MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

ORIGINAL

TECHNICAL PROPOSAL

MD 4

(PENNSYLVANIA AVE) AT SUITLAND PARKWAY INTERCHANGE IMPROVEMENTS

PRINCE GEORGE'S COUNTY

Contract No. PG6185470

CORMAN KOKOSING

June 30, 2021

B. Capability

B. CAPABILITY

1. KEY STAFF

SCOTT SZYMPRUCH, PE | PROPOSED ROLE: PROJECT MANAGER

EDUCATION, REGISTRATION

BS, Civil Engineering
Registered PE: MD #25502

Scott has 26 years of management experience on heavy highway projects. His career trajectory took him from project engineer to sr. project engineer to project manager, to chief engineer to division manager to Vice President of Corman Kokosing's Mid-Atlantic Division to Vice President, Alternative Contracting. Scott's portfolio encompasses four CMAR projects where he was project manager on two. **CMAR/CMCG White Flint, Gaithersburg, MD, $45.4 Million, Montgomery County: Project Manager.** As the main point of communication between owner and Corman Kokosing, Scott participated in the CMAR process from procurement to preconstruction to construction, which involved design assistance, identifying risks, constructability reviews, cost estimating, Opinion of Probable Construction Cost (OPCC) reviews, and partnering with agencies/stakeholders. He manages the project team, equipment and material procurement, objectives/goals, work plans, budgets/resources, coordinates subcontractors, monitors schedules, conducts progress meetings, minimizes exposures/ risks, mitigates issues, reviews/approves deliverables, RFIs, change orders, administers contracts, and oversees budget, safety, and quality compliance. Scott led development of the Advanced Utility Package which included MOT, electric, communications, water/sewer, and gas. Project constructs new infrastructure including reconfiguring MD 187/Executive Blvd. intersection.

RELEVANCY: *CMAR, intersection re-configuration, traffic control plans, large underground box culvert with complex SOE, drainage design/construction, roadway construction, stormwater/erosion & sediment controls, traffic signals/ signing/ marking, temporary road construction, retaining walls, lighting, utility coordination and self-performed relocations*

Design-Build Intercounty Connector Contract A, Montgomery County, MD, $483.4 Million, MDOT SHA: Construction Manager. Onsite full time from preconstruction to completion, Scott participated in weekly team meetings, implemented a Risk Register to track risks/opportunities/impacts; led conceptual design development, provided constructability reviews; developed construction phasing; and authored/optimized the construction schedule, including early work packages, long lead items, and critical path. He participated in task force meetings with owner/stakeholders, directed the design team regarding sequence of construction, access and preferred construction techniques and supervised field layout, construction, quality control, and safety management. Scott oversaw construction of the entire project, including field team, monitored craft workers and construction resources, and coordinated with field engineering for subcontractor scheduling and supplier logistics to maintain schedule/budget, He oversaw field design change requests and ensured coordination of our QC operations. Scott contributed to partnering/progress meetings, participated in public outreach meetings, and coordinated inspections/ resolutions with our independent QC team. He worked with design-build coordinators and construction project engineers leading the bridge, drainage, roadway, environmental, utility and subcontracting areas. 7.2 miles new tri-lane divided highway, including a trumpet interchange, partial cloverleaf interchange, 18 steel girder/precast concrete girder bridges, four bridge widenings, and coordinated with 12 utility companies to complete 106 utility relocations. Project eases congestion on Maryland's highways/ local roads while improving safety/mobility.

RELEVANCY: *Grade separated interchange configurations, bridge construction/widening, traffic control plans, drainage design/construction (55,000 LF pipe), open section roadways, stormwater management ponds, traffic signals/signing/ marking, temporary road construction, 130,000 SF retaining/MSE walls, lighting, utility coordination/relocations, landscaping*

Design-Build Route 1 Improvements at Fort Belvoir, Lorton, VA, $82.1 Million, FHWA/EFLHD: Design-Build Project Manager. Scott oversaw project from startup, including preconstruction, design, construction, utility relocations, to close out. He led discipline task forces performing constructability reviews and cost comparisons while maintaining project schedule. Scott implemented a Risk Register to track risks/opportunities/impacts, led coordination of relocating overhead utility (Dominion, Verizon, Cox) facilities for the entire project. He met with designer weekly for design reviews and held over-the-shoulder reviews with owner/stakeholders. Scott and design team coordinated/participated in *Pardon our Dust* meetings. He was the main point of communication to the project team, managed the project team, equipment, material, and labor procurement, objectives/goals, work plans, and budgets/resources; procured/coordinated subcontractors; monitored schedules; conducted progress meetings; mitigated issues; reviewed/approved deliverables, RFIs, and change orders; administered contracts; and oversaw budget/safety/quality compliance. Constructed new/widened Route 1 with left/right turns at intersecting roadways, bridge replacement, self-performed water/sewer relocations and managed $6.2 million utility relocations. Project relieves heavy traffic.

RELEVANCY: *Bridge demolition/construction, traffic control plans, drainage design/construction, open section roadway, stormwater management ponds, traffic signals/signing/marking, temporary road construction, retaining walls, lighting, utility coordination/relocations, landscaping*

KYLE KERN | PROPOSED ROLE: CONSTRUCTION MANAGER

Kyle's has 31 years' onsite experience leading to progressing roles where he manages construction on highway/bridge projects with complex and aggressive coordination/schedules issue. Corman Kokosing continually recognizes his expertise and throughout his career has promoted him to bridge foreman, superintendent, and currently as a construction manager/project manager.

CERTIFICATIONS
MDE Erosion & Sediment Control #RPC010790
MDOT SHA Temporary Traffic Control Manager
OSHA 30/10-Hour
Confined Space
Fall Prevention Protection
Utility Strike Prevention

CMAR/CMCG White Flint, Gaithersburg, MD, $45.4 Million, Montgomery County: Construction Manager. Kyle supervises field operations, conducts preconstruction staff meetings establishing goals/ responsibilities, evaluates safety exposures/risks, participates in developing project-specific safety program, work plans, and Job Hazard Analyses, reviews scope to identify specialized safety training needs, ensures materials used/work performed meet contract requirements and Quality Control Plan, reviews designs for constructability, participates in public engagement, coordinates with stakeholders, oversees environmental sensitivity and maintenance of traffic, reviews Toolbox Talks, Take Fives, Morning Huddles, and Site Inspections weekly, conducts weekly safety inspections, submits weekly Safety Inspection Reports, and coordinates labor, equipment, subcontractors and schedules. Project constructs new infrastructure, including reconfiguring MD 187/Executive Blvd. intersection. There was an Advanced Utility Package which included MOT, electric, communications, water/sewer, and gas.

RELEVANCY: *CMAR, intersection re-configuration, traffic control plans, large underground box culvert with complex support of excavation, drainage design/ construction, roadway construction, stormwater and erosion & sediment controls, traffic signals/signing/marking, temporary road construction, retaining walls, lighting, utility coordination and self-performed relocations*

Design-Build Intercounty Connector Contract A, Montgomery County, MD, $483.4 Million, MDOT SHA: Construction Manager-Structures. Kyle supervised field operations, including up to 14 bridge crews, conducted preconstruction staff meetings establishing goals/responsibilities, evaluated safety exposures/risks, participated in developing project-specific safety program, work plans, and Job Hazard Analyses, reviewed scope to identify specialized safety training needs, QC check point procedures with QA/QC team for specification compliance, designs for constructability, ensured materials used/work performed met contract requirements and approved for construction plans/specifications, reviewed Toolbox Talks, Take Fives, Morning Huddles, and Site Inspections weekly, conducted weekly safety inspections, submitted weekly Safety Inspection Reports, coordinated labor, equipment, subcontractors, and schedules, oversaw QC compliance and project close out. 7.2 miles new tri-lane divided highway, including a trumpet interchange, partial cloverleaf interchange, 18 steel girder/precast concrete girder bridges, four bridge widenings, and coordinated with 12 utility companies to complete 106 utility relocations. Project eases congestion on Maryland's highways/local roads while improving safety/mobility.

RELEVANCY: *Grade separated interchange configurations, bridge construction/widening, traffic control plans, drainage design/construction (55,000 LF drainage pipe), open section roadways, stormwater management ponds, traffic signals/signing/marking, temporary road construction, 130,000 SF retaining/MSE walls, lighting, utility coordination/ relocations, landscaping*

Design-Build I-70 Phase 2D, Frederick, MD, $37.5 Million, MDOT SHA: Construction Manager. Kyle supervised field operations, conducted preconstruction staff meetings establishing goals/responsibilities, evaluated safety exposures/risks, participated in developing project-specific safety program, work plans, and Job Hazard Analyses, reviewed scope to identify specialized safety training needs, ensured materials used/work performed met contract requirements and approved for construction plans/specifications, reviewed designs for constructability, participated in public engagement, coordinated with stakeholders, oversaw environmental compliance, reviewed Toolbox Talks, Take Fives, Morning Huddles, and Site Inspections weekly, conducted weekly safety inspections, submitted weekly Safety Inspection Reports, coordinated labor, equipment, subcontractors, and schedules, and oversaw project close out. Reconstructed/widened dual-divided I-70, replaced two multi-span bridges, and utility relocations (sanitary, CCTV, gas). Project eliminates merging traffic on this part of the interstate with the new dedicated through-lane and auxiliary lane in each direction and improves safety, congestion, and traffic flow.

RELEVANCY: *Grade separated interchange configuration, bridge construction, traffic control plans, drainage design/construction, open section roadways, stormwater management pond, traffic signals/signing/marking, temporary road construction, retaining walls, lighting, utility coordination and self-performed utility relocations*

GAETAN CARRIER | PROPOSED ROLE: COST ESTIMATOR

Gaetan possesses 30 years of estimating experience, 50% of that period in role as a chief estimator, estimating transportation/heavy-civil projects. As Chief Estimator, he leads the Corman Kokosing Estimating Department on Construction Management At-Risk (CMAR), Design-Build (DB) and Bid-Build (B/B) projects involving take offs/pricing for bridges, highways, heavy-civil and utility pursuits. Most of those pursuits have been for Maryland Dept. of Transportation/State Highway Administration (MDOT SHA) and Virginia Dept. of Transportation (VDOT) ranging up to over $500 Million.

Gaetan has either led or represented Corman Kokosing on over a dozen Joint Venture (JV) pursuits ranging from $100 to $500 Million. *He led all three successful pursuits attached here as reference projects and most recently, MDTA's Harry Nice Bridge where Corman Kokosing is a JV partner as the design-builder. The lead estimating process for a JV pursuit mirror developing an Opinion of Probable Construction Cost (OPCC), and JV coordination is the same type of interaction as with the Independent Cost Estimator (ICE).* The JV coordination steps/iterations below apply to all pursuits and does not warrant repeating for each specific pursuit; only project specifics change.

EDUCATION

BS, Building Construction

YEARS ESTIMATING EXPERIENCE

30

Just like start up for the OPCC on a CMAR, Gaetan drafted Bid Instructions (rules of the road) for JV partners so that both estimating teams have the same basis for pricing. Next, all partners agree on a bid item list (Work Breakdown Structure) to facilitate comparisons. He led quantity take-offs for internal pricing and coordinated JV quantity reconciliation. The goal is to agree on as many pricing factors as possible and to limit discussions/disagreements to means and methods and productions. A debugging session was held, then an open-book cost comparison, and finally a second read to reconcile differences. Throughout this process, risks are shared and identified. After all pricing is reconciled, a Risk Matrix was assembled with identified risks and associated cost values with a rating scale and individuals from each partner assign values to each risk. The final product (line items/bottom line) was a risk/contingency analysis (Risk-Sharing Pool) that represented the JV. The above steps represent the JV's total costs which equals a GMP for a CMAR. Projects include:

Design-Build Intercounty Connector Contract B, Montgomery County, MD, $560.9 Million, MDOT SHA: Chief/Lead Estimator: 7.1-mile six lane divided highway on new alignment in extremely environmentally-sensitive region, including a diamond interchange and a single point urban interchange (SPUI), 10 mainline bridges, five crossover bridges, 2.4 million CY of excavation, extensive drainage and roadway items. Major logistical challenges included moving earthwork across multiple crossroads, setting large 150-ft. bulb-tee girders with limited LOD and maintaining high E&S standards. One major pursuit challenge was streamlining the mainline bridge substructures. After cassions were selected as the approach, Gaetan refined constructability of the shafts. The initial designs were for 108-in. shafts, but working with the design team and by adding substantial reinforcing steel, using *O-Cell* testing to reduce safety factors and review of scours analyses, the shaft diameters were reduced to 78-in. Drilling could then be accomplished with conventional rock tooling and rotary drills used by local subcontractors, resulting in substantial cost/schedule savings. During construction, the schist formations proved to be extremely hard, the reduced shaft diameters greatly contributed to mitigating risks.

RELEVANCY: *Interchange configurations, bridge construction, traffic control plans, drainage design/construction (55,000 LF drainage pipe), open section roadways, five stormwater management ponds, traffic signals/signing/marking, temporary road construction, 20 retaining walls, lighting, utility coordination/relocations, landscaping*

I-95 Telegraph Road Interchange Improvements, Alexandria, VA, $268.6 Million, VDOT: Chief/Lead Estimator: Considered the largest VDOT project at the time and most complex of all the Woodrow Wilson Bridge contracts, the sheer volume of structures, earthwork, drainage, and phasing made pricing/coordination of this estimate a monumental task. Gaetan led estimating for the JV pursuit where Corman Kokosing was the lead JV partner. This project was a major I-95 interchange with 14 bridges, 22 retaining walls, ground improvements for wet soils, concrete and steel girders, and design/build sound walls. Multiple milestones for incentive/disincentive schedule requirements with over a million manhours to complete the project and multi-phases with 160,000 ADT.

