TABLE OF CONTENTS

B. CAPABILITY OF THE PROPOSER

1. KEY STAFF

SCOTT SZYMPRUCH, PE | CMAR PROJECT MANAGER

Education
BS/1995/Civil Engineering

Years of Experience
21 Years (17 with Corman)

Professional Registration
Maryland Registered Professional Engineer #25502

2013-2017 | FHWA/EFLHD | Design-Build Route 1 Improvements at Fort Belvoir, Lorton, VA-$82.1M–Design-Build Project Manager. This project widened Route 1 from four to six lanes including bridge demolition/construction. Constructed two bridges. Replaced one with a new 170-ft. pre-stressed girder bridge. Maintenance of traffic was a major focus of local/federal elected officials, with an emphasis on stakeholder communication and protecting the environment. Scott oversaw the preconstruction, design, right-of-way acquisitions, construction, and utility relocations. He led coordination with relocation of overhead utilities (Elec, Tel/Com, Cable, Gas, Water and Sewer) facilities. Scott was the main point of communication to the project team. He managed the project team, equipment, material, and labor procurement, risk analysis objectives/goals, work plans, and budgets/resources; procured/coordinated subcontractors; monitored schedules; conducted progress meetings; minimized exposures and risks; mitigated issues; reviewed/approved deliverables, RFIs, and change orders; administered contracts; oversaw budget, safety, and quality compliance; met obligations and avoided/resolved disputes under the contract, and steered the project to successful completion per contract. Maintained two-way traffic during bridge replacement by building first bridge phase off line. ***Relevancy*** *– Alternative project delivery, bridge replacement, stormwater management facilities, limited environmental and traveling public impacts, stakeholder coordination, utilities, and extensive MOT.*

2014-2017 | VDOT | Design-Build Fall Hill Avenue & Mary Washington Blvd Extension, Fredericksburg, VA-$30.8M–Division Manager. Scott oversaw engineering and project management, responsible for preconstruction, construction, and coordination of the project. Lead risk analysis / mitigation. This project widened Fall Hill Avenue from two to four lanes, extended Mary Washington Boulevard, and replaced the bridge over I-95 in phases with a concrete substructure and multiple girder bridge. There are utility relocations including Elec., Tel/Com, Cable, Gas, Water and Sewer, new storm drainage system, and new retaining walls to minimize environmental and right-of-way impacts. The bridge and road stayed open to traffic; one lane was open in each direction, with traffic shifts as construction progressed. ***Relevancy*** *– Alternative project delivery, steel girder bridge replacement, stormwater management facility, limited utility, traveling public and environmental impacts, stakeholder coordination, and MOT.*

2007-2011 | MDOT | Design-Build Intercounty Connector Contract A, Montgomery County, MD-$483.4M–Construction Manager. 7.2 mile controlled-access tri-lane divided highway project widened six steel girder bridges on I-370; traffic was shifted for the bridges to remain open during construction. There was maintenance of traffic, erosion and sediment controls, and community outreach to 10,000 residents. Major utility relocations were completed at 106 locations. Scott led design coordination, risk analysis and mitigation as well as all construction. Upon NTP, he participated in design development task force meetings and provided constructability reviews. Scott directed the design team regarding sequence of construction, access requirements, and preferred construction techniques. ***Relevancy*** *– Alternative project delivery, steel girder bridge widening, stormwater management facilities, limited environmental and traveling public impacts, stakeholder coordination, utilities, and MOT.*

KRIS WILSON, CHST | CONSTRUCTION MANAGER

2009-2010 | MDOT | Design-Build Intercounty Connector Contract B (ICC-B), Montgomery County, MD-$560.9M–Structure Construction Manager. Kris oversaw construction of five mainline bridges, including ensuring they were completed per project requirements, coordinated the schedule, managed 10-12 crews, and oversaw crew environmental compliance. He attended progress, schedule, and safety meetings pertaining to these bridges, and scheduled daily activities. ICC-B consisted of a new 7.1 mile six-lane divided highway, including 10 mainline bridges, five crossover bridges, community outreach, stakeholder and third-party coordination (including over 10 utility companies for major utility relocations in highly-congested areas), phased maintenance of traffic for all crossings and interchange points and a stringent environmental compliance program. Maintained access with temporary roads, walkways and detours for pedestrians/vehicles. ***Relevancy*** *– Alternative project delivery, steel girder bridges, stormwater management facilities, limited environmental and traveling public impacts, stakeholder coordination, utilities, and MOT.*

2005-2006 | MDOT | MD Route 70 Rowe Blvd Bridges, Annapolis, MD-$29.6M–Construction Manager. Kris supervised all construction, including the College Creek Bridge, roadwork, and erosion & sediment controls and coordinated the schedule and traffic control on this project that rehabilitated/replaced two 50+ year old structurally-deficient bridges including, a stormwater management pond retrofit, new 12" water main, high-voltage electrical and communication cable relocations, and installed/maintained erosion and sediment controls. Kris coordinated MOT, including night time lane closures. He oversaw the reversible lane system which accommodated the heavy traffic volume entering/exiting Annapolis. During the morning rush hour, there were two lanes going into Annapolis and one lane going out; for the evening rush hour, there was one lane for inbound traffic and two lanes for outbound traffic. ***Relevancy*** *– Steel girder bridge replacement, utility relocations, MOT, stormwater management facility, limited traveling public impacts and environmental, extensive stakeholder coordination.*

2006-2007 | MDOT | Woodrow Wilson Bridge VA Approach Spans VAC, Alexandria, VA-$126.8M–Construction Manager. Kris supervised field operations, including the cast-in-place concrete bridge work, including the V-Piers. He established goals/responsibilities, evaluated safety exposures/risks, coordinated labor, equipment, and subcontractors, schedules, and oversaw quality control compliance. Two-phase construction included segmental bridge with onsite casting and erection of 364 precast concrete substructure segments and 64 precast concrete tie beams for the V-piers, installation, stressing and grouting of post-tensioning bars and tendons, placed two 2,300-ft. long, 145-ft. wide CIP concrete bridge decks, demolition/removal of a six-lane structure and foundation construction of inner loop bridges. Pier construction included cofferdam installation, driven precast concrete piling and concrete footings. Maintained traffic on the Capital Beltway during construction.
Relevancy *– Steel girder bridge demolition, stormwater management facilities, limited environmental and traveling public impacts, stakeholder coordination, utilities, and MOT.*

Years of Experience
25 Years (25 with Corman)

Certifications
Construction Health & Safety Technician #C2818

MD/SHA Erosion & Sediment Control Yellow Card/MDE Certification - pending

Awards
2016 Maryland Transportation Builders and Materials Association (MTBMA) Distinguished Supervisor Safety Award

2016 Maryland Transportation Builders and Materials Association (MTBMA) Commitment to Safety Award

DAVID GATES | COST ESTIMATOR

Education
BS/1981/Civil Engineering, University of Hartford

Years of Experience
31 Years (11 with Corman)

2013-2015 | MDOT | CMAR: MD 24–Sections A&G, Harford County, MD -$5.1M–Lead Cost Estimator. Dave prepared bid rules, item, and quantity evaluations, production rates and developed the risk sheet. He met with owner, designer and MDOT's Independent Cost Estimator (ICE) to develop a constructible, innovative, cost effective, and timely design to mitigate issues during construction. Dave developed a risk matrix in the event of unforeseen conditions during construction. Risks were agreed to by all parties and used to develop a budget/schedule. Dave met with stakeholders to incorporate their concerns. He led developing the open-cost model with MDOT's ICE, where they advanced through three progressive cost estimates. Dave developed take-off quantities for roadway reconstruction, retaining walls, MOT, excavation, storm drainage, erosion & sediment controls, stream relocation, clearing/grubbing, and reinforcing earth slope. He developed the Subcontracting Plan to include DBEs for the construction phase (Actual DBE exceeded the 16% DBE goal). Through an open-book cost model with MDOT, an Opinions of Probable Construction Cost (OPCC) and a Guaranteed Maximum Price (GMP) was prepared/approved. MD 24 is a major rural highway passing through Rocks State Park with extensive pedestrian/hiker usage. The project improved road safety by remediating the eroding slope supporting MD 24, repairing the pavement, and improving roadway drainage. ***Relevancy*** *– CMAR, coordination with SHA Designer and ICE, limited traveling public and environmental impacts, stakeholder coordination, and MOT.*

2015-2016 | Prince George's County | CMAR Piscataway Emergency Repairs, Fort Washington, MD-$7.7M–Lead Cost Estimator. On this emergency contract to stabilize a slope failure compromising a residential neighborhood, Dave worked with the owner via a CMAR process to rebuild the roadway, storm drain system, and water/sewer lines. He prepared bid rules, item, and quantity evaluations, production rates and developed the risk sheet. He met with owner, designer, and ICE to devise a constructible, innovative, cost effective, and timely design to mitigate issues during construction. Dave developed a risk matrix covering unforeseen conditions that might occur – these risks were agreed to by all parties and used to project budget and schedule. Dave's innovative pile shoring solution (steel piles driven / pined into the slope) to support the slope mitigated a major risk of excavating in the unstable clays at the base of an unstable steep slope. ***Relevancy*** *– CMAR, coordination with owner's Designer and ICE, limited traveling public/environmental impacts, stakeholder coordination, utility coordination/relocation, MOT.*

2016-2017 | MDOT | CMAR I-95 Baltimore Washington Parkway to US 1, Greenbelt, MD-$150M–Lead Cost Estimator for JV Team. Dave assisted in preparing bid rules, item and quantity evaluations, production rates, and developed the Risk Sheet for this project that progressed through most stages of CMAR process before being put on hold and eventually cancelled. Prior to cancellation, he worked with MDOT, designers, and agencies to review the plans and provide constructability reviews to reconstruct the I-95/495 Greenbelt Metro Station Interchange which included **removing an old bridge over the interstate and construction of two new bridges over the interstate while maintaining 8 lanes of traffic below.** The Metro Station was to be reconstructed with no service interruption to transit users. Dave met with owner, designer, and MDOT's Independent Cost Estimator (ICE) to develop a constructible, innovative, cost effective, and timely design to mitigate issues during construction. He assisted in leading/developing an open cost model with MDOT's ICE through one Construction Cost Estimate prior to the project being cancelled. Dave developed take-off quantities for roadway construction, bridges, retaining walls, MOT, excavation, storm drainage, E&S controls, stream relocation, clearing and grubbing, and reinforcing earth slope. ***Relevancy*** *– CMAR, steel girder bridge replacements, extensive MOT on Capital Beltway, stormwater management facilities, limited environmental impacts, stakeholder coordination, and utilities***.**

2. TEAM PAST PERFORMANCE

PROJECT #1 3rd STREET OVER BUFFALO CREEK, FARMVILLE, VIRGINIA			
CORMAN – LEAD DESIGN BUILD CONTRACTOR			
OWNER/POINT OF CONTACT NAME AND TELEPHONE NUMBER Virginia Department of Transportation Terry Meadows 434-856-8317 Terry.Meadows@VDOT.Virginia.gov	PROJECT DELIVERY METHOD Design Build	INITIAL CONTRACT VALUE $2,972,041.00	FINAL CONTRACT VALUE $2,972,041.00
**SPECIFIC REASONS FOR DIFFERENCE: N/A*			
INITIAL COMPLETION DATE 8/30/08		FINAL COMPLETION DATE 8/12/08**	
****SPECIFIC REASONS FOR DIFFERENCE:*** Completed this year and a half project 18 days ahead of schedule			

BRIEF PROJECT DESCRIPTION: Design/construction of a new bridge and approach work on Route 15/460 (Third Street), which is 8’ wider and 34’ longer than the existing structurally-deficient, four-lane, seven-span concrete bridge.

The project was designed and constructed with minimal impacts to adjacent property. The design lengthened the structure in an environmentally-sensitive manner to improve its hydraulic capacity while minimizing approach roadwork by maintaining the existing vertical alignment, which eliminated the need for causeways, trestles, or creek crossings.

Bridge: The new bridge and its floodplain is a low maintenance, four-lane, three-span integral structure with weathering steel girders constructed in two phases to maintain traffic with a third phase to install a 5’ pedestrian sidewalk on the north side. The superstructure has seven steel plate girders supporting a concrete deck/riding surface. The supporting piers are solid wall-type piers founded on steel H-piles driven to refusal/rock. The abutments are fully integral supported on H-piles that have their weak axis perpendicular to the longitudinal axis of the bridge. The out-to-out bridge width is 58’-8” and the length from end-of-slab to end-of slab is 270’-2”.

The challenge was to design and construct a bridge replacement, in the same location, while maintaining traffic along 3rd Street (Route 15/460). Preliminary plans, provided as part of the procurement process, depicted only one lane of traffic remaining open during construction with temporary signals at each end of the work zone. Corman provided a plan where one lane of traffic in each direction was provided without signals. Flagging took place as needed while moving construction equipment. The MOT plan and final design provided accessibility from the fire station at the northeast corner of the bridge to 3rd Street (Route 15/460) without creating fire and emergency vehicle impacts. Our design reduced constructions phases, project cost, construction time, and impacts to the public.

The existing bridge was removed in stages and the proposed, three-span, 270' long replacement bridge was constructed in stages while maintaining traffic on 3rd Street (Route 15/460). In addition to replacing the existing bridge, new approach roadways were designed to tie into the existing approach roadway, drainage system, and sidewalks and accommodate the proposed bridge typical section. Design services included bridge, roadway, drainage, erosion & sediment control, hydrologic and hydraulic analysis (H&HA), scour analysis, bridge load rating, shop drawing review, and consultation during construction.

