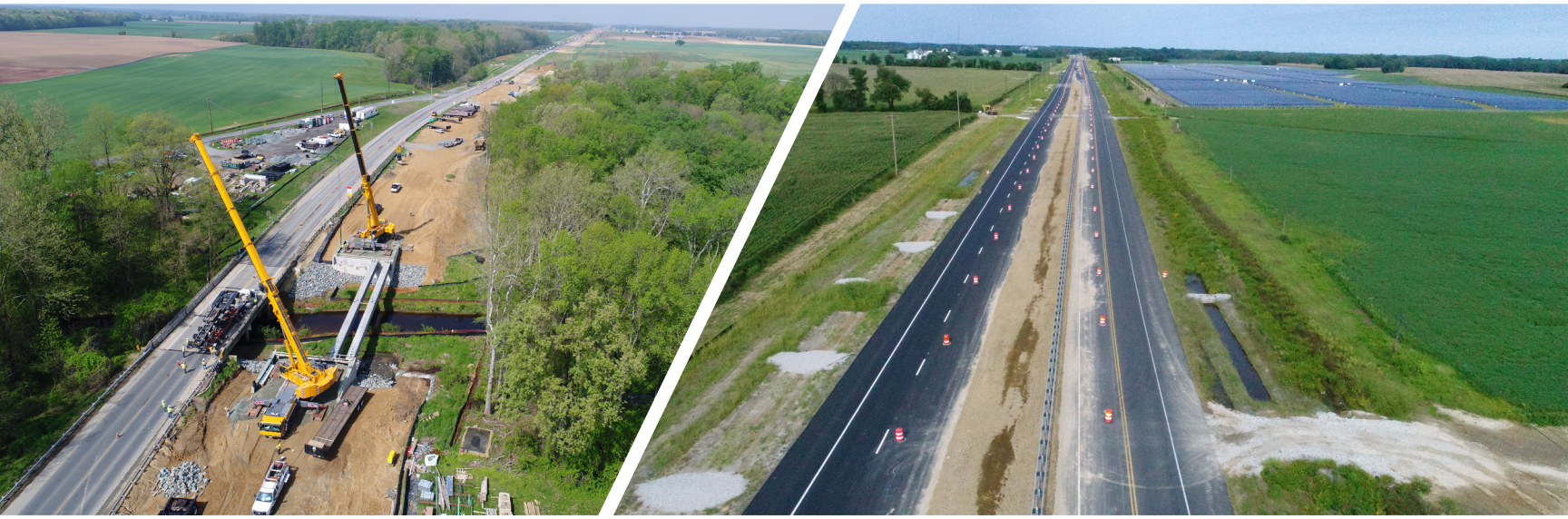
STATEMENT OF QUALIFICATIONS

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

MD 32 SOUTH OF

LINDEN CHURCH ROAD TO I-70

DESIGN-BUILD | CONTRACT NO. HO7565370 | MARCH 2, 2018



WAGMAN WRA
General Construction | Heavy Civil | Geotechnical

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DESIGN-BUILDER CAPABILITY

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KEY STAFF

WAGMAN WRA
General Construction | Heavy Civil | Geotechnical

ANTHONY BEDNARIK, DBIA – Design-Build Project Manager/Primary Individual Contact

Firm: Wagman Heavy Civil, Inc.
Education: BS, Civil Engineering, 1987
Years of Experience: With Firm: 18; In Industry: 31
Professional Registration: DBIA-certified Professional; ARTBA Project Management Academy, ASCE

As Vice President of Major Pursuits/Design-Build for Wagman, Anthony is responsible for design-build projects from pursuit to final completion. He is assigned to major pursuits and organizes project pursuit teams, manages the design development process, establishes a collaborative environment, and coordinates with the construction team, designer, owner and stakeholders. Anthony is responsible for cost, schedule, safety, customer satisfaction, and stakeholder coordination. Over the past 18 years, Anthony has worked as a Design-Build Project Manager, Project Manager, Design-Build Coordinator, and Estimator on many transportation projects including expressways, arterial re-alignments, major interchanges, new alignment, interchange creation and reconstruction, intersection, capacity and safety improvement, and major structures. He understands the need for collaboration, coordination and communication with all team members and will bring his expertise from large design-build fast-track projects to the MD 32 project (HO7565370).

PROJECT EXPERIENCE:

MD 404 from US 50 to East of Holly Road Design-Build, MDOT SHA, Caroline, Queen Anne's and Talbot Counties, MD ($110.8M) – Design-Build Project Manager. Anthony was responsible for the development of innovative ATCs, design, design reviews, CPM schedules, and construction for the project. The project dualized MD 404 to a 4-lane divided highway with J-turns and Maryland T intersections, increasing mobility and safety throughout the corridor. Westbound MD 404 was new construction with extensive earthwork, through multiple watersheds, environmentally-sensitive areas, and had many stakeholders. Eastbound MD 404 was a roadway rehabilitation including milling and resurfacing. Anthony managed right-of-way coordination, utility coordination and relocation, complex construction sequencing, maintenance of traffic, maintenance of stream flow, bridge construction, box and pipe culvert construction, SWM facility construction, E&SC permit acquisition, permit modifications, MDOT SHA–PRD/MDE permitting, stream restriction periods, stakeholder communication, public outreach, partnering, and an aggressive schedule (comprised of multiple, coordinated design/construction packages).

Intercounty Connector (MD 200) Contract A Design-Build, MDOT SHA, Montgomery County, MD ($484.1M) – Wagman's Design-Build Project Manager. Anthony was responsible for the development of innovative ATCs, design, design reviews, and initial construction. He led design coordination, avoidance and minimization of environmental impacts, RTE relocation, project mobilization, agency permitting including MDE, public outreach meetings, and provided technical assistance to all disciplines, including earthwork, utility avoidance and relocation, and structures. He was instrumental in creating a collaborative environment to fully integrate the joint construction team of three separate contractors and co-location with the design team and MDOT SHA. To accelerate the design and construction into a 3-year period, Anthony started design during limited Notice-to-Proceed and started construction of early design packages as they were approved. This 8.5-mile-long, 6-lane divided highway design-build project included 18 structures with specific aesthetic requirements, earthwork, pipe and box culverts, ITS, major sign structures, reforestation, environmental compliance/mitigation, stream relocation, wildlife passage and fencing, and utility coordination. Seven miles of Contract A was a greenfield project that intersected multiple cross roads requiring maintenance of traffic and property owner coordination.

Intercounty Connector (MD 200) Contract B Design-Build, MDOT SHA, Montgomery and Prince George's Counties, MD ($560.8M) – Wagman's Design Coordination Manager. Anthony organized a fully-integrated construction joint venture and was instrumental in the successful execution of Contract B. Anthony used his experience from Contract A to streamline processes on Contract B. With primary attention to environmental compliance, agency coordination, and MDE permits, Anthony worked with designers and field personnel to ensure that all environmental commitments, design, aesthetic, and constructability requirements were met. His understanding of the MDE review process was a key element that kept the project on schedule. This 7-mile-long design-build greenfield project included major structures and earthwork to construct a 7-lane divided highway and was designed and constructed in three years on a fast-track schedule. The highway alignment crossed multiple environmentally-sensitive areas requiring multiple mainline and overpass bridges and two new interchanges. A complex TMP, involving phased construction, was developed to minimize inconvenience to the community and the travelling public. *This project won numerous awards for safety and design excellence, including the DBIA National Design-Build Award and ENR Best Transportation Project*.

WALTER MILLER, PE – Design Manager/Secondary Individual Contact

Firm: Whitman, Requardt & Associates, LLP
Education: BS, Civil Engineering, 1987
Years of Experience: With Firm: 24; In Industry: 30
Professional Registration: Maryland Registered Professional Engineer, License No. 19165

Walter has 30 years of experience designing and managing a wide range of multi-discipline transportation projects covering all aspects of transportation design including studies, preliminary and final design, development of contract documents, and construction support services. Project types have included new roadways, dualizations and widenings, new interchanges and interchange modifications, intersection modifications including roundabouts, safety improvements, new structures, structure rehabilitation/replacements, MOT, traffic studies and improvements, access control plans, pavement and geotechnical improvements and remediation, drainage improvements, E&SC, SWM, stream relocations and restoration, wetland mitigation and creation, environmental permitting, and multi-modal facilities. Walter is well-versed in MDOT SHA, AASHTO, MDMUTCD, and FHWA specifications, standards, policies, and criteria. Walter has been the Design Manager for four MDOT SHA design-build projects, including MD 32 Phase 1, MD 237, MD 210, and Arena Drive.

PROJECT EXPERIENCE:

MD 32 from MD 108 to Linden Church Road Design-Build, MDOT SHA, Howard County, MD ($32.6M) – Design Manager. Walter is managing all design efforts for the dualization (two to four lanes divided) of 3.0 miles of MD 32 incorporating environmental site design (ESD)/structural SWM facilities, realignment/reconstruction of interchange ramps at Linden Church Road, and connection into the existing dualization at the MD 108 interchange. Design efforts include innovative ATCs; surveys; roadway; H&H analysis and design for drainage, SWM, and multi-phase E&SC; structural design including box culvert and headwall design; complex multi-phase MOT; soil borings; pavement cores; geotechnical engineering and pavement design; TMP; interchange and intersection lighting; signing/markings; landscape design and on-site reforestation; utility designating/test pitting; coordination; environmental permitting/approvals (MDOT SHA-PRD SWM and E&SC, MDE Plan Review and Dam Safety, forest, Section 404/wetlands and waterways, NEPA); public outreach; design QC; and IDQM certifications. The design is significantly complete.

MD 237 from MD 235 to Pegg Road Design-Build, MDOT SHA, St. Mary's County, MD ($37.8M) – Design Manager. Walter managed all design efforts for the dualization (two to four lanes divided) and reconstruction of 2.9 miles of MD 237, including innovative ATCs; survey; roadway and bicycle/pedestrian improvements; intersections with J-turns; H&H analysis and design for drainage, SWM, multi-phase E&SC, fish passage, and maintenance of stream flow; design of pipe culverts and a box culvert; noise wall and retaining wall design; complex multi-phase MOT using temporary cross-overs; soil borings; pavement cores and FWD testing; geotechnical engineering and pavement design using an alternative pavement section resulting in cost savings to MDOT SHA; traffic signals, intersection lighting, signing and markings; landscape including reforestation design; utility designating and test pitting; gas, water and sewer design and coordination of electric and communications; permitting/approvals/compliance (SWM, E&SC, NOI/NPDES, forest, Section 404/wetlands and waterways, NEPA); public outreach; partnering; design QC; and construction support services, including as-built plans.

MD 210 at Livingston Road/Kerby Hill Road Interchange Design-Build, MDOT SHA, Prince George's County, MD ($82.6M) – Design Manager. Walter managed all design efforts for the reconstruction of an at-grade intersection to a grade-separated interchange, including survey; roadway and bicycle/pedestrian improvements; H&H analysis and design for drainage, SWM, multi-phase E&SC, a stream relocation/restoration, maintenance of stream flow, and flood studies; design of box culvert extensions and pipe culverts, bridges, noise walls, and retaining walls; complex multi-phase MOT; soil borings; pavement cores; geotechnical engineering and pavement design; TMP; traffic operational analyses; traffic signals, interchange and intersection lighting, and signing/markings; landscape design and on-site reforestation; utility designating/test pitting; utility design of gas, water and sewer; extensive utility coordination of electric and communications; environmental permitting/approvals/compliance (SWM, E&SC, NOI/NPDES, forest, Section 404/wetlands and waterways, NEPA); public outreach; partnering; design QC; and construction support services.

I-495 at Arena Drive from MD 202 to MD 214 Design-Build, MDOT SHA, Prince George's County, MD ($29.5M) – Design Manager. Walter managed all design efforts for the median widening of 1.9 miles of I-495 for additional lanes in each direction, reconfiguration of ramps and modification of intersections at the MD 214 and MD 202 interchanges, and modification of intersections at the Arena Drive interchange. Design efforts included survey; roadway and drainage improvements; SWM; multi-phase MOT and E&SC; geotechnical and pavement design; traffic signals, interchange lighting, signing/markings and ITS; landscape design and on-site reforestation; utility coordination; interstate access approval; environmental permitting/approvals/compliance; public outreach; partnering; design QC; and construction support services.

CARL BENTON – Construction Manager

Firm: Wagman Heavy Civil, Inc.
Education: Catonsville Community College, Advanced Construction Management, 1988; Operating Engineers Apprenticeship Program Local 37, 1983
Years of Experience: With Firm: <1; In Industry: 32
Certifications/Training: OSHA 10-Hr. Yellow Card – Environmental; Confined Space; Defensive Driving; Crane Rigging; Crane Awareness; ARTBA Backing & Rollover, Trenching & Excavation; First Aid & CPR

Carl has been responsible for coordination of field personnel, equipment, materials and subcontractors. Carl works closely with our construction and engineering groups to ensure constructability of all project elements. As a Construction Manager assigned to a single project, Carl is responsible for project safety, schedule, environmental compliance, and cost. On design-build projects, Carl works closely with the design team and performs over-the-shoulder constructability reviews. Carl uses his vast knowledge of MDOT SHA and MDE (now delegated to MDOT SHA-PRD) to review E&SC plans for proper sequence of construction to minimize the need for field changes and to maintain compliance. Carl has experience in major earth moving projects and projects with complex MOT and construction phasing.

PROJECT EXPERIENCE:

I-95 Express Toll Lanes – MD 43 Interchange, MDTA, Baltimore County, MD ($142.5M) – Construction Manager. Carl was responsible for managing construction activities including scheduling and coordination for earthwork, structures, storm drainage, utilities, paving, MOT, signage, and ITS. The project involved the reconstruction of 1.6 miles of the existing 8-lane divided highway to eight general purpose lanes and four express toll lanes and the widening of MD 43 from four lanes to six lanes, with multiple access points to MD 43. The project also included the realignment of interchange ramps, intersection improvements, signalization, relocation of a 30 MGD sanitary sewer trunk line and high voltage duct bank, coordination of gas main and electrical relocations, and installation/maintenance of E&SC. Signalization was added at the ramp connections to MD 43 and cross roads of MD 43. The project used five significant MOT phases to maintain ADTs of 173,000 on I-95 and 60,000 on MD 43, while maintaining mobility and safety for the travelling public. Carl assisted the public outreach team during construction to communicate changing travel patterns to the traveling public.

Intercounty Connector (MD 200) Contract A Design-Build, MDOT SHA, Montgomery County, MD ($484.1M) – Assistant Construction Manager. Carl was responsible for managing construction activities including scheduling and coordination for all subcontractors (electrical, fiber optic, signing, concrete, asphalt and conversion of SWM facilities) and gathering of as-built information to close out the project. This 8.5-mile-long, 6-lane divided highway design-build project included earthwork, E&SC, complex sequence of construction, structures with specific aesthetic requirements, pipe and box culverts, ITS, major sign structures, intersection improvements, reforestation, environmental compliance/mitigation, stream relocation, wildlife passage and fencing, and utility coordination. Carl worked within a collaborative team working on design resolutions and design modifications that included MDE permit modifications. Carl provided input to the project schedule and developed information for the public outreach effort to notify motorists of upcoming lane closures and traffic switches to minimize inconvenience to the community and the traveling public.

Intercounty Connector (MD 200) Contract B Design-Build, MDOT SHA, Montgomery and Prince George's Counties, MD ($560.8M) – Assistant Construction Manager. Carl was responsible for managing construction activities including scheduling and coordination. This 7-mile-long design-build greenfield project included over two million cubic yards of earthwork, storm drain, sewer and water relocations, noise walls, and bridge work to construct a 7-lane divided highway and two interchanges across multiple environmentally-sensitive areas. Carl was also responsible for maintenance of stream flow with time-of-year restrictions and earth moving operations. Carl completed constructability reviews of the complex sequence of construction and E&SC plans with clean water ditches, grass swales, wet swale, and bioswales He worked with MDE on field modifications to maintain environmental compliance and keep the project on schedule. Carl successfully complied with the project's environmental stewardship commitments.

Hampstead Bypass Design-Build, MDOT SHA, Carroll County, MD ($43M) – Assistant Construction Manager. Carl was responsible for constructability reviews and managing construction activities including scheduling and coordination. This project was the first 100% design-build project in Maryland which included seven miles of new highway, one million cubic yards of earthwork, four bridges, three roundabouts, drainage systems, eight culverts, SWM facilities, and utility coordination and relocation. Construction was scheduled around in-stream restrictions for Use I, II and IV waterways. Carl worked with MDE to maintain environmental compliance and developed information for public outreach during construction. Coordination concerning an RTE (Bog Turtle) was critical to the project schedule.

GARY BUSH, PE – Highway Engineer

Firm: Whitman, Requardt & Associates, LLP

Education: BS, Civil Engineering, 1976

Years of Experience: With Firm: 40; In Industry: 40

Professional Registration: Maryland Registered Professional Engineer, License No. 14255

Gary has spent his entire 40-year career as a Highway Engineer at WRA on projects in Maryland, with a majority of projects being for MDOT SHA. Responsibilities have consisted of all phases of projects including planning, preliminary design, final design, preparation of design-bid-build and design-build documents and construction-related services. His experience includes typical section development, horizontal/vertical alignments, grading, superelevation, intersection design including roundabouts, grade separation and interchange ramp design, MOT, signing/marking, utility coordination, ROW, construction details, writing specifications, and developing detailed cost estimates. He has prepared ATCs, led and performed value engineering studies, developed access control plans, prepared alternative intersection designs including J-turns and modified Maryland Ts, performed constructability reviews, and conducted public meetings. Gary has been the Highway Engineer for four MDOT SHA design-build projects, including MD 32 Phase 1, MD 237, MD 210, and Arena Drive.

