

Design Build Project

US 219 • I-68 to Old Salisbury Road
Garrett County, Maryland

Contract No. GA6465270

Federal No. AC-ADHS-203-1(3)N

May 23, 2017



Submitted by:

Triton Construction, Inc.

In association with:

A. Morton Thomas and Associates, Inc.

Submitted To :

**Maryland Department of
Transportation**

State Highway Administration

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Years Experience:

Total 16 w/TCl: 6

Education:

MS, Civil Engineering, 2005

BS, Civil Engineering, 2001

Active Registration:

Registered Professional
Engineer: WV #17051

Bruce Dunlap is a Professional Engineer with extensive experience as Project Manager (Construction), District Administrator and Owner Resident Engineer for major highway and bridge construction projects. At Triton, he serves in a Senior Project Management role, coordinating and planning the construction sequencing, leading interactions with stakeholders, and managing Value Engineering change proposals. As former District 9 Maintenance Engineer for WVDOH, he identified and prioritized the needs of a \$40 Million (\$40M) annual budget, managed the engineering necessary to solve complex issues, planned and implemented repairs and upgrades, and managed outside contracting solutions. Relevant project experience includes:

New River Parkway, Hinton, WV; West Virginia Division of Highways (WVDOH) [\$12.0M]: Served as Project Manager for 1.4 miles of roadway safety upgrade, re-alignment, and widening, including a new bridge crossing of Madam Creek. Roadway construction involved significant profile adjustments to eliminate dangerous vertical curve break-overs and sags while maintaining two lanes of traffic on sub-standard rural road. Mr. Dunlap modified the traffic control plan to allow constructing the roadway full width “under traffic” in order to eliminate large drop-offs along travel lane with no room to accommodate barrier. He was responsible for coordinating and planning the construction sequence, resourcing labor and materials, and leading interactions with the National Park Service. Mr. Dunlap also managed the bridge VE design modifications resulting in a \$400,000 savings. This project required aesthetic treatments on walls and bridge parapets.

Lochgelly Interchange, Oaks, WV; West Virginia Division of Highways [\$20.2M (Total Project)]: As Resident Project Engineer, Mr. Dunlap oversaw construction of the Lochgelly Interchange, a new diamond/loop grade separated interchange with Corridor L (US Route 19). The project included constructing a 2-span bridge over US 19 with a median pier and MSE Retained abutments, and nearly 500,000 CY of excavation, significant portion in rock, to construct the new entrance and exit ramps. Approximately 2,500 linear feet of stream and 4.3 acres of wetlands were impacted, with the relocation of 430 linear feet of Wolf Creek, and the installation of several temporary dams. Mr. Dunlap ensured the project was constructed within the specifications and plan design, traffic control, quality assurance inspection and project documentation.

Martin L. King, Jr. Bridge over Norfolk Southern Railroad, Bluefield, WV; West Virginia Division of Highways (WVDOH) [\$7.5M (Total Project)]: Project Manager for the replacement of Bridge over the main Norfolk Southern Railyard, located on the primary route moving freight from the loading docks in Norfolk to Bluefield, WV. Mr. Dunlap’s

efforts helped re-sequence the work, to replace the bridge when not utilized for school bus access, since the area has limited alternative access routes. He managed the design of a VE proposal to significantly re-design the bridge, modifying the superstructure construction methods while maintaining the previous commitments to work within the short available windows of taking the rail tracks out of service. The original plan was designed to “pre-build” the composite fabricated steel girder/ concrete deck in sections, erect the sections with two splices per girder line, closing the splice areas and longitudinal joints in place. Mr. Dunlap’s VE proposal modified the plan to use Accelerated Bridge Construction (ABC) techniques, including pre-assembly of the steel girders, and setting the girders in pairs from abutment bearing to bearing, then using pre-cast deck panels, erected without stopping rail traffic. The VE was designed, reviewed and implemented in 4-months.

WV 3 - New River Veterans Memorial Bridge, Bellepoint, WV; West Virginia Division of Highways (WVDOH) [\$5.0M]: Assigned as Resident Engineer for high-profile, environmentally sensitive project to ensure all environmental permits and commitments were met. The project completed the second half of a phased project after work was suspended due to an earlier stop work from the Army Corps of Engineers. Two year later, after the state rectified all prior permitting issues and obtained authorization, Mr. Dunlap replaced the previous Resident Engineer and oversaw the complete superstructure replacement over the New River, immediately downstream of the Bluestone Dam. Mr. Dunlap was responsible for resolving plan conflicts, managing plan revisions, negotiating change orders, ensuring construction met all specifications, and ensuring contractor compliance with all environmental permit conditions. With Mr. Dunlap’s oversight, the project was completed on time and with no environmental violations.

Years Experience:

Total 31 w/AMT 6

Education:

BS, Civil Engineering, 1986

Active Registrations:

MD Registered Professional Engineer: MD #19222

Laura Mehiel, PE is an integral member of AMT's senior management team with a focus on large, complex transportation projects and alternative delivery. She has designed multiple interstate projects, implementing approved IAPA modifications. Over the past fifteen years, she has served in project leadership roles on seven (7) design/build projects in Maryland, Virginia and Washington, DC. Relevant project experience includes:

Design-Build US Route 1 Improvements, Fairfax County, VA, FHWA Eastern Federal Lands Highway Division [\$80M]: As **Design Manager**, Ms. Mehiel was responsible for managing a multi-disciplinary team of in-house staff and 7 subconsultants, and for ensuring QC compliance, for new alignment and widening of 3.7 miles of US 1, from 4 lanes undivided to a 6-lane divided facility. The project includes a half mile of new alignment through historically sensitive area, safety and capacity improvements, bridges and major culverts, new trail/ sidewalk, retaining walls, 5 ponds, and pile-stabilized slopes. Ms. Mehiel managed all design including geometric alignments, intersection improvements, traffic analysis, bridge design, MOT, drainage and SWM design, E&S control, topographic and utility surveys, and geotechnical engineering. She organized and ran two design public hearings and conducted stakeholder design workshops, and four Pardon Our Dust meetings. She also oversaw the Right-of-Way acquisition for 25 impacted parcels and managed environmental permits including wetland/stream impacts, floodplain model of the new bridge crossing, and on-site reforestation for tree impacts. Her efforts helped facilitate schedule, by obtaining wetland permits within 7-months, and by negotiating to remove time-of-year restrictions for 5 Waters of the U.S. and allow sand bag diversions in 4 others.

Southgate Drive Re-alignment and Interchange, Blacksburg VA, Virginia Department of Transportation (VDOT) [\$46.7M]: **Design Manager** on this "turn-key" project which was the #1 priority of the Salem District, a \$47 million interchange and roadway improvement project adjacent to Virginia Tech. Ms. Mehiel oversaw a cutting-edge design that incorporated multiple innovative intersections including two roundabouts and a DDI interchange. She managed a multi-discipline team of 22 in-house staff and 5 subconsultants to prepare alternatives analyses, public hearing/design approval, and 100% PS&E, all in a period of 19 months. She provided technical leadership and ensure QC compliance for the design of highway, interchange, and shared-use path, roundabout design, TMP/MOT, SWM, and drainage facilities, and managed the staff who performed traffic modeling, bridge and retaining wall design, geotechnical investigations, right of way

plans, design waivers, and environmental permits. Ms. Mehiel organized and facilitated public outreach, which included workshops and simulations. Significant context sensitive and aesthetic "hardscape" designs were included on this project.

Design-Build I-495 "HOT Lanes", Northern VA, Virginia Department of Transportation (VDOT) [\$170M for "Area 1"]: This billion dollar "mega project" was divided into 4 Design-Build segments, with separate Design Managers and teams handling each. Area 1 was from south of Braddock Road to north of US 50, containing four (4) interchange over nearly five miles. As **Area 1 Design Manager**, Ms. Mehiel managed more than 50 staff and subconsultants in producing 55 design packages for grading/drainage, erosion control, final grading/roadway, noise and retaining walls, 13 bridges, utility relocations, and ROW plans, 80% of which was completed in a 10-month period. Ms. Mehiel ensured QC procedures were followed. She worked closely with the Contractor and GEC reviewers daily by use of over-the-shoulder reviews, comment resolution meetings, and discipline-specific design sessions to maintain production schedule. Ms. Mehiel and her team prepared a complex MOT staging plan for interchange ramp reconstruction, which required traffic modeling for each phase. Her design provided retaining walls to mitigate impacts to Accotink Creek, and outfall improvements at degraded outfalls throughout Wakefield Park meeting channel protection requirements. Wetland and stream permits were obtained for unavoidable environmental impacts. Ms. Mehiel assisted with extensive utility coordination and right of way plans.

Design-Build US 113 Widening/Dualization (2 phases), Worcester County, MD, Maryland State Highway Administration (SHA) [>\$30M]: **Joint Venture Partner Project Manager** who served as owner's agent for multiple phases, from the Delaware State Line to Snow Hill. Her experience representing MDOT-SHA gave her valuable insights as to SHA's priorities, interests, and goals in the design-build process. On two phases, Laura prepared the design-build package including plans, specifications and RFQ/RFP package related to all hydrology/hydraulics design. Coordinated with design-build team, SHA HDD, SHA HDD, & MDE.

Years Experience:
 Total 11 w/TCl: 4

Education:
 BS, Civil Engineering, 2005

Active Certifications/Training:
 OSHA 30-Hour, MDE Green Card
 SHA Yellow Card, SHA TTCM

Mr. Diehl serves as a Regional Construction Manager for Triton, handling a wide range of complex bridge and highway construction projects. He has managed construction of numerous complex highway projects in Maryland and West Virginia, involving environmental, traffic, and schedule constraints. Mr. Diehl responsibilities include managing road and bridge construction activities, developing and implementing schedules, and coordination of all phases of construction. Relevant project experience includes:

I-81 (Maryland Veterans Memorial Highway) Widening, Washington County, MD (MSHA) [\$87.1M]: Serving as **Construction Manager** on this major interstate widening project which carries 58,000 vehicles per day, administered by MDOT SHA in collaboration with WVDOH. The project widens a 5-mile segment between US 11 in West Virginia and MD 63/MD 68 (Lappans Road) in Williamsport, MD, to create a total of six travel lanes. Included are the reconstruction of four bridges, with aesthetic parapets, over the Potomac and at Lappans Road. Includes installation of strict environmental measures to protect the Potomac River, storm water management systems, and upgrading lighting, signs and guardrail to enhance safety along this corridor. The environmental challenges involve both creating features and accessing new construction elements in the midst of a protected stream with endangered species. Mr. Diehl is responsible for complete construction oversight, including scheduling of work (both internal and subcontract), schedule updates, and ensuring work complies with design plans.

US 48 "Corridor H" Phase 5, Scherr, WV, (WVDOH) [\$54.7M]: Served as **Construction Manager** for 4.05 miles of new alignment between Bismark and Route 93 near Scherr, requiring 2.9 Million cubic yards of excavation. The project included constructing two sets of parallel bridges, each 1100 feet long with 100-120 foot piers. Challenges included constructing 4 lanes roadway in steep mountainous terrain while protecting higher elevation streams. One set of bridges was over a County Route in a deep hollow, the other set over County Route a small stream and active quarry. Mr. Diehl was responsible for managing all construction activities including the scheduling and coordination of all internal and subcontractor resources. He supervised and coordinated all trades with multiple crews for bridge, earthwork, and paving.

Design-Build I-70 Bridge Replacements over Black Rock Road, Hagerstown, MD (MSHA) [\$7.8M]: **Project Engineer** who supported the construction of the dual bridges (3-span, steel multi-girder superstructure supported on integral abutments

and multi-column piers). The replacement bridges were constructed in stages using a temporary detour bridge built in the median of I-70. Mr. Diehl was responsible for schedule updates, project controls, processing materials submittals, and coordinating with vendors. The project received national recognition from FHWA for the design and development of a lump sum cost tracking system.

Keyser McCoolle Bridge, Keyser, WV, (WVDOH) [\$23.4M]. Served as **Construction Manager** for this project over the South Branch of the Potomac River, which involved constructing new approach alignments while tying in those alignments with US 220 and Keyser city streets, as well as constructing the new, 2,200 foot long parallel bridge with aesthetic treatments carrying US 220 on more than 560 feet of drilled shaft piers. Other major components of the project included over a thousand feet of 6" waterline relocation, new sidewalk, curb and gutter, and closed storm drainage system. Mr. Diehl was responsible for managing all construction activities including the scheduling and coordination of all internal and subcontractor resources.

Deck Replacement/Rehabilitation of MD 956 over Potomac River, Allegany County, MD (MSHA) [\$4.4M]: Served as Construction Project Manager for deck replacement and rehabilitation of Bridge No. 1098, with work being performed in both Maryland and West Virginia. The existing six (6) span steel beam bridge is 482' long with a 33' roadway. Project included removal and replacement of the existing bridge that required rehabilitation to the existing abutments, special sequencing for the removal and replacement of the deck segments, complete painting of the structural steel, approach roadway work, placement of new traffic barriers, temporary signalization, and permanent pavement striping. One alternating lane of traffic, controlled by signals, was maintained during the span of the contract. Mr. Diehl was responsible for managing all construction activities including the scheduling and coordination of all internal and subcontractor resources. The project was completed approximately seven months ahead of schedule.

Years Experience:

Total 30 w/AMT: 17

Education:

BS, Civil Engineering, 1986

Active Registrations:

MD Registered Professional Engineer: MD #24232

Heidi Van Luven, PE has extensive experience in highway engineering for SHA, local jurisdictions including Garrett County, and throughout the Mid-Atlantic Region. She has been the Lead Highway Engineer for four (4) SHA advertised construction contracts over the past 2 years, has designed numerous interstate projects, and has served as design-build discipline lead. Relevant project experience includes:

MD 4/Suitland Parkway Interchange, Prince George's County, MD, Maryland DOT/State Highway Administration (SHA) [\$67M]: Lead Highway Engineer responsible for all highway design elements for mainline widening of MD 4, a diamond interchange at Suitland Parkway, reconstruction at project limit transitions and adjacent intersection capacity and safety improvements at Dower House Road, Westphalia Road and Marlboro Pike. Responsible for design and SHA/consultant collaboration through two (2) constructability reviews, a value engineering study, and a Practical Design process that reduced the construction cost by 30%. Design duties included vertical and horizontal alignments, interchange design, new turn lanes and modified lane use at intersections, and a comprehensive TMP. Significant earthwork was required due to depression of MD 4 mainline to maintain elevation of Suitland Parkway. Other duties included direct coordination with utility owners, PG County, NPS, FHWA for NEPA reevaluation, developers, property owners and SHA's District 3 Office. Responsible for compilation of design drawings on Projectwise for all disciplines.

FDR Boulevard Extension and Roundabouts, MD 237 to Pegg Road, St. Mary's County, MD, (St. Mary's County DPW) [\$18M]: Lead Highway Engineer for the design of a 1.8-mile extension of FDR Boulevard. Responsible for design of all highway components for new 4-lane divided roadway and design of three new roundabouts at intersecting streets. Typical section includes a corridor-wide trail. Managed MOT, signing and pavement marking, public outreach, and participated in extensive utility coordination.

Design-Build US Route 1 Improvements, Fairfax County, VA, (FHWA-EFLHD) [\$80M]: Highway Engineer and Public Involvement Lead for corridor widening and new alignment project to provide traffic relief near Fort Belvoir. The improvements partially re-align, widen and dualize 3.68 miles of Route 1 from four to six lanes, adding sidewalk and multi-use trail. Ms. Van Luven provided roadway engineering design for horizontal, vertical, and typical sections. She also played a key role in developing displays, PowerPoint

shows, flyers, and other collateral support for both the Public Outreach component of the TMP, and multiple Public Meetings and design workshops with the citizens and elected officials in attendance. Her attention to detail and understanding of how to convert technical design elements into lay terms for the public was a tremendous asset to the project and a large reason for the success of the public outreach.

US 29 Widening and Interchange Ramp Improvements, Howard County, MD, (MDOT-SHA) [\$16M]: Lead Highway Engineer responsible for all roadway design elements for the improvements to US 29 for approximately 3.2 miles, from MD 32 to MD 175, including widening to add 3rd northbound lane on the inside shoulder for the section of roadway within the project limits; and ramp modifications on US 29 northbound to eastbound on MD 175 for an extended deceleration lane. Steep slopes and proximity to developed properties required design of retaining wall and a stream relocation. Coordinated design efforts of consultants and associated Projectwise file management.

I-695/US 1 Interchange and Roadway Improvements, Baltimore County, MD, (MDOT-SHA) [\$40M]: Lead Highway Engineer for unique combination of "road diet," access, pedestrian, and capacity improvements along US 1 and interchange modifications at I-695. The improvements along US 1 will provide more direct local and commuter access to the I-695 Inner Loop from US 1 and reduce traffic on local streets by relocating the terminus of an existing on-ramp to I-695 from Leeds Avenue to US 1. Prepared the project Interstate Access Point Approval Report, highway design plans, typical sections, TMP/MOT, and oversaw SWM design.

