will assign our most senior and experienced staff with a history of effectively communicating and delivering quality projects on time and on budget on past Maryland State Highway Administration (MSHA) projects. These same individuals worked with you and your Designer on MSHA's first CMAR project on MD 24 at Deer Creek where collaboration and teamwork excelled. Their functional responsibilities are described on page 7. Corman Construction, Inc, as the Prime Contractor, will be the contracting entity and will work jointly with the Designer and MSHA. Key functions by Corman preconstruction include: Project management, pricing, constructability reviews, value engineering, cost estimating, and schedule preperation of designs prepared by others. Active participation in the utility process and public outreach and stakeholder coordination will also be performed by Corman staff. Once construction starts, Corman will act in the traditional role of the contractor responsible for all contractual items to include: management, Part1 General Provisions requirements, material purchasing, survey / stake out, clearing and E&S control installation / mauintenance, grading for and placement of all specified contract items, Maintenance of Traffic (MOT), site safety for workers and the general public that may be near or on the site, and Quality Control of its work. Depending upon the actual scope of work, Corman may also obtain construction-related permits. Another key to project success will be partnering and coordination with MSHA, Designer and major stakeholders, including Maryland-National Capital Park and Planning Commission (M-NCPPC) and state and local historic committees, local authorities (Town Commission, and County School, EMS, Police and Fire responders) and permitting agencies.

Corman has asked ***Chesapeake Environmental Management (CEM)*** to join our team for the preconstruction and construction portions of the project. CEM is a full-service WBE environmental consulting firm serving commercial and governmental entities throughout the mid-atlantic region. They solve client environmental challenges by carefully considering the complex inter-relationships of the environmental sciences including: geology, hydrology, ecology, geomorphology, geography, and engineering. Their past projects have required extensive interactions with the same agencies anticipated on the MD 97 project, including: USACE, US FWS, US EPA, MD DNR, SHPO, MSHA, and MDE. Their key staff has a history of working with Corman on projects, such as Hampstead Bypass, ICCs A and B, and I-70 Phase 2D. For this project, we envision CEM being involved during preconstruction and construction where their expertise will prove invaluable in assisting in our Value Engineering and scheduling, as well as confirming all anticipated permits have been accounted for. During construction, we envision CEM providing an Environmental Compliance Monitor to ensure compliance. CEM teamed with MSHA, JMT, and Corman on the recent successful MD 24 Deer Creek CMAR project. The same individuals that work closely together on that project will again form a collaborative team on this new project *—there will be no learning curve to get to know each other—their strengths and our abilities.*

Positioning Key Staff to Meet the Project Goals, Including Building a Professional and Collaborative Project Team and Partnering with the MSHA and Designer in the Project Development: Prior to the start of any preconstruction efforts, the Corman Team will join forces with the MSHA and Designer in a collaborative Scoping/Partnering workshop to understand what has been completed so far, what the constraints are, stakeholder concerns, key project goals that need to be stressed, schedule, and proposed working relationships. We will participate in outreach meetings with MSHA and the Design Team with the key stakeholders to include local officials, utilities, M-NCPPC officials, local and state historic commissions, permit reviewers, school transportation departments and EMS responders to clearly understand their concerns and answer any questions about schedules, construction phasing and methods.

After reviewing designs and environmental documents prepared to-date, reading stakeholder and/or design team meeting minutes, attending the above-mentioned partnering / stakeholder meetings, we would conduct a Designer / MSHA / Contractor workshop to evaluate project risks and any value engineering opportunities available. Value Engineering will follow the procedures outlined in the most recent FHWA circular modified for the size and complexity of the MD 97 project with the value engineering study geared to ensure economical compliance with the five (5) key project goals listed in the RFP. The formal Value Engineering Workshop can be facilitated by Lou Robbins P.E. of Corman Construction, who has the 40 hr FHWA Value Engineering

Certificate and has also taken the FHWA two day course on effective Context Sensitive Solutions (CSS). Corman will continuously investigate and evaluate, with MSHA and its Designers, any opportunities to incorporate CSS into the design. Simple examples that could have a major impact on the new roadway "fitting in" to the historic and rural village setting are stone facades on the bridge, abutments, piers and parapet walls, or special pavers in the inner radius of the roundabouts. Flattening the side slopes, using stone faced retaining walls, and designing the landscaping to blend into the surrounding area would also be advantageous to gain agency and community acceptance. Working closely with the three person Town Commission will be critical to the project's success. MD 97 (Georgia Avenue), which begins in Washington D.C., is a two lane road when it passes through the Town of Brookeville, with a stop sign and tight turn that takes it through the historic district. In 1989, the road carried 8,000 vehicles daily, a number that had increased to 18,000 vehicles each weekday in 2007. The traffic mainly consists of commuters from Carroll and Howard Counties. The traffic volume on Georgia Avenue is more than the road was designed to handle. Brookeville residents have advocated for a bypass road to be constructed to take traffic around the town. The bypass road around the town has been in the planning stages for some time, since being recommended by county planning officials in 1966. This project is sorely needed and anticipated by the Town's residents, however, care needs to be taken to protect the historic nature of the town which served as our nation's capital during the War of 1812.

Due to the historic and environmentally sensitive nature of the area—the majority of the ROW will come from M-NCPPC property—there are many stakeholders who will be tracking the progress of this visible and important project. Therefore, it is critical that we collaboratively work with our partners (MSHA, Designer, impacted County and M-NCPPC authorities, Town Commission, historic environmental, and regulatory agencies) to ensure project success. They will be kept informed and invited to meetings during both preconstruction and construction. Preconstruction Corman Management Staff will be available to meet with impacted stakeholders, the MSHA, and/or Designer to offer contractor perspectives.

During construction, any issues that could impact the local community, M-NCPPC historic features, or the traveling public will be shared with the Owner as soon as the Corman Team becomes aware of its existence, and decisions will be jointly made regarding how best to react.

The following is how Corman will effectively work with MSHA and the many stakeholders:

1. As mentioned, immediately after the Notice-to-Proceed (NTP), hold the Kick-off workshop meeting with MSHA and its Designer, stakeholders and agencies;
2. Hold daily informal meetings between our Construction Manager (CM) and MSHA on-site representative to discuss daily and upcoming issues, such as future temporary lane closures, additional signing required, working within the streams or returning a local resident's phone call.
3. Produce tracking sheets for:
   - Utility relocations;
   - Construction progress;
   - Environmental commitments / permits;
   - Review / approval status of design element submittals
   - Material approvals
   - RFI logs
   - Shop drawings
   - Field changes
3. Share construction QC non-conformance logs regularly with MSHA representatives;
4. Hold bi-weekly Progress meetings at the project field office during construction and invite appropriate stakeholders;
5. Hold regular (monthly) Progress / Partnering meetings with the major stakeholders, including MSHA, M-NCPPC, Town Commission, historic committees, Designer, utilities, permit agencies, and major subcontractors / vendors as appropriate for the work being performed.

Along with the Designer, we will coordinate with permitting agencies, State Historic Preservation Office (SHPO), and utilities early and aggressively manage the processes to stay on schedule. The key is assigning dedicated Permit and Utility Coordinators to assist MSHA in completing applications expeditiously, address review comments immediately, and schedule field efforts effectively. Danielle Litardo is our Utility Coordinator and CEM's Matt Wiherle, Environmental Permitting Coordinator, will assist MSHA in the permitting efforts working closely with the MSHA's Design Permit Coordinator. They will band together to see that utility and permitting tracking matrices are updated and any delays or conflicts are quickly resolved. We recognize the historic sensitive nature of this project and will work to expedite these critical path elements. Matt will work closely with the MSHA's design team to:

- Assist MSHA in Contacting each permitting agency to confirm understanding of the permit requirements and procedures to obtain the permit for our roadway, wetland and stream work, as well as those required by the utility companies;
- Explore methods to avoid or mitigate impacts to historic resources. (The Brookeville Historic District including the Newill/Down Mill complex was placed on the National Register of Historic Places in 1979);
- Develop a Permit Tracking Database that individually lists the activities required to submit and the time considerations of each activity / review;
- Review the Permit / Environmental Commitment Tracking Database weekly with the Project Manager;
- Pay special attention to permits that are on the project's critical path;
- Identify potential roadblocks or delays in obtaining permits and develop mitigation strategies;
- Review any Time-of-Year Restrictions (TOY) pertaining to working within jurisdictional waters / wetlands or forests;
- Work with regulating agencies to develop strategies and practices limiting the impact of clearing and grading on resources being avoided in the project corridor;
- Coordinate with MSHA regarding any additional project effects outside of the previously defined Area of Potential Effect;
- Continuously review compliance with the permits received;
- Review and coordinate preconstruction, construction, and any post-construction related inspections and submittal of these reports to the necessary agencies.

After NTP, during the Preconstruction phase, Corman will endeavor to form a partnership with MSHA, their Designer, Town Commission, local historic committees, and M-NCPPC authorities to establish lines of communication and discuss specific traffic requirements for the area and any special events that may occur over the course of construction. All MOT will be coordinated with the local authorities.

During construction, the Corman Team will have weekly Operations Meetings to generate a three week look-ahead work schedule which will include any MOT changes or potential road/lane closures that will affect the towns residents and commuters. This schedule will be distributed to the interested third parties. Stakeholders will be notified two weeks in advance of the initial MOT installation or any major MOT traffic switches. In addition, we will notify the traveling pubic of major traffic changes or lane closures through message boards. In the event of a traffic emergency, local emergency responders will be notified immediately in accordance with our Emergency Response Plan submitted after NTP.

Corman's Safety Programs and Initiatives: We will implement preventative measures to keep the community and every employee safe and healthy, such as orange construction fencing and signing on adjacent hiking trails notifying the public of the dangers. Other measures will include:

- Motorist safety measures, such as daily review of signs, barrels, VMS etc. to ensure applicability for current conditions will be incorporated into all maintenance of traffic alternatives and detours.
- Since this is an active M-NCPPC park area, we will pay close attention to safely separate recreational users from the work areas.
- Worker safety is held in high regard. All work will require a detailed work plan and job hazard analysis for each definable task. There will be Daily Huddles at the start of shift to facilitate communication between the Foreman and the crew and review the upcoming day's activities, safety and quality.

FORM A-1 – Key Staff Information

Name of Proposer: **Corman Construction, Inc.**

Position	Name	Years of Experience[1]	Education/ Registrations	Name of Employer
Project Manager	Jo Ellen Sines, DBIA	35 / 36	BS, Civil Engineering, DBIA, MD/SHA Erosion & Sediment Control Yellow Card	Corman Construction
Construction Manager	Jeff Walton	14 / 30	MD/SHA Erosion & Sediment Control Yellow Card	Corman Construction
Cost Estimator	David Gates	9 / 29	BS, Civil Engineering MDE Green Card	Corman Construction

[1]Present Firm / Total

2. Key Staff

Jo Ellen Sines, DBIA - Project Manager

Years with Corman: *35* **Total Years:** *36*	**Active Registrations/Certifications/Training**: *DBIA #D651;MD/SHA Erosion & Sediment Control Yellow Card #04-008; MDE Green Card #28597; Guidelines for OSHA Site Inspection; Environmental Compliance Awarness Training;SHA MOT*
Education: *BS, Civil Engineering, University of Pittsburgh*	
Commitment & Time Availability For This Project: *Precon. 30% / Const. 30%*	

Jo Ellen served as a Field Engineer, Estimator, Project Engineer, Project Manager, Operations Manager, and Design-Build Project Manager with Corman. Today, as **Vice President of Project Development,** she manages roadway/highway, bridge and utility construction, cost control, schedule compliance (integrating design and construction), procurement, corporate resources, and completes projects on schedule and on budget. She is an advocate for partnering initiatives with Maryland State Highway Administration (MSHA). She has 35 years of experience on MSHA projects, including Project Manager on the following local DB projects (all with large Environmental Components and close coordination required with Designers during design phase: Hampstead Bypass, TMDL SWM Enhancement in AA County, CMAR MD 24 / Deer Creek, and MD 216 US 29 to I 95.

RELEVANT PROJECT EXPERIENCE

Dec. 2013-April 2015 Construction Management At-Risk MD 24, Sections A & G, Harford County, MD-$5.1M-MSHA As **Project Manager**, Jo Ellen led all aspects of the CMAR process from procurement to closeout. This involved developing the technical proposal, design development, constructability reviews, cost estimating, OPCC reviews, partnering with the agencies and stakeholders, and oversight of construction from start-up to close-out. During construction she managed the project team, equipment and material procurement, objectives and goals, work plans, budgets and resources, subcontractor coordination, scheduling, progress meetings, minimizing exposures and risks, mitigating issues, RFIs, change orders, contract administration, safety and quality compliance. .