PROJECT EXPERIENCE:

MD 32 from MD 108 from Linden Church Road Design-Build, MDOT SHA, Howard County, MD ($32.6M) – Highway Engineer. Gary is responsible for the highway design and MOT for the dualization (two to four lanes divided) of 3.0 miles of MD 32. The highway design includes the development of innovative ATCs; the MD 32 dualization; reconfiguration of interchange ramps at Linden Church Road; development of the horizontal and vertical alignment geometry; intersection design; correction of existing MD 32 superelevation; and the development of phased construction packages. He is also responsible for the preparation of the multi-phased MOT plans including the temporary cross-overs that were developed to minimize inconvenience to the community and the travelling public. The highway design meets MDOT SHA, AASHTO, MDMUTCD, and FHWA specifications, standards, policies, and criteria.

MD 237 from MD 235 to Pegg Road Design-Build, MDOT SHA, St. Mary's County, MD ($37.8M) – Highway Engineer. Gary was responsible for highway design and MOT for the dualization (two to four lanes divided) and reconstruction of 2.9 miles of MD 237, including the construction of new pavement, rehabilitation of the existing pavement, and connection to an existing dualization. The project required 2,200 LF of the vertical alignment to be raised approx. 12 ft. to accommodate the replacement of existing undersize pipes to a larger twin-cell box culvert. Portions of the MD 237 horizontal alignment were relocated to eliminate several small horizontal curves. At select locations, intersecting roadways were realigned to provide for improved intersection geometry. The project was constructed in four zones requiring four MOT packages utilizing temporary connections between construction zones to maintain traffic without detours. Gary was responsible for the preparation of final roadway plans, an access management plan with J-turns, assistance with utility coordination and relocations including coordinating test holes, and review of water, sewer, gas, and signing/markings designs. He coordinated surveys, prepared design schedules, and coordinated partnering meetings and public outreach.

MD 210 at Livingston Road/Kerby Hill Road Interchange Design-Build, MDOT SHA, Prince George's County, MD ($82.6M) – Highway Engineer. Gary was responsible for all highway design and MOT for the reconstruction of an at-grade intersection to a grade-separated interchange including the widening of 1.9 miles of MD 210. He was responsible for the final highway design which included the interchange ramp design, intersection design, service roads and temporary roadways. He oversaw the development of the MD 210 roadway profile to minimize the existing pavement being rehabilitated which will reduce disruptions to traffic during construction. He assisted in the design relocation of fiber optic, water, sanitary sewer and gas utilities. Many design challenges were overcome to meet the design intent within the limited available right-of-way including installing retaining walls, concrete retaining barriers and noise barrier retaining panels. The project also includes roadway and intersection improvements, MOT, TMP, traffic signals, lighting, signing/markings, landscaping and on-site reforestation mitigation, utility design with coordination of overhead and underground facilitities, permitting/approvals/compliance, public outreach, partnering, and construction support services.

I-495 at Arena Drive from MD 202 to MD 214 Design-Build, MDOT SHA, Prince George's County, MD ($29.5M) – Highway Engineer. Gary was responsible for all highway design and MOT for the reconfiguration of interchange ramps and intersections at MD 202 and MD 214, intersection improvements at Arena Drive, and for the median widening of 1.9 miles of I-95/I-495. Gary oversaw the roadway design, preparation of final plans, and preparation of multi-phase MOT. He assisted with utility coordination, developed design schedules, and was a major participant in partnering and public outreach.

JASON COSLER, PE – Water Resources Engineer

Firm: Whitman, Requardt & Associates, LLP

Education: BS, Civil Engineering, 1992

Years of Experience: With Firm: 18; In Industry: 25

Professional Registration: Maryland Registered Professional Engineer, License No. 28467

Jason has more than 25 years of experience in water resources engineering for public infrastructure and transportation projects. His experience includes the investigation, analysis, and design of storm drains, culverts, SWM facilities, E&SC, bridges and low-water crossings, stream stability assessments and restoration design, wetland creation design, scour analysis, and countermeasure/revetment design. He has significant experience in SWM/ESD assessment, design, review, permitting and as-built certification. He has significant experience in hydrologic/hydraulic methodoligies and software including HDS-5, HY-8, HY-22, HEC-11, HEC-14, HEC-18, HEC-21, HEC-23, TR-55, HEC-RAS, GIS Hydro 2000, TR-20, ABSCOUR and is E&SC Yellow Card-certified. He possesses training in stream assessment and restoration based upon Rosgen methodologies. Jason has been the Water Resources Engineer for four design-build projects for MDOT SHA, including MD 32 Phase 1, MD 237, MD 210, and Arena Drive, and has been responsible for water resources-related permit acquisition through MDOT SHA-PRD; MDE Plan Review, Non-tidal Wetlands and Waterways (NTWW) and Dam Safety Divisions; USACE; USFWS; and FEMA.

PROJECT EXPERIENCE:

MD 32 from MD 108 to Linden Church Road Design-Build, MDOT SHA, Howard County, MD ($32.6M) – Water Resources Engineer. Jason is responsible for all water resources engineering for the dualization (two to four lanes divided) of 3.0 miles of MD 32. He is overseeing the design and plan preparation of all final drainage, phased E&SC with MOT, and ESD/structural SWM facilities specifically designed to minimize thermal impacts to sensitive Use IV-P receiving waters. He has completed all MDOT SHA-PRD submittals and approvals, including the MDE NPDES permit, for concept, final, IFC and "toolkit" modifications for SWM and E&SC. He obtained MDE Plan Review and Dam Safety Division approvals of all pond/headwater elements and MDE NTWWD/USACE approval of H&H and maintenance of stream flow for new culvert crossings. All work was prepared in accordance with the MDE 2000 Maryland Stormwater Design Manual, MDE 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control, MDOT SHA-PRD 2015 Sediment and Stormwater Guidelines and Procedures (SSGP, V 1.2) and 2011 MDOT SHA SWM Site Development Criteria, as well as the MDOT SHA Drainage Manual, and the MDOT SHA OOS Manual for Hydrologic and Hydraulic Design (2011 version).

MD 237 from MD 235 to Pegg Road Design-Build, MDOT SHA, St. Mary's County, MD ($37.8M) – Water Resources Engineer. Jason was responsible for all water resources designs for the dualization (two to four lanes divided) of 2.9 miles of MD 237. He oversaw the design, plan preparation, and MDE, USACE and MDOT SHA permits/approvals for open and closed storm drain systems; eight traditional SWM facilities; SWM as-built certification; and H&H analysis/design for phased E&SC with MOT, drainage culverts, a two-cell CIP box culvert, including maintenance of stream flow, constructed in phases at the Jarboesville Run crossing and the design/construction of a rock ramp for fish passage.

MD 210 at Livingston Road/Kerby Hill Road Interchange Design-Build, MDOT SHA, Prince George's County, MD ($82.6M) – Water Resources Engineer. Jason was responsible for all water resources engineering for the reconstruction of an at-grade intersection to a grade-separated interchange. He oversaw all design and plan preparation, as well as MDE, USACE and MDOT SHA permits/approvals for final drainage, SWM (structural and ESD), H&H analysis for drainage culverts, a bridge over Carey Branch, phased E&SC, and the Cary Branch stream relocation/restoration. He worked to minimize impacts to all environmental features and coordinated with electric, communication, gas and water/sewer utilities.

I-495 at Arena Drive from MD 202 to MD 214 Design-Build, MDOT SHA, Prince George's County, MD ($29.5M) – Water Resources Engineer. Jason was responsible for all water resources engineering for the median widening of 1.9 miles of the Capital Beltway, reconfiguration of ramps at MD 214 and MD 202, and modifying intersections at the Arena Drive ramp termini. He oversaw the design and plan development of drainage, SWM, and E&SC; coordinated MDOT SHA/MDE permit approvals; and provided SWM as-built certification. Jason revised the concept SWM which eliminated the construction of a SWM facility in a forested area. Project included a 48-inch conduit jacked/bored under I-495.

US 301, Section 1, DelDOT, New Castle County, DE ($138.1M) – Water Resources Engineer. Jason was responsible for all the water resources engineering for 5.5 miles of limited-access, 4-lane divided highway on a new alignment. He was responsible for the SWM design consisting of a combination of bioswales, wet ponds, infiltration trenches and infiltration basins, floodplain analysis, open and closed storm drain systems and E&SC. Jason participated in regulatory agency coordination and oversaw the design for impacts to and restoration of Scott Run.

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FIRM PAST PERFORMANCE

WAGMAN WRA

General Construction | Heavy Civil | Geotechnical

MD 404 FROM US 50 TO EAST OF HOLLY ROAD DESIGN-BUILD – Caroline, Queen Anne's and Talbot Counties, Maryland

FIRM: Wagman Heavy Civil, Inc. (Lead Construction Firm)
OWNER CONTACT: MDOT State Highway Administration | Mr. Bret Hadzimichalis | 410.810.3270 | bhadzimichalis@sha.state.md.us
CONTRACT/PROJECT NO.: AW8965170
DELIVERY METHOD: Design-Build
CONSTRUCTION COSTS: *Initial Contract Value:* $106.0M | *Final Contract Value*: $110.8M | *Reason for Difference:* Early completion and environmental incentive(s); owner-approved change orders.
SCHEDULE PERFORMANCE: *Initial Completion Date:* 11/2017 | *Substantial Completion Date*: 11/2017 (on-time)

RELEVANCE TO HO7565370:

Safety and Mobility
- Dualized existing 2-lane roadway to 4-lane divided
- Improved existing intersections
- Introduced J-turns
- Incorporated access management plan

Project Schedule and Management
- Design-build delivery
- Fast-track schedule
- Completed on-time
- TMP minimized impacts to traveling public

Well Managed Project
- Similar terrain, traffic elements, and utilities
- Reduced environmental impacts from original EIS document
- Utility coordination to reduce impacts and facilitate relocations
- Progressive public outreach plan
- Innovation through partnering

PROJECT DESCRIPTION:

Wagman Heavy Civil, Inc. (Wagman) was the Managing Partner of the MD 404 Corridor Safety Constructors (404 CSC) Joint Venture for the nine miles of the dualization of existing MD 404 from an existing 2-lane roadway to a 4-lane divided roadway with a green median from US 50 to east of Holly Road, which crossed three separate counties. At select intersections, J-turns and Maryland T intersections were constructed to eliminate unprotected left turns from side streets and new service roads. These innovative traffic intersections consolidated access points with residential and commercial properties to improve safety along the MD 404 corridor. Other improvements included cross-street tie-ins to the dual highway; 18 significant drainage structures including cross culvert extensions/replacements, box culverts and multi-cell pipes; a 115 ft. single span bridge over Norwich Creek; new roadway pavement section; existing roadway rehabilitation (patching, milling, wedge and level, and surface paving); open/closed drainage systems; stormwater quality ESDv and quantity facilities; intersection lighting; corridor-wide signing, pavement marking, and ITS devices; traffic signal modification at US 50; noise abatement earth berms; and landscaping. **To meet the aggressive 18-month schedule to design and construct**, Wagman divided the project into three segments, with each partner of the 404 CSC responsible for providing adequate resources to design and construct their segment of the project. As Managing Partner, Wagman was responsible for the overall project management and work on Segment B, 2.5 miles of dualization from Church Road to 2,000 ft. east of Norwich Creek. Overall, our team was able to reduce cost by incorporating multiple ATCs, resulting in a $12M savings to MDOT SHA. On November 20, 2017, MD 404 was opened to four lanes of traffic, two lanes in each direction, providing MDOT SHA with beneficial use of the highway. MD 404's rolling terrain, with forest, wetlands, streams and multiple cross pipes, is very similar to the MD 32 project (HO7565370). Environmental compliance was a priority to reduce environmental resource impacts. A complete boring program was performed to confirm existing conditions. A transportation management plan (TMP) was prepared to ensure safe construction and a safe final roadway plan. Existing utilities were located parallel to the existing roadway and crossed MD 404 in multiple locations. Several utilities were impacted, requiring relocation and coordination with the utility owners throughout design and construction. The design-build delivery method provided us the ability to prioritize the utility relocations and, in difficult areas, work around the existing utility until it was relocated. In some instances, we were able to avoid the utility relocation entirely. A utility access road was constructed to allow future access to the relocated utilities. A comprehensive change management program was established to minimize re-work and to ensure that all personnel on the project had the proper documents to construct the work. Some project revisions were straight forward and design changes were performed using ProjectWise. Those revisions that impacted the E&SC sequence of construction required OED QA Toolkit modifications to be prepared and submitted for approval. On the existing MD 404 roadway, there were 22 cross culverts at various stream or Waters of the U.S. designations. Each culvert had to be upgraded and replaced, requiring lane closures during non-peak traffic periods. At select locations, cross culverts were designed and constructed for fish passage. A comprehensive public outreach plan was developed with MDOT SHA. The program included regularly-scheduled updates, lane closure schedules, and traffic switch milestones. Multiple public meetings were held to discuss the project and additional meetings

were held with first responders to discuss ways to allow their vehicles to travel through the construction zone without delay. The project team also provided content to MDOT SHA's website and social media, including posting a drone video to show real-time progress of the project. To mitigate cost and minimize delay due to unsuitable soils, a soil cement design was developed to modify areas with a lower CBR. Wet swales, grass swales, and bio-swales were designed and constructed to meet the SWM requirements. A comprehensive landscape plan was developed and the planting started in 2017. An efficient earthwork hauling plan was prepared by creating a 3D model of the project. This allowed material to flow within each segment and between segments without impacting the project schedule. A new single span bridge was constructed over Norwich Creek and two box culverts were extended on tributaries to Norwich Creek that inhabited an RTE (mussel). At the bridge structures over Norwich Creek, scour protection measures were installed on the new structure and upgrades to the existing protection were performed on the existing structure.

SUCCESSFUL METHODS, APPROACHES AND INNOVATIONS:

Safety and Mobility – The dualization of MD 404 is extremely similar to the MD 32 project (HO7565370) in that MD 404 had a safety concern within the heavily traveled 2-lane roadway. The uncontrolled access roadway had numerous access points, resulting in a corridor with high crash rates. The dualization from a 2-lane section to 4-lane divided roadway provided opportunities to consolidate access points by incorporating an access control plan with select connections to MD 404. Furthermore, innovations at the intersections incorporated J-turns and Maryland Ts to eliminate select left turn movements while providing for predominate turning movements. The dualization required traffic to be maintained at all time. This was accomplished by maintaining traffic on the existing roadway while constructing the new westbound roadway. After westbound was completed, traffic was shifted onto the new pavement, the existing pavement was rehabilitated, and traffic was split to one lane in each direction to complete the median, final pavement surface, markings, and signing.

Project Schedule and Project Management – MD 404 was to be designed and constructed to allow four lanes of unimpeded traffic within 18 months. To meet the aggressive schedule, the project was divided into three segments so each team member had sufficient resources to perform the design and construction. Each segment was designed and constructed independently of each other to allow each individual segment to proceed without impact to resources or interference between resources. A key tool was a fully-integrated CPM schedule that was maintained throughout the project that consisted of over 2,000 activities which defined each segment's design, submittal and construction activities, under the responsible charge of Wagman as the Managing Partner. The schedule information was distributed at the weekly construction and design meetings to stay on-point. Change was managed to ensure the latest drawings were in the hands of the field operations and MDOT SHA inspectors.

Well Managed Project – As an early work activity, we met with newly-established MDOT SHA-PRD (delegated authority from MDE) as soon as we were notified of award, since this was one of the first and largest design-build projects to be reviewed by MDOT SHA-PRD. We wanted to start the open and free communication and fully understand the E&SC permitting review and approval process. Our design teams developed E&SC plans with sequence of construction for submission to our IDQA firm, who reviewed the documents for project compliance. After approval from our IDQA firm, the submission was forwarded to MDOT SHA and MDOT SHA-PRD for review. Issues were resolved through partnering and open communication. A reduction in permitted environmental impacts was achieved during design and construction with NEPA re-evaluation and modifications to the permits coordinated with the permitting agencies. Quarterly environmental reports were prepared and submitted, documenting the environmental activities. A project-specific health and safety plan was prepared which included environmental commitments and compliance requirements. Design development began as soon as the Notice of Award was issued. The design team, MDOT SHA, and constructors all met to discuss the information provided by MDOT SHA and the constructability of the project. The IDQA firm was engaged from the beginning to the end of the project. Weekly task force meetings were held to progress the design by discipline and by each segment. Each task force meeting reported weekly to the management committee and the management committee steered the task force groups to maintain the project schedule. We met with MDOT SHA monthly for partnering meetings and every two weeks for progress meetings. Impromptu over-the-shoulder meetings with MDOT SHA were scheduled as required. As design progressed, additional over-the-shoulder reviews were held to inform MDOT SHA of the content of submittal packages. Prior to issuing Released for Construction Plans to construction, an all-inclusive work plan meeting was held with field personnel and designers to ensure the field personnel understood the sequence of construction, design elements, QA, safety, environmental compliance, and change management.