Eastern Boulevard Phase II, Washington County, MD, (Washington County DOT) [\$7.7M]: Lead Highway Engineer for part of this multi-phased effort to improve the corridor east of Hagerstown. Ms. Van Luven prepared plans for widening an existing 2-lane road to a 4-lane divided highway, with sidewalks throughout. She developed the reconfiguration of two intersections to improve steep grade and minimize impacts to a historic community, directed the utility test hole program, and managed the NEPA re-evaluation.

Years Experience:

Total 22 w/AMT: 22

Education:

BS, Civil Engineering, 1995

Active Registrations:

MD Registered Professional

Engineer: #25868

Resp. Person #006165;

SHA Green Card #9755; Yellow

Card #06-519; Rosgen Level I

Matthew Willems, PE, has designed, retrofitted, permitted (both as an approved MDE Expedited Reviewer for SHA since 2001 and as a designer), inspected and performed as-built certifications for every type of Maryland stormwater (SWM) facility. He has led SWM and E/S permitting with both PRD and MDE and ensured that all H/H design (SWM, storm drains, culverts and ditches) are in accordance with SHA standards and specifications. He excels at working closely with contractors on D/B projects during the sediment control design process so that construction can proceed per schedule and in 100% environmental compliance. Relevant project experience includes:

Design-Build MD 200/ICC Contract B, Montgomery County, MD, Maryland DOT-State Highway Administration (SHA) [\$560M]:

Due to his excellent work on ICC Contract A, Matt was selected to be **Lead Water Resources Engineer** for the 2.25-mile section within the Upper Paint Branch Special Protection Area, the most environmentally sensitive area within the entire ICC. Mr. Willems was responsible for leading the design and obtaining the permits so construction could begin on time. Coordinated grading, utility relocations, culverts, storm drain, sediment control and stormwater designs with numerous environmental agencies (FHWA, USACOE, USFWS, MDE and local county agencies), SHA, and the contractor, especially since the narrow ROW impacted construction methods. Due to significant concerns of thermal impacts to local trout streams and SHA environmental commitments to minimize forest impacts to surrounding parklands, he designed 200 linear innovative sand filters and recharge trenches, which were located beneath water quality grass swales. The filters promoted extensive groundwater recharge and provide maximum water quality benefits. Obtained USACOE/MDE final approval for sediment control; stormwater management; and for all work in wetlands, waterways and floodplains. Sequenced construction activities to avoid stream closure periods and minimize impact to FIDS and vernal pool habitats. Designed modifications to existing outfall channels and banks so that there was a smooth, non-erosive transition into the Paint Branch. The roadway drainage (culverts, swales, and storm drain) designs were all completed in conformance with SHA standards, and the SHA Drainage Manual.

Design-Build MD 200/ICC Contract A, Montgomery County, MD, Maryland DOT-State Highway Administration (SHA) [\$478M]: Matt served as **Water Resources Engineer** for the development of

initial, intermediate, and final E/S control plans with detailed sequencing (coordinated with the contractor); maintenance of stream flow plans (MOSF) for challenging culverts; and obtained MDE approvals for work prior to stream closure dates.

Design-Build US Route 1 Improvements, Fairfax County, VA, FHWA Eastern Federal Lands Highway Division [\$80M]:

Matt served as **Water Resources Discipline Lead** for the 3.68-mile design-build highway improvement project. He was responsible for designing SWM for to address water quality, quantity, and channels stability; designing 4 phases (advance grading, initial, interim, and final) of sediment control, collaborating with Construction team to develop refined culvert sequencing such that the downstream environment is protected, stream flow is preserved, and traffic is maintained; developing the drainage design such that interim drainage would be maintained during all phases of construction; overseeing the Floodplain model/HEC-RAS and scour analysis for a new Accotink Creek bridge and the 3-cell Mason Run culvert; and overseeing the wetland permitting applications.

Water Quality Facility Design for TMDL Projects, Statewide, MD, Maryland DOT-State Highway Administration (SHA) [\$600,000-design]:

Matt works in SHA's office as **SHA Consultant Project Manager** for projects that include retrofits of existing SHA facilities in Districts 6 and 3; new BMP's to treat previously untreated roadways in District 7; and a program that determined the baseline for how much existing impervious area is treated under SHA's October 2015 MS4 permit. Retrofits include creating wet ponds and submerged gravel wetlands in previous dry ponds while new designs include biofilters, swales, and other ESD practices. Coordinated all aspects of designs internally with SHA, including District 6, HHD, OMT, PRD (concept, site development, and Final Approval), EPD (wetland/waterway permitting), and MDE (including permits from MDE Dam Safety Division).

Years Experience:

Total 17 w/AMT: 10

Education:

BS, Civil Engineering, 2000

Active Registrations/Certifications:

MD Registered Professional Engineer: #31177; Rosgen Levels I-IV; MDE Green Card; SHA Yellow Card; SHA E&S Designers Blue Card

Gregory Fox, PE

Gregory Fox, PE is a stream design specialist with significant management and technical experience in stream and wetland projects, Natural Channel Design (NCD), and SWM/ESD/LID design for NPDES/TMDL compliance. His expertise includes fluvial geomorphological assessment, stabilization and restoration design; wetland/waterway impact assessment and mitigation; hydrologic and hydraulic modeling; environmental permitting; streamside wetland creation; floodplain studies; as well as SWM facility and storm drain outfall design. Relevant Experience includes:

WSSC BOA Stream Restorations, Various Locations, MD, WSSC [\$1.98M-design] : Greg served as **Stream Restoration Specialist** responsible for fluvial geomorphic analysis, natural channel design (NCD) for stream restoration/stabilization, and permits for 8 sites in Northwest Branch, 2 in Rock Run, and 10 in Piscataway Creek basins, totaling more than 1 mile. Services included fluvial geomorphic analysis, H&H modeling, NCD plans, E&S and planting plans for permit and construction packages. Developed concept design, performed geomorphic assessment & reporting, and provided stream design support on 33 additional WSSC asset repair projects. Served as stream expert at community meetings.

Water Resources Engineering MS4 Projects, Montgomery County, MD, Montgomery County DEP [\$1.8M-design]: Greg served as **Stream Restoration Specialist** for MS4 Term Contract for the County. Tasks include stream restoration on 8,000 LF of Gunners Branch tributaries, 1,600 LF on the Old Farm tributary to Cabin John Creek, and 8,000 LF of Rock Creek tributaries in the Grosvenor area near I-270. The projects are influenced by highway culverts, ponds and a lake. Stream reaches were assessed using geomorphic/geofluvial methods, GIS-Hydro and HEC-RAS models.

Cabin Branch Phase 1, Stream Restoration and Watershed Assessment Area Study, Anne Arundel County, MD: Greg served as **Lead Stream Restoration Specialist** of the stream assessment, watershed investigation, and design concept identification and prioritization along 4,000 feet of stream channel. Assessment and reporting included natural resources inventory, wetland identification and avoidance strategy, fluvial geomorphic assessment/analysis including a BEHI/NBS for BANCS model, H&H modeling (GIS-Hydro, TR-20 and HEC-RAS), and stream functions pyramid reporting. Design approach includes floodplain reconnection, NCD and LSR designs, working with existing beaver habitat.

Design-Build Hampstead Bypass, Carroll County, MD (MDOT-SHA) [\$24M]: Served as **Stream Quality Monitor** during construction, responsible for designing and locating weirs for in-stream flow sampling sites. Monitoring plan used of a combination of ISCO automated samplers and grab samples to determine the impacts of the construction on sensitive habitats and to determine the effectiveness of E&S controls.

Gude Garden Pond & Downstream Wetland System Renovation/Retrofit, Brookside Gardens, Montgomery County, MD, Maryland-National Capital Park and Planning Commission: Greg served as **Project Manager and Lead Mitigation Designer** for the renovation and retrofit of the existing 3-cell pond and downstream wetland system. Project included outfall design; hydrologic and hydraulic analysis; flow balancing; wetland retrofit; plans, specifications, and estimate; agency permit approval; construction phase services; and as built preparation. Permits included Montgomery County, MDE non-tidal wetland approval, NRI/FSD and Forest Conservation approval from M-NCPPC.

Stoney Creek Wetland Remediation, Montgomery County, MD, National Institutes of Health: Greg served as **Project Manager and Lead Designer** for project to remove sediment from the in-stream pond and adjacent wetlands, stabilize eroded stream banks, and repair concrete dam. Developed design to restore wetlands depth, replant native wetland vegetation, dredge the sediments out of the pond, stabilize the stream banks and repair the control dam. Obtained MDE sediment control permit, and JPA for wetlands/waterways work.

Design-Build US Route 1 Improvements, Fairfax County, VA, FHWA-EFLHD [\$80M]: Greg served as **Wetland Permit and Mitigation Support** for 3.68 mile highway project near Fort Belvoir. Developed waterway construction/wetland permit application which included avoidance and mitigation narrative, impact plates, and compensatory mitigation plan. .

Years Experience:

Total 17 w/AMT: 11

Education:

MLA, Landscape Architect,
2005

Active Registrations:

MD Registered Landscape
Architect: #3520

Mr. Torgerson has 17 year of experience in landscape architecture and environmental planning for transportation and community projects and ensures that the landscape and architectural elements are completed using good professional judgement, meeting design requirements. His experience focuses on safe, aesthetically pleasing, context sensitive, sustainable and environmentally sensitive designs for transportation projects throughout Maryland, Virginia, and the District of Columbia. He has a thorough knowledge of applicable SHA standards and specs, Landscape Design Guide, AASHTO guidelines, ADA compliance, environmental regulations, Design/Build, and use of ProjectWise. He has prepared designs for highway intersections, noise

walls, bridge aesthetics, hardscapes, site contour grading, and stormwater BMPs. He has extensive experience with Roadside Tree Permits, reforestation, tree protection measures (including champion trees) and invasive species management plans. Mr. Torgerson has completed numerous planting designs for transportation projects and for SWM facilities, wetland mitigation, historic mitigation, screenings, and along the roadsides that are low maintenance, yet aesthetically pleasing. Relevant experience includes:

MD 4/Suitland Parkway Interchange, Prince George’s County, MD, (MDOT-SHA) [\$67M]: Served as **Lead Landscape Architect** for planning and design for urban streetscape including pedestrian circulation, bumpouts, planters, and LID planters to treat stormwater for the preparation of final design of the MD 4/Suitland Parkway Interchange. Mr. Torgerson supported partnering workshops with stakeholders and governmental officials by preparing graphics and displays to illustrate design intent, particularly the viewshed renderings that were critical to the National Park Service “buy-in” of the design solution. The project includes mainline widening, new interchange, five (5) new bridges, and intersection improvements.

MD 5/Naylor Road Community Enhancement Improvements, Prince George’s County, MD, (MDOT-SHA) [\$7.3M]: Served as **Lead Landscape Architect** for concept development and design of streetscape improvements in support of TOD development at Naylor Metro Station. The project includes pedestrian access/ADA improvements, turn lanes, bike lanes and streetscape details and design. Partnered with SWM designer to prepare context sensitive and low maintenance SWM solutions, meeting ESD requirements. Prepared public meeting displays and multiple design renderings.

Design-Build US Route 1 Improvements, Fairfax County, VA, (FHWA-EFLHD) [\$80M]: Served as **Project Landscape Architect** for a design-build project that widens and re-aligns Rotue 1 through two historic districts, Woodlawn Historic District in Mount Vernon Virginia, and the Pohick Historic District on the southern terminus of the project. Provided design for cultural and environmental impact mitigation, and infrastructure design for the

new roadway to blend with the character of the area in a context sensitive manner. Project included architectural treatments on MSE retaining walls and noise walls, SWM ponds with landforms to blend with the natural contour, SWM planting design, reforestation design tree protection measures, wetland planting design in the low and high marsh regions of the stormwater facilities, invasive species management, historic mitigation plantings, and landscape screening along SWM facilities using low maintenance, but attractive planting species.

Southgate Drive/US 460 Connector, Blacksburg, VA, Virginia Department of Transportation (VDOT) [\$46.7M]: Served as **Project Landscape Architect** for aesthetic treatments and planting designs for a grade separated interchange, two new roundabouts on Virginia Tech Campus, and relocated recreational trail. Activities include bridge and retaining wall aesthetic options to correspond to the character of the site, coordination with the University planners regarding the roadway character which will strive to a “parkway feel,” viewshed renderings to illustrate design options, tree protection measures for 200-year-old trees and their critical root zones.

Main Street Complete Street Improvements, Salisbury, MD, (City of Salisbury) [\$8.3M]: **Lead Landscape Architect** for context sensitive solutions and implementing a complete street design for the historic streetscape of downtown Salisbury. The project includes pedestrian/ADA improvements, decorative crosswalks, sidewalk improvements, site furnishings, lighting, walls, turn lanes, bike lanes, environmental site design using urban bioretention facilities and enhanced soils/planting areas for street trees, and mitigation of historic resource impacts.

New River Parkway (Route 125), Phase 1

Hinton, WV



Triton Construction built, and partially designed, the first 1.4 mile segment of the scenic, highway from Hinton to south of Richmond Bottom, which will eventually extend 10 miles from I-64 at Sandstone through Raleigh, Summers and Mercer Counties. The project -- the result of a partnership between the West Virginia Division of Highways, New River Parkways Authority, the National Park Service and FHWA -- created two lanes with shoulders to improve the mostly one-lane "shoulderless" road, included a new bridge, and used a context sensitive approach with aesthetic treatment on walls and bridge parapets. Upgrading, re-aligning and improving this roadway into the New River Gorge National Park presented multiple challenges:

- The construction sequence and traffic control scenario in the design plans presented significant hurdles due to the constrained available width throughout the project, with steep embankments adjacent to the new river on one side and steep mountainous terrain hillsides along the other. Located within the National Park, clearing and excavating into the hillsides was restricted to the absolute minimum in order to maintain Park Service buy-in.
- Performing significant grading and grading work immediately adjacent to the protected, scenic New River.
- Maintaining 2-way traffic throughout project, with existing roadway of insufficient width to accommodate 2-lanes of traffic.
- Achieving the desired architectural finish, fitting the scenic surrounding of the park and adjacent river.
- Significant overhead utility relocations along much of the project length in terrain that did not allow readily relocating the utilities off the roadway.

Triton Construction assessed the project challenges and developed a set of design and construction solutions which addressed the challenges while meeting the original completion schedule. Our team formulated a proposed alternative sequence which more readily allowed vehicles to pass through the work zone and eliminated unacceptable drop offs, while significantly altering the roadway profile to eliminate alternating and excessively steep vertical curve crests and sags. Triton also focused on sequencing our work to minimize and prevent erosion and sediment risk to the New River. We worked "hand-in-hand" with the National Park Service personnel to achieve the desired architectural appearances exceeding the expectations of the Park personnel without increasing the project costs. In addition, two significant design modifications were made to the plan concepts during construction.

- (1) Through the Value Engineering process, Triton reduced the length of the bridge over Madam Creek from a two span 220 Ft bridge to a single span 158 Ft bridge while maintaining sufficient waterway opening and retaining the architectural features desired by the National Park Service.
- (2) A prominent architectural feature involved treating five hillside retaining walls to mimic aged laid sandstone block walls. Working with the WVDOH and the National Park Service, Triton modified the process for achieving the final architectural appearance. The construction plans solely relied on the final staining process to achieve the desired effect, after the concrete was cast using form-liners to mimic individual blocks. Triton worked closely with the National Park Service to develop a

LEAD CONSTRUCTION FIRM

Triton Construction, Inc.

OWNER & CONTACT INFO

West Virginia Division of Highways
Duane Blevins, PE
Phone: 304.487.5228

CONTRACT/PROJECT NO.

X341-125-0.02 02

DELIVERY METHOD

Design-Bid-Build (*with significant Contractor-initiated design during construction*)

CONSTRUCTION COST

Initial Contract Value: \$11.3

Final Contract Value: \$12.0

Additional parcel structures demolition, paving added outside original limits

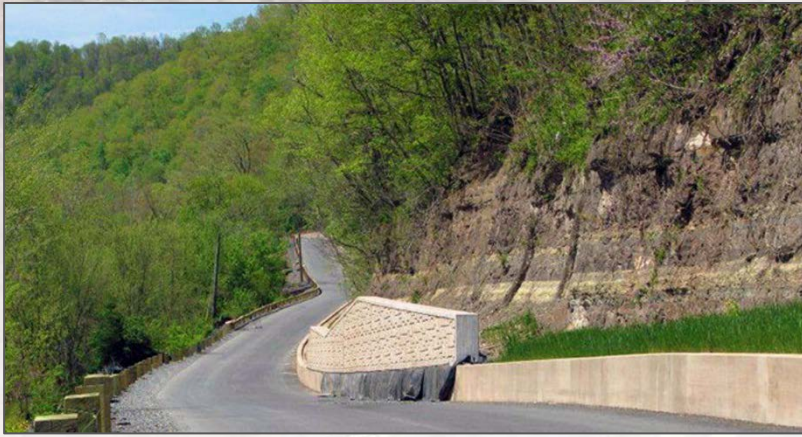
SCHEDULE

Initial Completion Date: 6/28/2013

Utility Delay Date: 10/17/2013

Final Completion Date: 9/4/2013





Triton won The Contractor's Association of West Virginia Quality Concrete Construction Award for this project.

combination of integral concrete coloring, staining the recessed joints, and sealing the final surface to achieve a superior effect. While this concept did not result in cost savings, the finished product was much improved, and provided a maintenance free lifespan.