Jan. 2006-Nov. 2011 Design-Build Intercounty Connector Contracts A & B, Montgomery County, MD-$1.1B-MSHA As **VP of Project Development,** Jo Ellen steered the project team during preconstruction and procurement by assembling a qualified and experienced team. She was instrumental in forming the environmental team and developing the environmental stewardship program. Jo Ellen provided management oversight and partnering, supervised project staffing, quality control program development, and joint venture monthly/quarterly reviews. ICC-A and B consisted of 14.3 miles controlled-access tri-lane divided highway with bridges and bridge widening. ICC-A included in-stream work**.**. ICC-B is the most environmentally-sensitive corridor with bridges spanning over streams, wetlands and 100-year floodplains.Two Northwest Branch tributaries were relocated/restored.

2006-2009 MD 30 Hampstead Bypass Design-Build (Best Value), Hampstead, MD-$41M-MSHA. As **Design-Build Project Manager,** Jo Ellen integrated the job team, participated in plan and schedule development, oversaw construction and PM Team, led team in environmental stewardship program, and managed partnering. She developed/ coordinated/ reviewed designs with design / permitting partner, collaborated with Designer and project management team on innovative solutions, phasing and design deliverable schedule. Hampstead Bypass is uniquely similar to this new Brookeville Bypass skirting around a central town center thru greenfield with environmental sensitive areas and a new roundabout at each tie-in point. Project included 4.5 mile new 2 lane road including asphalt roadway with 8 cross culverts, 4 bridges, 2 noise walls, storm drainage, roundabout lighting, 900,000 cy of excavation including 236,000 cy of rock, utility relocations, 3 roundabouts, and 13 new SWM ponds. Project included a bog turtle habitat requiring special design accommodations. There were 22 design packages in all. Partnering project with "A" ratings in MOT, environmental and contractor performance.

Jeff Walton - Construction Manager

Years with Corman: *14* **Total Years:** *30*	**Active Registrations/Certifications/Training**: *MD/SHA Erosion & Sediment Control Yellow Card #10-270; MDE Green Card #17768 ; Environmental Compliance Awareness Training; OSHA 10-Hour CPR; First Aid; MD Temporary Traffic Control Manager; Guidelines for OSHA Site Inspection;*
Education: *N/A*	
Commitment & Time Availability For This Project: *Precon. 10% / Const. 100%*	

Designated projects presented opportunities where Jeff excels in stream restorations/relocations, permitting, environmental stewardship, community outreach/sensitivity, earthwork, underground utility construction, and construction layout. As Corman's **Construction Manager,** Jeff supervises field operations, coordinates labor, equipment, and subcontractors, develops short-term look ahead schedules, participates in CPM schedule reviews, oversees safety and quality control compliance and close out. Jeff is seasoned at the plan review process on design-build projects. His CMAR experience includes the reciently completed MD 24 / Deer Creek project, similar to MD 97 in that it is in a park environment.

RELEVANT PROJECT EXPERIENCE

Dec. 2013-April 2015 Construction Management At-Risk MD 24, Sections A & G, Harford County, MD-$5.1M-MSHA-As **Superintendent/Construction Manager,** Jeff partipcated in the CMAR process from preconstruction NTP to the post construction project closeout. He provided design input, performed constructability reviews, participated in the cost estimating and OPCC reviews, and activity participated in agency partnering meetings. During construction Jeff supervised field operations, coordinated labor, equipment, materials and subcontractors, and developed short and long-term scheduling. He participated in Management quarterly reviews, and was responsible for safety and quality control compliance and project close-out.

April 2007-July 2011, Design-Build Intercounty Connector Contract A, Montgomery County, MD-$478.6M-MSHA-As **E&S Control Construction Manager/Site Superintendent**, Jeff was assigned from start-up to close-out and oversaw E&S controls, participated in discipline task force meetings, reviewed design packages for constructability and sequence of construction. He was responsible for E&S compliance, field changes, and oversaw environmental commitment program compliance for all aspects of the project including the bridges. He temporarily relocated five streams (to build permanent structures) and stream restoration in their permanent locations, while maintaining stream flow. Jeff managed earthwork, drainage construction, and stormwater management and oversaw/coordinated with the adjacent MDTA Maintenance Facility, and assisted the PM in scheduling over 50 utility relocations. ICC-A consisted of 7.2 miles controlled-access tri-lane divided highway with bridges and bridge widenings. Oversaw environmental design for each stream crossing with mitigation to minimize impacts within the ROW. Evaluated opportunities for aquatic/mammal passage and maintained sediment competency of the affected stream reach. The project maintained an average Environmental rating of A for the four years of construction

Sept. 2003-May 2005 Design-Build MD 216 US 29 to I-95, Laurel, MD-$21.1M-MSHA-As **Construction Manager,** Jeff worked with the PM (Jo Ellen Sines) on constructability reviews of design packages and permits. He supervised field operations and coordinated with utility companies, homeowners, communities, and agencies. The job team implemented an *"Environment Stewardship Program"* with MSHA to mitigate impacts in environmentally-sensitive areas. Jeff coordinated with the Independent Environmental Manager and MSHA QA Inspector. He conducted weekly E&S control meetings, inspected controls daily, participated in modifications with MDE. Stream enhancements included 1,032 LF of stream restoration/relocation within Hammond Branch to correct instability, including bank erosion and bed degradation, and improve riparian and instream habitat.

David Gates – Cost Estimator

Years with Corman: *9* **Total Years:** *29*	**Active Registrations/Certifications/Training:** *MDE Green Card; Environmental Compliance Awareness Training*
Education: *BS, Civil Engineering, University of Hartford*	
Commitment & Time Availability For This Project: *Precon. 30% / Const. 10%*	

Progressing from Estimator to Estimating Manager, David leads 11 Corman estimators on highway, bridge, design-build, and utility proposals and bids, including schedules and final pricing. With an emphasis on heavy civil/roadway and environmental, David analyzes drawings/specifications, itemizes components and formulates strategies that gives Corman a competitive edge. His expertise also leads to innovative value engineering, means and methods, and accelerated schedule concepts that result in cost savings for clients and Corman.

RELEVANT COST ESTIMATING EXPERIENCE:

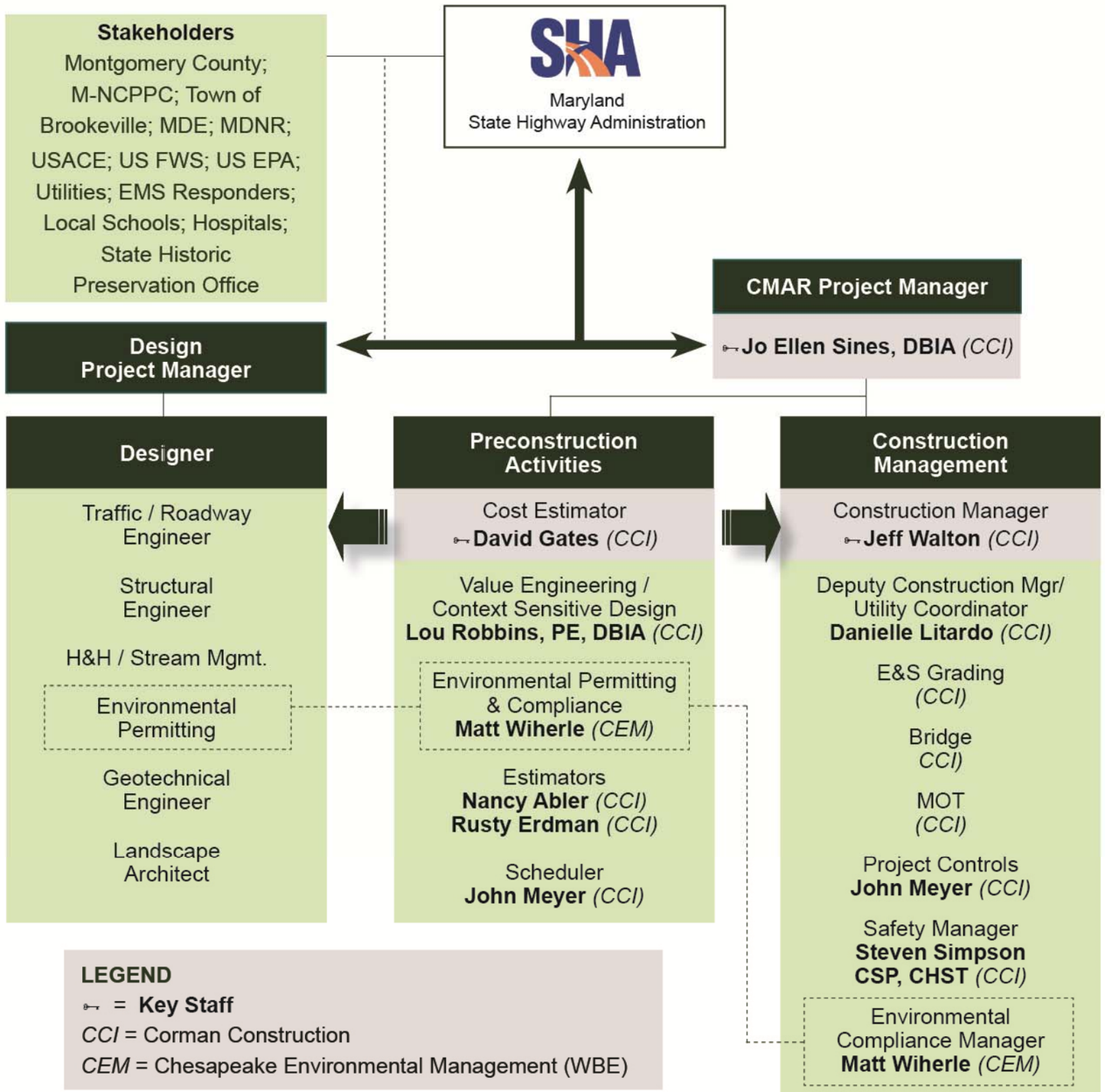
Dec. 2013 April 2015 Construction Management at-Risk (CMAR): MD 24 – Sections A&G, Harford County, MD-$5.5 – MSHA As **Cost Estimator** on the preconstruction team, David met with the Owner, Designer (JMT), and independent cost estimator to develop a constructible, innovative, cost effective, and timely design. He met with stakeholders (local officials, utility companies, Park officials, school transportation officials, and community groups) to incorporate their concerns to protect the environmentally-sensitive Deer Creek River alongside MD 24. As a team member, David assisted the Owner and Designer and, as the design was advanced, with the permitting agencies. He led developing the open-cost model with MSHA's ICE, where they successfully advanced through three progressive cost estimates. David developed the Subcontracting Plan to include DBEs for the construction phase (and exceeded the 16% DBE goal) and participated in risk assessment and mitigation workshops. Through an open-book cost model with MSHA, a Guaranteed Maximum Price (GMP) was prepared and approved, which advanced Corman into the construction phase of the project.

Jan. 2006-2007 Design-Build Intercounty Connector Contract A, Montgomery County, MD-$478.6M-MSHA- 7.2 miles controlled-access tri-lane divided highway with bridges and bridge widenings. Oversaw environmental design for each stream crossing with mitigation to minimize impacts within the ROW. Evaluated opportunities for aquatic/mammal passage and maintained sediment competency of the affected stream reach. For each crossing, there was stream relocation or restoration. Estimating components included excavation, drainage, retaining walls, paving, structural concrete, maintenance of stream flow, dewatering, and maintenance of traffic. As **Cost Estimator,** David estimated the major roadway, MOT and environmental components (including roadway, bridge, and in-stream work) and led the transition from the estimates to the initial design coordination. As an initial **Onsite Roadway Design-Build Coordinator,** David coordinated design and permit approvals for seven (7) mile roadway design segments with design and construction groups, Owner, and MDE to meet fast-track schedules. This onsite experience enables him to clearly understand the impact between permit acquisition, cost, schedule and constructability.

2007-2010 Intercounty Connector Contract B Design-Build, Montgomery County, MD-$558M-MHSA- ICC-B is the most environmentally-sensitive corridor with bridges spanning over streams, wetlands and 100-year floodplains.Two Northwest Branch tributaries were relocated/restored. Estimating components included 13 bridge structures, excavation, drainage, retaining walls, paving, structural concrete, maintenance of stream flow, dewatering, and maintenance of traffic. As **Cost Estimator,** David estimated the major roadway components and led the transition from the estimates to the initial design coordination. Prior to construction, David, as **Lead Onsite Roadway Design-Build Coordinator**, met with the designers to coordinate designs and obtain MDE permit approval for roadway design segments. He met with MDE reviewers regularly keeping designs on course. David continued to work with the designers after permit approvals and coordinated with the construction management team to construct the project, follow sequence of construction, meet the project goals, and adhere to strict environmental requirements.

Successful Contract Awards estimated by David: 2010 I-70, Phase 2D D-B, Frederick, MD-$35.3M-MSHA; 2013 Rte 1 Widening Ft. Belvoir D-B, Ft. Belvoir, VA-$69.3M-FHWA; 2014 Fall Hill Ave D-B, Fredricksburg, VA $30.7M-VDOT; 2014 I-64 Widening D-B, Richmond, VA $33.2M-VDOT; 2015 Div D and Div I DC Water Clean Rivers CSO Concent Decre Washington DC $80M-DC Water.