RELEVANCY: *Major interchange, bridge construction/widening, traffic control plans, drainage construction, open section roadways, six stormwater management ponds, traffic signals/signing/marking, 22 retaining/MSE walls (100,000 SF), lighting, utility coordination/relocations, landscaping*

CMAR EXPERIENCE

CMAR Piscataway Emergency Repairs, Fort Washington, MD, $7.7 Million, Prince George's County Government: Lead Start-Up Estimator: Worked with owner and their designer. Gaetan led early estimating efforts for evaluating costs to stabilize slopes to save homes on uphill side of slope failure. Developed constructability approach and pricing for using Junttan Pile Driving Rig that efficiently drove the long HP 14x117 sections. This construction method accelerated the schedule and greatly reduced pile costs, contributing to an overall lower project cost as compared to initial estimates.

2. TEAM PAST PERFORMANCE

INTERCOUNTY CONNECTER CONTRACT A
MONTGOMERY COUNTY, MD

OWNER/CLIENT
Maryland Dept. of Transportation/State Highway Administration

Rob Shreeve (Retired; now with AECOM)
410-785-7220

PROJECT DELIVERY METHOD
Design-Build

CONSTRUCTION COST

Initial Contract Value
$463,885,499

Final Contract Value
$483,409,033

Reason for Difference
Owner-directed change orders due to changes in scope, price adjustments and incentive payments.

SCHEDULE PERFORMANCE

Initial Completion Date
8/1/10

Final Completion Date
2/22/11

Reason for Difference
Due to owner-directed change orders and time extensions.

ICC-A facing west toward western terminus of ICC project over MD355-I-370 interchange including two bridges on the left

BRIEF PROJECT DESCRIPTION: Intercounty Connector Contract A (ICC-A) consisted of 7.2 miles controlled-access tri-lane divided highway, including a trumpet interchange, a partial cloverleaf interchange, 18 steel girder or precast concrete girder bridges and four bridge widenings on I-370 highlighted by a 625-ft. deck-over structure (top-down construction), a *Signature* Arch Bridge spanning Rock Creek, and a *Gateway* Bridge at the MD 97 Interchange. This project eases congestion on Maryland's highways and local roads while improving mobility and safety.

Widened/constructed a new I-370 grade-separated interchange to WMATA's busy Shady Grove Metro Station to replace the existing partial interchange. I-370/Metro Access Road and Shady Grove Road grade-separated interchanges have a trumpet configuration and were constructed in phases to accommodate the two lanes of traffic in each direction while the roadway was widened to the inside and outside, making three lanes in each direction. Constructed a new interchange at MD200 and MD 97 (major access road into Washington, DC) while maintaining traffic and was configured as a partial clover leaf. Two major interchanges included high mast lighting systems.

There was interior widening for a new lane and exterior widening for acceleration/deceleration lanes, 2,500,000 CY excavation, 130,000 SF retaining/MSE walls (mechanically-anchored retaining walls), 400,000 SF sound walls, stormwater management/drainage systems, 630,000 SY HMA pavement which encompassed new access ramps to two major interchanges, including milling/ resurfacing at tie-in limits, lighting/signalization, utility relocations, landscaping, and erosion and sediment controls. This project was completed on time under an aggressive schedule.

Five bridges were dual span, steel girder, and H-pile foundation structures. The two-span bridge over Little Rock Creek was heavily skewed to reduce hydrologic effects. Some bridges with interior/exterior widenings on existing I-370, improvements on I-270, a deck-over structure and signature bridge necessitated working and maintaining traffic on major thoroughfares and working over heavily-traveled roadways, such as MD 355, over and around Rock Creek and in extremely sensitive neighborhoods with public outreach.

ICC-A was lowered below existing grade, making the highway less visible and intrusive in the surrounding community. ICC-A ramps were constructed and tie into a heavily travelled thoroughfare to existing local roads: MD 200 to Shady Grove Road, Shady Grove Road Metro Station and MD 97.

WHAT WORK, INCLUDING ANY SUCCESSFUL METHODS, APPROACHES, AND INNOVATIONS ARE RELEVANT AND WHY: **Interchange Redesign:** We redesigned the Metro Access Road Interchange from a three-level to a two-level trumpet interchange eliminating retaining walls and saving the owner millions of dollars long term while still meeting the mandated level of service.

Stormwater Runoff: Another major innovation was developing a stormwater runoff treatment using chitosan flocculant to let the suspended clay soils and solids in stormwater runoff separate and be removed prior to out letting into a natural watercourse. The Maryland Dept. of the Environment had set an NTU discharge limit of a 50 NTU monthly average and a 150 NTU daily maximum for this project which this new process was able to obtain economically with no schedule impacts. It was the first time this was used in Maryland and has since become common on many MDOT SHA projects.

Utility Relocations: Major utility relocations included water, sewer, power/electrical, cable, and fiber optic (underground/ overhead), and coordinated/relocated critical transmission lines (26, 30, 42) for Columbia and Williams Gas. Worked outside normal timeframes, especially when doing tie-ins. The sewer work at two major stream crossings with impending stream closure deadlines necessitated working 24/7 with adverse ground conditions (water running in). Many relocations involved elaborate, complex and extensive piping design, coordination, and construction. Some complexities included working around stringent MOT time limits for lane closures and coordinating with many utility owners in highly-congested areas. The most important aspect of the approach included bringing all stakeholders together early, including permitting agencies, the owner and our team.

WHY RELEVANT? Mitigation for utility relocations would be similar to CMAR MD 4 for the relocations still to be performed with the addition of checking utilities already relocated to confirm they were relocated correctly. The lessons learned in the interchange configuration innovation could also be applicable considering the need to be innovative with many of the on-site stored material designed for the current RFP design. The innovative storm water treatment has since become standard in the industry and will undoubtedly be included in our means and methods for the MD 4 project.

AWARDS: 2012 AGC of America Alliant Build America-Design-Build Highway & Transportation | 2011 FHWA Award for Exceptional Environmental Stewardship | 2011 Engineering News Record (ENR) NE Division Best Project-Transportation

INTERCOUNTY CONNECTER CONTRACT B
MONTGOMERY COUNTY, MD

OWNER/CLIENT
Maryland Dept. of Transportation/State Highway Administration

Rob Shreeve (Retired; now with AECOM)
410-785-7220

PROJECT DELIVERY METHOD
Design-Build

CONSTRUCTION COST

Initial Contract Value
$559,000,000

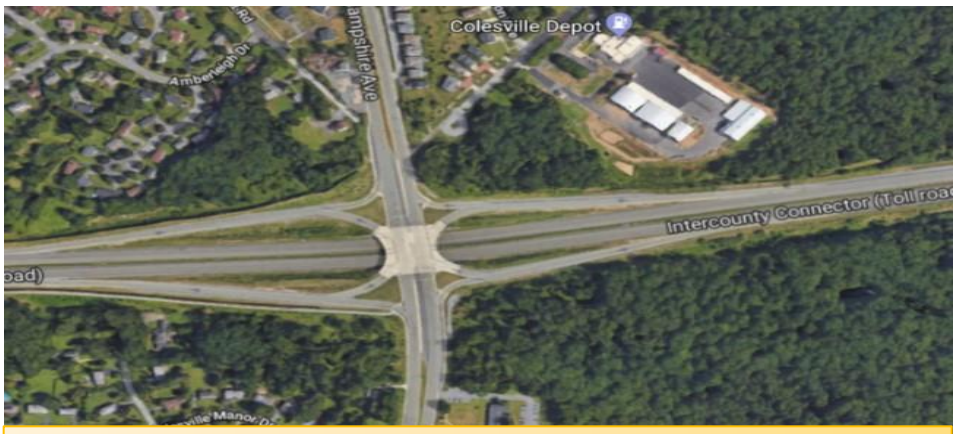
Final Contract Value
$560,970,000

Reason for Difference
Owner-directed change orders and environmental incentive payments.

SCHEDULE PERFORMANCE

Initial Completion Date
11/11/11

Final Completion Date
11/11/11
Received E&S Control quarterly incentives for high E&S ratings. Project ended with the project team earning 95% conformance rating and meeting all key project goals.



MD 650 SPUI Bridge

BRIEF PROJECT DESCRIPTION: Intercounty Connector Contract B (ICC-B) consisted of a new 7.1 mile six-lane divided highway on new alignment starting at MD 97, extending east just before Old Columbia Pike and included a diamond interchange and a single point urban interchange (SPUI) It reroutes commuter traffic from clogged neighborhood streets onto six lanes of controlled-access highway, improves mobility/safety and reduces traffic on major arteries connecting Washington, DC and Baltimore, Maryland.

There are 10 mainline bridges, totaling over 600,000 SF of concrete deck and 150-ft. average spans, five crossover bridges (two had interchanges) and span 4,400 LF over streams, wetlands and 100-year floodplains. There are several new intersections; five were modified to accommodate the new traffic patterns. A major element was the SPUI at MD 650 with a bridge, major maintenance of traffic (MOT) phasing on MD 650 (major commuter route), and complex traffic signalization.

Designed/phased construction of five arterial roadways, 2.4 million CY of excavation, 2 million CY of embankment, 500,000 SY new pavement, 20 retaining walls ranging 5-ft. to 28-ft., seven miles of sound barriers and roadway lighting, over 80,000 LF of drainage, relocated six side roads, and lowered the mainline roadway profile below existing side roads to reduce noise and visual impacts. There was milling and resurfacing and landscaping of medians, outside areas and interchanges, phased maintenance of traffic for all crossings and interchange points and a stringent environmental compliance program. Designs accommodated future improvements to Maryland Route 29.

Coordinated with over 10 utility companies for major utility relocations in highly congested areas; 47 utilities were relocated requiring coordination and redesigning prior to relocating. To construct the

highway, temporary relocations were often performed and then moved to their permanent locations. Systems and service were maintained along the seven-mile highway stretch, including overhead/ underground electric, cable, telephone, fiber-optics, communication lines, signals, lighting, gas, water, and sanitary sewer lines. This project was complete on schedule and on budget.

WHAT WORK, INCLUDING ANY SUCCESSFUL METHODS, APPROACHES, AND INNOVATIONS ARE RELEVANT AND WHY: **Modifying Roadway Profile:** Our Alternative Technical Concept (ATC) for the eastern alignment between MD 28 and MD 97 raised the roadway 5-ft. to reduced earthwork imbalance. The increased profile impacted the viewshed for Willow Grove, a National Register Eligible historic property. To implement the ATC, we addressed/mitigated the impacts with design studies to screen the ICC and eliminate the impact. The property was within 600-ft. of ICC ROW and alternatives included lowering the alignment, building a berm to screen the ICC and/or a combination option that included a berm with the proposed stormwater management pond. We prepared alternate view displays for the Environmental/GEC Team to review/comment on the options. As the concepts were revised/ updated to address the comments, our Environmental Team met with Federal Highway Administration (FHWA) and MD SHPO to review/determine the least impactful and beneficial alternative that would screen the historic resource from the project. Our environmental staff and the owner's environmental staff coordinated with regulatory agencies to address and obtain approval for this design revision.

WHY RELEVANT? Understanding how, where, and which roadway profile to modify could have a profound impact on the MD 4 CMAR project. Class I excavation is severely unbalanced where a large portion of excavation will go off-site because there is no corresponding embankment to receive the excavated material. This off-site waste adds costs through additional trucking and dumpsite fees. Reducing the cut volume and potentially increasing the fill zone as was completed on the ICC would benefit all stakeholders.

Maintenance of Traffic (MOT): Due to the high traffic volume in the surrounding area, MOT was crucial. Multi-modal access was maintained with temporary vehicular roads and walkways/paths for pedestrians/bicyclists. Four temporary elevated detours and one surface detour were installed over the ICC mainline at the major roadway intersections during beam setting and overhead work to eliminate lane closures. Phased MOT was used at crossings and interchange points. In constrained and environmentally-sensitive areas, underground stormwater management structures were used. Traffic Control/MOT, including for work in major roadway medians and changes to RFP MOT plans for safer conditions and reduced pattern changes.

WHY RELEVANT? The novel MOT patterns and detours on ICC-B were a product of our team's efforts to improve success for all stakeholders. Our Proposed Technical Concept **(PTC) #1** in **Section C: Project Approach** brings that same initiative by proposing to move the westbound MD 4 turning movements onto Suitland Parkway further to the west. This will open up the entirety of the MD 4 excavation, allow accelerated construction for S1 and enable S1 and S2 to be constructed concurrently. This concept provides a substantial cost savings to MDOT SHA and ***reduces the project schedule by nine months***. This innovation and reduced schedule greatly benefits the traveling public who will have to endure reduced service of the interchange during construction.

