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Introduction

DAB/JMT has successfully completed 4 previous US 113 Design-Build Projects and is excited to have the opportunity to again provide our services to SHA. The following narrative demonstrates DAB/JMT’s thorough understanding of the Technical Elements and Approach to successfully design and construct Phase 3 of US 113.

General Design Approach to Address Project Goals and Key Issues

Our design approach will be geared toward meeting all of the SHA’s goals for this project:

<u>PROJECT GOALS</u>	
✓ A safe roadway which maintains mobility for all users	✓ Control access while minimizing delays to roadway users
✓ Provide safe access for emergency responders which minimizes delays	✓ Provide a roadway that minimizes maintenance efforts and costs
✓ Address construction coordination and scheduling issues related to the MD & Delaware RR crossing	✓ Minimize environmental impacts including FID bird species
✓ Provide safe bicycle accessibility	

Project Key Issues

Emergency Response

- Design and construct roadway improvements to increase safety by minimizing uncontrolled access points and reduce response time for emergency responders.
- Design and construct roadway improvements to address emergency responder equipment turning movements.
- Langmaid Road signal will be eliminated based on SHA signal warrants. The intersection design will address traffic safety while providing emergency responder access.

Access/Delay and Safety Issues

- The DAB/JMT design will address the conflicting priorities of a safer roadway with reduced access points vs. added travel time due to the inherent restrictions of a divided roadway. Utilizing J-turns and median openings, the increased travel times and associated delays will be addressed.
- Turning movements by non-typical vehicles such as combines, tractors, other farm equipment, school buses, etc., will be verified with the geometric design using Autoturn software addressing specific vehicle types.

Schedule

- The reconstruction of the US 113 crossing of the Maryland and Delaware Railroad (MD/DE) will be accomplished within the established timeframe of the contract specified rail embargo (September 8, 2016 to September 8, 2017). DAB/JMT will coordinate with the MD/DE to insure that work is completed well within the embargo period and work outside the 100 foot limitation is completed well in advance of the MD/DE work so that the whole operation will result in minimal delays to stakeholders.
- Per Section 2.07.02.05.6, all right-of-way acquisition will be completed by June 30, 2015 and thus will not impact the construction schedule.
- Utility relocations and associated scheduling of work around these issues will be fully coordinated by DAB/JMT with the District 1 Utility Engineer and with the utility owners; Verizon, Choptank Electric, Delmarva Power, Maryland Broadband Co-op and Office of Traffic and Safety.
- Environmental restrictions including Use 1 in-stream work restrictions (March 1 – June 15 inclusive). Based on the Environmental Re-Evaluation Document approved by the FWHA on June 25, 2014, the SHA commitments to minimize impacts to FIDS includes refraining from clearing forest during the breeding season (May through August) for the following areas; south of MD/DE RR crossing (9.9 acre area).

Bicycle Accommodation

- SHA's goal to safely accommodate cyclists will be addressed per RFP requirements and SHA's *Bicycle Policy and Design Guidelines, May 2013*. DAB/JMT design will address pocket lanes, and bike lane transitions at intersections and shoulder widths will reflect bike lanes and location of rumble strips.

Technical Elements of the Scope of Work

DAB/JMT's approach to addressing the Project Goals and Key Design issues as well as addressing the overall design and construction for each specific design element and discipline is presented as follows:

Emergency Response

The dualization of US 113 and resulting addition of a median and restricted access requires the design to address access for emergency responders. SHA has provided J-turns to allow emergency responders to safely and efficiently reverse their direction of travel. However, DAB/JMT will take these concepts and address specific design issues to ensure that emergency response times remain minimally affected.

Addressing Emergency Responder Vehicle Characteristics – DAB/JMT has researched emergency responder equipment issues, through contact with the Newark Volunteer Fire Company (NVFC) to identify challenges their vehicles face when responding to emergency situations. Their equipment includes two single unit fire trucks (manufacturer: Pearce and Four-Guys) and one single unit tanker truck (manufacturer: Four-Guys). Since it is a rural area, there are no fire hydrants thus tanker trucks are critical to supply water to fight fires. NVFC indicated that supplemental tanker trucks are contracted to supply water. To address vehicle characteristics, every turning movement, including J-turn geometry will be verified to ensure the roadway geometry does not affect the movement of the vehicle and henceforth response time. Utilizing Autoturn and manufacturer vehicle characteristics, a custom Autoturn model will be developed to ensure efficient and safe movements for the responders while addressing roadway safety.

Access to the Newark Water Tower –The NVFC indicated that the Mill Street water tower is the preferred location for filling fire and tank trucks. The ability to cross US 113 is critical to fire response east of US 113. Langmaid Road and Newark Road are the primary access routes to the water tower. However, the new roadway design eliminates the through movement across US 113 to improve traffic safety. JMT will work closely with SHA and emergency responder stakeholders to develop a design that address roadway safety and emergency responder access to the water tower.

Emergency Access During Construction – DAB/JMT will develop phased maintenance of traffic plans that address maintaining access for local emergency responders. DAB will provide updates and communication with the NVFC and other local emergency responders on construction issues that may affect emergency response.

Accommodating Bicycles at Intersections

A primary project goal is to provide safe cyclist access. SHA has incorporated bicycle accessibility along the mainline by proposing 10 foot shoulders which incorporate 6 foot bike lanes. At intersections, the proposed 8 foot shoulder width will address bicycle access, rumble strips, and the orientation of the bike lane along the auxiliary lanes. Figure 1 and 2 below show typical layouts for cyclist accommodations at intersections. Since this design is in compliance with SHA bike policy, no design waivers are required.

Where the bike lane crosses the MD/DE railroad tracks at an angle less than 45 degrees, the cyclist needs to be provided with a safer crossing angle. DAB/JMT will modify the bike lane shoulder so that at a minimum, the cyclist will cross the tracks at as close to a 90 degree angle as possible.

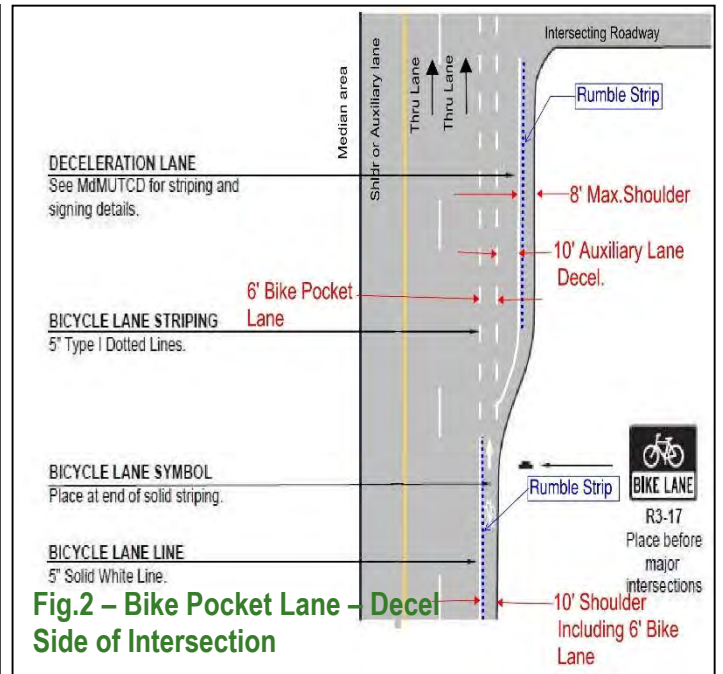
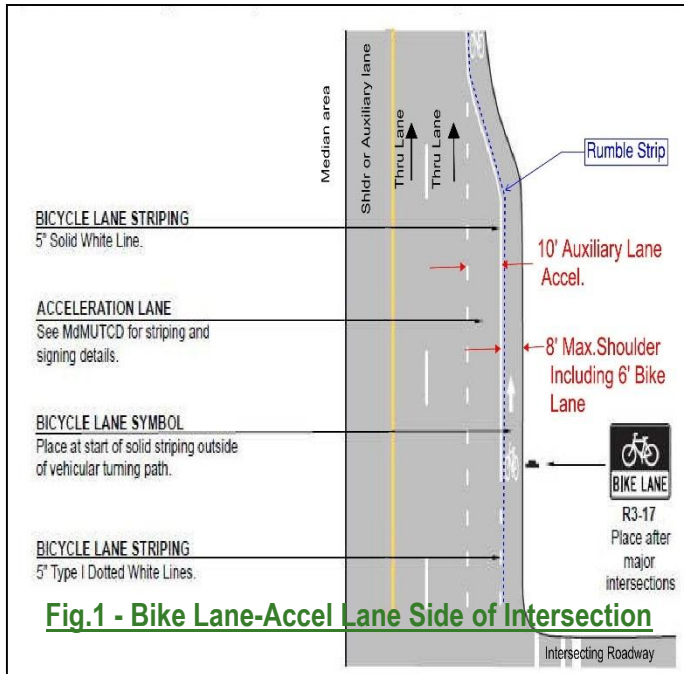
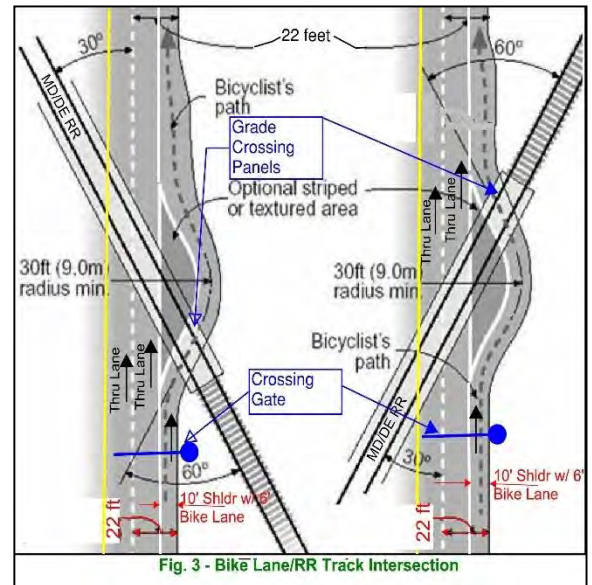


Figure 3 shows an approximation of the DAB/JMT design. Note that the SHA concept plans show the right turn (deceleration) auxiliary lane for Newark Road extending beyond the tracks. The placement of the proper track crossing for bikes would preclude the use of a pocket lane for this location. Thus SHA will need to either consider a waiver for the bike pocket lane or for the proper crossing angle for the bike lane crossing of the track.