INDIVIDUALS ON THIS PROJECT PROPOSED AS KEY STAFF FOR THE MD 32 PROJECT (HO7565370):

Anthony Bednarik, DBIA – Design-Build Project Manager

INTERCOUNTY CONNECTOR (MD 200) CONTRACT A DESIGN-BUILD – Montgomery County, Maryland

FIRM: Wagman Heavy Civil, Inc. (Lead Construction Firm)
OWNER CONTACT: MDOT State Highway Administration | Ms. Melinda Peters (retired) | 443.865.9865 | mpeters@rkk.com
CONTRACT/PROJECT NO.: AT3765960
DELIVERY METHOD: Design-Build | Best Value
CONSTRUCTION COSTS: *Initial Contract Value:* $463.9M | *Final Contract Value*: $484.1M | *Reason for Difference:* Environmental incentives to reduce impacts during design, environmental incentives to maintain compliance during construction and owner scope modifications.
SCHEDULE PERFORMANCE: *Initial Completion Date:* 8/2010 | *Final Completion Date*: 12/2010 | *Reason for Difference:* Owner-granted change orders and time extension.
PROJECT DESCRIPTION:

RELEVANCE TO HO7565370:

Safety and Mobility
- New dualized roadway
- Improved intercounty roadway network
- Improved existing roadway facilities
- Compatible with future extension

Project Schedule and Management
- Design-build delivery
- Fast-track schedule
- Completed on-time
- Complete design-construction integration
- TMP minimized impacts to traveling public and communities

Well Managed Project
- Reduced environmental impacts from original EIS
- Utility coordination to reduce impacts and facilitate relocations
- Innovation through Partnering
- Comprehensive public outreach program

Contract A was the first major roadway contract of the Intercounty Connector (MD 200), located in Montgomery County with a Design-Build, Best Value delivery method. Wagman was an equity member of a fully-integrated design-build construction joint venture and was financially responsible for the project. The project was a new 8.5-mile-long, 6-lane divided highway on a new alignment with four new interchanges from I-370 to MD 97. The project included 18 bridge structures; 350,000 SF of noise walls; utility relocations; right-of-way acquisition; environmental permitting and monitoring; drainage; numerous and innovative SWM facilities; and over three million cubic yards of excavation. On the western end of the project, Wagman widened and rehabilitated 1.5 miles of existing I-370, reconstructing bridges and widening I-370. The existing pavement was rehabilitated with an asphalt overlay. The project included reforestation, landscaping, maintenance of stream flow, and SWM/E&SC. Major traffic control and traffic reconfigurations were implemented on the western end to minimize impacts to the traveling public, which maintained mobility and increased safety. Several cross roads were traversed by the new limited-access roadway. The project included extensive traffic signalization, signage, and markings within and beyond the project limits to inform motorists of potential delays and alternate travel routes to maintain traffic flow and public safety. The ATC process was used extensively to reduce costs and engage innovation. Risk allocation and risk sharing discussions were utilized for controlling costs and improving design-build processes. One ATC saved over $15 million. Similar to the MD 32 project (HO7565370), Contract A included construction of new roadway sections, rehabilitation of existing roadways with milling and paving, and new access roads connecting to existing neighborhoods and local roads. The new dualized roadway required major earthwork hauling operations, grade separations of existing road crossings, and the relocated connections to existing roads and access points. When crossing an environmentally-sensitive resource, the limits of the resource were identified, the resource was protected, and impacts were avoided or minimized. NEPA re-evaluations and permit modifications were submitted when required. The project included widening, pavement milling with asphalt overlay, complex MOT including detours, and temporary run-arounds to maintain roadway network connections. During the design and construction phase, the design-builder was responsible for quality control and environmental compliance and coordination. Wagman's design coordinators minimized utility impacts through active coordination with utility designers; relocating noise walls, bridge piers and adjusting alignment to avoid utilities. Through innovation and coordination with MDOT SHA, the designer, and environmental agencies, Wagman reduced environmental impacts. Context-sensitive design for elements such as bridges, noise walls, retaining walls and culverts ensured compliance with aesthetic requirements and the project's commitment tracking checklist. Project aesthetics included structural formwork, concrete stain, landscaping, signage, etc. Existing streams and stream flows were maintained and in-stream work was strictly performed in conformance to time of year restrictions for Use III and IV streams. Several streams were temporarily relocated, then placed in final location with accommodations for fish passage. Third-party stakeholder coordination required a comprehensive public outreach plan, including newsletters, social media and "open house" meetings. Local communities and adjacent neighbors were invited to learn about the progress of the project and to provide input. The

design-build team proactively communicated with stakeholders and addressed their concerns to improve customer satisfaction. A proactive partnering process created a collaborative environment and improved communications between the design-build team and MDOT SHA. New overhead bridges were constructed to maintain connectivity of neighborhoods. Existing structures along I-370 required demolition and reconstruction over traffic. The project included a hiker/biker trail and utility access points for future utility maintenance and repair. Bridges and box culverts were built to accommodate fish passage and small and large mammal passage were designed and constructed to allow larger animals to continue their natural crossings without creating unsafe contact with motorists.

SUCCESSFUL METHODS, APPROACHES AND INNOVATIONS:

Safety and Mobility – This project bisected many neighborhoods and cross roadways. The design-build team maintained mobility and safety by utilizing temporary detours to "run around" the work site for all cross streets. This minimized the impact to commuter times while allowing work to progress. A comprehensive TMP was created to address MOT during construction mitigating impacts to mobility, improving safety for the travelling public and workers, and ensuring a safe highway when turned over the owner. The design-build team worked over two million man-hours without a fatality. Incident rates were well below the national averages. Safety was paramount and part of every activity work plan and design. This project improved the traffic network within and around Montgomery County through design and construction, alleviating traffic volume on local roads that were routinely congested before construction of the project.

Project Schedule and Project Management – The schedule was very aggressive for this $484.1M project, which was designed and constructed in 40 months. The design-build team utilized accelerated techniques such as early design packages and initiated design during limited NTP to advance the project schedule. A phased design-build approach allowed construction to begin while design was still being finalized. The fully-integrated complex sequenced CPM had over 4,000 design, submittal, and construction activities that were updated monthly. The design-build team created a well-conceived construction phasing scheme to progress the project and to provide safe passage for the travelling public and local commuters. During design and construction, we produced three-week look ahead schedules so that all participants, designers, constructors, agencies, MDOT SHA, and third-party stakeholders were informed in a timely fashion.

Well Managed Project – The project utilized 3D modeling to assist with survey and earth-moving operations to economize grading operations. The vertical and horizontal alignments were optimized to eliminate excess excavated material and reduce environmental impacts; saving forest, champion trees, and minimizing impacts to wetlands, streams, and floodplains. Through innovation and coordination with MDOT SHA and environmental agencies, Wagman reduced impacts to streams by utilizing open bottom culverts to maintain the natural stream channel, and installed underground SWM basins to reduce thermal impact and bioswales for long-term water quality. RTE species were relocated utilizing innovative techniques such as dogs and electro-shock. Access roads within floodplains were constructed utilizing wood mulch to mitigate wetland impacts. A project-specific commitment tracking sheet was prepared and used during design and construction to maintain compliance. The design team, construction team, and owner were co-located in a central office to expedite solutions, review design innovation, perform over-the-shoulder review, and obtain approvals. Through the ATC process, a three-level interchange was redesigned into a two-level trumpet interchange reducing bid cost, long-term maintenance costs, and improving safety and mobility. Other ATCs such as jointless bridge technology, steel diaphragms and underground SWM basins reduced cost, time, and environmental impacts. A complete TMP was developed that included all phases of construction and improved safety and mobility during and after construction. Multiple structures were designed and constructed, in particular a signature arch bridge crossing Rock Creek, within the sensitive Rock Creek Park. Roadway geometry was adjusted to reduce excavation, environmental impact and project schedule.

AWARDS:

- MdQI Award of Excellence
- Partnering Silver Award
- DBIA National Design-Build Award
- FHWA Exemplary Ecosystem Initiatives Award
- NVTA Alliance Award
- ARTBA Globe Award for Environmental Excellence
- ENR Best Transportation Project Award

INDIVIDUALS ON THIS PROJECT PROPOSED AS KEY STAFF FOR THE MD 32 PROJECT (HO7565370):

Anthony Bednarik, DBIA – Design-Build Project Manager and Carl Benton – Assistant Construction Manager

INTERCOUNTY CONNECTOR (MD 200) CONTRACT B DESIGN-BUILD – Montgomery and Prince George's Counties, Maryland

FIRM: Wagman Heavy Civil, Inc. (Lead Construction Firm)
OWNER CONTACT: MDOT State Highway Administration | Ms. Melinda Peters (retired) | 443.865.9865 | mpeters@rkk.com
CONTRACT/PROJECT NO.: AT3765B60
DELIVERY METHOD: Design-Build | Best Value
CONSTRUCTION COSTS: *Initial Contract Value:* $545.1M | *Final Contract Value*: $560.8M | *Reason for Difference:* Environmental incentive (design and construction; owner-added scope.
SCHEDULE PERFORMANCE: *Initial Completion Date:* 11/2011 | *Final Completion Date*: 11/2011

RELEVANCE TO HO7565370:

Safety and Mobility
- New dualized roadway
- Improved intercounty roadway network
- Improved existing roadway facilities

Project Schedule and Management
- Design-build delivery
- Fast-track schedule
- Completed on-time
- Complete design-construction integration
- TMP minimize impacts to traveling public and communities

Well Managed Project
- Reduced environmental impacts from original EIS
- Utility coordination to reduce impacts and facilitate relocations
- Innovations through partnering
- Comprehensive public outreach program

PROJECT DESCRIPTION:

Contract B was a $560.8M highway Design-Build, Best Value project extending the Intercounty Connector (MD 200) from MD 97 to MD 29. Wagman was an equity member of a fully-integrated construction JV, and was financially responsible for the design and construction of this project. Contract B constructed 7 miles of a new access-controlled facility within a greenfield through similar terrain as the MD 32 project (HO7565370). Contract B included a new 7-lane divided highway; new grade-separated interchanges at MD 650 (New Hampshire Ave.) and MD 182 (Layhill Road); three new overpass bridges; and new roundabout intersections. The work included 2.5 million yards of excavation, drainage, E&SC/SWM, temporary detours for cross roads, utility relocations, 13 bridges, and 300,000 SF of noise walls and retaining walls. The project included design of multiple intersections within the project area that were affected by the changes in traffic patterns. Quality control was the responsibility of the design-builder and Wagman managed the QC program. Contract B was an extremely environmentally- and community-sensitive project and extensive measures were implemented by the design-build team to minimize the environmental impacts of the project. Many Wagman personnel excelled and were placed in positions of authority, such as Structure CM, General Bridge Superintendent, Piling Manager, Beam Erection Manager, field engineers, carpenters, operators, laborers, E&SC workers and MOT personnel. Similar to the MD 32 Phase 2 project (HO7565370), Contract B included an aggressive schedule, environmental challenges, and a need for design excellence. Contract B was primarily a greenfield project that intersected and connected to existing major cross roads. Major earth-moving activities, drainage, rock excavation, intersection signalization, lighting, and signing were part of Contract B. During the design and construction phase, we were responsible for environmental compliance and coordination with the various agencies. Wagman's design coordinators minimized environmental impacts through active coordination with the designers, MDOT SHA, and agencies. Through innovation and coordination, context-sensitive design for elements such as bridges, noise walls, retaining walls, interchanges, and culverts ensured compliance with aesthetic requirements and the project's commitments. Existing streams and stream flow were maintained in compliance with time-of-year restrictions; streams were relocated to avoid impact. To be a good neighbor, we developed a robust public outreach plan to coordinate with third-party stakeholders. This was accomplished through meetings, newsletters, email, social media and traditional media. Wagman successfully implemented a proactive partnering processes to quickly resolve issues and keep the project on track.

SUCCESSFUL METHODS, APPROACHES AND INNOVATIONS:

Safety and Mobility – A comprehensive TMP was developed to construct this greenfield project that bisects many neighborhoods and major arteries. It involved phased construction, mostly off-line, to minimize impact to the travelling public. In areas around neighborhoods or cross roads, temporary detours were constructed to maintain access, increase mobility, and provide safe work space during construction. Final design and construction of the project improved local mobility by reducing traffic on local roads and allowing traffic to flow between I-95 and I-270. Safety is a core value of Wagman and we were able to complete Contract B without major injury or fatality. Having constructors involved in the design development process and working alongside designers allowed the project to be designed and constructed with

safety in mind for construction and final configuration.

Project Schedule and Project Management – The project maintained a fully-integrated CPM schedule that consisted of over 2,500 design, submittal, and construction activities. The project was split into three segments so Contract B delivered multiple project segments concurrently, which were designed and constructed concurrently on a fast-track schedule. Each segment was completed on-time and within budget. The work breakdown structure was detailed in such a manner as to assign and group each activity based on types of work, project location, responsible party, and unique activity codes, to assist with schedule reporting and analysis. Weekly meetings were held with the project leads to properly update/communicate the status of the schedule. These meetings focused on design progress, safety, utility relocations, critical submittal status, QC involvement, upcoming critical items and overall project completion. Three-week look-ahead schedules (which included design elements) were developed and updated each week following the schedule meeting and were distributed to the entire project team. The overall process promoted early identification of potential schedule impacts and resources were frequently reassessed in an effective, timely manner to mitigate any potential schedule issues, resulting in the project being completed on schedule. Contract B was the last section to open the overall Intercounty Connector roadway to the traveling public and it was completed on-time and under budget, while mitigating environmental and utility impacts

Well Managed Project – The Contract B project delivered multiple project segments concurrently on a fast-track schedule. The Contract B project was split into three segments which were designed and constructed concurrently. Each segment was completed on-time and within budget. The Contract B project utilized numerous innovative techniques such as redundant SWM treatment through grass ditches, sand filters, infiltration trenches, and underground SWM basins that treated quantity, quality, and temperature. Contract B featured a single point urban interchange. The construction and design team co-located in a central office with MDOT SHA, thus streamlining the design, review, and approval process. The design-build team employed an MDE Reviewer to review designs prior to submission to MDE, which minimized the review cycle with MDE. Massive underground SWM basins, constructed within limited ROW, were installed to reduce thermal impact to sensitive streams and waterways. Pier locations were modified to minimize major utility impacts, or avoid utilities all together. Several ATCs and other innovations were implemented to reduce cost, improve schedule or improve environmental performance, such as underground SWM facilities to minimize the thermal impact to fresh water streams after a rain event, caissons in lieu of spread footings to minimize permanent impacts to wetlands and flood plains, and alternate pier locations to minimize impacts to wetlands, streams and underground utilities. Our survey team utilized 3D modeling, adjusted the vertical and horizontal alignment, and matched existing elements to eliminate excess excavated material disposal while increasing production. Through a well-conceived and planned sequence of earth moving, we avoided trucking on local roads which eliminated conflicts between vehicles and our work equipment. The design-build team utilized numerous innovative techniques such as redundant SWM treatment through grass ditches, sand filters, infiltration trenches, and underground SWM basins that treated quantity, quality, and controlled outfall temperature. A major portion of Contract B traversed through Maryland-National Capital Park and Planning Commission parks that required redundant E&SC facilities. Multiple E&SC incentives were achieved for excellent project compliance during construction and many environmental incentives were also achieved by minimizing impacts during design and construction. Dedicated environmental compliance crews worked constantly to maintain, and in some instances exceed, compliance. Resources were avoided by design solutions that modified the roadway alignment or constructed elements such as retaining walls. To be a good neighbor, extra precautions and mitigation measures were implemented to address challenges, including additional community meetings, restrictions for construction vehicles on neighboring streets and other measures to reduce noise and impacts to these communities, such as temporary roads and bridges.

AWARDS:

- 2012 DBIA National Design-Build Award Winner
- 2012 Exemplary Ecosystem Initiatives Award
- 2012 America's Transportation Awards Top 10 Finalist
- 2012 Northern Virginia Transportation Alliance Award
- 2012 ARTBA Globe Award for Environmental Excellence
- 2012 ENR Mid-Atlantic Best Project of the Year
- 2013 Award of Excellence Partnering Silver Award from Maryland Quality Initiative

INDIVIDUALS ON THIS PROJECT PROPOSED AS KEY STAFF FOR THE MD 32 PROJECT (HO7565370):

Anthony Bednarik, DBIA – Design-Build Project Manager and Carl Benton – Assistant Construction Manager

MD 32 FROM MD 108 TO LINDEN CHURCH ROAD DESIGN-BUILD – Howard County, Maryland

FIRM: Whitman, Requardt & Associates, LLP (Lead Design Firm)
OWNER CONTACT: MDOT State Highway Administration | Mr. Jason Stolicny | 410.545.0379 | jstolicny@sha.state.md.us
CONTRACT/PROJECT NO.: HO1415170
DELIVERY METHOD: Design-Build | Best Value
CONSTRUCTION COSTS: *Initial Contract Value:* $32.6M | *Final Contract Value*: Ongoing; currently within the initial contract value.
SCHEDULE PERFORMANCE: *Initial Completion Date:* 11/2018 | *Final Completion Date*: 11/2018 (est.); currently on schedule.
PROJECT DESCRIPTION:

WRA was the Lead Design firm responsible for completing the final engineering services, preparing final construction documents, and is currently obtaining the final permits/approvals for the MD 32 from MD 108 to Linden Church Road Design-Build project. This project is the direct southern extension of the proposed MD 32 project (HO756370). The project was procured with an A+B bid including a schedule component. This resulted in an aggressive schedule for which WRA has met or surpassed the design milestones and required approvals to initiate construction. The project consists of the dualization of 3.0 miles of MD 32 from an existing 2-lane roadway to a 4-lane divided roadway with a grass median incorporating SWM facilities, realignment/reconstruction of interchange ramps at Linden Church Road, and connections into the existing dualization at the MD 108 interchange. WRA has performed overall management for the project, including coordinating with our DBE project team, leading partnering meetings, and coordinating with MDOT SHA divisions and other stakeholders.

The project includes four new small structures including two box culverts; a reinforced soil slope to minimize wetland impacts; existing pavement rehabilitation and new pavement construction; new open and closed storm drain systems; SWM quality ESDv and quantity control facilities; complex multi-phase E&SC; utility coordination for the relocation of gas, telephone, and fiber optic being designed and relocated by utility owners; utility coordination for the avoidance of several major gas transmission mains; MOT including temporary cross-overs to facilitate construction of the dualized roadway in two zones; new signing, pavement markings, and interchange and intersection lighting; and ITS devices including new traffic cameras at the MD 108 and Linden Church Road interchanges.

