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Technical Proposal

Contract No. GA6465270 | May 23, 2017

US 219 from I-68 to Old Salisbury Road

DESIGN-BUILD

WRA

MDOT

MARYLAND DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ADMINISTRATION

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XVII.A. Design-Builder Capability

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XVII.A. Design-Builder Capability

Tyson Hicks – Design-Build Project Manager

Firm: Fay, an i+iconUSA Company
Registration(s)/Certification(s): OSHA 30, Multiple OSHA Compliance Trainings
Education/Training: BS – Civil Engineering
Years of Experience: With Firm: 8 Total: 17

Tyson Hicks has 17 years of transportation construction experience including overall management of projects, coordination with key design and construction team members, management of scheduling and budgets, and coordination of safety and quality efforts. Most of his career has been spent constructing complex roadway projects for state Department of Transportation clients, including those utilizing design-build construction and working closely with engineers and design teams on other projects. Tyson is well experienced in managing projects with strict time restraints. He successfully managed two award-winning accelerated bridge replacement projects, completing both ahead of schedule. In addition, Tyson has spent much of his career working with various governmental entities on highly-sensitive environmental projects for the timely securing of permits. Relevant experience includes:

Design-Build I-90 over Six Mile Creek Gorge Twin Bridges Replacement | PennDOT | Erie County, PA | $33.9M | 4/09-5/12 | Design-Build Project Manager. Tyson managed all design and construction efforts for this large-scale design-build project involving the replacement of 7,000 LF of interstate highway. The complex work also involved design and construction of dual bridges and their massive 180-ft. high piers, which were among the tallest in the entire state. Tyson worked closely with PennDOT and stakeholders, served as the primary point-of-contact, performed key reviews, coordinated the design with construction and developed and monitored the CPM schedule. Tyson's planning provided unrestricted vehicular movement on I-90 for the project's duration. An innovative alternate project execution plan ensured the roadway and bridges opened to traffic as scheduled. This project included new pavement construction, drainage, SWM, E&SC, stream/wetland mitigation, MOT, temporary roadways, landscaping, and signing and marking. Project requirements also included significant environmental permitting efforts working directly with agencies, including the USACE, USFWS, Pennsylvania Department of Environmental Protection (PADEP), and the PA Fish and Boat Commission. This project won an ABCD *Outstanding New Multiple Span Bridge Award* and an *ACEC/PA Diamond Award*.

SR 51/88 Interchange Improvements | PennDOT | Pittsburgh, PA | $19M | 6/13-5/16 | Project Director. Tyson managed this high-profile intersection improvement project for SR 51/88, serving as the client's primary point-of-contact. He directly oversaw the construction of a new jug-handle interchange, replacement of five structurally-deficient bridges, construction of a new sixth bridge, building of a 320 LF precast arch culvert, and the addition of approximately 3,000 LF of major storm drainage improvements to reduce flash flooding in this congested area. Tyson provided leadership for all aspects of the job, including new pavement construction, major utility coordination, drainage, SWM, E&SC, signing, marking, and landscaping. Additionally, he partnered with PennDOT to reduce the project from ten phases to three, in order to save PennDOT money and keep the project on schedule. Tyson was a key figure in the public relations support, attending public meetings and working with PennDOT to maintain traffic throughout construction. This was a crucial feature since the interchange was a vital transportation link to neighboring businesses and residences.

Liberty Bridge Rehabilitation | PennDOT | Pittsburgh, PA | $80.8M | 4/15-Present | Project Director. Tyson is responsible for both the design and construction of this rehabilitation project. WRA is performing MOT and utility relocation design services for Fay on this project. Tyson is overseeing all work, including critical bridge rehabilitation services, removal and replacement of 170,000 SF of bridge deck on the 16-span structure, new pavement construction, structural steel repairs, environmental permitting, utility coordination and relocation, signing, lighting and marking for this vital connection to downtown Pittsburgh. Tyson is coordinating the design and construction with WRA, PennDOT, the Coast Guard, CSX and N/S Railroad, and other businesses and stakeholders. He provides critical support for environmental protection, permitting due diligence, PADEP water obstruction and encroachment 105/404, and USACE NWP 3 Permits.

Mansfield Bridge Rehabilitation | Allegheny County DPW | McKeesport, PA | $33.6M | 1/12-10/14 | Project Manager. Tyson managed this complex large bridge rehabilitation project, including the replacement of a concrete bridge deck and structural steel repairs. He served as the client's primary point-of-contact and oversaw all work, which included new pavement construction, existing pavement rehabilitation, environmental aspects, signing, and marking. Tyson phased the construction on this project and ensured that continuous traffic across the bridge was maintained throughout the duration of the project. His management allowed the project to be completed ahead of schedule and the work earned high praise from the mayor of Dravosburg, a Pennsylvania state representative, and the county executive.

Walter Miller, PE – Design Manager

Firm: Whitman, Requardt & Associates, LLP
Registration(s): 1991/Maryland Registered Professional Engineer, License No. 19165
Education/Training: BS/1987/Civil Engineering
Years of Experience: With Firm: 24 Total: 30

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

Design-Build MD 237 from MD 235 to Pegg Road | SHA | St. Mary's County, MD | $37.8M | 12/07-10/11 | Design Manager. Walter managed all design efforts for the dualization (two to four lanes) and reconstruction of 2.9 miles of MD 237, including survey; roadway and bicycle/pedestrian improvements; H&H analysis and design for drainage, SWM, multi-phase E&SC, a rock ramp, and maintenance of stream flow; design of pipe culverts and a box culvert; noise wall and retaining wall design; complex multi-phase MOT using temporary crossovers; soil borings; pavement cores and FWD testing; geotechnical engineering and pavement design using an alternative pavement section resulting in cost savings to SHA; traffic signals, intersection lighting, signing and markings; landscape including reforestation design; utility designating and test pitting; utility design for gas, water and sewer and coordination for electric and communications; permitting/approvals/compliance (SWM, E&SC, NOI/NPDES, forest, Section 404/wetlands and waterways, NEPA); public outreach; partnering; design QC; and construction support services, including as-built plans.

Design-Build MD 210 at Livingston Road/Kerby Hill Road Interchange | SHA | Prince George's County, MD | $82.6M | 3/15-Present | Design Manager. Walter is managing all design efforts for the reconstruction of an at-grade intersection to a grade separated interchange, including survey; roadway and bicycle/pedestrian improvements; H&H analysis and design for drainage, SWM, multi-phase E&SC, a stream relocation/restoration, maintenance of stream flow, and flood studies; design of box culvert extensions and pipe culverts, bridges, noise walls, and retaining walls; complex multi-phase MOT; soil borings; pavement cores; geotechnical engineering and pavement design; TMP; traffic signals, interchange and intersection lighting, and signing/markings; landscape design and on-site reforestation; utility designating/test pitting; utility design of gas, water and sewer; extensive utility coordination of electric and communications; environmental permitting/approvals/compliance (SWM, E&SC, NOI/NPDES, forest, Section 404/wetlands and waterways, NEPA); public outreach; Partnering; design QC; and construction support services. Project design is 98% complete.

Design-Build I-495 at Arena Drive from MD 202 to MD 214 | SHA | Prince George's County, MD | $29.5M | 5/07-12/09 | Design Manager. Walter managed all design efforts for the median widening of 1.9 miles of I-495 for additional lanes in each direction, reconfiguration of ramps and modification of intersections at the MD 214 and MD 202 interchanges, and modification of intersections at the Arena Drive interchange. Design efforts included survey; roadway and drainage improvements; SWM; multi-phase MOT and E&SC; geotechnical and pavement design; traffic signals, interchange lighting, signing/markings and ITS; landscape design and on-site reforestation; utility coordination; interstate access approval; environmental permitting/approvals/compliance; public outreach; partnering; design QC; and construction support services.

Design-Build MD 32 from MD 108 to Linden Church Road | SHA | Howard County, MD | $32.6M | 12/16-Present | Design Manager. Walter is managing all design efforts for the dualization of 3.0 miles of MD 32 from an existing two lane roadway to a divided four lane roadway with a grass median incorporating SWM facilities, realignment/reconstruction of interchange ramps at Linden Church Road, and connecting into the existing dualization at MD 108 interchange. Design efforts including roadway: H&H analysis and design for drainage, SWM, and multi-phase E&SC; structural design including box culvert and headwall design; complex multi-phase MOT; soil borings; pavement cores; geotechnical engineering and pavement design; TMP; interchange and intersection lighting; signing/markings; landscape design and on-site reforestation; utility designating/test pitting; utility coordination; environmental permitting/approvals (SWM, E&SC, forest, Section 404/wetlands and waterways, NEPA); public outreach; and design QC. Project design is 60% complete.

US 301, Section 1 | DelDOT | New Castle County, DE | $137.6M | 8/08-Present | Project Bridge Supervisor and Design QC. Walter was responsible for the structure design associated with 5.5 miles of limited-access four lane divided highway on a new alignment including eight new structures, three MSE retaining walls, and seven sign structures.

Ed Chaney – Construction Manager

Firm: Fay, an i+iconUSA Company
Registration(s)/Certification(s): SHA E&SC Manager, SHA Traffic Control Manager, ACOE Quality Control Management, OSHA 30-Hour Course, SHA Certificate of Training, First Aid & CPR, (*continued*) Training, Master Rigger 1 & 2, Multiple MOSH Compliance Training
Education/Training: High School
Years of Experience: With Firm: 19 Total: 35

Ed Chaney has 35 years of relevant transportation construction experience building large and complex projects for state transportation agencies, including MDOT SHA (SHA). His experience includes safety, stakeholder coordination, scheduling, managing and supervising major earthwork, roadway, utility, bridge, and highway interchange projects. Working in Maryland for most of his career, he has significant knowledge and familiarity with Maryland's wetland and waterway requirements, permitting agencies and regulations, and the implementation of Best Management Practices. His projects have all received "A" ratings from SHA and his projects have been recognized with seven MdQI awards, as well as many other achievement awards. Relevant experience includes:

Union Bridge Quarry Replacement Phase I and II | Lehigh Cement Company, LLC | New Windsor, MD | $60.2M | 5/15-11/17 | General Superintendent/Construction Manager. Ed was responsible for management, scheduling, and stakeholder/subcontractor coordination for the opening of a new quarry and construction of a 4.5-mile rock conveyor system for Lehigh cement. Similar aspects include 141 acres of clearing, 2.2 million CY of excavation, 26,000 CY of structural concrete, a 15,000 SF retaining wall, a design-build shop-office, relocation of several Verizon and electric utilities, roadway construction, stream relocations, SWM, E&SC, and permit acquisition and compliance.

Bridge No. 050012 on MD 328 over Tuckahoe Creek Replacement | SHA | Caroline and Talbot Counties, MD | $11.5M | 9/10-2/13 | General Superintendent/Construction Manager. Ed was responsible for the management, scheduling and stakeholder/subcontractor coordination for the realignment of 2,600 LF of MD 328 and construction of a 930 LF bridge. Located in an environmentally-sensitive area, a USE II waterway, with extensive wetlands within the LOD, a section of the project site was also located on the burial grounds of a Tuckahoe Indian tribe. Best Management Practices included a 400 LF trestle designed-built by Fay for staged bridge construction. Critical to construction success: four stages of MOT over 29 months with zero work zone incidents, procured MDE and the Caroline County Soil Conservation District permits for new borrow pit, placed 23,000 CY of earthwork excavation and embankment through four stages of quarantine periods, 4,000 TON of asphalt pavement, 600 LF of new drainage piping and structures, overhead electric relocation, signing, pavement markings, roadway lighting infrastructure, and landscaping. The project finished on time through numerous work quarantine and restriction periods. This project maintained an "A" rating for environmental compliance and won the 2012 MdQI Award of Excellence for Partnering.

Joppa Road and Cowenton Avenue Bridges over I-95 Replacement | MDTA | Perry Hall, MD | $15.1M | 5/06-11/07 | General Superintendent/Construction Manager. Ed was responsible for the management, scheduling and stakeholder/subcontractor coordination for the realignment and reconstruction of 3,700 LF of Cowenton Avenue and Joppa Road and replacement of two bridges over I-95. Utility coordination and schedule management provided the reopening of the Joppa Road section four months early. Other aspects included multi-phased MOT plans coordinated with adjacent I-95 projects, 64,000 CY of earthwork, 1,600 LF of closed storm drain systems, SWM, E&SC, multiple utility relocations for sewer, water, gas, electric, and communications, design-build micropile bridge foundations, new pavement, pavement reconstruction, and singing and marking. The project earned an "A" rating from MDTA and won the *MdQI Award of Excellence in the New Structure Category* and an Award of Merit from McGraw Hill construction's *"Best of 2007 Construction Projects."*

I-695 and York Road/MD 45 Bridge and Interchange Improvements | SHA | Baltimore County, MD | $14.1M | 10/03-12/05 | General Superintendent/Construction Manager. Ed was responsible for the management, scheduling and stakeholder/subcontractor coordination for the reconstruction of the I-695 interchange at MD 45, and the reconstruction of 2,500 LF of MD 45 to remediate congestion. Other aspects of the project included overlapping multi-stage MOT, many businesses located within the footprint of construction, 72,000 CY of earthwork, 3,500 LF of drainage, SWM, E&SC, concrete and bituminous full depth pavements, water main replacement up to 30" diameter, gas main relocation, BGE, Verizon and Comcast relocations, and lighting and landscaping. He also played a key role on the project partnering team, addressed all MDE compliance and inspection items, and managed traffic control and permitting compliance. The project received an "A" rating from SHA and an *Excellence for Heavy Construction Award* from the American Concrete Institute.

Gary Bush, PE – Highway Engineer

Firm: Whitman, Requardt & Associates, LLP
Registration(s): 1985/Maryland Registered Professional Engineer, License No. 14255
Education/Training: BS/1976/Civil Engineering
Years of Experience: With Firm: 39 With Others: 0

Gary Bush has spent his entire 39-year career as a Highway Engineer at WRA on projects in Maryland, with a majority of projects being for MDOT SHA (SHA). Responsibilities have consisted of all phases of projects including planning, preliminary design, final design, preparation of design-bid-build and design-build documents and construction related services. His experience includes typical section development, horizontal/vertical alignments, grading, superelevation, intersection layout including roundabouts, interchange layouts, MOT, noise measurement, analysis and barrier design, signing/marking, utility coordination, ROW, construction details, writing specifications, and developing detailed cost estimates. He has prepared Alternative Technical Concepts, participated in value engineering studies, performed constructability reviews, and participated in public meetings. Gary has been the Highway Engineer for four design-build projects for SHA, including MD 237, MD 210, Arena Drive and currently MD 32. Relevant experience includes:

Design-Build MD 237 from MD 235 to Pegg Road | SHA | St. Mary's County, MD | $37.8M | 12/07-10/11 | Highway Engineer. Gary was responsible for highway design and MOT for the dualization (two to four lanes) and reconstruction of 2.9 miles of MD 237, including the construction of new pavement, rehabilitation of the existing pavement, and connection to an existing dualization. The project required 2,200 LF portion of MD 237 vertical alignment be raised approximately 12 ft. to accommodate the replacement of existing undersize pipes to a larger twin cell box culvert. Portions of MD 237 horizontal alignment were relocated to eliminate several small horizontal curves. At select locations, intersecting roadways were realigned to provide for improved intersection geometry. The project was constructed in four zones requiring four MOT packages utilizing temporary connections between construction zones to maintain traffic without detours. Gary oversaw the preparation of final roadway plans, assisted in utility coordination and relocations including coordinating test holes, and reviewed water, sewer, gas, and signing/markings designs. He coordinated surveys, prepared design schedules, and participated in partnering meetings and the public outreach program. The project also included drainage, SWM, multi-phase E&SC, a box culvert, noise barriers, traffic barrier, traffic signals, lighting, signing/markings, landscaping, utility coordination, permitting/approvals/compliance, and construction support services, including as-builts.

Design-Build MD 210 at Livingston Road/Kerby Hill Road Interchange | SHA | Prince George's County, MD | $82.6M | 3/15-Present | Highway Engineer. Gary is responsible for all highway design and MOT for the reconstruction of an at-grade intersection to a grade separated interchange including the widening of 1.9 miles of MD 210. He is responsible for the final highway design which includes the interchange ramp design, intersection design, service roads and temporary roadways. In an effort to minimize disruptions to traffic during construction, the existing pavement is being rehabilitated to the greatest extent possible. Many design challenges were overcome in order to meet the design intent within the limited available right-of-way. The project also includes roadway and intersections improvements, noise barriers, MOT, TMP, traffic signals, lighting, signing/markings, landscaping and on-site reforestation mitigation, utility design with coordination of overhead and underground electric and communications, permitting/approvals/compliance, public outreach, Partnering, and construction support services. The highway design is complete. Project design is 98% complete.

Design-Build I-495 at Arena Drive from MD 202 to MD 214 | SHA | Prince George's County, MD | $29.5M | 5/07-12/09 | Highway Engineer. Gary was responsible for all highway design and MOT for the reconfiguration of interchange ramps and intersections at MD 202 and MD 214, intersection improvements at Arena Drive, and for the median widening of 1.9 miles of I-95/I-495. Gary oversaw the roadway design, preparation of final plans, preparation of multi-phase MOT, assisted with utility coordination, developed design schedules, participated in Partnering and public outreach.

Design-Build MD 32 from MD 108 to Linden Church Road | SHA | Howard County, MD | $32.6M |12/16-Present | Highway Engineer. Gary is responsible for highway and MOT for the dualization of 3.0 miles of MD 32 from a two-lane roadway to a divided four-lane roadway. He is responsible for the highway design including MD 32 dualization, reconfiguration of interchange ramps at Linden Church Road, and intersection design. During procurement, Gary developed an ATC that was approved to modify the open median which resulted in minimizing impacts to an environmental resource. The highway design is 60% complete.

US 301, Section 1 | DelDOT | New Castle County, DE | $137.6M | 8/08-8/11 |Highway Engineer. Gary was responsible for developing preliminary highway engineering and cost estimates for Section 1 consisting of 5.5 miles of limited- access four-lane divided highway on a new alignment. Work efforts included preparing preliminary roadway horizontal and vertical alignments, estimating major item quantities, developing unit costs and tracking proposed construction contracts.

Jason Cosler, PE – Water Resources Engineer

Firm: Whitman, Requardt & Associates, LLP
Registration(s): 2002/Maryland Registered Professional Engineer, License No. 28467
Education/Training: BS/1992/Civil Engineering
Years of Experience: With Firm: 18 Total: 25

Jason Cosler has 25 years of experience in water resources engineering for public infrastructure, transportation and development-related projects. His experience includes the investigation, analysis, and design of storm drains, culverts, SWM facilities, bridges and low-water crossings, E&SC measures and permitting, stream stability assessments and restoration design, scour analysis and countermeasure/revetment design. He is experienced in the application and interpretations of the 2000 Maryland Stormwater Design Manual including recent updates requiring environmental site design (ESD), as well as methodologies and programs including HDS-5, HY-8, HY-22, HEC-11, HEC-14, HEC-18, HEC-21, HEC-23 and TR-55. He has advanced training in HEC-RAS, GIS Hydro 2000, TR-20, ABSCOUR and is Yellow Card certified. He possesses training in stream assessment and restoration based upon Rosgen methodologies. Jason has been the Water Resources Engineer for four design-build projects for MDOT SHA (SHA), including MD 237, MD 210, Arena Drive and currently MD 32. Relevant experience includes:

Design-Build MD 237 from MD 235 to Pegg Road | SHA | St. Mary's County, MD | $37.8M | 12/07-10/11 | Water Resources Engineer. Jason was responsible for all water resources designs for the dualization (two to four lanes) and reconstruction of 2.9 miles of MD 237. He oversaw the design, plan preparation, and MDE, USACE and SHA permits/approvals for open and closed storm drain systems; eight traditional SWM facilities; SWM as-built certification; and H&H analysis/design for phased E&SC with MOT, drainage culverts, a two-cell CIP box culvert, including maintenance of stream flow, constructed in phases at the Jarboesville Run crossing and the design/construction of a rock ramp for fish passage downstream of the box culvert. The project also included roadway and bicycle/pedestrian improvements, noise barriers, traffic signals, intersection lighting, signing/markings, landscaping, utility design/coordination of overhead and underground facilities, permitting/approvals/compliance, public outreach, partnering, and construction support services.