AWARDS: 2012 MdQI Award of Excellence Partnering Silver | 2012 ENR Mid-Atlantic Best Transportation Project | 2012 ARTBA "Globe" Environmental Award | 2011 FHWA Award for Exceptional Environmental Stewardship

I-95 TELEGRAPH ROAD INTERCHANGE IMPROVEMENTS
ALEXANDRIA, VA

OWNER/CLIENT
Virginia Dept. of Transportation

John Lynch, PE
703-259-0243

PROJECT DELIVERY METHOD
Design-Bid-Build

CONSTRUCTION COST

Initial Contract Value
$236,393,188

Final Contract Value
$268,622,645

Reason for Difference
Owner-authorized changes (unforeseen utility relocation and MOT safety upgrades) and earned incentive payments.

SCHEDULE PERFORMANCE

Initial Completion Date
6/30/13

Final Completion Date
6/27/13

Reason for Difference
Achieved substantial completion 112 days early and completed project ahead of schedule.

Aerial of the Telegraph Road project

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 and a widening/ reconstruction connecting the Woodrow Wilson Bridge project with new HOT lane projects to the west and north. Constructed two Express lanes, four local lanes in each direction and auxiliary lanes for the interchange. Improvements along Telegraph Road included roadway/bridge reconstruction, intersection improvements, and utility relocations. The new grade-separated interchange provides access to eastbound Huntington Avenue and North Kings Highway from the Beltway Outer Loop and southbound Telegraph Road, through dual flyover elevated ramps over Telegraph Road and I-95, opposed to signalized intersections, to refine traffic flow and provide easier/safer access.

Project encompassed nine new bridges and five flyover ramps totaling 380,000 SF of bridge deck, one bridge repair, one bridge widening, four signaled intersections, and 17 interchange structures. There were improvements to 24 lane miles with 321,000 SF of roadway paving, milling and resurfacing, extensive maintenance of traffic, pavement marking, 22 retaining and MSE walls, four sound barrier walls, storm drainage with six stormwater management ponds, landscaping/seeding, including restoring areas where pavements were removed, electrical, communication and water line installation, protected/relocated a 36-in. water main., new traffic systems, lighting (on the mainline beltway, ramps, and along Telegraph Road), and interstate-grade overhead, cantilever, and ground-mounted sign systems.

Complete demolition of five bridges; partial demolition of two bridges–maintained traffic on remaining existing bridges while partial new bridges were constructed and reconstructed the seven adjacent to or over traffic.

WHAT WORK, INCLUDING ANY SUCCESSFUL METHODS, APPROACHES, AND INNOVATIONS ARE RELEVANT AND WHY: **Maintenance of Traffic (MOT):** Maintained traffic involving an ADT of 160,000. Mitigated traffic flow issues before they became problematic. Six lanes; three lanes in each direction of I-95, were maintained at all times during construction. Constructed a section of roadway, switched traffic to the new lanes and began improvements to the old roadway. Traffic control and safety were huge concerns, with most construction that impacted traffic completed at night and/or during off-peak hours. Revised Maintenance of Traffic Plans, greatly reducing the original design of six phases to three phases and from 12 traffic shifts to six shifts which improved public travelling conditions. Team partnering identified and resolved issues early in the planning stages.

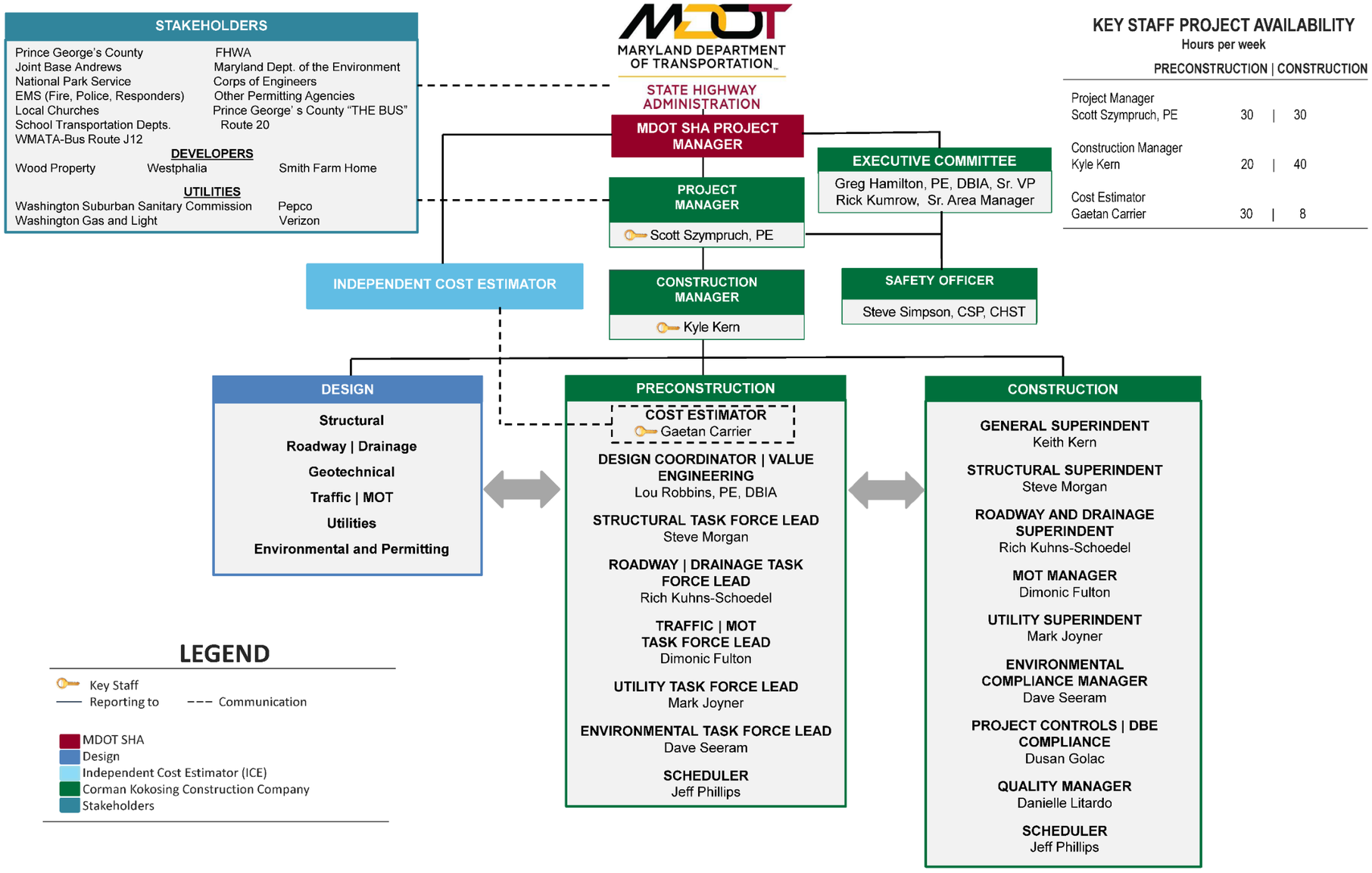
WHY RELEVANT? Innovation enhanced compliance with the project goals of minimizing traffic, schedule and cost – the same goals as on the MD 4 CMAR project. The revisions in our **PTC #1** below follow lessons learned on this project.

Utilities: Contract drawings showed no utility conflicts; however, as work began, it was clear many existed. Rather than wait to discover them, Corman Kokosing 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 within the existing aggressive schedule.

WHY RELEVANT? Solving problems is a sign of a strong contractor. Simply being impacted and giving notice to the client is insufficient. Utility conflicts/delays are almost common place on complex, phased projects. Just like on this Telegraph Road project, Corman Kokosing identified issues early and brought solutions to the client, which dovetails well with the CMAR process where alternate methods can be entertained during the design phase.

AWARDS: 2013 VTCA Transportation Engineering Overall Winner

3. ORGANIZATIONAL CHART



KEY STAFF PROJECT AVAILABILITY

Hours per week

	PRECONSTRUCTION	CONSTRUCTION
Project Manager Scott Szympruch, PE	30	30
Construction Manager Kyle Kern	20	40
Cost Estimator Gaetan Carrier	30	8

FIGURE 1: ORGANIZATIONAL CHART

C. Project Approach

C. PROJECT APPROACH

1. PRECONSTRUCTION APPROACH

a. Collaboration: As per the RFP, ***Collaboration, Cooperation*** and ***Trust*** are the three key components that are the pulse of a successful team. After completing MDOT SHA's first transportation Construction Management at Risk (CMAR) project, MD 24-Sections A & G, under budget and on schedule, Corman Kokosing has partnered on four other CMAR projects for MDOT SHA and local counties over the past seven years and provides significant value to owners as a CMAR team member. Owners choose CMAR delivery to add lessons learned and experiences from the contracting community as they relate to schedule and means and methods to increase efficiency and reduce cost and schedule duration, without sacrificing quality on challenging projects, such as this project.

The Corman Kokosing group becomes an integrated team member. We start off by participating in the initial Scoping/Partnering workshop where the entire project team meets and launches the teambuilding process. The partnering portion brings us in to understand how the MDOT SHA/Designer Team has been operating prior to Notice to Proceed (NTP) and guides us into a seamless integration. A new wrinkle will be confirming the delivery and condition of already purchased materials from the previous contract to ensure there are no issues that impact the progression of the next contract. It will be a unified transition as Corman Kokosing is an advocate of partnering as it fuels cooperation and trust through transparency and strong communication. We have been the recipient of nine partnering awards over the last 19 years serving as a testament to how we value cooperation and trust. We are committed to a ***Project First!*** approach to partnering on our projects and it is working extremely well on our Harry Nice Bridge design-build project for MDTA where all team members are committed to the project's success as a key to ensuring their own success.

Trust: Of the three key components, trust is the most challenging to build and maintain. If the team focuses on the common goal of putting the ***Project First!*** in delivering a successful project, then trust grows instantly. The team must also understand that each member has their own goals of a successful project: MDOT SHA's would be to build the project under budget, on schedule with minimal impacts to users, and having the public speak highly of it. The designer's goal would be to design a constructible project within their design budget with little to no red lines, and Corman Kokosing's would be to build a quality project safely and on schedule while meeting the mutually agreed to GMP with MDOT SHA. Trust is built on understanding the goals of the team as a whole and of each individual team member. Corman Kokosing has a strong track record of demonstrating trust with our four recent CMAR projects, along with other successfully completed design-build projects.

Cooperation also thrives from knowing the goals of the team and those of the individuals. As the team discusses the project, Corman Kokosing will present efficient, cost-effective construction techniques and work with the designer to incorporate them. We will brainstorm collaboratively until the team achieves a constructible, cost effective and schedule-friendly design. We will be cognitive that this project is completely designed and that wholesale changes cannot be made at this stage without bringing real value to the process, especially ones that involve right-of-way concerns, major permitting and/or impacts any major material items that are on-site. Our Proposed Technical Concepts (PTCs) in this section bring enormous value in terms of cost and time savings with only minor re-design and re-sequencing.

Supporting MDOT SHA in Stakeholder Involvement during Preconstruction: One of the greatest advantages of the CMAR delivery approach is getting the contractor involved early in the design process. From working with MDOT SHA on the MD 24-Sections A & G (MDOT SHA's first CMAR) and MD 5 CMAR Point Lookout projects, as well as with Montgomery County on the $45 Million White Flint Sector Plan Reconstruction CMAR, Corman Kokosing knows the most effective way to build a professional, collaborative team is to partner with the client and all stakeholders from day one. We bring a collection of staff with preconstruction/construction experience on past CMARs who stay involved throughout the entire project. Incorporating the construction team at the preconstruction phase benefits MDOT SHA, as team members gain firsthand knowledge of the project's history, goals, and details that will not need to be passed on to new team members as the project progresses. The following showcases our approach in working with the stakeholders:

- ✓ Hold a **Kick-off/Partnering Workshop** with MDOT SHA, their designer, stakeholders and agencies immediately after NTP to hear concerns and propose construction sequencing or means and methods that minimize impacts. Part of these initial meetings are a debriefing of design/ constructability issues that surfaced in the previous contract so our team can go about brainstorming and bringing viable solutions to the team.
- ✓ **Stakeholder Meetings:** Support MDOT SHA participating in outreach meetings with key stakeholders, including local officials, utilities, National Park Service, Joint Base Andrews, local/ state historic commissions, permit reviewers, developers, school transportation departments and EMS responders to clearly understand their concerns and answer any questions pertaining to project schedule, construction phasing and methods. One successful approach is to meet either individually or in groups with the stakeholders most impacted by the traffic detours/switches, such as emergency responders or school transportation officials.
- ✓ **Utility Meetings:** Meet during the design phase to coordinate work between our crews and utilities to confirm actual relocation efforts performed to date and schedule future required relocations. On one local CMAR project, we test pitted to ensure previous relocations were performed properly and found several key instances where they were not we suggest design work- arounds to accommodate those relocations in place without having to perform any rework. If it reduces cost or accelerates the schedule, we will clear and grade or install conduits or other duct work in advance for the utility as part of our operations.
- ✓ **Permits:** Review with the designer and permit agencies all permit restrictions and conditions in place, including any time-of-year (TOY) restrictions, and build a rapport that will make construction-related changes to erosion & sediment controls easier.
- ✓ **Risk Management Meetings:** Here, the group can identify, discuss and determine ways to eliminate or mitigation any risk to stakeholders based on past experiences.
- ✓ **Schedule Analysis Meetings**: By continually updating the project schedule, modifications can be made to the design, sequence of construction, or material types to alleviate any schedule hurdles. As we have done on other projects, critical work items can be assembled into early work packages to reduce adverse impacts to the construction schedule. Schedules would be shared with the stakeholders so they can better pre-plan and adept their operations to the construction impacts.

b. Design and Constructability Review: During design, we highly encourage in-person task force meetings with MDOT SHA and designer staff. Video teleconferences will be available and recently proved highly effective for those who cannot attend. If a face-to-face meeting is needed outside our

task force meetings, our proposed key staff live locally and can attend on short notice. This eliminates rework if a concept is developed too far ahead of vetting with the group.