3. Organizational Chart



FUNCTIONAL ROLES

Jo Ellen Sines, DBIA, will be the CMAR **Project Manager (PM)** and the project team's main point of communication to MSHA. All of Corman's efforts will be under her control starting with preconstruction, through design, construction, and punch out. She will oversee the Construction Manager's preconstruction services (estimating, quantity take offs, utility and permit coordination, value engineering, stakeholder outreach, risk analysis, design coordination and schedule preparation). During construction, Jo Ellen will continue to lead our team managing the Construction Manager, Safety Officer, and Environmental Compliance Manager. Jo Ellen will assist with constructability reviews and safety audits, and oversee the quality management program, purchasing and all construction. She has a head start in this type of project oversight having been the Project Manager on MSHA's first CMAR Project, MD 24 - Deer Creek.

Construction Manager, Jeff Walton reports to the PM. Jeff will manage the on-site construction team, including the engineering and project controls staff, Safety Manager, and field staff. He will be assigned to this project and be on site full-time for the duration of construction. He will play a key role in pre-construction performing constructability reviews for design. He will work with Ms. Sines and Mr. Gates coordinating between the design and construction forces with regard to design, access, material deliveries, equipment placement, utilities, ROW and MOT. Once construction starts, he will focus on ensuring construction is performed safely, and along with our QC engineers, that materials and work are per approved plans, permits and the contract. He will coordinate with the Designers during construction for the proper and timely issuance and review of RFIs and shop drawings, as well as field visits, preparation of as-builts, and plan revisions. Jeff was the Construction Manager on MSHA's first CMAR Project - MD 24 - Deer Creek.

Cost Estimator, David Gates will lead the conceptual estimating utilizing incomplete design plans and permitting activities at the schedule points specified. Having worked onsite on ICC-A and B with Corman's JV Management team, he clearly understands what MDE and other review agencies are likely to request and will include those items early on in his estimates thereby mitigating any surprises later on. David was the Cost Estimator on MSHA's first CMAR Project, MD 24 - Deer Creek.

Environmental Compliance Manager, Matt Wiherle of CEM will lead Environmental Compliance on this extremely environmentally-sensitive project along Reddy and Meadow Branches. During preconstruction, he will coordinate with the designers, owner, and permit agencies to assess the impact of their decisions and offer alternative environmentally-sound solutions to proceed construction with the least disruption to cost / schedule and the environment. During construction, Matt will regularly visit the construction site at key stages to review that environmental conditions in the specifications and permits are followed. CEM provided similar services on MSHA's first CMAR Project, MD 24 - Deer Creek

Value Engineering / Context Sensitive Design, Lou Robbins PE, DBIA of Corman will lead the Value Engineering Workshops. He has completed the Federal Highway Administration (FHWA) 40-Hour Value Engineering workshop and utilized lessons learned when preparing Design-Build proposals and project implementations. Additionally, Lou has completed the two-day FHWA Context Sensitive Design training class. Should Outreach with the Advisory Committee or Park officials be required during preconstruction or construction, Lou will assist Jo Ellen in putting them in place.

Safety Manager, Steven Simpson, CSP, CHST of Corman will report to the PM. Steven will regularly oversee plans and field activities to provide a safe environment for MSHA, construction workers, and the traveling public. He will spearhead the safety training and aid in developing a job-specific safety plan addressing unique hazards that enhance our standard Corman policies, including subcontractor protocols. He will also assess our safety efforts with regard to the hikers, picnickers, canoers and tubers near the project. Steven has the authority to stop work for any safety concern that does not meet our strict safety requirements.

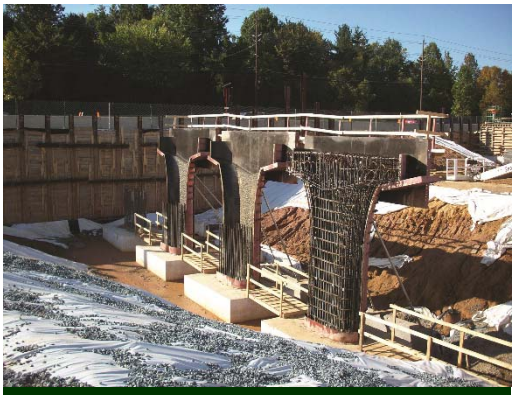
4. Project Team Past Performance

FORM A-2 PAST PROJECT DESCRIPTION

Name of Proposer: Corman Construction, Inc.

Name of Construction Firm: Corman Construction, Inc.
Project Role: Lead Constructor **Contractor:** X **Other (Describe):** _____
Years of Experience: Roads/Streets: 95 **Bridges/Structures:** 95 **Environmental:** 40
Project Name and Location: **Design-Build ICC Contract, A, Montgomery County, MD**
Project Key Staff (as applicable to project)
Project Manager: Jo Ellen Sines, **Construction Manager:** Jeff Walton, **Cost Estimator:** David Gates

Description and Specific Nature of Work for which Firm was responsible and how it is relevant to this contract: 7.2 miles controlled-access tri-lane divided highway with 18 steel girder or precast concrete girder bridges and four bridge widenings on I-370 highlighted by a 625′ deck-over structure, a "Signature" Arch Bridge spanning Rock Creek, and a "Gateway" Bridge at the MD 97 Interchange. Ramps were constructed to tie in a heavily-travelled thoroughfare to existing local roads. Motorists enter and exit through three interchanges: I-370/MD 355 (Frederick Avenue); I-370 Shady Grove Road and the access road to the Shady Grove Metro Station; and I-370/MD 97 (Georgia Avenue).



MD 97 Interchange , bridge piers

The environmental sensitivity of this project is unprecedented as it traverses through Rock Creek Regional Park, protected wetlands and watersheds, specimen forests, streams and cultural and socio-economic resources. There was 2.5 million CY earthwork, 400,000 SF sound walls, box culverts, CONSPAN precast arches, fencing, guardrails, stormwater management/ drainage systems, concrete flatwork, landscaping/ roadside development, building demolition, 130,000 SF retaining and MSE walls (mechanically-anchored retaining walls), 630,000 SY HMA pavement, lighting/signalization, overhead and cantilever signs, Electronic Toll Collection (ETC) facilities, Intelligent Transportation Systems (ITS), utility relocations, maintenance of traffic, quality control, and community outreach to approximately 10,000 residents surrounding the corridor. Our team community/public outreach manager did such a great job, that the client decided to use our services for community issues/concerns meetings, and all other community needs. There are caissons and shafts for sound wall posts and pole foundations.

Major utility relocations were completed at 106 locations, including water, sewer, power/electrical, cable lines, and fiber optic, both underground and overhead. Many relocations involved elaborate, complex and extensive piping design, coordination, and construction. Complexities included working around stringent MOT time limits for lane closures and coordinating with many utility owners in highly-congested areas.With requirements and major incentives to avoid and minimize impacts to forest, wetlands, and waterways, over 35 acres of forest, over 1,000 LF of stream, five acres of parkland were saved and a great deal of stream channel and wetlands were restored. *Project finished with a 92% "A" rating for environmental compliance and averaged "A" Ratings for erosion & sediment control.*

- As Erosion & Sediment Control Construction Manager / Site Superintendent**, Jeff Walton** was assigned from start up to close out and oversaw erosion & sediment (E&S) controls, participated in discipline task force meetings, reviewed design packages for constructability, including complex multi-phased drainage and MDE designs and their integration with environmental compliance, and sequence of construction.

-As Chief Cost Estimator, **David Gates** estimated the major roadway, MOT, and environmental components and led the transition from the estimates to the initial design coordination. As an initial Onsite Roadway Design-Build Coordinator, David coordinated design and permit approvals for roadway design segments with design and construction groups, Owner, and MDE to meet fast-track schedules.

List any awards and/or commendations received for the project: 2012 AGC of America Alliant Build America Award –Design-Build Highway & Transportation; 2011 ENR Best Project 2011 –Transportation (NE Division); 2010 EFCO Safety Award; 2009 Granite Division Safety Award
Name of Client (Owner/Agency, Contractor, etc.): MSHA
Address: 707 N. Calvert Street, Baltimore, MD 21202
Contact Name: Mark Coblentz **Telephone:** 301-586-9267
Owner's Project or Contract No.: AT3765960 **Fax No.:** 301-586-9222
Contract Value (US $): $463,885,499 **Final Value (US $):** $483,409,033 *(increase due to changes in scope, price adjustments, and incentive payments)*
Percent of Total Work Performed by Company: 53% (As part of the JV / 47% subcontracted)
Commencement Date: 9/1/07 **Original Completion Date As Defined in IFB:** 8/1/10
Actual Completion Date: 2/22/11 *(completed on time with Owner granted time extensions)*
Any disputes taken to arbitration or litigation? Yes ☐ No ☒

FORM A-2 PAST PROJECT DESCRIPTION

Name of Proposer: Corman Construction, Inc.

Name of Construction Firm: Corman Construction, Inc.
Project Role: Lead Constructor **Contractor:** X **Other (Describe):** _____
Years of Experience: Roads/Streets: 95 **Bridges/Structures:** 95 **Environmental:** 40
Project Name and Location: **Design-Build MD 30 Hampstead Bypass, Hampstead, MD**
Project Key Staff (as applicable to project)
Project Manager: Jo Ellen Sines, **Construction Manager & Cost Estimator:** N/A

Description and Specific Nature of Work for which Firm was responsible and how it is relevant to this contract: Two-lane asphalt roadway with stream and wetland crossings and four bridges spanning them, three roundabouts, new storm drainage, MSE and noise walls, 13 storm water management ponds, water and sewer relocations, erosion & sediment controls, landscaping, signing, pavement markings, traffic signals, ROW acquisition, two major traffic tie-ins and BGE, Verizon and Adelphia utility relocations.

MD 30 Hampstead Bypass. Photo by WBCM.

Four bridges designed and constructed: A single span, pre-stressed concrete girder bridge carrying Houcksville Road over the bypass; a single span, steel girder bridge carrying the bypass over Shiloh Road; a single span, pre-stressed concrete girder bridge over Indian Run; and a single span, concrete girder bridge over a tributary to the east branch of the Patapsco River. Sheeting and shoring was used for bridge construction. One noise wall was on the east side of the bypass adjacent to the Singer Heights community and thesecond one was on the west side of the bypass adjacent to the Westwood Community totaling 3,500 LF. Design and construction incorporated integral abutments for the first time on MSHA bridges.

Since this endeavor involved impacts to forest, Waters of the US and wetlands, it was imperative to schedule construction around in-stream restrictions for Use I, II and IV waterways.

As Design-Builder (DB), Corman was responsible for design and construction of this new two lane roadway, including new turn-lane off existing MD 30, roadway, drainage, grading / erosion & sediment controls, structures (bridges and noise walls), landscaping, signing, striping and lighting, 1,040 LF of temporary detour roads, environmental compliance, utility relocations, obtaining permits, design and construction quality control, and community relations.

Corman provided a full-time Erosion and Sediment Control Manager to perform daily compliance inspections, partnered with MSHA and the Independent Environmental Monitor and spent time in design development with the Designer. Meetings were held regularly to review design plans and look for ways to reduce temporary and permanent impacts. As a result, the team succeeded in reducing wetland impacts by an additional 0.5 acres,

forest by three acres, and water impacts by 1,000′ of what was permitted resulting in a 10% reduction in wetlands, 37% streams, and 18% of forest when compared to the permitted impacts.
Partnering was successful during the entire project, including special requests from local land owners and farmers. The DB team worked with the Owner in public outreach keeping the local community informed of schedules and impacts. Corman maintained an "800" line for public information, produced monthly newsletters and kept a detailed customer satisfaction log.
The DB team acquired all permits for construction and coordinated electric, telephone, cable, water and sewer relocations and adjustments with utility companies. Our Team was also responsible for design of turf and landscaping plans ranging from wetland plantings to carefully-designed gateway plans which incorporated local and project county approvals. Pedestrian facilities, both temporary and permanent, were provided at the north tie-in point of the adjacent to a large Walmart shopping center.

Description of Specific Nature of Work for which Key Staff proposed for this contract was responsible for on project and how it is relevant to this contract: As **Design-Build Project Manager, Jo Ellen Sines** developed/reviewed designs with design partner, worked with staff on project management, including planning, scheduling and cost management, and developed approaches for the procurement phase, including erosion & sediment control. She integrated the job team, participated in plan and schedule development (integrating design and construction), in-house reviews and reviews with owners and agencies, oversaw construction and Project Management Team, led team in environmental stewardship program, and managed partnering. She developed/ coordinated/ reviewed designs with design/permitting partner, collaborated with Ddesigner and project management team on innovative solutions, phasing, and design deliverable schedule. Jo Ellen provided construction management expertise to the Corman project team, including public relations, and provided construction quality oversight.
Jo Ellen conducted an immediate utility company meeting regarding an approved Alternative Technical Concept to shift roadway alignment which affected their planned relocation. She established weekly meetings at Consultant's office to develop/advise on design progression and concurrently managed Project Management, including field office set up, DBE plan execution, CPM schedule, budget establishment, buyout and project staffing. She participated in Oowner reviews and developed an all-day partnering workshop with Oowner. Pre-bid, Jo Ellen developed technical approach with Ddesigner and prepared a best value submission. Post-bid, she assisted in determining extent of explorations, such as geotechnical, utility and hazmat.