Design-Build MD 210 at Livingston Road/Kerby Hill Road Interchange | SHA | Prince George's County, MD | $82.6M | 3/15-Present | Water Resources Engineer. Jason is responsible for all water resources engineering for the reconstruction of an at-grade intersection to a grade separated interchange. He oversaw all design and plan preparation, as well as MDE, USACE and SHA permits/approvals for final drainage, SWM (traditional and ESD), H&H analysis for drainage culverts, a bridge over Carey Branch, phased E&SC, and stream relocation (stream stability analysis and maintenance of stream flow design). He has worked to minimize impacts to all environmental features and coordinated with electric, communication, gas and water/sewer utilities. The project also includes roadway and bicycle/pedestrian improvements, noise barrier design, MOT, traffic signals, intersection lighting, signing/markings, landscaping and on-site reforestation mitigation, utility design/coordination of electric and communications, permitting/approvals/compliance, public outreach, Partnering, and construction support services. Project design is 98% complete.

Design-Build I-495 at Arena Drive from MD 202 to MD 214 | SHA | Prince George's County, MD | $29.5M | 5/07-12/09 | Water Resources Engineer. Jason was responsible for all water resources engineering for the median widening of 1.9 miles of the Capital Beltway for additional lanes in each direction, reconfiguration of ramps and modifying intersections at MD 214 and MD 202, and modifying intersections at the Arena Drive ramp termini. He oversaw the design and plan development of final drainage, SWM, and E&SC; coordinated SHA/MDE permit approvals; and provided SWM as-built certification. Jason revised the concept SWM which eliminated the construction of a SWM facility in a wooded area, drainage design consisted of 1,700 LF of storm drain trunk line including a 48" conduit jacked/bored under I-495.

Design-Build MD 32 from MD 108 to Linden Church Road | SHA | Howard County, MD | $32.6M |12/16-Present | Water Resource Engineer. Jason is responsible for all water resources engineering for the dualization of 3.0 miles of MD 32 from a two-lane roadway to a divided four-lane facility. He is overseeing the design and the plan preparation of final drainage, phased E&SC with MOT, ESD and traditional SWM facilities, and MDE, USACE, PRD and SHA permits/approvals, maintenance of stream flow for new culvert crossings. Water resources design is 50% complete.

US 301, Section 1 | DelDOT | New Castle County, DE | $137.6M | 8/08-Present | Water Resources Engineer. Jason was responsible for all the water resources engineering for 5.5 miles of limited-access four-lane divided highway on a new alignment. He was responsible for the SWM design consisting of a combination of bio-swales, wet ponds, infiltration trenches and infiltration basins, floodplain analysis, open and closed storm drain systems and E&SC. Jason participated in regulatory agency coordination and oversaw the design for impacts to and restoration of Scott Run.

Charles Hegberg – Wetland Creation/Stream Restoration Design & Permit Specialist

Firm: Skelly and Loy, Inc.
Registration(s): 2016/MDE RPC #RPC005534
SHA E&S Control #06-590
Education/Training: BS/1987/Natural Science
MA/1996/Environmental Planning
Years of Experience: With Firm: 3 Total: 30

Since 1987, Charles (Chuck) Hegberg has been involved in a breadth of environmental restoration projects. He is experienced in projects that have spanned the entire life cycle from planning through construction and restoration/mitigation monitoring. Specific ecological restoration/water resources-related experience includes: permit acquisition, modification and compliance; avoidance and minimization; owner/regulatory agency coordination; tidal/nontidal wetland/stream restoration and compensatory mitigation design; floodplain reconnection; outfall stabilization/reconstruction; stream bank stabilization; bioengineered slope stabilization; natural and structural wildlife and fish passage design; environmental construction management/inspection; and field review meetings and public meetings. Relevant experience includes:

US 219 to I-68 Mitigation Site Search Project | SHA | Garrett County, MD | $464,745 | 9/15-3/17 | Project Manager/Senior Technical Scientist. Chuck was responsible for supervising identification of potential mitigation opportunities; concept mitigation development for off-site opportunities; and agency/permit coordination for the project. Developed mitigation strategies within the Casselman River watershed including site screening, property owner coordination, site review, and agency coordination/field meetings. Strategies involved exploration of mitigation within ROW, offsite locations, out-of-kind opportunities including acid rock drainage, fish passage barriers and wetland preservation.

MD 210 Livingston Road/Kerby Hill Road Interchange Design-Build | SHA | Prince George's County, MD | $98,000 | 3/15-4/16 | Restoration Specialist. Chuck served as Restoration Specialist for the relocation of approximately 800 LF of perennial stream. Work involved the complete relocation of a reach of Carey Branch utilizing natural channel design principles. Completed comprehensive review of the concept study, a Level I geomorphic assessment, hydrologic/ hydraulic analyses, riparian buffer/floodplain buffer reconnection/restoration. Validated concept design elements including hydrologic/hydraulic models and developed semi-final and final stream relocation design plans. The final design of the stream relocation included analysis of the tributary for sediment transport, allowable shear stresses on the banks and bed material, incipient motion, and threshold criteria. A function-based assessment using the US EPA document "Function-Based Framework for Stream Assessment and Restoration Projects," (William Harman et al., 2011) was completed. The assessment allowed for the determination of impaired functions and to set the baseline for any functional improvements made during the restoration efforts.

Intercounty Connector (ICC) Highway Design-Build | SHA | Montgomery County, MD | $4.5M | 4/07-8/12 | Environmental Manager and Stream/Wetland Restoration Specialist. Chuck served as the Environmental Manager and Stream/Wetland Restoration Specialist for the 7.2 mile design-build Contract "A." Responsibilities included environmental compliance monitoring of the design and construction process, avoidance and minimization analysis, documentation of impact reductions, agency coordination of design and construction, permit modifications, technical support studies and design and construction oversight. The restoration design and construction oversight involved stream/wetland reconstruction and restoration including floodplain reconstruction/reconnection including emergent and shrub wetlands and vernal pools, bioengineering of banks and re-vegetation, and wood habitat structures. Stream crossings involved riffle grade controls, culvert concrete and metal weir structures and resting habitat boulder for fish passage in small culverts and channel functional lift opportunities. Habitat designs and construction also included large/small mammal culvert cells, specialized aquatic passage with natural substrate for deer and amphibian in arch bottomless culvert, deer escape ramps and specialized turtle fencing along highway ROW. The stream design and construction were primarily associated with culvert and bridge crossing requiring channel realignments, bed slope and material adjustments, front-of-culvert cutoff walls to ensure water flow into new culverts, bank stabilization, and floodplain reconnection within right-of-way limits.

US Route 220 Stream Restoration | PennDOT District 2 | State College, Pennsylvania | $5.5M | 01-07 | Stream Restoration Specialist. Chuck served as the Stream Restoration Specialist for this project that involved the restoration of over 21,000 LF of channel in order to satisfy the mitigation requirements for the proposed US 220 improvements between Tyrone Expressway (I-99) to Mt. Nittany Expressway (US 322) in the State College area. The project efforts include locating impaired channel reaches, development of concept plans and final design packages. All the restoration work involved using fluvial geomorphic principles, hydrology/hydraulic analysis, topographic surveys, geotechnical analysis, sediment transport assessment, bioengineering, aquatic biology and public education/involvement. Construction of stream channels was completed in 2003.

Diane Szekely, RLA – Landscape Architect

Firm: Streetscapes, Inc.
Registration(s): 1990/Maryland-Registered Landscape Architect, License No. 961
Education/Training: BS/1986/Landscape Architecture
Cert. Merit – Ornamental Plant Material
Years of Experience: With Firm: 21 Total: 31

Diane Szekely has 31 years of experience as a Landscape Architect in the public sector, including more than 10 years with MDOT SHA (SHA). Over the last 21 years, her clients have included various MDOT Business Units including SHA, MTA, MDTA, and MAA, as well as M-NCPPC and various towns and counties throughout Maryland. As a Landscape Architect, she is proficient in the design process, preparing illustrative drawings, and giving public presentations. Her experience includes supporting a project from conception to completion including: site inventory and analysis, base plan preparation, program development, conceptual design, design development, construction document preparation (plans, specifications and cost estimates), shop drawing review, and post construction evaluation. Her work routinely includes context sensitive solutions for designing roadside revegetation/reforestation, median and streetscape planting, and planting for SWM/bioretention facilities and wetland mitigation. Her understanding of the MD Roadside Tree Law, MD Reforestation Law, and SWM facility visual and environmental quality and safety criteria provide comprehensive design development. Relevant experience includes:

Design-Build MD 237 from MD 235 to Pegg Road| SHA | St. Mary's County, MD | $37.8M | 12/07-10/11 | Landscape Architect. Diane was responsible for the preparation of landscape construction documents for the dualization and reconstruction of 2.9 miles of MD 237. Context sensitive landscape design included forest edge planting utilizing trees and shrubs; roadside planting utilizing seed or sod; roadside and median planting areas utilizing trees, shrubs, ornamental grasses and seed or sod for medians less than 16' wide; roadside and median areas at least 16' wide utilizing trees, shrubs, ornamental grasses, groundcovers and perennials, and seed or sod; planting along roadside of noise barrier utilizing shrubs, perennials and ornamental grasses, and vines; planting behind noise barrier utilizing trees and shrub; and, planting for approximately eight SWM facilities. Responsibilities also included assisting the team Arborist with the preparation of the tree impact avoidance and minimization report; attending partnering meetings; meeting with design-build team on an as-needed basis for project status review and design coordination; coordinating with other disciplines to ensure project constructability; and coordinating with SHA to ensure desired design parameters were met.

Design-Build MD 210 at Livingston Road/Kerby Hill Road Interchange | SHA | Prince George's County, MD | $82.6M | 3/15-Present | Landscape Architect. Diane was responsible for the preparation of landscape construction documents for the reconstruction of an at-grade intersection to a grade separated interchange. The context sensitive landscape design included roadside seeding and planting, planting adjacent to noise barriers, reforestation, planting within utility corridor and planting within a SWM facility. Landscape and reforestation design included on-site meetings, design charrette, coordination with design-build subcontractors, development of preliminary and final plans, including tree preservation areas, reforestation areas, general plant types, locations and species selections, landscaping concepts. Project design is 98% complete.

Design-Build MD 404 | SHA | Caroline and Queen Anne's Counties, MD | $100M | 1/16-Present | IDQA Review. Diane is responsible for providing an Independent Design Quality Assurance (IDQA) for the roadside landscape and reforestation design portion of the MD 404 design-build project, which consists of design and construction of MD 404 to a four-lane divided highway from US 50 to east of Holly Road, a distance of about nine miles. Diane is responsible for reviewing the landscape aspect of the design documents to ensure compliance with the contract documents and related references and guidelines. Reviews are conducted on plans at preliminary, pre-final and final stages. Reviews are also conducted on noxious weed control plan, soil test reports and nutrient management plan/report.

Design-Build ICC Contract C | SHA and MDTA | Montgomery and Prince George's Counties, MD | $100M | 8/08-11/14 | Landscape Architect. Diane assisted in the preparation of landscape construction documents for the area west of US 29 to east of I-95. Landscape design included planting adjacent to roads, bridges, bicycle paths, SWM facilities and noise barriers, including roadside screening, forest edge, reforestation, riparian buffer, and street tree and gateway treatments where appropriate. The landscape architectural design team addressed – in a collaborative, multi-disciplinary approach – the functional and aesthetic needs of the project, which included the preparation and implementation of successful design responses to the commitments established for the project. Her responsibilities included developing MicroStation files defining location of individual plant materials and providing QA/QC review of landscape submittals.

US 219 New Highway Construction/Earthwork Contract

Somerset County, Pennsylvania

Firm: Fay, an i+iconUSA Company (Lead Construction Firm)

Owner: Pennsylvania Department of Transportation

Owner Contract Number: P-2002190720A-0970-373-1 (WBS)/ECMS 23620

Owner Point of Contact: Mr. Tom Prestash | 814.696.7130

Project Delivery Method: Design-Bid-Build

Overall Construction Cost:

Initial Contract Value: $110.6 million

Final Contract Value: $110.9 million

Reason for Difference: Owner-approved addition of work

Overall Schedule Performance:

Notice to Proceed Date: September 2013

Initial Completion Date: October 2016

Final Completion Date: October 2016

Reason for Difference: N/A

Relevance of this Project to US 219 Design-Build Project:

Schedule

- On-Time Completion
- Met all Ten Milestone Completion Dates
- Safety - Zero Lost Time

Environmental Compliance

- ATC/VE Eliminated Environmental Impacts
- Constructed Wetland and Stream Mitigation
- Complied with SWM and E&SC Permits
- Protected Wildlife and Endangered Species
- Historic Compliance – Architectural Bridge Elements
- Mine Remediation

Design Excellence

- ATC/VE Eliminated Environmental Impacts, Reduced Cost, and Reduced Future Maintenance
- Partnering
- Stakeholder Coordination
- Utility Coordination
- Public Outreach

Project Description and Specific Nature of Work: **This US 219 project is part of the Appalachian Development Highway System (ADHS) Corridor N.** The project is part of the joint effort between MDOT and PennDOT to complete the section of the ADHS that runs between I-68 in Maryland and US 22 in Pennsylvania. The US 219 New Highway Construction/Earthwork contract included construction for an 11 mile 4-lane limited access roadway on a new alignment between Somerset and Meyersdale in Western PA.

As the lead construction firm, Fay was responsible for all construction including mass excavation, roadway, drainage, SWM, E&SC, permitting waste areas, wetland creation, stream restoration for mitigation, four box culverts, one set of dual bridges, a bridge modification, the construction of an interchange, the relocation of various local roads and other miscellaneous construction. Fay also performed mining of coal (sold to an electrical power producer) and encapsulation of coal and mine waste. Roadway concrete was supplied by a mobile batch plant permitted specifically for this project. At the time of construction this was the largest ongoing PennDOT project in Western PA. Fay won two major industry awards, ***2016 Alliant Build America Award*** (New Highway and Transportation category) and ***2015 AASHTO National Value Engineering Award*** for the most value added proposal during construction in this environmentally-sensitive area.

Major quantities of work include: 13,000,000 CY of excavation; 4,900,000 CY of shot rock; 58,640 SY of 11” reinforced concrete pavement; 58,000 SY of asphalt treated permeable base; 28,000 SY of full depth asphalt pavement; 68,000 LF of closed storm drain; 400 EA drainage structures; 28 EA sediment pond basins; 5 EA stream relocations; 7 EA wetland creations; 1,700 LF of electrical duct bank; and 15,000 LF of guide rail.

Currently, there is a dispute with PennDOT related to two geotechnical work items. Failure of the wick drain system resulted in an embankment settlement, which had to be undercut and stabilized with rock fill, and the contract borings did not accurately locate “Best Available Rock.”

Successful Methods, Approaches, and Innovations: The project had ten interim schedule milestone requirements, with a $40,000.00 per calendar day penalty for failing to achieve a scheduled milestone. Construction milestone dates included roadway relocations, geotechnical treatments and embankment placement, bridge construction and grading area

completion. Additional restrictions controlling the work included completion of wetland mitigations, tree cutting, in-stream work, blasting, and tree removal within bat hibernaculum. The first milestone was within 2 ½ months after the NTP. Fay mobilized to the site, established SWM and E&SC, excavated 75,000 CY of material and relocated 200 LF of a local road successfully. Fay never missed a milestone completion date throughout construction.

Fay's excavation crews moved as much as 50,000 CY of material in a single day. Approximately 1,000,000 CY of material was hauled across an active highway with no traffic issues or accidents. For the new bridge, Fay constructed columns with a stacked stone architectural feature to meet the historic requirements in the Swamp Creek Valley Historic District.

Partnering was absolutely essential to the success of this project. Our team conducted weekly partnering meetings with PennDOT and stakeholders, providing solutions to concerns before they could become issues. Coordination, communication and public outreach was critical to project success. PennDOT's staff included a construction manager, two environmental specialists, and 23 inspectors. Fay worked directly with more than 30 key agencies including government, utility clients, railroads, and community and emergency services groups. Communication with railroads in particular was key as Fay demolished two bridges over the CSX Railroad at the Meyersdale interchange to accommodate the new on and off ramps. Fay managed more than 30 subcontractors while ensuring their conformance to our safety and quality standards. MBE and WBE participation goals were exceeded. Trainees were also utilized on the project.

With such a vast project area covering a large amount of previously undeveloped territory, environmental compliance was another major factor. There were numerous protected wildlife species within the LOD. Fay partnered with the Pennsylvania Department of Environmental Protection and the Somerset County Conservation District to ensure regulatory compliance. Fay partnered with other key agencies including the USFWS, the Pennsylvania Fish and Boat Commission, and the Pennsylvania Game Commission to ensure the protection of wildlife. Fay secured numerous permits, including NPDES permits for waste areas and a value engineering (ATC) effecting wetlands, archaeological impacts, and excavation. Additionally, the site included the presence of old coal mine wastes, sensitive archaeological resources, and historical structures. A significant value engineering (ATC) saved more than $9 million and provided a better overall and more environmentally-sound project. The original contract called for a reinforced soil slope to hold back a section of the roadway embankment. Fay proposed an alignment for the US 219 roadway that allowed the embankment to be sloped and eliminated the reinforced soil wall. Fay assisted PennDOT with additional ROW acquisition for the new alignment. In addition to the cost savings, the value engineering component greatly reduced the Class I excavation and significantly reduced environmental impacts. The new alignment moved the roadway away from a high quality creek and wetlands area and decreased the amount of forested acreage. The ATC also improved the constructability and eliminated future maintenance costs by replacing the slope with an embankment fill.

Technology helped to give Fay an advantage. Using drones, the project team was able to remotely view the site and generate weekly progress reports. Use of the drones and 3D imaging was important as they helped ensure accuracy of the quantities, grade, and slope as we performed the excavation, particularly on slope conditions with high elevations. With personnel spread across 11 miles on the site, Fay utilized iPads and Bluebeam software to not only keep in touch, but to provide all workers with the most up-to-date drawings.

Individuals on this Project Proposed for US 219 Design-Build Project: James McNelis was involved as Senior Vice President with corporate oversight on construction.

Design-Build I-90 over Six Mile Creek Gorge Twin Bridges Replacement

Erie County, Pennsylvania

Firm: Fay, an i+iconUSA Company (Lead Construction Firm)

Owner: Pennsylvania Department of Transportation

Owner Contract Number: P-10009-0-0-7B0-8012-036 (WBS)/ECMS 1278

Owner Point of Contact: Mr. Mike Deibert | 814.678.7120

Project Delivery Method: Design-Build | Best-Value

Overall Construction Cost:

Initial Contract Value: $33.6 million

Final Contract Value: $33.9 million

Reason for Difference: Owner-approved modifications

Overall Schedule Performance:

Notice to Proceed Date: April 2009

Initial Completion Date: June 2012

Final Completion Date: May 2012

Reason for Difference: Worked through anticipated winter shutdowns

Relevance of this Project to US 219 Design-Build Project:

Schedule
- Completed ahead of Schedule
- Developed Work Plans to Avoid Winter Shutdowns
- Safety - Zero Lost Time

Environmental Compliance
- Acquired Permits
- Minimized Impacts to Resources
- Constructed Wetland and Stream Mitigation
- Complied with SWM and E&SC Permits

Design Excellence
- Multi-Phased MOT to Maintain Interstate Traffic
- Partnering
- Stakeholder Coordination

Project Description and Specific Nature of Work: The purpose of the I-90 over Six Mile Creek project was to enhance the safety and operations of Interstate 90 and replace two structurally-deficient bridges over Six Mile Creek gorge in Erie County, PA. The construction was completed over and adjacent to the 100-year floodplain, a sensitive tributary (classified as Cold Water Fish & Migratory Fish) and local parklands. Temporary and permanent stream, wetland and ROW impacts were included in the project. Traffic management utilized a 6-stage MOT plan to maintain four lanes of unrestricted interstate flow throughout construction.

As the Design-Builder, Fay was responsible for the design, construction, permitting, temporary easements, public outreach, stakeholder coordination, scheduling, contract administration, partnering and overall project management for: the realignment and reconstruction of the highway; replacement of dual bridges 180' above the gorge; construction of access roads to the bottom of the gorge; temporary pavement for MOT; stream crossings; upgrading of existing drainage; SWM and E&SC; guardrail; pavement markings; signage; re-vegetation of disturbed areas; perennial stream channel work within the gorge; and wetland creation. As a result of Fay's success on this unique project, Fay was honored with two separate awards, ***Outstanding New Multiple Span Bridge Award*** from the Association for Bridge Construction and Design Pittsburgh Chapter and a ***Diamond Award Certificate*** from the American Council of Engineering Companies Pennsylvania Chapter.