Roadway Design – Maximizing Operations and Safety

The DAB/JMT design will address SHA’s goal of maximizing roadway safety, by minimizing access and conflict points, and addressing AASHTO, SHA and MUTCD design criteria, including:

- Emergency responder access and response
- Providing safe access for bicycle traffic
- Curvature and grades need to be in proper balance to meet driver expectancy
- Minimize drivers’ decisions by minimizing the number of access points to US 113
- Uniformity and consistency of design; avoid sudden and drastic changes in roadway elements
- Refine/design horizontal alignments to meet or exceed minimum requirements
- Focus on speed change areas
- Ensure clear zone is clear of obstacles
- Check intersection and stopping sight distance at intersections, roadway and at auxiliary lane conflict points
- Provide super elevation transitions to meet or exceed AASHTO requirements
- Design roadside grading and traffic barrier per the AASHTO Roadside Design Guide and SHA policy
- Provide appropriate roadway lighting per the RFP and SHA’s guidelines



The roadway design will be in accordance with TC Section 3 of the RFP. Specific project items not identified in the RFP will be designed to follow the Guidelines for Roadway in Table 1 of Section 3.09.02.

DAB/JMT reviewed the roadway geometrics in the plans provided by SHA with the RFP. We focused the design and computations to determine the projects' compliance with SHA, AASHTO, and RFP requirements.

DAB/JMT will advance the design from the current concept level to 100% Final Design/Construction Documents. A rolling submittal process will be used for reviews when applicable. The design will also include drainage and ESD type stormwater management (SWM), erosion and sediment control (ESC), MOT during construction, structural design for culvert crossing related structures, and signing. All design and plans will be prepared under the supervision of a Professional Engineer licensed by the State of Maryland using GEOPAK or Inroads and Microstation V8i.

Horizontal Alignment: The following table summarizes the design speed, minimum allowable radius, and actual radius of curvature of each roadway; including access and other intersection roadways.

Location	Design Speed (MPH)	Minimum Curve Radius		Maximum Superelevation (FT/FT)
		Required (FT)	Provided (FT)	
US 113 NBR/SBR	60 mph	1330	1400+	0.06
US 113 Interim Tie-in at South Limit of Work	60 mph	1330	2335	0.06
Basket Switch Road	40 mph	485	105* (< 20 mph)	0.06
Langmaid Road	40 mph	485	No Curve	0.06
Newark Road	40 mph	485	105* (< 20 mph)	0.06
Newark Road South	40 mph	485	510	0.06
Access Roads	40 mph	485	location dependent	0.06

As is evident from the above table, the US 113 mainline roadway alignment meets AASHTO and SHA geometric criteria of 60 mph design speed. However, there are several connecting roadways and initial curves identified with an (*) that do not meet the 40 mph design speed requirements as per the Design Criteria of County and Services Roads. It is not practical to satisfy the 40 mph design speed criteria as noted in RFP Section 3.09.04.01 and still meet access requirements within the constraints of the ROW. However, where practical DAB/JMT will revise the proposed radii shown in the SHA concept plans to meet at least the minimum radius for a 20 mph curve, 115 feet, and refine the connecting fillet radii to provide for the turning movements of the WB-67 design vehicle.

Vertical Alignment: All vertical curves in the concept drawings meet the design criteria for sag and crest curves for 60 mph. DAB/JMT will attempt to re-design the vertical alignments to exceed the required minimum 0.50% grade. Vertical alignment design will meet the Minimum Overtopping Design Flood Frequency criteria, 100 years storm for US 113 and 25 years storm for the county/access roads.

Certain access road vertical alignments do not provide adequate cross culvert cover or proper overtopping elevation. Profiles will be revised to provide adequate cover, comfort level, and sight distance.

Typical Sections: DAB/JMT will not change the number of lanes or lane widths; however, as suggested in Section 2.07.02.04, we will revise the shoulder configuration to meet the Bicycle Accommodation requirements. We will adhere to the 34 foot median design criteria as outlined in the RFP, including the lane shift transition rate of 60:1. Wherever feasible, roadways will utilize open drainage sections. The roadside ditches will be designed to minimize the use of traffic barriers by providing recoverable grading within the clear zones.

Cross Street Improvements: Improvements to cross-streets will be designed and constructed per the concept plans. The corner fillet radii of all intersecting streets will be designed to accommodate the WB-67 design vehicle. DAB/JMT verified that the approach site distance at each intersection for vehicles approaching the intersection have an unobstructed view of the entire intersection. SHA specified a single unit vehicle to design the right turn geometry for US 113 to Newark Road South movement.

Addressing Non-Standard Vehicle Types: The community and SHA have concerns how intersection and J-turn geometry will be designed and constructed so that non-standard vehicle types will be accommodated. JMT will utilize Autoturn abilities to assess ‘user created vehicles’ to address relevant non-standard vehicles types, including farm equipment, to check turning movements for intersections, auxiliary lanes, and J-turn geometry.

Maryland and Delaware Railroad Coordination: Upon notice of apparent award, DAB/JMT will immediately partner with SHA and MD/DE to develop a plan for track crossing design and construction coordination. We will preview and discuss the preliminary MOT and construction sequencing concepts. In addition to the required Pre-Design, Pre-Design Submission and Pre-Construction coordination meetings, DAB/JMT will communicate as necessary to address the design coordination of the track grade with the road grade. MD/DE will install the grade crossing panels, ties, rail ballast, crossing gates and all rail related items. DAB will provide MOT for all railroad crossing related work.

Access to Residential and Commercial Properties: DAB/JMT will strive to phase construction to maintain access to all adjacent properties and access points while keeping the community informed of construction activity. Residents and businesses will be supplied with phone contact information for DAB’s construction supervisor.

Roadside Barriers: DAB/JMT understands that a “traffic barrier” is itself a hazard and should only be used when the consequences of impacting the obstacle are significantly more serious than striking the barrier. In view of the above we will remove any obstacle or redesign it so it can be safely traversed, relocate the obstacle to where it is less likely to be impacted, or reduce impact severity by using an appropriate breakaway device. If we cannot apply these three design options, DAB/JMT will design the traffic barriers to shield the obstacles. We will ensure that all traffic barriers and end treatments within the project limits meet SHA, FHWA and AASHTO standards.

Right-of-Way and Easement Lines: DAB/JMT will design and construct all roadway components within the provided right-of-way and easements.

Southbound Lane Drop and Interim Northbound Roadway Crossover: An interim tie-in area is needed to shift traffic between the proposed 4-lane section of US 113 to be constructed under this project and the existing 2-lane section of US 113 to the south. The existing 2-lane section consists of two 12 foot lanes and 8 foot shoulders. The proposed 4-lane section will be stubbed out to the limits shown in the RFP plans at Station 1430+00. DAB/JMT proposes using the existing roadway alignment to move the southbound traffic to the existing traffic pattern south of the Phase 3 project.

For northbound US 113, a single lane will diverge from the existing northbound roadway at Station 1441+50± with an 8,100 foot radius (plane incline) curve to the right. This crossover roadway will provide a minimum pavement width of 28 feet; a 4 foot inside shoulder, 14 foot lane, and a 10 foot outside shoulder. The transition will tie into the future inside lane of northbound US 113 and will open up into the two-lane configuration at Station 1447+50±. This will accommodate the future traffic shift in the subsequent contract.

For southbound US 113, we will stripe the lane drop for alternating right-of-way using 120:1 tapers to tie into the southbound lane of the existing 2-lane, normal crown section.

Tie-in at Limits of Preceding Contract (WO6345270): A stub-out of the northbound US 113 roadway and interim southbound crossover roadway, similar to that described in preceding sections, was constructed under the

previous contract to Station 1613+00±. Traffic will remain on the interim southbound crossover roadway until the outside lane of the proposed southbound roadway is ready to accept one lane of southbound traffic.