As a CMAR team member, Corman Kokosing does not just rely on our proposed key staff. It is typical for us to pull in field engineers, superintendents and foremen who actually performed the work on a similar project to document lessons learned, past costs and possible risks. By incorporating hands on experience into the review process, it solidifies the work item is constructible, practical, and cost effective. In addition, based on the major scopes of work identified during preconstruction, we will invite key subcontractors to collaborate with the project team to evaluate potential savings/schedule impacts. These firms might include soil-cement, wick drain and other companies with settlement analysis and ground modification expertise. These are areas that could have major positive impacts on the schedule.

When the Corman Kokosing team joins forces with the MDOT SHA team, we will conduct a site visit to confirm the current state of utility relocations, right of way status and limitations, and current progress from the previous contract. We will develop an inventory list of stored materials, as well as natural features not readily apparent on the current plans. We will then review the current design plans and confirm all items identified during the site visit were captured. We will also note any additional details required, possible alternative options to be discussed at task force meetings, and any inconsistences found in the plans. Shop drawings of the stored material will be reviewed and field measurements taken to confirm compatibility with current designs.

Since one of the major controlling factors to cost AND schedule is the earthwork, we will institute the following to improve constructability and reduce the schedule duration **(See Figure 2).** The grading tables in the provided plans show sufficient excavated material is not available at the beginning of the project when the embankments will be built. We will not only perform time-sensitive mass earthwork diagrams, but based upon the results and earth needs identified, we will re-work the project schedule and phasing to better balance the excavation and embankment needs to minimize borrow material. We will promote our **PTC #3** for re-using the maximum volume of excavated materials from Phase 2, thereby eliminating the need for off-site borrow.

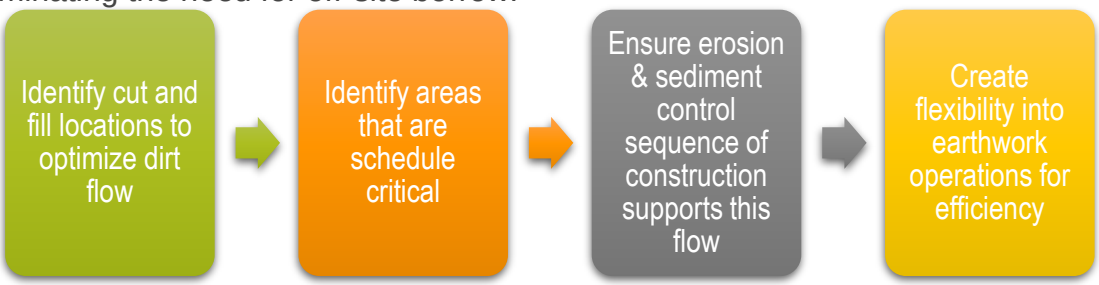


FIGURE 2: PROCESS TO IMPROVE CONSTRUCTABILITY AND REDUCE SCHEDULE DURATION

Maintaining Drainage/Stormwater Management: Installing the trunk line from MH-1 to EW-1 as a first order of work enables existing MD 4 and proposed MD 4 to be properly drained through construction. Our **PTC #4** proposes moving the MH-2 to MH-1 leg to the proposed ditch line of MD 4 to avoid requiring expensive lightweight fill. Its usage also helps drain the excavation as the cut progresses. Otherwise, the cut could not be drained until reaching grade on MD 4. A manhole structure will be placed above the trunk line and manhole sections will be removed as the 25-ft. cut progresses,

allowing for continuous draining of the cut after pre-treating the water with temporary onsite erosion & sediment measures as was done on our two Intercounty Connector projects.

As we reach each design milestone, we will update our Opinion of Probable Construction Cost (OPCC), as well as the construction schedule based on the most current design set available. The estimating and project controls teams will meet regularly to evaluate the project as a whole and, along with the field staff, develop cost and time saving strategies.

The following is our proposed approach to meeting MDOT SHA's goals of reducing errors and omissions, improving the final quality, and increasing constructability while reducing cost:

Step 1: Establish working task forces between MDOT SHA, designer and Corman Kokosing. We initially envision five groups: ***Structural, Roadway/Drainage, Environmental, Geotechnical*** and ***Traffic/MOT,*** which will meet regularly during the design process to:

- Evaluate the discipline specific designs for constructability and, based upon our preferred means and methods, propose the most economical design results in the shortest schedule. We will coordinate and look for efficiencies between disciplines, such as optimizing roadway and drainage in each MOT phase.
- Test pit to field verify that all utility locations are verified and conflicts addressed in the latest design phase to avoid unanticipated impacts to the construction completion date.
- Assess the drainage and stormwater management layouts and designs to confirm the most economic layout and treatment options with the shortest permitting and construction schedules are selected.
- Confirm the previously purchased and stockpiled materials are appropriate and conform to the requirements of the most recent designs.
- Examine alternate geotechnical means and methods that consider the anticipated ground water, soft soil and other potential geotechnical risks, including pre-consolidation, that have the least cost, risk and adverse schedule impacts.
- The most economical structural details are used that also produce the most schedule enhancements.
- Review task force dynamics and combine individual groups or form others. For example, partway through the process, it may be advisable to combine the Structural and Geotechnical Task Forces, just as the design-build team did during the design phase of the high-profile Harry Nice Bridge for MDTA. This was done as the issues discussed were duplicated and all key players were present reducing duplication of meetings.
- Research/evaluate any new or ongoing environmental legislation and permits that may be influenced by CMAR contracting process.

Task Force discussions are recorded in the meeting minutes and action items assigned with due dates for resolution. There are also formal reviews of the plans/specifications developed with comments tracked to confirm adjustments agreed upon were completed.

Step 2: Develop a Risk Matrix individually by each working Task Force to identify the potential risk and its impact on the project, i.e., cost, schedule, MOT impacts/disruption to stakeholders.

- → Hold a joint Task Force meeting with the project leaders (MDOT SHA, designer and Corman Kokosing) to evaluate the risks and develop mitigation methods to eliminate the risk and determine a path forward.

Step 3: Agree with MDOT SHA and the Independent Cost Estimator (ICE) on:

- → Items
- → Quantities
- → Labor/equipment rates
- → Material stored on site that is stockpiled from the previous cancelled contract to be used in construction
- → Risk sharing contingency pool/budget as appropriate.

Prepare progress cost estimates at various stages of plan development to prevent scope creep and cost surprises at the end of the design. Construction elements that show cost increases from the preceding estimates are reviewed with the group with actions taken to reduce the cost or accept the increase and justifications documented.

Step 4: Prepare a baseline schedule at the start of the process and at each major change or resubmittal to confirm the schedule did not increase. Monitor changes to scope or means and methods as to how they impacted the roadway opening to traffic and mitigation methods implemented to not exceed the completion baseline dates.

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c. Risk Management: Approach to Assisting the Project Team in Managing Risks: Corman Kokosing dives in and develops a Risk Matrix on all of our CMAR, design-build and design-bid-build projects that becomes a management tool during the pricing and actual construction. It is discussed internally and with the client at regular progress meetings. It is not a static document that is developed and then filed away; it is dynamic and updated frequently to target what the project management and field staffs need to pay close attention to.

At our regular progress meetings, the Risk Matrix is reviewed, and the individual/team responsible for managing a certain risk gives a status report. Old items no longer pertinent are shaded out, and we discuss what new items, if any, should be added based on current progress and knowledge.

As new risks are identified, they are quickly added to the matrix and assigned to an individual/team to manage and mitigate. Our strategy is to develop a preconstruction mitigation plan for every meaningful identified impactful risk.

Approach to Assisting the Project Team to Develop/Evaluate Potential Innovations: We will sit with MDOT SHA and their designers at Task Force meetings to develop/evaluate innovative ideas suggested by our team, the designer or MDOT SHA. The Task Force confirms the suggestion advances the project goals, meets the MDOT SHA and AASHTO criteria, speeds up construction or reduces risk or cost. Discussions are open with all viewpoints expressed and as typically happens, the original suggestion morphs into something that better solves the issue and advances construction. Corman Kokosing will evaluate the option from a constructability, cost, risk reduction and schedule perspective and report back to the Task Force/team for agreement to include, discard or modify to improve upon the original suggestion.

Initial Risk Matrix: Corman Kokosing created an Initial Risk Matrix for this project **(See Table 1)** which was developed based upon our current knowledge gained by a review of the provided documentation and our own investigations/site visits, plus a review of past lessons learned on similar projects.

= Low | = Medium | = High

TABLE 1: INITIAL RISK MATRIX

RISK	PROBABILITY	COST IMPACT	SCHEDULE IMPACT	WHO'S RESPONSIBLE	POTENTIAL MITIGATION
Impacts to Traffic during Construction				Corman Kokosing	Re-evaluate/revise TMP Resequencing operations, such as implementing our **PTC #1** Accelerate project Off peak lane closures
High Groundwater, Saturated Soil and Soft Soils				Corman Kokosing Designer	Evaluate ground improvement methods for large fills/drainage systems Evaluate schedule for extended settlement durations and/or surcharges vs. light weight fill Work with designer to redesign drainage facilities Compare costs of dewatering techniques for large pipe runs
Utility Conflicts				Corman Kokosing MDOT SHA Designer	On-Site survey and test pits to confirm relocated utilities are clear
High Security Events at Joint Base Andrews				Corman Kokosing	Constant communication with Base personnel Install fencing/barrier wall if added security is needed Re-sequence work away from base entrances Re-evaluate TMP

RISK	PROBABILITY	COST IMPACT	SCHEDULE IMPACT	WHO'S RESPONSIBLE	POTENTIAL MITIGATION
Unanticipated Weather Delays			to	Corman Kokosing	In the schedule, account for potential weather, and schedule weather-dependent operations at appropriate seasons early on Schedule overtime for earthwork operations in ideal work periods
Material Stored Onsite Does Not Fit New Design or is Damaged		to	to	Corman Kokosing Designer	Corman Kokosing to recheck stored material quantity, size and condition during design

d. Proposed Technical Concepts (PTCs):

PTC #1 | MODIFY MD 4 NORTHBOUND/SOUTHBOUND MAINTENANCE OF TRAFFIC

Corman Kokosing's first PTC is to modify use of the temporary MD 4 roadway and eliminate the temporary Suitland Parkway extension across the existing MD 4 alignment. As the RFP plans now stand, installing the temporary Suitland Parkway extension across MD 4 increases the project schedule by forcing the roadway excavation of MD 4 to be completed in two phases and defers construction of Structure S-2 to later in the schedule.

Saves Time and Money: *This PTC will reduce project duration by nine months and makes a* ***significant*** *reduction in MDOT SHA and contractor supervision and indirect cost associated with that time savings.*

How it's done: **PTC #1** requires the following to be incorporated into the project:

1. Use proposed temporary MD 4 roadway for northbound MD 4 traffic only.
2. Use proposed Ramps H and I for temporary southbound MD 4 traffic.
3. Create a dedicated MD 4 northbound U-Turn area to access Suitland Parkway and eliminate the temporary Suitland Parkway extension.

We propose to eliminate the proposed at grade crossing of the current MD 4 alignment by using a temporary roadway on the west/south side of MD 4, combined with the accelerated proposed Ramps H and I to carry southbound Pennsylvania Avenue around mainline and S-1 construction.

To allow access to Suitland Parkway from northbound MD 4, a signalized U-Turn will be provided in the MD 4 median. The existing wide median would provide ample room to allow two U-Turn lanes. If necessary, temporary shoulder widening can be provided for large trucks making the turn. If an additional signal on southbound MD 4 causes unacceptable traffic conditions during construction, the

existing signal at Westphalia Road could be modified to allow the U-Turn movement at that location by adding a second left turn lane and widening the receiving shoulder at this location.

FIGURE 3: PTC #1

The proposed MD 4 southbound temporary road is constructed offset right of the existing alignment, which is also offset right of proposed Ramp H baseline. South of Ramp H Baseline Sta. 702+00, temporary pavement is required to shift existing southbound MD 4 lanes toward the existing median to maintain the existing limits of disturbance (LOD) near the PEPCO Storage Lot. The temporary widening and shift end at Ramp H Baseline Sta. 709+50 where the existing roadway has widened for the two left turn lanes from southbound MD 4 onto Presidential Parkway. ***BENEFIT:*** By shifting existing southbound traffic toward the median, the temporary roadway can be constructed within the LOD while still allowing a majority of Ramp H to be built in **PTC Stage 3.**

This PTC allows the following construction activities to begin:

- Southbound MD 4 excavation and roadway construction from Mainline Sta. 55+00 to 84+00. ***BENEFIT: Provides embankment material earlier for fills which improves earthwork sequencing.***
- Northbound MD 4 excavation and roadway construction from Mainline Sta. 55+00 to 88+00. ***BENEFIT: Allows for better drainage since the excavated areas are not separated by the RFP proposed crossing to provide for the northbound left turn.***
- Construct Ramp H full width from 701+00 to 710+00 and partial width from 710+00 to Suitland Parkway.
- Construct Abutment A, Pier 1 and Pier 2 of Structure S-2, and set portions of the structural steel earlier in the schedule.