Triton aggressively pursued progressing this project in spite of utility delays and ROW Parcels not being available when anticipated, which was supposed to allow final paving at the start in the Spring 2013. We sequenced the work to allow the overhead utilities to be relocated in sections into the barrier wall along the mountainous terrain hillsides, so that service was not interrupted while maintaining progress without excessively extending the completion date. Paving progressed as anticipated, with substantial completion in early June of 2013.

Triton overcame one last hurdle, completing the project by actively supporting the DBE Guardrail installer who was in the process of ceasing their operation. Triton provided the assistance for architectural guardrail components to be acquired, and payroll for the subcontractor to complete the project. With the subcontractor unable to pursue progress as normally would have been expected, the completion was not achieved until late Summer 2013, but was still achieved early, with project DBE goals successfully achieved.

The project demonstrates Triton's ability to plan and sequence grading operations in an environmentally sensitive and scenic area while maintaining safe use in very constrained conditions with multiple stakeholder interaction. The project also exemplifies Triton's leadership, through their management of the redesign to provide greater return for the project owner while maintaining essential features. Finally, Triton's ability to interact with and satisfy external stakeholder concerns and desires, and their commitment to actively support its subcontractors and meet project DBE goals, were clearly demonstrated on this project.

Successful Methods, Approaches, and Innovations

A Safer Work Zone – Triton's redesign of the TCP created a safer work zone. The existing road was only 1 ½ lanes wide, the west side against the hillside with minimal widening to that side, and the East side having steep embankment leading to the river. As the profile was being adjusted, traditional staged construction resulted in elevation differences between lanes over 5-feet with no room to set barrier. We installed the west side walls and then adjusted the profile to avoid this dangerous situation.

Design Excellence & Reduced Maintenance – Triton's design approach for the aesthetic treatments provided a superior appearance, and virtually eliminates long-term maintenance.

Commitment to both DBE Program and Schedule – Completed project one (1) month early in spite of the impending collapse of a DBE subcontractor.

Applicability to US 219 Goals

Schedule

- ▶ Construction time saved and public inconvenience minimized due to alternative construction sequence
- ▶ Completed the project one (1) month early in spite of DBE contractor inability to continue services

Environmental

- ▶ Located within National Park, impacts were to be absolutely minimized, therefore slope grades were maximized and clearing was minimized.

Design Excellence

- ▶ Long term maintenance for walls was virtually eliminated by the aesthetics

Project Relevance

- > Modified/Improved roadway alignment (1.4 miles)
- > New Bridge w/aesthetic treatment
- > Protection of Environmental Resources: Waters of the US (New River), scenic parkland
- > Drainage and SWM
- > Context Sensitive Design
- > Utility Relocations

WV 10 | Road Improvements & New Bridge over Guyandotte River



Logan, West Virginia

The project provided one half mile of roadway re-alignment, two miles of roadway repair, and a new bridge crossing of the Guyandotte River. The Purpose and Need is better access and mobility for the Logan community.

The bridge was designed as 7-span, 1095 foot long structure with a maximum span length of 180 feet. The original bridge was designed as dual adjacent structures to achieve four (4) lanes, with a 42" median barrier and longitudinal compression seal along the new median barrier. Piers were single column with hammer head caps supported by end bearing caissons. Eight (8) steel girder lines which were potentially unstable to erect, of which Contractors were warned by a WVDOH bid addendum. Furthermore, the original retaining walls were designed to be constructed along the Guyandotte River with footing elevations below the ordinary high water elevation. The as-designed walls interfered with the intake tunnel for the Logan City Water works, requiring its demolition and a new pump station/raw water intake to be constructed as part of the contract.

Triton Construction assessed the project challenges and developed a set of new design and construction solutions which addressed the challenges while beating the original completion schedule. Triton hired local engineers and partnered with them to develop modified designs as Value Engineering proposals. The revised bridge design was for one structure, utilizing similar pile supported spread footing retaining wall abutments with minor modifications, 2-column spanning caps supported

LEAD CONSTRUCTION FIRM
Triton Construction, Inc.

OWNER & CONTACT INFO
West Virginia Division of Highways
Chris Collins, PE
304.528.5625

CONTRACT/PROJECT NO.
EBNH-0010(223) TC

DELIVERY METHOD
Design-Bid Build
(with significant Contractor-initiated re-design)

CONSTRUCTION COST
Initial Contract Value: \$17.7 Million
Final Contract Value: \$18.8 Million
Owner-directed change order

SCHEDULE PERFORMANCE
Initial Completion Date: 6/30/2015
Final Completion Date: 12/2014



by end bearing caissons, thus eliminating the longitudinal compression seal. The bridge was reduced to a 4-span bridge, 850 feet in length, and the steel superstructure was reduced to six (6) girder lines, with beams designed to be stable during the erection process.

A second redesign VE proposal was prepared for the retaining walls, which were established as MSE walls with an internal MSE zone designed to function properly below the 100-year flood elevation. The redesigned walls eliminated the need to demolish the raw water intake tunnel

and construct the new intake system. As part of the accepted VE change, the existing intake system was modified to remediate deficient features, adding a new intake system by utilizing the existing tunnel to significantly improve the system capabilities.

The WVDOH gained additional benefit due to the diligence of the Triton "quasi-Design-Build" team. Our engineer discovered extensive old mine works directly below the bridge on the east approach which would have caused significant delays when the as-designed caissons encountered the old works. Instead, Triton was able to develop and implement a remediation plan without causing delays to the project completion date.

Triton constructed the embankment approach for the east side along the Guyandotte River with rock blankets and slope protection features to prevent the embankment from failing during high water events.

Project Relevance

- > New Bridge
- > 1.5 mile of new road alignment
- > Two (2) miles of roadway alignment repair
- > Protection of Environmental Resources (Waters of the US, archaeological site)
- > Major Grading
- > Utility Relocation



Applicability to US 219 Goals

Schedule

- ▶ Impacts of mines evaluated through VE process mitigated potentially significant schedule impacts.
- ▶ Proactively hired engineers and developed new design/construction solutions that allowed for a more aggressive schedule.

Environmental

- ▶ Constructed embankments with rock blankets and slope protection.

Design Excellence

- ▶ Work with local stakeholders to address non transportation issues in a “practical design” approach salvaging and improving a raw water intake.

Project Roadway Construction: The project required constructing re-aligned WV 10 tie-in to the existing alignment, and a connector to an existing city street, constructed in a sequence that allowed traffic lanes to be maintained. In addition, due to their excellent performance on the contract, Triton was requested to repair two miles to previously pre-graded roadbed, addressing major soil slides that developed after the original construction was completed by another contractor. Triton also performed additional excavation and stabilization to prevent additional slides in areas demonstrating slip potential.

This project demonstrates Triton’s ability to:

- Manage a complex design engineering process in the midst of construction, to address both the re-designed bridge and unforeseen issues, without adding any time to the schedule.
- Perform major roadway construction while maintaining traffic on an access corridor that also serves as major coal haul route, without causing extensive traffic delays.
- Perform excavation and embankment construction, overcoming slope failures and removing steep slopes to a stable condition.
- Work with stakeholders outside of the project owner, such as the city of Logan to address its raw water intake, while maintaining service to its customers.

Successful Methods, Approaches, and Innovations

Reduced both Cost and Maintenance – The combined effect of the Triton Value Engineering, Design-Build proposals for bridge and retaining wall design eliminated the need to construct a new raw water intake system for the City of Logan. The elimination of the traditional concrete cantilever walls, and use of MSE walls, will mean less maintenance for the WV DOH.

Environmental Protection and Stewardship – Extreme care was required during construction along the banks of the Guyandotte River, due to the potentially unstable subgrade. All Waterway Construction permit water quality protection measures were strictly followed, with no environmental violations issued.

Schedule – Due Triton’s design efforts using a Value Engineering process, WVDOH was able to address significant mine works underlying the new bridge which could have greatly hindered the schedule. The project was substantially complete 7-months early, despite redesigning the bridge, while also overcoming a one-month utility delay – all without the WVDOH requesting Triton to accelerate construction.

MD 956 (Patriot Parkway) over North Branch of Potomac River Allegany County, MD

East Coast Bridge, LLC
a Wholly Owned Subsidiary of

TRITON
CONSTRUCTION, INC.

This project consisted of replacement and rehabilitation for bridge number 1098, a two-lane bridge carrying MD 956 over the North Branch of the Potomac River. The 482 foot long bridge in current condition was declared structurally deficient, and the rehabilitation includes concrete superstructure and modifying the steel superstructure.

SHA's design plan presented a construction sequence to replace only 80 feet of a single lane at a time, due to the limited loading constraints. As well, virtually no ground access was allowed below the bridge due to archeologically sensitive areas. The SHA envisioned achieving the concrete superstructure replacement and steel superstructure modifications using continuous one lane closure throughout the 2016 construction season, followed by cleaning and painting the steel superstructure the following Spring under daily lane closures. Triton's planning and execution allowed for the continuous lane closure to be removed by October 1, 2016 and the entire project, including painting, to be substantially complete by the original Incentive/Disincentive date.

Project Challenge | Virtually no ground access was allowed below the bridge due to archeologically sensitive areas. This required the team to install the debris containment system and perform all the work from the limited deck closure area instead of supporting the construction from the area below the bridge adding, another obstacle to be overcome in a very compressed construction period.

This project demonstrates Triton's ability to plan and execute its work to overcome significant obstacles and constraints, which allowed the project to be completed significantly ahead of schedule, reducing and the period of time affecting the traveling public.

LEAD CONSTRUCTION FIRM

East Coast Bridge, LLC

OWNER & CONTACT INFO

Maryland State Highway
Administration
Stephen Bucy, PE
District 6 ADE Construction
301.729.8410

CONTRACT/PROJECT NO.

AL4595180

DELIVERY METHOD

Design-Bid-Build

CONSTRUCTION COST

Initial Contract Value: \$4.43 Million
Final Contract Value: \$4.37 Million

SCHEDULE

Original I/D Date: 11/15/2016
Achieved Incentive Date: 10/01/2016
Original Completion Date: 6/15/2017
Substantial Completion: 11/15/2016



Project Relevance

- > Maryland DOT- SHA Project
- > District 6 Project
- > Bridge Construction
- > Environmental Resources and Impacts: Wetlands, Waters of the U.S., Archaeological Site
- > MDE Compliance for SWM and E/S Control
- > Time of year restrictions



Applicability to US 219 Goals

Schedule

► Project completed significantly (6 months) ahead of schedule, eliminating months of daily lane closures.

Environmental

► Archeologically sensitive areas required debris containment and that all work be performed within the deck closure.

Design Excellence

► Significantly reduced project impacts to the traveling public

SHA District 6 | This project and others in District 6 have afforded Triton’s staff the opportunity to work closely with D6 Construction on complex issues. Largely because of East Coast Bridge/ Triton’s successful execution of the MD 956 bridge project, we have scored excellent grades on the SHA report card for 2016. We are proud to partner with SHA to help deliver important transportation projects to the communities of western Maryland.

ODC41 rev. 12-16-10

MARYLAND STATE HIGHWAY ADMINISTRATION
SHA RATING OF CONTRACTOR/ SUBCONTRACTOR

Contract No.: AL4595180 *District: District6 *Div: GD *Rating Type: Interim

Project Description: MD 956 - Deck Replacement & Rehabilitation of Bridge No. 0109800 over the North Branch of Potomac River
Contractor Name: East Coast Bridge, LLC

Grading Scale	
4.0 - 5.0	A
3.0 - 3.9	B
2.0 - 2.9	C
1.0 - 1.9	D
0.0 - 0.9	F

22 of 26 criteria graded from questions 1-7 above.

	Score	x Wgt =	Grade
1. Contractor Administration, Personnel, Equipment, Partnering, and Public Relations	5.0	0.10	0.50 A
2. MBE/DBE/WBE Compliance - [Prime Contractor Only] (10%)	5.0	0.10	0.50 A
3. Quality of Work (40%) --- This criteria MUST be rated!	4.0	0.40	1.60 A
4. Safety (10%)	4.7	0.10	0.47 A
5. Project Schedule (10%)	5.0	0.10	0.50 A
6. Erosion & Sediment QA (Environmental Stewardship) (10%)	4.0	0.10	0.40 A
7. Maintenance of Traffic QA (10%)	4.0	0.10	0.40 A
Total Weight of Criteria Used:		1.00	
Sum of Grades = Raw Score:		4.37	
Sum of Grades / Total Weight of Criteria Used = Final Adj. Score:		4.37	
		[4.0 to 5.0 = A] [3.0 to 3.99 = B] [2.0 to 2.99 = C] [1.0 to 1.99 = D] [0.0 to 0.99 = F] Letter Grade:	A

2016 MD 956 Project Ratings from MSHA

Successful Methods, Approaches, and Innovations

Reduction of Cost to Public – Triton’s planning and execution allowed for the continuous lane closure to be removed by October 1, 2016 versus Spring 2017.

Environmental Protection and Stewardship – Virtually no ground access was allowed due to archeologically sensitive areas and performed all the work from the deck closure.

Schedule – *“Contractor aggressively pursued the contract, properly scheduling all materials, subcontractors, etc. this was a challenge with multiple phase requiring all subs to mobilize 12 times, on time and completing work to specification, as well as ahead of schedule. Contractor maintained existing deck and roadway requiring numerous prompt mobilizations in emergency situations.”* –MD 956 Rating of Contractor Comments.

MD 4 & Suitland Parkway - Interchange and Roadway Improvements

Prince George's County, Maryland



As part of a corridor improvement plan for MD 4, AMT prepared final design and bid documents for a new grade separated interchange at MD 4 and Suitland Parkway, and all associated roadway improvements. AMT provided concept planning, preliminary and final design, and construction phase services.

The project includes new interchange ramps; MD 4 mainline realignment, reconstruction, and widening; new frontage roads; retaining walls; multi-use trail; intersection improvements; utility corridor; and reconstruction of a historic stone bridge. The AMT team developed multiple interchange configuration alternatives using an inclusive stakeholder process, resulting in the selection of a diamond interchange with a directional flyover ramp. Key stakeholders in the planning and design included the National Park Service (NPS), FHWA-Eastern Federal Lands, Joint Base Andrews (JBA), Prince George's County, and utility companies.

Following 100% design completion and an initial advertisement at end of 2015, the project was chosen by MDOT-SHA as one of the first two "practical design" assessment projects. Two years earlier, AMT had developed a phased construction recommendation, supported by traffic analysis and cost estimates, deferring the flyover ramp and other work to future contracts. The Practical Design process resulted in a similar plan, with reduction of through lanes and removal of three (3) bridges, including the flyover, projected to reduce initial construction cost between 25% and 30%. The following modifications to the original design were made, still meeting the project's purpose and need without compromising safety:

- Removed proposed flyover ramp and provided third left-turn lane on the NB MD 4 ramp to Suitland Parkway. This yielded high cost savings due to the removal of three structures. The risk was low as regional traffic growth had slowed, the interchange will function sufficiently, and the flyover ramp could be constructed in a future contract. Lesser impacts to NPS property, and tree impacts reduced.
- Reduced bridge width by one lane generated additional savings. Level of service was acceptable.
- Reduced the mainline by two lanes inside the interchange. Travel forecasts didn't justify adding a third lane for the next 20 years. The roadway was graded for the ultimate design.
- Removed on/off ramps into Pepco property providing access to/from MD 4 instead of through the Westphalia intersection. Grading was maintained so as not to preclude future ramp construction.

LEAD DESIGN FIRM

A. Morton Thomas and Associates, Inc.

OWNER & CONTACT

Maryland DOT - State Highway Administration
Moreswar Kulkarni
410.545.8825

CONTRACT/PROJECT NO.