List any awards and/or commendations received for the project: 2010 DBIA National Design-Build Excellence Award; 2010 DBIA Mid-Atlantic Regional Design-Build Excellence Award; 2010 ARTBA Globe Environmental Award; 2010 MdQI Award of Excellence –Environmental, Green Transportation, and Consultant Highway Design; 2010 ACEC/Maryland –Honor Award

Name of Client (Owner/Agency, Contractor, etc.): MSHA

Address: 707 N. Calvert Street, Baltimore, MD 21202

Contact Name: Ross Clingan **Telephone:** 301-343-8377 (Cell)

Owner's Project or Contract No.: CL4165370 **Fax No.:** 301-624-8259

Contract Value (US $): $40,137,000 **Final Value (US $):** $43,294,527.13

(Owner-approved change orders included adding extra lanes on the roundabout on the north/south lanes and installation of two temporary bridges to adhere to an aggressive schedule.

Percent of Total Work Performed by Company: 100% (51% self-performed/49% subcontracted)

Commencement Date: 5/30/06 **Original Completion Date As Defined in IFB:** 12/1/08

Actual Completion Date: 8/7/09 (*MSHA requested plan/construction changes to roundabouts after they were completed which was at end of construction season; this resulted in a winter shutdown by MSHA and completion of changes at start of following season.)*

Any disputes taken to arbitration or litigation? Yes ☐ No ☒

FORM A-2 PAST PROJECT DESCRIPTION

Name of Proposer: Corman Construction, Inc.

Name of Construction Firm: Corman Construction, Inc.
Project Role: Lead Constructor **Contractor:** X **Other (Describe):**
Years of Experience:Roads/Streets: 95 **Bridges/Structures:** 95 **Environmental:** 40
Project Name and Location: **CMAR: MD 24 – Sections A&G, Harford County, MD**
Project Key Staff (as applicable to project)
Project Manager: Jo Ellen Sines, **Construction Manager:**Jeff Walton, **Cost Estimator:** David Gates

Description and Specific Nature of Work for which Firm was responsible and how it is relevant to this contract: MD 24 is a major rural highway passing through Rocks State Park in Harford County, MD that runs adjacent to Deer Creek, a designated Use III-P stream. Erosion of the embankment necessitated remediation of the slope supporting MD 24, pavement repair, and roadway drainage improvements. The site presented many challenges including location within a large watershed, complex geotechnical conditions, and environmental concerns focused on the "creeper" freshwater mussel, the most threatened and endangered species in the US.

MD 24

Out of concern for constructability of the preliminary design, SHA chose to utilize the CMAR approach due to its contractor involvement. Since this is MSHA's first CMAR project, they hired a design firm and began working through design alternatives prior to selecting a contractor partner. This also involved initial stakeholder and agency involvement. Corman was selected on best value which involved qualifications of proposed management personnel for preconstruction services, bid prices for selected construction items, and assessment of project risks for preconstruction services.

Corman proposed both design and constructability solutions for the construction of the slope which led to the elimination of one proposed retaining wall and reduced construction impacts to the stream for another. The original design included an imbricated stone wall on a concrete foundation. Construction of this, however, greatly infringed upon the stream and was not considered safe or easy to construct. To reduce these impacts, Corman recommended a retaining wall design that consisted of a caisson/pile foundation with sheeting driven between the piles. A pile cap was then utilized to construct a wire wall to stabilize the slope with a decorative imbricated stone facing. The design reduced the infringement upon the stream as most work was undertaken from the top of the slope as opposed to the SHA concept which would have required up to a 30′ impact on the stream to construct the concrete foundation.

During the preconstruction phase, Corman, MSHA, and the Designer met to review constraints, project goals, schedule, and proposed working relationships. Meetings were held with key stakeholders (local officials, utility companies, Park officials, permit reviewers, school transportation officials, EMS responders, and local community groups) to discuss concerns. The Owner, Designer, Contractor, and MSHA's Independent Cost Estimator (ICE) met every two weeks to develop constructible design alternatives. Monthly partnering meetings were held to discuss design progress. Corman developed and participated in cost model meetings with MSHA and their ICE to discuss cost assumptions, risk identification and mitigation through a risk sharing pool. On completion of the final design, cost estimating advanced with three rounds of cost comparisons, culminating with an agreed upon Guaranteed Maximum Price (GMP). Construction began in July 2014 with an estimated completion date in early 2015. Monthly partnering meetings are held with stakeholders, agencies, MSHA, FHWA, and the designer to review job progress and review/revise designs as needed for differing site conditions. Throughout construction, the team works with the local advisory committee and Park authorities to discuss traffic conditions and concerns, while working with them to coordinate special events. Corman successfully provided continued vibration monitoring of an adjacent historic property on the north end of the project. Currently projected to be completed on time and under budget.

Description of Specific Nature of Work for which Key Staff proposed for this contract was responsible for on project and how it is relevant to this contract: As **Project Manager**, **Jo Ellen Sines** participated all aspects of the CMAR process from procurement to closeout. This involved developing the technical proposal, design development, constructability reviews, cost estimating, OPCC reviews, partnering with the agencies and stakeholders, and oversight of construction from start up to close out.
As **Superintendent/Construction Manager, Jeff Walton** partipcated in the CMAR process from NTP to project closeout. He provided design input, performed constructability reviews, participated in the cost estimating and OPCC reviews, and activlity participated in agency partnering meetings. During construction Jeff supervised field operations, coordinated labor, equipment, materials and subcontractors, and developed short and long-term scheduling.
As **Cost Estimator** on the preconstruction team, **David Gates** met with the Owner, Designer, and Independent Cost Estimator (ICE)to develop a constructible, innovative, cost effective, and timely design. He led developing the open-cost model with MSHA's ICE, where they successfully advanced through three progressive cost estimates. David developed the Subcontracting Plan to include DBEs for the construction phase (and exceeded the 16% DBE goal) and participated in risk assessment and mitigation workshops. Corman maintained "A" ratings on ESC inspections.

List any awards and/or commendations received for the project:

"During the 2014 year, Corman has performed their work on the MD 24 project with the utmost professionalism and respect. Project staff starting from the superintendent to the foreman on site have a high esteem for environmental stewardship, proper project documentation, and have always been willing to partner despite delays on the project that were out of their control." *– Brent Robinson (SHA Rating Evaluator)*

"Without the partnership and assistance by Corman in the design phase and continuing through the construction phase, this project and the pilot CMAR process would not have been nearly as successful for the SHA
– Lisa B. Choplin, Chief, Innovative Contracting Division (SHA)"

Name of Client (Owner/Agency, Contractor, etc.): MSHA	
Address: 707 N. Calvert Street, Baltimore, MD 21202	
Contact Name: Lisa Choplin	**Telephone:** 410-545-8824
Owner's Project or Contract No.: HA3345171	**Fax No.:** 410-209-5001
Contract Value (US $): $5,500,000	**Final Value (US $):** $5,174,547
Percent of Total Work Performed by Company: *78% Corman 22% Subcontracted*	
Commencement Date: 12/23/13	**Original Completion Date As Defined in IFB:** 07/01/14
Actual Completion Date: April 28, 2015	
Any disputes taken to arbitration or litigation? Yes ☐	No ☒

Environmental Past Performance

Corman was pivotal in several Maryland projects driven by environmental protection, enhancement issues, and restrictions. To date, Maryland's most environmentally-sensitive project is the ***Design-Build Intercounty Connector (ICC).*** Corman was a construction joint venture partner for Contracts A and B where environmental restrictions defined the projects. The following are ***techniques and procedures that our Design-Build Team initiated to reduce environmental impacts, waste, and/or pollution:***

- Design / construction of high headwalls on major culverts to minimize stream impacts;
- Used MSE walls, retaining walls, and fan walls to minimize impacts;
- Underground SWM for protection from thermal impacts to Special Protection Areas;
- Spill protection in ditches and SWM facilities;
- Drilled shaft foundations to reduce impacts in Special Protection Areas;
- Avoided hauling on local roadways to minimize dust and tracking mud;
- Used geo-grid, wood chip and aggregate system for haul roads through wetlands;
- Installed erosion and sediment controls in Special Protection Areas;
- Provided habitat awareness training for workforce;
- On-site same day slope stabilization;

- Evaluated over 1,400 specimen trees, saving 225 trees;
- Used flocculants to reduce turbidity of sediment laden water;
- Used earth berms for noise abatement;
- Measured and managed noise / dust / mud tracking;
- Community sensitivity / awareness through Public Relations;
- Monitored and protected water quality using telemetry sensors in streams;
- Median/ROW width reductions via innovative SWM and geometry improvements.

Others include phased roadway construction to minimize Erosion and Sediment Control (ESC) bumpouts, top-down construction of structures, footprint reduction using alternative construction techniques, ESC Best Management Practices (BMPs) that reduce width, such as fence diversions instead of berm diversions, lengthening bridge spans to avoid floodplain impacts, early construction of noise walls and perimeter fencing to prevent wildlife encroachment, lined concrete washout pits, rock / fabric blankets to convey seeps and maintain wetland hydrology, and creating vernal pools or floodplain wetlands under bridges.

A close second for recent environmentally-driven MSHA projects is the ***MD 30 Hampstead Bypass Design-Build*** project due to the Bog Turtle Habitat. As a contractor initiated innovation, we eliminated a noise barrier and replaced it with earth berm reducing concrete wall production / transportation and pulled in LOD to minimize disturbances and clearing. SWM weir walls reduce maintenance, seepage, and erosion compared to risers and barrels and provide long-term sustainability. Grass channels provide water quality benefits, and shut-off valves were used in ponds near the Bog Turtle Habitat. Hydro-seeders stabilized disturbed areas daily. We also initiated a full-time ESC Manager (a first in the starte) resulting in an average ESC environmental quality assurance rating of 97.34%.

CMAR MD 24 / Deer Creek in Harford County, Maryland, Corman proposed both design and constructability solutions for the construction of the slope which led to the elimination of one proposed retaining wall and reduced construction impacts to the stream for another. The original design included an imbricated stone wall on a concrete foundation. Construction of this, however, greatly infringed upon the stream and was not considered safe or easy to construct. To reduce these impacts, Corman recommended a retaining wall design that consisted of a caisson/pile foundation with sheeting driven between the piles. A pile cap was then utilized to construct a wire wall to stabilize the slope with a decorative imbricated stone facing. The design reduced the infringement upon the stream as most work was undertaken from the top of the slope as opposed to the original concept which would have required up to a 30′ impact on the stream to construct the concrete foundation.

MD 216 US 29 to I-95 in Howard County is another D-B MSHA Corman project that initiated innovative techniques to minimize impacts. We preposed a bifurcated roadway to reduce earthwork minimizing wetlands and buffer impacts while reducing truck traffic. Clean water diversion ditches were used for larger drainage areas to bypass the construction zone.

On the ***I-95 / 695 Interchange Section 100*** project in Baltimore, Maryland, our Team devised a plan to use (for the first time in MD) a "Rain-for-Rent" dewatering system to treat sediment laden water from an existing sediment basin for discharge into Moores Run. This allowed the leaky riser structure in the basin releasing "untreated" water into Moores Run to be repaired. It treated approximately 160 gallons per minute and the leaky riser was repaired within one week. Utilization of this system has since become the norm on MSHA projects.

Past Performance Issues / Solutions for Environmental Deficiencies:

1. A stop-work order was issued on the MD 216 project until all erosion and sediment problems in the box culvert area were corrected. Water was being pumped into a sump pit from the work area, and then pumped into the adjacent woods without an approved sediment control device. During the inspection, the water appeared to be clear, but the device was necessary and required as agreed to by all parties. The problem was remedied that day and work resumed the next day. ***How We Addressed It:*** Additional management practices were instituted for the remainder of the project, which lasted an additional two years, and consisted of the following:

- Weekly ECS meetings in the contractor's field office with the Environmental Monitor, Contractor PM, DB Manager, Superintendent, ECS Manager, MSHA Inspection Staff, DB Designer as needed, and MDE Inspector and MSHA QA Inspector, if available;

- Briefings with Contractor after QA inspections to discuss current conditions;
- Teamwork between MSHA and Contractor for walk-thru inspections after rain events;
- Contractor involvement with MSHA Team to study future modifications to ECS specifications and training requirements;
- Raised company-wide environmental awareness for environmental stewardship.

These practices benefitted all parties involved for the remainder of the project.

2. On the MD Rowe Boulevard project, we received a repeat non-compliance item on the Quality Assurance Report that was not corrected within the time allowed. ***How We Addressed It:*** We implemented an ESC – Self Inspection Policy requirement within the company and instituted a policy that required projects to email copies of independent MSHA or outside agency inspections to upper management the same day the report is received. A Ratings Log is also now reviewed by upper management.