Maintenance of Traffic: VDOT concept plans called for partial demo of the structure to maintain alternating two-way traffic on the remaining portion of the structure, building the new half structure and then switching traffic to build the remaining portions of the structure. Corman and its designers revised the design to eliminate the need for temporary signalization with alternating traffic. Our design maintained two-way traffic on the structure at all times, thus improving safety, reducing construction time, reducing risk and cost.

Utilities: We provided efficient and timely permit application data and sketches and facilitated/coordinated with utility owners/Town of Farmville for utility relocations. We partnered with project stakeholders, local community, VDOT, utility owners and environmental agencies for timely flow of information, including progress and changes in traffic patterns, to project partners and the public.

DISCUSSION OF WHAT WORK, INCLUDING ANY SUCCESSFUL METHODS, APPROACHES, AND INNOVATIONS ON THE PROJECT IS RELEVANT TO THIS CONTRACT AND WHY:

Innovations

- Developed alternate phased MOT plan to maintain two-way traffic through the work zone without one-way alternating traffic and accommodated emergency responders within the project limits without disrupting motorists. Relevant: Proposing to utilize similar innovative method
- Worked with VDOT to modify the normal construction procedure to allow continuous pours of the concrete deck and approach slabs which advanced the schedule and eliminated deck construction joints. Relevant**:** Will utilize if applicable to this contract.

PROJECT #2 REHABILITATION OF 11 BRIDGES ON US 13, SALISBURY BYPASS, WICOMICO COUNTY, MARYLAND

CORMAN – LEAD CONTRACTOR

OWNER/POINT OF CONTACT NAME AND TELEPHONE NUMBER	PROJECT DELIVERY METHOD	INITIAL CONTRACT VALUE	FINAL CONTRACT VALUE
Maryland State Highway Administration Glen Evans 443-805-4979 gevans@sha.state.md.us	Design-Bid-Build	$23,957,800.00	$24,057,757.72

SPECIFIC REASONS FOR DIFFERENCE:

Owner directed changes due to deteriorated condition of existing substructures.

INITIAL COMPLETION DATE	FINAL COMPLETION DATE
6/8/18	6/8/18 (est.) open for beneficial use of traffic

***SPECIFIC REASONS FOR DIFFERENCE:*

BRIEF PROJECT DESCRIPTION: Rehabilitating 11- 40-year old concrete and steel beamed bridges on the Salisbury bypass which leads to Ocean City, MD, a popular vacation spot. With a current ADT of 36,225, that number is expected to increase to 53,000 by 2035. Work includes new piling and footings, new substructure and substructure modifications, replacing partial or full superstructure, parapet replacement, latex modified concrete deck overlay, roadway resurfacing, mainline pavement repairs, abutment replacement, new supplemental piles, utility protection/rehabilitation, temporary erosion & sediment controls, new girders, minor structural repairs, permitting and public outreach. The following bridges are being rehabilitated:

- One ramp-bridge from Route 13 business to the Salisbury bypass.
- Two bridges over the Norfolk Southern railroad line.
- Two bridges over Old Ocean City Road.
- Two bridges over Route 50.
- Two bridges over Mount Hermon Road.
- Two bridges over Parker Pond.

Bridge: Bridges are being reconstructed in phases with northbound traffic relocated to share the southbound lanes of the bypass in the first phase during the winter months, thereby limiting traffic impacts during the busy summer tourist season. Constructed three crossovers through the median to detour traffic throughout all maintenance of traffic phases. Concrete barriers placed between northbound and southbound traffic for one lane traffic flow to repair the northbound bridges prior to the start of the tourist season.

Maintenance of Traffic: Proper MOT was critical with strict time of year restrictions on allowable work and traffic impacts. To maintain free flow during the summer lane closures were limited to the non-summer resort seasons. Temporary detours were implemented during the allowable work season to allow Corman to reconstruct the structures. At the end of the tourist season, the southbound lanes were closed, traffic shifted to share the northbound lanes, and the southbound bridges repaired. After reconstruction of those structures, traffic will be shifted back to its original configuration.

Ramp C (US 13 over US 50) was the exception. Per the concept designs that bridge was to be reconstructed one half at a time with only one narrow lane available for through traffic. However, after implementation it was found the large trucks utilizing the roadway could not navigate the sharp radius of the narrowed lanes. The MDOT, Contractor and Design team meet in the field and collaboratively developing an alternative detour route for traffic while the full width of the structure was reconstructed. This detour route included extensive Stakeholder and public notification campaign, extensive signage, temporary message boards and the installation

of temporary portable traffic signals at two previously un-signalized intersections. The state was given a credit for the elimination of one construction stage, traffic flow improved during construction and that portion of the project finished early.

DISCUSSION OF WHAT WORK, INCLUDING ANY SUCCESSFUL METHODS, APPROACHES, AND INNOVATIONS ON THE PROJECT IS RELEVANT TO THIS CONTRACT AND WHY:

Revised traffic plan to account for unworkable partial bridge reconstruction – lowered cost and reduced schedule. **Relevancy:** Lessons learned can be applied to this project.

PROJECT #3 I-95 TELEGRAPH ROAD INTERCHANGE IMPROVEMENTS, ALEXANDRIA, VA

CORMAN – LEAD CONTRACTOR LEAD JOINT VENTURE PARTNER (CK CONSTRUCTORS, A JOINT VENTURE)

OWNER/POINT OF CONTACT NAME AND TELEPHONE NUMBER	PROJECT DELIVERY METHOD	INITIAL CONTRACT VALUE	FINAL CONTRACT VALUE
Virginia Dept. of Transportation Mimi Kronisch, PE Project Manager 703-246-0028 mkronisch@rkk.com	Design-Bid-Build	$236,393,188.00	$268,622,645.00*

**SPECIFIC REASONS FOR DIFFERENCE:* Due to incentives and owner-authorized changes (unforeseen utility relocation and MOT safety upgrades) and earned incentive payments

INITIAL COMPLETION DATE	FINAL COMPLETION DATE
6/30/13	6/27/13**

***SPECIFIC REASONS FOR DIFFERENCE:* Achieved substantial completion 112 days early which was well ahead of the required completion date and 17 days less than the full incentive date. Project was completed three days ahead of schedule.

BRIEF PROJECT DESCRIPTION: Fast-track reconstruction of 2.5 miles of I-95/I-495 and Telegraph Road for traffic to enter/exit Virginia by crossing the new Woodrow Wilson Bridge. Improvements included 16 bridges, roadway reconstruction, storm drainage with six stormwater management ponds, utility relocations, and an environmental mitigation project at nearby Cameron Run wetlands.

Bridges: Project encompasses 11 new bridges and five flyover ramps. ***Included partial demolition of two bridges - maintaining traffic on remaining existing bridge structures while partial new bridges constructed,*** reconstructed seven adjacent to or over traffic and complete demolition of five bridges:

- Existing steel girder bridge that carries Ramp A over Telegraph Road and I-95 into a new steel girder flyover with curved girders and carries shared-path foot traffic**.**
- New steel girder flyover Telegraph Road westbound I-95**.**

- Existing steel beam structure carries I-95 over Cameron Run into a new three phase construction concrete girder at I-95/495 over Cameron Run**.**
- Existing steel beam structure that carries I-95 over Telegraph Road into a new three-phase construction concrete girder I-95/495 over Telegraph Road**.**
- Existing three-span steel beam structure carries Telegraph Road over Cameron Run into a new three-phase construction concrete girder bridge at Telegraph Road over Cameron Run**.**
- Existing steel girder bridge that carries Ramp A over Telegraph Road and I-95 into a new steel girder flyover I-95 with curved girders**.**
- New steel girder bridge over Telegraph Road.
- New steel girder bridge over a ramp**.**
- New steel girder bridge over Telegraph Road**.**
- Widened a steel girder bridge that carries Telegraph Road over WMATA, Norfolk Southern, and CSX railroad tracks, and pedestrian traffic from the tunnel. Widened the four piers and replaced the deck and structural steel.

Maintenance of Traffic: The project team revised MOT plans, greatly reducing the original design of six phases to three phases and from 12 traffic shifts to six shifts. This positioned the team to meet all major interim milestones and incentives, while improving public travelling conditions. Team partnering identified and resolved issues early in the planning stages. Motorists benefit from smoother traffic flow on Telegraph Road and Huntington Avenue, new and improved bridges, traffic lights, drainage systems, and retaining noise walls. Pedestrians have safer access to the bridge and improved walking paths.

Traffic Engineering: Due to excessive traffic congestion, Corman proposed MOT revisions to improve traffic flow which eliminated three phases of traffic and reduced traffic shifts from 12 to six. These revisions were implemented with VDOT's approval resulting in improved public traveling.

Stakeholders: There was extensive coordination with adjacent projects and properties, local residents, utility companies, City of Alexandria, hotels, retail stores, police, fire, and other emergency responders. Daily onsite coordination and weekly meetings at the owner's general engineering consultant (GEC) offices discussed work plans and public information. The project team managed third-party stakeholders and assisted in the Woodrow Wilson Bridge community outreach program with VDOT's GEC.

Utilities: Installed electrical, communication, and water lines, and protected/relocated a 36" water main. At the start of the project, it was apparent that utilities were relocated into the path of the proposed work. Alternate schedules and work areas were developed to keep the project on track. Features included notification of possible conflicts of existing/new utilities and proposed new work/field operations; coordination between project operations/staff and other utility contractors working in the area; coordination with utility owners; and coordination/management of utility subcontractors.

This complex project had an aggressive schedule as it was linked with existing traffic patterns and other Woodrow Wilson Bridge projects that had to be accommodated while working over water, rail systems and on the Capital Beltway, considered one of the busiest roads in the country. Coordinated progress meetings every week with the client, as well as meetings dealing with MOT, scheduling and lane closures to discuss coordination with the other projects. All six incentive interim milestones were achieved and the final incentive milestone of substantial completion was met.

Awards:

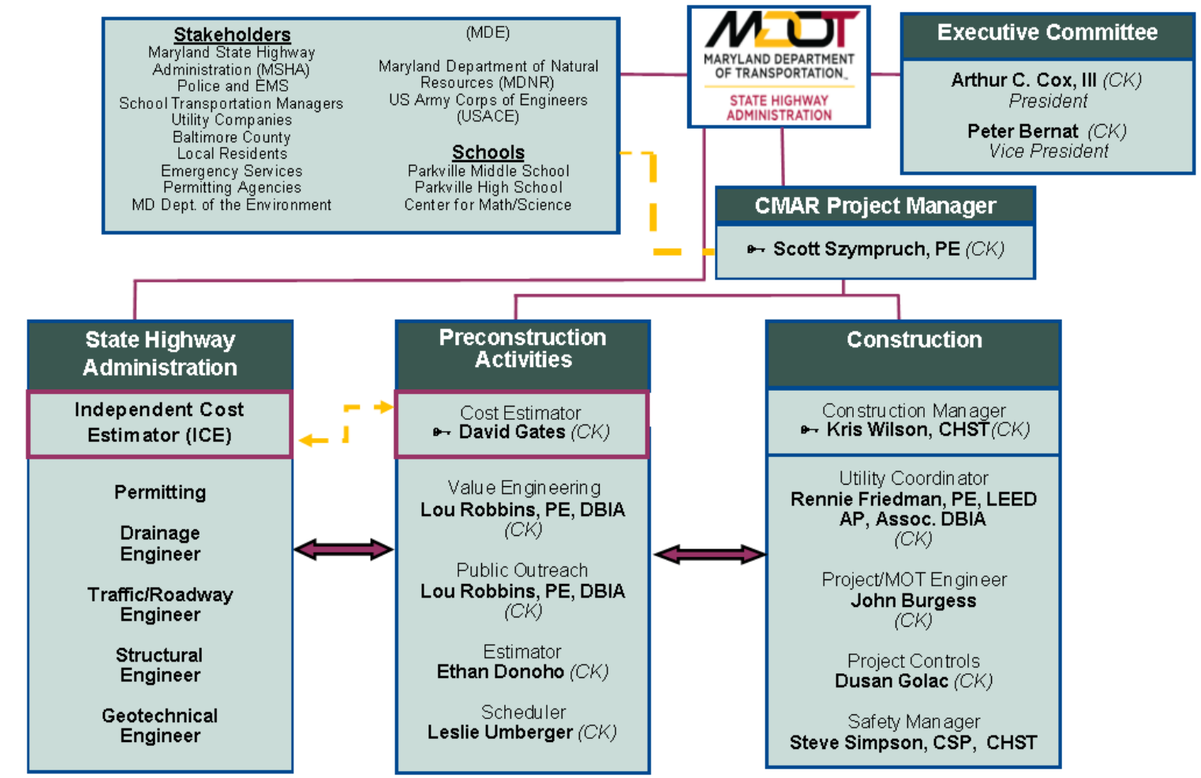
- 2013 VTCA Transportation Engineering Overall Winner

DISCUSSION OF WHAT WORK, INCLUDING ANY SUCCESSFUL METHODS, APPROACHES, AND INNOVATIONS ON THE PROJECT IS RELEVANT TO THIS CONTRACT AND WHY:

Contract drawings showed no utility conflicts; however, as work began, it was clear many existed. Rather than wait to discover them, Corman identified and recorded existing utility locations for the entire project and recorded the conflicts. As a result, the original schedule was maintained with extensive relocations coordinated with the schedule. **Why Relevant –** Partnered response to maintain project schedule**.**

Maintaining traffic involving a 160,000 ADT was the most critical aspect of the project's success. Traffic flow issues were mitigated before they became problematic. Six lanes; three lanes in each direction of I-95 was maintained at all times during construction. The project team reducing the original design of six phases to three phases and from 12 traffic shifts to six shifts. **Why Relevant -** MOT innovation positioned the team to meet all major interim milestones and incentives, while improving public traveling conditions.

