ORIGINAL

Technical Proposal

MD 24-Section A, from Deer Creek Bridge to 1,800 feet South of the bridge, and Section G, from 900 feet South of Sharon Road to 1,700 feet North of Ferncliff Lane

Harford County

Project Number HA3345171
FAP Number Pending

October 2, 2013

Submitted to:

SHA State Highway Administration
Maryland Department of Transportation

Submitted by:

CORMAN CONSTRUCTION

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Project Management Team

Corman's Capability

B. PROJECT MANAGEMENT TEAM / CORMAN'S CAPABILITIES

1. Project Management Team

a. Key to success of any project is the assigned staff – their experience in the anticipated work, their ability to work collectively, communicate, and 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 MSHA projects.

Corman Construction, Inc, as the Prime Contractor, will lead the effort and be the contracting entity to Maryland State Highway Administration (MSHA). Key functions by Corman preconstruction include: Project management, pricing, constructability reviews and value engineering of designs prepared by others. Active participation in the existing 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, division 100 requirements, material purchasing, survey / stake out, clearing and E&S control installation, grading for and placement of all specified contract items, 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 will also obtain construction-related permits. Another key to project success will be partnering and coordination with MSHA, Designer and major stakeholders, including the Park and advisory committee, local authorities (School, EMS, Police and Fire responders) and permitting agencies.

Corman has asked ***Chesapeake Environmental Services (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 Deer Creek project, including: USACE, US FWS, US EPA, MD DNR,, MSHA, and MDE. Their key staff has a history of working with Corman on projects, such as Hampstead Bypass, ICC's 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 of the design, as well as confirming all anticipated permits have been accounted for. During construction, we envision CEM providing an Environmental Compliance Monitor to ensure compliance.

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, the Corman Team will join forces with the MSHA and designer in a collaborative Partnering session to understand what has been completed so far, what the constraints are, key project goals that need to be stressed, schedule, and proposed working relationships. With MSHA's approval, we would also meet with the key stakeholders to include local officials, utilities, Park officials, permit reviewers, school transportation departments and EMS responders to clearly understand their concerns. These meetings could be held jointly with the Design team and / or MSHA.

After reviewing designs to date, reading stakeholder and/or design team meeting minutes, attending the abovementioned partnering / stakeholder meetings, we would conduct a Designer / MSHA / Contractor meeting 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 Deer Creek project with the value engineering study geared to ensure economical compliance with the 10 key project goals listed in the RFP.

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 Park authorities, and environmental resources 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, park users, 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 the many stakeholders during construction:

1. As mentioned, immediately after the NTP, hold the Kick-off meeting with MSHA and its designer, stakeholders and agencies.

2. Hold daily informal meetings between our CM and MSHA on-site representative to discuss daily and upcoming issues, such as future temporary lane closures, additional signing required, working within the creek, or returning a local resident's phone call. 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 Progress / Partnering meetings with the major stakeholders, including MSHA, Park Authorities, 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 and utilities early and aggressively manage the processes to stay on schedule. The key is assigning dedicated Permit and Utility Coordinators to take charge in completing applications expeditiously, address review comments immediately, and schedule field efforts effectively. Tim Bulford is our Utility Coordinator and CEM's Matt Wiherle, Environmental Permitting Coordinator, who will lead the permitting efforts for Corman, will both work 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. They will navigate through the requisite channels of utilities or permits, respectively, to accelerate decision making and reviews. We recognize the time-sensitive nature of this project and will work to expedite these two critical path elements. Matt will work closely with the MSHA's design team to:

- Contact each permitting agency to confirm understanding of the permit requirements and procedures to obtain the permit for our stream and roadway work, as well as those required by the utility companies.
- Develop a Permit Tracking Database that individually lists the activities required to submit and the time considerations of each activity / review.
- Review the Permit Tracking Database weekly with the Project Manager.
- Visit with the permit agency as needed to review the tracking sheet and confirm policies and procedures.
- 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.

- Adhere to any Time-of-Year Restrictions (TOYR) pertaining to working within jurisdictional waters.
- 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 reviewing parties regarding any additional project effects outside of the previously defined Area of Potential Effect (APE).
- 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, the local advisory committee and Park authorities and 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 maintenance and protection of traffic will be coordinated with the Park and local authorities.

During construction, the Corman Team will have weekly Operations Meetings to generate a two-week work schedule which will include any MOT changes or potential road/lane closure that will affect the Park. 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. Road/lane closures will be required and will only be implemented during off-peak traffic hours. 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 notifing 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 park area, we will pay close attention to safely separate recreational users from the work areas on land and on water.
- 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.

b.

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	33 / 34	BS, Civil Engineering MD/SHA Erosion & Sediment Control Yellow Card	Corman Construction
Construction Manager	Jeff Walton	12 / 28	MD/SHA Erosion & Sediment Control Yellow Card	Corman Construction
Cost Estimator	David Gates	7 / 27	BS, Civil Engineering MDE Green Card	Corman Construction

[1] Present Firm/Total

JO ELLEN SINES, DBIA - PROJECT MANAGER

YEARS WITH CORMAN: *33* / **TOTAL YEARS:** *34*
EDUCATION: *BS, Civil Engineering, University of Pittsburgh*
ACTIVE REGISTRATIONS: *DBIA #D651*
MD/SHA Erosion & Sediment Control Yellow Card, MDE Green Card; *OSHA 10-Hour, Guidelines for OSHA Site Inspection; Environmental Compliance Awarness Training*
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. She has 34 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, and MD 216 US 29 to I 95.

RELEVANT PROJECT EXPERIENCE

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 ***imbricated stone and 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.

Sept. 2002-June 2005 Design-Build MD Route 216 US 29 to I-95, Howard County, MD-$21.1M- MSHA As **Design-Build Project Manager,** Jo Ellen integrated the job team and lead preconstruction design and procurement, assisted in the integrated design and constructon schedule, oversaw construction, 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 (including bifurcating east and westbound roadways to reduce earthwork), phasing and design deliverable schedule, worked with staff on project management functions, and developed approaches for the procurement phase. Project was a two-mile realignment of MD 216 with two signalized intersections, a new off-ramp, and roadway reconstruction. ***Stream enhancements included 1,032 LF and 9,174 SF of stream restoration/relocation*** within Hammond Branch to correct instability, including bank erosion and bed degradation, and improve riparian and in-stream habitat.

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. 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 236,000cy of rock, utility relocations, 3 round-a-bouts, 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. Worked 292,092 man-hours with one recordable incident.

1997 Sligo Creek, Montgomery County, MD -$2.3 M-Washington Suburban Sanitary Commission **Project Manager** for a a Sligo Creek Trunk Sewer replacement and 4,000' hiker/biker trail and foot bridges ***with imbricated rip rap walls*** supporting Sligo Creek Parkway.