RELEVANCE TO HO7565370:

Safety and Mobility
- Dualization of 2-lane roadway to 4-lane divided
- Interchange reconfiguration
- Increased capacity will reduce traffic on local network
- Compatible with future extension

Project Schedule and Management
- Design-build delivery
- Fast-track schedule
- Project approach facilitated early construction packages
- Comprehensive MOT that maximizes use of dualization
- Design reduced interchange ramp closure duration

Well Managed Project
- Adjacent projects with similar terrain, traffic, utilities, geology, community and stakeholders
- Early, frequent and extensive utility coordination
- Implemented design elements to reduce the LOD, eliminated SWM facilities, reduced wetland and forest impacts
- Public outreach program
- Partnering

The project includes 210,000 CY of excavation, 145,000 CY of embankment, 11,000 LF of storm drains, 14,000 LF of underdrain, 650 LF of reinforced soil slope, 45,000 tons of asphalt, 10,000 LF of traffic barrier W beam, and 11,000 LF of median traffic barrier W beam. Surveys were performed to verify and supplement the information provided by MDOT SHA. WRA coordinated a comprehensive utility test hole and subsurface investigation program. Extensive supplemental subsurface exploration and testing was performed and more than 24 test holes were taken. Geotechnical services included evaluation and design of new and rehabilitated pavement, including Falling Weight Deflectometer testing; evaluation/design of roadway embankments and cuts including areas of potential rock, groundwater control, and a reinforced soil slope. Highway design included mainline widening, interchange ramps, narrowing of the median to minimize wetland impacts, vertical clearance studies at MD 108 and Linden Church Road, superelevation evaluation and correction, and coordination with the small structures and SWM facilities. WRA performed structural design of two box culverts and two other small structures and the associated headwalls, and incidental structures. Traffic engineering included design of signing, markings, interchange and intersection lighting, new traffic cameras at the MD 108 and Linden Church Road interchanges, a TMP, and the development of MOT including multiple stages. Hydrology/hydraulics was performed for the two box culverts including stream assessment. SWM design included a total of twenty (20) bioswales, twenty-eight (28) grass swales, five (5) SWM ponds, and four (4) headwater pools to provide ESDv of 77,898 CF. A multi-phase E&SC plan was developed in conjunction with MOT. WRA acquired MDOT SHA-PRD E&SC and SWM approvals, including MDE

Dam Safety and Small Pond approvals. WRA coordinated and supported MDOT SHA in obtaining a CLOMR, and later will obtain the LOMR from FEMA. The final design resulted in reductions in permitted wetland impacts. WRA coordinated with the team's IDQM for independent design QC reviews and certifications. WRA prepared the necessary permit impact plates and documentations for MDOT SHA-EPD to submit permit modifications for approval. Public outreach for the MD 32 project included preparation of multiple displays for two large-format public meetings and the preparation of responses to public inquiries. Other services that WRA has completed include landscape and reforestation design; a tree survey and Tree Avoidance and Minimization Report and tree preservation plan identifying significant trees, tree protection measures, and ash tree removal; and design QC. As SWM facilities are being completed, WRA will be performing SWM inspections and completing as-built certifications.

SUCCESSFUL METHODS, APPROACHES AND INNOVATIONS:

Safety and Mobility – One of the project goals was to maintain mobility by minimizing delays during construction, specifically any detours. The RFP documents included an incentive to minimize inconveniences to the community and the traveling public with a proposed detour of the on-ramp traffic from Linden Church Road to MD 32 southbound (Ramp A). The detour was needed to facilitate the realignment of Ramp A with the additional traffic being diverted onto already congested county roadways with residential driveway connections. The local citizens expressed their concerns of the additional traffic and their ability to access their properties. WRA evaluated the conceptual ramp alignment and designed an alternate alignment which allows for the existing ramp to remain open during construction of the new ramp realignment. Only a short duration closure (a single Friday to Monday) is required when the existing ramp is closed and traffic is diverted to the new ramp; resulting in minimal inconvenience to the community and traveling public.

The MD 32 southbound off-ramp to Linden Church Road (Ramp B) also required a complete realignment and therefore needed to be detoured during construction. Ramp B traffic volumes are substantially lower than Ramp A and the contract did not include restrictions on the amount of time allowed for a Ramp B detour. However, as part of design development, WRA developed the construction sequence so that the Ramp B detour and realignment would be performed as a sub-stage thereby allowing the ramp to remain open to traffic; minimizing inconvenience to the community and traveling public.

Project Schedule and Project Management – Our proactive approach to design development and knowledge of construction facilitated meeting the aggressive project schedule with a reasonable and feasible plan. To maintain the schedule, the project was divided into two zones allowing for earlier completion of the first zone which includes all four small structures. In this way, two-way traffic can be switched onto the new southbound roadway earlier in order to allow construction of the second half of the small structures while the remaining southbound roadway in the second zone is being constructed. Structural elements such as the box culverts were submitted in advance of obtaining final roadway IFC documents, which allowed for early shop drawings and fabrication of elements so they would be ready for installation when the roadway package was approved for construction. Advanced rough grading packages were prepared to obtain initial excavation and embankment approval for earth moving prior to receiving final roadway approval.

Well Managed Project – Proactive coordination with utility owners was a key component of the project in order to expedite concurrent utility relocations. A utility coordination meeting with utility owners, MDOT SHA including District 7, and the design-build team was held shortly after NTP, in order to coordinate our design with the required utility relocations and to coordinate construction schedules. Subsequent utility meetings were held to further coordinate the proposed utility relocations with the project design and will continue during construction until all relocations are completed.

During the RFP bidding phase, WRA developed and presented to MDOT SHA several innovative ATCs to bring added value to the project. Some examples included maintaining the normal crown along existing MD 32 to reduce the amount of wedge/level and the use of an increased subgrade modulus for pavement design based on a review of the available soil borings to reduce the pavement section.

INDIVIDUALS ON THIS PROJECT PROPOSED AS KEY STAFF FOR THE MD 32 PROJECT (HO7565370):

Walter Miller, PE – Design Manager, Gary Bush, PE – Highway Engineer, and Jason Cosler, PE – Water Resources Engineer

MD 237 FROM MD 235 TO PEGG ROAD DESIGN-BUILD – St. Mary's County, Maryland

FIRM: Whitman, Requardt & Associates, LLP (Lead Design Firm)
OWNER CONTACT: MDOT State Highway Administration | Mr. Jeffrey Folden | 410.545.8814 | jfolden@sha.state.md.us
CONTRACT/PROJECT NO.: SM7575171
DELIVERY METHOD: Design-Build | Low Bid
CONSTRUCTION COSTS: *Initial Contract Value:* $35.9M | *Final Contract Value*: $37.8M | *Reason for Difference:* Owner-added utility relocations and an intersection modification for a future County project.
SCHEDULE PERFORMANCE: *Initial Completion Date:* 11/2010 | *Final Completion Date*: 10/2011 | *Reason for Difference:* Owner-added approved extra work (see above).
PROJECT DESCRIPTION:

WRA was the Lead Design firm responsible for completing the final engineering services, preparing final construction documents, and obtaining permits/approvals for the MD 237 from MD 235 to Pegg Road Design-Build project. The project consisted of the dualization and reconstruction of 2.9 miles of MD 237 from an existing 2-lane roadway to a 4-lane divided roadway with intersections with J-turn movements. Bicycle lanes and pedestrian sidewalks were installed along the entire project. Horizontally, MD 237 alignment was realigned to eliminate substandard horizontal curves and to minimize impacts to environmental resources, including undocumented graves in an adjacent cemetery. The vertical alignment of MD 237 was adjusted to improved sight distance, and a 2,200 LF portion of MD 237 was raised 12 feet to accommodate the replacement of undersized pipe culverts with a larger twin-cell reinforced box culvert supported on a pile foundation. Earthwork for the dualization consisted of 107,000 CY of excavation and 87,000 CY of borrow. The majority of the borrow material was found on-site, requiring a construction sequence of excavation of cuts prior to fill embankments.

RELEVANCE TO HO7565370:

Safety and Mobility
- Dualized existing 2-lane roadway to 4-lane divided
- Access management plan
- J-turns
- Reconfigured high accident intersections
- Improved sight distance
- Auxiliary lanes
- Signalized major intersections
- Context-sensitive design

Project Schedule and Management
- Design-build delivery
- Fast-track schedule
- No extended detours

Well Managed Project
- Reduced permitted wetland and forest impacts
- Eliminated SWM facilities
- Extensive utility coordination to synchronize relocation with roadway construction
- Public outreach program
- Partnering

The project included the resurfacing/reconstruction of 16 intersecting side streets and 65 driveways/entrances. A complete new closed storm drain system with over 13,500 LF of drainage pipe and eight new traditional SWM facilities were constructed. Multi-phase E&SC in coordination with MOT was designed, approved, and implemented. A temporary geo-fabric wall was designed and installed along the fill embankment to maintain MD 237 traffic during the box culvert construction. A temporary drainage system was designed and constructed to maintain positive drainage within the bifurcated construction zone. WRA designed and monitored the installation of steel piles for the box culvert foundation. Three noise walls, totaling 1,700 LF, were designed and constructed adjacent to residential properties. Over 10,000 LF of 12" ductile iron water pipe, 6,000 LF of 6" and 8" gas line, and 350 LF of low pressure sanitary sewer line with grinder pumps were designed and constructed. WRA coordinated with utility companies to relocate aerial electric, telephone, and cable, requiring individual meetings with utility owners to synchronize their relocation with the roadway reconstruction. Advanced relocation of major electric and telephone aerial facilities was required to facilitate pile driving for the new box culvert. Traffic engineering services included five traffic signals, signal interconnect, signing/markings, and intersection lighting. Intersections were designed to be ADA compliant and were field checked for compliancy during construction. The MOT plans were developed to maintain traffic along roadways and access to driveways and entrances at all times, without detours. Temporary cross-overs from newly-constructed pavement to the existing pavement were installed as portions of the project were completed. Landscape architectural services included the design of roadside plantings along MD 237, median plantings in MD 237, plantings for SWM facilities, and for wetland and forest mitigation. Geotechnical services included foundation design for the twin-cell box culvert and noise walls, evaluation/design of roadway embankments and cuts, monitoring of the installation of the piles for the box culvert, and evaluation and design of new and rehabilitated pavement, including Falling Weight Deflectometer testing of the existing pavement.

The project was divided into four construction zones to accelerate critical path elements (e.g., utility relocation, box culvert, noise walls, etc.) and to manage stormwater runoff during construction. SWM facilities were initially constructed

as sediment traps and then converted to final SWM facilities as zones were completed. Each zone was designed and submitted for approval separately so that construction could proceed in approved zones as subsequent zones were being designed and approved.

Coordination with MDOT SHA's Independent Environmental Monitor (IEM) maintained the project within the permit conditions as authorized by MDE, USACE, DNR, and the approved permits/plans/specifications. Emphasis was placed on Jarboesville Run to replace the pipe culverts with a box culvert due to its importance as a natural resource. An automated water quality data logger was installed upstream and downstream to monitor water quality. Temporary stream diversions facilitated construction of the box culvert and a rock ramp for fish passage. A portion of the project improvements were located alongside a historic church and cemetery with unmarked graves. During construction, several graves were discovered and MDOT SHA's archeologist was promptly contacted for proper reinternment. A public outreach program included public meetings and distribution of brochures to inform the public of progress and upcoming work. There were property owner meetings to discuss impacts and respond to questions. The design required coordination with an adjoining St. Mary's County project which required redesign to accommodate a future County project. WRA provided design QC and DBE/non-DBE subconsultant coordination.

SUCCESSFUL METHODS, APPROACHES AND INNOVATIONS:

Safety and Mobility – With the introduction of the raised median, driveway access was provided in one direction only. To allow access in both directions, J-turn movements were introduced at select intersections or provided between intersections to reduce the travel time required to access private properties. Several intersecting side streets were realigned from offset intersections to a four legged intersection, providing safer controlled access. The MD 237 horizontal and vertical alignment was upgraded to meet current design standards, requiring portions of the roadway to be reconstructed in its entirety while maintaining traffic.

Project Schedule and Project Management – The project schedule was critical with an established contract time. To maintain the schedule, the project was divided into four zones that governed design and construction, with zones being ready for construction while subsequent zones were under design/approval. Separate structural submission packages were used to expedite the approval process. The selection of zone limits was based on several factors including maintaining a drainage area within each zone, providing E&SC, and logical traffic control cross-overs. The zone at Jarboesville Run was the most schedule critical with stream closure restrictions with a long construction duration.

Two lanes of traffic were continuously maintained throughout construction without detours in order to minimize disruptions to the community and the traveling public. Adjacent property access was maintained at all times throughout construction. It was necessary to coordinate the re-routing of USPS services when existing mail boxes were inaccessible.

Well Managed Project – A key issue of the project was to reduce impacts to environmental features. Through design and construction collaboration, originally permitted wetlands and Waters of the US were reduced by 13,517 SF. Several SWM facilities shown in the conceptual design were eliminated during final design, saving MDOT SHA initial and future maintenance costs. Environmentally-sensitive Jarboesville Run was monitored during construction, especially during severe weather events, and the design-build team was prepared to respond to emergencies. The design-build team provided continual coordination with MDOT SHA's IEM and responded quickly when issues arose. The project earned impact reduction incentives for the final design reduction of wetlands and forest impacts.

Coordination with utility companies as an early work effort was performed to prioritize utility relocations and coordinate the construction sequencing. Coordination included holding regularly scheduled meetings to discuss design progress and resolve issues. Coordination continued through construction, especially when utility relocations were suspended due to a utility contractor being pulled from the project in order to respond to a major storm outage outside the project.

The design-build team incorporated several cost savings measures that included utilizing a ROW acquisition residential property for the team's field office and a pavement section that incorporated a bank run gravel base for the base course material, not commonly used by MDOT SHA but local to southern Maryland.

INDIVIDUALS ON THIS PROJECT PROPOSED AS KEY STAFF FOR THE MD 32 PROJECT (HO7565370):

Walter Miller, PE – Design Manager, Gary Bush, PE – Highway Engineer, and Jason Cosler, PE – Water Resources Engineer

US 301, SECTION 1 – New Castle County, Delaware

FIRM: Whitman, Requardt & Associates, LLP (Lead Design Firm)
OWNER CONTACT: Delaware Dept. of Transportation | Ms. Diane Gunn | 302.326.4487 | Diane.Gunn@state.de.us
CONTRACT/PROJECT NO.: Agreement No. 1445
DELIVERY METHOD: Design-Bid-Build
CONSTRUCTION COSTS: *Initial Contract Value:* $137.6M | *Final Contract Value*: Ongoing; currently $138.1M | *Reason for Difference:* Various minor change orders to address diesel fuel price adjustments, paying for police for traffic control, unsuitable material removal, and owner-approved changes.
SCHEDULE PERFORMANCE: *Initial Completion Date:* 5/2019 | *Final Completion Date*: 5/2019 (est.) currently on schedule.
PROJECT DESCRIPTION:

WRA performed advanced project development, preliminary and final design and preparation of final contract documents for 5.5 miles of limited-access 4-lane divided highway on a new alignment. Improvements include a complex flyover interchange at SR 1 and US 13, a diamond interchange with roundabout intersections at Jamison Corner Road, and an access control plan including relocating existing roadways. WRA's Section 1 consists of four construction contracts, all of which were designed concurrently and coordinated with adjoining contracts on a fast-track basis to minimize the time between the project funding expenditure and in-service tolling revenue. The four construction contracts are described below.

RELEVANCE TO HO7565370:

Safety and Mobility
- New 4-lane divided roadway
- Operational traffic analysis
- Access control plan
- Improved existing roadway network

Project Schedule and Management
- Fast-track design to minimize time to service
- Comprehensive sequence of earthwork hauling operation
- Installed temporary roadways to minimize detours
- Comprehensive sequence of construction

Well Managed Project
- Advance utility relocation contract
- Avoidance and minimization of impacts
- Stream restoration
- Archeology site avoidance
- Stakeholder coordination

US 301 – Contract 1A, from SR 896 to SR 1 (Construction Cost – $69.8M): Major elements include a diamond interchange with roundabout intersections at Jamison Corner Road and ETL ramp toll plazas. This contract also included substantial utility coordination to create a utility relocation corridor at the Hyetts Corner Road crossing, extensive evaluation of earthwork and provision of borrow sites to meet earthwork needs, avoidance of and stream mitigation for environmentally-sensitive Scott's Run, and coordination with the Airmont community.

US 301 – Contract 1B, US 301 and SR 1 Interchange (Construction Cost – $35.4M): Improvements include a complex flyover interchange at SR 1 and US 13, which was one of the most constrained design elements of the project. This interchange's close proximity to the existing Biddles Corner toll plaza on SR 1, in conjunction with significant traffic volumes from US 13 NB to SR 1 NB, required comprehensive traffic and geometric analyses in order to design an appropriate, lane-balanced configuration for reducing ten lanes to three (the lanes originating from the SR 1 cash and express toll lanes, US 301 NB, and a ramp from US 13) prior to the geometrically-constrained William V. Roth Bridge over the Chesapeake and Delaware Canal. The detailed traffic analysis and geometric analysis ensured that all ramp terminals met AASHTO design guidelines and that they could be signed effectively and safely per the MUTCD.

US 301 – Contract 1C, US 301 and SR 1 Interchange (Construction Cost – $21.3M): Improvements include an environmentally-sensitive crossing of Drawyer's Creek and five (5) borrow sites in archaeologically-sensitive areas to provide borrow for the alignment and approaches to bridges over SR 896 and the Norfolk Southern Railroad.

US 301 – Contract 1D, US 13 and Port Penn Road Intersection (Construction Cost – $11.1M): Significant traffic volumes from US 13 NB to SR 1 NB required design of a signalized intersection at Port Penn Road and the reconfiguration of the site layout for the Biddles Corner toll plaza. The intersection includes a 3,500-foot channelized northbound left-turn lane to address an existing queuing safety issue, and adds a southbound auxiliary through lane. The project includes establishment of a utility relocation corridor.