3. ORGANIZATIONAL CHART



LEGEND:
= Key Staff
CK = Corman Kokosing
= Communication
= Reporting to

Key Staff Member	Title	Hours per week during Preconstruction (Avg)	Hours per week during Construction (Avg)
Scott Szympruch, PE	CMAR Project Manager	15 to 20	25 to 30
David Gates	Cost Estimator	20 to 25	0 to 10
Kris Wilson, CHST	Construction Manager	20	40+

FUNCTIONAL ROLES

Scott Szympruch, PE, will be the **CMAR Project Manager (PM)** and the project team's main point of communication to MDOT. All of Corman's efforts will be under his control starting with preconstruction, through design, construction, and punch out. He will oversee the Pre-Construction Services (estimating, quantity take offs, utility and permit coordination, value engineering, stakeholder outreach, risk analysis, design coordination and schedule preparation). During construction, Scott will continue to lead our team managing the Construction Manager, and Safety Officer. Scott will assist with constructability reviews and safety audits, and oversee the Risk Analysis, quality management program, purchasing and all construction.

Construction Manager, Kris Wilson, CHST, reports to the PM. Kris will manage the on-site construction team, including the Project Control team, On-Site Safety Staff, 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 Mr. Gates coordinating between the design and construction forces with regard to design, access, material deliveries, equipment placement, utilities, 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. He clearly understands what MDE and other review agencies are likely to request having performed in the same role on several other CMAR projects with MDOT and will include lessons learned on those projects early on in his estimates thereby mitigating any surprises later on. Dave will also lead the risk analyses and maintain the risk register. He will lead our coordination with the Independent Cost Estimator (ICE).

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 County officials or community be required during pre-construction or construction, Lou will assist Scott in leading our participation.

Safety Manager, Steve Simpson, CSP, CHST, of Corman will report to the CM. Steve will regularly oversee plans and field activities to provide a safe environment for MDOT, 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 motorists and pedestrians on the project. Steve has the authority to stop work which does not meet our strict safety requirements.

Organizational Chart

C. PROJECT APPROACH

1. PRECONSTRUCTION APPROACH

Corman understands this is the fifth Construction Management at Risk (CMAR) project for MDOT and like the first four, success will be gained by:

- A solid collaboration that fosters teamwork,
- Limiting negative impacts to the vehicle and pedestrian traffic currently utilizing the bridge, and
- Finding the best cost-effective solutions given the site and community constraints.

As the successful Contractor on the State's first CMAR, JV partner on the third, and currently finalizing the preconstruction phase on the fourth MDOT CMAR to date, we will build on the success and relationships cultivated during those projects. The CMAR project delivery anticipates a contract duration less than traditional design-bid-build and design-build with risk appropriately distributed between Owner and Contractor. The goal is to reach an agreeable Guaranteed Maximum Price (GMP) with concurrence from an Independent Cost Estimator (ICE) so as to proceed to construction with a fair market price GMP. Preconstruction services include constructability and risk analysis, value engineering, scheduling, site assessments, and cost estimating with input to the MDOT from the Contractor through each phase. Construction estimates of probable cost will be developed by Corman and shared with MDOT and its ICE at key milestones.

Corman was the contractor for MDOT's first CMAR - MD 24 – Deer Creek Project a JV Partner & Lead Estimator for the third which is the largest to date (I-95 Greenbelt) and Contractor for the fourth-MD 5 at Point Lookout - which is close to finishing the Pre-Construction phase

a. / b. Collaboration / Design and Constructability Reviews

Throughout preconstruction and construction, solutions are generated through a collaboration between MDOT, and Corman. Frequent meetings, partnering, constructability reviews, risk assessment and workshops and progressive cost estimating at milestones Opinion of Probably Cost (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 develop solutions that deliver these project goals:

Table 1. Goal's Descriptions and Mitigations

Goal No.	Goal Description	Suggested Mitigation
GOAL #1	Replace a structural deficient bridge	Make sure the pre-construction phase is successful so we proceed to the actual construction by open and honest collaboration and partnering between Corman, MDOT and all relevant stakeholders.
GOAL #2	Minimize Project Construction Cost Within the Current Budget	Evaluate MOT, material and structural options to determine the most cost-effective solution while still meeting or exceeding all other project goals.
Goal #3	Minimize Project Delivery time	Evaluate MOT and structural sequencing and schedule options to minimize project delivery time
GOAL #4	Minimize Impacts to the Physical Environment	Evaluate construction activities and required equipment to minimize the required LOD to perform

Goal No.	Goal Description	Suggested Mitigation
		work. Reduce the need for temporary construction easements.
GOAL #5	Minimize inconveniences and impacts to the traveling public, especially during peak hours during the school year	Balance construction schedule to maximize work during school's summer vacation. Work 6 -10 days in the summer season.
GOAL 6	Facilitate a collaborative partnership with all members of the project team and stakeholders	Incorporate facilitated Partnering with monthly evaluations and feed back into the project requirements

Solutions to meeting most of the goals above are entwined in that addressing one will impact another. For example - reducing the inconvenience to the traveling public **(Goal #5)** and Facilitating a collaborative partnership with stakeholders **(Goal # 6**) can be addressed by building a temporary structure off line or rolling the existing inbound portion of the structure to adjacent temporary supports and constructing the existing inbound lanes while maintaining two way traffic or with additional overtime, weekend or summer work – those traffic mitigation methods could however adversely impact meeting **Goal #2** (Cost) and **Goals # 4** (Minimize impacts to the physical environment). To address this issue, we will prepare a matrix and each suggestion proposed (during any value engineering evaluation or pre-construction meeting) be ranked on its impact to all six goals as stated above. The suggestion would be rated as having a positive, negative or neutral impact on each goal and the decision to proceed, or not, be based on the resulting scoring. *This Approach will:*

- *Streamline design decisions to best meet all the project goals,*
- *Reduce errors and omissions by eliminating rework to reengineer to meet the goals later during subsequent reviews,*
- *Improve constructability and quality as the team is jointly making the decisions, and*
- *Reduce both the cost of construction as well as project delivery schedule, as best possible, in concert with meeting the other goals.*

Many of the goals are also design dependent, such as minimizing impacts to the traveling public (**Goal #5)** could increase the project cost **(Goal # 2)**, etc. As described in later pages, we will work closely with the MDOT designers to perform constructability reviews to minimize cost **(Goal #2)** while maximizing production to minimize construction duration **(Goal #3).** As the Contractor chosen, we pledge to Partner with MDOT to deliver the project while maintaining an emphasis on meeting the above goals and Key Issues listed in the RFP - *our pledge* will be to continue to maintain awareness to these goals and key issues during the entire project – pre-construction as well as the actual construction itself.

In order to initiate *collaboration, cooperation, and trust between MDOT, the design team, and contractor,* immediately upon Award, MDOT (Project Manager and the In-house Design Team) and Corman will start meeting right away to establish a partnering approach to the project. The approach could entail a formal facilitated program with monthly evaluations or a more informal approach as agreed to by the parties. The goal, either way, would be to develop trust, collaboration and a cooperative spirit among the team members before we get down to the business of design, estimating, and construction. The next meeting will be to confirm design direction before additional design is performed. Joining forces beforehand gets the ball rolling and discussions out on the table, so we are in agreement when the design packages are ready for approval. After reviewing current designs and environmental documents, reading past stakeholder and/or Design Team meeting minutes, we will conduct a MDOT / Contractor workshop to:

1. Evaluate the constructability of the design to date,
2. Evaluate / mitigate project risks, and
3. Identify any value engineering opportunities that may be appropriate to either reduce costs, shorten the schedule, improve quality, or reduce stakeholder impacts.

Value Engineering will follow the procedures outlined in the most recent FHWA circular modified for the size and complexity of this project with the effort geared toward attaining the project goals listed in the RFP. The value engineering would be led by Lou Robbins, P.E., who would facilitate an informal half day value engineering workshop to expand upon any previously performed by MDOT. Lou has been trained in Value Engineering by having taken the 40-Hour FHWA Value Engineering Workshop training and currently performs a similar function on our many Design Build projects finding the best way to design and/or construct a project.

An example of this process on an earlier MDOT CMAR project was the revision proposed for the foundation of the imbricated stones on the MD 24 CMAR project. On the MD 24 CMAR project we were able to provide crucial constructability reviews as part of team with MDOT and the project designer JMT. The early design had an imbricated rock wall placed on a concrete foundation along Rock Creek. These early designs had a foundation footer being constructed 5'-10' below the stream bed. To build the footer would require major support of excavation and risky stream diversion work in Rock Creek. With a stream that can rise 8-10' with a 1" storm upstream, this work would have been very costly, risky and quite possibly not constructible. As the team worked together Corman recommended driving caisson foundations up to the stream water level and then constructing a footer for the imbricated wall to sit on. Through joint constructability reviews between MDOT, JMT, and Corman the most cost effective and constructible design was finalized and ultimately included in the project.

We then progress to having senior estimators and field personnel develop anticipated work plans and sequencing graphs to create a project schedule. These plans are shared with MDOT and creates an opportunity to break out selected design packages or identify long-lead items. For example, if a temporary bridge option is chosen to maintain two-way traffic at all times, the bidding and procurement of that structure from the several available firms (Acrow, Mabey or Baily) may need to be performed in an advance package so the particular requirements / dimensions of the selected system can be incorporated into the final design package. The potential that the temporary structure would need to carry temporary water or gas mains could impact the structures design and needs to be an early decision item. This would prevent during construction having to potentially revise the designs to meet the least cost temporary bridge providers structure; thereby, maximizing our ability to meet Goals #1, #2, #3, and #5.

Similarly, from a review of the plans, several utilities will need to be relocated to allow for the safe construction of the new structure – this would include Gas, Electric, and Tel/Com. One way to remove the negative impact of the utilities in proximity to work would be the placement of the overhead utilities in new bores under I-695. The same could be done for the existing gas adjacent to the fascia beam. We would work with the utilities during the early stages of the preconstruction stage to determine options available, with the time and cost consequences known and incorporated into the design – eliminating potential subsequent rework decreasing both time and design cost to MDOT. The suggestion again allows the team to better meet Project Goals # 2, 3, 5 and 6 and keep the project moving forward and advance the projects ultimate goal of timely replacing the structure.

Any field issues stemming from these early packages, i.e., difference in span length, cross section capabilities lengths or load carrying capabilities of the different temporary structures could be addressed in the final structural designs. Schedule planning will take into account minimizing impacts to MOT. We do not anticipate the typical permitting or environmental Time-of-Year (TOY) schedule impacts on this project with its small footprint in an urban setting, however TOY will be important to minimize impact to the adjacent schools and summer work may need to be accelerated.

To keep records on decision making, meeting minutes will include action items identifying "*Ball in Court*" and due dates. Design enhancements/modifications are tracked with a tracking sheet that contains design changes, identifies cost or schedule advantages, additional risks, impacts on other portions of the design or permitting, status of investigation or implementation, team member responsible and action item deadline (*see visual left*). Suggestions could come from Corman estimators, field staff, MDOT Project Management or in-house designers. This tracking sheet is reviewed at each progress meeting. Face-to-face meetings or conference calls can be set up with key personnel (MDOT, Corman, or permit/stakeholder agencies) to discuss ideas. A champion advocate is then assigned to each idea for quick evaluation and resolution. At

regular or special meetings, the idea/comment is discussed by Corman and MDOT to reach a decision and a direction to either "Incorporate", "Further Investigate", or "Eliminate." The tracking sheet is then updated and becomes a permanent reference. Risks and value engineering suggestions will be evaluated by the project team on how it will positively or negatively impact the six project goals.

At our initial project "*Kick Off*" meeting, Corman will join forces with MDOT in a Scoping/ Partnering workshop to review what has been completed so far, identify what the constraints are, stakeholder concerns, key project goals that need to be stressed, schedule, and proposed working relationships.

We will participate in public outreach meetings with MDOT and the local stakeholders, including Baltimore County Schools, local homeowner associations, MD State & Baltimore County Police, EMS responders, etc.), utilities, permitting agencies, and other interested officials, or permit reviewers, to clearly understand their concerns and answer any questions regarding schedules and construction phasing, as well as means and methods. Additional or concurrent Public Information Meetings will be suggested during key milestones in the design process with the local residents to hear their concerns and explain our planned mitigation to keep the roadway safe and passable at all times. Staff will be available from both MDOT and Corman to explain the specifics that may impact them. These meeting could be formal in a public school or other Government owned facility or smaller in scope at one of the adjacent resident's homes where more "one on one" informal discussions would be appropriate. Both have worked well on our past projects and a combination of the two maybe most appropriate on this project. The goal will be to listen to their concerns, incorporate what we can and explain why we can't accommodate some of the suggestions. Phone numbers for our key staff will be provided, if approved by MDOT, so they can call to ask specific questions that may impact them.