Since the typical sections for this and the previous contract are consistent, the northbound roadway will be widened by an additional 8 feet from Station 1611+00± to Station 1617+00± to provide an acceleration lane from the J-turn at the north end of the project.

Value Added by DAB/JMT

Value Added Experience: DAB/JMT has successfully completed four US 113 D/B projects including the abutting project to the north. Our team experience provides us an unmatched understanding of the area, the project design, the local geology, terrain and the local community.

Value Added Maintenance Benefits: DAB/JMT will provide the following technical elements that reduce maintenance requirements or facilitate future maintenance and construction activities of SHA and utility owners:

- 25 year life-cycle for full depth pavement sections, and protect this investment with subgrade drainage
- Flatter side slopes to aid in mowing areas with environmental or ROW constraints
- Work with utilities to provide effective access to their respective facilities
- SWM maintenance access from frontage or county roads rather than from US 113 to provide a greater degree of safety for the maintenance crews, eliminating a need for expensive barriers or removal of traffic barriers during maintenance operations
- Native plantings in SWM facilities, which require less care and have a greater survival rate. The landscaping will blend into the native environment and provide wildlife habitat
- Minimize forest clearing to provide areas that require no maintenance
- LED lighting for intersections reducing electricity usage and light fixture maintenance
- SWM design will utilize grass swales and submerged gravel wetlands, requiring reduced maintenance

Environmental Benefits: DAB/JMT has taken a proactive approach to reducing impacts to the environmental features throughout the project by reevaluating the concept design to determine what changes can be performed to reduce environmental impacts. DAB/JMT will reduce impacts from the project by the following:

- Optimize the horizontal and vertical alignments and make adjustments that minimize environmental impacts without reducing the quality of the roadway corridor
- Limit disturbance for installation of ESC devices, such as super silt fence, to 5 feet from toe of slope
- Limit disturbances at pipe crossings by utilizing the existing pipes or box culvert for maintenance of stream flow during construction of the new crossing

Geotechnical and Pavement Design

Pavement Analysis and Design

Pavement Investigation. DAB/JMT will develop a plan for the pavement condition survey, per the RFP and the 2006 SHA Pavement Design Guide.

- The pavement and subgrade investigation borings will be done concurrently with the supplemental geotechnical investigation borings
- The visual survey per ASTM D 6433 and the non-destructive deflection testing done separately
- Strategically locate the borings both in areas of distress and apparent good pavement
- Use Falling Weight Deflectometer (FWD) on the existing pavements to be resurfaced to evaluate the physical properties. FWD test data will be used to calculate stiffness related parameters of the pavement structure and subgrade soils.

- Test representative samples recovered from the borings for natural moisture content, AASHTO classifications, moisture density relationship (proctor) and California Bearing Ratio to estimate the resilient modulus (MR) of the pavement subgrade soils.

Using the above and historical pavement data, JMT will prepare a Pavement Investigation Plan Report for approval for each design unit that will describe type, details, frequency and methods of testing. Upon approval of the planning report, DAB/JMT will proceed with the pavement investigation.

Pavement Analysis and Design. The DAB/JMT team will perform all pavement designs and submit a Pavement Report documenting such design in accordance with the requirements set forth in the “1993 AASHTO Guide for Design of Pavement Structures”, the “2006 SHA Pavement Design Guide”, and the sections of the RFP’s Pavement Performance Specifications. Our design will address groundwater conditions for this project.

Subsurface Exploration and Geotechnical Engineering and Analysis. JMT will plan and conduct the supplemental phase of the subsurface investigation and perform the geotechnical engineering analyses to provide geotechnical design recommendations for culvert crossings, embankments and SWM facilities. The results of these analyses will be used to support the final design efforts. Descriptions of the proposed technical approach for the subsurface investigation, geotechnical engineering analysis, and reports are given below.

Prior to proceeding with the subsurface investigation, Geotechnical Planning Reports in general accordance with Section 3.14.05.01 will be prepared for individual project elements to describe general philosophy. The Geotechnical Planning Reports will be submitted to address anticipated geologic conditions, methods of investigation, preliminary design and analysis, and anticipated means of construction for SHA review. Upon approval of the planning reports, the subsurface investigation will proceed as follows.

- Borings will consist of standard penetration test (SPT)
- Borings performed in accordance with the applicable MSHA, AASHTO and FHWA standard specifications for subsurface explorations. The supplemental boring plan will be prepared based on results of an initial site visit, review and analysis of the preliminary boring data provided by SHA, review of historic pavement condition survey information available from SHA and discussions and meeting with Worcester County SHA Resident Maintenance Engineer (RME) on specific problem areas.
- Roadway borings for the additional lanes and pavement condition borings will have a maximum spacing of 500 and 200 feet, respectively, and drilled to a minimum depth of 10 feet
- Embankment Side Slopes and Significant Permanent Cut Slopes borings will be spaced at a 100 foot maximum with a minimum of three borings drilled in the transverse direction for slope stability analysis
- Borings for structures will be determined based on the need of the individual structure

Based on our experience in the area, the ground water table is expected to be shallow and therefore, 24-hour water level readings will be taken. Geophysical methods are not proposed for use on this project due to the geologic conditions.

Soil Laboratory Testing. Soil laboratory testing will be performed on representative samples recovered from the borings. Samples will be tested for natural moisture content, AASHTO soil classifications, Moisture-Density relationships (Proctor, AASHTO, T-180), California Bearing Ratio for pavement support characteristics, corrosive characteristics including pH and USDA classification for the SWM boring samples. If soft clays or silts are encountered, “Undisturbed” Shelby Tubes will be obtained and tested in the laboratory for strength and compressibility characteristics.

Geotechnical Analysis and Report. All boring and soil test data will be entered in the gINT database and the boring locations plotted on the plan sheets. Boring logs will be plotted on the roadway, SWM profiles and structure foundation sheets.

The project consists of various elements including culvert crossings, light poles, signs, pavements and embankments. “Interim Design Memoranda” reports per Section 3.14.05.02 will be prepared for the project elements. When it is logical and permitted by the project schedule, project elements will be grouped together in the interim reports. For elements that require Type, Size and Location submittals, individual interim reports will be prepared for the elements that are included in the submittal. Prior to release of the contract documents or after approval of the Type, Size and Location Submittal, final geotechnical reports will be prepared in general accordance with Section 3.14.05.03. All reports will be prepared based on FHWA Geotechnical Checklist and Guidelines (FHWA-ED-88-053).

Traffic Engineering

Signing - DAB/JMT will prepare a “Definitive Design Signing Roll Plan” for a review meeting with SHA, OOTS. The roll plan will include proposed sign relocations and messages for all guide, supplemental, regulatory, and warning signs. All proposed signing shall be sized to match the following projects: US 113 Phase 2B (W06345270).

Our team has already performed a sign inventory of the existing signs on the project, and we will show all existing signs to be removed or relocated along with the proposed locations for the relocated signs. The roll plans will also depict proposed signing on the side roads and access roads.

Once approval is received from SHA, OOTS we will develop signing plans with proposed sign message and MD MUTCD/MUTCD designation. Our team will also provide for the modification or removal of any signage outside the limits of our project that is no longer pertinent. We will perform all design and fabrication/construction of signing as per MD MUTCD and MUTCD guidelines.

Pavement Marking - DAB/JMT will show all proposed pavement markings on the definitive plans for signing, to be reviewed and approved by SHA. Once approved, we will show all pavement markings on the same plan sheets as the signs. We will adhere to Table 6 of 3.12.06.01 for all final pavement marking lane lines including parallel and intersection auxiliary lanes.

All transverse pavement markings (i.e. yield symbols, stop lines etc.), and all arrows, symbols and letters will be heat applied permanent preformed thermoplastic. In addition, all durable pavement markings shall demonstrate wet retro reflective markings in accordance with ASTM #E 2177-01.

Construction Sequencing - Maintenance of Traffic (MOT)/Transportation Management Plan (TMP)

DAB/JMT’s phased approach to MOT is to minimize any disruptions to existing traffic patterns while completing the construction. The MOT Phases will maintain a minimum of two lanes in each direction on US 113 as well as providing access to adjacent properties. DAB’s Project Construction Manager will maintain continuous communication with all property owners and businesses adjacent to the project. We will work with business owners to minimize impacts to their schedules and businesses.

For the US 113 mainline and side roads, we will use approved channelizing devices to provide safe separation between the travel lanes and construction areas. Our MOT will address the safe and efficient passage of bicycles, and vehicular traffic through and around all construction zones. We will perform our work in a manner that will minimize any negative impact to residents, commuters, and businesses. We will maintain and provide access at all times to property owners, customers, visitors, and emergency vehicles while developing and coordinating MOT activities with local schools, the Maryland State Police, local law enforcement, the NVFD, and other emergency service agencies to ensure public safety and emergency response times are not compromised. We will establish and implement a Public Outreach campaign in cooperation with SHA and develop an Incident Management Plan for accidents, should they occur within the project limits. The Incident Management Plan will include accident prevention strategies, emergency procedures, reporting requirements, and mitigation strategies.

In addition, we will develop a Transportation Management Plan (TMP); a report that will address Traffic Control Plans (TCP) as well as transportation operations, public information and outreach strategies, and other items as specified in Section 3.16.05.01.