PG 618-5170R

DELIVERY METHOD

Design-Bid-Build

CONSTRUCTION COST

Initial Contract Value: \$67.7M

Final Contract Value: Under

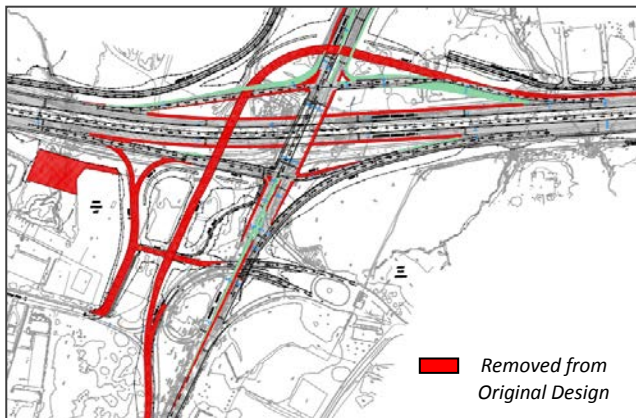
Construction

CONSTRUCTION SCHEDULE

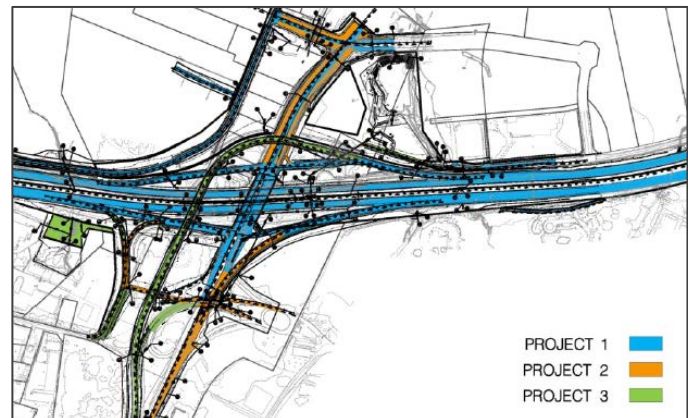
Initial Completion Date: 10/2020

Final Completion Date: Under

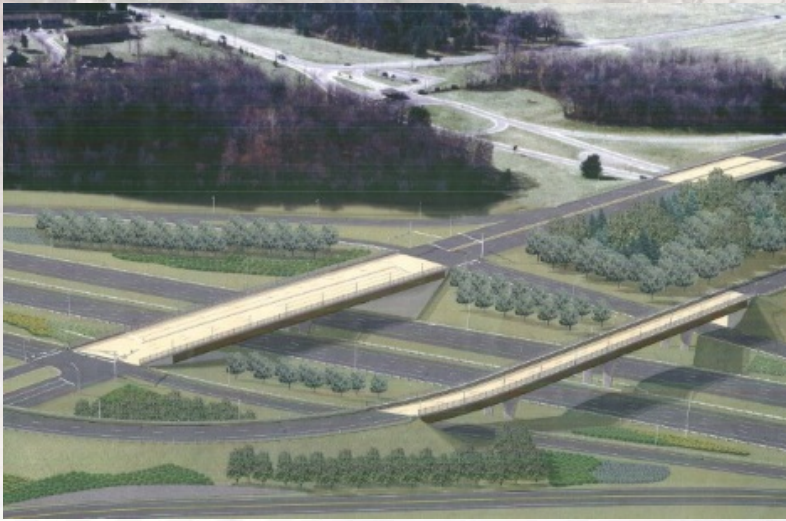
Construction



Final "Practical Design" Alternative
2016 Bids: \$67.7M to \$89.4M



2013 Phased Construction Concept Proposed by AMT
Project 1 Engineer's Estimate: \$78.9M



Applicability to US 219 Goals

Schedule

- ▶ Re-design to remove fly-over and other modifications per “practical design”.
- ▶ Performed within 9 months with bids within 1% of engineering cost.

Environmental

- ▶ Wetland, Stream, and reforestation mitigation both on site and off.

Design Excellence

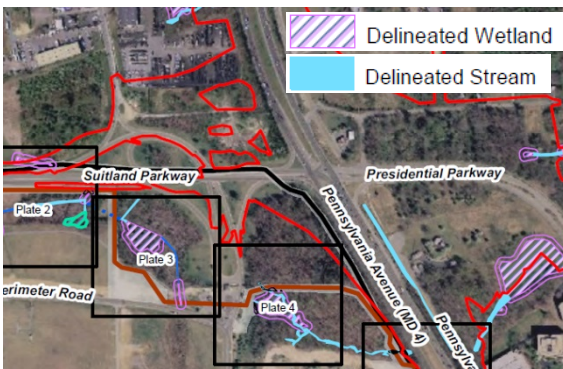
- ▶ Landscape Architect plans consistent with NPS “viewshed” requirements.
- ▶ First “significant” TMP under taken for a SHA project.
- ▶ First “Practical Design” implementation

Unique aspects of this major transportation design project include:

Transportation Management Plan (TMP) – SHA’s first TMP for a “significant” project. Conducted an extensive MOT Alternatives Analysis, given complex construction phasing. Work zone strategies were recommended to mitigate traffic impacts, including an incident management detour plan.

Landscape Architectural Design – Prepared landscape architectural plans consistent with the National Park Service’s (NPS) “viewshed” requirements. In a collaborative effort with NPS staff, reforestation plans and specific NPS design requirements were incorporated in the roadway, bridge and landscaping plans. A 3D visualization was a key tool for reaching design consensus with the NPS.

Stormwater Management and E/S Control – Comprehensive SWM analyses to determine the most effective quantity/quality solution. Prepared extensive E/S phasing plans compatible with MOT.



Environmental Impacts and Mitigation – Although located in an urban area, the project has both wetlands and streams present within its limits. Just over an acre of wetlands will be temporarily impacted, though permanent impacts were minimized to only 1709 square feet. The project also permanently impacts 2479 feet of Waters of the U.S., and 27 acres of forest. Reforestation was designed by the AMT team for 24 acres of on-site reforestation, with 3 acres provided offsite. Compensatory mitigation for stream impacts is provided through a stream restoration site in

District Heights, which will improve bank stability, riparian habitat, and in-stream ecology, replacing the functions and values impacted by the MD 4/Suitland Parkway project.

Successful Methods, Approaches, and Innovations

- Incorporated lightweight fill aggregate and foam concrete in embankments to reduce loads and avoid settlement, thus preventing future failure of utility lines.
- Prepared 3D visualization of proposed interchange and landscape treatment from multiple views for NPS to ensure a visual “gateway” was created with the associated improvements.
- To expedite utility relocations, AMT developed contract plans for construction/grading of a utility corridor. These plans were broken-out of the main contract to simplify procurement, fast-track construction and expedite the utility relocations.

Project Relevance

- › Large Scale, Maryland DOT- SHA Project
- › Interchange Design
- › New Bridges
- › Environmental Resources and Impacts: Park Land, Wetlands, Waters of the U.S., Forest/Trees
- › MDE Compliance for SWM and E/S Control
- › Context Sensitive Approach
- › Practical Design Solutions

Roadway Relocation, Roundabouts and Intechange Southgate Drive and US 460 Bypass

Blacksburg, Virginia



AMT designed a new interchange, two new roundabouts, and one (1) mile of relocated roadway alignment through wooded and agricultural land for this project adjacent to Virginia Tech (VT) in Blacksburg, Virginia. The project purpose is to eliminate the existing signalized at-grade T-intersection at the heaviest used, primary entrance to VT campus. An innovative configuration, known as the diverging diamond interchange (DDI), was selected through a rigorous screening process culminating in an Interchange Justification Report. Coordination was needed with several adjacent projects, including the Tech airport runway extension, US 460



Rendering of Aesthetic Bridge Design

Connector, and Hokie Bikeway. The bridge is considered a gateway to the university and was designed with aesthetic features with architectural fascia beams and custom

formliner resembling “Hokie Stone”.

The project scope includes new roadway alignment, existing pavement rehabilitation, new bridges, drainage, stormwater management, erosion & sediment control, landscaping, signing and marking, interchange lighting, construction of small structures such as culverts, utility coordination and relocations, and environmental permit acquisition. The project design also accommodated the **future expansion of a roundabout**, future widening of US 460, and a future 4th leg connection to the DDI.

AMT’s team designed roadway improvements including new auxiliary lanes on US 460, interchange ramps, realignment of Southgate Drive, realignment of Research Center Drive, and two new roundabout intersections. The team also designed new bridges for the grade separation, MSE and soil nail retaining walls, context-appropriate planting and landscape design, closed and open drainage, SWM quality and quantity control facilities, erosion & sediment control, new culvert crossings, and a shared-use path with grade separated crossings. Also included in the scope of the project were traffic analysis, major interchange signing, lighting photometric analysis, pavement markings, signal design, a multi-phase



New Roundabout under Construction

maintenance of traffic plan with a TMP, utility relocations of fiber, water main, and a sanitary force main, and demolition of Virginia Tech’s existing Dairy complex, which interfered with the roadway re-alignment.

AMT encountered numerous environmental challenges including old-growth (200 year old) forests, wetlands, jurisdictional channels, an archaeologically significant site, and endangered species. AMT conducted a tree survey noting species, size, and health, and significant effort was taken by the design team to reduce impacts to

LEAD DESIGN FIRM

A. Morton Thomas and Associates, Inc.

OWNER & CONTACT INFO

Virginia Department of Transportation (VDOT)
Philip Hammack, PE
540.378.5041

CONTRACT/PROJECT NO.

0460-150-204

DELIVERY METHOD

Design-Bid-Build
(Turn-key Design)

CONSTRUCTION COST

Initial Contract Value: \$46.7 Million
Final Contract Value: Under Construction

CONSTRUCTION SCHEDULE

Initial Completion Date: 12/2018
Final Completion Date: Under Construction

Project Relevance

- > New alignment
- > Relocated roadway alignments
- > New Roundabouts
- > New Bridges with architectural treatment
- > National Highway System
- > Environmental Resources and Impacts: Wetlands, Waters of the U.S., Forest/Trees, Archaeology
- > Accelerated Design Schedule
- > Context Sensitive Approach
- > Rolling Terrain with Challenging Subsurface Conditions (Rock/Karst)
- > Proactive Design Approach (acting as Turn-key consultant for VDOT)

the sensitive environmental areas, including locating the interchange where the impacts to environmental areas would be minimized, re-using the footprints of existing gravel roads and paths in the forest for proposed roads and trails, and tailored vertical alignments to avoid cutting through root zones.

Still Shot from AMT's Award Winning 3D Simulation



Applicability to US 219 Goals

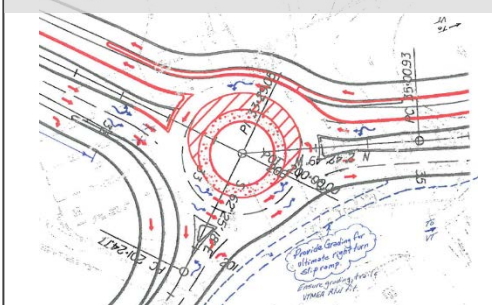
- **Schedule** - 6 months from the Public Hearing (~40% design) to 100% PSE submission
- **Environmental**-Minimized impacts to 200-year-old trees by adjusting alignment to avoid cut through root areas; Context Sensitive design for a gateway treatment at primary entrance to Virginia Tech.
- **Design Excellence**-Developed stakeholder inclusion process through design which allowed input early and kept design on track. Bridge and wall architectural elements

Successful Methods, Approaches, and Innovations

The AMT design team provided creative solutions to provide for stakeholder inclusion, accelerated schedule, minimization of impacts, and produce an excellent design project, including:

- **Innovative Diverging Diamond interchange:** The DDI provided for the least overall cost due to optimization of the bridge footprint, while also providing excellent traffic level of service during peak hours. The solution also minimized environmental impacts and right-of-way needs.

Staged Roundabout (initial build depicted in red)



- **Roadway Roundabouts** - AMT's design utilized 3rd generation "best practice" recommendations for approach and departure geometry, fastest path analyses, and yield bar pavement markings. The southern roundabout was designed to the ultimate footprint, but construction is staged to build only a portion of the pavement until traffic volume triggers future expansion for the completion of the second roundabout lane, and an additional southbound approach/departure lane.
- **Trail roundabouts** - implemented to help alleviate potential safety concerns at two trail intersections where speed reduction of bikers was a critical concern.

- Held discipline specific task forces which included client (VDOT), design team, Town, Virginia Tech, and others. The process was key for meeting the accelerated project schedule, in that it fostered communication and consensus building among stakeholders with differing priorities.
- Implemented alignment and grading techniques to avoid damage to old growth forest.
- Involved landscape architect team in grading design, to provide context sensitive landforms for SWM pond grading and cut slopes. This was important to VT, to provide a visually interesting "entry sequence" when arriving to campus from the US 460 interchange.
- Provide SWM design to separate airport runway flow from roadway flow, thus reducing VDOT's long term maintenance/assets.
- Utilized cutting edge technology to develop realistic, three-dimensionally accurate visualizations, bird's-eye views, and a drive-through movie using Autodesk 3DS Max. Typically used for video games and other sophisticated animation, the software was mastered by AMT's talented graphic artist team to provide important visual aids to Virginia Tech, who was donating the right-of-way.

The Southgate Drive/US 460 project won the 2016 Merit Award from the VA Chapter of the American Society of Landscape Architects.

Design-Build US 1 Improvements at Fort Belvoir

Fairfax County, Virginia



AMT is the Engineer of Record for this 3.68 mile long design-build project in northern Virginia, which provides traffic relief for the ongoing BRAC consolidation occurring in the vicinity of Fort Belvoir. The project, from Telegraph Road north to Mt. Vernon Memorial Highway, realigns and/or widens Route 1 from a four-lane undivided highway to a six-lane divided highway, improves intersection operations and capacity with new traffic signals and turn lanes, provides new large culvert crossings and a bridge to convey streams under the road, and provides parallel pedestrian and bicycle facilities for the entire corridor.

The scope of improvements included new roadway alignment and widening, existing pavement rehabilitation, new bridges and retaining walls, drainage, stormwater management, erosion & sediment control, reforestation, landscaping, signing and marking, roadway lighting, utility coordination and extensive relocations (power, telecommunications, gas, water and sewer), and environmental permit acquisition. The project design also accommodated future widening at the northern limit of work as well as the future construction of Bus Rapid Transit lanes in the median.

Improvements for which AMT was responsible include realignment of Route 1 in the Woodlawn Historic District, widening for the entire corridor, new bridges over Accotink Creek to resolve frequent flooding of the roadway, MSE retaining walls, noise barriers, reforestation, closed and open drainage, six (6) SWM ponds, 4-phase erosion & sediment control, new culverts, several wildlife crossing structures under Route 1, and the removal of an existing military railroad crossing. Also included is signing, lighting, pavement markings, signal design, a three-phase maintenance of traffic plan which avoided detours for all work, utility relocations, and structure demolition. The design plans were subdivided into phases, both geographically and by discipline, to facilitate early start of construction.

The project permitting and compensatory mitigation for the project's permanent impacts to 2.2 acres of wetlands and 3,480 LF of stream. AMT obtained permits from several agencies including: 404 Joint Permit for wetland and stream impacts from ACOE, VA DEQ and Virginia Marine Resources Commission, Virginia DEQ for Stormwater Management and Erosion & Sediment Control, and Fairfax County building permit for the relocation of a historic house. AMT also managed the right-of-way acquisition, which impacted 25 parcels (primarily total takes) and required more than 100 relocations.

LEAD DESIGN FIRM

A. Morton Thomas and Associates, Inc.

OWNER & CONTACT INFO

Federal Highway Administration –Eastern Federal Lands Highway Division (FHWA/EFLHD)

Thomas Shifflett, PE
703.404.6323

CONTRACT/PROJECT NO.