JEFF WALTON - CONSTRUCTION MANAGER

YEARS WITH CORMAN: *12* / **TOTAL YEARS:** *28*
ACTIVE REGISTRATIONS: ***MD/SHA E&S Yellow Card; MDE Green Card;*** *ATSSA Flagger*
Certification; OSHA 10-Hour, CPR; First Aid
TRAINING: *ECAT; Confined Space; Fall Protection; Excavation; Scaffold*
COMMITMENT & TIME AVAILABILITY FOR THIS PROJECT: *Precon. 15% / 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 experience includes installation of imbricated stone walls and in-stream diversions, including the portadam system and mussel suvey/translocation on the James River Project just completed in 2012.***

RELEVANT PROJECT EXPERIENCE

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, coordinated E&S field changes, and oversaw environmental commitment program compliance. He temporarily relocated five streams (to build permanent structures) and stream restoration in their permanent locations, while maintaining stream flow. He managed three crews who meticulously built ***imbricated walls,*** plunge pools, and hand placed rocks per design. Work was completed while maintaining the stream and wildlife habitats. Jeff managed earthwork, drainage construction, and stormwater management and oversaw/coordinated with the MDTA Maintenance Facility, adjacent ICC-B project, and assisted the Project Manager 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. For each crossing, there was stream relocation/ restoration.

June 2011-Sept. 2012 Stream Restoration/Fish Passage on Rock Creek, Rock Creek Park, Montgomery County, MD- >$1M-MSHA-As **Construction Manager,** Jeff oversees construction permit acquisitions, installation of fish weirs across the stream, changing the hydraulics so fish can migrate downstream and over the sewer lines and boulder toe and wall construction to stop erosion of the stream banks. Project included ***in-stream diversions*** and restorations at four locations along Rock Creek. Installed ***imbricated fish weirs*** to create ideal areas for fish to spawn; ***imbricated stone walls; and toe of slope protection*** along the creek for tree root preservation and live branch slope protection to reduce future stream erosion. Trenchless silt fence, mulch access roads, and construction entrances to limit areas disturbed during construction.

Sept. 2003-May 2005 Design-Build MD 216 US 29 to I-95, Laurel, MD-$21.1M-Maryland Dept. of Transportation/State Highway Administration-As **Construction Manager,** Jeff worked with the Project Manager (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 IEM and MSHA QA Inspector, often walking the project to verify compliance. He conducted weekly E&S control meetings, inspected controls daily, participated in modifications with MDE, and tested the OOC61 form. ***Stream enhancements included 1,032 LF and 9,174 SF of stream restoration/relocation*** within Hammond Branch to correct instability, including bank erosion and bed degradation, and improve riparian and instream habitat.

*As a **Foreman** with Charles E. Brake in St. Thomas, PA, Jeff oversaw and installed an ½ mile long, 40' high **imbricated boulder toe wall** to armor the bank of the new approach to the new Harpers Ferry Bridge project in West Virginia.*

DAVID GATES – COST ESTIMATOR

YEARS WITH CORMAN: *7* / **TOTAL YEARS:** *27*
EDUCATION: *BS, Civil Engineering, University of Hartford*
TRAINING: ***MDE Green Card;*** *Environmental Compliance Awareness Training; Guidelines for OSHA Site Inspection*
COMMITMENT & TIME AVAILABILITY FOR THIS PROJECT: *Precon. 30% / Const. 5%*

Progressing from Estimator to Estimating Manager, David leads nine 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:

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 in-stream work and imbricated stone walls)*** 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. 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 excavation, drainage, retaining walls, paving, structural concrete, maintenance of stream flow, dewatering, and maintenance of traffic.*

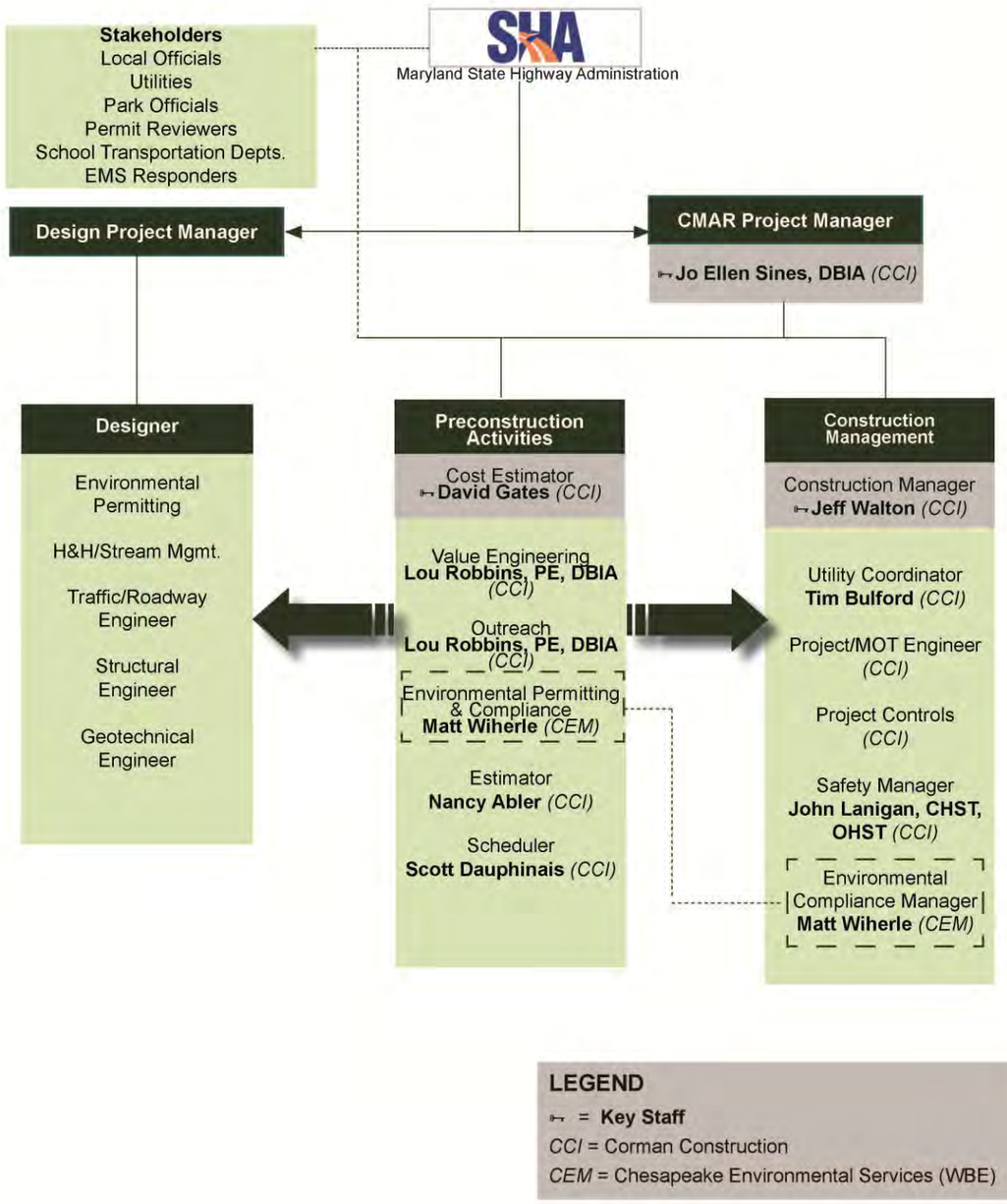
As **Cost Estimator,** David estimated the major roadway components and led the transition from the estimates to the initial design coordination. Prior to construction, David, as **Lead Onsite Roadway Design-Build Coordinator**, met with the designers to coordinate designs and obtain MDE permit approval 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.