Specific stages/sequences of construction are described below:

STAGE 1: US 113 Northbound from Sta 1521+00 to 1619+20 (Northbound New Construction)

- The MD/DE embargo will take place during Stage 1 Construction. Construction will continue outside of the 100 feet restricted zone from the centerline of the tracks until the embargo is in place
- The existing traffic pattern will remain as is during initial Stage 1 construction
- Set up erosion and sediment control measures
- Construct offsite flow control ditches (outer ditches)
- Construct the culvert crossings at Marshall Creek, Sta. 1578+60± and the unnamed tributary of the Pocomoke River at Sta. 1535+80±
- Construct US 113 Northbound mainline from the Phase 2B “stub out” at Sta. 1619+20 to 1553+00± adjacent to the Railroad restricted zone
- Construct Newark Road South, the Langmaid Road intersection, and Access Roads in this Stage
- Construct US 113 Southbound mainline from Sta. 1521+00± to 1548+00± including portion of US 113 Southbound on new alignment
- Construct US 113 Northbound from Sta. 1533+00± to 1548+00±
- Construct Newark Road intersection and all driveways in this Stage
- Demolish and remove the existing rail road crossing and construct the base for the railroad reconstruction
 - The existing two-way traffic will be slightly shifted during the Railroad Crossing replacement in US 113 Southbound roadway. Shift two-way traffic to newly installed US 113 Southbound between Sta. 1521+00 and 1553+00 for the Railroad Crossing replacement in US 113 Northbound roadway.

STAGE 2: US 113 Southbound from Sta. 1430+00 to 1452+00± and Northbound from Sta 1433+00± to 1533+00±

- The existing traffic pattern remain on the existing US 113 from Sta. 1143+00 to 1521+00±. The two-way traffic, shifted during the Railroad Crossing replacement on new US 113 Southbound between Sta. 1521+00 and 1553+00 will remain.
- Set up Erosion and Sediment control measures
- Construct the culvert crossing at Coon Foot Branch, Sta. 1481+00±
- Construct US 113 Northbound mainline from Sta. 1430+00± to 1533+00±
- Construct US 113 Southbound mainline from Station 1430+00 to tie in with the existing roadway at Sta. 1451+00±. This pavement will facilitate the tie in to the next US 113 dualization project
- Construct Basket Switch Road, Access Roads, and all Driveways during this Stage
- Shift one lane of traffic to both Northbound and Southbound US 113 and shift to either the inside lane or outside lane as deemed appropriate during construction
- Construct the median elements of US 113 mainline
 - Median traffic barrier, removal of pavement, and swale grading
- Construct wedge and level on existing US 113
- Construct the surface course for all roadways
- Open the roadway to traffic

Utilities - Verizon, Choptank Electric, Delmarva Power, and Maryland Broadband Cooperative have underground and/or aerial facilities within the project limits. As noted in the utility statement, some relocations may not commence until our team completes clearing and grubbing in specific areas. Upon notice of apparent award to our team, we will immediately initiate coordination with SHA and utility stakeholders. We will ensure that:

- Utilities are protected during construction
- Utility services are maintained at all times during construction of the project
- Potential conflict areas, both overhead and underground, are identified,
- Test pits are performed as needed to resolve any conflicts

We will incorporate the design and relocation activities of each utility owner into the project's schedule and sequence of construction (with the required predecessors and lead-time as noted in the Utility Statement).

Drainage - DAB/JMT will perform the engineering design for hydrologic and hydraulic design (H/H), SWM and ESC, and that will be used to support the final design efforts. DAB/JMT will generate the reports, plans and documents necessary to obtain the final approval for drainage, SWM and ESC from SHA and the MD Department of the Environment (MDE). DAB/JMT will perform the drainage design, including culvert hydraulics, per RFP Sections 3.07.02, 3.08.01.5, 3.11.03, 3.11.04, and 3.17, Category 300 items, SHA Highway Drainage Manual, and SHA Drainage Design Guidelines. H/H computations will be in accordance with the SHA, Office of Bridge Development Manual on Hydrologic and Hydraulic Design and SHA, Office of Highway Hydraulics Division. Backwater curve analysis will be in accordance with the US Army Corps of Engineers (USACE), HEC-RAS software, Version 4.1.0. Headwater computations for culvert will be performed utilizing FHWA program HY-8, version 7.3. Waterway structures will be designed to comply with the MDE Code of Maryland Regulations, Title 26.08.02 – Water Quality, Title 26.17.04 – Construction on Non-tidal Waters and Floodplains. H/H analyses will determine flow rates, volumes of runoff, flow velocities, water surface elevations and other parameters required for drainage design. The proposed conditions 100-year headwater pools and replacement or extension of existing culverts, will remain within the existing 100-year pool areas (or ROW) and will not overtop US 113 roadway.

DAB/JMT will decide if the SHA proposed design options are acceptable for all cross culvert under US 113 as shown on the concept plans and, if not, develop and secure approvals for acceptable alternative designs. The DAB/JMT team will develop Maintenance of Stream (MOS) flow plans, per MDE, MD Waterway Construction Guidelines for Construction on Nontidal Waters and Floodplains, that will allow for the culvert extensions or replacements to occur in the dry while maintaining the flow underneath US 113. Surface drainage will primarily be via vegetated swales and closed storm drains will only be used in areas where the roadway is curbed (such as medians and some intersection locations). Runoff will be conveyed underneath the US 113 roadway using properly sized culverts and directed to SWM facilities. The drainage structure design and materials selected shall consider the lifespan and “long-term” maintenance requirements.

SWM Design, Approvals, Construction and As-built Certification (including MDE approval) - DAB/JMT will perform the SWM analysis and design, including obtaining approvals for SWM and As-built drawings from the MDE, per RFP Sections 3.07.03.1, 3.05.16, 3.08.01.5 and 3.17, and Category 300 items. The SWM design will comply with the Code of Maryland Regulations (COMAR) Title 26.17.02 – Stormwater Management, the MDE 2000 Maryland Stormwater Design Manual, Volumes I and II, Supplement No. 1, 2010 and the 2010 Stormwater Management Guidelines for State and Federal Projects. SWM computations and reports will be in accordance with the requirements of Special Provisions 3.17.02, SHA, Guidelines and References.

DAB/JMT will comply with the MDE “Letter of Intent” for SWM and the US 113 commitments with regard to SWM. The DAB team will provide the design necessary to obtain approval from the MDE for SWM for the Environmental Site Design (ESD), recharge volume and 2-year out of bank management. DAB/JMT will utilize ESD, SWM practices to the Maximum Extent Practicable (MEP) before utilizing structural SWM practices. The anticipated ESD, SWM practices will consist of Submerged Gravel Wetlands, Dry Wells, Micro-bioretenion, Bio-swales, and Infiltration Berms. It is anticipated that structural SWM practices will be required and will consist of Bioretention facilities. SWM quantity management for the 2-year peak discharges will be handled utilizing the

Runoff Reduction Method (Adjusted RCN method). SHA Standard Yard inlets will be installed in each SWM facility as a means to handle the bypass of higher storm events.

ESC Design, Approvals, Implementation (including NPDES and MDE Approvals) - DAB/JMT will perform the ESC analysis and design, including obtaining approvals for ESC from the MDE, per the RFP, the MDE 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control, the 2004 Erosion and Sediment Control Guidelines for State and Federal Projects, and will comply with the Code of Maryland Regulations (COMAR) Title 26.17.01 – Erosion and Sediment Control, Title 26.08.04 – National Pollutant Discharge Elimination System General Permit for Construction Activity and Title 26.08.02.10 – Water Quality Certification.

DAB/JMT will develop ESC plans that are acceptable to the MDE and will implement the ESC plans, including the stake-out of the Limits of Disturbance (LOD) and any environmental protection devices (tree protection and orange safety fence) prior to any earth grading activities within the project limits. The Stabilized Construction Entrance (SCE) and perimeter controls will be installed as clearing proceeds. The ESD, SWM practices will be installed once all of the upstream contributing drainage area is stabilized to minimize contamination of SWM facilities. Offsite (clear water) runoff will be diverted around the ESC devices, as practicable. Once the ESC perimeter controls are installed the grubbing and other earth disturbance activities can precede.

As the work progresses, additional ESC devices (silt fence (SF) and super silt fence (SSF)) will be used to treat the runoff prior to entering the stabilized ditches. DAB/JMT will stabilize areas (with temporary or permanent seeding/mulch, sod, or aggregate) as the final grades are achieved to reduce the area of disturbed earth open at any given time. Sediment laden runoff from installation of structures will be pumped through ESC devices (portable sediment tanks or sediment bags) prior to leaving the site. Other disturbed areas will be treated using temporary stone outlet structures (TSOS); temporary gabion outlet structures (TGOS), SF, SSF and inlet protection (IP). No disturbed earth areas will be left without same day stabilization at the end of the work day unless the disturbed areas are directed to a properly designed, installed and maintained ESC device.

Landscaping - DAB/JMT will provide landscape enhancements addressing or exceeding the requirements in the RFP. The intent of these plantings will be to provide aesthetic enhancements within the right of way, address Reforestation requirements, enhance newly established forest edges and provide plantings appropriate for the specific ESD, SWM practices utilized. Plantings will include deciduous canopy trees, understory or flowering trees, evergreen trees, evergreen and deciduous shrubs, perennials, ornamental grasses, and herbaceous emergents.