DTFH71-12-R-00007

DELIVERY METHOD: Design-Build

CONSTRUCTION COST

Initial Contract Value: \$69 Million

Final Contract Value: \$80 Million

(scope expanded by client to include new trail connection, trail bridge, new signals, CCTV at signals)

SCHEDULE PERFORMANCE

Initial Completion Date: 2/28/2016

Final Completion Date: 6/1/2017

(asbestos abatement +2 months, utility delay/strike +5 months, weather days +1 month, owner change orders + 7 months)

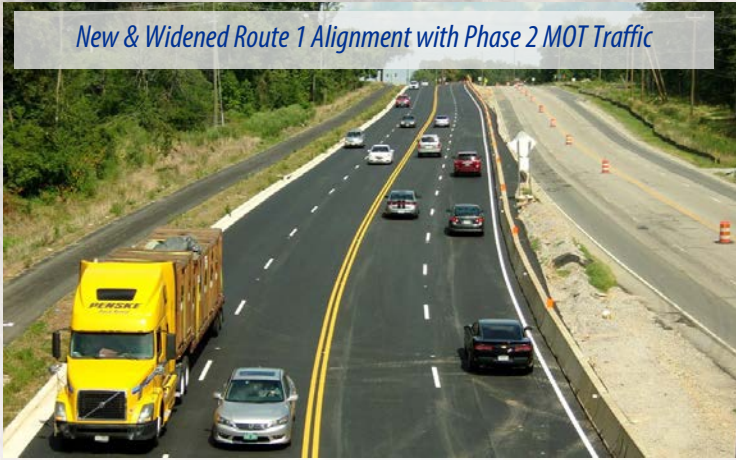


New Route 1 Alignment through Woodlawn Historic District

Project Relevance

- > Design-Build Project
- > US 1 New Alignment (0.7 miles) with tie-in to existing US 1
- > Significant Environmental Impacts (including 10 Acres of Reforestation, & Compensatory Wetland/Stream Mitigation)
- > Historic District
- > FEMA Floodplain Impacts/Model
- > Utility Relocations
- > Multiple Stakeholders

New & Widened Route 1 Alignment with Phase 2 MOT Traffic



Route 1 Displays at "Pardon Our Dust" Public Meeting



Applicability to US 219 Project Goals

- **Schedule** – Produced first construction package (advance grading/utilities) within 1 month of 60% design approval; Acquired 404 Permit from ACOE and VA DEQ within 7 months of application (2 months ahead of Contractor’s schedule)
- **Environmental/NEPA Commitments** – Met Programmatic Agreement to minimize property impacts in Woodlawn Historic District using steepened slopes, narrowed lanes, and reduced buffer to trail (design waivers)
- **Design Excellence** – Developed a Design RFI and field issue resolution ladder to facilitate sound decision making and expedited solutions during construction

Successful Methods, Approaches, and Innovations

The AMT design team provided creative solutions to produce design excellence while facilitating quicker construction and reduced impacts, including:

- Designed an advanced grading package to rough grade and allow utility poles to begin relocations early, thus facilitating earlier start of construction.
- Designed the dualized lanes with bifurcated profile to balance earthwork, minimize footprint, grading, and reduce environmental impacts.
- Developed slope stability design solutions including pile supported slopes and seep relief designs, which in turn allowed the slopes to be contained within ROW and minimize overall footprint.
- Implemented the “1% Rule” at large stream crossings to minimize SWM detention footprint. This resulted in elimination of a SWM pond which would have impacted an existing wetland, and reduced VDOT’s maintenance burden.
- Utilized excess median area for and alignment shift along Fairfax County Parkway, to avoid a sensitive FEMA floodplain impact.
- Designed landform grading for ponds and historic mitigation landscaping to mitigate impacts in the Woodlawn Historic District.
- Negotiated with permitting agencies (Marine Resources Commission, Virginia Department of Environmental Quality, and ACOE) to remove time-of-year restrictions for five Waters of the U.S. locations, and to allow sand bag diversions in four others, thus allowing construction to continue without unnecessary interruption.

Aesthetic Pond Design and Historic Mitigation Landscaping



The project design was completed within budget and in accordance with the approved CPM schedule. Design of several owner-directed contract modifications which extended the schedule have been completed, including a new trail extension and signal design updates to meet the 2016 VDOT guidelines which were adopted after project award.

ORGANIZATION CHART

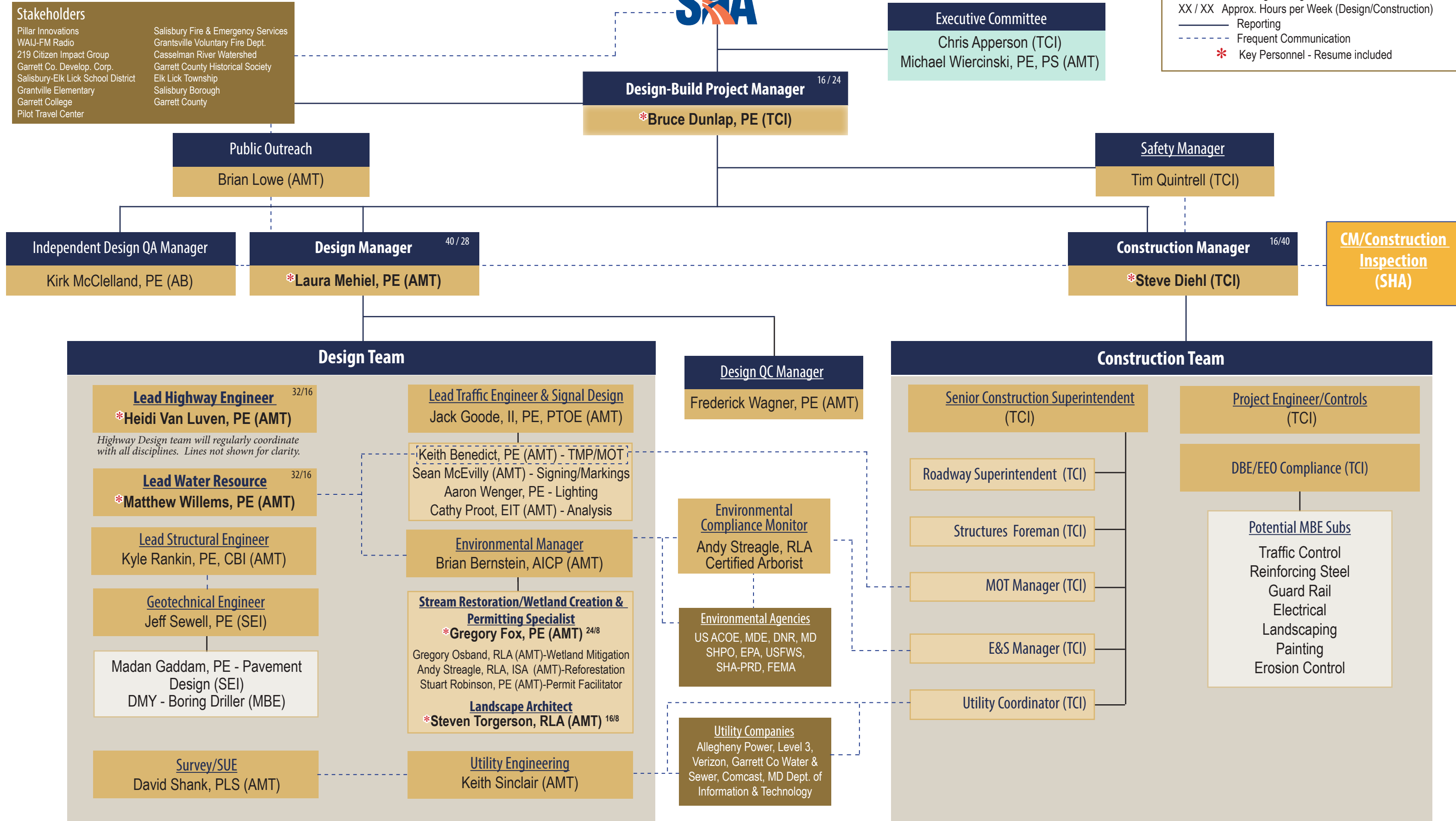
US 219 • I-68 to Old Salisbury Road Design Build

Technical Proposal • Contract No. GA6465270 • FAP No. AC-ADHS-203-1(3)N



LEGEND

- TCI Triton Contractors
- AMT A. Morton Thomas and Associates, Inc.
- AB AB Consultants, Inc.
- SEI Schnabel Engineering, Inc.
- XX / XX Approx. Hours per Week (Design/Construction)
- Reporting
- - - - - Frequent Communication
- * Key Personnel - Resume included



B. PROJECT UNDERSTANDING AND DESIGN-BUILD APPROACH

B-i: Understanding the Most Relevant and Critical Risks

In order to effectively assess the project risks, the Triton Design-Build team began with a thorough review of the project background, purpose and need, selected alternative, and SHA's established goals of the Design-Build contract. An understanding of the project is essential, so that we can best identify key issues that have the potential to jeopardize the project's success. Our project review and assessment is briefly described here, as a tool to frame the risk discussion.

Project Overview

The Maryland Department of Transportation's State Highway Administration (SHA), in cooperation with the Federal Highway Administration (FHWA), are pursuing improvements to the 1.4-mile segment of US 219 (Chestnut Ridge Road), from 1-68 to Old Salisbury Road in Garrett County. The US 219 Improvement Project was identified as a stand-alone project in the US 219: 1-68 (MD) to Meyersdale (PA) Planning and Environment Linkages (PEL) study. The US 219 Improvement Project adds a segment to Corridor N of the Appalachian Development Highway System (ADHS).

Purpose and Need

The project needs are to support local and regional economic growth, efficient highway operations for development, and community access. This project will support economic growth by providing enhanced access to a 340-acre mixed use/industrial site known as the Casselman Farm Development site in northeast Garrett County. The Casselman Farm Development site is a proposed development located within an economic development area identified in Garrett County's Comprehensive Plan (2008) known as the Chestnut Ridge Development Corridor. The corridor runs from the intersection of US 40 Alternate (National Pike), and New Germany Road, east along US 40 Alternate to the intersection of US 40 Alternate and US 219, north along US 219 to the intersection with Old Salisbury Road, and south along US 219 to a point south of 1-68.

The US 219 Improvement Project is also intended to meet the regional goals for the ADHS by contributing a 1.4 mile segment to the completion of Corridor N. The goals of the ADHS are to generate economic development in previously isolated areas, supplement the interstate system, connect Appalachia to the interstate system, and provide access to markets within the Region and the rest of the nation.

Selected Alternative: **Roundabout Interchange with Local and Relocated US 219**

The original selected alternate proposed a new roadway alignment with a roundabout at the northern ramp termini. The new alignment began near the 1-68 interchange as a two-lane roundabout, and replaced the existing intersection at US 219 and the 1-68 westbound on and off ramps. It looped around the Pilot Travel Center as a four-lane divided highway and cross over US 40 Alternate via a bridge and continue along a new alignment for approximately one mile before it tied back into existing US 219, near the entrance to the proposed Casselman Farm Development site and Old Salisbury Road. The new alignment of US 219 features two 12-foot wide travel lanes in each direction, and is divided by a 28-foot wide grass median.

Following the Joint Public Hearing on February 6, 2017, SHA continued to refine the alternative based on impacts to the community, natural and cultural resources, and coordination with citizens, business owners, and environmental resource agencies. The improvement replaced the existing intersection at the I-68 eastbound exit and entrance ramps with a single-lane roundabout. The addition of this roundabout ensures continuous traffic flow along the corridor, reduces conflict points, and improves mobility.

Project Scope and Goals

Our understanding of the Project Goals identified in the RFP are listed below:

Project Goal #1 | **Schedule**

Break ground in Spring of 2018, and complete construction by December 11, 2020.

Project Goal #2 | **Environmental Compliance**

Meet NEPA commitments, provide context sensitive design, proactively acquire all permits, and avoid and minimize impacts.

Project Goal #3 | **Design Excellence**

Engage a highly capable design-build team, that is proactive and provides collaborative management, design, and decision making (including partnering), and equal or better end product through alternative technical concepts.

Risk Assessment

Considering the project purpose and need, SHA efforts to date during planning and preliminary design, and the project goals, the Triton team prepared an initial risk assessment matrix. This analysis looked at the items that, in our experience, can often create a bottleneck in a project's progress, or result in a less than favorable final product. Considered in this matrix are items such as utility relocations, geotechnical concerns, building roadways "under traffic", and environmental regulations/permits.

Once the potential risk items were identified, our team reviewed each potential risk element in detail, in relation to the US 219 project's conceptual design layout, scope of work for each discipline, impacts, and available time for construction as stipulated in the Draft Step 2 RFP. A summary of our assessment matrix, which forms the basis of our team's "Risk Register" to be carried forward once the project begins, is provided on the following page.

Based on this detailed team review, we have identified the three (3) most critical risks to achieving the Project Goals of this projects as:

1. Obtaining SHA-PRD Approval of First Work Package by Spring 2018
2. Obtaining Wetland "404 Permit" Approvals to Commence Construction
3. Effective Project Sequencing to Ensure Schedule and Design Excellence

Risk Management

The Triton Team employs the Construction Management Association of American (CMAA) endorsed approach to risk management through a "Risk Register" which includes a list of identified risks, potential impacts, and mitigation for each. A robust risk management process considers risks throughout the project's life and delivery processes. Our Team's risk management process has sprung into action, will evolve throughout design and construction, and will position us to respond to changes as specific as issues unfold. The five (5) step Risk Management Approach includes:

1. **Identify:** name risks, determine cause and effect, and categorize
2. **Assess:** assign probability of occurrence, severity of impact, and determine response
3. **Analyze:** quantify severity, determine exposure, establish tolerance level, and determine contingency (applicable during preliminary design and pricing)
4. **Manage:** define response plans and actions, establish risk ownership, and manage response (after NTP)
5. **Monitor 1 Review:** monitor/review/update risks, monitor response plans, update exposure, analyze trends, and produce reports (after NTP, during design, during construction)

Draft Risk Register

Build • Cont.

Issue/Risk	Why Considered	Initial US 219 Assessment
Utility Impacts and Relocations	Timing of utility companies' work is typically beyond the control of both SHA and the DBT, and relocation delays can stall construction progress.	Three utility companies (Verizon, Comcast, Alleghany Power) will have 90 days to relocate their facilities once the DBT installs underground conduits in two areas (along US 219 WB near ramp, and along US 40 ALT). We note that the US 40 undergrounding is required prior to southern abutment of US 219 SB, as well as all superstructure work. The UG conduits can be installed with minimal advance grading, with SHA approval of related E/S control and MOT. We plan to install UG conduit by end of 2018 to ensure utility relocations are not on the critical path, thus not a critical project risk.
Environmental Permits - Waters of the US, Wetlands ("Joint permit")	Individual permits can take up to a year to obtain, which can greatly hinder the ability to begin construction and/or impact wetlands/ streams.	SHA has obtained a provisional permit, but DBT must obtain final approval based on final impacts, documented avoidance and minimization, and final mitigation design. This item has been assigned to the Critical Path and the length of time for the regulatory approval is not under the DBT's control. The Joint permit is deemed a critical risk to meeting Schedule goals.
Indiana Bat/Northern Long-Eared Bat	Presence of bats or their habitat can result in clearing time-of-year restrictions in Spring/ Summer months.	The Phase 2 Draft RFP statement that no RTE's are expected to be impacted leads us to the conclusion that bat studies have already occurred. Based on available materials and current regulatory requirements, presence of bats has been identified as a low risk item. We note that as regulations evolve, new regulations/restrictions could move this item to a critical risk.
Final Bridge Design	Bridge construction is often a long duration item, and commonly on the critical path.	SHA will need time to review and approve all bridge design submittals, including geotechnical report. SHA will also sign off on bridge shop drawings. Even so, the bridge is not large and is not anticipated to be on the Critical Path. Bridge construction will begin in mid-2019 and will take 9-10 months to open to traffic. Bridge design is assigned a moderate risk.
Traffic Control - Construction "Under Traffic" (especially on interstate)	Reconstruction projects can be complicated due to need to maintain traffic during construction, creating the need for multiple phases and reduced efficiencies.	The vast majority of the project is built "off-line", i.e. away from existing traffic. The work on I-68, the ramp reconstruction (roundabouts), the northern US 219 terminus, and the new bridge over US 40 Alt will all require some Traffic Control. However, based on the project scale, this will not become a critical path concern. The item is assigned a lower risk level.
PRD Approval of SWM and E/S Control	Clearing is the first item of work, and cannot begin without an approved Erosion and Sediment Control Plan.	SHA-PRD requires 4 weeks for review of submittals. There are 3 submittals - Concept Design, Site Development Design, and Final Design. With an NTP in 12/2017, the review time alone brings us to March 2018. This approval is also a condition to the 404 wetland permit. Due to time required for design and reviews, obtaining PRD approval for 1st work package is designated as a critical risk to the goal of starting construction by Spring 2018.
Public Involvement	Public comments and/or opposition can hinder design progress, diverting the engineering team's attention during design.	Considerable outreach has already been conducted over the years during the NEPA/Planning phase. There have been some comments from the community opposing the use of Roundabouts on US 219, however once the Record of Decision is approved by FHWA, it is generally the "green light" to proceed with design without further alternatives. Therefore this has been assigned a lower risk level.
Geotechnical Conditions	Soil borings are only reflective of conditions at the site of the boring. Beyond the boring location, soil characteristics can change greatly which can create field problems.	Our geotechnical consultant, Schnabel, has reviewed the site and found no evidence of problem soils (e.g. coal, bedrock, etc.) However, a thorough drilling program is required, along with contingency plans for addressing unforeseen conditions. We feel that our subsurface investigation program, Triton's experience working in the region, and consultations with Geotechnical Engineer during construction are sufficient to remove this item from the "critical risk" category.
Proper (and Strategic) Construction Sequencing	About 930 calendar days is available for construction, yielding roughly 565 working days. Activity durations and resourcing must be assessed to ensure achievable schedule.	The quantities of clearing, grading, paving, and related work for the US 219 relocation segment will consume most of the available working days. Other work (bridge, I-68 mainline, roundabouts, tie-ins) must be overlapped and properly sequenced. Cold weather will impact asphalt work. Design packages must be complete to construct particular areas. Due to these complexities and other sequencing intricacies (utility companies, etc.) this item has been deemed a critical risk to schedule and design excellence.

RISK #1: SHA-PRD APPROVAL (E&S/SWM) OF WORK PACKAGES

Risk Identification: SHA-PRD requires four weeks for review of each submittal. There are a minimum of three (3) submittals -- more if the project is divided into work packages: i.e. Concept Design, Site Development Design, and Final Design. With a Notice to Proceed in December 2017, review time alone of three submittals puts us in March 2018.