Major quantities of work included: 22 AC of clearing and grubbing; 200,000 CY of earthwork; 24,080 SY of full depth asphalt pavement for the permanent roadway; 14,000 LF of closed storm drain; 8,000 SY of full depth pavement for MOT crossovers; and 7,000 LF of temporary concrete traffic barrier.

E&SC was a considerable part of this work, sequenced with a 6-stage E&SC plan and included: 3,800 LF of V-notch ditches and channels for water runoff control; approximately 200,000 SY of erosion control matting; clear water diversions; wetland delineation fencing; sediment traps, several water bars, rock aprons and rock entrances; and two stream crossings (each consisting of five 60" diameter corrugated pipes). The project scope included stream restoration, landscaping and the planting of 560 trees and vegetation.

The dual bridges are 3-span, continuous steel I-girder structures. The westbound bridge was constructed immediately adjacent to the former westbound structure. The eastbound bridge was built in the same footprint as its predecessor. The

new bridges are a total of 746' long x 48' wide. Fay designed and constructed the 180-foot high piers to support the bridge which are among the tallest in all of Pennsylvania. Each bridge was built with 3,000 CY of substructure concrete, consisting of 50' x 41' spread footers, with 180' tall piers. The deck required 1,600 CY of concrete.

Successful Methods, Approaches, and Innovations: Fay's integration of the design and construction, and partnering, enhanced its value with the following:

Fay obtained additional temporary easements which allowed for the realignment of the gorge access as originally permitted by PennDOT. Fay implemented the access change which eliminated 180,000 CY of side-hill excavation in the 100-year floodplain. PennDOT benefited with significant cost and schedule savings.

Fay's experience with the permitting process allowed it to fast track the approval of the E&SC plans including construction, maintenance, inspection, disposal and environmental due diligence. Fay completed all of the necessary permitting, coordinating with numerous governmental agencies at both the federal and state levels including the USACE, USFWS, the Pennsylvania Department of Environmental Protection, and the Pennsylvania Fish and Boat Commission.

In the design phase, Fay's construction team, understanding how critical a sufficient causeway was to the success of the project, worked with its designer to design and permit a causeway utilizing pipe with sufficient capacity that would not restrict flow of the creek and provide structural stability for equipment crossing.

Removal of the existing bridges utilized conventional demolition with excavators and hydraulic attachments and the use of explosives techniques. Fay successfully completed the demolition adjacent to the new construction with a controlled approach in the tight working space between the old bridges and the new structures. As an environmental steward, Fay recycled the roadway pavement along with the structural steel from the existing bridges. Additionally, all bridge demolition concrete was processed on-site and subsequently approved and used for undercut backfill and toe of slope stabilization, again providing cost savings to PennDOT.

Because of the severity of Erie winters, the owner's initial schedule restricted winter work. Fay implemented an execution plan to work through the difficult Erie winter seasons. Fay utilized heated forms including heating of the 180' tall piers, enclosed access, special concrete mixes, a revised scheme for the structure's steel erection, and continuous haul road maintenance to successfully and safely complete this project ahead of schedule.

Fay's flexibility and innovative approaches allowed for the twin bridges to be opened to traffic on time and the overall project to be completed ahead of schedule. This resulted in a high-quality product with exceptional value to PennDOT and all stakeholders involved. The finished project was exceptional with zero accidents.

Individuals on this Project Proposed for US 219 Design-Build Project: Tyson Hicks – Design-Build Project Manager; James McNelis was involved as Senior Vice President with corporate oversight on construction.

I-70 New Stanton Interchange Reconstruction

New Stanton, Pennsylvania

Firm: Fay, an i+iconUSA Company (Lead Construction Firm)

Owner: Pennsylvania Department of Transportation

Owner Contract Number: ECMS 32032

Owner Point of Contact: Mr. Dominec Caruso, PE | 724.439.7286

Project Delivery Method: Design-Bid-Build

Overall Construction Cost:

Initial Contract Value: $53.7 million

Final Contract Value: $53.0 million (estimated)

Reason for Difference: N/A

Overall Schedule Performance:

Notice to Proceed Date: August 2015

Initial Completion Date: October 2018

Open to Beneficial Use of Traffic: January 2017

Final Completion Date: October 2017 (estimated)

Reason for Difference: Significant schedule savings from bridge and MOT ATCs

Relevance of this Project to US 219 Design-Build Project:

Schedule
- Early Schedule Completion
- ATCs Accelerated Schedule
- Safety - Zero Lost Time

Environmental Compliance
- ATC Eliminated Environmental Impacts
- Constructed Wetland and Stream Mitigation
- Reforestation
- Complied with SWM and E&SC Permits
- Protected Endangered Species

Design Excellence
- ATCs Eliminated Environmental Impacts, Improved Traffic, Provided a Better Final Product, Reduced Cost
- Partnering
- Stakeholder Coordination
- Utility Coordination
- Public Outreach

Project Description and Specific Nature of Work: The purpose of the I-70 New Stanton Interchange Reconstruction project is to enhance safety, improve mobility and increase access for road users along this section of I-70. **The project is part of the Appalachian Development Highway System (ADHS) Corridor M.** The project provides for the closure of two existing and closely spaced interchanges, New Stanton and Hunker, and the construction of one new diamond interchange with roundabouts at the ramp intersections. The project location is situated adjacent to many businesses and residents. The work includes: the reconstruction and realignment of I-70 for approximately 1.8 miles; construction of three local connector roads for business/resident vehicular access to the interchange; a Park and Ride; two new bridges; structural steel rehabilitation of an existing bridge; a new retaining wall; geosynthetic reinforced slope system; sloped rock embankments; traffic signals, signing, pavement markings and lighting; ITS relocation work; utility relocation; SWM, E&SC; stream relocation; excavation and handling of hazardous and contaminated soil and groundwater; and other miscellaneous construction. The new interchange is open for beneficial use and the project will be completed 12 months ahead of schedule.

Project improvements include: demolition of 12 properties; 567,000 CY of excavation; 230,000 CY of embankment; processing of 50,000 CY of rock excavation for undercut treatment; 99,000 SY of concrete pavement; 115,000 SY of asphalt pavement; 19,000 LF of closed storm drain; 190 drainage structures; 3,299 CY of structural concrete; 23,000 SY of topsoil placement; and planting of 1,226 trees for reforestation. Fay is also coordinating with affected utility companies for the relocation of utilities (including Comcast, Verizon, and Allegheny Energy).

Environmental protection is a significant part of this project. Fay is protecting the local environment through wetland and stream mitigation as well as stream relocation. More than 1,500 feet of stream mitigation is being completed with Fay creating ephemeral and perennial streams using native sandstone and trees to create step pools and reforestation with native trees, shrubs, and seeds. Constraints were put on clearing to ensure protection of the endangered Northern Long-Eared Bats which nested within the LOD.

Successful Methods, Approaches, and Innovations: Fay's proposed and accepted ATCs have significantly advanced project goals accelerating the schedule, reducing cost and enhancing quality.

As the Lead Construction firm, Fay was responsible for implementation of two significant ATCs. **Fay subcontracted with Whitman, Requardt & Associates, LLP (WRA) for design and permitting assistance.**

Fay/WRA's first ATC provided new structural steel for the Sewickley Bridge in lieu of PennDOT's designed structural steel rehabilitation. The original bridge design called for the existing girders to be rehabilitated with structural repairs, followed by sandblasting and painting. Fay/WRA's ATC replaced the steel superstructure with new steel girders, bearings and paint. This was done for a zero dollar cost change and eliminated environmental impacts associated with blasting and painting operations above the Sewickley Creek.

Fay/WRA's second ATC redesigned the original MOT plan for the entire project. The redesign eliminated the use of cross-overs to maintain the required two lanes of unrestricted traffic. This MOT redesign improved traffic flows, reduced quantities of work (cost savings) and accelerated the scheduled completion date. Our traffic and phasing redesign also eliminated the need to place 2-hour accelerated concrete paving mix for nightly opening of the roadway to traffic. Fay/WRA's new MOT plan provided less obstructions to traffic flow and only required normal concrete paving mix with an extended cure time. The savings to PennDOT was $700,000. It also provided a more durable concrete pavement section with less future maintenance costs.

Fay/WRA's third ATC replaced PennDOT's original design using a geosynthetic reinforced slope system for slope stability. Fay/WRA provided an improved alternate design, which was done for a zero dollar cost change. Fay/WRA redesigned the engineered 1:1 sloped rock embankments to reduce the time of construction and eliminate future maintenance concerns with the reinforced slopes.

Fay coordinated and performed due diligence with PennDOT for major revisions to PennDOT's NPDES permit. Fay placed excess excavation as fill material at a PennDOT-owned site, which enhanced the property that PennDOT now plans to sell. Fay was responsible for the design, construction, and maintenance of all E&SC features.

Fay also partnered with all emergency response services and, together, developed contingency plans during construction. The plan included the local fire department establishing an alternate access around the affected bridges so that they can more easily reach a fire if necessary. Partnering efforts have been a significant part of this project. Our team has worked closely with PennDOT, stakeholders, utility owners, subcontractors and suppliers in an effort to identify and resolve issues in a timely manner. This close coordination has allowed us to remain well ahead of schedule, anticipate potential problems before they occur, and provide open lines of communication so that all stakeholder expectations are met and exceeded.

Finally, Fay is providing support to PennDOT through participation in the community relations efforts associated with this work and coordination with stakeholders. Fay is sending representatives to participate in community outreach meetings and distributing flyers to notify area residents and businesses about the project.

Individuals on this Project Proposed for US 219 Design-Build Project: James McNelis was involved as Senior Vice President with corporate oversight on construction.

Design-Build MD 237 from MD 235 to Pegg Road

St. Mary's County, Maryland

Firm: Whitman, Requardt & Associates, LLP (Lead Design Firm)

Owner: MDOT State Highway Administration (SHA)

Owner Contract Number: SM7575171

Owner Point of Contact: Mr. Jeffrey Folden | 410.545.8814

Project Delivery Method: Design-Build | Low Bid

Overall Construction Cost: WRA was responsible for 100% of the design
Initial Contract Value: $35.9 million
Final Contract Value: $37.8 million
Reason for Difference: Owner-added utility relocations and an intersection modification for a future County project

Overall Schedule Performance:
Notice to Proceed Date: December 2007
Initial Completion Date: November 2010
Final Completion Date: October 2011
Reason for Difference: Owner-added approved extra work (see above)

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

Relevance of this Project to US 219 Design-Build Project:

Schedule
- Met all Design Deliverable Dates

Environmental Compliance
- Design Complied with NEPA Commitments
- Reduced Permitted Wetlands and Forest Impacts
- Stream Mitigation
- On-Site Reforestation
- Acquired all Permits

Design Excellence
- Design and Construction Packages were Developed to Efficiently Deliver Project
- Earthwork Analysis was Performed to Sequence Material Handling
- Innovative Pavement Designs Reduced Cost
- Eliminated SWM Facilities Reducing Future Maintenance Costs
- Cultural Resource Coordination
- Stakeholder Coordination
- Utility Coordination
- Public Outreach
- Partnering
- Design Quality Control

The project included the resurfacing/reconstruction of 16 intersecting side streets and 65 driveways/entrances. A complete new closed storm drain system with over 13,500 LF of drainage pipe and eight new traditional SWM facilities were constructed. Multi-phase E&SC in coordination with MOT was designed, approved, and implemented. A temporary geo-fabric wall was designed and installed along the fill embankment to maintain MD 237 traffic during the box culvert construction. A temporary drainage system was designed and constructed to maintain positive drainage within the bifurcated construction zone. WRA designed and monitored the installation of steel piles for the box culvert foundation. Three noise walls, totaling 1,700 LF, were designed and constructed adjacent to residential properties. Over 10,000 LF of 12" ductile iron water pipe, 6,000 LF of 6" and 8" gas line, and 350 LF of low pressure sanitary sewer line with grinder pumps were designed and constructed. WRA coordinated with utility companies to relocate aerial electric, telephone, and cable, requiring individual meetings with utility owners, to synchronize their relocation with the roadway reconstruction. Advanced relocation of major electric and telephone aerial facilities was required to facilitate pile driving for the new box culvert. Traffic engineering services included five traffic signals, signal interconnect, signing/markings, and intersection lighting. Intersections were designed to be ADA compliant and were field checked for compliancy during construction.

MOT plans maintained traffic along roadways and access to driveways and entrances at all times, without detours. Temporary cross-overs from newly-constructed pavement to the existing pavement were installed as portions of the project were completed. Landscape architect services included the design of roadside plantings along MD 237, median plantings in MD 237, plantings for SWM facilities, and for wetland and forest mitigation. Geotechnical services included foundation design for the twin-cell box culvert and noise walls, evaluation/design of roadway embankments and cuts, monitoring of the installation of the piles for the box culvert, and evaluation and design of new and rehabilitated pavement, including Falling Weight Deflectometer testing of the existing pavement.

The project was divided into four construction zones to accelerate critical path elements (e.g., utility relocation, box culvert, noise walls, etc.) and to manage stormwater runoff during construction. SWM facilities were initially constructed as sediment traps then converted to final SWM facilities as zones were completed. Each construction zone was designed and submitted for approval separately for construction to proceed in approved zones as subsequent zones were being designed and approved.

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

Successful Methods, Approaches, and Innovations: The project was schedule critical with an established contract time. To maintain the schedule, the project was divided into four zones which governed design and construction. The selection of zone limits was based on several factors including maintaining a drainage area within each zone, providing E&SC, and logical traffic control cross-overs. The zone at Jarboesville Run was the most schedule critical with stream closure restrictions with a long construction duration. Two lanes of traffic were continuously maintained throughout construction without detours. The pavement section incorporated a bank run gravel base for the base course material, not commonly used by SHA but local to southern Maryland, resulting in a cost savings to SHA. A key issue of the project was to reduce impacts to environmental features. Through design and construction collaboration, originally permitted wetlands and Waters of the U.S. were reduced by 13,517 SF. Several SWM facilities shown in the conceptual design were eliminated during final design, saving SHA initial and future maintenance costs. Environmentally-sensitive Jarboesville Run was monitored during construction, especially during severe weather events, and the design-build team was prepared to respond to emergencies. The design-build team provided continual coordination with SHA's IEM and responded quickly when issues arose. A safe MOT route was provided for transitioning between construction zones, and adjacent property access was maintained at all times throughout construction, including coordinating the re-routing of USPS services when existing mail boxes were inaccessible. The design-build team utilized a ROW total take property residential structure for the team's field office resulting in cost savings to SHA. Coordination with utility companies as an early work effort was performed to prioritize utility relocations and coordinate them with the construction sequencing. Coordination included holding regularly scheduled meetings to discuss design progress and resolve issues. Coordination continued through construction, especially when utility relocations were suspended due to a utility contractor being pulled from the project in order to respond to a major storm outage outside the project. The project earned impact reduction incentives for the final design reduction of wetlands and forest impacts.

Individuals on this Project Proposed for the US 219 Design-Build Project: Walter Miller, PE – Design Manager; Gary Bush, PE – Highway Engineer; Jason Cosler, PE – Water Resources Engineer; Diane Szekely, RLA – Landscape Architect

Design-Build MD 210 at Livingston Road/Kerby Hill Road Interchange

Prince George's County, Maryland

Firm: Whitman, Requardt & Associates, LLP (Lead Design Firm)

Owner: MDOT State Highway Administration (SHA)

Owner Contract Number: PG7005170

Owner Point of Contact: Mr. Jason Stolicny | 410.545.0379

Project Delivery Method: Design-Build | Best Value

Overall Construction Cost: WRA was responsible for 100% of the design
Initial Contract Value: $82.6 million
Final Contract Value: Ongoing; currently $82.6 million
Reason for Difference: Change orders are being negotiated due to errors in owner-supplied survey, unforeseen field conditions, third party utility relocation issues, and owner-directed changes.

Overall Schedule Performance:
Notice to Proceed Date: 8/2015
Initial Completion Date: 11/2018
Final Completion Date: 11/2019 (estimated)
Reason for Difference: Owner delays due to a delayed NTP due to a bid protest and errors in owner-supplied base survey that required correction.

Relevance of this Project to US 219 Design-Build Project:

Schedule
- Met all Design Deliverable Dates
- Accelerated Design and Construction Schedule

Environmental Compliance
- Design Complied with NEPA Commitments
- Avoidance and Minimization of Impacts
- Stream Mitigation
- On-Site Reforestation
- Acquired all Permits

Design Excellence
- Design and Construction Packages were Developed to Efficiently Deliver Project
- Stakeholder Coordination
- Utility Coordination
- Public Outreach
- Partnering
- Design Quality Control

Project Description and Specific Nature of Work: WRA is the Lead Design firm responsible for completing the final engineering services, preparing final construction documents, and obtaining permits/approvals for the Design-Build MD 210 at Livingston Road/Kerby Hill Road Interchange Improvements project. The project consists of the reconstruction of an existing at-grade intersection to a grade separated interchange between MD 210 and Livingston Road/Kerby Hill Road. MDOT SHA (SHA) had identified MD 210 (Oxon Hill Road) from I-95/I-495 (Capital Beltway) to MD 228 (south of Livingston Road/Kerby Hill Road) as a highly-congested corridor and has proposed overpasses at each main signalized intersection along the corridor. The interchange at Livingston Road/Kerby Hill Road is the first of several projects to relieve traffic congestion along the corridor. The Livingston Road/Kerby Hill Road interchange incorporates median ramps in lieu of outer ramps. WRA has completed 98% of the final engineering services and has obtained the necessary permits and approvals for construction. Construction is well underway. WRA is currently addressing final SHA comments on two bridges and is performing construction related support services.

The project includes the realignment of Livingston Road and Kerby Hill Road approaching the new interchange; two new bridges over MD 210; a new bridge over Carey Branch; retaining walls to support the median ramps; noise barriers along a majority of the project limits; construction of service roads to maintain access to residential and commercial properties; construction of intersections; existing pavement rehabilitation and new pavement construction for roadway widening; new open and closed storm drain systems; SWM quality and quantity control facilities; E&SC; Carey Branch stream relocation and stabilization; box culvert extensions; utility coordination for the relocation of electrical, communication, cable and fiber optic being designed and relocated by utility owners; utility design and relocation of water, sewer and gas performed by the design-build team; extensive MOT including temporary roadway connections to maintain access to Livingston Road and Kerby Hill Road from/to MD 210; new signing, pavement markings, and interchange and intersection lighting; and a new traffic signal at the intersection of the MD 210 median ramps at the Livingston Road/Kerby Hill Road intersection.

The project includes 20,000 LF of concrete barrier, 80,000 CY of excavation, 14,000 LF of storm drains, 15,000 LF of underdrain, 2,200 LF of retaining walls, 14,000 LF of noise wall, 26,000 SF of bridge, 52,000 tons of asphalt, 14,000 LF of curb, 30,000 SF of sidewalk, 8,800 LF of gas main (including 7,300 LF of 12" high pressure gas main), 3,100 LF of water main, and 1,500 LF of sewer main. Surveys were performed to verify and supplement the information provided by SHA.