2013 TMDL Stormwater Facility Enhancements Design-Build-District 5-$3.7M-MSHA-Retrofitting/ enhancing 11 stormwater ponds to maximize pollution removals, Total Suspended Solids and increase water quality benefits. As **Estimating Manager,** David estimated the entire project, including *excavation, drainage, structural concrete, dewatering, and maintenance of traffic.*

2012 Upper Little Patuxent Stream Restoration, Howard County, MD-MSHA-As **Estimating Manager,** David estimated the entire project,including, *excavation, drainage, maintenance of stream flow, dewatering, and maintenance of traffic.*

Recent Contract Awards where David led the Estimating:
2010 I-70, Phase 2D Design-Build, Frederick, MD-$35.3 Million-MSHA
2013 Route 1 Widening Ft. Belvoir Design-Build, Ft. Belvoir, VA-$69.3M-FHWA

c.



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 pre-construction 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 coordinating with the proposed designer, JMT, having collaborated on several Design-Build projects with them, including our current TMDL project in District 5.

Construction Manager, Jeff Walton reports to the PM. Jeff will manage the on-site construction team, including the Project Control team, 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 coordination 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.

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.

Environmental Compliance Manager Matt Wiherle of CEM will lead Environmental Compliance on this extremely environmentally-sensitive project along Deer Creek. During pre-construction, 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.

Value Engineering 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. Should Outreach with the Advisory Committee or Park officials be required during pre-construction or construction, Lou will assist Jo Ellen in putting them in place.

Safety Manager John Lanigan, CHST, OHST of Corman will report to the PM. John 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, pickners, canoers and tubers near the project. John has the authority to stop work which does not meet our strict safety requirements.

Utility Coordinator Tim Bulford will report to the Construction Manager (CM). He will manage and coordinate all utility interaction during pre-construction and construction and ensure communication and partnering is stressed with all the private, and government utilities. He will maintain and monitor the utility tracking logs, engage the utilities to ensure their work (design and construction) is in concert and agreement with project needs and per MSHA policies and procedures. Tim will also meet regularly with the utilities and their designers to keep abreast of any schedule or cost issues that may arise and will foster a close relationship with the design team.

d.

FORM A-2 PAST PROJECT DESCRIPTION

Name of Proposer: Corman Construction, Inc.

Name of Construction Firm: **Corman Construction, Inc. (part of Intercounty Constructors JV)**

Project Role: **Joint Venture Prime Contractor**
Contractor: ✓ Other (Describe): _____

Years of Experience: Roads/Streets: **93** Bridges/Structures: **93** Environmental: **38**

Project Name and Location: **DESIGN-BUILD INTERCOUNTY CONNECTOR CONTRACT A MONTGOMERY COUNTY, MD**

Project Key Staff (as applicable to project)

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:
ICC-A consists of 7.2 miles controlled-access tri-lane divided highway with utility relocations completed at 106 locations and community outreach to approximately 10,000 residents surrounding the corridor. The environmental sensitivity was unprecedented as it traverses through Rock Creek Regional Park, protected wetlands and watersheds, specimen forests, and streams. Environmental strategies reduced impacts, which are incorporated into written management plans, and included rigorous review of design and construction for regulatory compliance, water-quality monitoring, spill prevention and storm water pollution countermeasures, and employee environmental stewardship training. 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 included an extensive PR program.


Upper end of oxbow relocation at Bridge 21

Oversaw environmental designs for each stream crossing. Mitigation minimized impacts within the ROW and opportunities were evaluated for aquatic and mammal passage, as well as maintaining sediment competency of the affected stream reach. Stream restoration highlights:

- Natural stream substrate materials delicately removed and stored and then placed into new stream locations.
- Substantial natural mass rock was excavated, recycled, and placed along new stream banks for slope protection.
- Tow rocks and cross vanes were installed to provide scour protection

The significant environmental commitments permit conditions and narrow right of ways in sensitive areas (streams, floodplains, wetlands, vernal pools) made designing/building the ICC one of the most challenging projects in the US. Project was completed on time, on budget and finished with a 92% "A" rating for environmental compliance.

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:
Jo Ellen Sines, DBIA (Proposed Project Manager) - 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. She provided management oversight and partnering, supervised project staffing, quality control program development, and joint venture monthly/quarterly reviews.
Jeff Walton (Proposed Construction Manager)-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, coordinated E&S field changes, and oversaw environmental commitment program compliance. He temporarily relocated five streams (to build permanent structures) and stream restoration in their permanent locations, while maintaining stream flow. He managed three crews who meticulously built ***imbricated walls,*** plunge pools, and hand placed rocks per design. Work was completed while maintaining the stream and wildlife habitats.

David Gates (Proposed Cost Estimator): As **Cost Estimator,** David estimated the major roadway, MOT and environmental components ***(including in-stream work and imbricated stone walls)*** 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. This onsite experience enables him to clearly understand the impact between permit acquisition, cost, schedule and constructability.

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.): Maryland State Highway Administration

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

Contact Name: Mark Coblentz **Telephone:** 301-586-9267 / 443-844-9886 Cell

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: **Prime Contractor**
Contractor: ✓ Other (Describe): _____

Years of Experience: Roads/Streets: **93** Bridges/Structures: **93** Environmental: **38**

Project Name and Location: **MD ROUTE 216 US 29 TO I-95 DESIGN-BUILD HOWARD COUNTY, MD**

Project Key Staff (as applicable to project)

Project Manager: **Jo Ellen Sines, DBIA**

Construction Manager: **Jeff Walton**

Description and Specific Nature of Work for which Firm was responsible and how it is relevant to this contract:
Two-mile realignment of MD 216 as a dual-divided highway with two signalized intersections, new off-ramp, and roadway reconstruction. Work included utility coordination, installation and/or relocation of electric, water, sewer, gas, petroleum, fiber optic, and cabling, context-sensitive noise wall construction, 11 new stormwater management ponds (Seven with sand filter constructed in the bottom which filters the water before returning back into streams and wetlands, two included the same filtering system, but encompassed forebay filtering, and two were constructed in a traditional method; one with a concrete weir and one with a concrete riser and outfall pipe). There was erosions & sediment control/permitting, storm drainage, MOT phasing, and stabilization of existing failing outfalls.

Environmental improvements to Hammond Branch stream included 1,032 LF and 9,174 SF of stream restoration/relocation. Restoration corrected instability issues, bank erosion and bed degradation, and improved riparian and in-stream habitat.