Route 1 reconstruction Public Outreach Meeting

As requested Corman can provide the following services during public stakeholder meetings:

- Prepare required Graphics
- Develop / Distribute Meeting notifications (print and web based)
- Provide the meeting space / equipment
- Provide required staff
- Provide script, power point, or other presentation materials

Preconstruction reviews are *over the shoulder* meetings or formal reviews with the designers, as well as at MDOT. Project Management conducted at pre-determined or required milestones during the design. We will encourage MDOT staff to call or set up teleconferences to discuss issues or opportunities as they arise during design. Picking up the telephone and calling saves time and strengthens team member collaboration, however, since the Corman staff is only a short half-hour drive from MDOT's offices, face-to-face visits are encouraged. Bi-weekly in person progress meetings are recommended to maintain progress. Corman's comments will be documented outlining benefits (cost savings, time acceleration, safety improvement, traveling public impact minimization, etc.), and a disposition (accepted/included, modified/included, under evaluation, or not accepted). Tracking sheets will identify the status of:

- ✓ Utility relocations / coordination
- ✓ ROW Impacts
- ✓ Community or stakeholder comments
- ✓ Environmental and other permits
- ✓ Status of comments by other agencies (County, EMS responders, etc.)
- ✓ Review / approval status of design submittals

An initial schedule will be prepared in conjunction with MDOT and our project team that lists preconstruction and construction operations. We encourage joint preparation of the schedule with MDOT to capture all design, permitting, utility and construction activities which will then be reviewed at each monthly meeting and updated.

After Notice to Proceed with construction, Corman will continue the partnership with MDOT and the local

residents and form additional relationships with the local police, County DPW, Trash Collectors, School transportation departments, etc. to establish lines of communication, discuss local traffic requirements, and any special events planned during construction.

During design development of our Design-Build projects, Corman will hold formal weekly meetings to review plan development/status. At those meetings, 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 MDOT commitments, or may require a design variance, the team evaluates the overall benefit and presents it to the MDOT Project Manager. Schedule, cost and quality are always considered, and depending on the contract can evolve into value engineering proposals. Constructability of design development is discussed as a team. There are formal plans 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 Owners Design Manager. We will hold similar regularly scheduled meetings on the CMAR project with the only changes being the project is designed in-house by MDOT and the meeting frequency would be reduced to twice monthly or as desired by MDOT. ***Our hard learned CMAR and DB skills will carry forward as an advantage to meet Putty Hill Bridges CMAR project goals.***

We will expand upon the meeting discussed above to have senior estimators and field personnel develop anticipated work plans and sequencing graphs to schedule the project. These plans would be shared with MDOT and its Designer, and opportunities for breaking out selected design packages or identifying long lead items or other risks would occur at this time. For example, the preferred MOT and sequencing needs to be agreed upon prior to final utility, ROW or bridge plans going beyond the concept stage so as to minimize rework.

Our construction schedule planning will take into account any identified Time-of-Year (TOY) restrictions to road or lanes due to holidays or the school year. Coordinating with the County School district and leaders at the Parkville Schools will begin early to schedule the most advantageous construction schedule to avoid the most impacts to the school and its transportation / bus routes.

Innovation for this project revolves around improving the MOT to reduce overall construction time and maintain a higher level of service **(Goals #3, #5 and #6)** while reducing utility impacts / conflicts to again speed the project and reduce potential utility cost overruns or schedule delays **(Goals #3, #5 and #6)**: Initial major issues we currently envision as having the ability to serious impact the project is listed below. They will all be discussed, evaluated and solutions developed to mitigate as a team.

c. Risk Management

To minimize risk and maintain efficient decision making, minutes of all meetings would include action items with *"Ball in Court"* and due dates identified. Suggested design enhancements/modifications that could minimize risk, cost or schedule that are suggested or identified would be tracked in a risk register, which include these headings:

Table 2. Risk Registry

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

The risk register maintains suggested changes to the design, identifying potential risk or innovation considered, cost or schedule advantages, additional risks, impacts on other portions of the design or permitting, status of investigation or implementation, individual responsible and anticipated date of any required action. These suggested changes could come from Corman estimators, field staff or the in-house MDOT designers. It is even possible a stakeholder or permit agency reviewer may contribute to the potential list of comments. The risk

register is then reviewed at each regular progress meeting. Separate face-to-face or conference calls are established with key personnel (Corman, MDOT PM, and Designers or permit / stakeholder agencies) available to discuss suggestions. An advocate is assigned to champion each suggestion to ensure timely evaluations are performed with the proper personnel involved and resolution obtained timely. At regular meetings, or at a special meeting, the suggestion/comment is discussed by Corman, MDOT PM, and Designers with a consensus reached on its merits and a direction determined to; 1) incorporate; 2) continue to investigate or obtain additional data/information; or 3) abandoned. The above-referenced risk register is updated and becomes a permanent reference of the comment and resolution.

Corman Cost Estimator David Gates will lead the development of an open cost model for the ICE so that assumptions, contingency, and approach to the estimate are similar. David successfully implemented this process on MDOT's recently completed MD 24, Section's A & G CMAR project, as well as the recent I-95 Greenbelt CMAR and currently on the MD 5 Point Lookout CMAR projects all with MDOT. Once the plans have reached their agreed upon design milestone for pricing, three progressive cost estimates are prepared through an open-book cost model with MDOT, and a Guaranteed Maximum Price (GMP) will be prepared with little risk to MDOT. To further minimize MDOT's risk, we anticipate that this process will occur multiple times for the agreed upon sections, phases or construction packages as determined through the scoping workshop and subsequent discussions to reach on-time or early project delivery. During this time, we also anticipate working with MDOT and the ICE on Long Lead Time Procurement (LLTP) of items included in the design.

Initial Risk Matrix: The following is an Initial Risk Matrix identified by Corman staff based upon site visits and reviews of the preliminary plans provided. While there are additional risks not listed in the table, we have identified the ones, based upon our experience, most likely to occur and adversely impact the project.

Table 3. Initial Risk Matrix

Risk	***Potential Impact***	***Mitigation Strategy***
Utility Relocation	Delays in relocations	Identify all conflicts early, mitigate to avoid conflicts whenever possible, hold regular progress meetings with appropriate Utility during design (in their offices if necessary), invite all impacted utilities to combined regular progress meetings, and follow up regularly on all utility activities, report any delays to the proper individuals / entities as soon as they become apparent.
	Relocated incorrectly	Overlay all designs received from utilities on MDOT designs and vice versa to confirm conflicts eliminated, have contractor stake out relocations for utilities, have contractor as-build relocations prior to performing his work
	Increase in Scope of Relocations	Understand reason and scope for each relocation and identify unnecessary relocations for Utilities benefit only and challenge the need for any relocation that appears to be unnecessary
Maintenance of Traffic	Reduced access to residences	Communicate sequencing and potential impacts to all residents, provide paved or stone access to all driveways, relocate mail boxes as required to maintain service, utilize flag men as appropriate, maintain pedestrian access at all times.
	Unsafe conditions due to narrow roadway	Phase work to open full width of roadway lanes each night and on weekends, inspect the Traffic Control devices on a regular basis (including weekends), back up excavations / widening's daily to avoid drop offs at edge of work areas, lower speed limit, utilize temporary striping and signing, provide temporary lighting at ends of work areas or at lane width transitions.
	Traffic congestion that blocks emergency vehicles	Seriously explore the alternatives outlined in the technical concept section below to provide two-way traffic at all times.

Risk	*Potential Impact*	*Mitigation Strategy*
	or local residents access	Establish preemption equipment for emergency vehicles to override temporary traffic signal standard default timing.
	Back up block adjacent intersections or become too long in one direction of traffic vs the other.	Install temporary Queue detection equipment to include preemption override to override temporary traffic signal standard default timing at set back up lengths. Seriously explore the alternatives outlined in the technical concept section below to provide two-way traffic at all times
Unforeseen Structural issues during partial demolition of the structure	Delays construction or increases cost	Work closely with MDOT's designers to develop a clear and safe demo and sequencing plans. Perform a detailed inspection / conditional assessment of the existing structure to identify unforeseen issues prior to the start of demolition.
Unforeseen subsurface conditions	Causes Redesign, delays construction or increases cost	Carefully review Geotech report – was the ground homogenous, are more subsurface tests / explorations appropriate, do the new borings match those from the original construction, During construction (pile driving, excavating for footings) are the conditions as expected? If not notify EOR prior to proceeding.
Lack of local labor, material supplier and subcontractors	Delays construction or increases cost	Partner with local subcontractors, suppliers and labor groups, hold outreach meetings with local vendors / subcontractors.

d. Proposed Technical Concepts

Throughout the text above and below several innovative ideas or technical concepts are discussed that may, upon further investigation and analysis, increase the likelihood of success and help balance the project goals of time, cost and quality. These potential improvements are shown on the attached graphic and include:

Alternative 1: Utilize a one lane temporary structure to maintain two lanes of traffic on Putty Hill Ave. One lane of traffic would be on the temporary structure and the other lane on the existing structure with pedestrians still using the existing sidewalk. This eliminates the need for the temporary traffic signal and reduces congestion on Putty Hill Ave. Substructure strengthening would still be needed on the existing structure. MDOT ROW appears available in the northwest quadrant to implement this alternative. The proposed temporary construction easement in the southwest quadrant may need to be expanded to accommodate the proposed temporary touchdown and roadway.

As a modification to this Alternative, the western half of the structure could cut from its existing foundations and be rolled to a temporary foundation to function as the temporary structure vs. purchasing and installing a temporary truss structure. It would then be demolished after its need is completed. Corman has performed this procedure on past projects.

This Alternative would add cost to the project, but could maintain or shorten the current proposed schedule while tremendously improving local and thru traffic mobility on Putty Hill Ave. It would require additional temporary construction easements that would have a slightly greater impact to the physical environment. It would greatly reduce inconvenience and impacts to commuters using Putty Hill Ave. and not affect the quality of the new structure. **BENEFITS: Reduces congestion, improves mobility, and minimizes commuter impacts.**

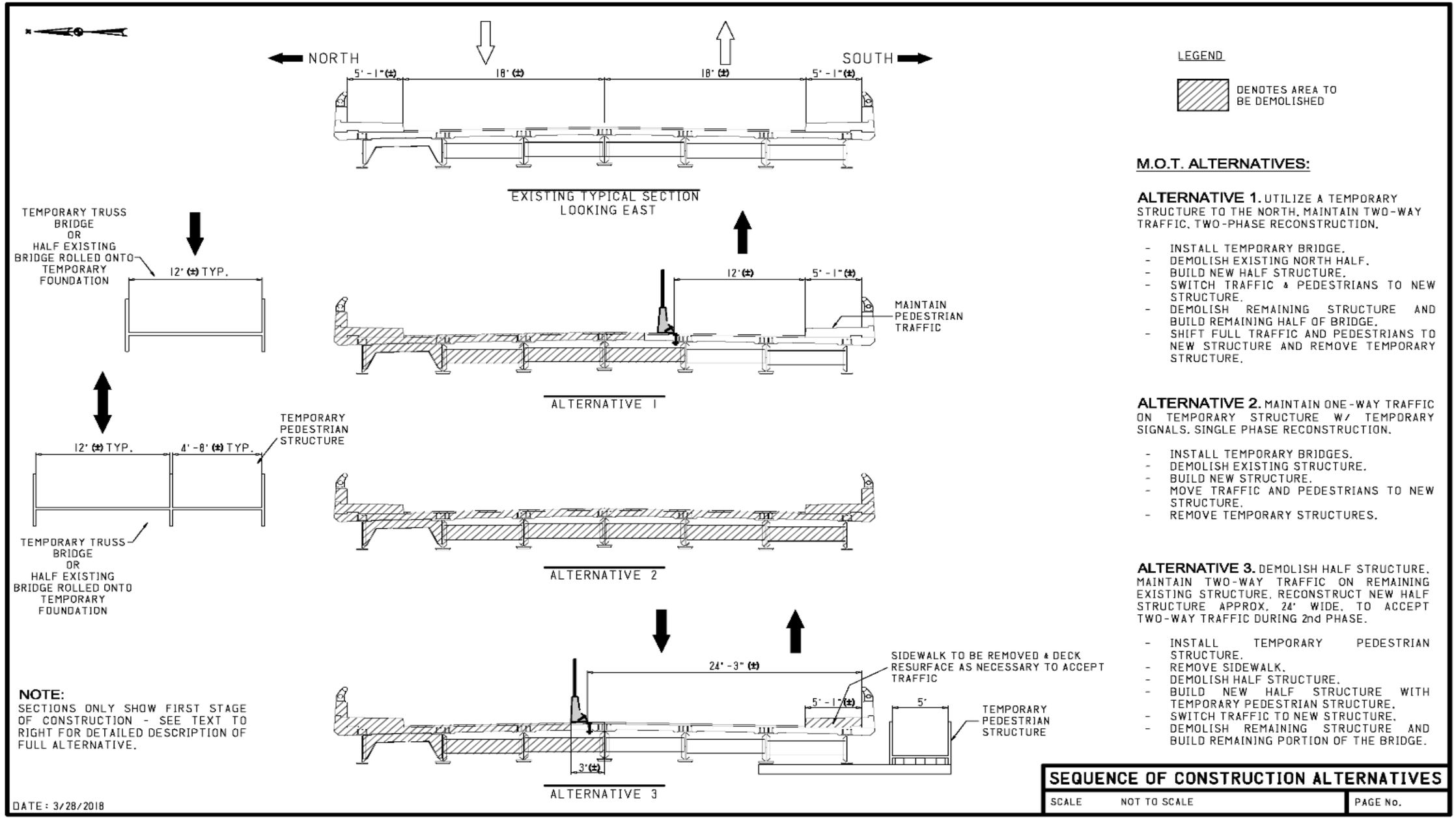


Figure 1. M.O.T. Alternatives

Alternative 2: Utilize a temporary structure capable of carrying one lane of vehicular traffic with an area for pedestrians. The temporary signal would still be used to alternate traffic flow across the bridge. The existing structure would be replaced in one phase which would eliminate the need to strengthen the substructure for phased construction. Again, as a modification to this Alternative, the western half of the structure could cut from its existing foundations and be rolled to a temporary foundation to function as the temporary structure vs. purchasing and installing a temporary truss structure. It would then be demolished after its need is completed.