3. D-B Intercounty Connector, Contract A: (a) A stop work order was issued for working out of sequence when demolishing homes. ESCs were in place but the subcontractor started in the wrong order. ***How We Addressed It:*** The D-B Team quickly implemented a new policy requiring subcontractors to review MDE sequence of work with a Field Engineer upon commencing. (b) A penalty was issued for erosion caused by a wash out from a 20″ water main break. ***How We Addressed It:*** Additional care was given during future utility relocations. (c) A stop work order was issued for working out of sequence when repairing a culvert headwall. ***How We Addressed It:*** Issue was corrected immediately and implemented a new procedure with ECT for work areas around streams.

4. On D-B Intercounty Connector Contract B, a stop work order was issued for working out of sequence. ***How We Addressed It:*** Corrected issue immediately and implemented a new procedure where ESC Manager kept a copy of the Sequence of Construction (SOC) from the plan and initialed off on each stage before proceeding. The jobsite Project Management Team held a standdown which heightened awareness of the environmental programs.

5. I-695/I-95 Interchange in Baltimore, MD: (a) Penalty for sediment washing onto a sidewalk from a damaged super silt fence. ***How We Addressed It:*** Directed to inspect ESC devices daily. (b) Penalty for failing to monitor dewatering from a tanker truck. ***How We Addressed It:*** Use "Rain-for-Rent" and dirt bags for future pumping / dewatering and pumping requires strict pumping work plans and management approval before commencing.

Addressing these issues resulted in Corman adopting these practices / requirements on all our projects:
1. Review SOC requirements with all supervisors and subcontractors;
2. Review of in-house requirements for daily self inspections was made and reiterated;
3. ESC requirements are reviewed by the Project Management Team with field supervisors to make sure processes are in place and understood.

Corman's environmental ratings below are a testament to our commitment to providing Owners, communities, and our employees environmental compliant worksites.

Project	Total A's	Total B's	Total # of Ratings	Completed
Intercounty Connector A	147	56	208	2011
MD 216 US 29 to I-95	5	16	28	2005
Fish Passage Rock Creek	24	2	27	2012
Intercounty Connector B	87	56	145	2011
MD 30 Hampstead Bypass	76	5	81	2009
CMAR MD 24 –Deer Creek	13	0	13	2015

As shown in the above table, 97 % of our total rankings on these projects were A's and B's. We will assign the same people to this project that were responsible for this success. Our proposed Key Staff, Jo Ellen, Jeff, and David were involved in all of the projects listed above.

Environmental Stewardship – A Corman Core Value

Overall, Corman has taken each enfraction to readjust our environmental focus to take it to the next highest level. We pride ourselves as we continue to achieve excellent ratings.

An effective Erosion & Sediment Control (ESC) Implementation program comes from being proactive. On this project, Corman will designate a supervisor to oversee the ESC Compliance, and can re-direct crews as necessary to attend to ESC needs. Prior to starting work, we will hold an ESC meeting onsite to establish protocols with all parties involved, including outside agencies.

ESC is a focal point of any earth-disturbing project. We will inspect ESC devices everyday (typically in the morning) to ensure controls are installed per approved plans and sequence of construction, and are maintained and functioning properly. Corman will have the right personnel onsite who know the regulations from past experience and training. Project-specific training will be provided to team members reinforcing the importance and zero tolerance principles for environmental compliance, and field supervisors will hold yellow and green certification cards.

The dynamics of construction can require modifications as the actual field conditions warrant and we understand the process utilizing the OOC-62. We further define our proactive approach to maintaining ESC devices by identifying and correcting potential issues before they happen, such as pre-storm inspections to identify any weaknesses. Local weather conditions and forecasts will be monitored and crews will prepare the site prior to and after a storm. We will develop a Storm Response Plan to respond to severe weather. After a storm, the site will be inspected and brought to full compliance within 48 hours. After each event, measures are evaluated for future events. Redundant control measures carry less impact to a project's schedule and budget than a violation or shutdown.

C. Project Approach

C. PROJECT APPROACH

1. Strategic Project Approach

a. Project Goals and Approach

Corman understands this is the second Construction Management at Risk (CMAR) project for MSHA and success will be gained by a solid collaboration that fosters teamwork, respect for the historic nature of the surrounding area, minimizing impacts to the environment and finding the best cost-effective solutions given the site constraints. As the successful Contractor on the State's first CMAR we hope to build on the success and relationships built on that project. The CMAR contracting process anticipates a contract duration less than traditional design-bid-build and design-build with equal risk between Owner and Contractor. The goal is to reach an agreeable Guaranteed Maximum Price (GMP) among our team with concurrence from an Independent Cost Engineer (ICE) to proceed to construction with a fair market price GMP. Preconstruction services include constructability analysis, value engineering, scheduling, site assessments and cost estimating with input to the MSHA and its Designer from the Contractor through each phase.

Corman Construction was the contractor for MSHA's first CMAR - MD 24 – Deer Creek Project

Throughout preconstruction and construction, solutions are generated through a partnership between MSHA, Designer, and Corman. Frequent meetings, partnering, constructability reviews, risk assessment and mitigations, workshops and progressive cost estimating at milestones (OPCC), coordination with stakeholders, schedule and phasing development and monitoring, development of the GMP and formal / informal communication throughout construction are sure fire ways to produce streamlined design, reduce project duration, lower cost, and solutions that deliver the project goals.

As the team develops design and construction approaches, value analysis studies will determine the most cost-effective solutions that meet contract requirements. MSHA set these project goals and we will position ourselves to meet them during design development and throughout construction:

1. Provide a two lane roadway to direct traffic away from the Town of Brookville which accommodates both motor vehicles and bicycles. This is the driving purpose and need for the project. Morning and afternoon rush hour traffic thru the town is heavy and constant – not at all compatible with the residential or historic nature of the community. Our job during the Preconstruction phase of the project is to ensure during our reviews the project is buildable and constructability, including pedestrian and bicycle compatible. Once the released for Construction (RFC) plans are released we will need to minimize our schedule to remove the traffic from the constrained town roads as soon as possible. This may include starting work, such as clearing, rough grading or drainage early, with only an initial advance package.

2. Minimize impacts to the physical environment (e.g. parkland, forests, streams, wetlands etc.) and provide an aesthetically pleasing and context sensitive project. This is paramount! Schedule restrictions involving the Time-of-Year Restrictions (March 1st thru May 31st) for the impacted streams and endangered species restrictions takes significant consideration. Stream diversions and environmental features will be developed to work with surrounding conditions. Erosion & Sediment Control (ESC) measures and construction for protection of the wetland not permitted to be impacted must be initiated early during the construction and maintained—inspected daily. During the Preconstruction phase, Lou Robbins P.E., a Corman employee with the FHWA Context Sensitive Solutions training will work with the MSHA and their Designer to suggest methods that could be implemented to protect the rural and historic nature of the surrounding area. Suggestions will be made to the final alignment and grading to minimize the forest impacts to the high quality woodlands—especially the specimen Tulip Poplar trees.

3. Complete the project within the current construction timeframe and within the current budget. The goal of all construction projects is on time and on budget delivery. This project is no exception and these goals will be obtained on this project by Corman by open and honest communication and collaboration at all stages of the project with ***all*** team members and stakeholders, proper planning of the work, identifying potential risks at each

stage and developing potential risk mitigation plans before required, scheduling proper resources (manpower and equipment) to perform on time, and regular management review of planned progress vs. actual with recovery plans developed as required.

4. Minimize inconvenience and impacts to the traveling public and other users of the area. We will research how to reduce closure periods and brainstorm ways to maintain use of the facilities as much as possible for park users as well as tourists to the Town.

5. Facilitate a collaborative partnership with all members of the project team and stakeholders. Corman is a proponent of partnering and interactive relationships and will collaborate with the project team and stakeholders early on. Corman will participate in the kick-off partnering session to become integrated into the team and understand everyone's roles and needs. Corman is highly enthusiastic about participating in the CMAR process and welcomes the opportunity to foster innovative solutions through partnerships in the preconstruction phase.

We would also suggest the following 6th goal be added for the project team consideration:

6. Maximize safety of workers, the traveling public, and other users of the area. This is a top priority. Designing and constructing safe detours, safety of park users and our workers will be at the forefront at each level of development and implementation. We will endeavor to improve road, pedestrian and bicyclist safety by opening the new MD 97 around the Town at the earliest opportunity. MOT and any temporary detours will be designed and maintained in accordance with current MSHA and MUTCD criteria. Detailed work plans and Job Hazard Analysis (JHAs) will be developed for each activity and a safety tool box talk held daily.

The following goals will also be at the forefront during preconstruction, including value engineering, constructability reviews, context sensitive design, estimating, and risk analysis:

- Turn over a quality product that minimizes future maintenance
- Blend the project in with the natural ambiance and context of the adjacent environment while respecting the historic nature of the town.

b. Approach to Reduce Errors / Omissions, Improve Constructability, Reduce Construction Cost

CMAR, like Design Build, allows the Contractor and Engineer to work together during the design process to not only ensure the constructability of the project but adds an extra set of eyes to the design quality process in addition to the Designers and MSHA standard Quality controls. As was done for the MD 24 CMAR project, we would suggest for this project an initial kick off meeting with MSHA, its Designers and Corman to establish scope and preferred methods of collaboration—in person meetings, electronic file sharing, telephone or WebEx meetings, or as with most projects a combination of them all. Goals would be refined and expanded upon as appropriate, method of obtaining input and communicating with many stakeholders agreed upon. These early initial efforts will pay dividends in reducing the errors and omissions in the design plans, reduce cost and tighten up the schedule.

During design development of our Design Build projects, we hold formal weekly meetings at the Designer's office to review plan development / status. Innovative suggestions are discussed and evaluated with decisions made to advance the suggestion. Advancing a suggestion can result in cost estimating, value analysis or exploring a design for feasibility. If it conflicts with restrictions, prior MSHA commitments, or may require a design variance, the team evaluates the overall benefit and presents it to the owner. Schedule, cost and quality are always considered and depending on the owner, can evolve into value engineering proposals. Constructability of design development is discussed as a team. There are formal plan and constructability reviews on the plans prior to submission and comments are provided to the design team by marking up plan sheets and discussing with the Designer or Design Manager. ***These DB skills will carry forward at an advantage to meet CMAR project goals.***

For the MD 97 project we would envision not waiting for the formal standard MSHA design packages for Corman's review of the plans—that will be performed—but if that is the only review / collaboration performed the process will fail. Corman and the MSHA and the Designer need to communicate openly and continuously.

We will expand upon the meeting discussed above to have senior estimators and field personnel develop anticipated work plans and sequencing graphs to schedule the project. These plans would be shared with MSHA and its Designer and opportunities for breaking out selected design packages or identifying long lead items

would occur at this time. For example, once the TSL plans for the structures are approved the Designer can produce separate substructure and superstructure design packages concurrently with the Contractor ordering steel (if H pile foundations) prior to final approval, as appropriate, to take advantage of production dates or anticipated changes in the material cost. Foundations can also be constructed prior to design completion of the superstructure, as is common on traditional Design Build projects. Issues that could arise in the field during these early packages (such as unanticipated driving conditions and / or additional pile depth) would then be incorporated into the follow-on plans with no loss of quality or delay to the project. Proper schedule planning would take into account the Time of Year (TOY) restrictions and Corman, MSHA and Designer working together to jump start designs or permit reviews of construction affected by the time restrictions or other permit issues. Because of the environmental sensitivity of the project, the project could also be broken down into sections with permits from MDE or other permitting agencies obtained in a staged order to meet the actual construction schedule or upland areas started prior to final approval of the lowland or stream sections.