There will be extensive areas of ESD, SWM facilities in the project corridor. Plantings located within ESD areas will contribute to water quality preservation, protection and improvement; while providing soil stabilization, multi-seasonal color, winter structure, and wildlife habitat. Plantings must be Maryland natives, indigenous to Maryland's coastal plain community. The remaining disturbed areas will be sodded or seeded with appropriate turf seed mixes selected to minimize short and long term maintenance requirements.

Planting design priorities will include maximizing roadway safety, including sight distance setbacks and adequate recovery zones, consideration for long term maintenance including mowing, and context sensitivity and visual quality. We will refer to MSHA planting guidelines to minimize additional adverse impacts to protect and restore the landscape. In preparing our designs, we will also refer to SHA's Integrated Vegetation Management Manual and Landscape Design Guide to provide for ease of installation and future maintenance. Meeting attendance and submittals will be per Section 3.13.05, Landscape Requirements.

DAB/JMT will design aesthetic enhancements along the mainline, at the Newark Road, Basket Switch Road and Langmaid Road intersections, access roads, and where practical, maintain adjacent residences' existing frontline trees. Aesthetic considerations include the selection and layout of the plants, plant sizes, plant shapes, coloration, and seasonal characteristics. A field review of the diversity of the existing forest cover indicates patches of

evergreens and deciduous mixed species including scrub/shrub species (typical Eastern Shore native coastal plain species) of various sizes and ages. Some areas immediately adjacent to the existing roadway contain linear groupings of evergreen trees 30-40 feet high. Many of these trees will be removed through construction and a design goal is to reestablish some of this evergreen character with the new plantings.

DAB/JMT will provide complete planting plans for the areas indicating planting zone types, and spacing requirements. Plant materials will include selected natives drawn from lists prepared by SHA. Selections will also be based on tolerance to roadside conditions and microclimate, minimal maintenance requirements, and suitability to fluctuating hydrologic regimes.

Planting designs will address sight distance, placement outside the clear zone, avoid roadway signage, address adequate off-sets from utilities, traffic barriers, signing, lighting, and drainage as well as selection of plant species, location, size, root condition, spacing. DAB/JMT will employ the services of an ISA-certified arborist and Maryland Licensed Tree Care Expert to identify any specimen or significant trees and develop a Tree Avoidance and Minimization Report for the construction. All plans will be prepared under the supervision of a MD registered landscape architect.

Structures - The design and construction of the following structures will be in accordance with all project RFP performance specifications and relevant design codes. Headwalls and wing walls for the culverts will be cast-in-place concrete. Based on the geotechnical information provided in the RFP, we assume that pipe culverts will not require pile foundations. Additional soil investigations will be performed in the vicinity of the culverts to assess foundation requirements. The design and details will be in accordance with the SHA Structural Standards.

Structure S1: Small Structure No. 23069X0, US 113 over Coonfoot Branch: DAB/JMT proposes to remove the existing single cell 6' -2"± X 4' -8"± concrete box culvert and construct a new crossing utilizing multiple runs of elliptical reinforced concrete pipe or a bottomless box culvert. The pipes or box culvert will be oriented approximately perpendicular to the Baseline of Construction as shown on the concept plans. The pipes/box culvert would likely be a triple run of 83" by 53" elliptical pipe or a bottomless box culvert sized at approximately 5.5' x 20' with pile-supported foundations at each outside wall. This crossing will be 230± feet in length to accommodate the dualization of US 113 and Access Road D. We will construct cast-in-place concrete headwalls at each end of the triple elliptical pipes, and at least one pipe run will be depressed one foot to accommodate fish passage should we choose this option. If the bottomless box culvert is utilized, we will construct cast-in-place wingwalls at each end and the bottom elevation will be configured to promote fish passage should we choose this option.

Structure S2: Small Structure No. 23070X0, US 113 over Branch to Marshall Creek: The proposed single 60 inch reinforced concrete pipe culvert carrying Marshall Creek at Station 1578+50± will be replaced with a single 72 inch reinforced concrete pipe 150± feet in length to accommodate the dualization of US 113. DAB/JMT will remove the existing culvert and construct the new culvert in the same general alignment (allowing for maintenance of stream flow), but depressed one foot to accommodate fish passage. The culvert is oriented approximately perpendicular to the baseline of construction US 113. We will construct cast-in-place concrete headwalls at each end of the culvert, and at least one culvert run will be depressed one foot to accommodate fish passage.

An additional culvert conveying an unnamed tributary of the Pocomoke River at Station 1535+75± will require a multiple run of elliptical reinforced concrete pipe. The culvert will be oriented approximately perpendicular to the baseline of construction US 113, as shown on the concept plans. The culverts will likely be a twin run of 76 inch by 48 inch elliptical pipe, 180± feet in length to accommodate the dualization of US 113. We will construct cast-in-place concrete headwalls at each end of the culvert, and at least one culvert run will be depressed one foot to accommodate fish passage.

Project Schedule

DAB/JMT is pleased to present its Design and Construction Summary Schedule and this supporting narrative. DAB/JMT has demonstrated our capability to develop, maintain and control project schedule for 4 previous US 113 design-build projects through the use of a Critical Path Method Project Schedule (CPM). We will use Primavera P6 Professional software to develop, update and control the project schedule and provide monthly CPM updates to SHA and DAB/JMT.

Design and Construction Schedule Summary

This narrative and the Design and Construction Summary Schedule (DCSS) details tasks and timing of the work effort and provides a realistic projection of events and dates for the entire project from notice of award through acceptance for maintenance. The schedule and its stages are structured to be executable within the timeframes provided. DAB/JMT has detailed perceived benefits to SHA, including methods to expedite the construction of critical path items on or before dates set in the RFP. Our project communication plan will enable us to identify opportunities through our internal partnering process and to proceed in a proactive manner to complete this project ahead of schedule. DAB/JMT's DCSS assumes an immediate Notice of Selection based on the Proposed Procurement Schedule set forth by SHA on page 23 of the Request for Qualifications and a Notification of Award 30 days after submission of the Price Proposal. SHA's timely award to DAB/JMT will benefit all project stakeholders in that it would increase the likelihood of starting the project during the 2015 construction season. Our schedule anticipates a September 22, 2015 construction start, based on the information provided by SHA. Section TC 2.10.05 states that the Contractor's prices are irrevocable for 180 days following receipt of the Price Proposal, however, due to the critical need for this project to be completed in the interest of public safety, we have confidence in our projections that SHA will partner with DAB/JMT in the form of timely Notification of Award and Notice to Proceed. DAB/JMT sees the successful achievement of early finish milestones and early completion of this project as a cooperative effort between all project stakeholders.

Management: DAB/JMT will employ a proactive approach to clearly document project goals, requirements, risks, constraints and assumptions, as noted in our Project Management Section. This approach will minimize rework from scope creep or any unfamiliarity with quality metrics. DAB/JMT relies heavily on over-the-shoulder reviews as verification that processes employed are delivering acceptable results, allowing us to identify corrective actions much earlier than through inspection of deliverables prior to handoff points.

Geotechnical Investigations: DAB/JMT will prepare a Geotechnical Planning Report that describes anticipated subsurface conditions and assesses the level of supplemental subsurface investigation as described in TC 3.14.01. SHA requires submission of this report 30 days prior to mobilization and a relevant review meeting. DAB/JMT proposes to begin this effort immediately upon issuance of the notice of award, so that our Interim (geotechnical) Design Memoranda and pavement reports are consistent with the approved Geotechnical Planning Report. DAB/JMT will provide Final Geotechnical Reports for all project elements for SHA approval.

Design and Issuance of Plans for Construction: DAB/JMT proposes to develop the design in two stages and to submit the 100% Final Plans and Specifications for review and comment. We propose construction of the Northbound US 113 from Station 1521+00 to Station 1919+20, along with the associated frontage roadways, under Stage 1. The remaining roadways will be constructed under Stage 2. We will combine multiple disciplines in each submission as practical to minimize the number of reviews. All submissions will comply with the format and 14-day notice requirements as noted in TC 3.05.20.1 of the RFP. Our schedule allows for a 21-calendar day review period.

Permitting: Final design will require permit modifications to document impact reductions. DAB/JMT is responsible for securing permits and final approvals per Sections 3.20.04 through 3.20.08. Construction of any

stage of the project will not proceed until all permits and approvals have been secured. We also highlight the following schedule requirements from the RFP:

- A Pre-Permitting meeting must be held once the Notice of Award has been issued per TC 3.05.16.1.
- We will adhere to Class I stream closures from March 1 through June 15, inclusive, during any year. No in-stream work will be allowed during this closure period.
- No forest clearing will occur south of Station 1509+00 between May and August.
- We will produce quarterly compliance reports regarding all permits per TC 3.20.04
- DAB/JMT will immediately notify the SHA's Project Engineer and halt construction work if archeological resources are discovered during ground disturbing activities per TC 3.20.08.07.02.

Right-of-Way (ROW): It is anticipated that SHA's acquisitions will be completed in the design phase and will not impact construction. However, DAB/JMT will coordinate construction phasing with the ROW acquisition schedule per TC 2.07.02.05.6 to minimize any delays.