WRA coordinated a comprehensive utility test hole and subsurface investigation program. Extensive supplemental subsurface exploration and testing was performed and more than 80 test holes were taken. Geotechnical services included foundation design for box culvert extensions, retaining walls, bridges, and noise walls, existing pavement evaluation and pavement repairs; evaluation/design of roadway embankments and cuts, and a reinforced soil slope. Highway design included mainline widening, interchange ramps, intersection design, superelevation evaluation and correction, coordination with the various structures and SWM facilities within a constrained right-of-way. WRA performed structural design of bridges, box culvert extensions, retaining walls, noise barriers and incidental structures. Traffic engineering included design of signing, markings, interchange and intersection lighting, signalization and ITS, a Traffic Management Plan, and the development of MOT including multiple stages and sub-stages. Hydrology/hydraulics was performed for the relocation of Carey Branch including stream assessment and relocation analysis. SWM design included a total of five (5) bio-swales, three (3) wet-swales, two (2) submerged gravel wetlands, and ten (10) micro-bioretention facilities to provide ESD volume of 48,573 CF. A multi-phase E&SC plan was developed in conjunction with MOT. WRA acquired MDE E&SC permit and SWM approval. During design, additional wetlands were identified that were not included in the original permit and final design resulted in minor changes to permitted impacts. WRA prepared the necessary permit impact plates and documentations for SHA-EPD to submit permit modifications for approval. Public outreach for the MD 210 project included preparation of multiple displays for a large formal public meeting, attendance and presentations at numerous smaller community association meetings, and weekly and monthly project updates for email distribution and SHA website posting. Other services that WRA has completed include landscape and reforestation design; a tree survey and Tree Avoidance and Minimization Report and tree preservation plan identifying significant trees, tree protection measures, and ash tree removal; water, sewer and gas utility relocation design; utility coordination; design QC; and subconsultant coordination. As SWM facilities are being completed, WRA will be performing SWM inspections and completing as-built certifications.

Successful Methods, Approaches, and Innovations:

Our proactive approach to design development and knowledge of construction facilitated meeting the project schedule. An advance clearing package for utility work, which was prepared by SHA and previously approved, was modified to incorporate early adjacent utility work being performed by the design-build team. Structural elements such as noise walls were submitted in advance of obtaining final roadway IFC documents, which allowed for early shop drawings and fabrication of elements so they would be ready for installation when the roadway package was approved for construction.

A key component of the project was coordination and relocation of existing utilities prior to and concurrent with the project roadway improvements. Monthly utility coordination meetings with utility owners, SHA, and the design-build team were a priority in order to coordinate the proposed utility relocations with the roadway design. These meetings were held early in design and are continuing to be held during construction. Conflicts between the proposed utility design and the roadway design were identified immediately and changes to the design implemented quickly to avoid future impacts. During construction, issues are being identified and resolutions are being expedited with on-site field meetings to resolve conflicts. The design-build team has been working with, and is continuing during construction to work with, the utility relocation personnel to prioritize relocations, which benefitted the utility owners and the construction schedule.

Maintaining mobility was a primary goal of the project. To minimize the duration of detours, the MOT plans were prepared to allow the main signalized intersection to remain operational as long as possible. Also, a proposed service road is being temporary utilized for mainline right turning vehicles onto Kirby Hill Road for a more efficient sequence of construction.

Due to the limited availability of ROW, the project required the installation of retaining walls and barriers which limited construction access. Several retaining walls were designed to maximize the available space while providing construction access within the ROW.

Avoidance and minimization of impacts to environmental resources was always a priority. Pipe culvert headwalls were oriented to minimize impacts to environmental features.

Individuals on this Project Proposed for the US 219 DB Project: Walter Miller, PE – Design Manager; Gary Bush, PE – Highway Engineer; Jason Cosler, PE – Water Resources Engineer, Charles Hegberg – Wetland and Stream Design, Diane Szekely, RLA – Landscape Architect

US 301, Section 1

New Castle County, Delaware

Firm: Whitman, Requardt & Associates, LLP (Lead Design Firm)

Owner: Delaware Department of Transportation

Owner Contract Number: 1445

Owner Point of Contact: Ms. Diane Gunn | 302.326.4487

Project Delivery Method: Design-Bid-Build

Overall Construction Cost: WRA was responsible for 100% of the design

Initial Contract Value: $137.6 million

Final Contract Value: Ongoing; currently $138.1 million

Reason for Difference: Various minor change orders to address diesel fuel price adjustments, paying for police for traffic control, unsuitable material removal, and owner-approved changes.

Overall Schedule Performance:

Notice to Proceed Date: October 2008

Initial Completion Date: May 2019

Final Completion Date: May 2019 (estimated)

Reason for Difference: N/A

Relevance of this Project to US 219 Design-Build Project:

Schedule

- Met all Design Deliverable Dates
- Fast-Track Design to Minimize Time to Service

Environmental Compliance

- Design Complied with NEPA Commitments
- Avoidance and Minimization of Impacts
- Stream Mitigation
- Acquired all Permits

Design Excellence

- Extensive Earthwork Analysis to Control Material Handling, Cost and Schedule
- Comprehensive Traffic Modeling to Minimize Typical Section
- Optimized Deep Foundation Design to Control Cost
- Designs Considered Future Maintenance and Rehabilitation
- Stakeholder Coordination
- Utility Coordination
- Public Outreach
- Design Quality Management Plan

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

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

US 301 – Contract 1B, US 301 and SR 1 Interchange (Construction Cost – $35.4 million): Improvements include a complex flyover interchange at SR 1 and US 13, which was one of the most constrained design elements of the project. This interchange's close proximity to the existing Biddles Corner toll plaza on SR 1, in conjunction with significant traffic volumes from US 13 NB to SR 1 NB, required comprehensive traffic and geometric analyses in order to design an appropriate, lane-balanced configuration for reducing 10 lanes to three (the lanes originating from the SR 1 cash and express toll lanes, US 301 NB, and a ramp from US 13) prior to the geometrically-constrained William V. Roth Bridge over the Chesapeake and Delaware Canal. The detailed traffic analysis and geometric analysis ensured that all ramp terminals met AASHTO design guidelines and that they could be signed effectively and safely per the MUTCD.

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

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

WRA work efforts included roadway design consisting of the design of 3.79 miles of new US 301 including 1.44 miles of interchange ramps, 0.53 miles of widening of SR 1, 1.21 miles of widening and reconstruction of US 13, and 0.57 miles of access control roadways. Other roadway design efforts included detailed earthwork analysis; multi-phase maintenance of traffic; intersection and roundabout design; water resources design efforts, including open and closed storm drain systems; floodplain analysis; SWM using a combination of bioswales, wet ponds, infiltration trenches and infiltration basins; and E&SC. Structural engineering elements consisted of eight new roadway bridges, eight major culverts, three MSE retaining walls (3,000' in total length), seven sign structures and a high mast light structure. Traffic tasks included design of pavement markings and signing, a traffic signal, and interchange lighting. ITS components included dynamic message signs, CCTV cameras, road weather information systems, remote traffic microwave sensors and variable speed signs. A detailed Transportation Management Plan and associated maintenance of traffic design were also prepared. Geotechnical engineering design services included a comprehensive geotechnical subsurface investigation plan for roadway embankment including proposed borrow sites, bridge foundations, retaining walls, stormwater management sites and practices. Environmental services include avoidance of archeology resource protection areas, Scott's Run stream restoration, and finalizing all required permit applications. Other services included participation in the public outreach program, extensive utility relocation coordination, design QC, and subconsultant coordination. Currently providing construction services.

Successful Methods, Approaches, and Innovations: Similar to the US 219 project, US 301 roadway excavation and embankment was a major construction element pertaining to cost, schedule and availability. To facilitate this work effort, WRA conducted a comprehensive earthwork analysis to ensure availability of required borrow types within the project limits through the placement of excavated material and establishment and design of borrow sites which eliminated the need for obtaining off-site borrow. By performing the analysis, we were able to optimize the excavation and embankment placement to reduce the rehandling of earthwork material, which reduced costs and construction duration.

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

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

Individuals on this Project Proposed for the US 219 Design-Build Project: Walter Miller, PE – Project Bridge Supervisor/Design QC; Gary Bush, PE – Preliminary Cost Estimating; Jason Cosler, PE – Water Resources Engineer

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

MARYLAND DEPARTMENT OF TRANSPORTATION — STATE HIGHWAY ADMINISTRATION

MDOT SHA Team

- Innovative Contracting Division
- Highway Design Division
- Highway Hydraulics Division
- District 6 Construction
- District 6 Traffic
- District 6 Utilities
- District 6 Right-of-Way
- District 6 Maintenance
- Office of Traffic & Safety
- Office of Structures
- Office of Environmental Design
- Office of Materials and Technology
- Plan Review Division (PRD)

Third-Party Stakeholders

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

Independent Design Quality Management Team

Manager - Anthony Frascarella, PE (CEI)
Highway - Tom Kubicz, PE (CEI)
Structures - Chris Minick, PE (CEI)
Water Resources - Tom Turner, PE (CEI)
Traffic - Barry King, TSOS (CEI)
Utilities - Ralph Young (CEI)
Landscape Architecture - Michael Pieranunzi, RLA (CEI)
Environmental - Craig Lynch, PE (CEI)
PRD Compliance - Renato (Ron) Gneo, PE (CEI)

Executive Committee

James McNelis (FAY)
Joseph Makar, PE (WRA)

Design-Build Project Manager

Tyson Hicks (FAY) - 20/20

DBE Compliance / Apprentice-in-Training

Arleen Dacey (FAY)

Safety Director

Chris Reefer, CSP (FAY)

Design Manager

Walter Miller, PE (WRA) - 24/10

Design / Construction Coordinator

Michael Veid (FAY)

Construction Manager

Ed Chaney (FAY) - 20/40

Public Relations / Outreach Coordinator

Brian Riffel, PE (WRA)

Design Team

Structures
James Guinther, PE, DBIA (WRA)
Andrew Conklin, PE (WRA)

Geotechnical / Pavement / Mine Remediation
Monica Paylor, PE (WRA)
Jeffrey Basford, PE (WRA)
Paul Zhang, PE (DMY)
Steve Mogilnicki (WRA)
Geologist

Landscape Architecture
Diane Szekely, RLA (SI) - 12/6
Michael Campbell, RLA (WRA)

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

Survey
Vernon Kelly, PLS (ABC)
Gregory King, PLS (WRA)

Subsurface Investigation
Paul Zhang, PE (DMY)
Soil Borings & Pavement Cores
Neil Eppig, PLS (ABC)
Utility Designating & Test Pitting

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

Traffic Engineering
Jeremy Mocny, PE, PTOE (WRA)
Neil Leary (WRA)

Utility Design
Monika Blassino, PE (WRA)
Sewer Design
Daniel Loveless, PE (WRA)
Conduit Design

Hydrology / Hydraulics / SWM / E&SC
Jason Cosler, PE (WRA) - 32/16
Debra Rasmussen, PE (WRA)
Weiwei Jia, PE (RJM)
Mark Schneck, PE (RJM)

Wetland Creation / Stream Restoration and Permitting Specialists
Charles H. Hegberg (S&L) - 16/8
Christina Casole, PE, QP (S&L)
Wetland Creation / Stream Restoration
Joe Mills (S&L)
Acid Rock Expert
Warren Gray, PWS, LPF (WRA)
NEPA Compliance
Timothy Hess (WRA)
Steve Ott, QP (S&L)
Permitting
Laura Callens, CFM (WRA)
Wetlands & Waters
Michael McQuade (WRA)
Forest / Trees

Quality Control / Quality Assurance Team

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

Construction QC / QA Manager
Jason Esser, PE (FAY)

Utility Coordination

Michael Veid (FAY)
Utilities Coordinator

Utility Companies / Public Utilities
- Allegheny Power
- Level 3 Communications
- Garrett County Water and Sewer
- MDOT SHA District 6 Utilities
- Maryland Dept. of Information Technology
- Comcast Cable
- Verizon of Maryland

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

Environmental Compliance Manager

James Ashby (WRA)

Resource Agencies
Maryland Dept. of the Environment (MDE)
U.S. Army Corps of Engineers (USACE)
U.S. Fish & Wildlife Service (USFWS)
Dept. of Natural Resources (DNR)
Federal Emergency Management Agency (FEMA)
Maryland State Preservation Officer (MD SHPO)
Maryland Department of Transportation State Highway Administration - Plan Review Division (MDOT SHA - PRD)
Maryland Bureau of Mines

Construction Team

Project Controls
Giuseppi Parente (FAY)

Project Scheduling
Jason Esser, PE (FAY)

Site Safety Coordinator
Vincent Corden (FAY)

Highway Superintendent
Mark King (FAY)

Structures Superintendent
Bryce Firestone (FAY)

MOT / Traffic Manager
James Galloway (FAY)

Surveys-Construction
Brian Kelly, PLS (FAY)

Utility Superintendent
Gary Rigsby (FAY)

E&SC / SWM Manager
Allen Sarver (FAY)

SWM As-Built Inspection / Certification
Brian Kelly, PLS (FAY)
Steven Reynolds (RJM)

LEGEND

FAY	Joseph B. Fay Company	S&L	Skelly & Loy, Inc.
WRA	Whitman, Requardt & Associates, LLP	🗝	Key Staff
CEI	Century Engineering, Inc.	XX / XX	Average Hours per Week (Design Phase / Construction Phase)
ABC	AB Consultants, Inc. (DBE)	———	Direct Report
RJM	RJM Engineering, Inc. (DBE)	- - -	Coordination and Communication
DMY	DMY Engineering Consultants, Inc. (DBE)		
SI	Streetscapes, Inc. (DBE)		

FAY — An ICON USA Company
WRA

FAY

An i+icon USA Company

Technical Proposal

XVII.B. Project Understanding and Design-Build Approach

Contract No. GA6465270

US 219 from I-68 to Old Salisbury Road

DESIGN-BUILD

WRA

MARYLAND DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ADMINISTRATION

XVII.B.i. MOST RELEVANT AND CRITICAL RISKS IN ACHIEVING PROJECT GOALS

RISK #1: Obtaining Permits/Approvals Necessary To Perform Construction

Fay/WRA understands the US 219 project passes through an area of diverse environmental, community, and cultural resources. As a result, impacts to cultural and environmental resources will result from the proposed US 219 improvements requiring numerous permits/approvals from MDOT SHA (SHA), federal, state and local permitting/regulatory agencies (SHA-PRD, MDE, USACE, DNR, MD SHPO, USFWS, EPA, FEMA, and FHWA).

Permits/Regulatory Approvals: We anticipate permanent and/or temporary impacts to the following resources on the project: nontidal wetlands, nontidal wetland buffers, waterways including in-stream work restrictions, floodplains, forest stands and individual trees, and cultural and archeological resources governed by an MOA between SHA, FHWA, and MD SHPO. In addition, we understand the project area has been extensively mined for coal which may require additional permitting efforts to address adverse conditions from acid mine drainage and acid producing rock.

We understand that permits required for project impacts will include: 1) Provisional Section 404 Individual Permit or MD-SPGP5 to be provided by SHA and final permit by Fay/WRA; 2) Section 401 Water Quality Certification; 3) MDE Nontidal Wetlands & Waterways Permit; 4) MD Reforestation Law approval/ Modification to the Reforestation Site Review Approval; 5) MDE Surface Water Appropriation Permit; 6) NOI/NPDES Permit including ESC Permit for earth disturbance, staging and stockpiling areas, disposal sites, and borrow pits from SHA-PRD, and SWM approval from SHA-PRD including MDE Dam Safety Division and Plan Review Division approvals for small ponds and embankments, if necessary; and 7) Potential Letter of Map Revision (LOMR) from FEMA.

Design Approvals: Anticipated design approvals for 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, wetland and stream mitigation and restoration, including required calculations and reports; 3) structures (bridges, 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) utilities relocation design for sewer and conduit; 7) Transportation Management Plan (TMP), signing, markings, lighting, signal, and ITS, including temporary elements; 8) tree avoidance and minimization report; 9) landscape for roadside, SWM and on-site reforestation; 10) public outreach plan; 11) other studies, reports, and documents (e.g., design exceptions, etc.) as needed for construction.

Why it is Critical: Permits and approvals are required to initiate and perform construction of the project. Fay/WRA recognizes that any issues will have a direct impact on the project schedule.

Potential Impact on Achieving the Project Goals: Delays in obtaining permits and approvals will directly impact our ability to construct the project, putting the completion date of December 11, 2020 (Schedule Goal) in jeopardy. In addition, a failure to secure permits and approvals in a timely manner would be indicative of a failure to effectively partner internally and with SHA and stakeholders, comply with RFP and permit/regulatory requirements, and/or produce quality documents, thus not achieving the Environmental Compliance Goal and Design Excellence Goal.

Mitigation Strategies to Address the Risk: Fay/WRA has extensive experience in preparing design and permit/regulatory packages necessary to obtain required permits and approvals for SHA projects. We also have a comprehensive knowledge of all policies, procedures, criteria, and permitting/approval regulations and requirements necessary to efficiently prepare accurate and complete design and permit/regulatory packages for SHA and permitting/regulatory agency approval. The following are strategies Fay/WRA will employ to mitigate the above risk:

- Perform a comprehensive review of the RFP and all related specifications, guidelines, regulations, etc. to gain a full understanding of the project requirements and permits/approvals required for construction of the project.
- Build a collaborative partnership with SHA, SHA-PRD, permitting/regulatory agencies, and project stakeholders by providing clear, consistent, and regular communication through partnering.
- Hold weekly internal design coordination meetings with key design and construction staff to review designs and facilitate design and construction collaboration, over-the-shoulder constructability reviews, and resolve issues quickly.
- Use highly qualified, experienced design and construction staff to produce high-quality plans, reports, permit applications, supporting documentation, etc. based on sound design and construction practices and principles.
- Create and routinely monitor/update a permit/regulatory approval tracking log. The log will show the permits and approvals required, entities involved, permit conditions and requirements for each resource, key milestone submittal and approval dates, and other compliance activities. **Environmental Compliance Manager James Ashby** will track each permit/regulatory approval (and modification) throughout its timeline.
- Create and routinely monitor/update a design approval tracking log. The log will show each design submittal, entities

involved, key milestone submittal and approval dates, and other related activities. **Project Design Manager Walter Miller, PE** will track each design package (and revisions package) throughout its timeline.

- Incorporate design and permit/regulatory approval items into the project CPM schedule to ascertain critical path or near critical path activities so that special attention and staffing get assigned.
- Attend a pre-permitting meeting with SHA, SHA-PRD, the Independent Environmental Monitor (IEM), and permitting/regulatory agencies to gain a more complete understanding of permit conditions/requirements, NEPA commitments, permitting timelines, submittal requirements, and expectations or concerns of each stakeholder.
- Ensure compliance with permit conditions and requirements throughout design. Our construction staff will perform over-the-shoulder reviews during design to incorporate constructability and means and methods into the design.
- Focus on critical path design and permit/approval activities and provide timely submittals to SHA, permitting/regulatory agencies, and the **IDQM firm, Century Engineering, Inc.** Special attention will be paid to culvert crossings, high groundwater, poor soil conditions, challenging SWM and E&SC constraints, identified cultural resources, and special permit conditions, etc. that may require more design and review timeframes or require greater coordination.
- Utilize **IDQM SHA-PRD Compliance Reviewer Renato (Ron) Gneo, PE** to perform over-the-shoulder and formal compliance reviews of SWM and E&SC submissions prior to submitting to SHA-PRD and MDE.
- Our **IDQM team, managed by Anthony Frascarella, PE,** will provide an independent review and certify that the design complies with the contract requirements. Our IDQM team will be integral part of your design quality management plan.

SHA and Other Agencies' Roles: Fay/WRA will partner with SHA, SHA-PRD, IEM, permitting/regulatory agencies, and project stakeholders from notice of selection to project completion. We anticipate all parties will communicate any special project/permit conditions, requirements and commitments, submittal requirements, review timelines, and other expectations or concerns. We anticipate a collaborative partnership where all parties participate and dedicate resources to provide timely feedback, reviews, and approvals.

RISK #2: Unforeseen Field Conditions due to Historic Coal Mining Operations and Karst Geology

Fay/WRA understands the US 219/Grantsville region is underlain by relatively flat-lying beds of sedimentary rock, including sandstone, siltstone, limestone, and coal, and has been extensively mined for coal using both deep and surface mining methods. Within the region, the Lower and Upper Bakerstown Coal Bed outcrops are located just east of US 219 and much of the area between US 219 and Chestnut Ridge is disturbed mined land. Risks associated with historic coal mining operations and karst geology include the potential for mine-related subsidence, settlement, and slope stability from unconsolidated surface mine spoil, exposure of acid mine drainage, acid producing rock, and sinkholes.

Why it is Critical: If unknown adverse site conditions due to historic coal mining operations or karst geology are discovered during design or construction, mitigation will be required. Time to complete mitigation designs, secure permits/regulatory approvals, and perform additional construction will impact the project schedule. Also, unintentional release of acid mine drainage may pose a health and safety threat and impact the environment.

Potential Impact on Achieving the Project Goals: If unknown adverse site conditions are discovered and mitigation design and additional construction are required, achieving the Schedule Goal will be in jeopardy. In addition, if acid mine drainage or acid producing rock are not addressed during design and construction, the environment may be adversely impacted, thus not achieving the Environmental Compliance Goal and Design Excellence Goal.