To maintain efficient decision making minutes of all meeting would include action items in the minutes with "Ball in Court" and due dates identified. Suggested enhancements / modifications to the design suggested or identified would be tracked. The tracking sheet would be maintained of all suggested changes to the design, identifying potential cost or schedule advantages, additional risks, impacts on other portions of the design or permitting, status of investigation or implementation, individual responsible and anticipated date of any required action. These suggested changes could come from Corman estimators, field staff or in-house designers or the MSHA or its Designer. It is even possible a stakeholder or permit agency reviewer may contribute to the potential list of comments. The tracking sheet would be reviewed at each regular progress meeting. Separate face to face or conference calls can be established with key personal (Contractor, State, Designer or permit / stakeholder agencies) available to discuss specific potential suggestions. An advocate would be assigned to champion each suggestion to insure full evaluation is performed with the proper personal involved and resolution obtained in a timely manner. At the regular meetings, or at a special meeting the suggestion / comment would be discussed by Corman, MSHA and Designer with a consensus reached on its merits and a direction determined to 1) incorporate, 2)continue to investigate or obtain additional data / information, or 3) abandoned. The above referenced tracking sheet would be updates and serve as a permanent reference of the comment and resolution. Risks and value suggestions will be evaluated by the full project team on the impact (positive or negative) to the key project goals.

c. Approach to Provide Successful General Contracting Services

Corman has a detailed project management manual that is utilized on all of our projects. The manual includes requirement for the development of work plans for each activity as well as the development of safety JHAs for the many construction tasks. Our project manager and Construction manager would be integrated into the estimating process so not only is their input obtained but they are familiar with the anticipated production rates, means and methods, buy outs and subcontracting strategy. Weekly meetings are held with the project team and corporate management with reports prepared by the project manager for discussion at the meeting that include:

- Safety
- Quality
- Schedule Adherence
- Manpower / Crew needs
- Equipment / Shop needs
- Buy out of Material and Suppliers
- Status of submittals
- Permit status / compliance
- Comparison of actual production rates vs estimated rates
- Comparison of actual costs vs estimated costs
- Cash Flow requirements
- Design issues / opportunities

RFI and Submittal Tracking Log for Project Records

ID Number	Process	Description / Issue	Reviewer	Date Received or Sent	Date Due	Date Returned	To	Status (Approved / Resubmit)	Comments
RFI 47R1	RFI	Use of A-3 Cocnrete at Rock Sockets	Bruce	9/18/2014	10/2/2014	9/23/2014	Corman	Closed	Informational RFI
SUB 45	SUB	Bearing Shop Drawings	Bruce	7/29/2014	8/12/2014	8/13/2014	Corman	Closed	
SUB 46	SUB	Rock Socket Installation Plan	Bruce	9/4/2014	9/18/2014	9/10/2014	Corman	Closed	
SUB 47	SUB	C.I.P. MSE Wall Barrier & Moment Slab	Bruce	9/15/2014	9/29/2014	9/29/2014	Corman	Closed	
SUB 009C	TSUB	Geotechnical Engineering Report Addendum #3	Bruce	7/24/2014	8/7/2014	8/7/2014	RK&K	Closed	

Sample RFI and Submittal Tracking log

Once construction commences, our field staff of managers and engineers, foreman and supers will continue to explore opportunities to improve efficiency, quality or shorten the schedule. Weekly progress meetings will also include Division Manager and / or General Manager as well to review progress Opportunities that do not require MSHA, Designer or permit agency / stakeholder review or approvals will be implemented by the onsite staff. Opportunities that require outside review or approval will be brought to MSHA's attention and then with MSHA's concurrence to the appropriate designer or stakeholder. Again tracking sheets for the RFIs generated will be tracked as shown on the spreadsheet below. In addition, the enhancements / modifications to the design would be progressed / tracked as indicated in **b.** above.

Utility Relocation Tracking Log

Activity ID	Utility	Activity Name	Parcel's Required	Parcels Cleared	BL Start	BL Finish	Utility Committed Start	Utility Committed Finish
Zone A - Utility Relocations								
A1130	Verizon	Mtrl. Procurement UG Verizon 107+60 to 128+00	-		15-Apr-15	24-Apr-15	15-Apr-15	Apr-27-15
A1150	Dominon Power	Mtrl. Procurement OH DVP 105+80 to 130+00	-		24-Apr-15	4-May-15	24-Apr-15	Apr-27-15
A3612	Verizon	Relocate UG Verizon 103+28 to 116+00	03, 05	4/27/2015	25-Apr-15	23-Jul-15	Apr-27-15	23-Jul-15
	Verizon	Relocate UG Verizon 124+71 to 131+00		5/12/2015	25-Apr-15	23-Jul-15	18-May-15	7-Jul-15
A1100	Comcast	Relocate OH Comcast 103+80 to 130+75	DVP Complete	8/2/2015	25-Apr-15	29-Apr-15	27-Jun-15	2-Aug-15
A3611	Dominon Power	Relocate OH DVP 105+80 to 130+00		5/12/2015	5-May-15	2-Aug-15	13-May-15	6-Jul-15

Sample Utility Relocation Tracking log

In addition to the full time estimating staff, we frequently supplement our estimating group with our field project management staff. Project Engineers and Managers gain estimating experience through a rotation in the Estimating Department as part of their career development. It gives them an insight to budgeting and cost control that are such a critical component of their jobs. For example, Jeff Walton (our proposed CM) assisted in estimating of the MD 24 CMAR project he then went on to construct. He will be involved in estimating this new project.

We have on staff seven Registered Professional Engineers licensed in Maryland. These professionals lend their expertise to the Estimating Department depending on project needs and are a resource that generates our own falsework, support of excavation and other temporary construction drawings requiring a PE stamp. We can quickly respond to changes in field conditions by eliminating a third-party engineer for construction drawings. It also lowers our costs by having them on staff and available.

Corman uses B2W, a software system designed to manage our estimating and bidding. Each estimate is uniquely constructed with customized detailed reports that show production, quantities, labor, equipment, materials and subcontractors. General conditions, overhead, and supervision costs are also displayed in detail. A formal overview will be offered to MSHA at the beginning of the project to review our reports to see if any modifications are needed.

Corman Construction, Inc.

12001 Guilford Road
Annapolis Junction, MD 20701
USA

Phone: (301) 953-0900
Fax: 301 953-2611

Cost Detail

Project Name:	4026 CMAR MD 24 Deer Creek			**Customer:**	Maryland State Highway Administration [Niche Supplied]
Job Number:	2945	**Bid Number:**	4026	**Billing Address:**	707 N. Calvert Street
Bid As:	Prime				Baltimore, MD
Estimator:	David Gates			**Phone:**	410-545-8489
Project Address:				**Contact:**	Jason Ridgway
Completion Date:					

Pay Items

Description	Quantity	UM	Unit Direct Cost	Total Direct Cost
1001 - Maintenance Of Traffic - Section A Only	1.00	LS	$94,496.71	$94,496.71
Maintenance Of Traffic	1.00	LS	$94,496.71	$94,496.71
Barricades - Type III 8'	5.00	EACH	$185.50	$927.50
MOT Drums	40.00	EACH	$74.20	$2,968.00
Safety Fence	2,560.00	LF	$2.12	$5,427.20
Temporary Traffic Signs	1,653.00	SF	$16.70	$27,596.84
Traffic Cones	20.00	EACH	$10.60	$212.00
CE-Message Board (1.00 HR/PH, 520.00 DY)	4,160.00	HR	$8.00	$33,280.00
Message Board	4,160.00	HR	$8.00	$33,280.00
Sign Stands	3.00	EACH	$206.70	$620.10
MOT Crew	1.00	LS	$18,222.68	$18,222.68

Tracking costs / budget management. For resource allocation, Corman uses a combination of performance measurement / evaluation tools and techniques to collect, analyze, and disseminate project / task cost control information to the Project Team, including:

- Weekly Cost Review Meetings
- Cost Forecast/Trend Analysis
- S-Curves
- Schedule Performance Index
- Unit Labor / Equipment Productivity Analysis
- Earned Value Analysis
- Variance Analysis

CORMAN CONSTRUCTION

Custom JC Unit Cost
For Actual Period: First thru Last
Job: 2945- MD 24 - Section A & G CMAR
Excludes cost types with no period activity

Last Quantity Posted: 05/01/2015
Last Payroll Actual Date: 05/28/2015

Project Manager: (59) Jeff Walton
Project Engineer: (19) Danielle Litardo

Cost Type	UM	Units (U) Estimate	Period	To Date	Cost ($) Estimate	Period	To Date	% Compl	Unit Cost ($/U) Estimate	Period	To Date	Proj.	Man Hours (MH) Est.	Pd.	TD.	MH Prod (MH/Units) Est.	Pd.	TD.	Proj.
Phase : 20.30.100- - CLEARING AND GRUBBING																			
Lab	AC	0.00	0.75	0.75	0.00	7,254.97	7,254.97	0.00	0.00	9,673.29	9,673.29	9,673.29	0.00	179.00	179.00	0.00	238.67	238.67	238.67
Equip	AC	0.00	0.75	0.75	0.00	3,279.13	3,279.13	0.00	0.00	4,372.17	4,372.17	2,905.51							
Total Phase :					0.00	10,534.10	10,534.10	9,434	0.00	14,045.46	14,045.46	12,578.80							

Unit Cost Report

The earned value analysis and labor/equipment (resources) analysis are our cornerstone performance evaluation tools. Once construction begins, the project team and Corman management reviews cost control metrics weekly, at a minimum. In some cases, for high production activities, there are daily reviews. Every quarter, each project team formally presents and reviews job progress and status to Corman's Executive team. The earned value method compares the budget, actual cost, and earned value of work performed to provide insight into forecasted performance vs. actually complete. The labor and equipment unit analysis reports production levels by task and is a curve tracking scheduled, earned, and actual hours.

This project will be administered using our VCP cloud based project management system. This tracks and manages the project life cycle, including controls, contract management, RFIs, change orders, submittal / transmittals, meetings, issue logs, and more. MSHA's Project Wise would be utilized as appropriate to transmit and store design and other record documents per MSHA requirements.

Schedule Management. The Project Manager, in conjunction with the design and construction team, will develop an integrated CPM schedule using Primavera P6. From the CPM schedule, field needs for a rolling three-week production schedule are determined. The three-week schedule is a key management tool that identifies upcoming work activities, production goals, QC testing needs, equipment and labor resource requirements, subcontractor schedules, and major material delivery dates. By incorporating these activities into a single rolling production level schedule, we mitigate the risk of resource schedule problems by keeping all the key groups involved in regular coordination. The CM, along with a Project Engineer, maintains and updates the schedules as work progresses. Prior to field activities commencing, Corman will establish a field office near the work site and hold progress /partnering meetings there. Our project controls system includes these meetings:

- **Weekly** three-week production schedule meetings with key operations staff and management (including executive level home office).
- **Bi-weekly** onsite owner / stakeholder progress meetings to review schedule progress, design issues, QA / QC matters, unresolved construction issues, safety performance, administration issues, and general project management matters.
- **Monthly** progress meetings to review progress, conflicts, safety, quality, and public involvement plan.
- **Monthly** partnering meetings with owner and stakeholders

Keeping the CPM big picture and relying on the three-week look ahead for the details has been successful. The connection between our daily work schedule and the CPM bridges the gap between what the CPM shows and what is actually going on in the field. This schedule management system identifies when tasks start to fall behind before it is too late and helps our field management create a recovery schedule and implement it quickly. For a time / weather sensitive project, such as this, schedule management is critical.

Construction the Project Management Team Can Self-Perform. Corman's corporate headquarters is in Annapolis Junction, Maryland, encompasses 12 acres, and includes a full service, eight-bay equipment maintenance shop staffed with professional heavy equipment mechanics to support a 350 heavy equipment

fleet. A construction yard, staffed with support personnel, maintains materials and supplies to support ongoing operations. Currently at 450 employees, Corman recognizes that personnel are its most valuable asset and prides itself in attracting and retaining top talent in the heavy construction industry. We specialize in new bridge construction, bridge rehabilitation, highway construction, environmental, streetscapes, and utilities. Work environments range from dense urban areas requiring extensive maintenance of traffic to undisturbed environmentally-sensitive areas. Corman has 92 years of experience constructing some of the area's largest or most environmentally sensitive roadway projects.

Corman has the capability and experience to self-perform the majority of work on this project, including maintenance of traffic, ESC, drainage & utility installations, grading, roadwork, stream improvements, bridge foundations, superstructure, abutments, piers and walls and associated work. As previously described, local in-house resources are available to staff the project. Major work that would be subcontracted includes: clearing, paving, line striping, traffic signals, guardrail, flat work, landscaping and street lighting. Subcontractors are required to perform specialty work and meet any DBE goals placed on the construction portion of the contract.

Corman always maintains a substantial database of Specialty / DBE firms qualified to work on our projects. Outreach efforts are continuous as a way to connect with additional qualified Specialty / DBE firms. Corman routinely meets and exceeds the DBE requirements on projects, so much so, that the Maryland Washington Minority Contractors Associations awarded Corman as "*Prime Contractor of the Year for Minority Business*" in 2011.

Corman will use their standard Specialty / DBE Subcontracting Plan, modified to meet the requirements and challenges of the chosen participation goal. The following checklist specifies ways we solicit Specialty / DBE firms during preconstruction:

1. Publish Proposal Notifications / Bid Notices in local and minority newspapers 30 and 10 days prior to GMP price due dates. Post plans and specifications on the Corman FTP site
2. Post Bid Notices on Maryland Washington Minority Contractors Association (MWMCA) website. This circulation reaches 10,000 companies, many based in Maryland.
3. Based on available scopes of work, identify potential Specialty / DBE firms
4. Corman's Estimating Assistants will reach out to identify Specialty / DBE firms from our company Firm Database, respond to project inquiries, and furnish requested information.
5. Validate qualifications of specialty and certified DBE subcontractors / suppliers
6. Review at regular intervals our compliance with COMAR 21.05.10.05

When preparing OPCC and GMP, we will track the status of our Specialty / DBE participation. This creates an awareness to maintain and / or increase our efforts to successfully meet the goals. As the OPCC and GMP submittal dates approaches construction DBE participation goals are evaluated and finalized to ensure they are met. During construction, the project team monitors DBE participation for compliance with the required goal.