Priority is given to the southbound MD 4 roadway and Ramp H construction so we can switch into the next phase of our PTC. Southbound MD 4 traffic is shifted off the temporary road onto the completed southbound lanes. Traffic accessing Suitland Parkway will use partially completed Ramp H that allows for right turns.

Structure S-1 will also be fast tracked to allow northbound traffic from the temporary roadway to access Suitland Parkway via the completed structure earlier in the schedule. The steel beams are already available on site and there will be no delay for time consuming shop drawings, scheduling of the rolling and then fabrication. This early completion will then eliminate the need for the temporary signalized U-Turn for which will then be removed.

This PTC will have a significant, positive impact on the project schedule and budget. As a team, we will refine the concept and determine the most appropriate, safe/efficient, location to provide the U-turn from northbound MD 4 to southbound MD 4 to Suitland Parkway. A more detailed sequence of construction for this PTC is outlined in Section 2.

PTC #2 | BRIDGE 1629900 S-3, RAMP D OVER CENTRAL PARK AVENUE

This is currently shown as a 232-ft. long, two-span steel girder bridge with standard cast-in-place abutments supported by steel H-pile.

How it's done: The proposed grade from the face of the abutments to the roadway below are shown as 2h:1v riprap protected slopes. This bridge can be shortened by using a stub abutment with MSE abutment walls and backfilled with foamed concrete if necessary to prevent future settlement. The abutments would still be supported by H-pile, but can be moved approximately 35-ft. closer to the baseline of Central Park Avenue. The steel for this bridge is not yet stockpiled on site.

Saving time and money: *This modification reduces the overall bridge length by 70-ft reducing duration to construct and cost.*

PTC #3 | CONSTRUCTION OF RAMP D, SERVICE ROAD, AND NORTHBOUND MD 4 DETOUR

The project requires almost 186,000 CY of fill, of which 100,000 CY is borrow material needed early in the project. Ramp D also requires surcharge material with a settlement period assumed to be measured in months. Based on the sequencing shown in the RFP plans, the major cut on the project is the MD 4 roadway which, per the RFP, sequencing is not readily available during this early period of the schedule. The original contract wasted the excavated material at the rate of 50% per the grading tables shown in the original plans. This wasted material appears to be moist and unconsolidated, which can be easily remedied with onsite drying and proper compaction. By using this wasted material from the early 2B phase, could easily supply the 90,000 CY specified in the current contract for off-site borrow.

Saving money: *By eliminating the need to import 90,000 CY of off-site borrow and not wasting 90,000 CY of excess material to an off-site dump, a significant cost reduction is realized.*

PTC #4 | CONSTRUCTION OF DRAINAGE WITH LIGHTWEIGHT FILL AGGREGATE

Lightweight Fill (LWF) Aggregate over drainage runs accounts for approximately 10% of the original value of this project. This product is only available from two sources that are located many states away, making transportation expensive.

How it's done: Much, if not most of the six areas depicted in the contract LWF table can be re-engineered and re-sequenced with conventional techniques described below to potentially save MDOT SHA substantial unnecessary costs. LWF should be reserved strictly

for existing drainage runs where conventional techniques are not easily employed. This limits LWF to strictly Areas 3 and 6 on the LWF schedule in the contract plans. These areas could be further mitigated by eliminating the existing 48-in. RCP run from MH-8 to the existing 78-in. RCP and re-routing that flow to the 78-in. pipe within the footprint of Ramp K where there is much less fill and no LWF requirement.

Settlement issues for the remaining four areas with LWF can be mitigated with conventional techniques, including pre-consolidating fills prior to pipe installation, re-routing drainage runs to shallow fills or cuts and using pipe/casing materials that are more capable of handling settlements. Pre-consolidating fills with wick drains and surcharges is cost effective for mitigating settlements, especially on projects like MD 4 where ample volumes of surcharge material are available on a temporary basis from embankment fills. Another option is to install steel casings as a carrier pipe for the actual drainage runs or to carry the flow themselves.

Area 2 has one of the largest quantities of LWF and is a prime candidate for pre-consolidation and/or relocating drainage runs. Drainage run MH-2 to MH-1 can be moved away from Ramp C, closer to MD 4, underneath the proposed ditch line. By putting this section of the trunk line in a roadway cut, it eliminates all settlement issues and potentially provides a simple method of draining the deep cut on MD 4 during construction by simply placing a drainage structure over the line that is modified as the cut progresses. The next leg of the run from MH-1 to MH-1A can be pre-consolidated during Phase 1 prior to the pipe installation in Phase 2B.

Area 1 along the service road is early in the project schedule, but can also be pre-consolidated and a 60-in. temporary steel casing carrier pipe installed. The casing carries flows during the settlement period and houses the permanent 48-in. RCP once settlements are complete.

Our four PTCs have a potential to bring enormous cost and schedule savings to this project. They are real, tangible examples of what innovative concepts from a team player, like Corman Kokosing, will bring to this process in the short proposal time window.

2. CONSTRUCTION APPROACH

a. Construction Sequencing: Maintenance of Traffic (MOT) is accomplished with detours, temporary roadways, temporary traffic signals and lane closures. Temporary roadways will be constructed to close the existing intersection for lowering MD 4 and new grade separated interchange construction. Lane closures will be kept to a minimum and used only when temporary protection is required for workers/commuters. Reconfiguring MD 4 at Suitland Parkway is a challenge due to:

- → Proposed interchange is located at the existing intersection with mainline MD 4 being lowered approximately 25-ft., which means the intersection must be closed to construct the interchange.
- → Traffic must be removed from existing MD 4 to lower the alignment.
- → Existing heavy commuter traffic must be detoured/rerouted to maintain current movements.
- → Existing Suitland Parkway Bridge over the access ramps to the North Gate limits options for major changes to the interchange profiles.

To take the existing intersection out of service, Suitland Parkway and Presidential Parkway traffic must be rerouted out of the existing intersection, while still maintaining access to and from MD 4. The previous contract's MOT concept accomplishes providing access to Presidential Parkway commuters

by extending the service road to tie into the newly-aligned Presidential Parkway, and commuters are given access to northbound/southbound Pennsylvania Avenue. From the south, MD 4 commuters can jump on the service road to Machinists Place for access as well. This eliminates commuters coming from the north or eastern side of the intersection.

To close the intersection, left turn traffic from Suitland Parkway wanting to head north on MD 4 must be detoured. Traffic can be routed onto MD 4 southbound to make a U-Turn at the Dower House Road intersection. If traffic volumes require it, the signal timing for this movement will be adjusted and/or a second left turn lane added. Other detours can be evaluated to route traffic to northbound MD 4 using local roads instead of a U-Turn at Dower House Road. Right turn traffic to Suitland Parkway is accommodated by the constructed temporary southbound MD 4 roadway **(See Figure 3 on Page 19)**

Construction Phasing: The phases of work described below address the critical path phasing items:

Phase 1 starts the process of detouring traffic off Presidential Parkway and Suitland Parkway.

For the Presidential Parkway side of MD 4, we will complete the following:

1. Construct Presidential Parkway from Armstrong Lane to Proposed Central Park Avenue.
2. Construct the service road from Armstrong Lane to the existing service road north of the intersection.
3. Construct Pennsylvania Avenue access road to Sta. 2600+00.
4. Clear and Grub to install wick drains on Ramps D and C.

For the Suitland Avenue side of MD 4:

1. Construct portions of Ramp H and temporary pavement for MD 4 southbound shift.
2. Detour Joint Base Andrews exit ramp and start Ramps J, D, O and Bridge S-4 construction.

Phase 2 detours traffic on the east side of MD 4 onto the service road routes constructed in the previous phase and closes Presidential Parkway. Critical work includes:

1. Constructing the northbound MD 4 temporary roadway.
2. Shifting existing southbound MD 4 lanes and constructing the southbound MD 4 temporary roadway, including portions of Ramps I and K.
3. Constructing U-Turn from northbound to southbound MD 4.
4. Constructing Ramp D, starting with wick drains and drainage blanket.
5. Constructing Central Park Avenue, starting with wick drains and drainage blanket.
6. Constructing Ramp C, starting with wick drains and drainage blankets.
7. Continue constructing Ramps D, J, A and S-4.

Phase 3A begins after traffic is detoured onto the northbound/southbound temporary roadways. Major construction activities are as follows:

1. Construct MD 4 northbound/southbound roadway.
2. Construct Ramp H roadway.
3. Construct Ramp K roadway
4. Construct Structure S-1 over proposed MD 4.
5. Construct Structure S-2 flyover Abutment A and Piers 1 and 2.

6. Construct Structure S-3 Ramp D over Central Park Avenue.

Phase 3B After completing Structure S-1 and Central Park Avenue, detoured northbound MD 4 traffic can use Structure S-1 to access Suitland Parkway and the temporary U-Turn can be removed.

Phase 4 After completing southbound MD 4 lanes, shift southbound traffic off the temporary roadway onto the proposed roadway. Use the partially-constructed Ramp H to allow access onto Suitland Parkway and start the following:

1. Remove temporary southbound MD 4 roadway.
2. Complete Ramps H, I and K.
3. Construct S-2 Abutment B and complete structure.
4. Reconstruct portions of Suitland Parkway.
5. Begin Ramp O and N tie-ins to southbound MD 4.
6. PEPCO Storage lot work.

Phase 5 After completing the northbound MD 4 roadway, shift northbound traffic on newly-constructed lanes and complete the following:

1. Remove temporary portions of northbound MD 4 temporary roadway
2. Construct portions of Ramps C, G, and D
3. Mill/overlay final areas.
4. Complete stormwater management facilities.

Independent Work Packages will be used to target schedule critical activities or long lead materials needed early on. The wick drains required on the Presidential Parkway side of the interchange are perfect examples of independent early work packages. By expediting installation of the wick drains and drainage blanket, fills can be started quickly and settlement times will have less of an impact on the project schedule. If rough grading packages for this area can be permitted early enough, wick drains and a drainage blanket may even be eliminated by surcharging the area and allowing settlement to occur over a longer period of time, saving money.

Schedule Factors: To account for outside factors out of our control, such as weather, our schedule will be developed with calendars using historical data from weather stations in the upper Marlboro area and updated with planned events at Andrews or Fed Ex Field as they are scheduled. This will set a solid foundation for how many days a month the project should be expecting to productively work.

b. Construction Schedule: The project schedule's critical or longest path dictates project duration. The following are estimated time frames for each phase:

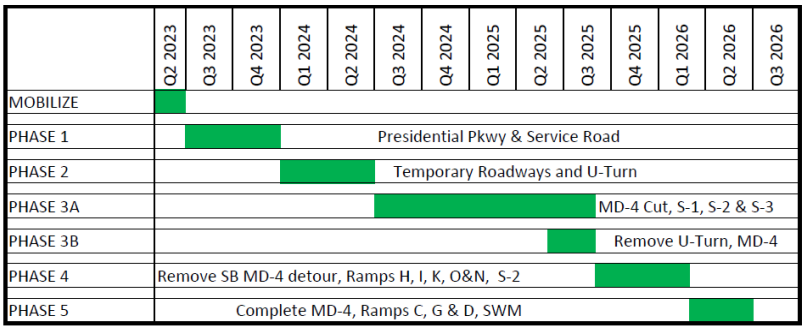


FIGURE 4: ESTIMATED TIMEFRAMES FOR EACH PHASE

PHASE 1 | EXPECTED DURATION – 8 MONTHS: The project's critical path begins with mobilizing to the site and obtaining approval of early submittals and shop drawings. Construction of proposed

Presidential Parkway and the service road is the longest path in the first phase of construction. Work includes installing a core/cut-off trench, cut to fill operations, placing lightweight material and constructing the roadway. The MD 4 northbound temporary road alignment will be used for fill material, if required. Asphalt placement for Presidential Parkway and the service road completes the phase allowing us to start Phase 2.

PHASE 2 | EXPECTED DURATION – 6 MONTHS: Critical activities are construction of the northbound MD 4 temporary roadway, including wick drain installation, followed by the drainage layer, fill, light weight material and roadway pavement. Other activities include MD 4 southbound temporary roadway, the U-Turn, Ramp D and Central Park Avenue wick drains and earthwork, as well as preliminary work on Ramps J, D and O. Structure S-4 can also begin in this phase.

PHASES 3A/B | EXPECTED DURATION - 14 MONTHS: The bulk of the project is constructed in Phases 3A/B. Critical path activities are mainline excavation, Structures S-1 and S-2 construction. Other activities include mainline drainage, roadway construction, Ramps H and K, and Structure S-3. Construction continues on activities from Phase 2 that have not been completed.

PHASE 4 | EXPECTED DURATION – 6 MONTHS: Southbound MD 4 is shifted onto the newly-constructed roadway and allows Structure S-2 Abutment B to begin. Critical path activities include completing Structure S-2, constructing Ramps D, N and O, and paving the roadway. Other activities include completing S-1, northbound MD 4 roadway and other non-critical activities still ongoing from Phase 3.