WRA work efforts included roadway design consisting of the design of 3.79 miles of new US 301 including 1.44 miles of interchange ramps, 0.53 miles of widening of SR 1, 1.21 miles of widening and reconstruction of US 13, and 0.57 miles of access-controlled roadways. Other roadway design efforts included detailed earthwork analysis; multi-phase MOT; intersection and roundabout design; water resources design efforts, including open and closed storm drain systems; floodplain analysis; SWM using a combination of bioswales, wet ponds, infiltration trenches and infiltration basins; and E&SC. Structural engineering elements consisted of eight new roadway bridges, eight major culverts, three MSE retaining

walls (3,000' in total length), seven sign structures and a high mast light structure. Traffic tasks included design of pavement markings and signing, a traffic signal, and interchange lighting. ITS components included dynamic message signs, CCTV cameras, road weather information systems, remote traffic microwave sensors and variable speed signs. A detailed TMP and associated maintenance of traffic design were also prepared. Geotechnical engineering design services included a comprehensive geotechnical subsurface investigation plan for roadway embankment including proposed borrow sites, bridge foundations, retaining walls, SWM sites and practices. Environmental services included avoidance of archeology resource protection areas, Scott's Run stream restoration, and finalizing all required permit applications. Other services included participation in the public outreach program, extensive utility relocation coordination, design QC, and subconsultant coordination. WRA is currently providing construction related services.

SUCCESSFUL METHODS, APPROACHES AND INNOVATIONS:

Safety and Mobility – The US 301 project relocates existing US 301, a 2-lane congested roadway, with a new 4-lane divided highway with a new extension to SR 1. Relocating US 301, and its extension, provides a limited-access roadway from US 301 in Maryland to SR 1, Delaware's north/south main expressway. The new alignment provides a bypass route for through traffic with select interchanges that connect to the existing local roadway network. WRA's project included the US 301 northern extension with a connection to SR 1 and existing US 13. An optimal lane configuration was determined to reduce lanes for SR 1 tolling facilities with US 301 NB and US 13 on ramp which were required to merge prior to the existing SR 1 bridge over the C&D Canal. Along US 13, existing intersections were reconfigured to improve the traffic operations along the corridor including new access to SR 1 northbound and the SR 1Toll Plaza.

Project Schedule and Project Management – Similar to the MD 32 project (HO7565370), US 301 roadway excavation and embankment was a major construction element pertaining to cost, schedule and availability. To facilitate this work effort, WRA conducted a comprehensive earthwork analysis to ensure availability of required borrow types within the project limits through the placement of excavated material and establishment and design of borrow sites which eliminated the need for obtaining off-site borrow. By performing the analysis, we were able to optimize the excavation and embankment placement to reduce the re-handling of earthwork material, which reduced costs and construction duration.

A three-phase comprehensive MOT plan was prepared to minimize disruptions to the community and the traveling public. As part of the plan, a temporary "run around" road was constructed to provide access to the local community as the existing roadway was being reconstructed to a grade-separated interchange. At US 13, 11-foot-wide travel lanes were used during construction so that all through lanes could remain open during the peak hours.

Well Managed Project – WRA implemented measures to reduce the overall roadway typical section, which reduced embankment requirements and right-of-way and environmental impacts. WRA performed comprehensive lane-balance and traffic analyses to determine an optimal lane configuration for reducing ten lanes originating from SR 1 cash and express toll lanes, US 301 NB, and a ramp from US 13 to three lanes prior to the William V. Roth Bridge over the Chesapeake and Delaware Canal; the solution included merging the US 13 ramp into US 301 NB lanes instead of SR 1 NB lanes.

As part of structural design effort, WRA performed a test pile program to optimize the required deep foundations of proposed bridge structures. At select bridges, alternate pile types (concrete and steel) foundations were designed. Along a curved flyover bridge, the right shoulder width was switched to the left to increase sight distance. At select bridge structures, deckovers were designed at both abutments to eliminate the transverse roadway joints. Future MOT (one lane of traffic in each direction) for future deck replacement was considered for a critical county roadway.

INDIVIDUALS ON THIS PROJECT PROPOSED AS KEY STAFF FOR THE MD 32 PROJECT (HO7565370):

Walter Miller, PE – Project Bridge Supervisor/Design QC, Gary Bush, PE – Preliminary Cost Estimating, and Jason Cosler, PE – Water Resources Engineer

MARYLAND DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ADMINISTRATION

STATEMENT OF QUALIFICATIONS

MD 32 SOUTH OF

LINDEN CHURCH ROAD TO I-70

DESIGN-BUILD | CONTRACT NO. H07565370

XVII.A.iii

ORGANIZATIONAL CHART

WAGMAN WRA

General Construction | Heavy Civil | Geotechnical

STATEMENT OF QUALIFICATIONS

MD 32 SOUTH OF LINDEN CHURCH ROAD TO I-70

DESIGN-BUILD | CONTRACT NO. H07565370 | ORGANIZATIONAL CHART

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

Independent Design Quality Management Team

Manager - Steve Hawtof, PE (GF)
Highway – George Welton, PE (GF)
Structures - Anthony Fusco, PE (GF)
Water Resources - Jason Alwine, PE (GF)
Joan Wang, PE (IEI)
Traffic - Timothy Connor, PE, PTOE (GF)
Utilities - Dennis Funk, PE (GF)
Landscape Architecture - Brian Shifflett, RLA (GF)
Environmental - Rob Scrafford, PE (GF)

MDOT SHA Team

Innovative Contracting Division
Highway Design Division
Highway Hydraulics Division
District 7 Construction
District 7 Traffic
District 7 Utilities
District 7 Right-of-Way
District 7 Community Liaison
District 7 Maintenance
Office of Communications
Office of Traffic & Safety
Office of Structures
Office of Environmental Design
Office of Materials and Technology
Plan Review Division (PRD)

Third-Party Stakeholders

FHWA
Howard County
State and Local Political Leaders
Utility Owners
Schools & Childcare Centers
Religious Entities
Homeowners' Associations
Businesses/Residents
Community/Public
Emergency Services
State & Local Police

Executive Committee

Greg Andricos, PE (WHC)
Joseph Makar, PE (WRA)

Design-Build Project Manager

Anthony Bednarik, DBIA (WHC) - 20/20

DBE Compliance/Apprentice-in-Training

Nici Wilson (WHC)

Safety Director

Cory Gaye (WHC)

Design Manager

Walter Miller, PE (WRA) - 24/10

Design/Construction Coordinator

Jerry Whitlock, PE, DBIA (WHC)

Construction Manager

Carl Benton (WHC) - 20/40

Public Relations/Outreach Coordinator

Brian Riffel, PE (WRA)

Design Team

Structures
James Guinther, PE, DBIA (WRA)
Candi Anderson, PE (MCI)

Geotechnical/Pavement
Monica Paylor, PE (WRA)
Jeffrey Basford, PE (WRA)

Landscape Architecture
Diane Szekely, RLA (SI)
Michael Campbell, RLA (WRA)

Roadway Lighting
Jeffrey Cheng, PE (WRA)
Neil Leary (WRA)

Survey
Thomas Yoakum, PLS (MCI)
Gregory King, PLS (WRA)

Subsurface Investigation
Siva Balu, PE (E2CR)
Soil Borings & Pavement Cores

Vladimir Antonov, PLS (AB)
Utility Designating & Test Pitting

Highway
Gary Bush, PE (WRA) - 32/16
Mark Roberts, PE, DBIA (WRA)

Traffic Analysis/Engineering
Jeremy Mocny, PE, PTOE (WRA)
Neil Leary (WRA)
Chris Peduzzi, PE, PTOE (T3)

Utility Design
Dominic Tiburzi, PE (WRA)

Hydrology/Hydraulics/SWM/E&SC
Jason Cosler, PE (WRA) - 32/16
Christopher Cusick, PE (WRA)
Rahul Kesarkar, PE, (SYC)
Mark Schneck, PE (RJM)
Weiwei Jia, PE (RJM)

Environmental Permitting/Design
Warren Gray, PWS, PWD, LPF, NEPA/MEPA
Permitting Coordinator
Michelle Floam, LLA (CRI)
Wetlands & Waters
Laura Callens, PWD, CFM (WRA)
Forest/Trees
Michael McQuade, CA (WRA)
Wetland Mitigation/Stream Restoration
Katie Scott, PE (CRI)
David Smith, PWS (CRI)
Jason Cosler, PE (WRA)

Quality Control Management Team

Design QA/QC Manager
Brian Riffel, PE (WRA)

Construction QA/QC Manager
Bryan Smith, PE (WHC)

Utility Coordination

Utility Coordinator
Jason Hershey, DBIA (WHC)
Design Utility Liaison
Paul Weiner, PE (WRA)

Utility Companies/Public Utilities

BGE Electric
BGE Gas Distibution
Columbia Gas Transmission, LLC
Level 3 Communications
Howard County DPW
MDOT SHA District Utility Engineer
Comcast Cable
Lightower Fiber Networks
Verizon of Maryland
Williams Gas
Howard County DTCS

Private Systems
Septic Systems • Leech Fields • Private Wells • House Connections

Environmental Compliance Manager

James Ashby (WRA)

Permitting/Regulatory Agencies

MD Department of the Environment (MDE)
U.S. Army Corps of Engineers (USACE)
U.S. Fish & Wildlife Service (USFWS)
MD Department of Natural Resources (DNR)
Federal Emergency Management Agency (FEMA)
Maryland State Historic Preservation Office (MD SHPO)
MDOT SHA Plan Review Division (MDOT SHA - PRD)

Construction Team

Roadway Superintendent
Mark Crist (WHC)

General Superintendent
Steve Wood (WHC)

Project Engineer/Controls
Thomas Medeiros (WHC)

Scheduling Manager
Cameron Takemori (WHC)

Survey Manager
Roland McClinton (WHC)

Site Safety Coordinator
Pete Kaplan (WHC)

Structures Superintendent
Andrew Michenzi (WHC)

MOT/Traffic Manager
Brian Sluder, ATSSA (WHC)

Utility Superintendent
Kevin Fessler (WHC)

E&SC/SWM Manager
Eric Mock (WHC)

SWM As-Built Inspection/Certification
Steve Reynolds, PE (RJM)

Environmental Mitigation
Duncan Kerr (CRI)

LEGEND

WHC	Wagman Heavy Civil, Inc.
WRA	Whitman, Requardt & Associates, LLP
GF	Gannett Fleming, Inc.
AB	AB Consultants, Inc. (DBE)
CRI	Coastal Resources, Inc. (DBE)
E2CR	E2CR, Inc. (DBE)
IEI	iDesign Engineering, Inc. (DBE)
MCI	Mercado Consultants, Inc. (DBE)
RJM	RJM Engineering, Inc. (DBE)
SI	Streetscapes, Inc. (DBE)
SYC	SuYash Consulting, LLC (DBE)
T3	T3 Design Corporation (DBE)

Key Staff
xx/xx Approximate Hours Per Week (Design/Construction)
Direct Report
Coordination and Communication

WAGMAN WRA
General Construction | Heavy Civil | Geotechnical

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

STATEMENT OF QUALIFICATIONS

MD 32 SOUTH OF
LINDEN CHURCH ROAD TO I-70

DESIGN-BUILD | CONTRACT NO. H07565370

XVII.B

PROJECT UNDERSTANDING AND DESIGN-BUILD APPROACH

WAGMAN WRA
General Construction | Heavy Civil | Geotechnical

XVII.B.i UNDERSTANDING OF THE PROJECT GOALS AND SCOPE

UNDERSTANDING OF THE PROJECT SCOPE:

The MD 32 South of Linden Church Road to I-70 Design-Build project will provide for the efficient and safe flow of traffic along MD 32 and nearby roadways, and consists of the design and construction of 6.7 miles of MD 32 from a 2-lane undivided to a 4-lane divided highway within Howard County, Maryland. The proposed roadway will typically be a 4-lane divided highway with paved shoulders and a grass median with traffic barrier protection. The signalized intersections at MD 144 and the I-70 ramps will be reconstructed. The existing at-grade intersection at the MDOT SHA Dayton Shop will be reconstructed with a preemption signal; however, alternative designs will be considered at this location. The Parliament Place, Stiles Way, Rosemary Lane, and Fox Chase Road intersections will be reconstructed and will incorporate full acceleration/deceleration/auxiliary lanes, based on intersection spacing. Left turns from intersections will be prohibited and appropriately-spaced J-turns will be implemented. J-turns will include left-turn lanes with full deceleration and storage length, pavement widening to accommodate U-turns for WB-67 vehicles, and full acceleration lanes adjacent to the pavement widening. Existing driveways to tie into MD 32 will be consolidated based on an access management plan with the time to access both directions of MD 32 not exceeding three minutes. All design will be in conformance with the RFP. Emergency vehicle access will be provided to River Valley Chase with a median turnaround at the same location and a second median turnaround located between Linden Church Road and Triadelphia Road. Existing pavement to remain will be rehabilitated. The design will accommodate the future planned corridor improvements as depicted in the 2005 FEIS with interchanges at the Dayton Shop, Rosemary Lane, MD 144, and I-70, as well as associated local access roadways.

Construction Services: The scope of construction services anticipated includes: earthwork; demolition; pavement rehabilitation and new construction; MOT; drainage; SWM; E&SC; maintenance of stream flow; roadside and SWM landscaping; reforestation; signing, pavement marking, signalization, intersection/interchange lighting, and ITS; wetland and stream mitigation; bridges, culverts, walls and incidental structures; utility service connections for MDOT SHA traffic control devices; utility corridors and access roads; relocation of septic systems; identification and protection of all environmental and cultural resources; and overall project site maintenance.

Engineering Services: The scope of engineering services anticipated includes: field surveys; roadway design; structural design; H&H analysis and design; traffic engineering studies and design for the preparation of a TMP, signing, markings, lighting, signalization, and ITS; MOT design; roadside and SWM landscape design; reforestation design; utility coordination; utility test pits; pavement and geotechnical engineering; supplemental subsurface exploration; SWM design, approvals, and as-built certification; E&SC design and approvals; permit acquisition/approvals/modifications; wetland and stream mitigation design and approvals; engineering studies and reports as required; and as-built plans.

Other Services: Others services anticipated include: partnering; design QA/QC; independent design quality management; public outreach/community relations; and mitigation/remediation for additional impacts or non-compliance.

UNDERSTANDING OF THE PROJECT GOALS:

The following outlines Wagman/WRA's understanding of the project goals and specific strategies to achieve them.

Project Goal #1 – Safety and Mobility: Wagman/WRA understands MDOT SHA's goal of improved safety and mobility along MD 32 by providing a project that maximizes the project elements to improve corridor traffic operations and safety while being compatible with the future planned corridor improvements. We also understand MDOT SHA's desire to provide efficient and safe flow of traffic along MD 32 and nearby roadways. Strategies to achieve this goal include:

- Design project elements to meet or exceed roadway and traffic design and safety guidelines and all other RFP requirements. Ensure roadway geometrics accommodate all required design vehicles.
- Perform operational assessments for the corridor, individual intersections (signalized and un-signalized), ramp junctions, weave sections, etc.
- Evaluate alternatives for consolidating MD 32 access points while still providing full access to all properties and ensure travel time for vehicles leaving private properties is less than three minutes to access both directions of MD 32.
- Evaluate intersection, access, and MOT alternatives that provide a high level of safety and mobility during and after construction. Ensure compatibility with future corridor improvements as depicted in the 2005 FEIS.
- Investigate intersection alternatives and/or inclusion of movements that are compatible with the ultimate interchanges at the Dayton Shop, Rosemary Lane, MD 144, and/or I-70, such as the roundabout on MD 144.
- Evaluate alternatives for J-turn locations for the project that include left-turn lanes with full deceleration and storage length, pavement widening to accommodate U-turns for WB-67 vehicles, and full acceleration lanes.
- Evaluate upgrading utility access paths to local roadways to consolidate access and improve safety and mobility.
- Minimize the installation of roadside barrier in favor of a graded clear zone typical section.

- Evaluate wildlife fencing, wildlife passages, and other mitigation measures to reduce the potential for deer strikes.
- Minimize MOT flagging and strategically locate construction entrances to allow for safe truck ingress/egress.
- Maintain at least one 10' shoulder along MD 32 with a minimum 2' offset to a temporary barrier during construction.
- Determine the length of left/right-turn lanes and sight distances for intersections and J-turns in each MOT stage.

Project Goal #2 – Project Schedule and Project Management: The Wagman/WRA team understands MDOT SHA's goal of minimizing inconvenience to the community and traveling public and completing the project in a timely and efficient manner. Wagman and WRA have a strong history for fast-tracking important MDOT SHA projects, including MD 404 Design-Build project (Wagman) and MD 32 Phase 1 Design-Build project (WRA). Strategies to achieve this goal include:

- Hold design coordination meetings with the technical stakeholders, such as MDOT SHA, MDOT SHA-PRD, MDE, permitting/regulatory agencies, and utilities to coordinate design packages and expedite reviews/approvals.
- Prepare concept SWM as early as possible. Prepare rough grading packages based on earthwork balance and drainage break points. Prepare elements with longer approval times, such as structures and stream relocations (Middle Patuxent River and Terrapin Branch). Design submissions concurrently to meet the project schedule.
- Coordinate submissions and shop drawings and obtain necessary approvals for items early in the CPM.
- Implement overlapping construction activities by providing resources to work multiple areas simultaneously.
- Propose ATCs and select design, materials and construction methods that promote efficiency.
- Create realistic and expeditious submittal and review/approval processes that are in sync with the overall schedule, the ROW clearance process, environmental time-of-year restrictions, and other project goals.
- Implement partnering between design and construction staff to optimize design and construction means and methods.
- Minimize changes that impact LOD or environmental commitments in permits and the NEPA document.
- Identify and protect all environmental and cultural resources.
- Hold regular construction progress meetings with MDOT SHA, MDOT SHA-PRD, the Independent Environmental Monitor (IEM), and permitting agencies to reduce field issues and expedite Greenline Revision or toolkit approvals.
- Develop innovative design and construction alternatives, including accelerated bridge construction methods, and evaluate traffic management strategies for the Triadelphia Road Bridge replacement to minimize the detour duration or eliminate the detour entirely.
- Develop and implement a TMP to minimize delay to the travelling public while maintaining a safe work zone. The TMP will include a traffic control plan and transportation operations and public information/outreach strategies.
- Support MDOT SHA with employing media, internet, CHART signage, variable message signage, and hotlines as needed to inform stakeholders and the traveling public of upcoming construction and traffic changes. Coordinate with Howard County DPW, Howard County Public Schools, the local community, and other third parties on pending detours.
- Incorporate maintenance of pedestrian and bicycle traffic and maintain access to adjacent properties.
- Field observations and review of signal timing, MOT, etc. by design staff with MOT/Traffic Manager.
- Maintain access to driveways and local roadways. Develop MOT plans that include the final driveway and local roadway access in early stages. Provide written and direct notice to residents and communities in advance.