Individual Specialty /DBE subcontractors will be chosen on the following criteria:

1. Past performance on Corman projects
2. Industry feedback / references from past performance on similar contracts
3. Personal interviews
4. Visits to subcontractors office / yards
5. Review of Quality program
6. Understanding of the project goals and scope during pricing and investigative phases
7. Ability to perform multiple contract tasks
8. Price of the work to provide the MSHA the best value

d. Approach to Minimize Environmental Impacts

Environmental Past Performance. Corman was pivotal in several Maryland projects driven by environmental protection, enhancement, issues, and restrictions. To date, Maryland's most environmentally-sensitive project

was the ***Design-Build Intercounty Connector (ICC)***. Corman was a construction joint venture partner for Contracts A and B where environmental restrictions defined the projects. Corman will draw on our past extensive experience from these projects with the following innovative techniques and procedures that our **Integrated Project Team** can initiate to reduce and avoid environmental impacts, waste and pollution on MD 97:

ICC-A Stream Diversion

- Design / construction of high headwalls on major culverts to minimize stream impacts;
- Use retaining walls to minimize impacts;
- Underground SWM for protection from thermal impacts to Special Protection Areas;
- Spill protection in ditches and SWM facilities;
- Drill shaft foundations to reduce impacts near Reddy Branch and Meadow Branch Areas;
- Avoid hauling on local roadways to minimize dust and tracking mud;
- Use geo-grid, wood chip and aggregate system for haul roads through wetlands;
- Install erosion and sediment controls to protect the sensitive intermittent Watercourse 3 and the Perennial Watercourse 4;
- Provide habitat awareness training for workforce;
- On-site same day slope stabilization;
- Locate, evaluate, and protect specimen trees;
- Use flocculants to reduce turbidity of sediment laden water;
- Use earth berms for noise abatement during construction;
- Measure and manage noise / dust / mud tracking;
- Community sensitivity / awareness through Public Relations;
- Monitor and protect water quality using telemetry sensors in streams;
- . ROW width reductions via innovative SWM and geometry improvements to avoid impacts to M-NCPPC parkland, forest, and additional Archeological sites
- Minimize our LOD during construction to lessen the temporary impacts to natural resources
- Minimize stream relocations, wetland mitigation, and forest mitigation work will be our priority.

Others include phased roadway construction to minimize ESC bumpouts, top-down construction of structures, footprint reduction using alternative construction techniques, ESC BMPs that reduce width such as fence diversions instead of berm diversions, lengthening bridge spans to avoid floodplain impacts, early construction of perimeter fencing to prevent wildlife encroachment, lined concrete washout pits, rock / fabric blankets to convey seeps and maintain wetland hydrology, and creating vernal pools or floodplain wetlands.

A close second for recent environmentally-driven MSHA projects is the ***MD 30 Hampstead Bypass Design-Build*** project due to the Bog Turtle Habitat. We eliminated a noise barrier and replaced it with earth berm, reducing concrete wall production / transportation and pulled in LOD to minimize disturbances and clearing. SWM weir walls reduce maintenance, seepage, and erosion compared to risers and barrels and provide long-term sustainability. Grass channels provide water quality benefits, and shut-off valves were used in ponds near the Bog Turtle Habitat. Hydro-seeders stabilized disturbed areas daily. We also initiated a full time ESC Manager resulting in an average ESC environmental quality assurance rating of 97.34%.

Hampstead Bypass roundabout

MD 216 US 29 to I-95 in Howard County is another Design-Build MSHA Corman project that initiated innovative techniques to minimize impacts. A bifurcated roadway was constructed to reduce earthwork minimizing wetlands and buffer impacts while reducing truck traffic. Clean water diversion ditches were used for larger drainage areas to bypass the construction zone.

MD 216 bifurcated roadway

On the ***I-95 / 695 Interchange Section 100*** project in Baltimore, Maryland, our Team devised a plan to use a Rain for Rent dewatering system to treat sediment laden water from an existing sediment basin for discharge into Moores Run. This allowed the leaky riser structure in the basin releasing "untreated" water into Moores Run to be repaired. It treated approximately 160 gallons per minute and the leaky riser was repaired within one week. Utilization of this system has since become the norm on MSHA projects.

On our ***MD 24 Rocks State Park CMAR*** project in Harford County we modified the super silt fence to avoid critical root zones by lengthening the spacing of stakes and utilizing tension wire. In addition we planted slopes with live stakes and trees for stabilization in lieu of hardscape elements which reduced cost and maintained the natural rural landscaping of the area.


CMAR MD 24 replanted slope

Addressing these issues and other issues resulted in Corman adopting these practices / requirements on all our projects:

1. Review sequence of construction requirements with all supervisors and subcontractors;
2. Review of in-house requirements for daily self-inspections was made and reiterated;
3. ESC requirements are reviewed by the Project Management Team with field supervisors to make sure processes are in place and understood;
4. Environmental issues expected to be encountered are included in the tool box talk with all crews each morning.

Corman's environmental ratings below are a testament to our commitment to providing owners, communities, and our employee's environmental compliant worksites.

Project	Total A's	Total B's	% A's and B's	Total # of Ratings	Completed
Intercounty Connector A	147	56	98%	208	2011
MD 216 US 29 to I-95	5	16	75%	28	2005
Fish Passage Rock Creek	24	2	96%	27	2012
Intercounty Connector B	87	56	99%	145	2011
MD 30 Hampstead Bypass	76	5	100%	81	2009

Project	Total A's	Total B's	% A's and B's	Total # of Ratings	Completed
MD 24 / Deer Creek CMAR	13	0		13	2015

Corman is proud to make this statement: As shown in the above table, 97 % of our total rankings on these projects were A's and B's. We will assign the same people to this project that were responsible for this success. Our proposed Key Staff, Jo Ellen, Jeff, and David were involved in all of the projects listed above.

Environmental Stewardship – A Corman Core Value

Overall, Corman has taken each infraction to readjust our environmental focus to take it to the next highest level. We pride ourselves as we continue to achieve excellent ratings.

An effective ESC Implementation program comes from being proactive. On this project, Corman will designate a supervisor to oversee the ESC Compliance, and can re-direct crews as necessary to attend to ESC needs. Prior to starting work, we will hold an ESC meeting onsite to establish protocols with all parties involved, including outside agencies.

ESC is a focal point of any earth-disturbing project. We will inspect ESC devices everyday as well as prior to and after storm events to ensure controls are installed, per approved plans and sequence of construction, and are maintained and functioning properly. Corman will have the right personnel onsite who know the regulations from past experience and training. Project-specific training will be provided to team members reinforcing the importance and zero tolerance principles for environmental compliance, and field supervisors will hold yellow and green certification cards.

The dynamics of construction can require modifications as the actual field conditions warrant and we understand the process utilizing the OOC-62. We further define our proactive approach to maintaining ESC devices by identifying and correcting potential issues before they happen, such as pre-storm inspections to identify any weaknesses. Local weather conditions and forecasts will be monitored and crews will prepare the site prior to and after a storm. We will develop a Storm Response Plan to respond to severe weather. After a storm, the site will be inspected and brought to full compliance within 48 hours. After each event, measures are evaluated for future events. Redundant control measures carry less impact to a project's schedule and budget than a violation or shutdown.

To minimize inconvenience and impacts to the traveling public and other local users, we will assist in developing constructible designs and detailed work plans before construction begins. On this project, we will tackle the in-stream work in Reddy Creek and its tributaries with the *"get-in, get-out"* philosophy. For protection of Wetlands, springs, historic features and other identified sensitive areas we will, prior to working adjacent to these sensitive areas, delineate the sensitive areas with orange construction fencing to insure they are not inadvertently disturbed. Detailed work plans will include sensitivity training for the tasks expected to be performed that day so workers know to respect and protect the MNCPPC Parkland, historic mill and mill race, and Reddy Creek and its tributaries. Daily inclusion of environmental issues with the safety talk each morning has been found to be more effective than formal sensitivity training *onc*e at the beginning of the project that is soon forgotten.

e. Construction Approach and Sequence

Similar to our Hampstead Bypass project this new roadway is on new alignment with Roundabout tie-ins at each end and several road / stream crossings in the middle.

During our site visits and when reviewing the roadway plans and public hearing documents available, we noted several items that may impact the actual sequencing of the project:

1. Overhead utilities need to be relocated on the west side of MD 97 near both tie-ins and on Brookville Road. These utilities consist of both primary and secondary power, as well as Verizon and other providers' communication lines;

2. Extensive wetland and intermittent stream impacts from the southern terminus to approximate station 50+50;
3. Several Specimen trees in the areas to be cleared—project requires a Forest Stand Delineation and Forest Conservation Plan and Variance Requests and mitigation for specimen trees over 30";
4. Extensive impacts to high quality forested parkland—some of which are productive wetlands or classified as a Biodiversity area;
5. Impacts to two historic mills and removal of one raceway with potential Phase 3 full recovery archaeological investigation required;
6. MNCPPC was not supportive of the current alignments impacts on the Meadow Branch however this may have been partially mitigated by the substitution of a bridge vs. the previously proposed culvert;
7. TOY restrictions on in-stream work from each March 1st to May 31st and potential additional TOY restrictions to protect other forested wildlife such as birds or amphibians

Based on our an initial analysis we would suggest three separate design packages

A. Package A – Advance clearing and grading, installation of environmental controls / drainage / SWM and installation of temporary bridges at both Reddy and Meadow Branches;
B. Package B – Meadow and Reddy Brach Bridge packages (can be separate or combined determined by review comments or issues with the individual designs) these packages could also be broken down into substructure and superstructure as appropriate. Any walls required to minimize the projects footprint and meet the MSHA project goal of minimizing impacts to the physical environment could also be included in this package;
C. Package C Finish package to include roadway section, guide rail, signing, stripping and traffic features, lighting, and landscaping

The advantage of these packages is they would allow field work to begin before all design work is completed and also allow for long lead items to be procured in a timely manner. The packages would remain severable in the unlikely event that a GMP cannot be reached among the parties. This will advance the goal of on time and on budget with completion prior to the end of 2018.

The corresponding construction sequence could then be:

1. Establishment of environmental controls in the areas of major cuts (station 54+40 to 64+00), and fills (station 65+00 to 70+00 and 48+00 to 54+00), both major stream crossings and along the center of the new alignment for the installation of a haul / access road;
2. Establish MOT controls on Brookeville Road (to facilitate crossings of earth moving equipment) and at the projects terminus (to eliminate the need for construction equipment to travel thru the town and facilitate import of embankment material);
3. Construct temporary crossing at both streams and install a haul road the entire length of the project as part of an early clearing and grading package. This would facilitate all materials and construction traffic enter the project at the two terminus points on MD 97 and be separated from the existing rush hour MD 97 traffic. It would avoid the hauling of embankment or other construction traffic thru the Town. This would advance MSHA's project goals, minimize inconvenience and impacts to the traveling public, and provide a context sensitive project;
4. Perform clearing in these area and initiate earthmoving and installing roadway drainage. We envision the dirt in the major cut section (station 54+40 to 64+00) would be used as fill at station 65+00 to 70+00 and 48+00 to 54+00. Fill for the other areas would most likely be imported;
5. Concurrent with the above construction and utilizing Package B, initiate bridge foundation construction on the Reddy Creek bridge and Meadow Branch structure. Follow the construction of the two foundations with abutment and pier (Reddy Branch), and superstructure construction;
6. Install Environmental controls and clear and grade as required to facilitate utility relocations;

7. Install remaining environmental controls and initiate clearing, grubbing, grading and drainage installation in all remaining areas;
8. Concurrent with completion of the bridges, fine grade and pave the roadway from the tie in points and perform roadway finishes in these areas to prepare for the transfer of traffic to the new alignment;
9. Construct the two roundabouts and northern terminus under traffic - shifting traffic to the new roadway as soon as possible.

The above suggested sequence could be modified to account for the actual approval process, For instance if the crossing at Meadow Branch is not resolved or archaeological recoveries encountered, those sections could be left off the initial work areas and fast tracked later to catch up with the progress of the previously initiated work.

We would anticipate the project could commence in one year during the summer of 2016 if there is no delay due to design, utility coordination, obtaining environmental permits, MNCPPC, or County and Town approvals and support.