Mitigation Strategies to Address the Risk: Fay/WRA has extensive experience in performing geologic and environmental studies, subsurface exploration programs, and geotechnical evaluations necessary to evaluate potential adverse conditions associated with historic coal mining operations and karst geology. We also have extensive knowledge of mitigation procedures and practices, and permitting/approval regulations and requirements necessary to efficiently prepare accurate and complete design and permit/regulatory packages for SHA and permit/regulatory agency review and approval. The following are strategies Fay/WRA will employ to mitigate the above risk:

- Assemble a highly qualified design and construction team experienced in construction operations in areas with historic mining operations and karst geology.
- Perform a desktop review of historic mine mapping provided by state environmental agencies (e.g., Frostburg University Mine Map Program, MDE Bureau of Mines website, etc.), review available abandon mine investigations, review active and closed mining permits, and available subsurface information.
- Perform field reconnaissance of the study area to look for potential mine openings and interview local residents knowledgeable about the study area.
- Partner with SHA, SHA-OMT, MDE Bureau of Mine, Abandoned Mine Lands and Acid Mine Drainage Division, and

project stakeholders to gather available information and knowledge on historic mining operations and karst geology.

- Perform a geophysical survey to map potential underground abandoned mines.
- If required, perform additional subsurface investigation using deep borings, use borehole video logging to examine the rock conditions, and obtain bedrock samples for laboratory Acid-Base Accounting (ABA) testing.
- If required, perform geotechnical evaluation and develop recommendations to treat and minimize potential roadway subsidence from abandoned mines in the project limits. Recommendations may include: conducting site grading during construction to promote drainage and avoid depressions that could accumulate rainwater; designing and constructing storm drain systems in the vicinities of the outcrops with sealed joints to prevent water leakage; constructing pavement in the vicinity of the outcrops with a dense graded asphalt aggregate mix to minimize infiltration, etc.)
- If roadway subsidence, settlement, and slope stability of thick unconsolidated surface mine spoil, exposure of acid mine drainage, and acid producing rock are discovered, notify SHA to discuss mitigation strategies such as grouting voids using low-slump grout, or spanning voids such as constructing ground slabs; removing and disposing of coal spoil to an approved waste site and backfilling area with suitable borrow material; actively (e.g., chemical treatment, etc.) or passively (e.g., wetlands, anoxic drains, etc.) treating acid mine drainage; and encapsulating exposed rock or installing limestone ditches to address acid rock conditions.
- If required, develop a geotechnical instrumentation and monitoring plan.

SHA and/or Other Agency Roles: Fay/WRA will partner with SHA, SHA-OMT, MDE, permitting/regulatory agencies, and project stakeholders to identify abandoned mines and mining operations and karst geology, and to mitigate their impact. We anticipate SHA will dedicate resources to assist in determining the extent of the abandoned coal mining operations and karst geology within the project area, help partner with MDE, permitting/regulatory agencies, and project stakeholders, and provide timely reviews and approvals for preventative and mitigation measures. As the property owner, SHA will maintain responsibility for treatment and/or disposal for any pre-existing hazardous or contaminated site material.

RISK #3: Unknown Cultural and Environmental Conditions and Severe Weather

The protection of cultural and environmental resources is of paramount importance to SHA and project stakeholders. We understand the extensive coordination with various environmental and regulatory agencies conducted by SHA to incorporate environmental stewardship measures to avoid and minimize impacts to the vast cultural and environmental resources within the project limits. There is a likelihood that unknown cultural or environmental conditions may be discovered within the project limits, and severe weather will be encountered, particularly in the Appalachian region. Hazardous or contaminated materials (e.g., buried tanks, leech fields, etc.) may also be encountered.

Why it is Critical: If unknown cultural or environmental conditions are discovered during design or construction, protection and/or mitigation will be required. Time to coordinate a regulatory response, address the identified condition or complete mitigation designs, secure permits/regulatory approvals, and/or perform additional construction will impact the project schedule. Also, exposure of hazardous or contaminated materials may pose a health and safety threat and impact the environment. In addition, if severe weather is encountered during construction, damage to E&SC measures may result, requiring remediation to restore the E&SC measures and/or other damage.

Potential Impact on Achieving the Project Goals: Additional coordination, design and/or construction may be required if unknown cultural or environmental conditions are discovered. This would put the Schedule Goal in jeopardy. If severe weather compromises E&SC measures resulting in damage to the environment, the Environmental Compliance Goal and Design Excellence Goal will not be achieved.

Mitigation Strategies to Address the Risk: Fay/WRA has extensive experience in partnering with SHA, SHA-EPD, SHA-PRD, MD SHPO, and other permitting/regulatory agencies engaged on this project. We also have a comprehensive knowledge of all policies, procedures, and criteria, and permitting/approval regulations and requirements. The following are strategies Fay/WRA will employ to mitigate the above risk:

- Build a collaborative partnership with SHA, SHA-EPD, SHA-PRD, MD SHPO, and other permitting/regulatory agencies to gain a complete understanding of regulatory conditions, NEPA commitments, and expectations of each stakeholder.
- Perform additional environmental reviews (office and field) and ground penetrating radar early in the design phase to identify potential unknown cultural and environmental features.
- Support SHA-EPD and project stakeholders in conducting cultural resource activities and provide access to conduct investigations as needed.
- Immediately halt construction operations and alert SHA upon discovery of unknown resources.
- Develop and implement a plan to manage, dispose and/or mitigate controlled hazardous materials, acid mine drainage, acid producing rock, and contaminated soil and groundwater that may be encountered during construction.

- Develop and implement a plan to respond to severe weather events and respond immediately with resources and equipment to remediate failed or damaged E&SC measures and environmental damage.
- Stage construction to limit clearing, grubbing and land disturbance to minimize the area and duration of soil exposure; ensure effective drawdown/dewatering of sediment traps/basins prior to forecasted rain events to provide needed storage volumes; employ aggressive temporary stabilization practices to establish permanent vegetation; and utilize slope protection to reduce erosion of finished work.

SHA and Other Agencies' Roles: Fay/WRA will partner with SHA, SHA-EPD, SHA-PRD, MD SHPO, and other permitting/regulatory agencies to identify unknown cultural and environmental resources and hazardous materials early. We anticipate SHA will dedicate resources to assist in addressing discovered resources or hazardous materials, help partner with MD SHPO, FHWA, and permitting/regulatory agencies, and provide timely responses to issues. We anticipate that all parties will communicate special project/permit conditions, requirements and commitments, and other expectations or concerns. As the property owner, SHA will maintain responsibility for treatment and/or disposal for any pre-existing hazardous or contaminated site material.

RISK #4: Property Owner Coordination and Maintenance of Access

Fay/WRA understands how construction of the US 219 project will temporarily disrupt and impact the local community on several levels, including acquiring properties along the alignment, traveling through the construction zone, access to local businesses and residences, impacts from construction means and methods (e.g., pile driving, additional truck traffic, etc.), changes in traffic patterns during construction (e.g., temporary detours, flaggers, etc.), and changes in traffic patterns after construction (e.g., new I-68 ramp access, maneuvering at roundabouts, etc.)

Why it is Critical: Construction activities can be very disruptive to residents, businesses, and the traveling public which can result in safety issues and/or poor public perception. Maintaining a positive relationship with the local community is essential for a successful project.

Potential Impact on Achieving the Project Goals: Delays in prosecuting the work, safety issues, and/or challenging community issues may prevent Fay/WRA from achieving the Schedule Goal. Public outreach is a cornerstone of SHA's project development process and essential to maintaining a positive and cooperative relationship with those impacted by construction projects. Therefore, a failure to engage, understand and address community concerns will result in failure to meet the Design Excellence Goal.

Mitigation Strategies to Address the Risk: Understanding the community concerns and providing solutions is a key element on any project. Fay/WRA have extensive experience with understanding community concerns, explaining the impacts of a project to the public, providing solutions for those impacts, and obtaining their support. The following are strategies Fay/WRA will engage to minimize the above risk:

- Perform comprehensive review of the previous public meetings, public comments and notes to understand the public concerns and issues.
- Partner with SHA's Office of Communication and District 6 Public Outreach Coordinator in the development of the Public Outreach Program. Open communication with the community will provide a means to reduce the impacts to those most affected by the project.
- Early in design, schedule a public meeting to discuss the proposed construction schedule, review project progress, and anticipated changes in traffic patterns.
- Provide open communication to those directly impacted by the construction. One-on-one meetings may be scheduled to gain a full understanding of their needs including developing a strategy on the business requirements such as providing alternate access that accommodates the vehicular traffic entering the property. Also, any special conditions the business operates.
- Provide updates to property owners on the status of the project as construction nears their property.
- Minimize the construction duration at all driveways and entrances
- In advance to changes in traffic patterns, install variable message signs alerting the public of upcoming changes.
- During monthly partnering meeting, discuss public comments on the project.

SHA and/or Other Agency Roles: The Fay/WRA team will partner with SHA in addressing local community concerns and supporting public outreach efforts. SHA's Office of Communication and District 6 Public Outreach Coordinator will lead the public outreach efforts and work with Fay/WRA and District 6 construction staff in communicating the project progress and upcoming changes in traffic that will affect the local community.

The table below describes additional risks facing Fay/WRA, SHA, and/or project stakeholders:

ISSUE/RISK	RESPONSIBLE PARTIES	IMPACT	RISK MITIGATION
Third Party Utility Relocations and Design Approvals	Shared – Fay/WRA and SHA	Schedule & Uninterrupted Service to Utility Customers	**Fay/WRA:** Utility Coordinator to meet regularly with utility owners and District Utility Engineer, begin required utility relocation designs as early as possible, conduct a comprehensive test pit program, update status/progress on CPM schedule.
			SHA: Timely processing and approval of clearing and grubbing drawings, prior rights documentation, and utility permits. Coordination with utility owners.
Maintenance of Traffic	Fay/WRA	Mobility and Safety of Public and Workers	**Fay/WRA:** Develop a comprehensive TMP; provide safe work zones for traveling public and workers; utilize public outreach, VMS, and static signs to notify motorists of upcoming changes in traffic patterns; coordinate with SHA, stakeholders, and community.
ROW Clearance	Shared – Fay/WRA and SHA	Schedule	**Fay/WRA:** Determine if adequate ROW has or will be acquired; notify SHA immediately if inadequate ROW has been acquired; phase construction to coincide with ROW clearance and adjust if clearance is delayed.
			SHA: Conduct timely updates to ROW plats; timely ROW clearance.
Personal Injury & Property Damage	Fay/WRA	Safety	**Fay/WRA:** Design, implement and audit a comprehensive Safety Management Program, encompassing a Site-Specific Health and Safety Plan, a TMP, and an Incident Management Plan (IMP).

XVII.B.ii. APPROACH TO DESIGN-BUILD

We provide best-value to our clients by focusing on the project's goals, such as Schedule, Environmental Compliance and Design Excellence, then identifying and solving project issues before they become risks to the client and the Fay team.

We continue to refine our approach to design-build by developing key aspects including: understanding that a project's success is dependent on achieving the owner's goals; providing design and construction excellence with the most qualified team for a specific project; providing an integrated team that has personal experience together; making timely decisions to expedite performance; and being an effective partner with all project stakeholders. The discussions below outline our approach to design-build starting with assembling an **Experienced and Qualified Team** carrying through **Identifying Project Goals, Design and Construction Development, Coordination and Decision Making, Design Quality Management, Schedule Management, Stakeholder Coordination, and Partnering.**

Experienced and Qualified Team: The Fay team's success on SHA projects and other projects on the Appalachian Development Highway System (e.g., PennDOT's US 219 New Highway Construction/Earthwork contract, Corridor N and I-70 New Stanton Interchange Reconstruction, Corridor M) are evidence that the effective implementation of safety, quality, teamwork, and environmental stewardship are key objectives of all of our project management teams. These projects provided firsthand experience of the importance of partnering, how to work effectively with local agencies to ensure environmental compliance, and effectively managing the design-build process – all of which will be important components on the US 219 project. Locally, the Fay team has also demonstrated our experience working in the state of Maryland. Fay has never received less than an "A" rating from MDOT, has an excellent E&SC quality assurance rating, and has received 12 Maryland Quality Initiative (MdQI) awards, five (5) for partnering. We have included WRA on our team as the lead design firm, a local design firm whose largest client is SHA. WRA has also demonstrated the same success working on SHA projects (e.g., Design-Build MD 237 from MD 235 to Pegg Road, Design-Build MD 210 at Livingston Road/Kerby Hill Road Interchange, and Design-Build MD 32 from MD 108 to Linden Church Road at Linden Church Road Interchange). This success is evidenced by their numerous repeat contracts with SHA and by their excellent consultant ratings year after year. They have also been awarded several MdQI awards for partnering. Both firms have established a proven ability to successfully complete design-build projects to the complete satisfaction of our clients.

Fay's and WRA's contractor-designer relationship extends beyond our collective SHA and design-build experience. Fay routinely engages WRA's expertise during the bidding and construction of traditional bid-build projects, while WRA

leverages Fay's construction expertise to improve the constructability and cost-effectiveness of WRA designs. This collaborative relationship has recently been on display with the construction of the PennDOT I-70 New Stanton Interchange Reconstruction project in New Stanton, PA (ADHC Corridor M) and the PennDOT Liberty Bridge project in Pittsburgh, PA. On both projects, Fay identified an opportunity to accelerate the project schedule and reduce costs by modifying the construction sequence and other project elements and engaged WRA to perform the required design efforts.

To fulfill our team's responsibility to provide superior design plans, project specifications, and working drawings, Fay has partnered exclusively with Century Engineering, Inc. (CEI), our IDQM firm, to provide independent design reviews and certify all design packages developed by WRA and their design subconsultants. CEI brings a wealth of SHA design-build and design quality assurance experience. They have worked with nearly every SHA office and district over the past 30 years providing design and project management for small and large transportation projects, including IDQM services for the Design-Build MD 404 from US 50 to East of Holly Road project, valued at $105M. CEI also brings a wealth of local and national design-build experience on roadway and other major civil projects. CEI follows strict quality processes established through a quality management plan tailored to each project that provides guidance, verification, and document control.

INDIVIDUAL FIRM DESIGN-BUILD EXPERIENCE AND TOTAL DOLLAR VALUE					
FAY		**WRA**		**CEI**	
Project	**Cost**	**Project**	**Cost**	**Project**	**Cost**
I-90 Six Mile Creek Br.	$34M	MD 32 Phase 1	$33	MD 404 – IDQM QA	$105M
PA Turnpike MP 2-10	$105M	MD 210 (Livingston/Kerby)	$83	I-95 at Contee Road	$31M
Charleroi-Monessen	$27M	MD 237 (MD 235-Pegg Rd)	$38	ICC-A – GEC QA	$486M
SR 79 Meadville	$28M	Arena Drive (I-495)	$30	I-70 Bridges QA/QC	$7M
Blvd. of the Allies Br.	$30M	US 29 Solutions	$117M	US 113 Phase 1	$12M
D-B Projects (7) < $5M	$19M	D-B Projects (>25) > $1M	$250M+	US 301 - GEC	$500M
TOTAL	**$243M**	**TOTAL**	**$551M+**	**TOTAL**	**$1,141M**
TOTAL TEAM DESIGN-BUILD EXPERIENCE = $1,935M					

Identifying Project Goals: Fay/WRA fully understands the US 219 Project Goals – *Schedule, Environmental Compliance, and Design Excellence* – the scope of work required for the project, the risks facing Fay/WRA and SHA for the project, and the required design, construction, quality control/assurance, and project management actions and activities necessary to successfully achieve the Project Goals. We understand that in order to be successful in achieving the Project Goals, we must also: 1) meet and/or exceed all contract requirements; 2) amicably resolve ambiguities in project requirements with SHA; 3) design and construct the project within the various project constraints; and 4) partner with SHA, SHA-PRD, permitting/regulatory agencies, utility owners, and all other project stakeholders. Key items to be employed by Fay/WRA toward achieving the Project Goals from design initiation through construction development will include: 1) a comprehensive knowledge of all policies, procedures, and criteria, and of all federal, state, and local permitting/approval regulations; 2) a practical design approach where we will look to eliminate non-essential project design elements during the ATC process and optimize others resulting in lower cost, quicker project delivery, and improved value; 3) development of innovative approaches and alternatives to minimize impacts to the environment, community, utilities, and traveling public; 4) practice environmental stewardship in design and construction through the use of design refinement techniques and alternative construction techniques; 5) adhere to a strict quality control and quality assurance program during design and construction; and 6) partner internally with SHA and all project stakeholders to complete the project ahead of schedule, within budget, safely, and to the satisfaction of SHA and other stakeholders.

Design and Construction Development: With decades of proven design and construction experience, Fay/WRA understands the necessary components required for successfully completing design-build projects. In this section, we discuss these various parts, including our ***collaborative design-build approach; approach to technical design submittals; managing risk, change, and safety and health***; and our team's overall approach to design and construction development.

Collaborative Design-Build Approach: Partnering and team integration are critical to realizing a successful project. We understand the importance of fostering continuous collaboration, coordination, and communication between all team members throughout design and construction to ensure sound and timely decision-making. This open forum allows the entire team to clearly define project criteria and address constructability during design. This approach provides a method for value engineering; ensures a consistent, reliable and compliant design; anticipates conflicts before they happen; ensures SHA's

and other stakeholders' expectations are met; and avoids having issues become critical to the schedule, environmental compliance, and/or design and construction quality. Communication and collaboration between Fay/WRA, CEI, SHA, SHA-PRD, permitting/regulatory agencies, utility companies, and other stakeholders will be critical to the overall success of this project.

Fay/WRA's integrated structure will facilitate involvement of construction expertise during design and design expertise during construction. Using personnel with roles in both design and construction will afford us the opportunity to quickly make adjustments to the timelines, level of detail, and project changes. By defining clear roles and responsibilities, each member of the team will be able to participate and provide the best solutions to meet SHA's and other stakeholders' expectations. As the central point of decision-making, **Design-Build Project Manager Tyson Hicks** will be responsible for communicating with the project delivery team as well as SHA and all involved in the project. Mr. Hicks will have full authority and responsibility for compliance with all project requirements, safety, quality, schedule, and overall project management and contract administration. He will ensure the team is fully integrated and that the project finishes within budget on and on or before the December 11, 2020 completion date. Mr. Hicks will be supported by other team members consisting of **Construction Manager Ed Chaney**, **Project Design Manager Walter Miller, PE**, and **IDQM Manager Anthony Frascarella, PE**. Fay has also assigned **Michael Veid as Design/Construction Coordinator.** Mr. Veid will report directly to Mr. Hicks and will be responsible for establishing and supporting collaboration between design and construction staff early on during the bidding and design phases and continue it throughout the construction phase. He will actively work with Mr. Hicks, Mr. Chaney and Mr. Miller to promote innovation and creativity, facilitate informed decision-making, and make sure all design submittals are reviewed for constructability, conformance with project requirements, and consistency with construction scheduling, sequencing, means/methods, and other project commitments. He will also coordinate with Mr. Frascarella to ensure contract requirements are being met as design progresses towards the initiation of construction activities.

Technical Design Submittals: Fay/WRA will perform required field surveys, test pitting, soil and pavement testing, and will develop and submit for review and approval all necessary permit revisions, certifications, documentation, studies, reports, etc. in support of the proposed design and construction activities as outlined in the RFP. Key technical submittals will include, but are not limited to, the following: Initial CPM schedule, Design Quality Control Plan, Public Outreach Plan, Transportation Management Plan, Tree Impact Minimization and Avoidance Report, and permits/permit modifications as may be required.

In order to expedite design approvals and initiate construction activities, Fay/WRA will package design submittals into distinct packages by discipline of work and as needed to tie inter-related work elements together. For instance, all roadway, MOT, E&SC, SWM and drainage elements will be included in a "roadway" package.