Utility Relocations: Upon notification of selection to our team, we will immediately request a coordination meeting with SHA and utility owners to update the schedule for remaining utility coordination efforts. We will notify Miss Utility 72 hours prior to any excavation operations. During construction, we will provide sufficient notice to each utility prior to excavation near any known utilities, and will coordinate clearing and grubbing with utility relocations after receipt of Notice to Proceed, provided the affected utilities are within the permitting and ROW constraints.

Railroad Embargo: DAB/JMT has included the Maryland/Delaware Railroad (MD/DE) Embargo in the CPM schedule. This embargo will take effect on September 8, 2016 and will end on September 8, 2017. The CPM schedule will include several coordination meetings per TC 3.09.17.01, 3.09.17.02, and 3.09.17.03. DAB/JMT will design and complete construction in this area during the embargo and have the rail crossing ready for rail traffic by July 1, 2017.

Project Completion: SHA requires project completion no later than November 30th, 2017. Based on a timely notice of award date of November/December 2014, our initial schedule presented in this section projects a completion date of October 30, 2017. To expedite construction of critical path items, DAB will use multiple construction crews in addition to concurrent construction of such items. When complete, DAB/JMT will finalize and submit an as-built certification package per TC 3.05.27.2.2, a SWM as-built certification package, and other required as-built certifications. We will also submit 2 copies of the approved final SWM report to SHA. All survey books shall be sent to SHA's Plats and Surveys Division for archiving. Project records will be archived in accordance with TC-5.07. We will also schedule a post-construction meeting regarding SWM Visual Quality and submit a request to the engineer for acceptance of bioretention and roadway plantings. DAB/JMT will also ensure that all proposed and existing luminaires within the Project limits are in working order upon completion of the Project. Prior to demobilization, DAB/JMT will request a project closeout meeting to formalize acceptance of the project and ensure that we have satisfied all contractual obligations for the project.

Site Restoration and Cleanup: DAB/JMT schedule specifically allows for the restoration and cleanup of disturbed areas within easements and ROW. Approximately one month prior to demobilization, DAB/JMT will request a project closeout meeting to develop a punch-list of any remaining actions needed to restore and cleanup areas affected by the project.

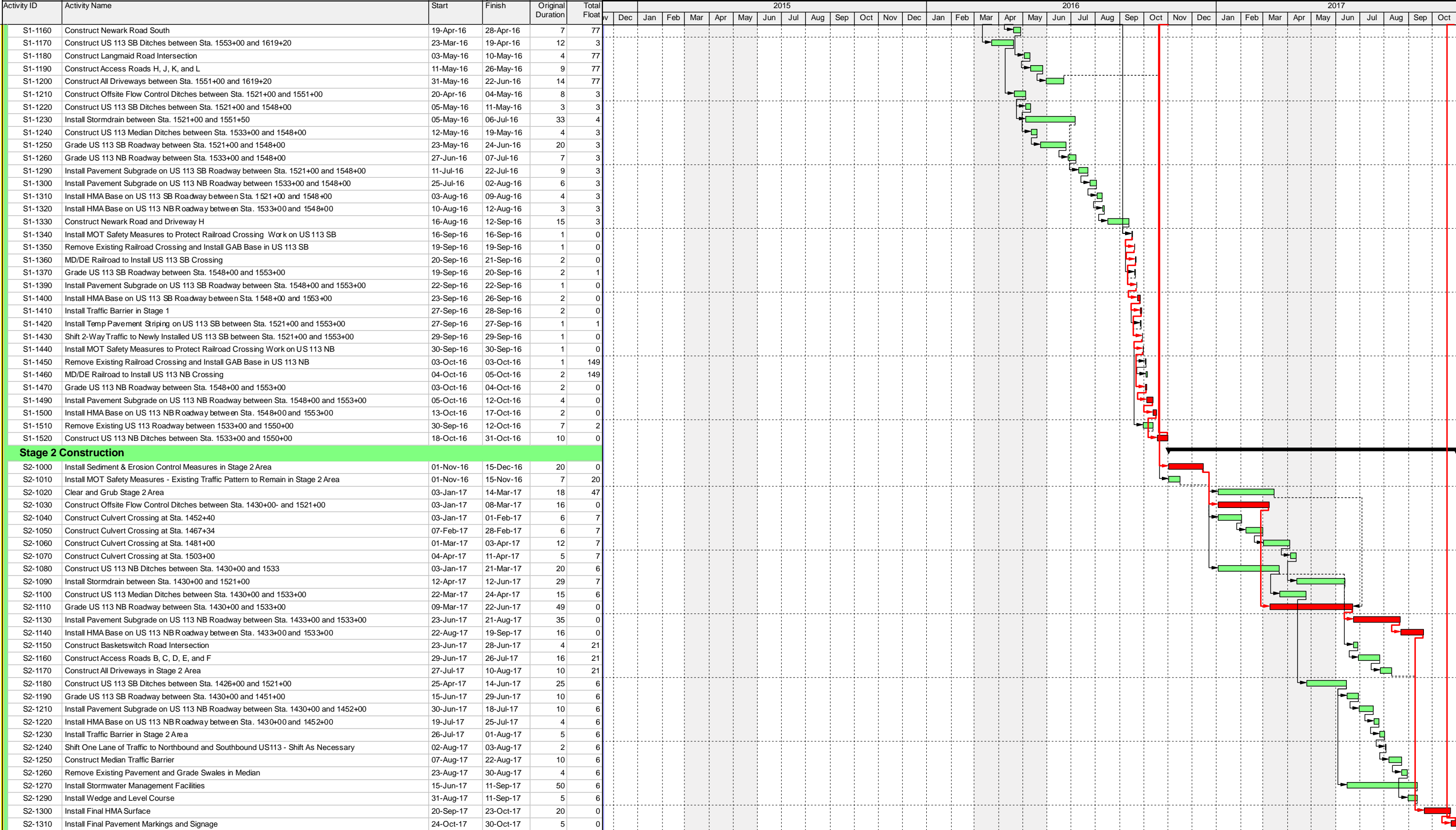
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Activity ID	Activity Name	Start	Finish	Original Duration	Total Float	2015												2016												2017											
						Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	
Design and Construction Summary Schedule																																									
Administration																																									
AD-1000	Bid Date	19-Nov-14	18-Dec-14	30	7																																				
AD-1010	Notice of Award	19-Dec-14	17-Jan-15	30	28																																				
AD-1020	Notice to Proceed	10-Feb-15	10-Feb-15	1	5																																				
AD-1070	Stage 1 Construction Start	22-Sep-15		0	3																																				
AD-1080	Stage 1 Construction Complete		31-Oct-16	0	0																																				
AD-1090	Stage 2 Construction Start	01-Nov-16		0	0																																				
AD-1100	Stage 2 Construction Complete		30-Oct-17	0	0																																				
AD-1110	Project Complete		30-Oct-17	0	0																																				
AD-1150	Railroad Embargo	08-Sep-16 A	08-Sep-17	365																																					
Design																																									
D-1000	Supplemental Field Surveys	10-Feb-15	12-Apr-15	43	10																																				
D-1010	Project Initiation and Partnering Meeting	10-Feb-15	11-Feb-15	1	7																																				
Design Quality Control Plan																																									
D-1020	Design Quality Control Plan	18-Dec-14	09-Feb-15	35	14																																				
D-1030	Prepare and Submit DQCP for Review	18-Dec-14	05-Jan-15	10	4																																				
D-1040	Administration Review	05-Jan-15	26-Jan-15	21	7																																				
D-1050	Address Comments and Resubmit DQCP for Approval	26-Jan-15	09-Feb-15	10	4																																				
D-1060	Request and Attend MDE Pre-Permitting Meeting	18-Dec-14	26-Dec-14	5	44																																				
D-1070	Request and Attend Railroad Pre-Design Coordination Meeting	18-Dec-14	26-Dec-14	5	39																																				
Stage1 - NB Sta. 1521+00 to 1919+20 & Associated Frontage Roads																																									
D-1080	Stage1 - NB Sta. 1521+00 to 1919+20 & Associated Frontage Roads	10-Feb-15	21-Sep-15	156	547																																				
Geotechnical Investigations																																									
D-1090	Geotechnical Investigations	10-Feb-15	04-Jun-15	81	63																																				
D-1100	Geotechnical Planning Report	10-Feb-15	03-Mar-15	15	3																																				
D-1110	SHA Geotechnical Planning Report Review & Attend Review Meeting	03-Mar-15	24-Mar-15	21	4																																				
D-1120	Subsurface Investigations	05-Mar-15	15-Apr-15	30	2																																				
D-1130	Interim Geotechnical Memorandums	26-Mar-15	06-May-15	30	2																																				
D-1140	Submit Final Geotechnical Report	02-Apr-15	04-Jun-15	45	63																																				
Utility Meetings, Research, Designations & Test Holes																																									
D-1150	Utility Meetings, Research, Designations & Test Holes	10-Feb-15	05-Jun-15	82	621																																				
D-1160	Hold Utility Coordination Meeting	10-Feb-15	11-Feb-15	1	621																																				
D-1170	Designations and SUE	11-Feb-15	11-Mar-15	20	621																																				
D-1180	Obtain Utility Data	11-Mar-15	06-May-15	40	621																																				
D-1190	Develop and Submit Test Hole Data Sheets	06-May-15	20-May-15	10	621																																				
D-1200	Utility Coordination Meeting	04-Jun-15	05-Jun-15	1	621																																				
Final Plans and Specifications Submittal -100%																																									
D-1210	Final Plans and Specifications Submittal -100%	16-Feb-15	29-Jul-15	116	288																																				
D-1220	Landscape Plans and Details	19-Mar-15	20-May-15	45	3																																				
D-1230	Railroad Design Submission Coordination Meeting	08-Apr-15	09-Apr-15	1	27																																				
Final Roadway, Traffic (MOT, Signing, Signals, Lighting) Plans																																									
D-1240	Final Roadway, Traffic (MOT, Signing, Signals, Lighting) Plans	19-Feb-15	13-May-15	60	3																																				
D-1250	Roadway Plans, Line & Grade, Typ Sections, SE	19-Feb-15	06-May-15	55	2																																				
D-1260	Traffic Engineering Plans, Definitive Roll Plan (MOT, Signing, Signals, Lighting, Temp Signal)	12-Mar-15	13-May-15	45	3																																				
Storm Water Management, Drainage & Erosion & Sediment Control & Landscaping																																									
D-1270	Storm Water Management, Drainage & Erosion & Sediment Control & Landscaping	26-Feb-15	21-Apr-15	39	3																																				
D-1280	Perform SWM, Drainage Designs, Visual Quality Plans, E&SC	26-Feb-15	21-Apr-15	39	3																																				
Structures																																									
D-1290	Structures	16-Feb-15	07-Jul-15	100	288																																				
D-1300	Structures TS&L Designs and Foundations Reports and Submit	02-Apr-15	15-Apr-15	10	286																																				
D-1310	Fourteen Day Notice of TS&Ls and Foundations Submission	16-Feb-15	17-Feb-15	1	328																																				
D-1320	SHA Review Structure TS&L Designs and Foundation Reports	15-Apr-15	25-May-15	40	410																																				
D-1330	Address SHA Review Comments and Receive SHA Concurrence	26-May-15	08-Jun-15	10	288																																				
D-1340	Structures Final Design	09-Jun-15	07-Jul-15	20	288																																				
Utility Relocation Design																																									
D-1350	Utility Relocation Design	11-Mar-15	04-Jun-15	60	29																																				
D-1360	Verizon (BY OTHERS)	11-Mar-15	10-May-15	60	68																																				
D-1370	Choptank Electric (BY OTHERS)	11-Mar-15	10-May-15	60	68																																				
D-1380	Delmarva Power (BY OTHERS)	11-Mar-15	10-May-15	60	68																																				
D-1390	Maryland Broad Band Cooperative (BY OTHERS)	11-Mar-15	10-May-15	60	68																																				
D-1400	SHA OOTS	02-Apr-15	04-Jun-15	45	29																																				
Environmental Permits - Wetlands																																									
D-1410	Environmental Permits - Wetlands	25-Feb-15	18-Jun-15	80	68																																				