Project Goal #3 – Well Managed Project: The Wagman/WRA team understands MDOT SHA's goal to minimize overall impacts and to provide proactive coordination. Strategies to achieve this goal include:

- During design, incorporate design refinements and stewardship measures, such as retaining walls and engineered fill slopes, to minimize and/or avoid impacts to wetlands, waterways, forests, utilities, and ROW/private property.
- Refine the roadway profile and consider bifurcation to minimize cuts and fills to reduce impacts.
- Analyze proposed ditches at environmental features and consider minimizing or replacing with a closed storm drain.
- Continuously monitor/track utility and environmental impacts during design and construction.
- Review the need for and size of all SWM BMPs and consider eliminating or optimizing BMP size.
- Review the use of BMP sub-drain to ensure that secondary impacts to wetland hydrology do not occur. Minimize Pond Code 378 embankments that may require clearing of embankments to toe-of-slope.
- Review the project versus the latest applicable guidelines and use practical design to minimize the typical section and thereby the project impacts while still meeting roadway geometric criteria.
- Use lower impact E&S controls such as diversion fence near environmental features.
- Minimize culvert lengths and size/depress per COMAR for aquatic passage.
- Avoid, minimize, and resolve utility conflicts through robust communication/coordination, design changes, and alternative construction means and methods.

- Facilitate utility coordination meetings between utility owners, MDOT SHA, and Wagman/WRA to coordinate with utilities beginning early in design and continuing during construction.
- Expedite construction of utility access roads to facilitate early utility relocations.
- Review and directly identify conflicts between proposed utility designs and the project design and update the design to minimize or avoid impacts. During construction, identify and resolve issues with on-site field meetings.
- Prioritize clearing, utility access, and other construction activities that facilitate third-party utility relocations.

XVII.B.ii UNDERSTANDING OF THE MOST RELEVANT AND CRITICAL RISKS

Wagman/WRA conducted a one-day risk analysis meeting to review, discuss, and assess the project, including existing conditions, conceptual designs based on available project exhibits, and project goals and requirements as outlined in the RFQ and Draft RFP. We have identified the following most relevant and critical risks to the success of the MD 32 project:

RISK #1: OBTAINING PERMITS/APPROVALS NECESSARY TO PERFORM CONSTRUCTION:

Why it is a Critical Risk: Timely permit acquisition is critical to satisfying the overall project construction schedule and is typically a long-lead item. Wagman/WRA recognizes that allowing adequate time to complete designs, prepare permit applications, coordinate with agencies, and address environmental commitments (including mitigation design, mitigation monitoring performance standard development), address required wetland/stream mitigation corrective action if required, and adhere to time-of-year restrictions for FIDS habitat clearing (April through August) and Use IV-P waterways (March 1 through May 31) is critical to meeting the project schedule and permit conditions.

Potential Impact on Achieving the Project Goals: Delays in obtaining permits/approvals will directly impact our ability meet the proposed project completion date. In addition, a failure to secure permits/approvals in a timely manner may be indicative of a failure to effectively coordinate with MDOT SHA and agency stakeholders, meet RFP and permit/regulatory requirements, and/or produce quality documents; thus, failing to properly and effectively manage the project.

Mitigation Strategies to Address the Risk: Wagman/WRA understands that final permit acquisition and compliance with existing permits and mitigation plans will be required, including: 1) compliance with the provisional USACE permit provided by MDOT SHA and final USACE permit obtained by Wagman/WRA; 2) MDE Section 401 Water Quality Certification; 3) MDE Nontidal Wetlands & Waterways Permit; 4) modified MD Reforestation Law approval from DNR; 5) MDE Surface Water Appropriation Permit; 6) MDE General Permit for Stormwater Associated with Construction Activity (NPDES); 7) MDOT SHA-PRD E&SC and SWM approvals, including approval from MDE Dam Safety and Plan Review Divisions; 8) Letter of Map Revision (LOMR) from FEMA for the Clydes Branch and Middle Patuxent crossings; 9) Phase II mitigation plan approval for the proposed wetland mitigation site and Rosemary Lane Tributary Fish Blockage Removal and Stream Restoration; and 10) NEPA environmental summaries/re-evaluations including cultural resource consultation for coordination by MDOT SHA and approval by FHWA.

Wagman/WRA has extensive experience in preparing designs and completing permit packages for authorization of MDOT SHA projects. We also have comprehensive knowledge of all federal and state policies, procedures, criteria, and regulations to efficiently and accurately complete design, permit applications, and Phase I/II mitigation packages for MDOT SHA and agency approval. Wagman/WRA will employ the following strategies to mitigate this risk:

- Comprehensively review the RFP and all project documents to determine information gaps and to fully understand the project requirements, environmental commitments, and permits/approvals required for design and construction.
- Attend a pre-permitting meeting with MDOT SHA, MDOT SHA-PRD, IEM, Stream Restoration Design/Permitting Specialist (SS), and agency staff to gain a more complete understanding of permit conditions/requirements, NEPA commitments, permitting timelines, submittal requirements, toolkit modification procedures, etc.
- Build a collaborative partnership with MDOT SHA, MDOT SHA-PRD, IEM, SS, permitting/regulatory agencies, and other project stakeholders by providing clear, consistent, and regular communication through partnering.
- Create and routinely monitor/update a permit/regulatory approval tracking log. The log will summarize required permits/approvals, entities involved, permit conditions/requirements for each affected resource, key milestone submittal and approval dates, and other compliance activities.
- Incorporate all design and agency approval items into a fully-integrated project CPM schedule to ascertain critical path or near critical path activities so we can take appropriate action as needed. All environmental constraints, such as Use IV-P stream and the FIDS habitat clearing restrictions, will be part of the schedule via calendars.
- Schedule sufficient time for incorporation of avoidance/minimization measures in the design, preparation of the Conceptual Avoidance and Minimization Plan, review and assessment of existing Phase I Mitigation Plan/Addendum and available data for wetland mitigation and stream restoration sites (groundwater, geotechnical, Waters of the U.S. (WUS), geomorphological studies, utilities, and large tree data), wetland and stream mitigation planning and design,

preparation of permit applications, and completion of the regulatory agency review process and receipt of final authorizations. The wetland and stream mitigation design should be advanced concurrently with the roadway design. The JPA must include the project impacts as well as the Phase II wetland and stream mitigation plans before MDE and USACE will provide project authorization.

- Develop design/construction phasing package that includes a concept SWM package for the entire project and rough grading packages that include E&SC and storm drains for sections of the project. The concept SWM package will be submitted as early as possible and will only include SWM facilities that are compatible with the Use IV-P waterways.
- Hold weekly internal design coordination meetings with design and construction staff to review designs and facilitate design and construction collaboration, to provide over-the-shoulder constructability reviews to incorporate constructability and means and methods into the design, to ensure compliance with permit conditions/requirements throughout design, and to resolve issues quickly.
- Focus on, and independently track, critical path design and permit/approval activities (e.g., Middle Patuxent River and Terrapin Branch areas) and provide timely submittals to the IDQM, MDOT SHA, and permitting agencies. Special attention will be paid to culvert crossings, bridge structures, high groundwater, poor soil conditions, challenging SWM and E&SC constraints, and special permit conditions. Any ambiguities in the interpretation of the RFP or permit conditions will be immediately brought to MDOT SHA's attention for resolution.
- Concurrently complete the design and approval process for Phase II wetland and stream mitigation plans and performance standards and monitoring protocols in conjunction with the overall project permitting.
- Field verify boundaries of jurisdictional resources (wetlands, streams, forest, specimen trees) are complete and accurate immediately after NTP. The Preconstruction Wetland and Stream Condition Report will be concurrently prepared and will reference sections of the existing Wetland Delineation Report to expedite completion.
- For the two crossings for which MDOT SHA will provide a CLOMR, strongly consider maintaining the structure and concept design to mitigate schedule risk from needing to obtain MDE and FEMA (and Howard County) approval.
- Assess the need for and size of all previously considered SWM BMPs and optimize the size of all practices.
- Consider incorporating engineered embankment or retaining walls to minimize impacts.
- Perform a comprehensive soil boring program, including groundwater readings and infiltration tests (where required) for SWM. Review borings to identify the presence of rock or unsuitable materials that may impact construction.
- Ensure compliance with Year-1 post-construction wetland mitigation monitoring performance standards following planting and promptly initiate remediation if required.
- Conduct regular E&SC field meetings during construction with MDOT SHA, IEM, and agencies staff to expedite OED toolkit modification approvals, and to provide a look-ahead during construction such that modifications are submitted early to minimize delay.
- Adhere to best management practices focused on time-of-year restrictions for Use IV-P streams and FIDS habitats.
- Provide a full-time E&SC Manager who has access to all necessary resources to maintain project compliance.
- Only use construction supervisors carrying an MDOT SHA Yellow Card.
- Construction supervisors will conduct daily inspections of all E&SC and direct immediate repair as needed.
- By authority of Wagman's CEO, all construction personnel have stop work authorization if they observe a non-compliant environmental or unsafe condition.

MDOT SHA and Other Agencies' Roles: We anticipate the following: MDOT SHA will assist with facilitating coordination and review meetings with MDOT SHA, MDOT SHA-PRD, IEM, and permitting/regulatory agencies; a collaborative partnership with all stakeholders; and timely feedback, reviews, and approvals by all stakeholders.

RISK #2: SAFETY AND MOBILITY DURING CONSTRUCTION:

Why it is a Critical Risk: Safety of the traveling public and project personnel during construction is of critical importance to both Wagman/WRA and MDOT SHA. In addition, the efficient access of the local community to/from, and movement of the traveling public along, a transportation facility during construction is an expectation of the local community and road users. However, both safety and mobility can be challenged during construction as traffic is shifted, lanes and shoulders are temporarily closed, and work zones are routinely changed to complete the proposed work. On the MD 32 project, these challenges are heightened as existing travel speeds are relatively high considering MD 32 has numerous connecting roadways and driveways requiring turning onto and off of MD 32. Furthermore, MD 32 carries heavy truck traffic, including permitted wide loads, also traveling at high speed.

Potential Impact on Achieving the Project Goals: Failure to provide a safe and operationally-acceptable project during construction would not meet the project goals of maximizing traffic operations and safety, and minimizing impacts to the community and the traveling public. Additionally, the project's cost, schedule, and public perception would be adversely impacted. Also, failure would indicate Wagman/WRA's inability to successful design and construct the project.

Mitigation Strategies to Address the Risk: Wagman/WRA has extensive experience designing and constructing projects for MDOT SHA that minimize risk to safety and mobility, such as the MD 404 Design-Build (Wagman) and MD 32 Phase 1 Design-Build (WRA) projects. Wagman/WRA will employ the following strategies to mitigate this risk:

- Develop and implement a TMP with transportation operations and public information/outreach strategies, including speed enforcement strategies, to help minimize delay to the local community and travelling public while maintaining a safe work zone. In addition, the TMP will include well-conceived, detailed temporary traffic control plans, and will help determine the best strategies to reduce delays and queues and maintain local access. Work zone impacts for traffic control and construction staging options will be evaluated for each MOT stage, including length of left/right-turn lanes and sight distances for intersections and J-turns. The TMP also will include contingency plans, with specific actions, that will be taken to minimize traffic impacts should unexpected events occur in the work zone, and an incident management plan to help reduce the duration and impacts of incidents and improve safety during the event.
- Construct the new dualized roadway while maintaining the adjacent existing 2-lane, two-way roadway to maximize throughput along MD 32 during construction. To the maximum extent possible, temporary barrier will be placed along the outside of the roadway shoulder, instead of adjacent to the travel lanes, with at least one 10-foot shoulder on one side of MD 32 with 2-foot offsets to barriers in other locations as needed. This will provide motorists with an area of refuge and will minimize the chances of traffic shying away from the temporary barrier toward opposing traffic.
- Provide pull-off locations for emergencies such as breakdowns or accidents.
- Evaluate construction sequencing options to modify access points early to alleviate existing safety and operational issues as soon as possible.
- Employ media, internet, static signage, variable message signage, hotlines, mailings, and outreach meetings in support of MDOT SHA to inform stakeholders and the traveling public of upcoming construction activities and traffic pattern changes. Ongoing, direct public outreach will improve public awareness of the project for road users and stakeholders.
- Coordinate with Howard County DPW, Howard County Public Schools, the local community, emergency responders, etc., especially during the development of MOT and any detours needed for the Triadelphia Road Bridge replacement.
- Provide flagging operations only during off-peak hours. Minimize and strategically place construction entrances to allow trucks to safely enter and exit the roadway with the least impact to the travelling public.
- Establish material laydown and equipment storage areas in protected areas.
- Incorporate maintenance of pedestrian and bicycle traffic as required in the corridor.
- Provide access at all times to properties for owners, customers, visitors, and emergency vehicles. Coordinate the MOT for this project with other adjacent projects to avoid additional unnecessary delays to the traveling public.
- Minimize the detour duration, or eliminate the detour entirely, for the Triadelphia Road Bridge replacement. If a detour is required, perform as much work as possible while the full roadway is open. Evaluate operational improvements along the detour route to improve safety and mobility along the detour route.
- Coordinate design submissions and shop drawing preparation for the Triadelphia Road Bridge to obtain the necessary approvals to initiate work within the RFP mandated time restrictions.
- Employ ATTSSA-certified traffic control manager and crews.
- Field observations and review of signal timing, MOT, etc. by design staff with MOT/Traffic Manager.
- Provision for 24-hour road towing for incidents to clear the roadway quickly.

MDOT SHA and Other Agencies' Roles: We anticipate the following: MDOT SHA will facilitate coordination meetings and direct public outreach with significant support by Wagman/WRA; a collaborative partnership with MDOT SHA, Howard County, and the local community; and timely feedback, reviews, and approvals by all stakeholders.

RISK #3: SAFETY AND MOBILITY FOR COMPLETED PROJECT:

Why it is a Critical Risk: The need for improvements to the MD 32 corridor has been identified since 1989 by the State and Howard County. The purpose for the improvements is to improve safety and capacity throughout this unsafe, highly congested corridor. Improved mobility and a high level of road user safety is an expectation for the completed project. However, improvements to safety and mobility must be balanced with the project's impact, budget, and schedule.

Potential Impact on Achieving the Project Goals: Failure to design and construct a completed project that improves safety and mobility throughout the corridor would fail to meet the project's purpose and need, and the expectations of Wagman/WRA, MDOT SHA, Howard County, the local community, and the traveling public. However, safety and mobility improvements will need to be completed within the contract budget while minimizing impacts to the environment, utilities, and adjacent properties (other MDOT SHA project goals). In addition, design alternatives will need to be evaluated, designed, and approved in a timely manner so construction can be completed on schedule.

Mitigation Strategies to Address the Risk: Through scope validation, operational analyses, and sound engineering principles and practical design, Wagman/WRA will ensure compliance with the RFP and accepted practices. Wagman/WRA will maximize safety and mobility while minimizing impacts (e.g., ROW, environmental resources, etc.), all within the project's budget and schedule. Wagman/WRA will employ the following strategies to mitigate this risk:

- Develop and present design alternatives, access control plans, intersection layouts, etc. during one-on-one meetings and through ATCs (pre-bid phase) and during final design development to effectively evaluate, refine, and obtain acceptance of project improvements to avoid issues and delays in obtaining acceptance/approvals from MDOT SHA and other stakeholders as needed such as Howard County and permitting/regulatory agencies.
- Hold weekly task force meetings to bring together design and construction ideas and develop design strategies to optimize safety and mobility.
- Conduct over-the-shoulder meetings with MDOT SHA, IDQM, and other stakeholders to review safety and mobility strategies and alternatives.
- Design project elements to meet or exceed MDOT SHA, AASHTO, MDMUTCD, Authority Having Jurisdiction (AHJ), and other roadway and traffic design and safety guidelines as specified in the RFP and in accordance with sound engineering principles and practical design. Ensure roadway geometrics accommodate all required design vehicles. Ensure left/right-turn lane lengths, weave movements, and sight distances are acceptable. Ensure compatibility with future planned corridor improvements as depicted in the 2005 FEIS.
- Perform operational assessment of corridor improvements, local roadways, individual intersections (signalized and un-signalized), weave movements, auxiliary (acceleration and deceleration) lanes, ramp junctions, etc. using 2040 design year build volumes and analysis techniques outlined in the RFP.
- Perform traffic analyses to evaluate consolidating MD 32 access points and verify travel time required to access MD 32 in both directions from private properties is less than three minutes.
- Perform turning movement analyses to ensure WB-67 vehicles can be accommodated at J-turns, I-70 ramps, and the Dayton Shop; WB-62 and WB-50 vehicles can be accommodated on state and/or local roadways; and vehicles with 45' turning radii can be accommodated at emergency cross-overs.
- Prepare a 3D model and compute line of sight distance for turning traffic at left turns, J-turns, and Maryland Ts, etc.
- Minimize the installation of traffic barrier by providing clear zone grading or removing obstacles.
- Provide provisions of extending drainage structures in the future to accommodate future improvements.
- Develop protected access to SWM facilities, and install low maintenance landscaping in the median and along roadway slopes and make sure landscaping does not interfere with sight distance or signage.
- Evaluate wildlife fencing, wildlife passages, and other mitigation measures to reduce the potential for deer strikes.