Why it is Critical: Due to the timeframe required for detailed design and several month-long reviews, and the anticipated Contract Award date of December 2017, obtaining SHA-PRD approval for first work package is designated as a critical risk to the goal of starting construction by Spring of 2018.

Risk Impact: Approval from SHA-PRD for Erosion and Sediment Control is a precedent of breaking ground. If the approval is not in hand, land disturbance cannot begin. SWM and E&S approval is also a condition to the Wetland/Water "404" permit, so it is critical to have complete SHA-PRD approval in order to meet conditions of the wetland permit. Furthermore, even if initial SHA-PRD E&S approvals are granted for early work packages, final approval of Stormwater Management design is needed in order to proceed "full throttle" on construction. For example, if a pond is to be used as a sediment basin during construction, it is important to first have the ultimate design of that facility graded out, in order to ensure the ideal retrofit when transitioning the facility from temporary sediment control to final SWM BMP.

Mitigation Strategy: Our mitigation strategy involves an integrated approach that considers the implications of all appropriate design disciplines, construction input, and close coordination with SHA. Although not currently stated in the Phase 2 Draft RFP, our initial strategy is to obtain approval of the SWM Concept Design, and Final Erosion and Sediment Control Approval for the first "work package", by May 2018 as a precedent to land disturbance. Specific components of our work plan to achieve this are as follows:

SWM Concept Approval, and Erosion & Sediment Control Approval for first "work package", by May 2018

- Fully review and assess Concept SWM Report provided by SHA as part of the Information Package.
- Field investigation to confirm appropriate SWM and E/S control locations (verify delineations of wetlands and streams, specimen trees, identify SWM sites and outfalls, etc.).
- Attend Pre-Permitting Meeting, with design team, IDQM H&H Engineer, HHD, and PRD to discuss project requirements, AMT's design approach, submission timeframes, and establish final expectations.
- Multi-disciplinary SWM and E&S Concept Design/Refinement:
 - Coordinate SWM with highway design as line, grade, profile and typical sections are established.
 - Determine drainage system design and location of BMP's
 - Coordinate with Environmental/Landscape Architecture Team on LOD limits (critical for determining impacts to wetlands, waterways, and forest/trees). Coordinate this work with the Tree Avoidance and Minimization Report.
 - Involve Landscape Architect in conceptual grading (landforms) and preliminary planting concept. Coordinate this work with the Preliminary Landscape Plan submittal.
 - Include Construction Manager, Steve Deihl, and invite other construction staff to review the design to verify their concurrence with the approach.
- Compile SWM concept plans, report, applicable waiver requests, and HHD signed WQSS; provide internal QC, and document with latest SHA/AMT certifications.
 - Submit an administratively complete package to PRD: AMT's Stu Robinson, PE, or his qualified designee will first review and certify by signature that the Stormwater Management and Erosion and Sediment Control plans have met the SWM/ ESC requirements.

Triton Construction's subsidiary, led by CM Steve Diehl, recently constructed one of SHA's largest SWM projects. Steve's team installed 77 Bio-swales in the I-70 median in Washington Co., meeting the original completion date despite experiencing a >300 calendar day delay due to outside agencies not providing information necessary for swale construction.

- AB Consultants, the Team's IDQM, will sign off that QA procedures have been followed.
- Copy to SHA-HHD.3
- Address PRD, and HHD, comments and resubmit with detailed point by point responses, not responses simply saying "accepted".
- Meet with PRD, if necessary, to resolve any outstanding comments.
- Obtain 'Concept Approval' for SWM, and 'E&S Approval' of first work package.
- Submit Notice of Intent (NOI) to MDE; Obtain NPDES (after public comment period)



With the SWM concept approval and initial E&S Plan approval in hand, a major milestone will have been achieved. However, the design team's work is not done, since the Construction team will need all remaining SWM and E&S phased design plans to continue their construction progress. Our team will continue to use a multi-disciplinary approach to further develop the SWM and E&S Design. Key steps in the process include:

- Analyze Geotechnical results (groundwater/infiltration); pavement design requirements (full depth replacement could affect SWM requirements); review any other changes to highway that could affect SWM, finalize LOD for environmental impacts and update SWM and E&S design affected.
- Prepare detailed pond design, routing, and grading plans (involving landscape architects)
- Prepare SWM site development plans and additional E&S Control Plan work packages, updated waivers/WQSS, and report; submit administratively complete package in same manner as Concept.
- Submit to MDE for small pond and/or dam safety approval.
- Address comments from PRD, HHD and MDE as applicable.
- Provide a final Constructability Review.
- Prepare SWM Final plans and reports, and submit administratively complete package in same manner as Concept.

Role of SHA and Other Agencies: SHA-PRD will be the approving authority for the SWM and E&S Control design packages and reports.

RISK #2: OBTAINING JOINT PERMIT - Army COE 404/ MDE Nontidal Wetland Permit

Risk Identification: The project is anticipated to permanently impact nearly 3500 feet of "Waters of the U.S.", and 1 acre of wetlands (inclusive of stream restoration scope at Meadow Run for grade controls). Individual permits from USACE/MDE can often take 9 to 12 months to obtain, which can greatly hinder the ability to begin construction, and/or impact wetlands and streams.

Why it is Critical: SHA has obtained a provisional waterway/wetland permit, but the Design-Build team must obtain final permit approval. To do so, sufficient design must be completed to delineate final impacts, while also documenting avoidance and minimization. We must also obtain approval on the final compensatory wetland/stream mitigation plan. The "404 permit" is deemed a critical risk to meeting Schedule goals because it must be in hand prior to impacting any stream or wetland. Furthermore, there is a hold point even for construction that does not directly impact waters, wetlands, floodplains or their buffers: Per the RFP, work in upland areas can only commence upon written concurrence from USACE or MDE, which will be must first be approved by SHA-EPD.

Risk Impact: The primary wetland/waters of the U.S. impacted by the project are in the vicinity of I-68. It is fortunate that there are not many wetland and stream impacts in the area where US 219 will be relocated. However, there are some impacts in the US 219 relocation area, and even work in "upland areas" is subject to a detailed coordination process and written concurrence first from SHA, then USACE and MDE. We believe we must be working in the wetland areas of the US 219 alignment by late 2018, and the areas adjacent to I-68 by early 2019, to achieve schedule goals. We must begin clearing work in Upland Areas by May of 2018 to meet Schedule goals.

Mitigation Strategy: Our mitigation strategy involves a robust, integrated approach that includes all design and construction personnel assigned to the project.

1. **Early Focus and Preparation** – An important aspect of our environmental permitting plan is to have the team, including our Environmental Compliance staff, focus early during the pre-construction to identify environmental critical paths and begin addressing each one. This is important because of the consulting agencies that are a part of the Wetland/Waterways permit (Fish and Wildlife, etc.). The early preparation will “kick-off” with the Pre-Permitting Meeting, held with SHA-EPD and the DBT.
2. **Develop Permit/Approval Strategy** – Our Environmental Team will draft an environmental permit strategy early in the project. **Based on our past SHA experience, the key to success in meeting the permit schedule is 1) bringing agency partners in early, 2) having both environmental and design work as one with the same goal in mind and 3) documentation and follow-up.** The early involvement of the agency partners is already underway, with SHA’s work to obtain provisional permits.
3. **Develop “Upland” Construction Package(s)** – Our approach includes at least one “upland” package for concurrence from both SHA-EPD and the regulatory agencies (USACE, MDE) that the construction of these areas will have no direct or indirect impact on wetlands. An initial, smaller package may be prepared first, to ensure as timely an approval as possible. Following that initial package, an expanded package may be prepared, depending on the progress of the actual permit package. Our environmental staff will carefully review the limits of work of these “upland” packages to validate that no impact to wetland or streams could potentially occur, which would hinder the approval progress.
4. **Coordination to Minimize Impacts** – Our Environmental Team has extensive experience working closely with our design and construction staff to partner in the commitment to minimizing impacts wherever possible. The goal is not simply to accept the impacts described in the NEPA document, but to identify opportunities to reduce impacts (e.g., reducing slopes, shifting alignments, etc.). Besides our commitment to environmental stewardship, this effort also shows our permitting agency partners our commitment to environmental protection. Our focus will be to determine a construction methodology that reduces impacts to surrounding areas while maintaining an aggressive schedule. The risk posed by design changes will be greatly reduced through rigorous internal communication between the design and environmental staff as plans are developed and changes proposed.
5. **Close Design/Construction Coordination on Culvert Sequencing** – Construction personnel will have very specific requirements and means and methods for performing work that impacts streams, for example construction of culverts which carry base flow. AMT will work very closely with Triton when developing temporary impacts associated with ‘maintenance of stream flow’ for such cases.
6. **Delineate “conservative” impacts in key areas** – Though this strategy may compete with the avoidance and minimization requirements described previously, it would avoid permit modifications if the design-build team is able to slightly enlarge the permitted impact from the specific toe of fill line, with the understanding that the actual impact may end up being less. This approach has worked for AMT on other projects without undue additional impacts on the environmental resources. We will discuss this approach further with SHA-EPD during the Pre-Permitting meeting.
7. **Addressing Individual Environmental Concerns** – The Joint Permit is concerned with the following:
 - **Water Quality.** Our primary focus will be to create the least amount of impact to resources. Strict sediment and erosion control measures will need to be maintained. Close coordination will occur to ensure compliance with the Stormwater and Erosion Control permits while minimizing impacts to existing resources.
 - **Reducing Temporary Impacts to Wetlands/ Floodplains.** Areas adjacent to the Project identified as wetlands will be avoided as much as possible. Both the USACE and MDE are responsible for the regulation of jurisdictional wetlands and Water of the United States (WOUS) through Section 404 and 401 of the Clean Water Act. This project could be permitted under a nationwide permit

(possibly an Individual Permit (IP)) based on the amount of expected disturbance to jurisdictional wetlands and WOUS. An IP requires that public notification and meeting be held in order to inform the public that impacts to wetlands are expected as a result of the proposed construction activity. This permit must be issued by the USACE, Baltimore District. Subsequently, we will identify minimization opportunities that could reduce the level of permitting required. The amount of mitigation effort required is determined by a schedule of standard ratios specific to the type of protected area impacted – the lower the impacts, the lower the mitigation required as well. We will work closely with the USACE and MDE during the permitting efforts. We have found bringing our designers to permit meetings with the agencies is a very effective way to gain agency collaboration and ultimately approval. As part of these meetings, the designers and agency staff can consider a variety of design impact reductions together. This creates a more personal atmosphere for collaboration and speeds the process up as well.

8. **Mitigation Designs** – Our work plan will also proactively progress mitigation designs for onsite and offsite mitigation. This work also includes the Meadow Run stream restoration work to install grade controls and provide stream modifications to allow herp and fish passage.

Role of SHA and Other Agencies: SHA-EPD will review joint permit packages prepared by the Design-Build team, and SHA-EPD will submit joint permit packages after concurring with their content. SHA-HHD will review stream restoration design at Meadow Run, and SHA-OED will review all elements pertaining to landscape/planting design.

RISK #3: EFFECTIVE PROJECT SCHEDULING/SEQUENCING OF WORK

Risk Identification: A primary goal of the US 219 project is to begin Construction by the Spring 2018, and to complete construction by, and preferably before, December 11, 2020. To promote the achievement of these schedule goals, SHA has established an Incentive provision in the contract to expedite construction which provides an incentive based on each calendar day that the actual completion date precedes the Total Contract Time. Therefore, the Triton/AMT team has identified project scheduling/ sequencing of work as a unique risk since a well-conceived and coordinated project schedule based on a sequence of construction that is synced (and successfully executed) with the progression of design, obtaining required permits/approvals, and other project constraints (e.g., work restriction periods, utility clearances, etc.) is critical to completing the project within the established Total Contract Time, thus meeting and/or exceeding the Project Schedule Goal.

Why it is Critical: In our initial review of the project, we have roughly determined that the amount of clearing, grading, paving, and related work for the US 219 relocation segment will consume most of the available working days between Spring 2018 and December 11, 2020. Other work (bridge, I-68 mainline, roundabouts, tie-ins) must be overlapped and properly sequenced. Cold weather will impact asphalt work, and sufficiently final design packages must be available to construct particular areas. Due to these complexities and other sequencing intricacies (utility companies, etc.) this item has been deemed a critical risk to schedule and design excellence. Management and monitoring of the schedule and work progress will be imperative to meeting and/or exceeding the Project Schedule and Design Excellence Goals.

Risk Impact: Problems with planning, scheduling, managing, and/or sequencing work activities will have a cascading negative effect in meeting and/or exceeding the Project Schedule Goals.

Mitigation Strategies: Led by our Design-Build Project Manager, Bruce Dunlap, PE, and our Project Scheduler, and in collaboration with our Construction Manager, Steve Diehl, our Project Design Manager, Laura Mehiel, PE, our Environmental Compliance Manager (ECM), Brian Bernstein, and our IDQM Manager, Kirk McClelland, PE, the Triton/AMT team will develop a project schedule and sequence of work that



includes all design, permitting/approvals, construction, work restriction periods, weather allowances, and other project activities (utility relocations, specific SHA approvals, materials procurement, etc.), specifically including activities on the critical path or requiring third party actions. Our schedule and sequence of work will provide a detailed plan for how the project will be designed, permitted/approved, and constructed in the most efficient manner starting from NTP to final clean-up. The Triton/AMT management team will proactively monitor and adjust the schedule and sequence of work activities, and allocate project resources, to gain efficiency where possible and recover from unforeseen issues when needed. Impacts to the schedule may include, but are not limited to: delays in obtaining permits/approvals, unforeseen site conditions, weather delays, or delays from third party utility relocations. Any impacts will be immediately communicated to SHA and project stakeholders for assistance with their resolution.

1. Preparatory Efforts – Upon notification of selection, the Triton/AMT team will immediately initiate advanced coordination efforts with SHA and project stakeholders, supplemental data collection activities, and project design activities. These early efforts will include, but are not limited to: attend and facilitate the utility conference and utility coordination meetings between the Triton/AMT team, SHA, and utility owners; identify critical path permitting items and attend a pre-permitting meeting; develop and submit our design quality control plan and design certifications; develop and submit the public outreach plan; develop and submit the TMP; perform the tree survey and prepare and submit the tree minimization and avoidance report; develop and submit the geotechnical planning report; perform supplemental field survey, utility test pitting, and soil borings and testing.
2. Work Packages - Understanding the importance of SHA's Project Schedule Goal, the Triton/AMT team will develop an approach to get shovels in the ground as soon as possible. To this end, we will design and submit for review and approval phased construction work packages. These phased construction work packages will be prepared for each of the anticipated construction phases discussed below. To expedite review and approval of separate design elements of the project, we will develop design submittal packages for the following: 1) clearing/grubbing/rough grading and initial E&SC implementation; 2) small structures including cross-culverts; 3) final roadway, drainage, SWM, E&SC, and MOT; 4) traffic signing, marking, intersection/interchange lighting; and 5) landscaping for roadside, SWM facilities, and reforestation.
3. Anticipated Construction Phasing – Our initial plan for the construction phasing is to focus on what we believe to drive the critical path, which is the relocation of US 219. The construction of the new alignment will likely require a construction crew a full 500+ working days. In addition to the new alignment crew, we anticipate two other separate construction operations to complete the work prior to December 2020: a bridge crew, and a crew to address the ramp and interstate widening, the roundabouts, and tie-in improvements at existing US 219. Specifics of our tentative sequencing plan that will form the framework of our schedule are:
 - Given the length of time it will take to complete the new alignment of US 219, it is possible we will have the roundabout constructed and operational with the new alignment portion closed until project completion. If so, then the ramp and interstate work will be critical to maintaining schedule and traffic flow.
 - Provided that we will be able to cross US 40 Alt with construction equipment, the bridge work is not expected to be on the critical path. However, it will be important that Triton install the underground conduit along US 40 Alt as soon as possible, certainly before the end of 2018, so that the utility owners can relocate their lines in their allotted 3 month schedule.
 - There will need to be significant portions of concurrent work; for example complete a segment of grading and drainage followed by stone and paving work, while another segment is being mass graded.