This Alternative would provide a more durable structure to the MDOT as it will be constructed in one phase eliminating a construction joint throughout the substructure and superstructure. A detailed cost analysis would have to be done but the cost would remain substantially the same. Cost savings would include one phase removal and reconstruction and eliminating substructure strengthening. Cost increase would be the temporary structure. The schedule would be improved if advanced packages were used to procure and begin the temporary structure installation while final plans are approved.

The physical impacts would be increase as additional area would be disturbed to install the temporary structure. Impacts and inconveniences to commuters and residents would be unchanged from that of the RFP plans. **BENEFITS: More durable structure (quality), shorter schedule, and cost savings,**

Alternative 3: Modify the phase 1 construction plans to allow for two-way vehicular traffic on the deck and a pedestrian path cantilevered off the new deck. Modifications would include removal of the easterly sidewalk for use as a portion of the roadway, delaying construction of the phase 1 sidewalk to phase 3, increasing the width of deck placed in phase 1 to accommodate two lanes of traffic and installing a cantilevered pedestrian walkway off the new constructed superstructure. This Alternative would still require substructure strengthening and the temporary traffic signal would only be needed for phase 1 demolition and construction.

This Alternative would add the cost of the cantilevered pedestrian path to the overall project budget but would reduce the cost of the temporary signal. The schedule would not be impacted by adding the pedestrian path as these activities will be done concurrently with critical path items of work. Impacts to the physical environment would be unchanged from those of the RFP concepts. Inconveniences and impacts to the traveling public would be unchanged during phase one but would be greatly reduced during the second and third phase of the project. **BENEFITS: No schedule impacts, reduces traveling public impacts.**

2. CONSTRUCTION APPROACH

a. Construction Sequencing

Maintenance of Traffic: Unless an alternate construction sequence is selected, the project will be built in 3 phases of construction as shown in the RFP plans. To begin the first phase, MOT will be established on I-695 to allow strengthening of Pier #2. The temporary traffic signal and other MOT devices on Putty Hill Ave will not be installed until the work below the bridge is complete. This will reduce the time commuters and pedestrians are impacted by the project. Once the pier has been strengthened, MOT devices and traffic and demolition barriers will be placed on Putty Hill Ave and along the outside shoulder of I-695 as required.

After Phase 1 is complete the traffic signal and MOT devices will be reconfigured and stage 2 demolition and reconstruction will be completed. All MOT devices and barriers will be removed after phase 2 is completed. Phase 3 work, which consists of surface paving and pavement markings will be performed with daily lane closures.

Access will be provided at all times to the local residences adjoining the project. Safe and unobstructed pedestrian paths will be maintained at all times.

Utility Relocation: Although not a part of the construction sequencing, but critical to the project schedule, existing overhead and underground utilities will be in the process of being relocated by the MDOT. The sequencing shown in the plans is exactly how Corman would have proposed reconstructing the project if one of the above alternatives was not acceptable. By beginning demolition and construction on the west bound portion of the bridge, additional time is allowed for the existing utilities impacting the eastbound reconstruction to be relocated. This work will be critical in allowing the second phase of bridge demolition and reconstruction to begin. It would also be our suggestion that utilities (Elec, Gas and Communication) relocate their new facilities in bores under the interstate – this will remove them from any interference during construction and protect against future storm related issues dropping live lines on I-695 below.

A majority of the utility relocations will be performed by MDOT prior to mobilizing into the field or during Phase 1 construction. Relocating the overhead lines on Putty Hill south of the bridge prior to our mobilization would be preferred so construction activities are not occurring on both sides of the road during Phase 1 construction. The existing Verizon cable and the SHA electric lines must be relocated prior to demolishing the first stage of the bridge. Schedule impacts will be realized if these lines are not relocated promptly.

The 24" water main and the 2" gas line will be relocated in stages during Phase 1 construction. The underground portions of the lines will be installed first so stormdrain and grading operation may be completed concurrently with bridge demolition and reconstruction. The structure mounted section will be installed after erecting the structural steel. The gas line is currently not shown on the new structure but for proposal purposes we are assuming that's where it will go. To mitigate schedule risks, our preference would be it cross I-695 in a new underground bore. Final tie-ins of the water and gas lines will happen prior to final grading and paving of the roadway. Removal of the existing lines will be completed during Phase 2 demolition. Should MDOT desire Corman to coordinate and work with the utilities to provide the required relocations it would be well within our capabilities as we regularly provide similar services on our VDOT and DDOT design build projects.

Construction Phasing / MOT: Construction phasing will follow the MOT phasing as well as the approved erosion and sedimentation control plan sequence of construction. Working as a team, we will develop a streamlined sequence to minimize project stakeholder, local resident and commuter impacts by only starting work that can be continuously progressed or is needed based on the critical path of the schedule. The bridge structure is the critical path on the project after the ROW and utilities have been completed so that's where the main focus of this section will be. *This section addresses the Sequence of Construction shown on the Concept Plans already developed by MDOT – not the alternatives described above.*

The first phase of construction is reinforcing existing pier 2 to allowing it to handle temporary traffic loading that it was not designed to carry. The reinforced concrete option shown in the plans is a good solution to the reconfiguration. We would also like to investigate steel supports that could be installed more quickly and possibly at a lower cost to help improve the project schedule and allow the team to meet the SHA's budget (Goal #1).

We will sequence the work so that impacts to local residents and the travelling public are minimized. Our first phase of construction is limited to the substructure improvements required to allow demolition of the first half of the structure to begin. By only implementing that portion of the MOT plan, commuters using Putty Hill Ave will not be affected until demolition is ready to begin. Impacts to commuters using I-695 will be minimal with barrier walls located on the edge of paving.

Phasing then progresses to Stage 1 demolition where single face temporary barrier wall is installed along with a protective shield between traffic and the work zone. Corman will evaluate different methods of demolition to find that balance between cost and schedule. First, a longitudinal sawcut will be made to ensure the stability of the existing deck that is to remain. The small approach spans on each end of the structure can be broken directly

to the ground below and the debris removed from below. There are multiple options that will be presented and discussed with the teams for the spans over the I-695 beltway. Options Include:

1. Install wood shielding on the bottom flanges of the beams and remove the deck during daytime hours. This option would minimize impacts to traffic on I-695 below and would limit construction noise to daytime hours. Removal of the deck could be done 2 different ways with this option:

    - Sawcut and remove the concrete deck in slabs. This requires extensive concrete sawing and drilling but minimized the amount of debris to be handled and disposed of.
    - Breaking the deck with hydraulic hammer and continually cleaning the deck and shielding of debris to maintain safe loading of the temporary shield. This method is usually less expensive than sawing, but is much noisier.

2. Utilizing lane closures on I-695 and demolishing the deck into containers below while shielding the open lanes on I-695. This method is less expensive than installing wood shielding, but is controlled by allowable lanes closure times, usually at night. Nighttime demolition may also be very noisy with complaints from the surrounding residents in the suburban neighbor.

Enhancements we would recommend to minimize the risk of extensive back-ups on Putty Hill Ave. during rush hour or when school lets out from impacting Emergency Vehicles access, access to local residents or free flow at adjacent intersections include:

- Install preemption equipment on emergency vehicles to override temporary traffic signal standard default timing.
- Install temporary Queue detection equipment to include preemption override to override temporary traffic signal standard default timing at set back-up queuing lengths.

More radical and effective solutions include the alternatives described above and on the graphic (Page 18). We have implemented these solutions on past projects where the preliminary designs called for alternating one-way traffic and partial structure demolition. For example, on the replacement of the Bull Run bridge for VDOT we revised the construction plans which called for partial demo and alternating one-way traffic, by installing temporary piers and over a long weekend rolling the existing two-lane bridge onto those temporary piers, constructing the new bridge in one phase, opening to two-way traffic and then demoing the old structure and temporary piers. Full time two-way traffic was maintained at all times. A similar approach was followed in Farmville VA for the replacement of Route 15/460 (3rd Street) with similar results.

Independent Work Packages: The schedule on this project is very fast paced so ensuring we have the ROW / easements, utilities relocated and materials available for early phase 1 construction will be vital. An early clearing package can be used to clear the proposed utilities easements for utility relocations to occur. This will allow the utility companies to focus and relocations instead of having to hire a clearing contractor.

An advanced package for the pier strengthening portion of the project would allow work to progress prior to final plan approval. The MDOT already owns all the property required for this work to begin. The advanced package would allow material to be ordered, fabricated and stored waiting for delivery to the site.
If an alternate construction concept was adopted, an independent package would allow a temporary structure to be procured along with materials required for the substructure. If not, MOT details can be release early to allow for the temporary signal to be procured and installed.

b. Construction Schedule

The RFP indicates that construction NTP will be given in July 2019. At that point in the project the team should have acquired all the ROW and construction easements to begin the work. It is difficult to tell from the plans exactly where all of the easements and takes will be but that list can be developed and prioritized based on the construction sequence. ROW on the westbound direction of Putty Hill would be required first to allow that construction to begin immediately.

Outside Constraints: The two outside constraints that we see are the utilities that the team is responsible to relocate and the ROW / Construction Easements. Both should be resolved prior to construction NTP being issued. If not, the utility priority is the relocation of the Verizon lines located in the existing sidewalk. Demolition of the structure can't begin until that utility is relocated. Strengthening of the existing pier can be completed prior to that line being relocated but we will not be able to progress any further and the project schedule will suffer.

If ROW / construction easements are not all settled, westbound Putty Hill should be the priority to allow Phase I demolition and reconstruction to begin.

Construction Schedule: Since the project is scheduled to be complete in December of 2020, landscaping and surface paving must be complete while weather conditions are favorable or those finish items delayed until the spring.

The critical path on the project begins with ROW and utility relocations and progresses into the substructure strengthening. As outlined above, the substructure strengthening is one area where an advanced package would save some time on the schedule. For the concept shown in the plans, rebar and other materials could be ordered early so the materials would be available when NTP is issued. If structure steel frames were considered, materials could be ordered and the frames fabricated in Corman's shop. This would save forming and curing time for the concrete reinforcement.

After the substructure has been strengthened, the critical path runs through the MOT on Putty Hill Ave. An advanced design package for the temporary signal would allow those material to be on hand for installation. Demolition of the first phase of the project will begin after shielding and other protective measures are put into place. The superstructure will be removed while crews are installing the required support of excavation to allow substructure removal to begin. Once demolition is complete, deep foundations, substructure concrete and superstructure concrete will be placed to complete the first phase of the structure. The existing water and gas lines will be relocated during this phase of construction. All the site and stormwater work required to be completed during phase I will be in process while the bridge is being reconstructed.

The critical path then flows through the MOT which entails resetting the concrete barrier wall, vertical demolition shield and adjusting the temporary signal for the new traffic pattern. Demolition of the structure, including all 3 piers is completed and the new structure is reconstructed. Construction of the drainage, stormwater facilities and roadway will be concurrent with the bridge structure work. Once phase 2 is completed, all MOT devices will be removed and the final milling and surface paving operation can begin.

Equipment and Labor: Due to the fast-paced nature of this project, two structure crews will be required to complete the bridge within the allotted time. One utility crew will be required to complete the stormdrain and wet utility relocations with a grading crew brought in behind them to finalize roadway and site grading operations.

Crew availability is not a concern to Corman as we have a large work force to pull from to ensure we can meet the schedule requirements.

A large lattice boom crane will be needed for the support of excavation and pile foundations at the abutments. A smaller Rough Terrain crane will then sit behind the abutments for forming and pouring operations. Since the center pier is founded on rock, the excavator used for class 3 excavation will be able to set the substructure forms. Corman owned or large day rent truck cranes will be used to set the structural steel. The availability of a wide paved median on I-695 will be an advantage to the project for access to the center pier and crane placement.

Seasonal Work: Phase I substructure and superstructure concrete work is being constructed in late fall and over the winter months. Propane heaters and frost mats will be used to provide proper pouring and curing conditions for the substructure while a ground heater with adequate hose and frost mats will be used to cure the deck as required. Winter concrete activities are encountered on many of the projects we build and are almost second nature to our crews.

The biggest seasonal risk to the project is the surface paving activity which is temperature dependent. Any schedule delay to the project could push paving operations to the end of the project where temperatures will be out of our control. Our schedule will have winter paving calendars that will alert the team to any adverse effects current activities are having on surface paving.

Materials: Other than the materials discussed in the independent work packages section, we do not see any materials that will impact our performance on this project.

Our proposed schedule is included on pages 25 and 26.

c. Stakeholder Coordination

Since it is critical that the MDOT be kept informed, representatives of the organizations on the Organizational chart may be invited to our Progress Meetings as appropriate to the agenda. Any issue that could impact the roads, adjacent schools, local community or the adjacent properties, will be shared as soon as the team is aware of their existence. As an early lead item during the pre-construction phase, a decision will be jointly made by Corman and MDOT on the best way to disperse information to the involved adjacent property owners, affected businesses, schools, county officials and traveling public. The information disbursement procedures will be monitored as the project progresses and modified as appropriate.