MDOT SHA and Other Agencies' Roles: We anticipate the following: MDOT SHA will assist with facilitating coordination and review meetings with MDOT SHA, Howard County, permitting/regulatory agencies, utilities, and the local community; a collaborative partnership with all stakeholders; and timely feedback, reviews, and approvals by all stakeholders.

RISK #4: TRIADEPLHIA ROAD BRIDGE REPLACEMENT:

Why it is a Critical Risk: Triadelphia Road is a Howard County 2-lane, two-way connector roadway, primarily serving residential communities and two adjacent public schools. The MD 32 improvements will require the existing bridge to be replaced. Any required detour is restricted to the period between Summer 2019 and Summer 2020. To accommodate the bridge replacement, ROW is being acquired and existing utilities (electrical, communications, cable TV, and fiber) are being relocated prior to reconstruction of the bridge. If the bridge is not ready to accept two lanes of traffic within the stipulated detour period, additional traffic impacts throughout the area will be unacceptable and commitments made to the local community and public schools by MDOT SHA and Howard County will not be fulfilled.

Potential Impact on Achieving the Project Goals: An extended detour duration would not achieve the project goal of minimizing disruptions to the community and the traveling public. In addition, the detoured traffic will place additional traffic on the local network which can cause safety and mobility issues.

Mitigation Strategies to Address the Risk: Wagman/WRA will employ the following strategies to mitigate this risk:

- Develop an integrated project schedule that incorporates all essential design elements and submissions necessary to obtain approvals to initiate work within the time restrictions.
- Complete shop drawings and procure materials early for lengthy procurement items, such as structural steel fabrication and bearings.
- Begin intensive coordination with the utility owners in conflict with the bridge replacement immediately after Notice of Award and continue the coordination until all utilities are relocated.
- Work with utility owners' representatives, utility owners' designers, and MDOT SHA District 7 Utility Engineer to understand impacts and potential mitigation measures, and make sure proposed relocations are not in conflict with the proposed work. With the close proximity of the existing and proposed utilities, consideration will be given to means and methods of the bridge demolition and construction for conformance to the High Voltage Act.
- Develop work plans that identify material needs and equipment placement within the restricted work area to mitigate delays in procuring materials and constructing the bridge.
- Perform early and continuous coordination with Howard County DPW, Howard County Public Schools, emergency responders, the surrounding community, and other stakeholders effected by the detour. Evaluate traffic management and public information/outreach strategies to implement early to minimize impacts and maximize awareness.
- Develop innovative design and construction alternatives**, including accelerated bridge construction methods, to minimize detour duration or eliminate it entirely. Methods previously used by Wagman/WRA on other projects include:
  - Build new structure off-line and roll/slide/remove existing bridge then roll/slide/lift new bridge into place
  - Use Lightweight Inverted Tee Beam superstructure (integrated beam/deck system)
  - Maximize the use of precast, prestressed concrete substructure and superstructure elements
  - Use Ultra High Performance Concrete and Latex Modified Concrete overlay for bridge deck

  ** All alternatives require a traffic analysis at Rosemary Lane to provide adequate MD 32 SB left-turn lane storage and intersection modifications to eliminate left turns out on to MD 32.

MDOT SHA and Other Agencies' Roles: We anticipate the following: MDOT SHA will assist with facilitating coordination and review meetings with MDOT SHA, Howard County, utilities, and the local community; a collaborative partnership with all stakeholders; timely feedback, reviews, and approvals by all stakeholders; timely procurement of ROW; and due consideration of accelerated bridge construction methods.

XVII.B.iii APPROACH TO DESIGN-BUILD

The Wagman/WRA team was specifically assembled with the primary intention of developing a team of well-respected firms that have prepared and delivered successful design-build and design-bid-build projects to MDOT SHA similar to the MD 32 South of Linden Church Road to I-70 Design-Build project. Wagman and WRA present MDOT SHA with a professional, collaborative, and integrated project team with a strong history of delivering fast-tracked, important infrastructure projects for MDOT SHA, including the recent MD 404 Design-Build project (Wagman) and the ongoing adjacent MD 32 Phase 1 Design-Build project (WRA). Our firms are currently teamed together on the VDOT Route 7 Widening and Bridge Rehabilitation Design-Build project and have worked together on design-bid-build projects during construction and/or through partnering in construction on numerous MDOT SHA projects, including three construction contracts on the I-95/I-495/I-295 Interchange (Woodrow Wilson Bridge) project and the ongoing Watkins Mill Road Interchange project. Through these work experiences, we have developed a successful approach to design-build project delivery, secured strong working relationships, established procedures that ensure the integration of design and construction staff throughout the project timeline, and proven our strong partnerships with MDOT SHA, permitting/regulatory agencies, and project stakeholders necessary for successful project delivery. Our approach to design-build project delivery includes:

- Forming a design-build team based on the project goals and scope with the selection of team partners with whom we have successfully work withed on projects of similar size, scope and complexity.
- Selecting the most qualified key personnel capable of assessing and managing the project risks and delivering a successful project to MDOT SHA and the public at large.
- Preparing a comprehensive schedule identifying critical path items and construction restrictions such as design approvals and permits, utility relocations, ROW clearance, time-of-year restrictions, MOT restrictions (temporary lane closures, Triadelphia Road detour, etc.), shop drawing preparation/approvals, long lead-time procurement items, etc.
- Developing innovative designs and employing innovative construction techniques to minimize project impacts (e.g., environmental resources, utilities, ROW, etc.), minimize inconvenience to the community and traveling public, and expedite the project's construction.

- Providing proactive ongoing coordination between team members and with MDOT SHA, permitting/regulatory agencies, utility owners, and project stakeholders to minimize risks/impacts and maintain the project schedule.
- Engaging construction staff during the design phase to integrate construction means and methods with design and engaging design staff during construction to be aware of field conditions and review/address field changes.
- Partnering with MDOT SHA, permitting/regulatory agencies, and project stakeholders to understand expectations and concerns, promptly resolve issues, and achieve project goals.

DESIGN AND CONSTRUCTION DEVELOPMENT:

Wagman/WRA will implement a comprehensive design and construction development approach to efficiently design, obtain approvals and permits, order and procure materials, mobilize work forces, and construct the project in conformance with the RFP, and to deliver a completed project that exceeds MDOT SHA's expectations, well in advance of the established contractual milestone and completion dates as committed by the Wagman/WRA team at time of bid. Our scheduling and construction phasing will be driven by the following project requirements/restrictions:

- Restrictions associated with work within and adjacent to the delineated WUS, including wetlands and buffers, until securing final MDE and USACE authorization for temporary and permanent impacts including approval of proposed wetland and stream mitigation and an Addendum to MDOT SHA's approved MD 32 Corridor Phase II Mitigation Plan.
- Restrictions associated with work within and adjacent to Use IV-P waterways from March 1 through May 31, and securing MDOT SHA and MDE approval for any changes to structure hydraulics that may be proposed by Wagman/WRA for Structures S-1, S-3, S-5, S-6 and S-7 (MDOT SHA and MDE hydrology must be used).
- Design and approval of the Rosemary Lane Tributary Stream Restoration Phase II Mitigation Plan.
- Design and approval of the Phase II Wetland Mitigation Site Plans.
- Approval of the FEMA Conditional Letter of Map Revisions (CLOMR) being secured by MDOT SHA for the Clydes Branch (S-3) and Middle Patuxent (S-6) crossings, including revisions that may be proposed by Wagman/WRA.
- Restrictions associated with FIDS habitat clearing at delineated forested areas between April and August, and until securing DNR final authorization for impacts and approval of our Tree Impact Minimization and Avoidance Plan.
- Coordination with and relocations of existing aerial and underground utilities by others at the Triadelphia Road Bridge over MD 32 to accommodate its replacement and along MD 32 and Access Road 4 to accommodate overall roadway construction. BGE electric, BGE gas, Verizon, Comcast, and Howard County fiber relocations are anticipated.
- Triadelphia Road eastbound traffic detour restriction between Summer 2019 and Summer 2020.
- Minimization of impacts to, and protection of, environmental resources (forest, specimen trees, and wetlands/WUS).
- ROW clearance, including demolition of existing structures on six properties and possible septic relocation(s).
- Design and securing MDOT SHA-PRD, MDE Dam Safety, and MDE Plan Review approvals for SWM facilities meeting regulations for SWM facilities located in the Middle Patuxent River Watershed (Use IV-P).
- Unsuitable/wet materials effecting design and construction of embankments, subgrade, and structure foundations.
- Maintenance of existing and/or newly-established temporary and permanent roads and roadside drainage facilities to ensure adjoining property and local roadway access to MD 32 and positive drainage for the duration of the project.

Construction Approach: Wagman/WRA's approach to construction will be focused on our ability to expeditiously obtain the necessary design approvals and permits in a sequenced and coordinated manner to allow for the construction of bridge and drainage structures outside of designated stream restriction periods, balance of earthwork, maintenance of access and the minimization of impacts to the community and traveling public throughout construction, and maintenance of drainage patterns and protection of the environment at all times. The following construction zones are anticipated:

- Zone 1 – Station 217+50 to Station 345+00 from the Southern Terminus to North of Triadelphia Road
- Zone 1A – Station 335+00 - Triadelphia Road Bridge over MD 32
- Zone 2 – Station 345+00 to Station 395+00 – Burntwoods Road Interchange Widening
- Zone 3 – Station 395+ 00 to Station 460+00 – North of Burntwoods Road to Rosemary Lane
- Zone 4 – Station 460+00 to Station 520+00 – Rosemary Lane to MD 144
- Zone 5 – Station 520+00 to Station 560+00 – MD 144 to I-70

Zone 1 construction will consist of the dualization of MD 32 from the south (current ongoing MD 32 project) to the existing Burntwoods Road interchange. The main construction activities in Zone 1 will consist of replacing several large existing drainage structures (Clydes Branch, 54" CMP, and 84" CMP), several new drainage structures, and roadway construction. Located in Zone 1 is MDOT SHA's Dayton Maintenance Facility, requiring full access to the facility at all times. Also, Triadelphia Road Bridge is located within this zone and is being replaced in its entirety. We envision this work being done

independently of Zone 1 as it will need to be substantially finished in advance of completing Zone 1.

Zone 1A construction will consist of the replacement of the Triadelphia Road Bridge. The replacement will mostly likely consist of staged construction while maintaining one westbound lane of traffic and detouring eastbound traffic. Once eastbound traffic is detoured, the existing bridge will be partially demolished and a portion of the new bridge constructed. Then, westbound traffic will be switched to the new bridge so the rest of the existing bridge can be demolished and the new bridge completed. During the bidding phase, Wagman/WRA will explore design and construction alternatives, accelerated bridge construction methods, and traffic management strategies to minimize the detour duration or eliminate it entirely. If a detour is required, scheduling and execution of this work will be critical in order to meet the RFP time restrictions for the eastbound detour. In addition, modifications to the existing intersection with Rosemary Lane at MD 32 will be required to eliminate left-turn movements onto MD 32 and to prohibit use of the roadway as a bypass to the Triadelphia Road detour.

Zone 2 construction will consist mainly of median widening within the existing Burntwoods Road interchange. Construction activities will include maintaining the interchange traffic, including through traffic, to allow median pavement widening, along with drainage and SWM improvements. Zone 2 is expected to be an early construction work effort.

Zone 3 construction will consist of the horizontal realignment of MD 32, requiring a complete reconstruction of both northbound and southbound roadways, while maintaining MD 32 traffic and access to three county roadways. Construction activities will include the construction of the MD 32 southbound lanes, shifting of traffic onto the new pavement, and construction of the MD 32 northbound lanes. Construction will include the replacement of a structure over a tributary of Middle Patuxent Branch. Temporary cross-overs will be necessary to maintain traffic from completed/future construction zones. A utility corridor and access road initially begins in Zone 3 along MD 32 northbound. The access road will need to be an early construction activity to facilitate the relocation of utilities in this area.

Zone 4 construction will be challenging, as it is located in an environmentally-sensitive area requiring the construction of replacement structures over Middle Patuxent River and Terrapin Branch. Temporary structures at Middle Patuxent River and Terrapin Branch may be required to maintain the waterways during construction. Also, with the numerous environmental features, construction access will be limited to minimize environmental impacts. The utility corridor and access road, including Access Road 4, continues in this zone. This work will need to be an early construction activity to facilitate the relocation of utilities in this area and eliminate numerous existing access points along MD 32 to minimize local property access impacts and simplify construction of MD 32 through this area.

Zone 5, northern tie-in, completes the construction with the mill and resurface of MD 32 interchange with I-70. With minor design and review efforts, Zone 5 is expected to be an early work effort.

Activities within each construction zone will include basic construction operations such as clearing, initial E&SC including clear water diversions and sediment traps, MOT, rough grading and drainage including cross culverts, final E&SC, fine grading, final drainage, sediment trap conversion and final SWM, and base/interim pavement section. Lighting, signalization, signing, and interim landscaping will all precede the final surface paving followed by final pavement markings, final traffic barrier installation, and final landscaping. The replacement of structures on Triadelphia Road Bridge and on MD 32 over Tributary of Middle Patuxent River, Middle Patuxent River and Terrapin Branch, and other new or replacement drainage structures and retaining walls will follow the necessary design and approval process, and construction activities will include items such as temporary support of excavation, maintenance of stream flow, demolition, foundations, and structure elements. The construction of each structure will be sequenced along with construction within its particular zone or separately as needed to advance project completion and meet the RFP requirements.

Design Approach: Wagman/WRA will perform required field surveys, soil and pavement testing, and utility test pitting, and will develop and submit for review and approval all necessary permits, permit modifications, certifications, documentation, studies, reports, design exceptions/waivers, shop drawings, etc. in support of the proposed design and construction activities as outlined earlier herein and in the RFP. Key technical submittals will include, but are not limited to, the following: Initial CPM schedule, Design Quality Control Plan, Public Outreach Plan, Transportation Management Plan, Conceptual Avoidance and Minimization Plan, Tree Impact Minimization and Avoidance Report, wetland mitigation/stream restoration design plans, Year 1 Wetland Mitigation Post-Construction Monitoring Report, geotechnical and pavement reports, foundation reports, SWM reports, and permits/permit modifications as may be required. Wagman/WRA will also coordinate with utility owners on their relocations. Design activities will include internal QA/QC, IDQM QA reviews and certifications, MDOT SHA-PRD SWM/E&SC reviews and approvals, MDE Dam Safety Division reviews and approvals (if required), and MDE Plan Review Division reviews and approvals. MDOT SHA-PRD/MDE review and approval is anticipated for waterway crossings, initial rough grading, and final roadway/drainage/SWM/E&SC plans. Review and approvals will also be required from USACE, MDE, DNR, USFWS, EPA

and/or FEMA for permits/permit modifications associated with impacts to wetlands, waterways, forests, and specimen trees. Plans for bridges, retaining walls, and box culverts will require both IDQM and MDOT SHA Office of Structures approval. Additionally, traffic submissions (signing, lighting, signalization, pavement marking and ITS) will require both IDQM and MDOT SHA Office of Traffic and Safety Divisions review and approval prior to signature. MDOT SHA may perform a review of any/all submissions to ensure they are compliant with the contract.

In order to expedite design approvals and initiate construction activities, Wagman/WRA will implement a rolling submittal schedule and will package together inter-related design elements into submittal packages while keeping discrete design elements separate in their own submittal package. Early work activities (e.g., utility access roads, construction staging areas/laydown yards, etc.) will be packaged and submitted for early approval separately. Late work activities (e.g., landscaping, permanent signing and pavement markings, etc.) may be packaged and submitted project-wide or may follow the grading and roadway packaging depending on construction scheduling.

- Grading and final roadway packages will include all grading, roadway, MOT, E&SC, SWM and drainage elements, as applicable, within a construction zone. We anticipate having five main construction zones as previously described earlier herein under **Construction Approach**. We will employ a rolling design submittal schedule by construction zone to expedite design approvals/permits and initiate early construction. Rolling submissions will include a Line/Grade submission (covering both the grading and final roadway packages for the entire project) followed by separate 60%, 100%, and Issued for Construction (IFC) grading and roadway submission packages for each zone. The MOT and E&SC for each grading and final roadway package will cover the construction and required sequencing necessary for construction of approved structures, traffic elements, environmental elements, and landscaping, as described below, within those zones.
- Bridges, retaining walls, and box culverts will be designed and submitted individually in their own design package following an independent design schedule for each. Submissions will be in conformance with the requirements outlined in PR 5 – Structures Performance Requirements.
- Traffic elements (signing and pavement markings, lighting, signalization, and ITS) will be designed and submitted as separate packages for each traffic element. Submissions will be in conformance with the requirements outlined in PR 6 – Traffic Performance Requirements. Traffic design will generally mirror the roadway design to ensure proper coordination between all design elements but may be packaged project-wide or may follow the grading and roadway packaging depending on construction scheduling. Service feeds for MDOT SHA facilities will be coordinated with BGE and Verizon as needed. Wagman/WRA will prepare all applications for services and coordinate with MDOT SHA for submission to BGE and Verizon as applicable.
- Wetland creation and stream restoration elements will be designed and submitted in conjunction with the appropriate E&SC and permit submission packages. Submissions will be in conformance with the requirements outlined in PR 11 – Drainage, SWM, E&SC Performance Requirements, PR 13 – Environmental Performance Requirements, and permitting/regulatory agency requirements.
- Landscaping and reforestation packages will start with a preliminary landscape and reforestation meeting with MDOT SHA in conformance with PR 7 – Landscaping Performance Requirements, followed by design packages for preliminary design, final design, and IFC submissions. Landscape and forestation design will generally follow the roadway design to ensure proper coordination between all design elements but may be packaged project-wide or may follow the grading and roadway packaging depending on construction scheduling.