█ Actual Work █ Critical Remaining Work ▶ Summary
█ Remaining Work ◆ Milestone



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Actual Work
 Critical Remaining Work
 Summary
 Remaining Work
 ◆ Milestone



Project Management

DAB/JMT strongly believes that sound project management practices are critical in identifying and achieving project goals. Our team has consistently demonstrated such practices and consequently met project goals during construction of the three most recent design-build projects within the US 113 corridor:

- US 113, North of Goody Hill Road to South of Massey Branch. SHA Contract W06345270
- US 113, Hayes Landing Road to North of Goody Hill Road. SHA Contract WO6345170
- US 113, Market Street to North of MD 365 (Public Landing Road). SHA Contract WO7675170

Through such experience and a review of the RFP, our team recognizes the critical nature of the following goals for this project:

- A safe roadway which maintains mobility for all users.
- Provide safe access for emergency responders which minimizes delays
- Address construction coordination and scheduling issues related to the Maryland & Delaware Railroad (MD/DE) crossing
- Providing safe bicycle accessibility
- Control access while minimizing delays to roadway users
- Provide a roadway that minimizes maintenance efforts and costs
- Minimize environmental impacts including FID bird species.

Design-Build Team

DAB/JMT is uniquely qualified to successfully complete this project with its staff, facilities, materials sources and equipment, and we desire to deliver another successful project in this corridor. Many of our staff have previously worked on our four US 113 corridor projects and are extremely familiar with the project site. An organizational chart outlining our team structure and communication hierarchy can be found at the end of the Project Management section.

DAB/JMT is pleased to present an overall description of our Project Management Plan.

Project Communication Plan - Our team fully understands that communication among DAB/JMT, SHA, MD/DE and other project stakeholders is crucial to project success throughout all phases of design and construction. For this reason, our team is committed to establishing communication protocols at the onset of the project in regards to document control, planning/coordination of submittals, public awareness, and partnering.

Document Control. DAB/JMT will implement and manage an electronic document management system (EDMS) to track all project correspondence between DAB, JMT, SHA, and all project stakeholders. Our team will solicit and enter contact information into the EDMS for all active project stakeholders from design through construction. We will establish distribution protocols to ensure that documents are distributed to appropriate contacts in a timely manner, thereby minimizing potential delays that could adversely impact project schedule. Our EDMS will track each submission (including shop drawings and RFIs), including submission dates, comments, responses, and deadlines for follow-up action. All exchanges of information between DAB/JMT and SHA will specifically be tracked via SHA ProjectWise. By linking the submittal and submission status logs with the CPM schedule, DAB/JMT can generate reports that provide the current status of each submission and use them to identify and minimize any potential delays in the process. Active use of this tracking system by all team members will ensure that time-critical activities, materials with long lead times, utility coordination and other urgent issues are promptly addressed to avoid potential delays.

Internal Communications. During design, DAB/JMT will employ an internal partnering process that promotes an active dialogue between designers, construction personnel, subcontractors and suppliers in

identifying and averting constructability issues. Our team will have a scheduled weekly meeting. This process will enable the team to draw upon their strengths and experience and will instill a sense of team ownership. This internal partnering will continue through the duration of construction with the active participation of JMT.

DAB/JMT has established a resolution ladder to expeditiously deal with issues outside of scheduled meeting times, and at the level most responsible for the design or construction. Thus, when a design issue occurs that requires contractor resolution, a defined procedure is established to allow the designer to communicate with the appropriate contractor representative, be it the project manager, the construction manager, or field personnel. Likewise, during construction when an issue arises the contractor will have a choice of personnel to resolve the issue with the appropriate design discipline. This will streamline communication and allow for quick issue resolution. Our process, will allow the resolution to be managed by the source and the person with the solution. Issues and resolutions will be logged and communicated to key contractor and design personnel.

In addition to reviewing working and shop drawings submitted by DAB, JMT's design staff will visit the project site regularly, attend progress meetings, and be available to quickly answer questions and resolve field issues as they arise. However, our team-building efforts will extend beyond DAB/JMT to SHA and other partnering stakeholders through our participation in a formal Partnering process.

Planning and Coordination of Submittals to the Administration. During the design phases, DAB/JMT and its key subcontractors and suppliers will review the plans to ensure cost effectiveness and constructability. Construction staff will provide formal review comments to JMT from each review, and comments and responses will be tracked through the EDMS as noted above. DAB/JMT will also provide at least 14-day notice of pending submissions.

Means and Methods for Communicating with the Public. DAB/JMT will develop a public awareness program to keep the general public and community officials informed of construction schedules, interruptions in traffic patterns, and construction progress. We intend to convey such information through a project website; a toll-free phone number that will be published in mailed announcements; and notices distributed by e-mail, fax, or doorstep memo, as required. DAB/JMT will also advise motorists traveling through the project of upcoming traffic pattern changes or closures through the use of solar-electric variable message signs posted on affected roadways. Such traffic messages will be posted a minimum of one week prior to any change. Communication with emergency responders such as Newark Volunteer Fire Department (NVFD) will be prioritized to ensure emergency response time will not be impacted.

DAB/JMT will work with SHA to develop a public outreach program to keep the general public and community officials apprised of significant issues and information related to the construction of this project. DAB/JMT will perform the following:

- **Respond to Inquiries and Comments:** Refer questions and comments from all stakeholders to SHA within 4 hours of receipt and assist in establishing a clear channel of communication between all parties. We will notify SHA within 4 hours of receiving a complaint regarding our construction operations and will assign the appropriate staff member to gather and communicate the information necessary to resolve any issue that may arise. Upon request from SHA, the DBPM will be available to speak on behalf of DAB/JMT on technical and safety issues.
- **Public Contact Records:** Provide SHA with electronic documentation of all contacts with business owners, residents, media, and property owners on a monthly basis.
- **Public Notifications:** Notify all stakeholders of lane closures, critical utility shut offs/diversions, weekly construction updates, and road/driveway closures in accordance with 3.21.03.02.02 of the RFP.
- **Construction Schedule/Maintenance of Traffic and Access:** Maintain a baseline progress schedule, schedule updates, and current MOT plans in a format that can be disseminated to all stakeholders.