Specific methods to ensure stakeholder's interests are being addressed includes:

- Hold Public Outreach meetings during the Pre-construction phase and "Pardon our Dust" meeting at the start of construction with affected residents to address their concerns and keep them updated on upcoming construction;
- Hold regular meetings with school Authorities during pre-construction and regular meetings during construction to discuss upcoming work, coordinate work with special school events and methods to minimize impacts;
- During the Pre-construction, attend with the designer's pre-permit application meetings with reviewing agencies.
- Provide clear, non-confusing MOT signage and facilities that conform to the MUTCD to meet driver expectations;
- Provide accurate "Three Week Look Aheads" to impacted agencies (including Police, EMS, and School transportation managers) to keep all concerned stakeholders aware of the work that can be expected;

- Pay special attention to the needs of the pedestrians (including school walkers) that use the bridge; and
- Pay special attention to the Utility Relocation process, invite ***all*** utilities to ***all*** progress meetings, have Corman and the Designers travel to the utilities offices vs. hoping they attend meetings in Baltimore or Corman's Annapolis Junction office, check to ensure the utilities are utilizing the latest roadway / bridge plans, and raise any utility delays to the proper individuals at first sign of any issues.

Additional or concurrent "Pardon our Dust" meetings would be suggested during key milestones in the design or construction process with the local residents and school or county officials to hear their concerns and explain our planned mitigation to keep the roadway safe and passable at all times for both vehicles and pedestrians.

Staff would be available from both MDOT and Corman to explain the specifics that may impact them. These meeting could be formal in a public school or other Government owned facility, or smaller in scope at one of the immediately adjacent resident's homes where more "one on one" informal discussions would be appropriate. Both have worked well on our past projects and a combination of the two maybe most appropriate on this project. The goal is to listen to all the Stakeholders concerns, incorporate what we can, and explain why we can't accommodate some of the suggestions.

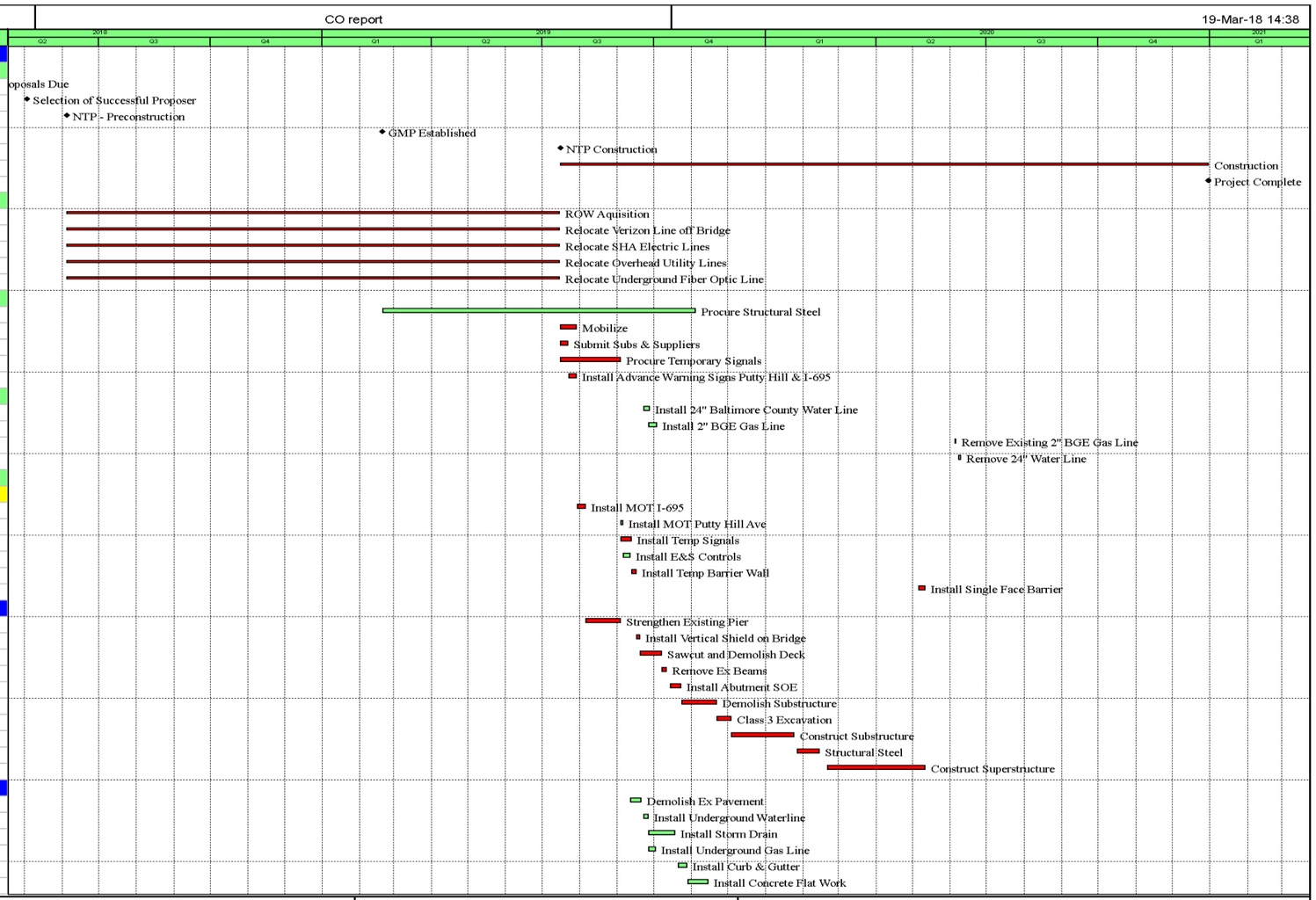
Coordination meetings would be held with Police, EMS, CHART and School transportation managers during the design and again prior to the start of construction to insure their concerns are addressed. Although MDOT will be handling the utility conflict / resolution process and ROW acquisition, Corman is available to also provide those services. Most of our VDOT Design Build projects transfer those responsibilities to us and we are well versed to assist the MDOT in managing both the utility and ROW process. During the pre-construction phase, Corman will coordinate with the Utility Companies to complete the necessary utility relocations and locate other utilities so they can be avoided. An added benefit of performing the utility coordination pre-construction is to insure MOT is not adversely impacted by Corman and Utility crews working on adjacent portions of the roadway at the same location simultaneously.

Planned work schedules and traffic updates would be provided to local media to distribute to the local populace. Information would also be provided, and regularly updated, to the County, Schools and MDOT to utilize on their websites. If desired during construction, a project specific web site could be established or regular updates made to the existing MDOT sites. The school district and County have Twitter, Facebook and other Social Media sites, updates would be sent to those social media sites as upcoming traffic switches or construction phase's change. Public Meetings would also be advertised in social media as appropriate.

We understand our work is for the public's benefit and that goal is best served by maintaining open and honest lines of communication with all affected, or interested, stakeholders.

Putty Hill Avenue Over I-695 CMAR — CO report — 19-Mar-18 14:38

Activity ID	Activity Name	Original Duration	Total Float	Start	Finish
Putty Hill Avenue Over I-695 CMAR		**700**	**0**	**03-Apr-18**	**30-Dec-20**
Milestones		1003	0	03-Apr-18	30-Dec-20
MS1000	Proposals Due	0	30	03-Apr-18	
MS1010	Selection of Successful Proposer	0	0	03-May-18*	
MS1030	NTP - Preconstruction	0	0	05-Jun-18*	
MS1040	GMP Established	0	0		19-Feb-19*
MS1050	NTP Construction	0	0	16-Jul-19*	
MS1060	Construction	534	0	16-Jul-19	30-Dec-20
MS1070	Project Complete	0	0		30-Dec-20
MDOT SHA Activities		279	0	05-Jun-18	15-Jul-19
SHA1000	ROW Aquisition	279	0	05-Jun-18	15-Jul-19
SHA1010	Relocate Verizon Line off Bridge	279	0	05-Jun-18	15-Jul-19
SHA1020	Relocate SHA Electric Lines	279	0	05-Jun-18	15-Jul-19
SHA1050	Relocate Overhead Utility Lines	279	0	05-Jun-18	15-Jul-19
SHA1060	Relocate Underground Fiber Optic Line	279	0	05-Jun-18	15-Jul-19
Project Wide		180	56	20-Feb-19	04-Nov-19
PW1030	Procure Structural Steel	180	56	20-Feb-19	04-Nov-19
PW1000	Mobilize	10	0	16-Jul-19	29-Jul-19
PW1010	Submit Subs & Suppliers	5	0	16-Jul-19	22-Jul-19
PW1020	Procure Temporary Signals	35	0	16-Jul-19	03-Sep-19
PW1100	Install Advance Warning Signs Putty Hill & I-695	5	0	23-Jul-19	29-Jul-19
Conctractor Utilities		183	1	23-Sep-19	09-Jun-20
A1020	Install 24" Baltimore County Water Line	5	100	23-Sep-19	27-Sep-19
A1000	Install 2" BGE Gas Line	5	96	27-Sep-19	03-Oct-19
A1010	Remove Existing 2" BGE Gas Line	1	1	05-Jun-20	05-Jun-20
A1030	Remove 24" Water Line	2	1	08-Jun-20	09-Jun-20
Construction		367	0	30-Jul-19	30-Dec-20
Phase 1		200	0	30-Jul-19	11-May-20
PI1000	Install MOT I-695	5	0	30-Jul-19	05-Aug-19
PI1020	Install MOT Putty Hill Ave	2	5	04-Sep-19	05-Sep-19
PI1030	Install Temp Signals	7	0	04-Sep-19	12-Sep-19
PI1090	Install E&S Controls	4	96	06-Sep-19	11-Sep-19
PI1040	Install Temp Barrier Wall	2	0	13-Sep-19	16-Sep-19
PI1140	Install Single Face Barrier	4	0	06-May-20	11-May-20
Structure		195	0	06-Aug-19	11-May-20
PI1010	Strengthen Existing Pier	20	0	06-Aug-19	03-Sep-19
PI1050	Install Vertical Shield on Bridge	3	0	17-Sep-19	19-Sep-19
PI1060	Sawcut and Demolish Deck	12	0	20-Sep-19	07-Oct-19
PI1070	Remove Ex Beams	4	0	08-Oct-19	11-Oct-19
PI1075	Install Abutment SOE	7	0	15-Oct-19	23-Oct-19
PI1080	Demolish Substructure	20	0	24-Oct-19	21-Nov-19
PI1100	Class 3 Excavation	7	0	22-Nov-19	03-Dec-19
PI1110	Construct Substructure	37	0	04-Dec-19	24-Jan-20
PI1120	Structural Steel	15	0	27-Jan-20	14-Feb-20
PI1130	Construct Superstructure	57	0	21-Feb-20	11-May-20
Site Work		118	51	12-Sep-19	28-Feb-20
A1040	Demolish Ex Pavement	7	96	12-Sep-19	20-Sep-19
A1050	Install Underground Waterline	4	96	23-Sep-19	26-Sep-19
A1060	Install Storm Drain	15	119	27-Sep-19	18-Oct-19
A1055	Install Underground Gas Line	4	96	27-Sep-19	02-Oct-19
A1080	Install Curb & Gutter	6	119	21-Oct-19	28-Oct-19
A1085	Install Concrete Flat Work	12	119	29-Oct-19	14-Nov-19



Remaining Level of Effort · Remaining Work · Milestone
Actual Work · Critical Remaining Work