PHASE 5 | EXPECTED DURATION – 4 MONTHS: Northbound MD 4 is shifted onto the newly-constructed roadway. Critical items are removing temporary pavement and completing Ramps C, D and G, final mill/overlay operations, stormwater management facilities and roadway finishes.

TOTAL DURATION OF CONSTRUCTION – 38 MONTHS

Once a fully detailed construction schedule is finalized during the preconstruction phase with updated NTP dates, environmental non-work periods, agreed upon scopes of work and sequence of construction, there are factors that will change these anticipated durations. The biggest adjustments will be made based on the project start date and how the work flow is impacted by winter weather. For instance, with earthwork, lightweight fill and asphalt paving work scopes to complete in the first phase the May 2023 expected NTP for construction would optimize the first construction season and get the project off to a great start. On the flip side, a fall start to the project could slow initial construction with freezing temperatures impacting foamed concrete and asphalt paving operations.

These same challenges can transpire at the end of a project as well when surface asphalt activities are commonly performed. A project nearing completion late fall/early winter will most likely be completed in the spring when temperatures are warm enough for surface paving and final pavement marking placement. Items that will impact the schedule with our proposed mitigation include:

- **Existing materials procured by the previous contractor** will be inventoried, verified they were fabricated/built according to the approved shop drawings and factored into our schedule.

- **Long lead items** that we identify as still required early in the schedule will be procured early in the construction schedule or segregated out as a separate, early procurement package during the preconstruction phase.
- To account for **outside factors out of our control, such as weather**, our schedule will be developed with calendars using historical data from weather stations in the upper Marlboro area and updated with **planned events at Andrews or Fed Ex Field** as they are scheduled. This sets a solid foundation for how many days a month the project should be expecting to productively work
- **Staffing or resource issues:** Corman Kokosing belongs to the Kokosing group of companies and can leverage Kokosing's wide range of resources, including one of largest self-maintained equipment fleets in the country, significant inventories of construction materials, such as formwork and trench boxes, and in-house subject matter expertise for construction engineering solutions on formwork, support of excavation, demolition and beam erection. These additional in-house resources positions Corman Kokosing to build the project with our own forces, equipment and supplies which reduces cost for MDOT SHA and improves schedule certainty by reducing reliance on outside companies for support.

c. Stakeholder Coordination: Our team knows the importance of keeping stakeholders informed on progress/potential impacts. The following are three key components to a successful outreach program:

BEING HEARD: Include stakeholders when implementing the Traffic Management Plan (TMP) and Traffic Control Plans for their input on important stakeholder issues, such as access to properties and emergency response considerations.

COLLABORATION: Form a Traffic Task Force which includes appropriate stakeholders, applicable Prince County Depts. (Transportation, Fire, EMS, Police, School, Transit), utilities, WMATA, local developers, National Park Service, Joint Base Andrews, and MDOT SHA, to collaborate on MOT issues, such as upcoming traffic switches, public notifications, events at Andrews or FedEx Field and other items that impact traffic flow and access.

TEAMWORK: A close working relationship between the MDOT SHA Team and Corman Kokosing for a continuous and cooperative dissemination of information to stakeholders.

Major Stakeholders, their role, and key anticipated risks or impacts **(See Table 2)**:

TABLE 2 | STAKEHOLDER IMPACTS/MITIGATION

STAKEHOLDER	IMPACT	COMMUNICATION | MITIGATION STRATEGIES
Prince George's County	Perceptions/issues raised by residents/ motorists/businesses.	✓ Regularly scheduled coordination meetings with TTF. ✓ Cooperatively address outreach and responses to business, developers and property owners.
Traveling Public	Potential time delay for temporary construction operations.	✓ Provide advance warning through Portable Changeable Message Signs ✓ Post project updates to social media/Andrews Base Wide bulletins. ✓ Facilitate meeting with stakeholders and a public outreach campaign (media). ✓ Minimize lane closures and traffic shifts and maximize temporary lane widths.

STAKEHOLDER	IMPACT	COMMUNICATION | MITIGATION STRATEGIES
Residences, Businesses, Developers *(Wood Property, Westphalia Developer Smith Farm Home)*	Construction noise, dust, and access.	✓ Advise our construction schedule and limit construction noise to allowed hours of operation. ✓ Through public outreach, alert affected parties of construction noise and start/stop times. ✓ Use dump truck bed covers and limit dust by spraying water. ✓ Maintain access to adjacent properties. ✓ Coordinate driveway/road tie-ins with affected parties.
Utilities	Construction delays and safety.	✓ Engage Traffic Task Force to evaluate and adjust the TMP to provide safe/efficient traffic control as dictated by needed utility operations.
County Schools	Potential delays to school buses, drop-off/pick-up traffic, and impacts on pedestrian safety.	✓ Facilitate meetings with stakeholders and public outreach campaigns (media). ✓ Coordinate with school administration and transportation departments. ✓ Schedule construction activities strategically. ✓ Analyze peak AM/PM traffic volumes to minimize disruptions.
First Responders (*e.g., Police, Fire, Rescue)*	Potential response time delays.	✓ Continuous ongoing coordination with stakeholders. ✓ Perform after-action reviews with stakeholders following incidents. ✓ Coordinate with a designated representative of each agency to serve as point of contact for proactive dissemination of upcoming traffic patterns and/or route changes. ✓ Analyze existing coverage areas and review need for pre-staging of services. ✓ Hold pre-traffic switch meetings with agencies at start of the project and before any traffic patterns change(s).
National Park Service and Joint Base Andrews	Potential traffic flow disruptions to their facilities. Tall crane booms from pile driving rigs posing risks to aircraft.	✓ Engage Traffic Task Force to evaluate/adjust the TMP to provide safe/efficient traffic control as dictated by needed base operations and/or security alerts. ✓ Engage Traffic Task Force to evaluate/adjust the TMP to provide safe/efficient traffic control onto and off Suitland Parkway. ✓ Hold pre-traffic switch meetings with agencies at start of the project and before any traffic pattern change(s). ✓ Use on Base newspaper to alert motorists using the North Gate of upcoming traffic shifts. ✓ Notify of piling operations. Use beacon lights as warnings. Obtain FAA Permits

Public Outreach Approach: Our team acknowledges the benefits of public outreach on a project of this nature and will make a concerted effort to include several stakeholders in the decision-making process, as well as informing necessary parties of key project changes prior to/during construction. This is handled as follows:

Develop a Traffic Task Force (TTF): Consists of members from Corman Kokosing, MDOT SHA, Prince George's County, and other appropriate third-party stakeholders. Proactively address any MOT risks:

- → Invite the County and relevant stakeholders to work with MDOT SHA and our project staff throughout the project to discuss potential risks prior to/during construction.
- → TTF meets regularly to review MOT and optimize traffic safety/efficiency.
- → TTF-generated recommendations are continually implemented into the MOT Plan.

Goals:

- → To minimize traveling public delays.
- → To reduce disruptions to adjacent businesses.
- → To maximize safety throughout the project's life cycle.
- → To keep the County and stakeholders up-to-date on project progress.
- → To alert the County, WMATA and stakeholders of any upcoming traffic pattern change(s).

Submit Graphics/Progress Photos: Provide MDOT SHA and the County written information and graphics about the project to post on the MDOT SHA, Joint Base Andrews and County's websites, social media posts or to use during informal meetings and presentations with the public which includes:

- → Plan of work graphics.
- → Schedule updates.
- → Anticipated temporary lane/shoulder closures.
- → General project photos.

Impacts to local routes, such as detours and/or lane closures, will be accompanied by graphics depicting the routes anticipated for traveling public to use.

- → Provide at least a month in advance of the impacts and updated as conditions change.

Attendance at Public Meetings/Presentations: Project team key members available to attend public meetings/presentations, as requested by MDOT SHA

MDOT SHA and County Coordination: We welcome an ongoing partnership with MDOT SHA and the County during project design/ construction through:

- → Formal MOT Plan and Traffic Management Plan document reviews.
- → Weekly progress meetings and regular updates to MDOT SHA and the County to ensure compliance with MDOT SHA standards throughout construction.

D. Approach to Cost Estimating

D. APPROACH TO COST ESTIMATING

1. ESTIMATING ENVIRONMENT

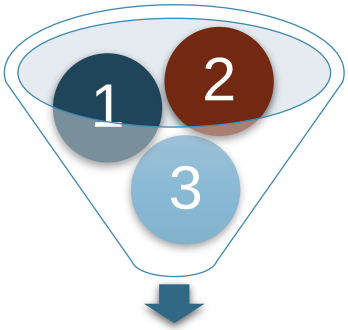
Corman Kokosing's cost estimating is led by our proposed Cost Estimator Gaetan Carrier who has a reputable track record of creating a collaborative team environment with Maryland government entities, such as Maryland Dept. of Transportation/State Highway Administration (MDOT SHA) and Montgomery County, and their Independent Cost Estimators (ICE) on Construction Management At-Risk (CMAR/CMCG) projects by leading fair, straightforward, and open book estimates.

Gaetan has been estimating transportations projects for over 35 years. He was Corman Kokosing's chief estimator on recent, local highway project pursuits, such as the Harry W Nice/Thomas "Mac" Middleton Bridge MDTA, Corman Kokosing's segment of Transurban's I-495 NEXT project, MDTA's Belvidere Road/I-95 Interchange and VDOT's Widening of I-95 near Occoquan, Virginia.

Gaetan has significant experience estimating Maryland projects, understands the Maryland marketplace, has established relationships with subcontractors/material suppliers and intimately understands MDOT SHA specifications/standards, the CMAR/CMCG contracting approach, and alternative delivery project procurements. With Corman Kokosing's involvement as either joint venture partners or dedicated subcontractors on local mega projects, we have considerable leadership experience in establishing/executing cost estimating processes. We will fully leverage our significant CMAR and alternative delivery estimating experience to establish trust and open communication with MDOT SHA and the ICE throughout the preconstruction phase.

Open and Transparent Estimating Environment: First, we look at MDOT SHA and the ICE as joint venture partners. As we kickoff the preconstruction phase, we establish schedule milestones to provide a road map for meeting deliverable dates for cost estimates and Guaranteed Maximum Price (GMP) submissions. We will develop Bidding Instructions for all partners to establish clarity and transparency on the organization of the bid. This includes protocols on points of contact between the partners, memorializing the agreed upon milestone dates, organization of the bid items, quantity alignment, cost structure for labor and equipment, material and subcontractor plug values and how to track changes in the cost estimate as the design progresses. After the bid items, quantities and cost structure is agreed upon, each team member works independently to estimate the project. By continually collaborating to align on the cost estimating approach, each partner has transparency to clearly identify where major cost differences occur and address them systematically, agreeing to each individual cost that makes up the total GMP.

The Big Three: The three major estimating components needed to effectively price the project **(See Figure 5)**:



1. **Items of work:** As each design milestone is met, each team member determines the items of work to complete the project (bid items) and quantities of each one.
2. **Item quantities:** We then come together to compare the items/quantities and agree as a team which ones will be used to price the project. From this point on, we all use the same bid items/quantities.
3. **Cost of resources:** We agree to the resource costs (labor, equipment, construction materials, permanent materials, subcontractors, overhead) to complete the work.

FIGURE 5: THREE MAJOR ESTIMATING COMPONENTS

We all agree to the unit labor and equipment costs used for each bid item. Labor costs are generated from the current wage determination, plus workman's compensation costs, fringes and taxes. Hourly equipment costs are submitted by Corman Kokosing with backup to show they are in line with industry standard costs. A list of materials with plug prices is provided to be used in the bid. Plug prices are also established for subcontracted work and are placeholders until we receive actual material suppliers/ subcontractors' quotes at which time the plugs are removed and actual quotes are inserted into the estimate.

Ready, Set, Price: Each team member now starts pricing the work using the established list of bid items, corresponding quantities and labor/equipment rates. Crews of labor and equipment are assembled and assigned a production rate to complete the work. Material costs for each work item are included. After the bid items are priced, we compare each partner's unit price for each bid item from a table. By following the Bidding Instructions, the differences in bid item unit costs will be attributed to how quickly the work is being performed (production rate), the equipment selected and size of the crew. In other words, if we are each performing the same quantity of work with resources that have the same cost rates for labor, equipment, material and subcontractors, the difference comes from the amount of resources assumed and how quickly the work is being done.

Each partner now walks through their means and methods to constructing the project and expected productions to execute the work. If there is a large cost difference, it is discussed, and everyone goes back, re-evaluates their approach, and revises the pricing. This is repeated until every bid item is agreed to or is within an acceptable range.

In addition to the direct items of work, the Bidding Instructions will define indirect items which are the costs associated with management and support of the project, such as supervision and their vehicles, field office expenses, time spanned labor and equipment costs, small tools/supplies, insurances, taxes, bonds and other incidentals. Corman Kokosing has established standard templates and we use costs from similar projects to develop these costs. A full printout of our indirect costs is provided for review/ comment.

Indirect costs are typically distributed across many bid items. Since these are fixed costs for the contractor, they will be placed in agreed upon lump sum bid items so variations in quantities do not cause a shortfall.