- For the roadway packages, we will employ a rolling design submittal schedule to expedite design approvals and initiate early construction. Rolling submissions will include a Line/Grade submission followed by a 60% submission, 100% submission, and an Issued for Construction (IFC) submission for the roadway packages. We anticipate having three main construction zones with sub-zones as described under *Construction Phasing* below.
- For the Wetland Creation and Stream Restoration elements, we will design and submit them in conjunction with the appropriate E&SC and permit submission packages.
- For the bridges over US 40 Alt. and other major or small structures, we will design and submit them as their own design packages following an independent design schedule in conformance with 3.05.10 and 3.11.
- For traffic elements (signing and marking, roadway lighting, signalization, and ITS), we will design and submit separate packages for each element in conformance with 3.12. Traffic design will generally follow the roadway design. This will ensure proper coordination between all design elements while allowing for the traffic elements to be designed and approved at nearly the same time as the roadway package.
- For landscaping and reforestation, we will start with a preliminary landscape and reforestation meeting with SHA followed by design packages for preliminary design, final design, and IFC submissions. Landscape and forestation design will generally follow the roadway design. This will ensure proper coordination between all design elements while allowing for the landscape and reforestation elements to be designed and approved at nearly the same time as the roadway package.

Risk Management: Fay/WRA's risk management process has already started with the development of this Technical Proposal and will continue throughout the bidding, design, and construction phases. Fay/WRA will manage and track all project risks by using a Project Risk Register. The risk register will be a living document used to identify, assess, analyze, classify, rate, and rank project risks, and then be used to help develop a plan to manage, mitigate and/or eliminate each project risk. The Project Risk Register will be discussed at all weekly team coordination meetings, weekly task force/discipline specific meetings, and monthly partnering meetings, to ensure identified issues do not negatively impact the project. Detailed information on the most relevant and critical risks facing Fay/WRA and SHA, is provided in *Most Relevant and Critical Risks* section of this proposal.

Change Management: Although this is a lump sum design-build contract, situations may arise that result in changes to the scope of the project or previously approved project documents. Fay/WRA's Partnering Charter with SHA will establish a clear and direct conflict resolution ladder for resolving potential and actual issues arising from the design and construction efforts. Typically, issues will be addressed through the RFI process and will be logged, distributed, and answered in accordance with this procedure. Upon determining a potential change to the scope of work or project documents, Mr. Hicks, will complete an RFI and transmit it to Mr. Miller, and SHA. The RFI will be reviewed then distributed to the appropriate parties responsible for responding to it.

Changes During Design: Changes that occur during design are typically the result of a change not included in the RFP scope of work that requires integration into the final construction and permit/approval documents. In these cases, Mr. Miller will contact SHA's Project Design Engineer to describe the change and discuss the potential impact(s) of the change. In order to mitigate the impact of the potential change, we will partner diligently with SHA and other stakeholders to address the issue as quickly as possible. Upon receiving authorization to proceed with the most reasonable solution selected and approved by SHA, Fay/WRA will expeditiously proceed with the change. Should permits/regulatory approvals require reassessment, the plans and supporting documents will be submitted to the permitting/regulatory agencies for approval. The revisions will only be initiated in construction after receiving the appropriate permitting/regulatory approvals.

Changes During Construction: Changes that occur during construction are often a result of unforeseen field conditions discovered during construction. As discussed above, changes will be addressed through the RFI process. Prior to initiating any change to approved IFC documents, we will partner with SHA to identify and determine an appropriate resolution similar to the procedure for change management during design discussed above. Once the change and its solution are identified, Mr. Miller will acquire all required SHA and permitting/regulatory approvals, by preparing and submitting through Mr. Hicks, a redline revision in conformance with 3.05.27.2.1 of the RFP. The redline revision will be submitted to SHA's Project Construction Manager and Project Design Engineer for review and approval by appropriate SHA staff and permitting/regulatory agencies. All IFC plan changes will be tracked and documented to ensure they are included on final as-built drawings. Revisions that require minor changes to IFC plans will be shown on field copies of current as-built plan set to be later documented on the project as-built drawings at project completion. Only plan sets that are stamped and signed as IFC will be used for construction. **Our Project Quality Control team,** led by **Giuseppi Parente**, will audit plan sets used in the field to ensure that they are current and approved. The Project Superintendents will also be responsible for checking the control sets to make sure that they are using the most up-to-date documents.

As-Built Drawings: During construction, all IFC plans will be updated for all field changes and field surveys, and all redline revisions will be incorporated in conformance with 3.05.27.2.2 of the RFP. Final approval will be given by Mr. Chaney and Mr. Miller after review. Each set of IFC plans will be incorporated into a set of as-built drawings, which will be submitted to SHA for approval and review. Once finalized, the approved signed and sealed set of as-built drawings, including an index sheet and a key plan, will be posted to ProjectWise and a CD ROM will be submitted to SHA. The SWM Facility As-Built Certification will be a separate submittal in conformance with 3.05.15.5 of the RFP.

Safety and Health Management: Fay/WRA approaches all their work with the highest commitment to safety. Our success is from "*always living to be safe and accident free*." **Chris Reefer, CSP, Fay's Safety Director,** will ensure that the project's Safety Management Program (SMP) is administered in accordance with the governing policies and programs. The Fay/WRA SMP is designed to identify and address all safety requirements for the project. The SMP will include a Site-Specific Health and Safety Plan (SSHSP) to address specific site hazards and provide training for items such as excavations, shoring, confined space, fall protection, crane signaling/rigging, silica, work zone safety, heavy equipment safety and underground and overhead utilities. Site-specific training is mandatory for all employees, regardless of position, and will be conducted by **Site Safety Coordinator Vincent Corden**. Mr. Corden will also conduct pre-employment, random and post-incident drug screening. As part of the SSHSP, each work task to be performed will require a Daily Task Planner, identifying and mitigating potential hazards. Heavy equipment inspections will completed daily prior to operating any equipment, any deficiencies will be addressed immediately. Daily safety assessments will be conducted by site supervision and regular safety assessments/audits will be conducted by Mr. Reefer and Mr. Corden.

Public safety is critical to project success, and will be addressed in the SMP with a sound TMP. The general public will be moved into clearly delineated paths and any pedestrian ramps that may be needed will meet all ADA requirements. Spotters and barricades will be posted in areas where pedestrians may come close to the work zones. **Certified Traffic Manager James Galloway**, in coordination with **Traffic Engineer Jeremy Mocny, PE, PTOE**, will ensure that temporary traffic control is set-up properly and remains in place per contract guidelines. We will also utilize our Public Outreach Plan (POP) to alert the general public of the upcoming changes in the area so as to limit the interruptions that they may face.

The SMP will also include an IMP. This plan will be incorporated into our TMP and will coincide with our traffic control plans, CPM schedule and construction activity plans. The IMP will provide for preventative measures, as well as a step-by-step procedures for any incident that occurs within the project site. This plan will establish guidelines for effective emergency response and communication procedures. Fay will establish a team of trained employees to be responsible for the first response, as well as coordination with emergency operations, jobsite supervision, and the local jurisdictions to ensure safety for people and property. Immediate incident notification will be provided to SHA, as well as any other local jurisdiction that may require such notification. An incident report will be documented and submitted to the SHA.

Coordination Management and Decision-Making: Working together, communicating effectively, and making smart decisions are essential functions of any project. Fay/WRA understands that those attributes are even more important for design-build projects where collaboration between design and construction staff is crucial. In this section, we will detail the structure of our team, communication practices and document management.

Integrated Organizational Structure: Team integration starts with Design-Build Project Manager Tyson Hicks, who will be the prime point-of-contact with SHA for all project matters. He will have full authority and responsibility for compliance with all project requirements, overall project management, and contract administration.

Mr. Hicks will be supported by Construction Manager Ed Chaney. Mr. Chaney will report directly to Mr. Hicks and will be responsible for the on-site construction team, including the project controls, scheduling, site safety, subcontractors, and Highway, ESC/SWM, MOT/Traffic, Structures, and Utilities Superintendents. Mr. Chaney will be assigned on-site full-time during construction. Mr. Chaney will ensure all construction coordination activities are being progressed to avoid schedule slips. During design, Mr. Chaney will ensure all design elements are reviewed for constructability and consistency with construction scheduling, sequencing, means/methods, etc. He will also regularly coordinate with the design team during construction on shop drawings reviews and to resolve unforeseen field issues. **Construction QA/QC Manager Jason Esser** will coordinate with Mr. Chaney, manage and coordinate construction QA/QC activities for compliance to project requirements, and bring any non-compliance issues to Mr. Chaney's and Mr. Hicks' attention. Mr. Esser will be independent from production and will report directly to Mr. Hicks.

On the design side, Mr. Hicks will be supported by Project Design Manager Walter Miller, PE. Mr. Miller will report directly to Mr. Hicks and will be responsible for all design activities and other professional services. All design discipline leads, including Highway, Water Resources, Structures, MOT/Traffic, Utility and Geotechnical/Pavement Engineers, Environmental Scientists and Wetland Creation/Stream Restoration and Permitting Specialists, Landscape Architect, Land Surveyor, etc. and subconsultants will report directly to the Mr. Miller. Mr. Miller will ensure all design leads coordinate with each other, our subconsultants, and construction staff. Mr. Miller will ensure that all necessary permits and approvals are obtained. He will assign resources, oversee/coordinate design subconsultants, coordinate design schedules, develop/implement corrective measures (if needed) and integrate environmental compliance/mitigation measures into our daily design process. During construction, Mr. Miller will manage plan modifications and shop drawings, and review construction activities with Mr. Chaney. **Design QC Manager Brian Riffel, PE** will implement and oversee our Design Quality Control Plan to ensure all design elements are thoroughly checked, meet project commitments, and constructible. Mr. Riffel will be independent from production and will report directly to Mr. Hicks.

To ensure full integration of our design and construction staff and leverage the collaboration afforded through design-build, Design-Construction Coordinator Michael Veid will work with our design and construction staff to ensure collaboration between design and construction staff starts early during the bidding and design phases and is sustained throughout the construction phase. Mr. Veid will report directly to Mr. Hicks and will actively work with Mr. Chaney and Mr. Miller to ensure all design submittals are reviewed for constructability, conformance with project requirements, and consistency with construction scheduling, sequencing, means/methods, and other project commitments. He will also assist Mr. Miller in keeping the design staff informed and integrated during construction so construction is being progressed in conformance with the design intent and project commitments, and unforeseen construction issues are resolved quickly.

To ensure coordination between design and construction on critical project elements (e.g., environmental permitting/approvals/compliance, utilities, MOT/traffic, etc.), we have assigned key personnel to manage and coordinate these elements. **James Ashby, Environmental Compliance Manager**, will work with **Allen Sarver, E&SC/SWM Manager**, and **Timothy Hess, Permitting Coordinator**, to ensure compliance with all permit/regulatory requirements during design and implementation of the design during construction. Mr. Ashby will review design plans along with construction staff, and will visit the construction site periodically and during critical phases to ensure permit conformance throughout. Particular attention will be paid during design to ensure impacts are minimized and constructability/construction access is considered in the design. Mr. Sarver will ensure all E&S controls are properly placed in the field, all construction

remains in permitted limits, and any field modifications are properly approved by SHA-PRD, MDE, and/or USACE. Mr. Hess will work with our design and construction teams, including **Water Resources Engineer Jason Cosler, PE**, and **Wetland Creation and Stream Restoration Design and Permitting Specialist Charles Hegberg** to ensure permits are being properly interpreted during design and construction, and he will prepare any necessary permit/regulatory approval modifications due to design or construction changes. **Mr. Veid, also acting as Utilities Coordinator**, will work directly with utility owner representatives, our utility design staff, and **On-Site Utility Superintendent Gary Rigsby** to ensure all utilities are identified, impacts minimized, and necessary relocations coordinated and effectively scheduled/sequenced. James Galloway, MOT/Traffic Manager, will work closely with our traffic engineering staff during design and will review plans to ensure all MOT/traffic elements are coordinated and sequenced with construction activities, including E&SC phasing. During construction, he will ensure the proper implementation of traffic control devices in the field and will review their performance. As needed, he will work with our traffic engineering staff to make improvements due to unanticipated road user behavior.

Our Collaboration, Coordination and Communication Practices: The success of any project relies on close collaboration, coordination, and communication between all team members to ensure that the project moves forward efficiently. Starting in the bidding phase, our construction and design staff will carefully evaluate all work activities on the project. Initial field investigations will be completed together in order to assess issues such as construction access, potential environmental constraints, and impacts to adjacent property owners or other stakeholders, such as utilities. This collaboration carries forward into design and construction through formal monthly partnering and our integrated daily workflow partnering approach. In the design phase, Fay will be heavily involved in design and constructability decisions in preparation of design submittals. During construction, WRA's designers will be consulted to assist Fay in developing construction solutions and provide design modifications to address unforeseen field conditions. Key construction inputs during design will include the following: 1) constructability reviews – review of scheduling, sequencing, means/methods, materials, etc.; 2) construction scheduling and development of the CPM schedule; 3) assisting with the development of cost-effective designs; 4) assessing utility impacts and relocation or avoidance measures; 5) assessing environmental impacts to identify/develop avoidance and minimization strategies; 6) over-the-shoulder reviews; and 7) cooperative efforts for shop drawing preparation. Key design inputs during construction will include the following: 1) design field support; 2) review of preliminary CPM schedules for construction; 3) assistance with permit compliance; 4) assistance with E&SC SHA-OED Quality Assurance Toolkit field changes; 5) assistance with MOT and approved traffic control plans; 6) supporting resolutions for changed field conditions; and 7) assisting with public involvement and community interaction.

As part of our integrated partnering approach, Fay/WRA, including our subconsultants and subcontractors, will actively communicate and coordinate through phone calls, email, and frequent meetings, video conferences, etc. All design and construction activities will be coordinated to ensure the seamless integration of all design components and the coordinated progression of construction. Meetings will include weekly team coordination meetings, weekly task force/discipline specific meetings, daily and weekly on-site construction meetings, monthly partnering meetings, design quality control meetings, permitting/regulatory compliance meetings, constructability review meetings, and other project coordination meetings to address specific activities or issues.

Weekly team coordination meetings will be led by Mr. Hicks, Mr. Chaney, and Mr. Miller. These meetings will be held to ensure all design and construction activities are being coordinated, critical issues are being addressed, and design and construction schedules are being met. IDQM staff will attend the meetings to stay informed of design progress and discuss design compliance issues or concerns.

Weekly task force/discipline-specific meetings, led by either Mr. Chaneny or Mr. Miller, will be held to ensure specific tasks or disciplines of work are properly coordinated, sequenced, and their respective schedules are being met. Meetings will include, but not be limited to: design review; constructability review; and design quality control, construction progress, utility, permitting, ROW and MOT. In the beginning, meetings will focus on addressing design progress and scheduling, critical path design activities, design issues and planned actions, quality control actions and consistency of work, construction sequencing and constructability, environmental impacts, minimization and permitting requirements, ROW clearances, contract commitment compliance, and other necessary items to ensure coordination of all design elements, constructability, and compliance with the RFP. Once construction begins, the meetings will address both design and construction activities. In addition to the design items discussed previously, we will also discuss upcoming construction activities to ensure the construction team fully understands the intent of the design, construction progress and scheduling, shop drawing approvals and material clearances, environmental restrictions/constraints, critical path items, construction issues/planned actions, quality control, safety, and other items necessary to ensure construction is progressing as planned.

Action item logs, in conjunction with our CPM schedule and 3-week look-a-head schedule (discussed under the *Schedule Management* section below) for key project activities will be developed and routinely updated by **Project Scheduler Jason Esser** to aid in keeping key project activities on schedule by tracking key dates and identifying, tracking, and addressing critical issues. All logs, and the 3-week look-ahead schedule, will be reviewed weekly by Mr. Hicks, Mr. Chaney, Mr. Miller, Mr. Veid, and Mr. Esser to ensure appropriate and timely action is being taken on key items. The logs and schedule also will be used during project meetings and partnering meetings to ensure all appropriate parties are informed and are taking appropriate and timely action on their respective items. During our weekly schedule reviews, an action item list will be generated and used by our project managers and dedicated coordinators/managers to focus attention on the resolution of specific schedule issues. We will proactively contact or meet with SHA or other project stakeholders and use the partnering process to quickly resolve issues. We will encourage SHA, CEI, and other project stakeholders to attend our design review, task force/discipline, and construction meetings to promote over-the-shoulder reviews and real-time feedback on design and construction decisions to minimize surprises and speed the review and approval process.

Document Control Methodology: Fay will use "Viewpoint" construction software to provide efficient and accurate document control on this project. Viewpoint is the construction document management system used by Fay to provide an integrated system with one point-of-entry, project finance, project management, and document management capabilities. Viewpoint allows real-time sharing of information with a quick link to documents and images, allowing for reviewing and emailing of stored documents. For documents shared with external partners and field personnel, Fay/WRA will use a combination of Projectwise, Dropbox, BlueBeam, and WRA's SecureShare document management tools. ProjectWise will be used for all documents being transmitted to/from SHA and project stakeholders. Dropbox, BlueBeam and SecureShare will be used for sharing documents with external partners, subcontractors and subconsultants, and field personnel.

Externally received and internally generated documents, meeting minutes, approvals/permits, action item logs, project compliance logs, design/construction schedules, construction drawings, reports, shop drawings, working drawings, material procurement/delivery schedules, closeout checklists, progress payments, etc. will be issued a file address, scanned, and saved in Viewpoint, with a hard copy in the master project file, held at the Fay project office. All paper correspondence and submittals will be date-stamped and will receive a specific number, and logged for future reference. All numbers will be organized by document type, and tracked in numerical order, chronologically. Incoming correspondence from SHA and others will be entered into the tracking log and routed to various team members to read, take action, or respond. All correspondence will flow through Mr. Hicks, to maintain a single point-of-contact and policy consistency for all formal project communication. Document management in Viewpoint will be executed by Giuseppi Parente. Mr. Parente will also be responsible for ensuring that the information in Viewpoint is properly coordinated with Fay/WRA's submittals, comment responses, drawings, and other documents to be uploaded to ProjectWise, Dropbox, BlueBeam, and SecureShares. Viewpoint will be updated with ProjectWise, Dropbox, BlueBeam and SecureShares upload information so all systems are synthesized. All shop drawings and working drawings will be checked and stamped with their approval by WRA, prior to sending to our IDQM team for their concurrence.

Design Quality Management: Quality management has been a vital part of Fay's and WRA's successes on past projects. Fay/WRA understand the importance of having strong quality control and quality assurance processes in place and checking our work through every stage of the project. Below is Fay/WRA's approach to this important area and how we will approach quality to ensure the SHA's satisfaction on the US 219 project.

Project Quality Control and Quality Assurance (QC/QA) Plan: Primary responsibility for implementation of our QC/QA Plan rests with Design-Build Project Manager Tyson Hicks. Construction Manager Ed Chaney will oversee construction quality control functions and Project Design Manager Walter Miller, PE, will oversee design quality control functions. Mr. Chaney and Mr. Miller 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. Mr. Hicks, Mr. Chaney and Mr. Miller will be supported by an independent quality control team (QCT) led by Design QC Manager Brian Riffel, PE, and Construction QC Manager Jason Esser, PE. Our QCT will carry out the quality control procedures outlined in our QC/QA Plan. Our QCT will assist the design and construction team in reviewing the project along its various stages to its conclusion (including during the development of the work schedule). Our team's quality control procedures are constructed to serve as effective tools for monitoring and controlling the accuracy, quality, and completeness of the work, and to ensure that the design and construction meets the project requirements. Mr. Hicks will be responsible for ensuring the QC/QA Plan is implemented and that QC/QA functions are independent of project production functions. He will perform periodic reviews to evaluate how the QC/QA Plan is meeting our quality goals.

Design Quality Control (QC): Design quality control is not a single step process but requires adequate controls, reviews,

and checking applied at each stage of a project's development. Our Design Quality Control Plan (DQCP) will outline our overall organization plan and reporting responsibilities for design quality control and will be focused on quality control measures, coordination activities, and document controls to be applied during project execution by all team members, including subconsultants, which are oriented towards assuring that the design is accurate and design and construction elements conform to the contract requirements while minimizing impacts. Primary responsibility for implementation of our DQCP rests with Mr. Hicks and Mr. Miller. Mr. Chaney will also take an active role during design to ensure over-the-shoulder reviews are being performed and construction inputs are incorporated into the design, that the design is constructible, the sequencing is logical and efficient, impacts during construction and post-construction are minimized, and that construction is performed safely.The DQCP will be distributed to all project team members, including subconsultants.