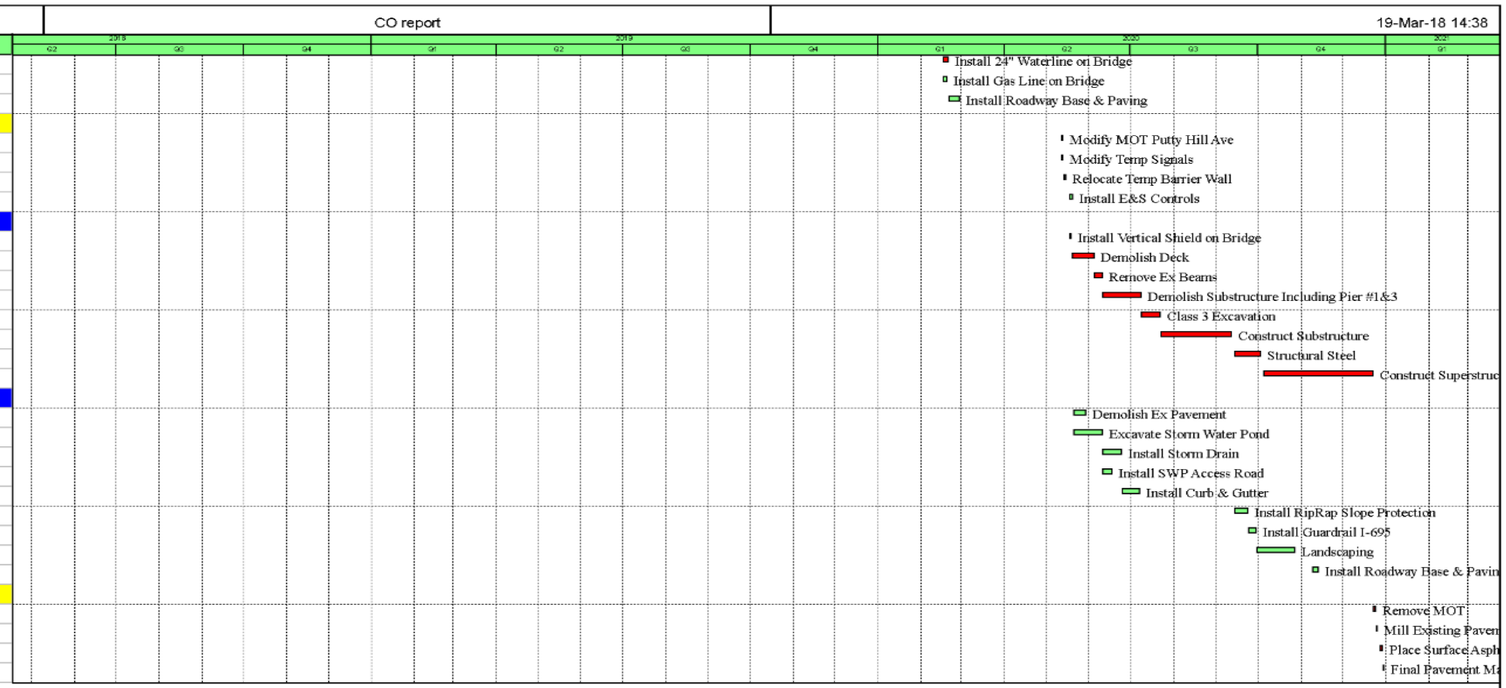
Page 1 of 2

TASK filter: All Activities

Figure 2. Proposed Schedule 1 of 2

Putty Hill Avenue Over I-695 CMAR — CO report — 19-Mar-18 14:38

Activity ID	Activity Name	Original Duration	Total Float	Start	Finish
A1053	Install 24" Waterline on Bridge	4	0	17-Feb-20	20-Feb-20
A1057	Install Gas Line on Bridge	3	1	17-Feb-20	19-Feb-20
A1090	Install Roadway Base & Paving	6	51	21-Feb-20	28-Feb-20
Phase 2		161	6	12-May-20	22-Dec-20
PII1020	Modify MOT Putty Hill Ave	2	0	12-May-20	13-May-20
PII1030	Modify Temp Signals	2	0	12-May-20	13-May-20
PII1040	Relocate Temp Barrier Wall	2	0	14-May-20	15-May-20
PII1090	Install E&S Controls	3	115	18-May-20	20-May-20
Structure		157	0	18-May-20	22-Dec-20
PII1050	Install Vertical Shield on Bridge	2	0	18-May-20	19-May-20
PII1060	Demolish Deck	12	0	20-May-20	04-Jun-20
PII1070	Remove Ex Beams	4	0	05-Jun-20	10-Jun-20
PII1080	Demolish Substructure Including Pier #1&3	20	0	11-Jun-20	08-Jul-20
PII1100	Class 3 Excavation	10	0	09-Jul-20	22-Jul-20
PII1110	Construct Substructure	37	0	23-Jul-20	11-Sep-20
PII1120	Structural Steel	15	0	14-Sep-20	02-Oct-20
PII1130	Construct Superstructure	57	0	05-Oct-20	22-Dec-20
Site Work		127	33	21-May-20	13-Nov-20
PII040	Demolish Ex Pavement	7	123	21-May-20	29-May-20
PII100	Excavate Storm Water Pond	15	115	21-May-20	10-Jun-20
PII060	Install Storm Drain	10	115	11-Jun-20	24-Jun-20
PII110	Install SWP Access Road	5	140	11-Jun-20	17-Jun-20
PII080	Install Curb & Gutter	9	115	25-Jun-20	07-Jul-20
PII130	Install RipRap Slope Protection	8	35	14-Sep-20	23-Sep-20
PII120	Install Guardrail I-695	4	35	24-Sep-20	29-Sep-20
PII140	Landscaping	20	35	30-Sep-20	27-Oct-20
PII090	Install Roadway Base & Paving	5	27	09-Nov-20	13-Nov-20
Phase 3		6	0	23-Dec-20	30-Dec-20
P3-1000	Remove MOT	2	0	23-Dec-20	24-Dec-20
P3-1010	Mill Existing Pavement	1	0	25-Dec-20	25-Dec-20
P3-1020	Place Surface Asphalt	2	0	28-Dec-20	29-Dec-20
P3-1030	Final Pavement Markings & Signs	1	0	30-Dec-20	30-Dec-20



Remaining Level of Effort | Remaining Work | Milestone
Actual Work | Critical Remaining Work

Page 2 of 2

TASK filter: All Activities

Figure 3. Proposed Schedule Page 2 of 2

D. APPROACH TO COST ESTIMATING

1. ESTIMATING ENVIRONMENT

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

Corman's estimating department is led by our proposed Cost Estimator David Gates. David has successfully created a team environment with MDOT and the ICE on other CMAR projects by leading estimates that were fair, straight-forward, and open book, including MD 24, Sections A & G, I-95 in Greenbelt and MD 5 in St Mary's County. David has been estimating MDOT projects since 1994, and knows MDOT specifications and standards, along with bid-build, design-build, and CMAR project delivery methods. This knowledge is crucial to leading the Cost Estimating team on this project.

As an integral member of the Design team, Corman will participate with initial workshops, project site visits, and help streamline the design process. During meetings, David and other Corman Estimators will review plans for constructability and help to reduce the cost, impacts, and duration of the construction as the team moves towards building an estimate. Open discussions will be held about optimizing the maintenance of traffic ideas to minimize impacts to the traveling public along Putty Hill Ave. with special attention paid to peak periods during the school year. The biggest cost saving ideas start in these collaborative meetings prior to formulating an estimate. The shared ideas from stakeholders, MDOT, and the ICE during this stage paves the way for a smooth transition into the estimate down the road. Creating an open, fair, and transparent environment for estimating starts early in the process. As collaborative plans are developed, the integrated estimating team (Corman, MDOT, and the ICE) will work closely together to establish a list of bid items that follow MDOT guidelines and formats. Corman's extensive MDOT experience will make building this list seamless. Input from all team members is crucial. David will use his past CMAR experience to lead the charge. As the collaborative plans are taken to final completion, the open and transparent estimate will follow right along. **The team's focus will always remain on producing the most cost and time effective estimate that best meets the project's six goals.**

As the conceptual design progresses the bid quantities will also be developed. Corman will estimate bid item quantities and with detailed back up available for the ICE to review. We will then meet with MDOT and the ICE to compare / discuss these quantities and come to an "agreed to" quantity to use for each item in our estimates. Some bid items often have many sub items. We will agree on the sub items and quantities with the ICE for all items as well. Clear detailed backup and open discussions make this process run smoothly and successfully. **By ensuring both the ICE and Corman are pricing up the exact same bid items and quantities, it removes one variable from the equation when comparing estimates.** Corman has used this same approach with our MDOT Design-Build mega-projects (ICC), where we were part of a large joint venture (JV) team. Each JV partner would prepare a separate estimate then gather to compare estimates and come up with the best cost-effective estimate for the group.

A key to having an open and transparent estimate is to ensure that Corman and the ICE team use the same unit costs for labor, equipment, materials, and subcontractor pricing. Corman will provide a complete and open breakdown of our labor costs (i.e. Foreman, operators, laborer, and etc.) and all our equipment costs (i.e. excavators, dozers, cranes, etc.). Corman will create a complete vendor list and solicit pricing for all materials and subcontractors. We will develop a DBE Out-reach program to meet the required goals for the project. Material pricing and subcontractor pricing DBE firms will be jointly shared and evaluated with the ICE team member.

A key to having an open and transparent estimate is that Corman and the ICE team use the same unit costs for labor, equipment, materials, and subcontractor

Once the quantities are agreed on by Corman and the ICE / MDOT, two independent estimates will be developed. Corman and ICE will come up with a complete estimate with crews and productions accordingly. Both estimates will be sent to MDOT, where comparison sheets are prepared for each bid item. For each item, the team will evaluate if the Corman estimate of probable cost, Engineer's Estimate, and the ICE's estimate are within acceptable tolerances. If prices are acceptable, MDOT will prepare a Construction contract amendment. If pricing is not acceptable, MDOT will enter into a process of risk identification that identifies price differences between the Contractor and the ICE. Corman and the ICE will compare crew size, equipment and productions, discuss the individual approaches / rates to identify and resolve any differences in our costing. This open and professional exchange of information and approach to estimating has worked well on past projects, because all parties are working towards the one goal to ensure MDOT is receiving the best fair and reasonable GMP price for the work desired.

Our estimates start with a bid item such as Maintenance of Traffic, Substructural Concrete (see Page 29 - Table 3: Estimate Summary – Costs and Prices). Bid items are broken into activities (see Page 30 – 32 – Cost Report). Corman assigns crews (with labor, equipment and production), activities and then add materials, supplies, subcontract work and trucking.

We use an estimating software program to help with formulating our pricing. In the program we follow these steps:

1. Create bid Items - Example 1001 Maintenance of traffic, 1002 Mobilization, and 4001 Substructure Concrete.
2. Under bid items we create activities for the "scope of work" within that bid item - Example 1001A Major Traffic Shift (see Bid Item 1001).
3. Next we add pricing components to the activity. This could be a whole crew (see MOT Lane closure), or a piece of equipment with an operator. We then assign a quantity and production for that crew. See activity 1001A has a quantity of 2 each and a production 1 per shift, for a total of 2 shifts. The production hours are calculated for the crew for those 2 shifts and costs are generated.
4. We can add permanent materials (see 2CMB burlap in activity 4001B), temporary materials (3FWW Wood Wall Forms in activity 4001A), and subcontract (see 4RODB – Rodbuster Sub in activity 4001C), Trucking (see 4Dtruck – trucking sub in activity 1001A)
5. We create indirect items where we add supervision cost as well as small tools and supplies. We then can apply these indirect cost to all items or just one item. For this sample estimate all the indirect costs is in bid item 1002 - Mobilization
6. An overall cost is then generated for each item.
7. We then assign profit and mark-ups to the bid items to generate a final bid price.

2. SAMPLE ESTIMATE

Table 4. Estimated Summary

Estimate Summary - Costs and Prices

Corman Construction 100 David Gates Page 1 of 1
4349A 4349A CMAR Putty Hill Ave Bridge 03/26/2018 5:15 PM

Direct Biditems

Manhours	Labor	Perm Materials	Const Materials	Equipment	Subs	Trucking	Direct Total	Indirect Charge	Addon Bond	Total Cost	Balanced Bid Markup	Balanced Bid Total	Bid Prices Markup	Bid Prices Total
1001 - Maintenance of Traffic				1 LS										
160	4,009			140	750		4,899			4,899	2,806	7,705.45	2,806	7,705.45
160.00										4,899.31	57.28%	7,705.45	57.28%	7,705.45
1002 - Mobilization				1 LS										
								109,530		109,530		109,530.22		109,530.22
										109,530.22		109,530.22		109,530.22
4001 - Substructure Concrete				1 LS										
715	20,547	27,445	5,943	9,329	6,181		69,445			69,445	39,776	109,220.69	39,776	109,220.69
715.26										69,445.14	57.28%	109,220.69	57.28%	109,220.69
Direct Totals														
875	**24,556**	**27,445**	**5,943**	**9,469**	**6,931**		**74,344**	**109,530**		**183,875**	**42,582**	**226,456**	**42,582**	**226,456**

Indirect Charges

MHs	Labor	Perm Matl	Constr Matl	Equipment	Subcontract		Total
99950 - I-1 Schedule Based Costs							
1,584	101,420	-	4,200	-	-		105,620
99970 - I-3 Small Tools & Supplies							
	-	-	3,910	-	-		3,910
Indirect Totals							
1,584	**101,420**	**-**	**8,110**	**-**	**-**		**109,530**

Profit-markup

Summary Information

Last Summary: 3/26/2018 5:15:00 PM
Last Spread: 3/26/2018 5:15:00 PM

Table 5. Cost Report

Cost Report

Corman Construction 100 David Gates Page 1 of 3
4349A 4349A CMAR Putty Hill Ave Bridge 03/26/2018 5:20 PM

Biditem 1001 — **Maintenance of Traffic**

Takeoff Qty: 1.000 LS
Bid Qty: 1.000 LS

supplies

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Trucking	Total
U. Cost	3,058.00	951.31	4,009.31	140.00	0.00	0.00	750.00	0.00	4,899.31
Total	3,058.00	951.31	4,009.31	140.00	0.00	0.00	750.00	0.00	4,899.31

Manhours	Unit/MH	MH/Unit	$/MH	Base Labor/MH	Total Labor/MH	Unit/CH
160.0000	0.0063	160.0000	30.6207	19.1125	25.0582	0.0500

Activity: 1001A Major Traffic Shift Quantity: 2 Unit: EA

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Trucking	Total
U. Cost	1,529.00	475.66	2,004.66	70.00	0.00	0.00	375.00	0.00	2,449.66
Total	3,058.00	951.31	4,009.31	140.00	0.00	0.00	750.00	0.00	4,899.31

Crew $/Unit	Crew Hrs/Unit	Units/Crew Hr	$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	$/Shift
2,074.6550	10.0000	0.1000	207.4655	2.0000	1.0000	1.0000	2,449.6550

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
160.0000	0.0125	80.0000	25.0582	1,529.0000

Calendar: 510 5 - 10 Hr Days Hrs/Shift: 10 WC: MD5506 Street or Road

Crew: MOTLC MOT LANECLOSURE Prod: S 2 Eff: 100.00 Crew Hrs: 20.00 Labor Pcs: 8.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4DTRUCK	Trucking - Sub	1.00	10.00	HR	75.00	100.00	75.00	750.00
8TPU	Pickup Truck	1.00	20.00	HR	7.00	100.00	7.00	140.00
CRP	Carpenter	2.00	40.00	MH	15.00	110.00	21.63	865.32
LS	Skilled Laborer	4.00	80.00	MH	14.00	110.00	20.19	1,615.26
OPTR	Operator-Truck	1.00	20.00	MH	18.00	110.00	25.96	519.19
ZFM	Foreman	1.00	20.00	MH	35.00	110.00	50.48	1,009.54