- The bulk of our mass grading will need to be completed by the Fall of 2019 in order to allow for fine grading, stone, paving, and tie-in work to be completed in 2020.
 - Other Significant milestones as we develop the final schedule will be the completion of the new ramps, interstate widening, and roundabout construction all of which will need to be completed prior to the new alignment section opening to traffic. We anticipate that the final month will be spent on traffic shift tie-ins and punch out.
4. Collaborative Design - In support of our design efforts, we will complete all necessary data collection and we will develop and submit for review and approval all necessary geotechnical and pavement submittals, required permits and permit modifications, project documentation, studies, reports, source of supply/material clearances, shop drawings, etc. These efforts will be coordinated with all other work activities to ensure approvals are synced with the overall project sequencing. To facilitate interdisciplinary coordination of the design submittal packages and design support efforts for each construction phase, the Triton/AMT team, including our subconsultants and subcontractors, will actively communicate and coordinate internally and externally through phone calls, email, and frequent meetings, including video conferences. All design and construction activities will be coordinated to ensure the seamless integration of all design components and the coordinated progression of construction. Staff from construction, quality control, and quality assurance will be engaged throughout the design process and will provide over-the-shoulder reviews to avoid unnecessary delays during compliance reviews/approvals and during construction. Meetings will include weekly team meetings, weekly task force/discipline specific meetings, monthly Partnering meetings, design quality control/quality assurance meetings, constructability review meetings, and other meetings to address specific issues.
5. Key Design Element: SWM and Erosion and Sediment Control (E&SC) - The Triton/AMT team recognizes that the design development and construction of the project's drainage, SWM and E&SC elements will be critical to the project's success. The project will greatly benefit from a well-developed, conceptual scheme for drainage and SWM that minimizes impacts to environmental resources and utilities. Previous work completed by SHA for these disciplines will be utilized to the greatest extent to expedite approvals. To further expedite getting shovels in the ground, we intend to receive approval and commence clearing/grubbing, rough grading, cross-culverts and initial E&SC implementation while the roadway, drainage, SWM, final E&SC, traffic elements, and landscaping are being designed, approved, and permitted. Based on proposed phasing of work as described below, we anticipate final drainage, SWM and E&SC design will be prepared to accommodate and treat runoff during and after construction for each construction phase. Temporary systems will be implemented as necessary to facilitate permit approval.
6. Utility Coordination - We understand the utilities present in the project area include overhead and underground utilities including, but not limited to: water, sewer, electric, communications, Level 3 fiber optic, utility conduit; poles and house service connections. Part of our scope will be the installation of underground conduit at the new US 40 Alt bridge crossing and along US 219 southbound, near the I-68 WB ramp, upon which Alleghany Power, Verizon, and MD Department of Information and Technology will self-perform their undergrounding relocations within 90 days. Our Utility Coordinator, Keith Sinclair will focus his full attention toward coordinating utilities and resolving conflicts throughout design and construction. We understand our responsibility to coordinate with the utility owners on the design, scheduling, and relocation of their facilities, and to help resolve conflicts throughout design and construction. We also understand that available utility information is not always accurate or complete and schedules may change due to unforeseen reasons resulting in unexpected conflict; however, the Triton/AMT team is prepared to address these challenges through active and ongoing engagement and partnering with SHA and utility owners. We will leverage the combined experience of our design and

construction staff to develop creative and innovative solutions to avoid or address conflicts and accelerate construction activities when possible.

SHA and/or Other Agency Role: We anticipate SHA providing timely ROW acquisition. We will partner with utility owners and anticipate that they will complete their relocation designs and construction within their prescribed duration. The Triton/AMT team will partner with SHA, SHA-PRD, regulatory/resource agencies, and other project stakeholders for the timely review and approval of drawings and permitting.



B-ii: Approach to Design-Build | From Design Initiation through Construction Completion

The Triton team endorses the philosophy that design excellence in a design-build project is achieved through **effective partnering between Owner, Constructor and Designer; successful stakeholder outreach and inclusion; design and construction team integration throughout design and construction; and the expertise and skill to ensure both a constructible and safe project.** An approach that incorporates these elements will ultimately deliver a project which is on time, on budget, and open to traffic with minimal complications. The Triton D-B Team brings the necessary expert staff and past MDOT-SHA and design-build experience to deliver the MD 219 project successfully using these strategies.

Selecting the Right Team

TRITON CONSTRUCTION, INC. personnel have spent their careers building major grading, paving, bridge, drainage, and stream/environmental projects throughout the Appalachian Mountains in both West Virginia and Maryland. Our proposed Construction Manager, Steve Diehl, is a Frostburg, MD native who has spent his career constructing projects in the terrain and geology that will be encountered in this project. Steve has been the Regional Manager for Triton Construction in this area since he joined us in 2013, and has extensively worked with Mr. Stephen Bucy and the MDSHA District 6 Construction Team completing five Triton/East Coast Bridge projects to date in District 6, which have all received “A grades” from SHA-District 6. Triton Construction has three current projects in District 6 for the MDSHA and continues to receive excellent grades. We understand the terrain, geology and the construction means and methods needed to successfully construct projects in this region, including very good working relationships with the suppliers and subcontractors who will be needed to complete the project.

A. Morton Thomas and Associates, Inc. AMT, over the past 60 years, has established a strong presence in the engineering and construction management fields, and provides a team who has the experience required to provide professional engineering services on important corridor projects, at any stage of development, from preliminary and final engineering design to engineering support during construction. AMT is extensively familiar with all design standards and specifications implemented by SHA, in addition to FHWA Guidelines. AMT has comprehensive expertise in providing design services including surveying, roadway and structural design, traffic data collection and analyses, stormwater management and drainage design, signage and pavement markings, utility coordination, aesthetics, and supporting environmental services.

AMT has been involved with numerous design build projects including the ICC, recently completed the Route 1 at Fort Belvoir project for Eastern Federal Lands, as well as been a major team member for the VDOT 460 P3 from Richmond to Norfolk. AMT is very familiar with Garrett County and SHA District currently holding a District 6 Construction inspection contract as well as the Supplemental Engineering Contract. Rick McGraw, an AMT Construction Lead, is a local resident and an ex SHA construction employee in District 6 who has been very helpful in providing local knowledge and input for this response.

Design and Construction Development

Our Team is structured to facilitate involvement of construction expertise during design and design expertise during construction. Having personnel with roles in both design and construction allows us to quickly adjust priorities, understand and develop appropriate levels of detail, and streamline project development. Construction staff and design staff will be integrated into a complete project team, fostering information sharing and knowledge transfer while ensuring consistency and quality in design and construction. Tools to facilitate team and specialty integration include:

- Weekly design progress meetings with all disciplines to discuss current priorities, latest updates to design which can impact other disciplines, design and permit status, and action items
- Inter-disciplinary design reviews prior to milestones to ensure design disciplines are coordinated
- Triton constructability reviews of design prior to submission to MDOT-SHA
- A robust project collaboration system (ProjectWise), giving all team members access to the same master files (design, RFI's, shop drawings, etc.), avoids duplicate/outdated design information
- Weekly schedule meetings to review the previous work and develop the two week look ahead
- Monthly scheduling meetings to monitor CPM progress and re-prioritize design as needed

Design-Construction Integration Overview

Triton will integrate the team's construction and design entities and facilitate joint involvement by providing "Construction input during Design" and "Design Input during Construction." This integration starts with our Design-Build Project Manager, Bruce Dunlap. Mr. Dunlap will have full responsibility for compliance with all project requirements, quality, overall project management, and contract administration. He will ensure the team is fully integrated and that the project meets and/or exceeds the contract schedule and stays within budget while meeting all contract requirements. Mr. Dunlap will be supported by our management team consisting of our Construction Manager, Steve Diehl, our Design Manager, Ms. Laura Mehiel, PE, and our IDQM Manager, Kirk McClelland, PE.

Mr. Dunlap and Mr. Diehl, as our DBPM and Construction Manager, respectively, will provide "over the shoulder" reviews of design during project development. They will perform constructability reviews, especially for construction phasing, MOT, construction footprint and access requirements, ease/feasibility of construction, erosion and sediment control, and assessment of utility impacts and relocation/avoidance. These reviews will focus on construction scheduling and development of construction activities on the critical path, assisting with the development of cost-effective designs, and assisting in developing avoidance and minimization strategies for environmental impacts. Our collaboration will result in optimizing personnel, equipment, and material resources to ensure efficient construction activities and the limit impacts to residents, the traveling public, and emergency responders.

Construction Staff Involvement in Design

Construction and design staff will hold weekly design/construction working meetings to discuss and analyze all work activities on the project. Field investigations will be completed together to review issues such as environmental constraints, construction access, utility impacts, and maintenance of traffic. Meetings will include weekly team coordination meetings, discipline-specific "task force" meetings, constructability review meetings, and other project coordination meetings to address specific issues.

Design Staff Involvement in Construction

AMT will assist Triton in addressing field issues, participate in progress meetings, interact with stakeholders, and remain a part of the D-B Team until project completion. This relationship will expedite the RFI process and ensure all parties are informed. AMT will perform shop drawing review, environmental and permit



compliance field reviews, and public outreach. Design staff will conduct field visits, communicate with construction staff, and attend Partnering Meetings. Design personnel will be responsible for expedited design revision to address changes in field conditions, following the Plan Revision process stipulated in the Phase 2 RFP. As recently experienced on the Route 1 Improvements at Fort Belvoir Design-Build Project, AMT design staff reacted quickly to revisions, resulting from the discovery of unsuitable materials, changes in material availability or, in the case of erosion and sediment control, design solutions to deal with extreme weather events.

During construction, we expect that bi-weekly meetings between construction and design staff will continue. Design input during construction will include: design field support; review of CPM schedules; assistance with permit compliance; assistance with MOT and traffic control plans; engineering solutions for changed field conditions; and assisting with public involvement and community interaction.

[Designing a Constructible and Safe Project](#)

Through the skill and expertise of our team, and the techniques and strategies described throughout this section, the Triton/AMT Team will deliver an exceptional MD 219 project that meets or exceeds MDOT-SHA's goals. AMT's extensive experience on prior design-build projects and ardent focus on both safety and constructability, combined with Triton's construction expertise, flexibility in responding to field issues, and reputation for excellence and work zone safety, will prove to be valuable assets to MDOT-SHA for this important project. As a design-build project, we recognize that a major component of design excellence includes providing plans that are easily constructed with minimal impacts to mobility, the environment, and local residents. Design, environmental and construction staff will exercise good judgment and sound decision-making to ensure that the design supports the construction means and methods, phasing/work sequencing, and environmental restrictions. During construction, our design staff will remain engaged to confirm design assumptions and oversee field changes.

Coordination and Decision Making

A key element in Triton's successful Design-Build approach is the integration of Partnering within the daily workflow of design and construction. Through our team's collective experience of working on Design-Build projects and extensive Value Engineering design changes during construction, we understand the importance of fostering continuous collaboration, coordination, and communication between all team members throughout the design and construction phases to ensure sound and timely decisions are made throughout the project timeline. This communication, coordination, and collaboration begins upon receipt of the RFP to the end of construction. This continual interaction fosters a deep understanding of each other's approach toward design and construction such that decisions on project elements and issues are mutually developed while ensuring the project design meets all contract requirements and environmental commitments, and best fits construction means, methods, practices, and products.

We also understand that many projects risks can be significantly managed through the design process. The Triton/AMT Team will identify, track, manage, and mitigate project risks throughout design. By reducing project risks through design, we can streamline the construction process and reduce field changes and red line revisions. In addition to the internal integration of our team members, communication and collaboration between the Triton/AMT team and SHA-HDD, Office of Structures, SHA-PRD, other SHA divisions, regulatory/resource agencies, utility companies (Alleghany Power, Verizon, Comcast, MD Dept. of Information and Technology, and Garrett County Sewer), and other project stakeholders will be critical to the overall success of this project. Partnering as promoted by SHA will be utilized as the framework for ongoing coordination and communication with SHA and project stakeholders. All key staff and key support staff of the Triton/AMT design and construction team, including our IDQM staff, will actively participate with SHA and project stakeholders in an initial Partnering workshop, and monthly Partnering meetings (or at the scheduled frequency).

During design, we will use file sharing and collaboration tools (such as ProjectWise) to ensure that our Team, SHA, and stakeholders always have access to the latest design information. Our approach to design excellence will continue into the construction phase by ensuring that the latest plans are easily identifiable and that any revisions are clearly logged. We will have both electronic and hard copy systems set up to ensure that all design and construction staff have the latest plans.



Design Quality Management

The Triton/AMT team is fully aware that it is our sole responsibility to provide the design and construction of the MD 219 project in conformance with the contract requirements through an integrated and well-documented quality management plan. Quality and contract conformance in construction is predicated on quality and contract conformance in the design phase.

The Triton/AMT team has a design-build quality control plan that has been successful on previous design-build projects. This plan includes the following key elements:

- Design Quality Control
- Design Quality Assurance
- Independent Design Quality Management
- Constructability Reviews
- Environmental Reviews
- SHA Audits and Reviews
- SHA-PRD Review
- Constructability Comments
- Materials/Working Drawings
- Design Document Management

Triton has selected AB Consultants, Inc. (AB) to serve the function of Independent Quality Assurance for Design. AB has been designing projects for MDOT-SHA for the past 20 years, has two senior ex-SHA employees (Kirk McClelland, PE and Steven Foster), has worked on numerous D-B projects, and recently performed in a similar fashion for MD 4; Forest Ave. to MD 458 Design build contract. AB also provides a full range of transportation services including geotechnical engineering, H&H design, certified PRD review, and subsurface utility investigations, providing a unique degree of insight to overall project compliance. AB Consultants formerly included a construction division, since divested, but providing the engineering staff with a different perspective on engineering design principles.

The Triton/AMT team understands that responsibility for design quality remains with lead designer AMT. All reviews by AB and SHA are only to confirm compliance with the contract. AB as the provider of independent quality assurance will be responsible for reviewing all submissions before they are submitted. They will review the SWM and E&S packages before submission to SHA-PRD, effectively providing the reviews and checks that SHA-HHD has traditionally performed. Furthermore, the plans will be reviewed for compliance with project limitations or conditions contained in the NEPA documentation and Joint Permit.

The Triton/AMT team will employ a quality management plan that promotes an environment where the goal for quality and contract compliance are expected, planned for, and implemented. This is achieved through a management philosophy that promotes active partnering between design, construction and quality control/quality assurance staff; assignment of sufficient qualified personnel (design, construction, quality control, and independent quality assurance staff); effective and continual communication between design, construction, and quality control/quality assurance personnel; document production and controls following strict control standards; accurate and timely reporting of progress to closely monitor design and construction processes; management and tracking of design changes during construction; completion of quality control reviews by independent staff; and completion of independent quality assurance reviews.

Design Quality Control

Quality control is an ongoing process that requires adequate controls, reviews, and checking at each stage of the project's development. Our design quality control plan for the US 219 project will outline our overall organization plan, reporting responsibilities for design quality control, and detailed plan elements to meet



the requirements of the project. The plan will focus on quality control checklists, coordination activities, and document controls to be followed by all team members, including subcontractors and subconsultants. Once a design is generated, it will be forwarded for an in-house QC review by engineers who will develop a list of recommended items for re-design, correction, or review. This process of performing QC checks on each design package will be followed in each phase of the design process. Each QC comment will be addressed and sent back to the QC reviewer for concurrence, and once all items in the design are acceptable to the designer and QC reviewer, the design will be forwarded to QA for review. QA comments will once again be given to the designer for resolution and/or comment. Once all comments made by QC and QA reviewers have been satisfied the design will be sent on for review by owner representatives.

The QC reviewers will check the following items:

- Math and engineering computations
- Technical accuracy
- Conformance to Contract requirements
- Review of form, content, and spelling
- Coordination with other disciplines
- Sequence of construction logic
- Verification that the drawings have been stamped, signed, and dated by a professional engineer licensed to perform work in Maryland

Primary responsibility for implementation of design quality control plan rests with our Design-Build Project Manager, Bruce Dunlap, PE, and our Project Design Manager, Laura Mehiel, PE. Our Construction Manager, Steve Diehl will also take an active role during the design phase to ensure over-the-shoulder reviews are being performed and construction input is being incorporated into the design. Mr. Dunlap, DBPM is responsible for ensuring the design quality control plan is implemented and that quality control functions are independent of project production functions. He will perform periodic reviews to ensure the plan is adequately meeting our quality goals. It will be distributed to all project team members, including subcontractors and subconsultants. Ms. Mehiel and Mr. Diehl will ensure the day-to-day planning, execution, coordination, and review of all work is being successfully completed. It is their responsibility to ensure that quality control procedures are followed and all work conforms to the contract requirements. Ms. Mehiel and Mr. Diehl will be assisted by an independent quality control team led by our Design QC Manager, Fred Wagner, PE. They will assist the design and construction team with reviewing the project and ensuring the quality plan is implemented effectively, including during the development of the work schedule when it is important that reviews of the concepts and approaches to the project construction are performed. Our team's quality control procedures are not ends in themselves, but serve as effective tools in monitoring and controlling the accuracy, quality, and completeness of the work, and that the design meets the project requirements.