Design Quality Assurance (QA): 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. Our IDQM team will provide independent design reviews of all design packages developed by WRA certifying they were developed in accordance with the DQCP and meet the requirements of the contract documents. CEI will also be responsible for the review and approval (with SHA concurrence) of the DQCP. Our QA approach will adhere to the same rigorous review and document control procedures as outlined above for quality control. Primary responsibility for implementation of our control assurance program rests with Mr. Hicks, and IDQM Manager Anthony Frascarella, PE. Mr. Frascarella will also ensure all design submissions are documented and the reviews performed by the IDQM team are posted on ProjectWise. SHA will review this documentation to further ensure the design review process and submissions are in compliance with the DQCP and contract requirements. SHA-OOS will also perform a concurrent review of any structures if required for the project. In the event of an ambiguity in the interpretation of the contract requirements between WRA and CEI, Mr. Hicks will immediately raise the issue with SHA's Project Design Manager for resolution.

Schedule Management: Fay/WRA understands that one of SHA's Project Goals is to begin construction in spring 2018 and complete the work no later than December 11, 2020. We further understand that SHA desires to expedite completion of the project to reduce time, minimize inconvenience and improve safety for motorists, and reduce costs.

Fay/WRA understands that we will face numerous scheduling challenges during design and construction, such as permitting/regulatory approvals, time of year restrictions, utility coordination and relocations, MOT restrictions, design reviews/approvals, right-of-way clearance, discovery of contaminated materials or cultural resources, unanticipated subsurface conditions (e.g., disturbances and voids from old coal mines, karst geology, unsuitable material, etc.), and reoccurring inclement weather. To address these challenges, Fay/WRA will rely on an integrated schedule management philosophy that promotes sound planning, close collaboration, coordination, and communication between all team members, proactive and efficient issue resolution, and execution in all phases of design and construction. Our CPM schedule will be comprehensive and the primary driver and management tool to plan and execute our work. This management approach is focused on looking ahead, proactively eliminating potential issues, and communicating expectations prior to executing the work.

Our CPM schedule will be developed and maintained by Project Scheduler Jason Esser, PE, in accordance with the RFP. Mr. Esser will monitor and prepare monthly schedule updates to track progress and identify any potential schedule impacts. Mr. Esser and SHA's Schedule Reviewer will meet at monthly intervals, or more frequently as required, to address the reviewer's comments, making any necessary changes to finalize the update as the current schedule of record. Schedules will be distributed to all subcontractors, critical material suppliers, and designers. Pre-construction meetings will be held with all subcontractors and suppliers sufficiently in advance of their required start date. We will develop design packages in a manner such that they can be designed, reviewed, and approved in a timeframe to allow construction to progress effecieintly. Upon notification of selection, early activities such as surveys, soil borings, TMP, environmental field work and reports, etc. will be undertaken so they are completed for early design and permit submissions. In addition, discrete design packages within each construction phase will be developed to ensure the proper allocation of staff resources, equipment, and supplied material, and to facilitate the early start of critical construction elements or procurement of long lead-time materials, such as utility relocations, structure foundations, steel fabrication, signalization, etc. Daily construction toolbox meetings will be held to provide schedule updates and a look-ahead of upcoming work. A similar approach will be undertaken during design to ensure sufficient design staff resources are allocated and that appropriate construction staff is engaged and providing over-the shoulder reviews.

A 3-week look-ahead schedule, along with the action item logs for key project activities discussed previously, will be developed and updated weekly to track the status of critical issues and to identify the actions and responses needed. The schedule and logs will be reviewed weekly by Mr. Hicks, Mr. Chaney, Mr. Miller, Mr. Esser, and Mr. Veid to ensure timely action is being taken

on key items. We will continually measure the progress of each activity against its timetable and address potential delays before they affect the schedule. Critical path or high risk activities will receive particular attention by assigning dedicated staff to facilitate coordination and issue resolution. The schedule and logs also will be used during project meetings and Partnering meetings to ensure all appropriate parties are informed and taking appropriate action. Upon recognition of a potential delay, plans will be made to re-sequence the work and/or mobilize additional crafts or design staff to mitigate any time losses.

Construction Phasing: Based on the US 219 Alt. 4 Concept Plans, Fay/WRA proposes to design and construct the project in three distinct zones: Zone 1 will construct the new alignment of US 219 north of the northern roundabout to the northern project limits including the construction of the US 219 bridges over US 40 Alt.; Zone 2 will include the reconstruction and widening of existing US 219 (Chestnut Ridge Road) including the roundabouts north and south of I-68; and Zone 3 will construct I-68 westbound widening, resurfacing, and interchange ramps reconstruction. Each zone may include separate construction packages for sub-zones to balance earthwork and initate construction as expeditiously as possible in locations where design and permits/regulatory approvals can be obtained more easily and right-of-way is clear.

SHA and Stakeholder Coordination: Communication is critical to a successful project. Fay and WRA have both had numerous successful past partnering efforts with SHA and are aware of the important role communication plays on construction projects. Communication and coordination between Fay/WRA and SHA is only one part of the puzzle, however. We also recognize the need for successful coordination with other entities, including utilities, permitting/regulatory agencies, and the public. Partnering will be the framework for continual coordination and communication with all stakeholders. Key personnel will actively participate in monthly partnering meetings, and other project coordination meetings addressing specific project activities. The agenda for these meeting will include team member expectations, project scheduling, submittal reviews/approvals, design and construction issues/solutions, permitting/regulatory compliance, construction means/methods, construction sequencing, and strategies to minimize impacts to the traveling public/community. These meetings will serve as a conduit to discuss, coordinate, and resolve design and construction issues in an integrated forum. This section outlines how Fay/WRA will effectively work with SHA, its stakeholders, and these third parties.

SHA and Stakeholder Coordination: All formal communication between Fay/WRA and SHA will be addressed through Design-Build Project Manager, Tyson Hicks. He will be responsible for coordinating the formal communication flow and to maintain consistent information tracking and documentation throughout the project. This communication flow will travel directly to SHA's Project Design Engineer and Project Construction Engineer. All formal project submittals, including design submittals, shop drawings, material certifications, etc., will be incorporated into the approved project CPM schedule. All submittals, including submittals for third party review, will be submitted to our IDQM team for review and to the appropriate SHA staff member for review, auditing, and/or distribution. Email to a distribution list of appropriate stakeholders typically will be the primary means of communicating regarding submittals distribution, comments, etc. We will notify SHA and our IDQM team in advance of all design submittals (typically 14-days). Design submittals and other design-related information will be placed on SHA's ProjectWise server in conformance with established SHA procedures for the project, including folder and file naming conventions. Since many third parties do not have the ability to access ProjectWise, we will leverage DropBox, BlueBeam, and WRA's SecureShares document systems as discussed above under the *Document Control Methodology* section for document transfer/distribution with many third parties. Hard copies will be provided to stakeholders as may be required. Point-by-point responses will be provided for all comments received from our IDQM team, SHA, permitting/regulatory agencies, and third parties, including utility owners. Prior to all design submittals, we will perform a thorough quality control review in conformance with our approved Design Quality Control Plan. This review will be led by Design QC Manager, Brian Riffel, PE, with comprehensive constructability reviews led by Construction QC Manager Jason Esser, PE.

Construction Manager Ed Chaney and Project Design Manager Walter Miller, PE will be responsible for coordinating all informal communication (e.g., phone calls, emails, etc.) on the project with SHA's Project Construction Engineer and Project Design Engineer to ensure smooth project coordination. Fay/WRA will coordinate with SHA to manage all communication with permitting/regulatory agencies, and third parties, including utility owners, for design submittals, permit applications and modifications, submittal review meetings, issue resolution meetings, field change requests, and other necessary coordination. All informal communication will occur between Mr. Chaney and/or Mr. Miller and the agency/third party point-of-contact, with follow-up e-mails and hard copies sent to SHA's Project Construction Engineer and Project Design Engineer. Hard copies and follow-up emails will be documented and stored in Viewpoint.

Utility Coordination and Relocations: Fay/WRA will be proactive in our coordination efforts with utility owners, understanding that avoidance of utility relocations will be the most efficient and cost-effective means to facilitate design

and construction of the project. We will identify potential impacts early in the design process and look at design and construction strategies that may avoid or minimize impacts. In the event that impacts are unavoidable and utility relocations are necessary, we will partner to coordinate relocation activities with our design and construction activities, providing the utility owners sufficient time for scheduling and completing their design and construction activities and/or to review and provide comments on our relocation designs. We understand that scheduling will be critical and that we will need to make accommodations and provide access for relocation crews to perform their work concurrent with our work, while minimizing impacts to the traveling public and local community. Our coordination efforts will be led by our Utility Coordinator, Michael Veid, with support from our design team. Mr. Veid will work with SHA's District 6 Utility Engineer on all utility activities.

As identified in the RFP, Allegheny Power, Verizon, Comcast, and Maryland Department of Information Technology (DOIT) maintain aerial and underground facilities within the project limits that may be impacted by project activities. In the event impacts to Allegheny Power and Verizon overhead facilities cannot be avoided, they will be responsible for their relocation design and construction. In the event Comcast Television and DOIT overhead and underground facilities cannot be avoided, they will be responsible for their relocation design and construction. Fay/WRA will be responsible for the design and construction of conduits along US 40 Alt. under the proposed bridge. Allegheny Power, Verizon, Comcast, and DOIT will be responsible for the relocation design and construction of the underground facilities within the conduits at this location. Fay/WRA will coordinate the activities of each utility owner with our design, schedule, and sequence of construction to avoid delays and disruptions to the utility owners and Fay/WRA's schedule. In addition to the dry utilities, Garrett County Water and Sewer maintains underground facilities within the project limits. Fay/WRA will be responsible for the design and construction of a sewer force main along US 40 Alt. under the proposed bridge and a gravity sewer line along the west side of the proposed westbound ramp. Fay/WRA will design and construction these facilities in adherence to Garrett County Water and Sewer standards and coordinate with them to provide design reviews/approvals and a field representative onsite during all construction and testing operations. In addition to the public utilities discussed above, Fay/WRA will coordinate, design, and relocate other utilities impacted by the project, including well, leech fields, septic tanks, and house connections. Mr. Veid will identify potential impacts early in the design process and work with SHA's District 6 Utility Engineer to coordinate with the owner to ensure timely design and construction of the relocated facilities.

Permitting/Regulatory Agency Coordination: Fay/WRA have extensive experience in coordinating with permitting/regulatory agencies needed to obtain the required permits and approvals for SHA projects. We also have a comprehensive knowledge of all policies, procedures, and criteria, and of federal, state, and local permitting/approval regulations, requirements, and procedures necessary to efficiently prepare accurate and completed permit/approval packages for SHA-EPD, SHA-PRD, and permitting/regulatory agencies review and approval. Our coordination efforts will start with developing a professional and collaborative partnership with SHA-EPD, SHA-PRD, permitting/regulatory agencies, and other project stakeholders by providing clear, consistent, and regular communication through formal and informal partnering. Our efforts will be led by Environmental Compliance Manager James Ashby and Water Resources Engineer Jason Cosler, PE. As a first order of work after Notice to Proceed, Fay/WRA will attend a pre-permitting meeting with SHA, SHA-PRD, the Independent Environmental Manager, and permitting/regulatory agencies to gain a complete understanding of permit conditions/requirements, NEPA commitments, permitting timelines, submittal requirements, and expectations or concerns of each stakeholder. At this meeting, Mr. Ashby and Mr. Cosler will outline our approach to SWM, E&SC, environmental compliance during design and construction, and resource impact minimization. To avoid surprises, we will solicit feedback for any deviations from the concept SWM report or other permit conditions discovered. We will focus staff resources and actively monitor critical path permit/approval activities so submittals are made timely and SHA, SHA-PRD, permitting/regulatory agencies, and our IDQM team are afforded the time to review them. If issues are encountered that may result in permit/approval delays, issues will be resolved quickly and/or additional staff will be added to accelerate progress. As identified in the RFP, Fay/WRA understands that coordination will be required for hydrology and hydraulics approval, NOI/NPDES Permit including E&SC Permit and SWM approval (including Pond 378 and Dam Safety approval), Nontidal Wetlands and Waterways Permit including mitigation approval, Section 401 Water Quality Certification, Surface Water Appropriation Permit, Section 404 Individual Permit, Letter of Map Revision, and MD Forestation Law and Site Review approval.

Public Involvement and External Communication with Others: Fay/WRA is sensitive to the role that good communication plays in helping to minimize the impact of the project, not only on the locality, but also on all road users (motorists, pedestrians, bicyclists, emergency services, school buses, etc.) and will continue the outreach efforts and philosophy established by the SHA during the project's planning and RFP development phases. Residents, businesses, local agencies, elected and community officials, the community, road users, emergency service providers, the general public,

and other interest groups impacted by the project will be kept informed, and their engagement throughout the design and construction process will remain critical to the project's successful completion. We will provide comprehensive support and assistance to SHA in the development of an integrated communications plan including maintaining a comprehensive list of stakeholders, community participation/interaction activities, and documentation of all outreach efforts. The communication plan will support SHA in informing and engaging adjacent landowners, communities and other interested parties, as well as informing and updating road users and the general public, on the proposed project elements, MOT activities, construction progress, etc. The emphasis of our approach is to ensure that accurate and timely information flows from Fay/WRA, through SHA, to the local communities, traveling public, and all locally represented stakeholders. **Public Relations/Outreach Coordinator Brian Riffel, PE,** will lead the communication efforts for Fay/WRA. He will work closely with SHA's Office of Communications, District 6 Community Liaison, and SHA-OHD and District 6 staff for all public communication. Our communications plan will follow the requirements of 3.05.29, 3.16.04.02, and 3.21 of the RFP.

For efforts involving adjacent property owners and communities directly impacted by the project, we will actively support SHA staff in meetings, preparation of materials, documentation of meeting minutes and other correspondence, and preparation of responses to inquiries and comments. Our goal will be to support the active engagement of all affected and interested groups so that they become an integral part of the design and construction process. This support will be primarily provided by our Project Management team of Mr. Hicks, Mr. Chaney, and Mr. Miller, with the support of design and construction staff.

For efforts involving local agencies, elected officials, community leaders/members, road users, the general public, and other interest groups, we will actively support SHA staff with the preparation of information related to the project design/construction scope, MOT activities, construction progress, and general communication to address suggestions, questions, or concerns. We anticipate these types of support efforts to have a broader reach but may be topic-specific or site-specific as needed. This support will be primarily provided by Mr. Riffel with the support of our Project Management team. We anticipate employing various outreach tools such as, public meetings for formal interaction with public stakeholders; press releases, mailers, and the "Projects Page" on SHA's website for project updates; and existing SHA ITS systems and project-specific traffic control devices, etc. to inform the public of upcoming activities that may impact road users. All communication will come directly from SHA. All public comments or questions will be documented and referred to the appropriate SHA staff member within 4 hours to upload to SHA's Customer Care Management System (CCMS) and address in accordance with SHA's customer service strategy.

Partnering: Soon after execution of the contract with SHA, Design-Build Project Manager Tyson Hicks, Project Construction Manager Ed Chaney, Project Design Manager Walter Miller, PE, and other appropriate Fay/WRA staff will attend a partnering kick-off workshop meeting with SHA's Assistance District Engineer of Construction, Project Construction Engineer, Project Design Manager, and other appropriate SHA representatives to develop and commit to a Partnering Charter and Issue Resolution process. The charter will establish the mutually identified goals for the project based on trust and honest dialogue. Following the kick-off workshop meeting, an initial partnering meeting will be held to discuss with Fay/WRA, SHA staff, and other project stakeholders the Partnering Charter, Issue Resolution process, and SHA's guidelines for partnering following the SHA's *Partnering Field Guide*. During the initial partnering meeting, open lines of communication will be established, initiating teamwork and cooperation among all team members as all parties share their expectations and expected outcomes for the project. Monthly partnering meetings will be held throughout the life of the project with active participation from all key staff and key support staff of the Fay/WRA design and construction team members including subcontractor, subconsultant, and IDQM staff. Partnering will be the cornerstone of our collaborative working relationship with SHA, permitting/regulatory agencies, utility owners, and other stakeholders. Key performance areas will be tracked for success and issue resolution will begin at the lowest level and be elevated only by necessity when resolutions cannot be achieved in the pre-determined timeframes following the Issue Resolution process.

XVII.B.iii. APPROACH TO ENVIRONMENTAL PERMITTING AND COMPLIANCE

Environmental Permit Acquisition: Our approach to coordinating with state, federal, and local permitting/regulatory agencies is based on the 20-plus years of experience the Fay/WRA staff have working with these agencies on SHA projects. We recognize that the most critical elements in environmental permit and regulatory approval acquisition for a project of the scale of the US 219 project include: 1) identification and continual coordination with environmental permit and regulatory stakeholders; 2) identification and tracking of impacted resources; 3) conducting permit and approval coordination and submission tracking; and 4) clear and consistent communication with the project team throughout the process.

We understand the *US 219: I-68 (MD) to Meyersdale (PA) Planning and Environment Linkages (PEL) Study* was completed in 2016 by MDOT, PennDOT, and FHWA to establish a corridor-wide framework for reference in ongoing NEPA studies. The PEL study identified issues that were considered in the NEPA process including potential cultural and environmental resource impacts and potential mitigation requirements, including the natural and built environments. The NEPA process was initiated by

SHA/FHWA for the US 219 - I-68 to Old Salisbury Road portion with selection of a Preferred Alignment in March 2017. Approval of the SHA Preferred Alignment by FHWA and conclusion of the NEPA EA process is anticipated in July 2017. Following the conclusion of the NEPA process and issuance of the FONSI, Fay/WRA will review the FONSI and summarize the permitting and regulatory requirements in a commitment tracking/environmental impact and permit/approval matrix. The matrix will identify NEPA commitments and permit/approval conditions with respect to avoidance, minimization, and mitigation of impacts to wetlands, streams, forest, specimen/significant trees, FIDS, RTEs, and cultural resources. The following have been considered in the permit/approval acquisition and coordination as described in 3.20.01.05 of the RFP:

- Permit/approval acquisition and mitigation design for unavoidable impacts to Waters of the U.S., including wetlands, will require coordination with MDE Nontidal Wetlands and Waterways Program (NTWWP) and the USACE with respect to impacts to waters of the U.S. (including wetlands), wetland buffers, and floodplains. The NTWWP and USACE typically receive input from commenting agencies including USFWS, EPA, MHT, and DNR. Coordination with these agencies is anticipated relative to wetland and waterways impacts and DNR Forest Service for forest impacts. SHA-PRD will be a primary and key stakeholder throughout design and construction for SWM, E&SC approval, and construction inspection.
- We recognize that while SHA-PRD has delegated authority for the review and approval of SWM and E&SC, the MDE Stormwater and Sediment Plan Review Division (MDE-PRD) and the MDE Dam Safety Division may also require coordination for the review and approval of low hazard dams (under the jurisdiction of MDE-PRD) and significant/high hazard dams (under the jurisdiction of MDE Dam Safety Division). We will work proactively with the SHA-PRD Reviewer, MDE-PRD and MDE Dam Safety Division staff during design. Our team is experienced in coordinating SHA-OED Quality Assurance Toolkit and Greenline SWM/E&SC permit/approval modifications through SHA-PRD, SHA-HHD and the SHA-QAD.
- Fay/WRA anticipates that any adverse effects to historic resources under Section 106 of the National Historic Preservation Act (NHPA) were resolved during the consultation process between SHA, FHWA, and MD SHPO and addressed under the Memorandum of Agreement (MOA) between said agencies. Fay/WRA understands that any proposed design refinements will require a review of potential effects on historic and archaeological resources and identification of necessary approvals by SHA and the MD SHPO. We understand our responsibility for coordinating with the MD SHPO and SHA's Archaeologist, Dr. Julie Schablitsky, should any unanticipated archaeological resources be discovered during construction. Fabricated test panels for bridge cladding and landscaping/vegetation plans near the Tomlinson Inn will be submitted for review and comment by SHA and MD SHPO/consulting parties under the Section 106 MOA.
- Fay/WRA understands the historic coal mining operations in the project area include the potential for mine-related subsidence, settlement, and slope stability of thick unconsolidated surface mine spoil, exposure of acid mine drainage, and acid producing rock. We will partner with SHA, SHA-OMT, MDE Bureau of Mine, Abandoned Mine Lands and Acid Mine Drainage Division, and other project stakeholders to gather available information and knowledge from their extensive history with adverse effects from mining operations.