Cross vane downstream of the new Leishear Road culvert was designed to hold grade and maintain fish passage through the culvert. Excavation and fill placement in and along the stream channel, established the proper stream platform, profile, and channel cross sections. Also stabilized the re-graded stream channel by installing sod mats and vegetative plantings along the streambanks and rock structures along the channel bed.

3'x3' imbricated rock on Leishear Road culvert

As Design-Builder, Corman was responsible for all aspects of design and construction, including highways/structures, stream improvements, noise walls, MOT, environmental permits and protection, public relations, utility coordination/relocations, and stormwater management facilities. Worked side-by-side during design/construction maximizing efficiency in design applications and construction means and methods.

Project earned impact reduction incentives, and maintained "A" ratings in MOT, environmental and contractor performance. Project was completed on-time, under budget and served as a testament true team partnering.

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:

Jo Ellen Sines, DBIA (Proposed Project Manager) – As **Design-Build Project Manager,** Jo Ellen integrated the job team and lead preconstruction design and procurement, assisted in the integrated design and constructon schedule, oversaw construction, 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 (including bifurcating east and westbound roadways to reduce earthwork), phasing and design deliverable schedule, worked with staff on project management functions, and developed approaches for the procurement phase.

Jeff Walton (Proposed Construction Manager)–As **Construction Manager,** Jeff worked with the Project Manager (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 IEM and MSHA QA Inspector, often walking the project to verify compliance. He conducted weekly E&S control meetings, inspected controls daily, participated in modifications with MDE, and tested the OOC61 form.

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

2006 MdQI Award of Excellence-Partnering-Major Project

2006 MdQI Award of Excellence-Major Roadway Project

2006 PCI Bridge Design Award –Best Custom Transportation Design

Name of Client (Owner/Agency, Contractor, etc.): Maryland State Highway Administration

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

Contact Name: Lisa Choplin **Telephone:** 410-545-8824

Owner's Project or Contract No.: HO3065171 **Fax No.:** 410-209-5001

Contract Value (US $): $20,435,000.00 **Final Value (US $)** $21,116,300.79 *(Includes owner-approved change orders)*

Percent of Total Work Performed by Company: 75% (25% subcontracted)

Commencement Date: 10/5/02 **Original Completion Date As Defined in IFB:** 11/1/04

Actual Completion Date: 5/1/05 *(includes owner-approved time extensions/change orders)*

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: **Prime Contractor**
Contractor: ✓ Other (Describe): _____

Years of Experience: Roads/Streets: **93** Bridges/Structures: **93** Environmental: **38**

Project Name and Location: **STREAM RESTORATION/FISH PASSAGE ON ROCK CREEK, ROCK CREEK PARK, MONTGOMERY COUNTY, MD**

Project Key Staff (as applicable to project)

Construction Manager: **Jeff Walton**

Description and Specific Nature of Work for which Firm was responsible and how it is relevant to this contract:

To effectively allow passage of fish through Rock Creek, this restoration project was broken into four reaches (A through D) associated with the four fish blockages. Reaches A and B were associated with an exposed sewer encasement. Reach C was an old ford within Rock Creek and Reach D was an exposed sewer encasement with a 1-2 foot drop below the pipe. Work consisted of in-stream construction using a pump around to dewater the work areas. The stream restorations at four locations along Rock Creek included:

1. Installing fish weirs (mini rock dams) across the stream, changing the hydraulics so fish can migrate downstream and over the sewer lines. They are constructed out of large imbricated riprap to create safe areas for fish to spawn and provide at least one foot of water flow over fish blockages within Rock Creek.

2. Installing trenchless silt fence, mulch access roads, and construction entrances to limit construction disturbance.
3. Constructing boulder wall and toe of slope protection along the creek for tree root preservation and live branch slope protection to reduce future stream erosion and stabilize the steep banks.
4. Maintaining E&S Control during construction per MDE-approved Contract Documents and environmental permits.

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:

Jeff Walton (Proposed Construction Manager): As Construction Manager, Jeff oversaw installation of fish wiers across the stream and changing the hydraulics, so fish can migrate downstream and over the sewer lines. He managed acquisition of construction permits and oversaw boulder toe and wall construction to stop stream bank erosion. Jeff designed and implemented the pumping system to divert the stream around the work areas. This was a very constrained site where materials are sequenced for delivery. Under Jeff's direction, mixing specialized materials for the stream bed were done at the quarry and delivered onsite. Jeff also supervises field operations, coordinates labor, equipment, and subcontractors, develops short-term look-ahead schedules and participates in CPM reviews, oversees safety and QC compliance and close out.

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

Name of Client (Owner/Agency, Contractor, etc.): Maryland State Highway Administration

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

Contact Name: Mark Coblentz	**Telephone:** 301-586-9267 / 443-844-9886 -Cell
Owner's Project or Contract No.: AX3765M60	**Fax No.:** 301-586-9222
Contract Value (US $): $665,171	**Final Value (US $)** $676,000 *(owner approved quantity overruns)*
Percent of Total Work Performed by Company: 90% (10% subcontracted)	
Commencement Date: 6/1/11	**Original Completion Date As Defined in IFB:** 5/31/12
Actual Completion Date: 2/1/13 Had 250 days to complete the project; we completed it in 180 days	
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 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 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. 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 provides 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 a average ESC environmental quality assurance rating of 97.34%.

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.

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.

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 E & S meetings in the contractor's field office with the Environmental Monitor, Contractor PM, DB Manager, Superintendent, E & S 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 E & S 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 Erosion and Sediment Controls – 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. DB Intercounty Connector, Contract A: (a) Stop work order was issued for working out of sequence when demolishing homes. E & S Controls, were in place, but the subcontractor started in the wrong order. ***HOW WE ADDRESSED IT:*** The DB 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 DB 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 ESCM 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 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.

Now on the flip side, 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

Corman is proud to make this statement: As shown in the above table, 96.9 % 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 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 E & S 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 E&S needs. Prior to starting work, we will hold an E & S meeting onsite to establish protocols with all parties involved, including outside agencies.

Erosion & Sediment Control 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.

Project Approach

C. PROJECT APPROACH

1. Project Goals

a. Corman understands this is the first Construction Management at Risk (CMAR) project for MSHA and success will be gained by a solid collaboration that fosters the best cost-effective solutions given the site constraints. 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 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 from the contractor through each phase.

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. 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 recreational users and workers will be at the forefront at each level of development and implementation. We will endeavor to improve road safety by remediating the slope supporting MD 24, repairing the pavement, improving roadway drainage, and addressing roadside safety concerns.

2. Minimize impacts to the physical environment (e.g. parkland, forests, streams, etc.) This is paramount. Schedule restrictions involving the Time-of-Year Restrictions (TOYR) for Deer Creek and endangered species takes significant consideration. Stream diversions and environmental features will be developed to work with surrounding conditions. ESC measures and construction methods of the diversions will account for weather fluctuations.

3. Minimize inconvenience and impacts to the traveling public and other users of the area: *W*e will research how to reduce closure periods and brainstorm ways to maintain use of the facilities as much as possible for recreational folks.