The proposed MD 97 construction schedule fits well with Corman's current backlog and resource availability. We will have experienced labor and equipment available to assign to the MD 97 project. Most are already experienced in the special emphasis MSHA puts on environmental stewardship having worked on the ICC, or our previous MSHA projects. With over 400 trade and craftsmen and $20 million dollars of company owned equipment, Corman can easily staff this new project with experienced labor employing the correct equipment to perform the work. In addition, the materials required for this project are those normally utilized in roadway construction with no need for special or exotic materials. The only issue could be if steel beams are specified, the beam production dates may control, however at current market economics and beam lengths we would assume standard pre-stressed concrete sections would be utilized and these sections are currently readily available locally.

f. Other Resources and Capabilities

Corman's unique capabilities that will directly benefit this project consist of:

- Major local Maryland based Civil Highway contractor with 92 years of history owned by the same family;
- A local MD yard complex encompasses 12 acres, including a full service, eight-bay equipment maintenance shop staffed with professional heavy equipment mechanics to support a 350 unit heavy equipment fleet;
- Successful delivery of MSHA's first CMAR project with direct experience with pre-ordering long lead items for the MD 24 project.;
- Successful delivery of MSHA's first DB project to include DB designed bridges (Hampstead Bypass);
- Key Staff have unique experience in environmental delivery of ICC A and ICC B where they served on task force teams to work through solutions directly with the environmental permitting agencies to gain timely approvals. This has provided valuable experience that results in continued environmental impact reductions.
- Key staff have direct experience with MSHA, Montgomery County and MNCPP;
- Key staff has direct experience with utility relocation. Both on the ICC projects and on our VDOT design build projects, Corman successfully coordinates with utility companies on utility relocation work which includes cost responsibility as well. Corman is well experienced to assist with MSHA's coordination effort with the utility companies on this project.
- Key staff has direct experience: 1) relocating streams and working with the natural habitats; and 2) leading and supporting public reach efforts on MSHA projects within Montgomery County.
- Corman's management and field staff have extensive experience on design-build projects. From project management to the laborer in the field, our staff is accustomed to providing innovative solutions at the design stage to implementing ESC accurately in the field and working within the contractor-led QC programs that have sharpened our in-house QC skills.

g. Innovative Ideas

Based upon our past extensive roadway and bridge construction in Maryland and surrounding areas, we would suggest the following potential innovative approaches be considered by MSHA:

1. Have the Contractor responsible to coordinate with the affected utilities as a reimbursable cost to the project;
2. Establish as a first order of business an Environmental / Stakeholder task force. We are not currently intimate with the project specifics but our research to-date indicates several key stakeholders including MDE, MNCPPC, and Montgomery County still have outstanding issues or questions regarding environmental issues (some listed above in section **e. "Construction Approach"** or below in **section 2. "Risk"**) that need to be resolved quickly for the project to progress on schedule. The taskforce would include Corman, MSHA, its Designer and key environmental groups or stakeholder that can derail the project's schedule;
3. Walls be considered adjacent to fills or cuts in environmental sensitive areas such as wetland, high quality forests or other sensitive areas;
4. Underground SWM be considered if environmental groups are concerned with thermal pollution of the waterways;
5. Form liners stained similar to those used on the ICC be utilized to improve the appearance of the structures and expedite environmental or stakeholder approval / acceptance. They are less expensive with fewer maintenance issues than laid up natural stone;
6. Phase 3 recovery Archeological investigations be performed by MSHA during the preconstruction phase;
7. A full-time environmental compliance monitor be employed to indicate to the permitting agencies MSHA's concern and dedication to protect the environment. We have already assumed this could occur and have added Chesapeake Environmental Service to our team;
8. Several hiking and bird watching trails exist within the park—design plans and stakeholder coordination should include provisions for relocation or protection of these facilities;
9. Begin mitigation / permitting coordination early on utilizing 30% plans vs. waiting till final or pre-final plans are ready. Requested changes can be incorporated easily and economically on schedule the earlier the comments are known.

As the design details are developed our team would work closely with the Designer and MSHA to identify and discuss additional innovative suggestions. Innovation would be suggested by our estimators, managers and experienced field construction foremen and superintendents based upon their extensive past experience on similar projects.

2. Risk and Innovation Management

a. Process for Eliminating / Mitigating Risk and Apply Innovation during Design Phase

During design development of our Design Build projects, we hold formal weekly meetings at the Designer's office to review plan development / status. Innovative suggestions are discussed and evaluated with decisions made to advance the suggestion. Advancing a suggestion can result in cost estimating, value analysis or exploring a design for feasibility. If it conflicts with restrictions, prior MSHA commitments, or may require a design variance, the team evaluates the overall benefit and presents it to the Owner. Schedule, cost and quality are always considered, and depending on the Owner, can evolve into value engineering proposals. Constructability of design development is discussed as a team. There are formal plan and constructability reviews on the plans prior to submission, and comments are provided to the design team by marking up plan sheets and discussing with the Designer or Design Manager. ***These DB skills will carry forward at an advantage to meet CMAR project goals.***

We will expand upon the meeting discussed above to have senior estimators and field personnel develop anticipated work plans and sequencing graphs to schedule the project. These plans would be shared with MSHA

and its Designer, and opportunities for breaking out selected design packages or identifying long lead items or other risks would occur at this time. For example, once the TSL plans for the structures are approved the designer can produce separate substructure and superstructure designs packages concurrently with the contractor ordering steel (if H pile foundations) prior to final approval, as appropriate, to take advantage to production dates or anticipated changes in the material cost. Foundations can also be constructed prior to design completion of the superstructures as is common on traditional Design Build projects. Issues that could arise in the field during these early packages (such as unanticipated driving conditions and/or additional pile depth) would then be incorporated into the follow on plans with no loss of quality or delay to the project.

Proper schedule planning would take into account the TOY restrictions, and the Contractor, State and Designer work together to jump start designs or permit reviews of construction affected by the time restrictions or other permit issues. Because of the environmental sensitivity of the project the project could also be broken down into sections with permits from MDE or other permitting agencies obtained in a staged order to meet the actual construction schedule or upland areas started prior to final approval of the lowland or stream sections.

To maintain efficient decision making minutes of all meeting would include action items in the minutes with "Ball in Court" and due dates identified. Suggested enhancements / modifications to the design that could minimize risk, cost or schedule that are suggested or identified would be tracked in a risk register. The risk registers heading utilized on this project could include:

Risk	Category	Impact (Minor, Moderate, Significant)	Risk to Cost, Schedule, Environment, Community Acceptance, Traffic, Historic, etc.	Best Entity to Manage the Risk	Probability of Risk Occurring	Potential Mitigation Strategies	Chosen Strategy	Person Responsible

The tracking sheet would be maintained of all suggested changes to the design, identifying potential risk eliminated, cost or schedule advantages, additional risks, impacts on other portions of the design or permitting, status of investigation or implementation, individual responsible and anticipated date of any required action. These suggested changes could come from Corman estimators, field staff or in-house designers or the MSHA or its designer. It is even possible a stakeholder or permit agency reviewer may contribute to the potential list of comments. The tracking sheet would be reviewed at each regular progress meeting. Separate face to face or conference calls can be established with key personal (Contractor, State, Designers or permit / stakeholder agencies) available to discuss specific potential suggestions. An advocate would be assigned to champion each suggestion to ensure full evaluation is performed with the proper personal involved and resolution obtained in a timely manner. the regular meetings, or at a special meeting the suggestion / comment would be discussed by Corman, MSHA and Designers with a consensus reached on its merits and a direction determined to 1) incorporate, 2)continue to investigate or obtain additional data/ information, or 3) abandoned. The above referenced tracking sheet would be updates and serve as a permanent reference of the comment and resolution.

Corman Cost Estimator, David Gates, will lead the development of an open cost model for the ICE so that assumptions, contingency, and approach to the estimate are similar. David successfully implemented this process on Corman's recently completed MD 24 CMAR project. Once the plans have reached their agreed upon design milestone for pricing, three progressive cost estimates will be prepared through an open-book cost model with MSHA, a Guaranteed Maximum Price (GMP) will be prepared with little risk to MSHA. To additionally minimize MSHA's risk it is anticipated that this process will occur multiple times for the various agreed upon sections, phases or construction packages as determined through the scoping workshop and subsequent discussions to reach on-time or early delivery of the project. During this time, we also anticipate working with MSHA and the ICE on Long Lead Time Procurement (LLTP) of items such as bridge elements or other specialty items included in the design of the project.

b. Top Risks and Innovations

RISK OR INNOVATION DESCRIPTION	**PROBABLE COST SAVINGS OF RISK MITIGATION OR INNOVATION	PROBABILITY OF OCCURRENCE	COST SAVINGS TO PROJECT *(PROBABLE COST SAVINGS X PROBABILITY OF OCCURRENCE)*	SCHEDULE IMPACTS TO PROJECT (DAYS)	SUMMARY OF IMPLEMENTATION OR MITIGATION / ELIMINATION PLAN
1. INNOVATION: Eliminate issues with site access and material handling within the existing Park environment along the alignment.	**Construction Cost:** $150,000 **User Cost Savings:** $1,095,000	100%	$945,000	700 days	Develop access plans along the entire alignment possibly using temporary bridges at stream crossings. This will keep construction traffic from having to go through the Town.
2. RISK: Schedule Delays that Requires the Extended MOT Impacts to of Route 97– Commuters, school busses, Park users, and EMS units will be counting on the project's timely completion within reasonable constraints. Extending the impacts beyond those assumed would put the project at risk in meeting the stated goals.	**Construction Cost Savings:** $100,000 **User Cost Savings:** $95,000	50%	$95,000	30 days	Use early design packages to help commence construction early to avoid delays. Provides more efficient approach to project schedule. Develop access plans along the entire alignment possibly using temporary bridges at stream crossings to minimize traffic impacts to existing roadway.
3a. RISK: Utility Relocations (Scenario A) – The overhead utility lines are not relocated timely jeopardizing the schedule.	**Construction Cost Savings:** $400,000 **User Cost Savings:** $	30%	$120,000	120 days	Mitigation 3A: Consider hiring a specialty firm to assist with utility design/construction coordination tasks. This projected cost is for accelerated forces to overcome the delay and maintain the schedule completion date.
3b. RISK: Utility Relocations (Scenario B) – The overhead utility lines are not relocated timely jeopardizing the schedule.	**Construction Cost Savings:** $400,000 **User Cost Savings:** $	30%	$120,000	120 days	Mitigation 3B: There are three sets of overhead lines where the alignment connects to existing roadways. Two (2) along MD 97 and one (1) on Brookeville Road. Proactive design interaction to develop solutions to avoid relocations at the southern roundabout and along Brookeville Road. The northern connection along MD 97 will require relocation work. This projected cost is for accelerated forces to overcome the delay and maintain the schedule completion date.
4. RISK: Schedule Delays Due inability to obtain A Permit / Stakeholder approval on time: a. MDE, DNR, & USEPA b. MNCP&P c. Montgomery County d. Town of Brookeville e. USACE f. US Fish & Wildlife	**Construction Cost Savings:** $200,000 **User Cost Savings:** $	40%	$80,000	60 days	Our team will work with MSHA, Designer and agencies to review project conformance to permit requirements. Innovative suggestions will be made to adjust means and methods to satisfy agency or stakeholder requirements. This projected cost savings is for accelerated forces to overcome the delay and maintain the schedule completion date.
5. INNOVATION: Avoid excessive design of SWM facilities such as ESD and SWM filtration ponds to meet stringent water quality/quantity requirements and avoid and minimize impacts to natural resources.	**Construction Cost Savings:** $150,000 **User Cost Savings:** $	100%	$150,000		Our team will work closely together during constructability reviews to optimize designs to meet requirements and keep costs under control. Alignment will be reviewed and adjusted to avoid and limit impacts.

RISK OR INNOVATION DESCRIPTION	**PROBABLE COST SAVINGS OF RISK MITIGATION OR INNOVATION	PROBABILITY OF OCCURRENCE	COST SAVINGS TO PROJECT *(PROBABLE COST SAVINGS X PROBABILITY OF OCCURRENCE)*	SCHEDULE IMPACTS TO PROJECT (DAYS)	SUMMARY OF IMPLEMENTATION OR MITIGATION / ELIMINATION PLAN
6. **Risk: Schedule delays in obtaining ROW**.	**Construction Cost Savings:** $150,000 **User Cost Savings:** $0	20%	$30,000	45 days	Add additional resources/manpower as necessary to mitigate schedule delays
7. **INNOVATION: Design for addressing the Intermittent Watercourse 3 and Perennial Watercourse 4 challenges for impacts and avoidance.**	**Construction Cost Savings:** $50,000 **User Cost Savings:** $0	10%	$50,000		Proactively work with design team to relocated Watercourse 3 along the alignment ditch lines.
8. **INNOVATION: Perform additional archeological site investigations within the proposed alignment**	**Construction Cost Savings:** $30,000 **User Cost Savings:** $	100%	$30,000		Pre-investigate work area for additional archeological items for removal.
9. **Risk: Geotechnical conditions are not as expected.** Possible rock excavation may occur in deep cuts causing delays while rock remediation technical are used.	**Construction Cost Savings:** $189,000 **User Cost Savings:** $	30%	$56,700		Provide additional rock probing in questionable areas for firm estimating purposes. This information could provide needed information for varied designs that may include retaining walls or steer uncertain rock excavation costs into risk sharing pool.
10. **Risk: Protection of the Reddy Branch and Meadow Branch (Class IV-P waters -Recreation Trout Waters & Public Water Supply) Instream work avoidance between March 1st. and May 31st.** Additional erosion controls maybe required to ensure streams are protected especially during bridge construction.	**Construction Cost Savings:** $80,000 **User Cost Savings:** $	50%	$40,000	120 days	Maintain optional dewatering devices such as a “Rain-for-Rent” pumping system for handling water beyond capacity of temporary dewatering devices. This will allow work to continue and avoid disruptions to project schedule. Perform Turbidity testing.
11. **Risk: Failure to establish a collaborative partnership with all stakeholders**	**Construction Cost Savings:** $100,000 **User Cost Savings:** $	20%	$20,000	30 days	Our team will meet early and often with all stakeholders to ensure their cooperation and assistance.