Biditem 1002 — **Mobilization**

Takeoff Qty: 1.000 LS
Bid Qty: 1.000 LS

Biditem 4001 — **Substructure Concrete**

Takeoff Qty: 1.000 LS
Bid Qty: 1.000 LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Trucking	Total
U. Cost	15,604.61	4,942.40	20,547.01	9,329.38	27,444.53	5,943.42	6,180.80	0.00	69,445.14
Total	15,604.61	4,942.40	20,547.01	9,329.38	27,444.53	5,943.42	6,180.80	0.00	69,445.14

Manhours	Unit/MH	MH/Unit	$/MH	Base Labor/MH	Total Labor/MH	Unit/CH
715.2600	0.0014	715.2600	97.0908	21.8167	28.7266	0.0084

Activity: 4001A Form Footing A + B Quantity: 1246 Unit: SF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Trucking	Total
U. Cost	9.82	3.11	12.93	5.87	0.00	4.77	0.00	0.00	23.57
Total	12,232.62	3,874.39	16,107.01	7,313.40	0.00	5,943.42	0.00	0.00	29,363.83

Crew $/Unit	Crew Hrs/Unit	Units/Crew Hr	$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	$/Shift

18.7965	0.0750	13.3333	250.6197	9.3450	133.3333	0.0075	3,142.1969

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
560.7000	2.2222	0.4500	28.7266	9.8175

Calendar: 510 5 - 10 Hr Days Hrs/Shift: 10 production WC: MD5222 Bridge Work

Crew: CFCRT Carpenter F&S 60T RT Prod: MU 0.45 Eff: 100.00 Crew Hrs: 93.45 Labor Pcs: 6.00 Equipment Pcs: 2.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
3FONT	Oil/Nails/Ties	1.00	1,246.00	SF	2.00	106.00	2.12	2,641.52
3FWW	Wood Wall Forms	1.00	1,246.00	SF	2.50	106.00	2.65	3,301.90
8EX060K	Excavator 60,000 LB (325)	1.00	93.45	HR	71.26	100.00	71.26	6,659.25
8TPU	Pickup Truck	1.00	93.45	HR	7.00	100.00	7.00	654.15
CRP	Carpenter	3.00	280.35	MH	15.00	110.00	21.73	6,090.89
LS	Skilled Laborer	1.00	93.45	MH	14.00	110.00	20.28	1,894.94
OPEX	Operator-Excavator	1.00	93.45	MH	25.00	110.00	36.21	3,383.82
ZFM	Foreman	1.00	93.45	MH	35.00	110.00	50.69	4,737.36

Activity: 4001B P/C Footings A+B Quantity: 179 Unit: CY

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Trucking	Total
U. Cost	15.27	4.84	20.11	9.13	126.35	0.00	0.00	0.00	155.58
Total	2,733.36	865.74	3,599.10	1,634.07	22,615.81	0.00	0.00	0.00	27,848.98

Crew $/Unit	Crew Hrs/Unit	Units/Crew Hr	$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	$/Shift
29.2356	0.1167	8.5714	250.5911	2.0883	85.7144	0.0117	13,335.5265

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
125.2900	1.4287	0.6999	28.7262	15.2702

Calendar: 510 5 - 10 Hr Days Hrs/Shift: 10 WC: MD5222 Bridge Work

Crew: CFCRT Carpenter F&S 60T RT Prod: MU 0.7 Eff: 100.00 Crew Hrs: 20.88 Labor Pcs: 6.00 Equipment Pcs: 2.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CMB	Burlap	1.00	1,246.00	SF	1.00	106.00	1.06	1,320.76
2CR35	3500 PSI Concrete (A3.5)	1.06	189.74	CY	103.88	106.00	110.11	20,892.80
2CRICE	Ice	1.06	189.74	CY	2.00	106.00	2.12	402.25
8EX060K	Excavator 60,000 LB (325)	1.00	20.88	HR	71.26	100.00	71.26	1,487.91
8TPU	Pickup Truck	1.00	20.88	HR	7.00	100.00	7.00	146.16
CRP	Carpenter	3.00	62.65	MH	15.00	110.00	21.73	1,361.14
LS	Skilled Laborer	1.00	20.88	MH	14.00	110.00	20.28	423.40
OPEX	Operator-Excavator	1.00	20.88	MH	25.00	110.00	36.21	756.07
ZFM	Foreman	1.00	20.88	MH	35.00	110.00	50.69	1,058.49

Activity: 4001C Reinforcing Steel in Footings Quantity: 14630 Unit: LB

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Trucking	Total
U. Cost	0.04	0.01	0.06	0.03	0.33	0.00	0.42	0.00	0.84
Total	638.63	202.27	840.90	381.91	4,828.72	0.00	6,180.80	0.00	12,232.33

Crew $/Unit	Crew Hrs/Unit	Units/Crew Hr	$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	$/Shift
0.0836	0.0003	2,999.9795	250.7454	0.4877	29,999.7949	0.0000	25,083.2120

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
29.2700	499.8292	0.0020	28.7291	0.0437

Calendar: 510 5 - 10 Hr Days Hrs/Shift: 10 WC: MD5222 Bridge Work

Crew: CFCLB Carpenter F&S Crawler Prod: MU 0.002 Eff: 100.00 Crew Hrs: 4.88 Labor Pcs: 6.00 Equipment Pcs: 2.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2REBARB	Black Rebar - Grade 60	1.00	14,630.00	LB	0.30	106.00	0.32	4,652.34
2REBARCOUP	Rebar Couplers	1.00	16.64	EA	10.00	106.00	10.60	176.38
4COUPLER	Install #7 Form Savers	1.00	16.64	EA	20.00	100.00	20.00	332.80

4349A 4349A CMAR Putty Hill Ave Bridge 03/26/2018 5:20 PM Page 3 of 3

4RODB	Rodbuster - Sub	1.00	7.31	TN	800.00	100.00	800.00	5,848.00
8EX060K	Excavator 60,000 LB (325)	1.00	4.88	HR	71.26	100.00	71.26	347.75
8TPU	Pickup Truck	1.00	4.88	HR	7.00	100.00	7.00	34.16
CRP	Carpenter	3.00	14.63	MH	15.00	110.00	21.73	317.85
LS	Skilled Laborer	1.00	4.88	MH	14.00	110.00	20.28	98.95
OPEX	Operator-Excavator	1.00	4.88	MH	25.00	110.00	36.21	176.71
ZFM	Foreman	1.00	4.88	MH	35.00	110.00	50.69	247.39

Report Summary

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Trucking	Total
Total	18,663	5,894	24,556	9,469	27,445	5,943	6,931	0	74,344

Job Notes

Updated 19FEB18 by SES
**********Estimate created on: 03/15/2018 by User#: 124 - Bonnie James
Source estimate used: H:\HEAVYBID\EST\MDMASTER

Calendars Used In Estimate

510 5 - 10 Hr Days

3. CONTRACTING PLAN

Approach to developing a subcontractor selection plan that allows for the competitive solicitation of bids from quality subcontractors: Corman self-performs on many of our projects and will be self-performing a minimum of 50% of the work required for this project. During preconstruction, a detailed subcontracting and DBE plan will be developed and submitted to MDOT for concurrence. The plan will be based on our current standard plan and emphasize selecting subcontractors based on:

- A past history of successful performance on other MDOT, Federal, local County or Corman projects,
- Price,
- Quality,
- Financial stability, and
- Schedule adherence
- Minority or Disadvantaged status.

Selection will be in accordance with COMAR 21.05.10.05, and the State's Nondiscrimination Clause as provided in State Finance and Procurement Article, §13-219, Annotated Code of Maryland, and the Commercial Nondiscrimination Policy as provided in State Finance and Procurement Article, Title 19, Annotated Code of Maryland.

Corman maintains a database of qualified Specialty/DBE firms. Outreach is continuous as a way to connect with additional firms. The following are ways we solicit Specialty/DBE firms for this project during the preconstruction phase:

1. Publish Proposal Notifications / Bid Notices in local and minority newspapers and eMaryland Marketplace 30 and 10 days prior to price due dates. Post plans and specifications on Corman's SharePoint Site.
2. Review past MDOT, MDTA, Baltimore City and County bids and projects for possible Specialty / DBE firms that maybe interested in the project – contact those firms to determine interest.
3. Review MDOT MBE/DBE directory to identify appropriate certified DBE subcontractors / suppliers.
4. Corman's Estimating Assistants will reach out to identify potential Specialty / DBE firms from our company database.
5. Based on available scopes of work if adequate response is not obtained an "Open House" will be held at a local venue to advertise the opportunity and solicit interest from the local contracting and DBE community.

6. Develop and maintain a list of identified potential Specialty / DBE firms to solicit prices from – the list would be prepared using Corman's database, as well as Items 1 through 5 above.
7. Validate licensing, qualifications, bonding capacity and references of specialty and certified DBE subcontractors / suppliers identified, respond to project inquiries, and furnish requested information as appropriate.
8. Review at regular intervals our compliance with project requirements, codes and ordinances.

Specialty / DBE subcontractors will be chosen based on:

- ✓ Past performance on Corman projects.
- ✓ Industry feedback/references from past performance on similar contracts.
- ✓ Personal interviews.
- ✓ Visits to subcontractors' office/yards.
- ✓ Review of subcontractor Quality program.
- ✓ Familiarity of working on Government (MDOT, MDTA, City or County) projects.
- ✓ Financial stability and strength.
- ✓ Understanding project goals/scope during pricing and investigative phases.
- ✓ Ability to perform multiple contract tasks.
- ✓ Price of the work to provide MDOT the best value.
- ✓ Availability of equipment and labor (Backlogs).
- ✓ Capacity to perform within the anticipated shorten seasonal schedule, weekends and at night.
- ✓ DBE status

Specific subcontracting opportunities will be determined and based upon the outreach and subcontracting venting described above, and a short list of qualified subcontractors will be developed and discussed with MDOT and the Governor's Office of Minority Affairs, as appropriate. The shortlisted Specialty / DBE firms will then be contacted; plans and specifications made available; and a pricing request sent. Corman will create a complete vendor list and solicit pricing for all materials and subcontractors. An Estimating Assistant oversees and manages the pricing for each of the bid items where Specialty / DBE pricing is required.

Demonstrating subcontractor's prices are competitive: We understand our responsibility to demonstrate to the ICE and MDOT the selected subcontractor's price is competitive. This is accomplished by:

- Not preselecting DBE firms at this early stage of the project
- Comparing submitted quotes from a minimum of three subcontractors to our own estimated pricing, utilizing our in-house estimating software.
- Reviewing the inclusions and exclusions in the subcontractor's scopes to ensure equal scopes have been priced.
- Providing a minimum of three quotes, four if available.
- If only one quote available:
  - Determine why only one avail from those invited but not submitting - Explore ways to attract more subcontractor interest – extend deadline to bid, revise scopes to be more attractive, etc.
  - Use past subcontracting pricing from other similar scope and size projects.
  - Utilize self-perform pricing

Commitments to enhance DBE participation: We will develop a DBE Outreach program to meet the required goals for the project. All the material pricing and subcontractor pricing DBE firms will be jointly shared and evaluated with the ICE team member. When preparing a fair price for the project, we will track the status of our DBE Participation. This creates an awareness to maintain and/or increase our efforts to successfully meet the goals. As the fair price submittal dates approaches construction, DBE participation goals are evaluated and finalized to meet them. If adequate DBE participation is not obtained thru the above process bid items Corman had originally planned to perform in-house would be broken out and sent to local or regional DBE firms to quote

on. However, at this time we believe adequate DBE firms are available to bid on the planned subcontracted items listed below. During construction, the project team monitors DBE participation for compliance with the goal.

We did not obtain commitments from DBE's at this time because that would eliminate any potential competition available to drive for the lowest price. Committing to a subcontractor now at this stage would tie our hands and eliminate any future price competition. This is especially true for this project where the items listed below to be subcontracted have many good local DBE subcontractors available to bid.

Items we would anticipate subcontracting out to Specialty/DBE firms include:

- Asphalt Paving
- Guide Rail Installation
- Trucking
- Underdrain Installation
- Signing
- Line Striping
- Fueling
- Seeding / Landscaping
- Material Supply (Rebar, etc.)

Complying with COMAR 21.05.10.05: COMAR 21.05.10.05 states:

A. The construction manager assumes all risk for the cost, schedule, and performance of the trade contracts.

B. Trade contracts may be procured concurrently or over the life of the project.

C. The construction manager or procurement unit shall send the solicitation notice for trade proposals to the Governor's Office of Minority Affairs and publish the notice in a newspaper of general circulation near the project, or Internet media, or both, at least 14 days before trade proposals are due. If the construction manager restricts trade proposals to prequalified contractors, the solicitation notice shall include information on the prequalification process.

D. The procurement agency shall publish notice of the project, contact information of the construction manager, and general information on trade proposal solicitation on its website and eMaryland Marketplace.

E. The construction manager may, subject to approval by the procurement officer, select trade contractors based on evaluation factors other than low bid, including, but not limited to, MBE participation, past performance, and special qualifications.

F. The construction manager shall comply with the State's Nondiscrimination Clause as provided in State Finance and Procurement Article, §13-219, Annotated Code of Maryland, and the Commercial Nondiscrimination Policy as provided in State Finance and Procurement Article, Title 19, Annotated Code of Maryland.

The Contracting plan described above clearly meets all of those requirements. We will regularly review our compliance with the CMAR requirements and adjust our actions accordingly to maintain compliance with COMAR 21.05.10.05. Our legal and estimating departments will along with the ICE and MDOT continuously monitor to insure or estimators are complying with the above COMAR 21.05.10.05 requirements.