These procedures provide the most open and transparent estimating environment and assures MDOT SHA of exactly what cost is being carried in the GMP. By having MDOT SHA and ICE fully integrated in the bid item selection, quantity take offs and reconciliations, cost rates, equipment selection and crew composition, there is transparency throughout the entire process. As a team, we will solicit material pricing and subcontractor quotes and analyze scope to determine the most cost-effective solution while meeting any DBE goals for the project. We always try to solicit at least three prices for materials and subcontracted work. If we only receive one price for subcontracted work we will work up a self-perform price to check the competitiveness of the quote. We can also check our bidding history as a check on the fairness of the quote.

On large subcontracted packages, such as signing and lighting, electrical and signals, a scope sheet will be put together to compare scopes, pricing, schedule and risk. It is common to have one subcontractor bid just the lighting and then another just the electrical work and yet another bid the entire package. The scope sheet will show the most economical option with the least risk.

Contingency Cost Determination: The project's Risk Register is updated as the preconstruction phase progresses and identified risks are further evaluated/understood. A reasonable assessment of potential costs, impacts and mitigation efforts is discussed and clearly defined. These risks and associated costs are discussed during a meeting with MDOT SHA, ICE and Corman Kokosing to identify:

- → Percent chance of occurrence.
- → Cost if the risk occurs.
- → Contingency dollars to be used in the actual contract which is the product of the above two items.

This process is open book with MDOT SHA, ICE and Corman Kokosing exchanging pricing information. The cost associated with these risks can be handled several ways. On past MDOT SHA CMAR projects, we developed allowance items, as neither party was sure if the cost would actually be spent. By developing allowances, the cost can be included in the MDOT SHA project budget and paid if, *and only if,* those risks are experienced and the costs incurred by Corman Kokosing and approved by MDOT SHA.

Corman Kokosing Testament: This contingency allowance worked well on MDOT SHA's first CMAR project, MD 24-Sections A and G, where flooding on the adjacent creek would adversely impact our work, but the number of potential occurrences during our construction was undefinable. Here, we carried two flooding events in the GMP cost with additional events included in the contingency, only to be paid, if required. Risk was reduced to both parties as the State was not charged for potential events whether they occurred or not, and we were covered for impactful events that could not be quantified in advance.

Meeting DBE Goals: We will work with MDOT SHA to develop and then meet any DBE goals and any other subcontracting goals established for the project. To generate competitive pricing, we will solicit

quotes from as many subcontractors/suppliers as possible, enter them into a matrix and analyze scope for accurate and complete cost comparisons. We will work with the team to determine who is selected to meet the project goals while minimizing costs and maintaining a high level of quality and attention to schedule compliance.

As the GMP unfolds, constant attention is given to meeting the DBE goals as their costs can sometimes differ from our self-performed costs. For this reason, DBE subcontractors are identified and requested to propose on items based upon their specialty with MDOT SHA and Corman Kokosing collaborating to select whether we perform the work in-house or which DBE subcontractor to use.

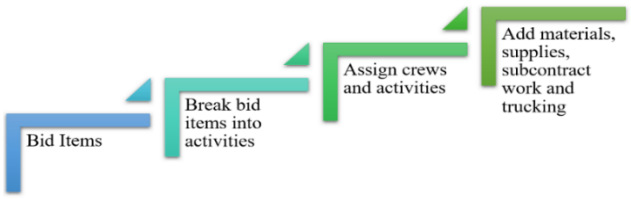


FIGURE 6: CORMAN KOKOSING'S STEP-BY-STEP APPROACH

2. SAMPLE ESTIMATE

Our estimate will be set up using MDOT category codes that are assigned a bid item following the SHA Standard Specifications for Construction. Items below each bid item, called child items, will detail direct cost required to complete the scope of each bid item.

On the following pages is a detailed cost report of the items shown in **Figures 7** and **8**. For example, as shown in **Figure 7,** Bid Item 201: Class 1 Excavation, includes excavation to the lines and grades shown on the plans (Item 202) and it also includes embankment of that material within fill areas on the project (Item 203), wasting material off site (Item 204), salvaging topsoil, removal/disposal of hardscaping (Item 206), etc. As you will see, all items incidental to excavating material on the site are broken out clearly, following the Standard Specifications. Using this format ensures direct costs for an item of work are clear, concise and placed in the correct bid item.

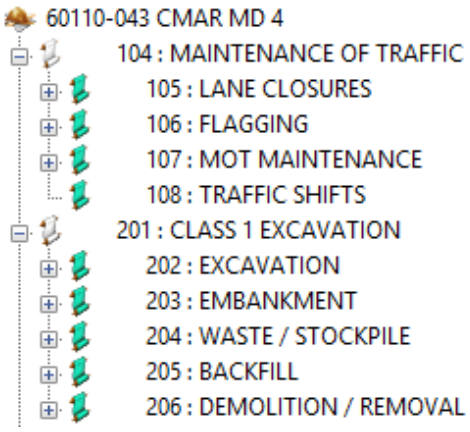


FIGURE 7: BID ITEM STRUCTURE

The next level of the bid, the child items, contain activities where the cost to perform the work is detailed out. Using Class 1 Excavation again as an example, locations of the cuts on the project are detailed out and quantified. **Figure 8** shows four activities that are part of the overall excavation on the project. It also shows corresponding fill activities for material that will be excavated in one location and embanked at another. Embankment placement is also broken down based on the quantity of fill being placed and the production which it can be placed.

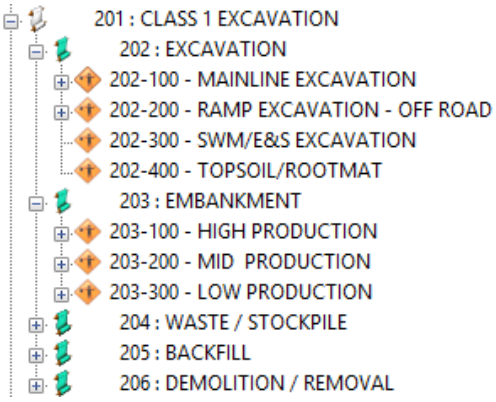


FIGURE 8: BID ITEM DETAIL

Indirect costs for the project are captured in a separate section of the estimate. They are not tied to direct items of work, but are to manage, supervise and support the project. On a standard unit price project these costs are spread to the lump sum items of work. On our past CMAR projects we have

left the indirect cost within the indirect items for OPCC and GMP review. How they are combined and distributed within the GMP schedule of values will be agreed to as a group after acceptance of the GMP.

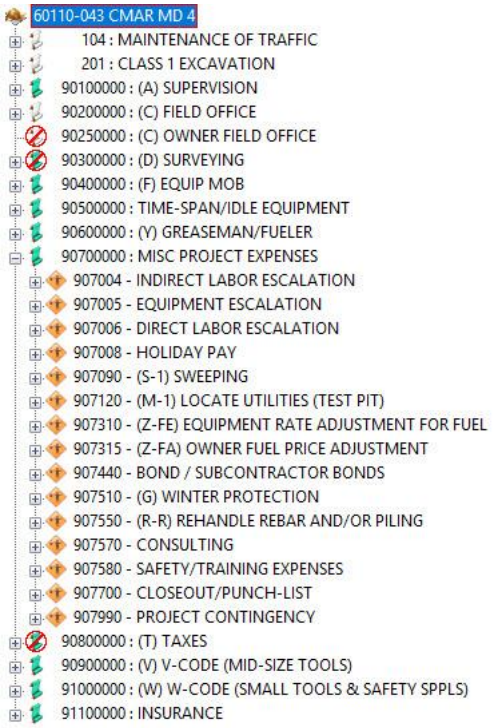


FIGURE 9: INDIRECTS STRUCTURE

Figure 9 shows the structure of our indirects within the estimating software. The "Supervision" item includes the project manager, construction manager, and all **on-site staff**, including construction management, administrative, safety and quality control to effectively manage the project. The "Field Office" item accounts for Corman Kokosing's field office facility, monthly costs and office supplies. The next two items, "Owner Field Office" and "Surveying", will be priced in MDOT SHA bid items so they are removed from the indirects. The next three items support equipment used in the direct items of work. They cover mobilizing/ demobilizing, stand-by time and fueling/servicing the equipment.

The "Misc Project Expenses" item covers a variety of cost seen over the life of the project. If not covered in the agreed to labor or equipment rates escalations are carried to adjust for employee pay increases, increased equipment rates, fuel escalation and/or fuel credit based on Contract Fuel escalation terms. Site logistic costs are handled here if double handling materials is needed, winter concrete costs and bond/subcontractor bond costs. Consulting engineering fees cover costs for third-party bridge erection design, complicated formwork or shoring needs. Safety/ Training expense are captured here also based on a standard factor used on all of our projects applied to projected project manhours. Closeout/Punchlist covers expenses to finalize, repair or replace work discovered during project closeout. The project Contingency item is where we would place funds to cover risky items of work that were priced in the direct items and agreed to with the MDOT SHA during development of the GMP.

The "V" and "W" code items are the one exception to having direct costs in the indirect cost area. These indirect bid items cover small equipment, tools and supplies needed to complete direct items of work. Trying to detail out items, such as brick and mortar for inlets, small pumps and generators, marking tape for utility lines or the number of hammers needed for carpenter crews is nearly impossible. Based on the project type, cost history is used to establish budgets to carry in each of these bid items. We use the past cost ratios of dollars per manhour to come up with a total cost for each category based on the number of manhours in this estimate.

The CMAR Management Fee will be the only markup added to the overall project cost. ***We do not markup subcontracted work in the direct cost section of the bid and then add the management fee on top of that.*** Subcontract quotes and scope analysis, as well as material quotes, will be shared to ensure a transparent price finalization process. When we submit an Opinion of Probable Construction Cost (OPCC) or GMP, it will be the estimated cost to complete the work. It will not include the management fee.

Figures 10A-C are printouts from our estimating software (HeavyBid) for the two items requested: Maintenance of Traffic and Excavation. As directed, they are samples only to show the approach used to determine costs.

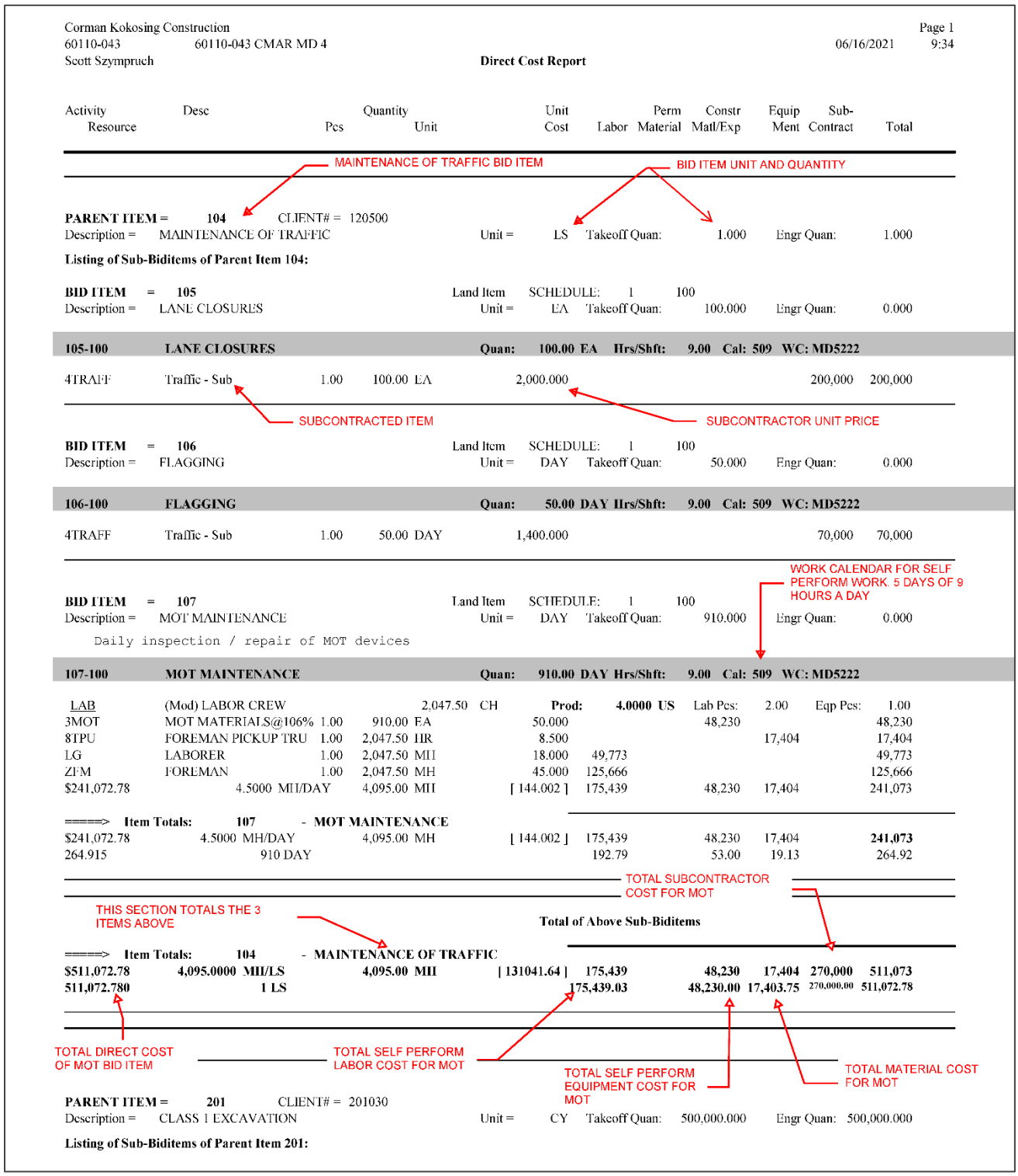


FIGURE 10A: SAMPLE ESTIMATE

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60110-043 60110-043 CMAR MD 4 — 06/16/2021 9:34
Scott Szympruch — **Direct Cost Report**