COORDINATION AND DECISION MAKING:

The Wagman/WRA approach to project coordination and decision making emphasizes partnering and team integration, within our design-build team, and with MDOT SHA and project stakeholders. We understand the importance of fostering continuous collaboration, coordination, and communication between all team members throughout design and construction to ensure sound and timely decision making. This approach provides a method for value engineering; ensures the design meets the project goals and is in conformance with the RFP; anticipates conflicts before they arise so conflicts can be proactively mitigated; ensures MDOT SHA's expectations are met; and avoids having issues impact the schedule, environmental compliance, and/or design and construction quality. As the central point of decision making, our ***Design-Build Project Manager, Anthony Bednarik***, will be the primary point-of-contact with MDOT SHA for all project matters. He will have full authority and responsibility for project compliance, including oversight of design and construction, coordination with third parties, and management of the project risks and schedule to ensure timely completion. ***Greg Andricos, PE, President and COO of Wagman***, will provide executive direction to a highly-qualified team of individuals who understand the design-build environment, possess a sense of urgency necessary for decision making/issue resolution on fast-paced projects, and have the experience and expertise to ensure that schedule, costs, and project controls are

balanced with environmental and public stewardship while delivering a quality product to MDOT SHA.

Design Management: Our ***Design Manager, Walter Miller, PE***, will be responsible for overall management of the design activities and other professional services. All design disciplines, including subconsultants, will report directly to Walter. Walter will ensure all design leads coordinate with each other, our subconsultants, and with construction staff. He will ensure necessary permits and approvals are acquired efficiently. He will assign resources, oversee/coordinate design subconsultants, coordinate design schedules, develop/implement corrective measures (if needed), and integrate environmental compliance/mitigation measures into our daily design process. Walter will conduct progress reviews weekly to measure progress towards milestone targets with an emphasis on subconsultants work progress. Managing the design team is paramount in meeting the overall design submittal deadlines. During construction, Walter will manage plan modifications and shop drawings, and review construction activities with our ***Construction Manager, Carl Benton***.

Construction Management: Our ***Construction Manager, Carl Benton***, will manage the construction planning and delivery process and will ensure that the construction work performed and materials provided meet the contractual requirements. Our ***Design/Construction Coordinator, Jerry Whitlock, PE, DBIA***, in conjunction with Carl, will coordinate with Walter during the bidding and design phases to ensure collaboration between design and construction staff so that all design submittals are reviewed for constructability, conformance with project requirements, and consistency with construction scheduling, sequence, means/methods, and other project commitments. Jerry will also assist Walter in keeping the design staff informed and integrated during construction so construction is being progressed in conformance with the design intent and unforeseen construction issues are addressed appropriately and in a timely manner.

To ensure coordination between design and construction on critical project elements (e.g., environmental permitting/approvals/compliance, MOT/traffic, utilities, etc.), we will assign key personnel to manage and coordinate these elements. Our ***Environmental Compliance Manager, James Ashby***, will work with our ***E&SC/SWM Manager, Eric Mock***, and our ***Permitting Coordinator, Timothy Hess***, to ensure our design is compliant with all permit/regulatory commitments and requirements, and is compatible with our construction means/methods to avoid unintended field issues and delays. They will also work together to ensure construction is performed in conformance with the design intent and compliant with all permit/regulatory requirements. Timothy will coordinate with our design and construction teams, including our ***Water Resources Engineer, Jason Cosler, PE***, to ensure E&SC and stream diversion elements are compatible with permit conditions, and he will prepare necessary permit/approval modifications resulting from the final design or field construction changes. During earth disturbance, Eric will regularly inspect the project to ensure that the project is in compliance with all permits/approvals. In the event the project falls out of compliance, Eric will have full authority to direct resources to promptly resolve issues and bring the project back into compliance.

Our ***MOT/Traffic Manager, Brian Sluder, ATSSA***, will work closely with our traffic engineering staff during design and will review plans to ensure MOT/traffic elements are coordinated and sequenced with construction activities. During construction, Brian will regularly inspect the project to ensure that the project is meeting established traffic mobility and safety metrics. Should issues arise, Brian will have full authority to direct resources to bring the project into compliance. Brian also will provide construction progress updates and look-ahead schedule information, and will support our ***Public Relations/Outreach Coordinator, Brian Riffel***, and MDOT SHA District 7's Community Liaison to address public issues, changes in access and notification of changes in traffic configuration.

Our ***Utility Coordinator, Jason Hershey***, will work directly with utility owners' representatives, our ***Utility Design Liaison, Paul Wiener, PE***, and our design and construction staff to ensure all utilities are identified, conflicts detected, impacts minimized, and required relocations are properly coordinated and efficiently scheduled/sequenced.

Our ***Project Engineer/Controls, Thomas Medeiros***, will oversee the comprehensive construction operations planning process and our ***General Superintendent, Steve Wood***, will direct all field operations throughout the construction of the project. Thomas and Steve will be supported by a construction team that includes Roadway and Structures Superintendents, Traffic Manager, Utilities Coordinator, E&SC/SWM Manager, and Survey Manager.

Our ***Construction QA/QC Manager, Bryan Smith, PE***, will ensure that our construction QA/QC program is functioning and construction is compliant with approved construction documents and specifications. Bryan will review work plans prior to the start of construction, and will oversee quality of all operations. He will participate in project construction planning meetings held by Carl and Thomas, along with the Superintendents, Managers, and Foremen to review upcoming work.

DESIGN QUALITY MANAGEMENT:

Wagman/WRA believes a strong quality control and quality assurance (QA/QC) program is vitally important to consistently producing quality design documents while ensuring all RFP requirements, environmental commitments, and project goals are met. WRA has successfully led the design effort for numerous design-build projects for MDOT SHA and

other regional transportation agencies. Our ***Design QA/QC Manager, Brian Riffel, PE***, will lead our design QA/QC program. He will perform the same services on this project as he is currently performing under the MD 32 Phase 1 Design-Build project. Similarly, our ***Independent Design Quality Management (IDQM) firm, Gannett Fleming, Inc.***, will also perform the same services on this project as they are currently performing on the MD 32 Phase 1 Design-Build project.

Our approach to design quality management is centered on a rigorous, verifiable process for producing the highest quality plans that are in conformance with the RFP and project commitments, are constructible, and are approved and permitted for construction in a timely manner that meets or exceed MDOT SHA's project goals outlined in the RFP. Our approach to design quality management will include the following:

- Performance of quality control reviews by an independent quality control team in conformance with our approved Design Quality Control Plan.
- Integration of design and construction staff into one team with construction staff providing continual insight/input on constructability issues during design.
- Design coordination meetings with all design disciplines, subconsultants, and construction staff.
- Over-the-shoulder reviews by construction staff and IDQM to ensure the design is constructible within the project constraints (e.g., environmental resources, utilities, ROW, etc.)
- Environmental reviews to ensure the project meets environmental commitments/permitting requirements within constructability constraints.
- Continual IDQM, MDOT SHA, MDOT SHA-PRD, MDE, and utility owner coordination and input through partnering to ensure design solutions are RFP compliant, permittable/approvable, and/or compatible with other work activities.
- A comprehensive design schedule that provides ample time for design, internal/external reviews, resubmission, audits, and final approvals, and is coordinated with construction sequencing needs and overall construction schedule.

Design Quality Control: Design quality control is not a single step process but requires adequate controls, reviews, and checking applied at each stage of a project's development. Our Design Quality Control Plan (DQCP) will outline our overall organization plan and reporting responsibilities for design quality control and will be focused on quality control measures, coordination activities, and document controls to be implemented by all team members, including subconsultants, which are oriented towards assuring that the design is accurate, and the design and construction elements conform to the RFP and project goals/commitments, while minimizing impacts. The DQCP will be distributed to all project team members, including subconsultants.

Design Quality Assurance: Design quality assurance will be comprised of verifying that all design quality control measures have been executed in conformance with the DQCP before design documents, permit applications, etc. are transmitted for review/approval or construction. Any deviations will be immediately corrected so as not to be repeated.

Independent Design Quality Management: Our team will also be responsible for independent design quality assurance of all design plans, project specifications, technical reports and working drawings, enabling the development of a finished product in compliance with the RFP. Gannett Fleming (GF), our IDQM team, will provide independent design reviews of all design packages developed by WRA, and our subconsultants, certifying they were developed in compliance with the DQCP and meet the requirements of the RFP. GF will also be responsible for the review and approval (with MDOT SHA concurrence) of the DQCP. Our QA approach will adhere to the same rigorous review and document control procedures as outlined above for quality control. MDOT SHA-OOS and MDOT SHA-OOTS will perform a concurrent review of all structures and traffic submissions, respectively. MDOT SHA may audit design submissions for compliance with the RFP and provide comments to be addressed. In the event of an ambiguity in the interpretation of the contract requirements between WRA and GF, Anthony will immediately raise the issue with MDOT SHA for resolution.

Constructability Review: Key construction staff will provide over-the-shoulder reviews during every stage of design development, making constructability reviews an integral part of the design quality process. Construction staff will attend design coordination meetings to provide ongoing construction insight/input on project phasing/sequencing, earthwork/hauling, MOT, E&SC, structures, utilities, etc.

Environmental Review: Experienced environmental staff will provide over-the-shoulder reviews to ensure compliance with commitments and provisional/final permit conditions, as well as to identify and obtain any additional permits or permit modifications.

MDOT SHA-PRD/MDE Review: We recognize that MDOT SHA-PRD and MDE Plan Review, Dam Safety, or Non-Tidal will be required to review elements of the design. We are prepared to obtain such approvals directly from MDOT SHA-PRD and MDE. We will provide plans for MDOT SHA-PRD/MDE review that can be approved with minimal comments by engaging MDOT SHA-PRD/MDE at the start of the project and throughout design with monthly coordination meetings;

encouraging over-the-shoulder reviews/input from MDOT SHA-PRD/MDE; and by requiring an independent peer review of all designs before they can be submitted to MDOT SHA-PRD/MDE.

Professional Seals: Within 30 days of NOA, Wagman/WRA will provide a Designer Certification and Checker Certification. All calculations, plans, specifications, and other technical documents will be signed and sealed by both the MD-registered PE responsible for the design and checking. Landscape plans will be prepared, signed, and sealed by a MD-registered LA. Reforestation plans and applications will be prepared, signed, and sealed by either a MD-registered LA, Licensed Forester, or qualified professional certified by MD DNR/Forest Service. All transmittals will include a design-build team, Lead Design firm and checker certification. Prior to construction, a similarly qualified IDQM person will sign and certify that each submittal complies with the RFP and DQCP.

DOCUMENT CONTROL:

Wagman will use project management software to provide efficient and accurate document control on this project. Externally received and internally generated documents will be issued a file address, scanned, and saved, with a hard copy in the master project file, held at the Wagman project office. All paper correspondence and submittals will be date stamped and will receive a specific number, and logged for future reference. Incoming correspondence from MDOT SHA and others will be entered into the system and routed to various team members as needed. Correspondence will generally flow through our Design-Build Project Manager, Anthony Bednarek, to maintain a single point-of-contact and policy consistency for all formal project communication. Email will be used to expedite communication and share meeting minutes, letters, etc.

ProjectWise will be used for all project documents being transmitted to/from MDOT SHA. We will utilize MDOT SHA's CADD standards for development of plans and MDOT SHA's MMS system for materials management. For documents shared with external partners and field personnel, Wagman/WRA will use a combination of Projectwise, Dropbox, BlueBeam, and WRA's SecureShare document management tools. Dropbox, BlueBeam and SecureShare will be used for sharing documents with external partners, subcontractors and subconsultants, and field personnel as needed.

All shop and working drawings will be checked and stamped with their approval by WRA, prior to sending to our IDQM team for their concurrence. Documents Issued for Construction (IFC), including Greenline Revisions, will include an identification marking along their margin indicating the IFC document's submission number and the date of issue. A tabular tracking summary of all IFC documents will be maintained so field personnel and MDOT SHA can confirm they are using the latest documents.

CHANGE MANAGEMENT:

Situations may arise that result in changes to the scope of the project or previously approved IFC documents. Requested changes to the project scope will only be performed at the direction of MDOT SHA. Wagman/WRA requested changes to IFC documents will be typically addressed through a formal Greenline Revision process in conformance with PR 1.26.2.1 of the RFP or the MDOT SHA-OED toolkit modification process for minor E&SC field changes.

Changes during Design: Changes that occur during design are typically the result of work elements that were not included in the RFP scope of work but are requested by MDOT SHA to be integrated into the final construction documents. In these cases, we will partner with MDOT SHA and other stakeholders to develop cost-effective solutions that minimize impact to the project schedule while addressing the issue as quickly as possible. Upon receiving authorization by MDOT SHA to proceed with the change, Wagman/WRA will expeditiously proceed with changes to construction documents and permit applications. The revisions will only be initiated in construction after receiving the appropriate IDQM certifications, permitting/regulatory approvals, and other third-party approvals if required.

Changes during Construction: Changes that occur during construction are often a result of unforeseen field conditions discovered during construction. As discussed above, changes will be typically addressed through a formal Greenline Revision or toolkit modification process. Prior to initiating any change to an IFC document, we will partner with MDOT SHA to identify and determine an appropriate resolution. Once the change and its solution are identified, Wagman/WRA will acquire all required IDQM certifications, and MDOT SHA and permitting/regulatory approvals, prior to initiating the change in construction. All changes to IFC documents will be tracked and documented to ensure they are included on final as-built drawings and provided to construction staff to be used for construction. Revisions that require minor changes to IFC plans will be shown on field copies of the current as-built plan set to be later documented on the project as-built drawings at project completion.

Our Construction QA/QC Manager, Bryan Smith, will audit plan sets used in the field to ensure they are current and approved. Project Superintendents will also be responsible for checking the control sets to make sure that they are using the most up-to-date documents. Only plan sets that are stamped and signed as IFC with an identification marking will be used for construction. To ensure field staff have the most up-to-date plans, the identification marking along the margin of revised IFC documents will be updated to include the Greenline Revision number and date. A tabular tracking summary of

all IFC documents will be maintained so field personnel and MDOT SHA can confirm they are using the latest documents.

As-Built Drawings: During construction, all IFC plans will be updated for all field changes and field surveys, and all IFC revisions will be incorporated in conformance with PR 1.26.2.2 of the RFP. Each set of IFC plans will be incorporated into a comprehensive set of as-built drawings. Once finalized, the approved signed and sealed set of as-built drawings, including an index sheet and a key plan, will be posted to ProjectWise and a CD ROM will be submitted to MDOT SHA. The SWM Facility As-Built Certification will be a separate submittal in conformance with PR 1.15.5 of the RFP. The Wetlands and Stream Restoration As-Built Certification will be a separate submittal in conformance with Special Provision 300 As-Built Certification and Inspection Design-Build.

SCHEDULE MANAGEMENT:

Wagman/WRA understands the vital importance of detailed planning and project scheduling to the success of this design-build project, with construction beginning in Spring 2019 and completing no later than October 31, 2021. We also recognize that effective schedule management, coupled with our detailed planning, will ensure that we meet MDOT SHA's project goals of maximizing traffic operations and safety, minimizing inconvenience to the community and the traveling public, minimizing overall impacts, and proactive coordination by: completing the project in the shortest possible time; adhering to schedule commitments with the community and third parties to avoid unnecessary inconvenience and/or delays; minimizing lane closures and detours through sound look-ahead and contingency planning; and allowing for proactive and timely coordination with MDOT SHA, Howard County, permitting/regulatory agencies, utilities, the community, and third parties through schedule adherence and visibility of upcoming work activities.

Our approach to schedule management emphasizes staying ahead of design submittals, construction operations, eliminating obstacles, and communicating the plan before the work occurs. Wagman/WRA understands that we will face numerous scheduling challenges during design and construction, such as permitting/regulatory approvals, design reviews/approvals, time-of-year restrictions, utility coordination and relocations, MOT restrictions, ROW clearance, discovery of contaminated materials or cultural resources, unanticipated subsurface conditions, and inclement weather. To address these challenges, Wagman/WRA will rely on an integrated schedule management philosophy that promotes sound planning; close collaboration, coordination, and communication between all team members; proactive and efficient issue resolution; and execution in all phases of design and construction. Our CPM schedule will be comprehensive and the primary driver and management tool for the short-term and long-term planning and execution of our work. This management approach is focused on looking ahead, proactively eliminating potential issues, and communicating expectations prior to executing the work. During weekly design task force meetings, we will use a three week look-ahead schedule to inform team members of upcoming design submittals and field operations. This is very critical in the beginning of the project during geotechnical investigations, scope validation, environmental surveys, and construction mobilization.

STAKEHOLDER COORDINATION:

A comprehensive public outreach plan is critical to successful stakeholder coordination. It provides a mechanism to create lines of open communication between the project team and all interested parties. Project stakeholders, such as adjacent property owners, communities, Howard County Government, Howard County Public Schools, emergency responders, USPS, historical properties, commuters, and utility companies, will be informed by meetings, news articles, newsletters, email chains, websites, social media and project-specific message boards. Our Public Outreach Coordinator, Brian Riffel, PE, will work closely with MDOT SHA, including Office of Communications and the District 7 Community Liaison, to provide the most current information to the public. We consider ourselves good neighbors and believe that open and honest communication with the stakeholders allows the project to be successful.

PARTNERING:

Wagman/WRA believes in partnering and we have had many successful projects with MDOT SHA because of partnering! The Wagman/WRA team started the partnering process during this SOQ development and promises to continue partnering during the project pursuit, through design and construction, until project completion and closeout. We believe partnering works best when all stakeholders are involved in the partnering process. Partnering allows open and honest communication within the project team ensuring a well-managed project. As our team progresses through the project, we will establish a more formal partnering process to encourage participation by all stakeholders. This formal partnering allows a structured procedure to resolve the more complex issues while maintaining the project schedule. To identify and resolve issues early, we encourage a less formal partnering process that involves all participants on the project. We empower our personnel to resolve issues at the lowest possible level and when functioning properly partnering becomes a very powerful tool to a successful project.

WAGMAN WRA

General Construction | Heavy Civil | Geotechnical