Design Quality Assurance

In addition to our quality control responsibilities outlined above, our team will also be responsible for independent quality assurance of all design plans, project specifications and working drawings enabling the development of a finished product in accordance with the contract documents. The primary goal of a comprehensive and functional Design QA program is to make sure that Quality Control measures have been taken, and assure that the design team's approach to the assignment is appropriate. Our independent quality assurance firm, AB, will provide independent design reviews of all design packages, including SWM and E&SC packages, developed by AMT to certify they were developed in accordance with the design quality control plan and meet the requirements of the contract documents. AB will also be responsible for the review and approval (with SHA concurrence) of the design quality control plan. QA reviews will include, but are not limited to, a discipline-by-discipline review of the qualifications of the design staff, a design



analysis, a review of the sequence of construction, a check on the adequacy of design discipline coordination, and a review of constructability issues. The quality assurance reviews will also focus on the review of design standards, typical sections, and materials to ensure that the proposed design uses commonly applied industry standards and pre-approved/commonly used construction material types. In addition, it will be the quality assurance team's responsibility to confirm that the design quality control review procedures are in place and being followed by each design discipline throughout each design phase. Our quality assurance approach will adhere to the same rigorous review and document control procedures as outlined above for quality control. Primary responsibility for implementation of our control assurance program rests with our Design-Build Project Manager Bruce Dunlap, and our IDQM Manager, Kirk McClelland. It is their responsibility to ensure that quality assurance is being performed and all work conforms to the contract requirements. Mr. McClelland will also ensure all design submissions are documented and the reviews performed by the IDQM are posted on ProjectWise. SHA will review this documentation to further ensure the design review process and submissions follow the design quality control plan and contract requirements. SHA-OOS will also perform a concurrent review of bridge and box culvert structures. Any ambiguity in the interpretation of the contract requirements between AMT and AB will immediately be raised with SHA's Project Manager for resolution by Mr. Bruce Dunlap, DBPM.

Schedule Management

We understand that to be successful in achieving the Project Schedule Goals, we must also meet and/or exceed contract requirements, resolve discrepancies in project requirements with SHA, design and construct the project within the various project constraints; and partner with SHA, regulatory/resource agencies, utility owners, and all other project stakeholders. The Triton/AMT team is comprised of highly qualified and experienced staff who fully understand the Project Goals, the scope of work, the risks involved to the D/B team as well as SHA, and the required design, construction, quality control/assurance, and project management necessary to achieve the Project Goals. Planning and execution founded on good judgment and sound decision-making at all levels is the key to success.

The Triton /AMT Team will carefully track and actively manage the schedule to ensure that it will achieve the completion date. Realistic design durations, QA/QC, IDQM, SHA, PRD, and other review and permitting durations will be included based on experience. We will provide a "look ahead" schedules on a weekly basis to set expectations on when design packages will be submitted. These updates will serve as the required advance notification of design submissions.

Effective communication between the Triton/AMT Team and SHA will be a key tool for managing schedule. As discussed previously, a ProjectWise will be used for real time sharing of the latest documents. We will develop distribution lists to facilitate contact between the parties. In addition, we will effectively partner with various SHA personnel by:

- Inviting SHA to weekly design / construction scheduling and coordination meetings.
- Inviting SHA to daily informal meetings of Construction team during construction.
- Providing entire team with 24/7 d access to file documentation, such as utility tracking, meeting minutes, review and approval status of design element submittals, material approvals, RFI logs, and shop drawings.
- Encouraging use of the Partnering Process (described below).

Stakeholder Coordination

The Triton/AMT Team understands the sensitivity of transportation projects impact on the environment and ways to avoid public negative reaction; for example, through AMT's work on the Intercounty

Connector (ICC). A successful project requires a proactive Public Outreach program. We have a two-pronged approach to ensuring effective stakeholder outreach and communications with the public. (1) involving the appropriate stakeholders during design, and (2) communicating with the traveling public and adjacent communities using diverse tools during construction.

- A project website to update the public on progress, next steps, and traffic switches/detours
- Social media sites to reach additional stakeholders and offer feedback
- Mail and hand-out informational flyers
- Community involvement meetings with stakeholders to discuss MOT concerns, as well as the public to educate them on the design and construction phasing
- Educational materials on the project website and at public meetings to demonstrate the way the design has provided environmental avoidance and mitigation
- VMS boards to inform motorists of upcoming changes in traffic patterns
- Press releases announcing project progress and upcoming changes in traffic patterns
- Local TV and/or radio station advertisements

Partnering

It is imperative to establish, at the outset of the project, a set of processes to facilitate timely and effective communication, collaboration, and issue resolution – known as partnering. We will participate in both informal and formal partnering in accordance with Contract requirements, and fully support our team’s commitment to the spirit of partnering and collaboration.

Construction and Design Partnership

Our team partnership will seek to ensure timely reviews and submittals by using the project office where the design and construction staff can work together side by side. The Design Manager, lead engineers, and task leaders will meet with the construction team weekly. The Administration staff and reviewers will be encouraged to join with us to become a full member of our D-B Team, performing informal over the shoulder reviews, attending our task force meetings, and truly becoming our Partner. By doing this, our goal of “No Surprises” will be realized and the MD 219 project delivered on schedule and budget.

Formal Partnering

MDOT-SHA requires formal partnering on all D-B projects. The partnership is structured to draw on the strengths of each organization through open communication, teamwork, and cooperative action to identify and achieve reciprocal goals. The objectives are effective and efficient Contract performance, completion within the Contract bid price, on schedule, and in conformance with the Contract Documents. The Administration's ADE Construction and Triton will meet, plan, and organize a partnering development team. An initial workshop team meeting will be held to establish the project charter and an issue resolution ladder, which strives to resolve issues at the lowest possible level prior to escalating the concern. Follow-up workshops will be held regularly as agreed.

Informal Partnering

We recommend the following framework to facilitate timely issue resolution:

- Regular Management & Oversight Meetings (such as monthly or bi-weekly as agreed upon during partnering workshop) including team management from the Administration, Triton, and AMT – a venue to discuss how MDOT-SHA can support upcoming construction priorities, and lingering issues such as unresolved design review comments.

- Partnering with Utility Owners to minimize their disruption, mitigate their cost and facilitate their relocation.
- Stakeholder partnering during development of the TMP and traffic control plan. Stakeholders to include Police, Fire and Rescue, Garrett County Schools, Garrett County Department of Public Works and SHA's District 6.
- Partner with Environmental Permit agencies for possible modifications to permits. A proactive approach will help to incorporate those agencies as stakeholders and generate a team approach. We will request face to face meetings to explain avoidance, mitigation, and constraints.



Documentation/Follow Up

We have found that preparing action item lists after each meeting, assigning “issue advocates” to matters as they become known, and giving them the tools and authority to solve that specific issue, is extremely successful in eliminating schedule or cost concerns. Maintaining aggressive pro-active application of the partnering principles and open communication will enhance and improve the desired partnership. The Triton/AMT Team will call or personally visit stakeholders, permitting agencies and utility companies, as required, since one-on-one meetings are an extremely effective method to ensure coordination as the work progresses. Appropriate representatives from the major stakeholders listed above will be invited to attend these informal discussions, so they can get an understanding of the reasoning behind the design and procedures for their own subsequent reviews. Design excellence will be achieved through full collaboration with SHA and project stakeholders, including utilities, resource agencies, local jurisdictions, communities, property owners and elected officials.

B-iii: Approach to Obtaining Required Environmental Permits

The most critical environmental compliance goals associated with this project lies in ensuring efficient and timely acquisition of all necessary permits and authorizations for impacts including stormwater management/erosion and sediment control, wetlands, State Waters and Waters of the United States and forest impacts. The Team understands obtaining permits/approvals, including modifications and reevaluations, from SHA, federal, state and local agencies is paramount to meeting and/or exceeding the project schedule goal for the project. We further understand the numerous partners that will play a key role in overseeing and/or reviewing our designs and/or issuing the required permits/approvals necessary to perform construction. These include numerous SHA Divisions and Districts (ICD, OHD, HHD, OOS, OED, OMT, OOTS, D-6 Construction, D-6 Traffic, D-6 Utilities, D-6 ROW and D-6 Maintenance), SHA-PRD, MDE, USACE, USFWS, DNR, FEMA, and FHWA. Anticipated environmental permits/approvals for the US 219 project will include the following:

- E&SC Permit for earth disturbance, stockpile areas, disposal sites, and borrow pits from SHA-PRD
- SWM Concept, Site Development and Final approvals from SHA-PRD
- MDE approval for small ponds (Code 378) and Dam Safety, if needed
- Section 404 Individual Permit, Water Quality Certification and Non-tidal Wetlands & Waterways Permit from USACE (in consultation w/USFWS) and MDE
- Reforestation Law approval from DNR
- NOI/NPDES Permit

A *proactive* approach to addressing regulatory concerns associated with this project will be necessary to acquire all authorizations and environmental permits within project timelines. An experienced team will need to anticipate all regulatory requirements and proactively address agency-specific concerns related to this environmentally sensitive portion of the project corridor. As part of our approach to obtaining environmental permits, we would focus on meeting agency needs including providing timely and accurate information and opportunities for close coordination. Our team will be responsible for ensuring that

impacts do not increase from the D/B Team's design efforts and when possible will actively identify opportunities to reduce environmental resource impacts.

Critical Path Management

Mapping out a critical path which meets the specific permit application review protocols for each permitting agency will be an essential first step in mitigating impacts. Based on past experiences, the key to successfully meet the unique environmental challenges is to bring permitting agencies and commenting partners into the process early. With SHA's approval and direction, our Team would schedule ongoing discussions with the key regulatory agencies (USACE, MDE, DNR and USFWS) early in the process. These early conversations are critical in identify any specific concerns of the permitting agencies and to establish expectations for permitting review, including overall schedules. The environmental agencies have invested significant time in this project during both the PEL and NEPA process. As the D/B Team, it's our job to carry those commitments, in partnership with SHA, on through the design and construction phase. This collaborative process also helps to bring the design, construction, and regulatory efforts together to focus on the pathway for achieving project goals and minimizing risks to project scope, cost and schedule. Anticipated design approvals necessary to perform construction of the US 219 project include the following: 1) design quality control plan and design certifications; 2) roadway, MOT, drainage, E&SC, SWM, and H&H studies, including required calculations and reports; 3) structures (bridge, culverts, walls, and incidental structures), including required calculations; 4) geotechnical studies, design, and reports, including planning report; 5) pavement evaluation, design and reports (rehabilitation of existing pavement and new pavement); 6) TMP, signing, markings, lighting, and ITS, including temporary elements; 7) Tree avoidance and minimization report; 8) Landscape for roadside, SWM and on-site reforestation; 9) public outreach plan; 10) other studies, reports, documents (e.g., design exceptions) as needed for construction.

Early Development of Environmental Compliance Plan

Our first step to obtaining environmental permits, will be to conduct an "introduction" meeting with the agencies. Besides reviewing resources, this meeting would also serve as an opportunity for the D/B team to meet with the agencies and begin the process of further evaluating opportunities to ensure impacts do not increase and even look to reduce those impacts. The meeting will allow the D/B team to explain to the agencies some of the design approaches the team is considering to meet the goals of the project. We will also use this meeting to introduce our teams Environmental Compliance Plan detailing our steps by step process for environmental compliance as its meets the conditions described in final NEPA documentation, SHA directives and all regulatory permits.

Wetland Permitting

This introduction meeting can also serve as the pre-permitting meeting where our Team, including lead environmental staff, will describe our process especially for wetland and waterway permitting relevant to avoidance and minimization efforts and overall project schedule and key agency-related milestones. Permit applications and support materials for wetlands and waters will be produced using the Joint Federal/State Application for the Alteration of any Floodplain, Waterway, Non-tidal Wetland in MD, per Section 404 of the Clean Water Act, MD Nontidal Wetlands Protection Act, and water quality certification regulations. We will submit through SHA EPD for all permit submittals. In addition, discussions regarding JPA amendment and Phase II mitigation plans will be held. Largely focusing on wetland permitting, we will develop an agenda, progress updates and schedules for each monthly agency meeting throughout the project. All agency coordination will go through SHA unless directed otherwise.

Stormwater Management and Erosion & Sediment Control

For SWM and E&SC compliance, the D/B team will closely coordinate design submittals for review by SHA's Plan Review Division for MDE compliance. Our SWM engineers will work closely with our environmental and design team to ensure SWM compliance doesn't offset other resources considered sensitive. Forest characterization and impact documentation will be utilized to develop permit submissions to DNR for approval. It is anticipated that the D/B Team will also coordinate how reforestation efforts will be conducted. It is our understanding that both wetland mitigation and reforestation sites have been identified. The D/B Team will be responsible for completion of final plans for both.

Other Permits

Other permits applied for, processed, and procured may include Hydraulics and Floodplain Approvals.

Mitigation Commitments


Once we receive our permits, environmental compliance is still contingent on meeting permit conditions during construction and that fulfill mitigation requirements. For example, our Team will need to complete the design and construction of all wetland mitigation and reforestation requirements. To do this, we have highly experienced designers with hands-on construction experience as well. In addition, our staff will manage all JPA amendments, revisions to Phase I mitigation plans and completion of the Phase mitigation approval as well. We will focus on ensuring that the selected site meets all the compensatory mitigation ratios as well as meeting functional uplift goals. We are very familiar with the Phase II Mitigation Checklist and have extensive EPD experience with both wetland mitigation and stream restoration efforts. During the construction of environmental mitigation projects, we will provide inspections of stakeout, grading, water control structures, stream structures, and plantings, stream length, longitudinal features, wetland grades, bioengineering, structural techniques, E&S control, quantities and quality of plant stock, provide red line revisions, and as-built survey services.

For mitigation, the ACOE and MDE will require that the applicant develop a Compensatory Mitigation Monitoring Plan (CMMP) that details the monitoring methodologies, procedures, and time frames, and defines successful achievement of intermediate and final COE and MDE performance standards. The Team will ensure that during the permitting process MDE and COE monitoring requirements are consistent with each other, achievable within the monitoring period, and meet the requirements of the *2008 Final Mitigation Rule, RGL 08-03; COE's 2015 Performance Standards and Monitoring for Non-Tidal Wetland Mitigation Banks in Maryland; MDE's Monitoring Protocol for Wetland Mitigation Projects November (2011); SHA's Mitigation Monitoring Protocols for Wetlands and Stream Restoration (Rev 2007); and Stream Functional Evaluation (2011)*. AMT will develop a CMMP that details reporting requirements and schedules, inspection requirements, and describe how and when corrective actions will be undertaken (e.g., remedial action plan) when intermediate performance goals are not met.

Avoiding and Minimizing Impacts to Environmental Resources

Our Team has the proven experience with the regulatory agencies to achieve consensus on appropriate avoidance and minimization actions. This helps reduce the costs of mitigation while minimizing risks to the schedule associated with securing the required environmental clearances and water quality permits. Specific steps taken to avoid or at least minimize environmental impacts include:

- Conduct a series of meetings minimize and manage environmental risk to the project. All efforts to avoid and minimize impacts will be documented as part our monthly Environmental Compliance Report (part of our larger Environmental Compliance Plan detailing every step toward 100 percent environmental Compliance).

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- The Team will identify the limits of features which will be regulated by each agency. Our team will focus regulatory authority on essential project elements while anticipating and minimizing avoidable regulatory oversight. Avoiding impacts would prevent the need for additional agency coordination and a detailed alternative analysis, reducing project costs and timelines.
 - Our environmental team will collaborate with the design and construction staff to minimize impacts associated with the project. The goal is to not just accept impacts as described by the NEPA documentation, but to also identify opportunities to reduce impacts, where possible, while maintaining an aggressive schedule.
 - Risks from design changes will be reduced through rigorous internal communication between design and environmental staff as plans are developed and changes proposed. We anticipate developing avoidance and minimization measures to document compliance with 404(b) (1) guidelines to first avoid, and then minimize, impacts to regulated resources. Innovative avoidance/ minimization options to be evaluated include but are not limited to: alignment shifts, steep slopes/geotechnical reinforcement, high headwalls, stormwater innovations, narrowed shoulder safety grading, and retaining walls.

Environmental Compliance During Construction

A thorough construction phase monitoring plan will be developed and implemented to guarantee permitted conditions are satisfied and potential non-compliance is identified and corrected before they result in a Notice of Violation or Stop Work Order. This will be particularly critical where multiple specific permit conditions are anticipated. In addition to the permit-mandated inspections, our Team will:

- Designate a lead environmental manager who will direct our environmental staff on site during all phases of construction helps to identify potential regulatory concerns in their earliest stages.
- Our Team's environmental compliance team may include environmental inspectors and designated specialists, Quality Assurance (E/SC) inspectors, and landscape inspectors.
- We will work closely with the Independent Environmental Monitor provided by SHA, as applicable to the project, to aim for 100 percent compliance through all phases of the project.
- Interactions between the Team's regulatory specialists and contractors will be encouraged to foster open lines of communication which results in proactive dialogue and an understanding of how regulatory obligations interacts with specific ground conditions. This multi-level understanding of project components creates a readymade, rapid response team which can act quickly and efficiently when unavoidable issues arise, allowing complications to be addressed promptly and to the satisfaction of regulatory agencies.

B-iv Potential Alternative Technical Concepts

At this time, we have not yet identified alternative technical concepts for the US 219 project.