Activity / Resource	Desc	Pcs	Quantity	Unit	Unit Cost	Labor	Perm Material	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
BID ITEM = 202					SCHEDULE: 1 100						
Description = EXCAVATION					Unit = CY Takeoff Quan: 500,000.000				Engr Quan:		0.000
202-100	**MAINLINE EXCAVATION**				**Quan: 200,000.00 CY Hrs/Shft: 10.00 Cal: 510 WC: MD5222**						
EX-345	Excavation Artic Trucks		900.00	CH	**Prod: 2,222.2222 US**			Lab Pcs: 6.00	Eqp Pcs:	6.00	
8DZD6	DOZER 180 HP (D-6)	1.00	900.00	HR	60.780			54,702		54,702	
8EX100K	EXCAVATOR 100K LB (C	1.00	900.00	HR	113.650			102,285		102,285	
8TAT30	DUMP TRUCK - OFF RO	3.00	2,700.00	HR	86.220			232,794		232,794	
8TPU	FOREMAN PICKUP TRU	1.00	900.00	HR	8.500			7,650		7,650	
OPDZ	OPERATOR-BULLDOZE	1.00	900.00	MH	24.000	30,130				30,130	
OPEX	OPERATOR-EXCAVATO	1.00	900.00	MH	27.000	33,896				33,896	
OPTR	OPERATOR-TRUCK	3.00	2,700.00	MH	20.000	75,325				75,325	
ZFM	FOREMAN	1.00	900.00	MH	45.000	55,238				55,238	
$592,019.46	0.0270 MH/CY		5,400.00	MH	[0.752]	194,588		397,431		592,019	
202-200	**RAMP EXCAVATION - OFF ROAD**				**Quan: 100,000.00 CY Hrs/Shft: 9.00 Cal: 509 WC: MD5222**						
EX-330	(Mod) Excavation Artic Trucks		514.28	CH	**Prod: 1,750.0000 US**			Lab Pcs: 6.00	Eqp Pcs:	6.00	
8DZD6	DOZER 180 HP (D-6)	1.00	514.29	HR	60.780			31,259		31,259	
8EX080K	EXCAVATOR 80,000 LB (	1.00	514.29	HR	79.000			40,629		40,629	
8TAT30	DUMP TRUCK - OFF RO	3.00	1,542.86	HR	86.220			133,025		133,025	
8TPU	FOREMAN PICKUP TRU	1.00	514.29	HR	8.500			4,371		4,371	
OPDZ	OPERATOR-BULLDOZE	1.00	514.29	MH	24.000					16,669	
OPEX	OPERATOR-EXCAVATO	1.00	514.29	MH	27.000					18,753	
OPTR	OPERATOR-TRUCK	3.00	1,542.86	MH	20.000					41,673	
ZFM	FOREMAN	1.00	514.29	MH	45.000					31,565	
$317,943.72	0.0308 MH/CY		3,085.73	MH	[0.834]			209,284		317,944	
202-300	**SWM/E&S EXCAVATION**				**Quan: 5,000.00 CY Hrs/Shft: 9.00 Cal: 509 WC: MD5222**						
	There are no cost resources for this activity.										
202-400	**TOPSOIL/ROOTMAT**				**Quan: 15,000.00 CY Hrs/Shft: 9.00 Cal: 509 WC: MD5222**						
	There are no cost resources for this activity.										
=====> **Item Totals: 202 - EXCAVATION**											
$909,963.18	0.0169 MH/CY		8,485.73	MH	[0.468]	303,248		606,715		**909,963**	
1.820	500000 CY					0.61		1.21		1.82	
BID ITEM = 203					Land Item SCHEDULE: 1 100						
Description = EMBANKMENT					Unit = CY Takeoff Quan: 200,000.000				Engr Quan:		0.000
203-100	**HIGH PRODUCTION**				**Quan: 150,000.00 CY Hrs/Shft: 9.00 Cal: 509 WC: MD5222**						
EM-IIIG	Embankment - Large		607.56	CH	**Prod: 2,222.0000 US**			Lab Pcs: 4.00	Eqp Pcs:	2.00	
8DZD6	DOZER 180 HP (D-6)	1.00	607.56	HR	60.780			36,927		36,927	
8RL84SD	SD ROLLER 84 IN	1.00	607.56	HR	67.350			40,919		40,919	
LS	SKILLED LABORER	1.00	607.56	MH	18.000	14,769				14,769	
OPDZ	OPERATOR-BULLDOZE	1.00	607.56	MH	24.000	19,692				19,692	
OPRL	OPERATOR-ROLLER	2.00	1,215.12	MH	21.000	34,461				34,461	
$146,769.47	0.0162 MH/CY		2,430.24	MH	[0.359]	68,923		77,847		146,769	
203-200	**MID PRODUCTION**				**Quan: 25,000.00 CY Hrs/Shft: 9.00 Cal: 509 WC: MD5222**						
EM-MID	Embankment - Mid		125.00	CH	**Prod: 1,800.0000 US**			Lab Pcs: 4.00	Eqp Pcs:	2.00	
8DZD6	DOZER 180 HP (D-6)	1.00	125.00	HR	60.780			7,598		7,598	

LABOR & EQUIPMENT FOR SELF PERFORM CREW

QUANTITY IN CREW

HOURLY COST FOR EACH RESOURCE

CREW PRODUCTION RATE. QUANTITY COMPLETED PER SHIFT

TOTAL COST FOR EACH RESOURCE

NO DATA TO MEET PAGE REQUIREMENT

NO DATA TO MEET PAGE REQUIREMENT

TOTAL HOURS OF EACH RESOURCE TO COMPLETE THE ACTIVITY QUANTITY

FIGURE 10B: SAMPLE ESTIMATE CONTINUED

Corman Kokosing Construction — Page 3
60110-043 60110-043 CMAR MD 4 — 06/16/2021 9:34
Scott Szympruch — **Direct Cost Report**

Activity / Resource	Desc	Pcs	Quantity	Unit	Unit Cost	Labor	Perm Material	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
BID ITEM = 203				Land Item	SCHEDULE: 1 100						
Description = EMBANKMENT				Unit =	CY Takeoff Quan:	200,000.000			Engr Quan:		0.000
8RL84SD	SD ROLLER 84 IN	1.00	125.00	HR	67.350				8,419		8,419
LS	SKILLED LABORER	1.00	125.00	MH	18.000	3,039					3,039
OPDZ	OPERATOR-BULLDOZE	1.00	125.00	MH	24.000	4,052					4,052
OPRL	OPERATOR-ROLLER	2.00	250.00	MH	21.000	7,090					7,090
$30,196.51	0.0200 MH/CY		500.00	MH	[0.443]	14,180			16,016		30,197
203-300	**LOW PRODUCTION**				**Quan: 2,500.00 CY Hrs/Shft: 9.00 Cal: 509 WC: MD5222**						
EM-MID	(Mod) Embankment - Mid			22.50 CH	**Prod: 1,000.0000 US**	Lab Pcs:	3.00	Eqp Pcs:	2.00		
8DZ450	DOZER 75 HP (450)	1.00	22.50	HR	35.700				803		803
8RL60SD	SD ROLLER 60 IN	1.00	22.50	HR	47.250				1,063		1,063
LS	SKILLED LABORER	1.00	22.50	MH	18.000	547					547
OPDZ	OPERATOR-BULLDOZE	1.00	22.50	MH	24.000	729					729
OPRL	OPERATOR-ROLLER	1.00	22.50	MH	21.000	638					638
$3,780.69	0.0270 MH/CY		67.50	MH	[0.599]	1,914			1,866		3,781
=====> **Item Totals:**	**203**	**- EMBANKMENT**									
$180,746.67	0.0149 MH/CY		2,997.74	MH	[0.332]	85,017			95,729		**180,747**
0.904	200000 CY					0.43			0.48		0.90
					Total of Above Sub-Biditems						
=====> **Item Totals:**	**201**	**- CLASS 1 EXCAVATION**									
$1,090,709.85	**0.0229 MH/CY**		**11,483.47**	**MH**	**[0.6]**	**388,265**			**702,445**		**1,090,710**
2.181	**500000 CY**					**0.78**			**1.40**		**2.18**
$1,601,782.63	***** Report Totals *****		15,578.47	MH		563,704		48,230	719,848	270,000	**1,601,783**

FIGURE 10C: SAMPLE ESTIMATE CONTINUED

3. CONTRACTING PLAN

Developing a Subcontractor Selection Plan: Although Corman Kokosing will be self-performing most of the work (over 50%), our Subcontractor Selection Plan encourages competitive solicitation of bids from quality subcontractors. During preconstruction, a Subcontracting and DBE Plan is submitted to MDOT SHA for concurrence. It is founded on our current standard plans and emphasizes selecting subcontractors based on:

- DBE status.
- Experience on similar projects.
- Labor availability when construction starts.
- Owner/prime contractor recommendations.
- Capacity to meet/exceed schedules.
- Industry feedback/references from past performance on similar contracts.
- Personal interviews.
- Visits to subcontractor's office/yards.
- Pre-qualifications for working on government (MDOT SHA, MDTA, City, County) projects.
- Review of their Quality Program.

- → Familiarity working on large highway projects with a major MOT component.
- → Financial stability/strength.
- → Understanding project goals/key issues/scope during pricing and investigative phases.
- → Ability to perform multiple contract tasks.

As the GMP unfolds, we focus on meeting the DBE goals as their costs are sometimes not the same as if we self-performed the work. For this reason, subcontractors are identified and requested to propose on appropriate items. As stated above, the cost agreed to by MDOT SHA, ICE, and Corman Kokosing may be based on actual quotes from DBE subcontractors. The process to identify these qualified DBE or specialty subcontractors is described in more detail below:

Our contracting plan emphasizes selecting subcontractors based on the above criteria. Corman Kokosing maintains a Specialty/DBE firm database. Outreach is continuous to provide opportunities to connect with additional firms. The following are how we solicit Specialty/DBE firms during the preconstruction phase:

1. Publish Proposal Notifications/Bid Notices in local/minority newspapers and eMaryland Marketplace Advantage (eMMA) 30 and 10 days prior to price due dates.
2. Provide MDOT SHA with information to publish notice of the project for trade proposals on their website.
3. Post plans/specifications on the Corman Kokosing SharePoint Site for potential subcontractors to review.
4. Review past MDOT SHA and MDTA bids/projects for potential Specialty/DBE firms and contact them to gauge interest in the current opportunity.
5. Review MDOT SHA, DDOT and local City/County DBE directories to identify certified subcontractors/suppliers.
6. Based on available scopes of work and number of responses obtained, an Open House can also be held to advertise the opportunity and solicit interest from local subcontractors.
7. Our Estimating Administrator reaches out to Specialty/DBE firms from our database. Develop/ maintain a list of potential Specialty/DBE firms to solicit prices from which is prepared using our database, as well as Items 1 through 5 above.
8. Validate licensing, qualifications, bonding capacity and references of identified specialty and certified DBE subcontractors/suppliers, respond to project inquiries, and furnish requested information.
9. Regularly review our compliance with project requirements, codes, and ordinances.

Demonstrating Subcontractor's Prices are Competitive:

- → Compare submitted quotes to pricing using our in-house estimates.
- → Review inclusions/exclusions in the subcontractor's scopes to ensure equal scopes were priced.
- → Provide a minimum of two quotes; Goal is to obtain three or more if subcontractors are available.
- → If only one quote – use past pricing from other similar scope/size projects to confirm pricing competitiveness.

Enhancing DBE Participation: We will develop an DBE Outreach Program to meet the goals. Material pricing and subcontractor pricing DBE firms will be shared and evaluated with the ICE. When preparing a fair price, we will track status of our DBE participation. This creates an awareness to maintain and/or

increase our efforts to meet the goals. As the fair price submittal dates approaches construction, DBE participation goals are evaluated/finalized to meet them. If adequate DBE participation is not obtained, bid items Corman Kokosing had originally planned to perform in-house will be broken out and sent to DBE firms to quote on. During construction, the project team monitors DBE participation for compliance with the established goal.

Compliance with COMAR 21.05.10.05: Corman Kokosing understands the procurement requirements of the Code of Maryland Regulations (COMAR) having met them on CMAR projects for MDOT SHA. COMAR Section 21.05.10.05 identifies the applicable requirements for subcontractor procurement on CMAR projects. It states that Corman Kokosing assumes all risk of cost, schedule, and performance of our subcontractors on the project. In addition, the regulation requires we provide notice, 14 days in advance of the due date of trade proposals, to the Governor's Office of Small, Minority & Women Business Affairs of the project. We must document all of our advertisement and outreach efforts. As discussed, we will select subcontractors in an environment of fairness to MDOT SHA and to them to receive the lowest cost combined with the highest quality in selection of Disadvantaged and Minority Business firms.