4. 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. A kick-off partnering session will immediately be held where everyone meets and understands their 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.

5. Project completion on budget and on schedule; 6. Provide high-quality design input and construction product; and 7. Provide an aesthetically-pleasing and context-sensitive project: Practical constructible solutions will be presented based on our extensive roadwork and environmental experience for on budget, on schedule completion and provide high-quality design input and construction product. We will approach these with aesthetically-pleasing and context-sensitive solutions by working with the advisory committee and other stakeholders for their concurrence.

8. Engage in meaningful risk and cost model discussions with the project team: Considered the backbone of the CMAR process, this is where Corman will vet options brought to the table to see if they will net cost-effective solutions. This promotes innovation, prevents unnecessary engineering costs and loss of valuable time.

9. Ensure equal opportunity and non-discrimination throughout the project and 10. Develop opportunities for and integrate small and disadvantaged businesses on the project: Corman supports equal opportunity and

non-discrimination in all company-related business everyday. We continually develop opportunities to incorporate small and disadvantaged businesses in all our projects.

b. ***Approach to Maximizing and Attaining the Project Goals:***

1. Safety is one of seven core values at Corman. It is the top priority of Corporate Management and every job-specific team. Our approach is to implement proactive and preventative measures to keep the community and every employee safe and healthy.

- Safety is a top priority that will be fully evaluated when discussing design and construction options..
- Motoring traveling public safety will be incorporated into all maintenance of traffic alternatives and detours. As the road will be closed, the goal is to lessen the duration as much as practical. Corman will maintain an active MOT inspection protocol to assure devices are maintained and functioning
- Since this is an active park area, special attention will be paid to safely separate recreational users from the work areas, on land and on water.
- Worker safety is held in high regard. All work will require a detailed work plan and job hazard analysis for each task. Daily Huddles will be at the start of shift to communicate between the Foreman and the crew and review upcoming activities, safety, and quality.

2. Minimizing impacts to the physical environment is also a top priority. Successful techniques from prior projects, such as the Hampstead Bypass and 14 miles of the ICC, during design development with MSHA and designer are just a few examples. We will suggest options and pricing accordingly. Over the past 10 years, Corman has successfully reduced environmental impacts on our DB and DBB projects.

PROJECT	TECHNIQUE	ENVIRONMENTAL BENEFITS
Intercounty Connector Contract B	Drilled shaft foundations	Reduced impacts in Special Protection Areas
	Used geo-grid, wood chip and aggregate system for haul road through wetlands	Minimize perminate impacts
	Measured / managed noise/dust/mud tracking	Minimize temporary Impacts
	Used telemetry sensors in streams	Monitored/protected water quality 24/7
MD 30 Hampstead Bypass	LOD was reduced where possible.	Avoided disturbance to the tree cover

3. 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 with the *"get-in, get-out"* philosophy. For example, we will approach the imbricated stone wall by completing work sections by shift so at the end of each shift, there is no chance of lost work or exposed disturbed earth. Detailed work schedules for highly-sensitive work areas will be discussed with the crews. These may include hourly schedules for the shift so all stones required to handle unexpected rain are installed.

Corman has a long history of delivering complex, aggressive projects on time with minimal impacts where we implemented our established project management practices that incorporate preconstruction planning, short and long-term scheduling, safety, and quality. To validate Corman's continued success on fast track, high demand projects, the following is an example:

- **Short-Term Detailed Scheduling:** Corman was the prime contractor for the Frederick Douglass DB reconstruction project adjacent to the Washington Nationals Baseball Stadium. The key requirement was to demolish a section of the existing bridge, hydraulically lower four spans to form a new approach and reconstruct six blocks of South Capitol Street within a 62-day closure. Corman worked 20 hour days/seven days a week to reopen South Capitol Street / bridge to traffic eight days ahead of schedule.

Detailed schedules were developed per shift. Planning meetings prior to each shift were held with the crews to review expectations, material needs, and work accomplished in the prior shift.

There was close coordination with city and federal agencies to implement the road closure given the critical nature of this arterial roadway. Corman deployed visual warning signs as far as 30 miles away. Assistance was provided to DDOT with a successful multi-media outreach program (radio, print, online, TV) to advertise the closure and avoided disastrous traffic jams.

4. With an understanding and agreement to utilize partnering to the fullest extent, we can focus our combined efforts to make this project a success. We will establish the standard for open and frequent communication between team members early on through brainstorming, design development sessions, constructability reviews, and progress meetings. This level of interaction and communication establishes an environment of trust and provides an avenue to continually monitor the project goals and the team's progress toward achieving them. We will work closely with third-party stakeholders to find clear cut solutions. Through partnering with the project team and stakeholders, cost effective and efficient solutions that come from shared experiences are revealed. Prior to construction, we will establish a resolution ladder to reach decisions immediately should unforeseen conditions arise. With the road closure period so critical, decisions need to be made without delay.

5. Corman delivers projects on budget and on schedule. Participating in the design provides an opportunity to discuss constructability and schedule risks. As the cost estimating is progressed at the milestone marks, MSHA, designer and Corman will monitor the affects to the budget and schedule to stay on track.

6. Our design-build experience and environmental construction resume are an outstanding asset when working with designers on constructible, cost-effective solutions. Our firsthand experience delivering superior quality design and construction on the ICC and other DB projects is invaluable. We are accustomed to working side-by-side with design teams to develop high-quality designs *and* working alongside with compliance teams in the field to follow through with superior final products. To valid this commitment, we consistently maintain environmental compliance ratings of over 90% and have won seven environmental awards in recent years.

7. We pride ourselves in providing aesthetically-pleasing and context-sensitive projects and have won two awards. In many instances, materials were imported from another state to provide the needed natural looking materials. As design progresses, we will research the availability of desired materials, which will be factored into the cost estimating for team member understanding and evaluation.

8. Risk and cost models will be evaluated as the project progresses. We are accustomed to these evaluations through our DB experience as we develop our preliminary plans during procurement and continue on through final plan development. For this project, one primary focus is the design and implementation of the stream diversions. Through our recent delivery of the ICC, Rock Creek, and several VDOT projects, we are positioned to engage in meaningful risk and cost model discussions of in-stream work with the project team.

9. Corman is committed to providing equal opportunity and non-discrimination throughout the project through strict enforcement of our current non-discrimination policies.10. Corman is committed to providing opportunities for small and disadvantaged businesses. We continually meet or exceed goals set forth by our contracts and have well established relationships with local DBE/WBE firms. In 2011, Corman was named *"Prime Contractor of the Year"* by the Maryland Washington Minority Contractors Association. We continually provide opportunities for minority subcontractors on all our projects, with or without mandated goals through an effective outreach program to local disadvantaged firm.

2. Project Approach

Corman's approach in providing successful general contracting services based on prior experience and how it applies to meeting MSHA's project objectives.

a. Corman has a proven record of professional excellence in contract management and on-time, on-budget completion of highly environmentally-sensitive and technically-challenging infrastructure projects on some of MSHA's most visible and heavily-traveled roadways. We will aggressively plan and manage this project

through detailed upfront planning and scheduling of key elements, including preconstruction services; construction activities; material orders and deliveries; quality; safety; and stakeholder coordination.