In conjunction with stakeholder identification and coordination, a key initial step in ensuring efficient permit/regulatory approval acquisition is the recognition of the types and extent of environmental features potentially impacted by the project. The major environmental features impacted by this project include forests, specimen/significant trees, nontidal wetlands, wetland buffer, Waters of the U.S., and floodplain. Although a provisional Joint Permit Application (JPA) for impacts to Waters of the U.S., including wetlands, has been completed to date, we anticipate that MDE and USACE will authorize permanent and temporary impacts including a minimum of approximately 17,200 SF of nontidal wetlands, 43,000 SF of nontidal wetland buffer, 1,200 LF of stream, and 0.30 acres of floodplain. Forest impacts are 35.93 acres as shown in the Concept Plates and on-site reforestation will be maximized. On-site reforestation of 43 acres (as specified in 3.13.01e of the RFP) is anticipated and Fay/WRA will coordinate permit modifications with DNR-Forest Service, SHA OED-LAD, and SHA-EPD. Compensatory mitigation for permanent wetland and stream impacts will be accomplished in accordance with the Phase I and II Mitigation Plans. SHA has submitted the JPA with the Phase I Mitigation Plan and Fay/WRA will submit a JPA amendment, including the final Phase I Mitigation Plan, in order to receive final permits. Fay/WRA will prepare and coordinate approval of the Phase II Mitigation Plan in conjunction with the JPA review process and will adhere to the information requirements listed in the MDE Phase I/II checklists.

We understand that permits required for project impacts will include 1) Provisional Section 404 Individual Permit or MD-SPGP5 to be provided by SHA and final permit by Fay/WRA; 2) Section 401 Water Quality Certification; 3) MDE Nontidal Wetlands & Waterways Permit; 4) MD Reforestation Law approval/ Modification to the Reforestation Site Review Approval; 5) MDE Surface Water Appropriation Permit; 6) NOI/NPDES Permit including ESC Permit for earth disturbance, staging and stockpiling areas, disposal sites, and borrow pits from SHA-PRD, and SWM approval from SHA-PRD including MDE Dam Safety Division and Plan Review Division approvals for small ponds and embankments, if necessary; and 7) Potential LOMR from FEMA. As noted in 3.20.02.04 of the RFP, no federally listed rare, threatened, or endangered (RTE) species are anticipated to

be directly impacted by the project and no historic or archeological resources are anticipated within the project's limit of disturbance.

Clear, consistent, and regular communication with stakeholders is a key component in our approach to coordinating with agencies to secure environmental permits. During design, Environmental Compliance Manager (ECM) James Ashby will track all permits and approvals on a weekly basis. This tracking will include permit number, authorized limits of disturbance and construction activities, critical path approvals, and any other relevant permit conditions. This tracking will be included in regular coordination meetings with SHA-EPD and distributed in regular coordination with the agency contacts. As we have done successfully for several other recent SHA design-build projects, we anticipate the preparation of a project-wide joint permit application or modification taking into account all anticipated impacts and mitigation strategies in order to ensure that the overall avoidance, minimization, and mitigation goals are achieved. As design progresses, we anticipate the need for modification of impacts (likely reductions) and the necessary modifications, all of which will be actively coordinated by Mr. Ashby in close communication with the SHA's IEM, design/construction staff, and permitting/regulatory agencies. We recognize that changes affecting permit authorizations are typical of design-build projects. Our ECM, with support from Project Design Manager Walter Miller, PE, Construction Manager Ed Chaney, and other technical staff will work with SHA to document changes in temporary and permanent impacts and facilitate agency understanding of necessary changes and the overall impact on the project.

Regarding forest/tree impacts and permitting, our team members, led by **ISA-certified Arborist Michael McQuade**, will complete an on-site assessment of forested areas and specimen/significant trees in conformance with 3.13 of the RFP. Per the RFP, individual trees and forested areas less than one acre will be regulated by the Roadside Tree Law, whereas impacted forest areas greater than one acre will be regulated by Maryland Reforestation Law. While the RFP dictates the order of precedence for the location of reforestation [within the limits of disturbance first and off-site mitigation second], Fay/WRA will make every effort, primarily through design refinements, to reduce forest and tree impacts. Where impacts are unavoidable, mitigation design, implementation, and plant species will be in conformance with the RFP.

Permit acquisition for SWM and E&SC through SHA-PRD and the MDE stakeholders identified above is a significant challenge for design-build projects, although one that we have met consistently. As a first order of work and as part of the Pre-Permitting Meeting, a team led by Water Resources Engineer Jason Cosler, PE, will describe to the SHA-HHD and SHA-PRD reviewers our general approach for the overall SWM design and layout our plan for phased design submittal package development, submittal, review, comment resolution, and ultimate approval issuance. Our approach to SWM and E&SC permitting will be similar to other recent design-build efforts and will include development of a project-wide Concept SWM Report addressing water quality and quantity needs for the entire project at the conceptual stage (30%-50% level). As the design progresses to construction stage, Site Development and Final Review packages will be developed per phase and submitted to SHA-PRD for approval. Throughout the SWM and E&SC permitting process, our IDQM team will perform concurrent reviews of all documents submitted to SHA-PRD in order to ensure that SHA-PRD and SHA-HHD requirements and goals are met.

Impact Avoidance and Minimization: The team is fully aware of the requirements for further avoidance and minimization of impacts to environmental resources and has successfully implemented a variety of techniques on previous SHA projects in order to "incorporate environmental stewardship measures to avoid and minimize impacts to the natural and forest areas, community, cultural resources (Section 106 Resources), and Parkland (Section 4(f)) to the greatest extent feasible and practical" (3.20.03.01.03 of the RFP). At a minimum, we will not alter the design in such a manner that increases or creates new impacts to forest, cultural resources, parkland, wetland, wetland buffer, waterway, or floodplain above the impacts shown in the RFP. Avoidance and minimization measures will be documented as described in 3.20.03.01 of the RFP. Avoidance and minimization requirements will be implemented during design as described in 3.20.03.02.01 and 3.20.03.02.04 of the RFP and summarized in Avoidance Minimization Memos per 3.20.03.01 of the RFP. Strategies for avoidance and minimization include:

- Design of stormwater management facility grading and outfalls to minimize impacts to resources. Design elements may include: weir walls to combine primary and emergency overflows from BMPs (thereby minimizing grading footprint); careful consideration of BMP subdrain and wet pool elevations to ensure that secondary impacts to wetlands hydrology do not occur; and minimization of Pond Code 378 embankments that may require clearing embankment toe-of-slope.
- Where practical, and not within mitigation sites, the use of retaining walls, steeper fill slopes, increased headwall heights, reduced roadway sections ,and any other feasible avoidance/minimization efforts.
- Minimize culvert lengths where practicable and size/depress per COMAR for aquatic passage.
- Complete avoidance of permanent and temporary impacts to Wetland 3A and its 25-foot wetland buffer.
- Avoidance of permanent impact to Wetland W41-A.
- Roadside ditches determined to be jurisdictional will be replaced in-kind and the hydrology will be maintained to W10-A, W40-A, and W42-A, in addition to others identified during the permitting process. W8-A will be spanned and only have

temporary impacts.

- All stream relocation work will be constructed in strict compliance with the approved maintenance of stream flow plans. For the protection of aquatic life, in-stream work will not occur during the closure period for Use I (March 1 through June 15 of any year, inclusive) and Use III (October 1 through April 30, inclusive) streams in order to avoid impacts to aquatic habitat spawning periods, and the work will comply with COMAR water quality standards.
- Avoid FIDS impacts by limiting forest impacts to edge habitats in conformance with 3.20.04.01 of the RFP and adherence to time of year restrictions (February/April through August) to minimize disturbance during the breeding season.
- Utilize MDE/USACE Best Management Practices for working in wetlands, wetland buffers, Waters and 100-year floodplains.
- Use of orange construction fence to protect sensitive habitats from encroachment during construction.
- Implement tree protection measures in conformance with 2008 *Standard Specifications for Construction and Materials*

Avoidance and minimization measures for wetland/stream systems directly impacted by new roadway construction along the main alignment will incorporate minimization strategies as follows:

- At the southern end nearest US 40 Alt., wetlands 5A/6A and 7A are influenced by a combination of springs and seeps, the main hydrology source being groundwater. This system falls almost entirely within the proposed limits of disturbance and is also a location of a proposed SWM structure. This resource it is likely to be a total take, unless hydrology can be maintained for any remnant portion not impacted. Use of culverts, underdrains, and retaining walls will be considered for minimization.
- The northern system 2A, 3A and 4A is also influenced by combination of groundwater seeps and springs, with a perennial stream. This system extends outside the proposed limits of disturbance and hydrology impacts may be minimized by the use of MSE walls, reinforced earth slopes, retaining walls, and steepened slopes per 3.20.03.02 of the RFP.

Context Sensitive Design: Our team is versed in the assessment, design, and construction of context sensitive solutions (CSS) for SHA projects and recognizes the unique elements of the US 219 project that require application of CSS. Our primary guide in the application of these principles in order to minimize impacts to environmental resources will be the SHA "Context Sensitive Solutions for Work on Maryland's Byways" (February 2008). Rolling, forested terrain combined with the surrounding wetlands and waterways help to define the US 219 project's character and the grading and drainage are two important elements that must accommodate it. The project exists at approximately elevation 2680, and the project limits extend through extended topographic relief indicative of western Maryland. Therefore, grading impacts as a result of roadway design, SWM facilities, culvert extensions, or other elements which typically require a larger footprint in order to tie-in grading must be considered with a CSS perspective. With specific reference to SWM facility design, the minimization of grading impacts can commonly be accomplished not only by the use of retaining structures, but by careful siteing of both traditional and micro-scale ESDs/BMPs. For example, the use of tighter check dam spacing in bioswales often allows for minimization of adjacent cut/fill slope impacts and avoidance of the "knife through butter" approach advised against in the CSS guidance. Similarly, our experience is that the location of permanent wet pools for traditional pond facilities must consider groundwater and stormwater outfall elevations in order to avoid secondary hydrologic impacts, as well as the potential for "chasing grade" down pond embankments and creating significant fill slope impacts. Commonly, our design of BMPs in steep and rolling terrain involves the placement of the BMPs at lower elevations in order to minimize grading impacts, while also ensuring that proper maintenance access is provided.

We also recognize that mitigation for the accommodation of stream grading for culvert extensions is an important element of this project's design context. For example, at the Meadow Run stream, we recognize that we are responsible for providing grade controls upstream and that the downstream channel may be modified to provide herp and fish passage through the culvert. Based upon the steepness of the terrain, it is possible that these elements will need to include a "step pool" type approach as opposed to the "riffle grade control" approach that may be utilized in the flatter terrain of the Western Coastal Plain.

Environmental Compliance: Fay/WRA takes a proactive approach to ensure compliance with all commitments, permits, mitigation, and regulations to minimize the potential for non-compliance. Compliance begins with identifying all resources in the project area and commitments affecting each. The FONSI, permits/approvals, RFP, Phase I/II Mitigation Plan, and final design plans will be used by our ECM to develop a cultural and environmental resource compliance schedule and database that will include resource locations, construction activities and schedule, design status, projected changes in limits of disturbance, and locations of potential conflicts. This database will be updated weekly and will be discussed during our weekly team coordination meetings and monthly partnering meetings. During construction, our ECM will prepare a quarterly Environmental Compliance Report (ECR) which tracks and confirms compliance with each commitment. This ECR will be submitted to SHA within one week of the end of each quarter. The report will include charts that track permitted, as-designed, and as-constructed impacts by design/construction package, and the overall project to ensure minimization opportunities are incorporated and documented during design and construction. In that regard, we will focus on: 1) minimization of forest/tree impacts and reforestation; 2) minimization and treatment of discharge of stormwater from the construction site; 3) adherence to permitted impacts; and 4)

implementation of wetland mitigation and stream restoration, and if possible, a reduction of impacts to wetlands and waterways.

Our team will ensure plans and construction methods are in compliance and permit conditions/NEPA commitments are satisfied as detailed in the ECP and through partnering with SHA. SHA's IEM will support the Fay/WRA team in satisfying it's environmental compliance responsibilities during design and construction as described in 3.20.01.03 of the RFP. All JPA amendments and supporting documentation, including updated Draft Phase I Mitigation Plan and Phase II Mitigation Plan (Wetland and Stream Mitigation Construction Plans), and reforestation site review applications will be coordinated with SHA-EPD for review and submission by SHA-EPD to the agencies.

To ensure compliance with the MD Reforestation Law, the Fay/WRA team will minimize impacts to forest and healthy trees in accordance with 3.13.01 of the RFP and coordinate with SHA on the review of Forest Impact Plans, Tree Impact Minimization Report, and Reforestation Site Review Application for submission to DNR-Forest Service. Fay/WRA will conduct a field review with SHA-LAD/LOD and collaborate on minimizing forest clearing, satisfying the terms of the DNR-Forest Service permit, and provide maximum on-site reforestation and specimen tree preservation. We are familiar with the Forest Impact Reduction and Forest Mitigation Incentives in 3.20.07.05.02 and 3.20.07.05.03 of the RFP.

The General Discharge Permit for Stormwater Associated with Construction Activities (the "General Permit"), effective January 1, 2015, emphasizes adherence to the MDE 2011 Erosion and Sediment Control Standards and Specifications including:

- All design and construction personnel must be trained to comply with the provisions of the General Permit. We meet this requirement by ensuring that all construction personnel minimally possess Green Card certification and that all design personnel possess Green and Yellow Card certifications.
- The project's design and construction must minimize the discharge of pollutants through wash waters, must minimize exposure of construction materials/wastes to stormwater, and must take measures to prevent potential pollutant spills and leaks and respond to them when they happen. A Hazardous Material Management Plan will be prepared in conformance with 3.20.05 of the RFP to address management and disposal of hazardous material and soil/groundwater that may be encountered during structure demolition, land clearing, and excavation
- Specific numerical limits for discharge (i.e., turbidity) are not included in the new permit, the quality of discharge from the construction site still requires the utmost of scrutiny from Fay/WRA. In that regard, we are experienced in the design of advanced filtering systems for stormwater runoff from construction sites, and are experienced in turbidity monitoring of construction site runoff, which we performed on previous design-build projects, should it be deemed necessary.

XVII.B.iv. POTENTIAL ALTERNATIVE TECHNICAL CONCEPTS

ATC 1: Modify US 219 Relocated Section: The current and proposed traffic volumes on US 219 Relocated do not appear to support a four-lane dual roadway. This ATC proposes to reduce US 219 to an undivided two-lane/two-way section consisting of one thru lane in each direction with auxiliary lanes at access connections and climbing lanes. The proposed modified US 219 Relocated still provides an improvement over the existing US 219 which does not meet current design standards for lane and shoulder widths, horizontal geometry, vertical grades, and sight distance. The elimination of numerous access point, improvement to travel time and the same level of service will be provided as with the proposed conceptual four lane dual roadway. Reducing the roadway to a much smaller section will result in a significant reduction in earthwork, pavement, drainage, SWM, and structures construction; environmental resources impacts; right-of-way needs; and potentially utility impacts. A portion of the project would be constructed as a dual four lane roadway such as at the north roundabout and then would transition to the two-lane/two-way section and continue north and tie into the existing US 219 two-lane/two-way roadway section. The two-lane/two-way roadway section would include full width 10' shoulders in both directions. A single structure over Alt US 40 would be constructed with minor additional widening for full width outside shoulders. Rough roadway grading limits, cross culverts installation and SWM facilities locations would be constructed to accommodate a possible future dualization.

ATC 2: Modify Outside Shoulder Pavement Sections: This ATC proposes to modify the US 219 mainline outside shoulders (Element 1) and I-68 Widening, Ramp A and Ramp B outside shoulders (Element 3) by reducing the asphalt thickness and increasing the graded aggregate base course thickness by the same amount, maintaining the same total pavement section. The shoulder pavement section will be designed using a reduced Average Daily Truck Traffic (10% of the Design ADTT) in accordance with the January 2015 Pavement and Geotechnical Design Guide.

ATC 3: Revise Ramp Typical Section: This ATC proposes to revise I-68 Ramp A (westbound exit) and Ramp B (westbound entrance) typical section. The outside shoulder width would be reduced from a 12' paved shoulder to a 10' graded shoulder with only 6' paved. The total paved portion of the ramp typical section would be 25' wide. This ATC would be contingent on verifying the adequacy of the typical section for the anticipated truck traffic.

ATC 4: Reduce Work Zone Speed Limit for MOT: This ATC proposes to reduce the work zone speed limits on I-68

and US 219 during construction. Reducing the speed limit during construction will improve safety for the traveling public and construction workers and reduce the lengths of tapers for temporary traffic shifts and lengths of buffer zones. Reducing the lengths of traffic shifts will shorten the limits of pavement rehabilitation to eradicate pavement markings, potentially reduce the area of shoulder reconstruction if they are not traffic bearing and are required to carry traffic during MOT, and potentially reduce requirements for SWM and impacts to environmental resources with less pavement reconstruction.

ATC 5: Reduce US 219 Median Width: The conceptual typical section for US 219 provides a continuous 28' wide grass median except in the area adjacent to Wetland 3A where it is reduced to a 6' wide paved median. This ATC proposes to reduce the median width in additional areas outside Wetland 3A adjacent to other environmental features including wetlands and forest. Reducing the median width will reduce impacts to environmental resources, reduce right-of-way needs, and potentially reduce utility impacts.

ATC 6: Maintain Existing Shoulders for MOT: This ATC proposes to use the existing paved shoulders to carry traffic during construction without performing shoulder pavement rehabilitation. The implementation of this ATC will depend on an analysis of the existing shoulder pavement to determine if they are structurally capable to carry traffic during construction. Reducing pavement reconstruction will improve safety for the traveling public and construction workers; reduce requirements for SWM; and potentially reduce impacts to environmental resources.

ATC 7: Reduce Asphalt Pavement Sections: This ATC proposes to reduce the proposed asphalt pavement sections by employing FWD testing on the prepared subgrade allowing for an increase in the Resilient Modulus of Subgrade (MR) used for the design of the pavement. The implementation of this ATC will depend on a review of available subsurface and pavement data to determine if a higher MR is cost effectively achievable. The use of a higher MR will result in a reduction in the overall pavement section.

ATC 8: Pavement Subsurface Drainage: The provided conceptual typical sections depict the installation of underdrain on both the high side and the low side along US 219 Relocated and the I-68 Ramps A and B. This ATC proposes to locate longitudinal underdrain on the outside edge of shoulder along normal roadway sections and on the low side along superelevated roadway sections. In both instances, the subbase course will be sloped from the high side to the low side.

ATC 9: Retain Existing I-68 Westbound Exit Direction Overhead Sign Structure and Existing ½ mile Advance Guide Sign: This ATC proposes to retain the existing overhead sign structure located at the existing theoretical gore and the existing ½ mile advance guide sign. Due to the relocation of the diverge point for Exit 22 from the I-68 westbound mainline lanes more than a ½ mile west of the existing location, the existing sign locations could be re-used as follows: the existing exit direction sign could become the ultimate ½ mile advance guide sign, with the existing ½ mile advance guide sign becoming the 1 mile advance guide sign.

ATC 10: High-Mast Roadway Lighting: This ATC proposes to consider the use of high-mast roadway lighting in lieu of low level roadway lighting to illuminate the large roundabout intersections and curvilinear ramps at I-68. Although low level LED roadway lighting is SHA's preferred roadway lighting system, the large areas requiring lighting at this rural interchange may be most efficiently served by high-mast lighting.

The table below indicates the benefits of each potential ATC noted above:

Benefit to Project	ATC 1	ACT 2	ATC 3	ATC 4	ATC 5	ATC 6	ATC 7	ATC 8	ATC 9	ATC 10
Reduces Construction Duration - Schedule	+					+				
Reduces Impacts to Environmental Resources – Environmental Compliance/Design Excellence	+			+	+	+				
Reduces Construction Cost – Design Excellence	+	+	+	+	+	+	+	+	+	+
Reduces Future Maintenance Cost – Design Excellence	+		+	+	+	+		+	+	+
Reduces Right-of-Way Cost	+				+					
Reduces Utility Cost	+				+					
Improves Safety and Mobility – Design Excellence				+		+			+	+
Maintains Project Quality – Design Excellence	+	+	+	+	+	+	+	+	+	+

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