To manage this project, our organizational structure consists of a Project Manager, Project Engineer, Construction Manager, Utility Coordinator and ESC Manager. The Project Engineer and Construction Manager will be the hands on Project Management staff onsite daily and supported by the Project Manager from the corporate office. The Construction Manager will oversee all work for quality control.

Integration with design team during preconstruction: The following project goals will be at the forefront during preconstruction, including value engineering, constructability reviews, estimating and risk analysis:

- Provide a Safe Site for our workers and the general public
- Minimize public inconvenience
- Protect the adjacent environment (stream, woodlands, and parkland) and comply with permit constraints
- Complete project on budget and on schedule
- Turn over a quality product that eliminates future erosion
- Blend project in with the natural ambiance and context of the adjacent environment

Risks and value suggestions will be evaluated by the full project team on these key project goals.

Many of the preconstruction requirements are similar to the standard practices Corman performs on our DB projects. This includes plan reviews, value analysis studies, and constructability reviews. We establish a collaborative relationship with our designer during procurement that continues until construction is complete.

During design development, 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.

In-house Estimating: Corman maintains a staff of 10 dedicated full-time estimators. Our three utility and underground estimators have 98 years combined experience. The bridge, highway, and environmental group is led by four estimators with a combined experience of 85 years in this area. The remainder are general construction estimators with broad experience in civil construction. Corman estimating includes detailed takeoff and production estimating, as well as intensive bid reviews prior to submission.

In addition to the full time 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. By working our field management staff into estimating, we boost our estimating capabilities during high volume bids/proposals. It also 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 Little Patuxent Stream Restoration and our TMDL projects, both DB projects for MSHA. He will be involved in estimating this new project.

We have on staff six 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 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 Bid2Win, 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.

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

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 Viewpoint project management system, which is hosted and maintained by Corman. This tracks and manages the project life cycle, including controls, contract management, RFIs, change orders, submittal/ transmittals, meetings, issue logs, and more.

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 two-week production schedule are determined. The two-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. Once field activities commence, Corman establishes field offices near the work site and holds progress/partnering meetings there. Our project controls system includes these meetings:

- **Weekly** two-week production schedule meetings with key operations staff and management.

- **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 two-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 400 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 the capability and experience to self perform the majority of work on this project, including maintenance of traffic, roadwork, stream diversions, imbricated walls and associated work, and erosion and sediment controls. As previously described, local resources are available to staff the project.

Subcontracted Work: Subcontract work will consist of the specialty items: asphalt paving, striping, signing, guardrails, trucking, landscaping, and rock excavation.

b. Environmental Process and Permitting Commitment Approach: For this project, we envision our subcontractor CEM's involvement during preconstruction and construction. Their expertise will be invaluable in our Value Engineering of the design and confirming anticipated permits are accounted for. From our ICC experience, Corman will provide input during constructability reviews to establish workable sequence of construction plans. During construction, we envision CEM providing an Environmental Compliance Monitor (ECM) to ensure compliance.

Implementing an Effective E&S Control Plan: In addition to CEM monitoring compliance, proposed Construction Manager Jeff Walton will oversee environmental compliance of our field operations daily. Jeff has firsthand experience on the ICC-A as the ESC Manager, where he was responsible for daily field compliance from start to finish. He will document compliance, work with MSHA and their inspectors, monitor weather, and redirect crews as necessary for post storm events. Jeff has a thorough knowledge of commitment tracking databases, processing field modifications when necessary, and installing environmental features. He will oversee the field work and provide input in developing the sequence of construction as it relates to environmental compliance.

c. Construction Approach and Sequence that Optimizes Value, with a Realistic View of Known Constraints

SECTION A - Our construction approach maximizes allowable construction time when flows are expected at their lowest elevation; August through October. This addresses the TOYR, March 1 – May 31, and mussel survey and translocation anticipated during July. It will take multiple crews, shifts, and locations to accomplish

the work in a short three-month window for in-stream work, followed by the roadwork to be concluded by mid-November.

With an expected NTP for construction of July 14, 2014, we anticipate closing the road immediately and prepare the in-stream work. At the beginning of August, after the mussel activity has concluded, in-stream work will begin with installing the stream diversion(s). Once the stream is diverted, grading will commence for the imbricated wall(s) construction, followed by the storm drainage, landscaping and road reconstruction / resurfacing and roadside improvements.

Our approach to constructing the imbricated walls is to open only the amount that can be finished within the shift. This eliminates exposure of unfinished work and exposed earth disturbed areas. Our experience with in stream work is to get in and get out as quickly as possible. With the project's schedule demands, we will look to working multiple shifts to lessen the time the diversions are in place. We have evaluated several types of the diversions for the project; each has their unique benefits vs. cost. We will cost estimate these alternatives through the preconstruction phase to determine the most beneficial to the project while incorporating the TYOR, mussel schedules, and overall goal of minimizing the road closer period.

SECTION G - In this section, the sequence of work will pattern after Section A unless the in-stream work significantly decreases and excavation work increases. NTP is suggested as July 14, 2015 and work could start immediately on mass excavation. The goal is still to perform all in-stream work directly after the mussel translocation during August through October. Getting the roadway paved prior to Thanksgiving is a priority.

Factors that Could Affect the Project Schedule:

- Delayed utility relocations – the utility poles adjacent to the imbricated walls are directly in conflict with the proposed design requiring relocation.
- Should the mussel survey and translocation take longer than a month, the in-stream work could be in jeopardy to finish during favorable low flows.
- Severe weather can overtake the in-stream diversion requiring re-work.
- Permit delay(s) could delay the start of work. This could affect getting the work done in the 2014 and 2015 seasons.

d. Other Corman Resources and Capabilities Beneficial in Achieveing Project Goals

1. Design-build experience is an asset during preconstruction.
2. All three key staff have ICC experience with its extensive environmental constraints. Experience was gained firsthand on the value of the contractor advising on the sequence of construction.
    - Jeff Walton was the ESCM on ICC-A from start to finish and is highly experienced in environmental compliance and installing features, such as imbricated walls, live stakes, rock benches, etc.
    - David Gates, Cost Estimator, was responsible for E & S plan development and review on ICC-B to obtain MDE permits. He worked with our team's Independent MDE Reviewer, to obtain permits timely. On Contract A, he provided the transition from estimating to production and oversaw environmental plan development.
    - Jo Ellen Sines, DBIA, Project Manager, oversaw formation of the environmental plan and team development on both ICC A and B, including the Environmental Compliance and Awareness Training (ECAT). She was also the DBPM on the Hampstead Bypass and MD 216 projects to implement in-house daily monitoring of ESC.

3. Corman has previously worked in Deer Creek. We reconstructed the Route 161 Bridge over Deer Creek where an in-stream diversion was utilized successfully consisting of sand bag/barrier wall combination

for pier/abutment construction. Special care was given to housekeeping and material/equipment staging in the flood areas to avoid debris from leaving the work area.

4. Corman has experience with many different in-stream diversions, ranging from Portadam systems in the Brandywine, James and Potomac Rivers, to conventional sand bags, large sand bags, sand bag/barrier systems, sheeting systems and large block diversions. In the last year, Jeff Walton installed a portadam system in the James River in the Richmond area where he constructed a berm inside the dam to separate clean water for the pumping system to maintain a dry work area.
5. Corman has constructed imbricated stone walls for WSSC at Sligo Creek in Takoma Park, MD, WVDOH at the Shenandoah in Harpers Ferry, WV, and MSHA on ICC A and the Rock Creek Stream Restoration. Many of the materials were imported from neighboring states to meet the aesthetic requirements. Jeff Walton installed three of these four walls. The wall along the Shenandoah was a ½ mile long and 40' high to armor the bank of the new approach to a new bridge. The imbricated rock was locked in place into the bank and faced with large riprap. Similar to stone work installed by a stone mason, placing imbricated walls is a combination of *Art and Stonework*. It requires a large work area to spread the stone out for selection of the next piece for production and high quality. Jeff also has firsthand experience on the excavator performing this work. He will be a great asset to the work crew for training of the proper and efficient placement of the rocks.
6. Corman maintains in-house construction engineering / stakeout to expedite responce time to issues that may arise in the field.
7. On our Korah 3 project in 2012, Jeff Walton was involved in the translocation of mussels.

e. Potential Project Challenges and Mitigation

1. Weather when working in streams, like Deer Creek, that range from a normal flow of 30" to a 2-year storm height of 12 to 13 feet. ***MITIGATION:*** We propose working in the most favorable months of the lowest flows. In addition, we will do extensive research and cost estimating of different diversions systems to use in rocky areas with flow variances of 10 feet to see which systems will prove most beneficial.
2. The unknown extent of the mussel survey/translocation. ***MITIGATION:*** We suggest as much pre-investigation as possible to realize the magnitude of the work and probable schedule duration.
3. Obtaining plan approvals from the Advisory Committee. ***MITIGATION:*** We would promote open communication among all team members and conduct workshops, if necessary, to advance their buy-in for approvals.
4. We will also promote open communication with DNR and Harford County Schools to aid us in getting their approval as we propose schedules for road closure periods.
5. In Section G, a potential project challenge will be maintaining ingress and egress of local traffic. ***MITIGATION:*** Again work with the Advory Committee, County Police / EMS and Schools to develop a workable plan – prior to closing the road.

f. Safety Approach During Design and Construction: Safety is one of seven core values at Corman. It is the top priority of Corporate Management and every job-specific team. Our approach is to implement proactive and preventative measures to keep the community, traveling public, and every employee safe and healthy. If incident(s) occur, we strive to minimize the frequency and severity of injuries. The root cause is explored, and revisions, if appropriate, are included in our program, planning, and training. Training, work planning, and visual upper level support are the keys in avoiding incidents.

Safety commitment begins at the very top. Corman's senior executive leadership and management are fully committed to integrating safety into everything we do. Safety is reinforced at every level, from management to the worker in the field. If at any time a potential hazard is identified, every employee on the job site has

the right and responsibility to intervene immediately to the extent necessary to prevent injury or harm without causing danger to themselves.
Corman has a distinct internal Safety Department featuring Corporate Safety Director John Lanigan, CHST,OHST, with over 45 years experience in safe construction practices and risk management, and a staff of safety professionals, safety engineers, and risk/safety administrators.

With working over a million manhours annually, Corman consistantly maintains an EMR between 0.62 and 0.72 respectively and currently holds an impressive 0.66 EMR.

For the MD 24 project, each employee and supervisor will be trained on the job-specific Safety Plan. Visitors must complete safety training and will be briefed on site and task-specific hazards that may be encountered. Personal Protective Equipment (PPE) will be provided for short-term visitors.

Each employee is responsible for creating a safe work environment and the project management team is responsible for the management, surveillance, inspection, and enforcement of the site-specific safety program. At a minimum, field supervisors must conduct weekly Toolbox Talks, Daily "Take 5" Huddles prior to shift, Job Hazard Analyses (JHA) and weekly site inspections. A monthly "All-Hands" safety meeting is held at the beginning of each month and a formal weekly subcontractor meeting is held with onsite subcontractors. Employees new to the site and subcontractor personnel must attend a site safety orientation meeting prior to starting work. Strick adherence is required for PPE, operator license and approved driver policy, and training requirements which include Corman's 29 in-house training classes, such as CPR, First Aid, Fall Protection, Excavation, Forklift, Aerial Lift, and Crane Operation.

At the beginning of the project, the field staff establishes relationships with local clinics and hospitals. "Grab-and-Go" packets are in jobsite offices and contain directions, policies, and forms to assist in treating injuries. If there is an injury, a project representative will accompany the employee to the local hospital or clinic.

Safety and the Community: Project efforts will affect the surrounding community and commuters along the MD 24 corridor. It is critical to develop an effective outreach program informing the public of changes to avoid "surprises" and safety concerns. Advance notification of detours will be implemented. Detours will be well marked and maintained for traveling public safety. Pedestrian / recreational safety will be of upmost concern as the project is in a State Park. Signage and fencing will be installed to communicate the hazards of the project and seal off dangerous work areas.

g. Specific Technical or Production Innovations Related to Design or Construction that may Further Improve Reaching Project Goals
Consider adding a utility relocation specialist firm to assist in timely relocations. This has worked for us recently on Virginia projects where we, as the design-builder, are responsible for utility relocation costs and schedules. The consultant specializes in utility coordination and employs skilled personnel for the design work. They negotiate with the utility company to allow the specialty firm to do the relocation design, present the design for approval and then expedite the actual relocation in the field. With the CMAR process, the utility relocation work does not depend on the NTP and can be advanced concurrently while design is being completed. Corman will work hand-in-hand with MSHA and the designer providing utility coordination during this process. This could potentially remove this scheduling risk to the project.

3. Risk and Innovation Management

a. Corman's Process to Eliminate, and/or Mitigate Risk and Apply Innovation during Design.
The risk and cost model discussions with the project team are the heartbeat of the CMAR process. This is where Corman will vet out options that have been brought to the table to see if they will be cost-effective solutions. This promotes innovative ideas, prevents unnecessary engineering, and loss of valuable time.

For the risk analysis, the joint MSHA, Designer, and Corman Team will employ the Construction Management Association of American (CMAA) endorsed approach to risk management through a *"Risk Register"* which includes a list of identified risks, potential impacts, and mitigation strategies. Successful risk management is robust because it considers risks throughout all facets of the project's life and delivery processes. Our Team's risk management has already commenced, will continue throughout design and construction, and positions us to respond to changes in an organized and proactive way as issues unfold.

The Risk Team will employ this five-step risk management approach:

1. **Identify** – Names risks, determines cause and effect, and categorizes them
2. **Assess** – Assigns probability of occurrence, severity of impact, and determines response
3. **Analyze** – Quantifies severity, determines exposure, establishes tolerance level, and determines contingency (applicable during preliminary design and pricing)
4. **Manage** – Defines response plans and actions, establishes ownership of risk, and manages response (after NTP)
5. **Monitor / Review** – Monitors/reviews/updates risks, monitors response plans, updates exposure, analyze trends, and produces reports *(after NTP, during design, and during construction)*

Tracking and Reporting Risk Mitigation and Innovative Savings: A Risk Tracking Log will be maintained. Collectively, the team will evaluate the design / construction options that provide mitigation strategies. This could involve new techniques, changes in concept ideas, methods of construction, etc. Cost estimates will be performed on those selected and any innovative savings will be tracked in the log.

How Corman will Support the Team During Preconstruction and Construction to Achieve a Favorable Cost: Corman will offer feedback on the cost of design development as it progresses. As we do when bidding projects, we are on the lookout for better, faster, more efficient, and new techniques for constructing the work. This often lends itself to changes in conventional designs. As the industry is continually pressed to improve productivity and quality, new products are always being introduced. We take an aggressive approach in keeping up with new technologies and will explore options for design / construction solutions. We will share these ideas at meetings as design is being developed.

b. Top Five Risks or Innovation Corman will Help Manage in Design and Construction.
We have reviewed the available project information, visited the site during various traffic and weather conditions, and discussed the major risks. With the mindset of project *risk* being defined as an issue that has the potential to impact the project schedule, budget, or both, we have identified the ***five*** most critical risks we will face during the course of the project in the table on the following page:

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. **RISK: Site Access and Material Handling within the Existing Project Environmental Park** Project is within a 100-year flood plain where inadvertent unpermitted actions would deter successful completion.	**Construction Cost Savings:** $60,000 **User Cost Savings:** $30,000	20%	$18,000	20 days	Coordinate with stakeholders to fully understand LOD restrictions and limitations.
2. **RISK: Schedule Delay that Requires the Extended Closure of Route 24 –** Commuters, school busses, Park users, and EMS units will be counting on the project's timely completion within permit constraints. Extending the closure beyond those set dates would put the project at risk in meeting the stated goals.	**Construction Cost Savings:** $135,000 **User Cost Savings:** $67,500	20%	$40,500	45 days	Utilize detailed short-term scheduling to maintain schedule compliance. Add additional resources / manpower as necessary to avoid extended road closure period.
3. **RISK: Stream Flow Fluctuations / Weather** The project is prone to unexpected rise in water levels that if unaccounted for, would endanger success.	**Construction Cost Savings:** $75,000 **User Cost Savings:** $22,500	100%	$97,500	Causes reconstruction of in-stream diversion and rework. Could vary depending on frequency. 5 days per occurrence (3 each) to recover.	Perform value analysis of different diversion systems to determine cost vs. risk to avoid re-work and adverse schedule impact.
4. **RISK: Utility Relocations –** The utility line is not relocated timely jeopardizing the schedule.	**Construction Cost Savings:** $250,000 **User Cost Savings:** $0	30%	$75,000	Could push work to next year.	Consider doing the design work with a specialty firm to either expedite relocation or temporarily support utility poles in the field. Perform required Utility engineering and relocation during the final design.
5. **RISK: Schedule Delay Due to Mussel Survey/Translocation –** Reduces adequate in-stream work during anticipated low flow periods.	**Construction Cost Savings:** $250,000 **User Cost Savings:** $0	10%	$25,000	Translocation takes three months instead of one which could ultimately push the work into the next season. 365 Days Potential	Pre-investigate work for the mussel survey and translocation so that resources can be scheduled to accomplish work in one month or less.

*** Assume Liquidated damages of $1500/day which is then applied as user cost per day.*

c. Additional Risk Mitigation or Innovation not Included in the Table, which will Improve the Project Approach.

Delayed permits resulting in delayed plan approvals – Establishing a protocol with the permitting agencies to avoid unexpected comments or delayed reviews which in turn could result in a compressed construction time resulting in increased overtime costs and / or difficult high water flows that affects in-stream work progress and requires re-work.

d. Corman's Past Performance in Mitigating Risks on Similar Construction Projects. Discuss how it will benefit this project, particularly in regard to scope, schedule, budget, quality, etc.

- ***Hampstead Bypass*** – Successful implementation of a full-time ESCM to monitor ESC controls daily. Implemented daily monitoring on all projects. ***BENEFIT TO MD 24 DEER CREEK:*** Reduce potential for Fines or stop work orders
- ***Frederick Douglass Bridge*** – Implementation of daily/hourly schedule for road closure period to assign resources and avoid the unexpected. This has been used on many projects since then when performing an extremely time-sensitive activity. ***BENEFIT TO MD 24 DEER CREEK:*** This would apply to the in-stream work to minimize our in stream exposure.
- ***Telegraph Road*** - At the start of the project, it was apparent that utilities had been relocated into the path of the proposed work. Alternate schedules and work areas were developed to avoid delays. Proactively, Corman did an extensive utility study to verify all remaining utilities. This resulted in further avoidance of schedule delays as the project was re-sequenced around other conflicts. ***BENEFIT TO MD 24 DEER CREEK:*** A complete utility designation map of the project site will be suggested to avoid unexpected delays when the road closure period is so critical.
- ***Various Projects*** –Monitoring weather for ESC devices and in-stream work. ***BENEFIT TO MD 24 DEER CREEK:*** Can be beneficial in preparing and anticipating the event to reduce adverse effects.
- ***Intercounty Connector Contract B*** – The JV Team added an Independent MDE Plan reviewer team member. Dave Gates and other JV design members worked hand-in-hand with roll plots determining the most cost-effective ESC solutions and sequence of construction details. This expedited the plan review process by MDE. ***BENEFIT TO MD 24 DEER CREEK:*** The team could exercise this option depending on risk assessment.
- ***Korah 3*** – Installed a portadam diversion in James River in Richmond, VA. A berm was installed within the portadam to keep seepage water from being contaminated by the work area. This enabled the water to be pumped directly from a sump pit back into the James River without treatment. ***BENEFIT TO MD 24 DEER CREEK:*** Lesson learned in similar rock conditions
- ***Various Projects*** – Short-term scheduling of crews, materials, and subcontractors. Detailed schedules are produced each week by the on-site Project Management Staff to address upcoming activities. This avoids scheduling issues with suppliers and subcontractors and unexpected expectations of in-house crews. This has been extremely beneficial across all projects. ***BENEFIT TO MD 24 DEER CREEK:*** Can be beneficial in preparing for a rain event to reduce adverse effects.
- ***All Projects -*** Take "5" Safety Meetings and Job Hazard Analysis (JHA) – Having daily meetings and detailed work plans of all definable work tasks has improved overall production at the company. Each crew is fully prepared for the day's activities, including all necessary safety procedures, equipment and hazard awareness. ***BENEFIT TO MD 24 DEER CREEK:*** This eliminates downtime to obtain forgotten items, reduces time to tend to safety infractions and has all but been eliminated workplace injuries.