- **Signage:** Provide Informational signs at strategic locations throughout the project limits as called out in 3.21.03.02.05, which provide the project name, project hotline number, and project website address.
- **Telephone Trees:** Establish and manage a telephone tree with phone numbers for emergency responders, SHA, and members of DAB/JMT. The telephone tree will be formatted in a manner that will insure that the appropriate individuals and agencies are contacted in order of priority for specific situations.
- **Public Forums:** Participate in public forums at the request of SHA and will provide all graphics and print materials needed to insure effective communication with project stakeholders.
- **Construction Progress Photographs:** Provide high-resolution construction progress photographs at the frequency required in Section 3.21.03.02.08. Construction progress photographs and additional photographs will be published on the project website and print media to insure that all stakeholders have access to current information related to job progress.
- **Media Relations:** Provide information as required for SHA to conduct media events.

Coordination Management - DAB/JMT will be responsible for determining the status of all designs and relocations, identifying all additional required relocations, and for coordinating the design and construction of the utilities with the design and construction of the roadway improvements of this project. SHA, Verizon, Choptank Electric, Delmarva Power, and Maryland Broadband Cooperative all have underground or aerial facilities that will require adjustment within the project limits. In addition, the MD/DE crossing of US 113 will be removed and reconstructed as part of this contract. Upon notification of selection, our team will immediately collect utility information from each stakeholder that will be necessary to complete the roadway design and construction. We will utilize this information to determine:

- How stakeholders will relocate their respective facilities
- How our respective design and construction efforts must be coordinated in the project schedule and sequence of construction (including provision of electrical services for intersection lighting)
- How we will track the status of the design and relocation of each utility and keep SHA informed.
- How our design and construction efforts will be coordinated to insure that all work associated with the MD/DE crossing at Sta. 1551+00 will be completed in a timely manner during the embargo period to ensure that the crossing will be ready for rail traffic on or before July 1, 2017.
 - We will conduct a Railroad Pre-Design Coordination Meeting, Railroad Design Submission Coordination Meeting, and Railroad Pre-Construction Coordination Meeting with MD/DE in accordance with Sections 3.09.17.01, 3.09.17.02, and 3.09.17.03 in order to insure a seamless interface between our design and construction operations and the installation and commissioning of the reconstructed rail crossing. DAB/JMT will be available to meet with utility representatives and MD/DE throughout the contract duration to facilitate the timely completion of their respective design and relocation efforts.

Based on the phased ROW clearance table as detailed in Section 2.07.02.05.6, our team is confident that our design and construction efforts will not be impacted by ROW clearance issues.

Risk Management - Based on our past experience on design-build projects on the US 113 corridor, our team is confident that we can avoid or mitigate any risks associated with the design and construction of this project. The intent of the risk management plan is to identify and prioritize project risks based on their implications. DAB/JMT will assess major risks in scope, design and construction and determine how the risk can be minimized or mitigated. The following table presents potential risk items, risk implications, and the DAB/JMT strategy for risk mitigation:

Risk Item	Risk Importance	Cost Implications	Project Implications	Risk Mitigation
Unanticipated delays in securing plan approvals	High	High	High	Partnering with SHA to expedite reviews and to limit the number of submissions.
Access accommodation for emergency responders	High	Med	High	Construct project in a manner that insures that emergency responders' access to all adjacent properties and businesses is always maintained
Access accommodation for adjacent property owners and businesses	Med	Med	Med	Maintain constant communication with property owners and businesses to reduce the impact of any required access impediments by timing construction to insure the least possible inconvenience
Ensure that work associated with MD/DE is completed in a timely manner (during the embargo period)	High	High	High	Partner with MD/DE immediately after Notice of Award to coordinate design and construction to insure that all work associated with the MD/DE crossing is performed within the railroad embargo timeframe and the specified completion date for this work.
Safety of the traveling public	High	High	High	Provide clear guidance and advanced warning of construction operations and differing traffic patterns to motorists
Unanticipated delays in securing permits	Low	Med	High	Partner with permitting agencies by applying for permits in a timely manner and maintaining communication to avoid delays and missed opportunities to expedite the process.
Safety of construction staff	High	High	High	Ensure that all workers use PPE. Conduct daily safety briefings and safety inspections to insure that safe construction practices are followed.
Avoiding negative impacts to the environment	High	High	High	Ensure that perimeter controls are properly installed and inspected on a daily basis. Conduct pre and post storm event inspections to prepare for and respond to impacts to sediment control devices.
ROW acquisition delays	High	High	High	Partner with SHA to ensure that all ROW is cleared within the timeframe established in the RFP. In the event that ROW is not cleared in accordance with the RFP, be prepared to adjust our operations to insure timely completion of the project.
Timing of utility relocations	High	High	High	Partner with all project stakeholders to schedule utility relocations in a manner to insure that any necessary interruptions in service occur during non-peak hours.

Design, management, and construction staff will be in constant communication and will partner to resolve any risks that may be identified throughout the design and construction of this project. In the event that a risk effects the timelines we have projected, we will adjust our schedule and resources allocated to this project to ensure that all critical milestones are achieved.

Design and Construction Management

Design Submittals - DAB/JMT proposes the use of rolling submissions to allow construction to proceed as work packages are approved by the SHA. We will combine as many disciplines in each submission as practical to minimize the number of reviews. We anticipate the following major submissions:

- 100% Final Plans and Specifications
- Design Quality Control Plan
- Tree Impact Minimization and Avoidance Report
- SWM/ESC Report
- Surface Drainage Report
- Transportation Management Plan Report
- Permit Applications
- H/H Studies and Reports and Scour Analysis
- Foundation Reports as needed
- Geotechnical Report
- Pavement Report
- Definitive Design Signing Roll Plan
- Definitive Design Lighting Roll Plan
- Public Outreach Materials
- As-built Drawings and Certifications
- Landscape Plans

All submissions will comply with the format and 14-day notice requirements in Section 3.05.20.1 or 3.05.27.2.2 of the RFP.

Plan for Development and Acceptance of Work Packages. Effective project management is essential throughout the duration of the project to efficiently develop and gain acceptance of all work packages. The first and most crucial step in ensuring the success of a project and its component work packages is to formalize closure on the quality standards that are relevant. We will submit a Design Quality Control Plan (DQCP) as called out in Section 3.05.06.1 of the RFP. This report will specifically identify and document acceptance criteria, goals, constraints, and any assumptions (most of which are already documented in the RFP) for each discipline for validation by the SHA and other partnering stakeholders. Our DQCP will also recommend efforts that are warranted to facilitate closure on concepts early in the project sequence, such as peer reviews.

Secondly, our DQCP will emphasize the importance of resource allocation and effective communication of quality metrics throughout the project duration:

- Using qualified and experienced staff for development, quality assurance, and inspection.
- Communicating relevant quality standards and staff accountability in meeting them.
- Ensuring that staff is familiar with interdependencies between their assignment and other work packages.

Quality Assurance. We will emphasize heavy dependence on the proactive processes of quality planning and quality assurance for both design and construction as detailed in the DQCP. Supervising staff will monitor progress and verify the quality of each work package as it progresses, so that any corrective actions are implemented before impacting quality, cost or schedule. Quality will also be inspected at key intervals and handoff points through the use of checklists to ensure constructability, compliance with standards, and compatibility with work packages in other disciplines.

Partnering with SHA. As called out in Section TC-2.06 of the RFP, formal partnering with SHA is required. DAB/JMT is fully supportive of a formal partnering process, as it provides benefits mutually beneficial to all participants:

- Partnering employs the strengths of each participant and the shared use of project organizational tools to identify and achieve mutual goals, resulting in buy-in from involved stakeholders.
- Partnering promotes quality through routine communication of these mutual goals (including effective control of scope, budget and schedule) throughout the duration of the project.

- Partnering clarifies the roles and responsibilities of each stakeholder and promotes accountability in the successful completion of the project through the establishment and use of a resolution ladder. Commitment to the partnering process is formalized among its participants through the signing of a partnering agreement.
- Partnering creates an atmosphere of trust, open communication and teamwork throughout the duration of the project.
- Partnering encourages early involvement of its participants, and encourages early resolution to issues that could become major impediments to successful completion of the project.

Schedule Management - DAB/JMT believes that through proper planning and continuous communication between all stakeholders, most, if not all impacts to scheduled operations can be mitigated or avoided. In the event that circumstances arise that impact planned schedule milestones, DAB/JMT is prepared to act in a proactive manner to address any issue. On a project of this magnitude, possible impacts to scheduled operations include, but are not limited to extended and repeated adverse weather events, lead times for specialty materials, discovery of hazardous materials, key personnel changes, material shortages, and unanticipated subsurface conditions.

Based on our prior experience on US 113 corridor Design-Build projects, we have collectively experienced and successfully worked through most of the schedule impact items listed above. Should conditions arise in one area of this project that adversely affect our scheduled operations we will be in a position to move to another work area in order to insure that progress continues towards the ultimate completion of the entire project. Based on our proactive approach to scheduling, we are confident that we can translate an unanticipated delay on one portion of this project into the accelerated completion of another portion. In the event that additional manpower and equipment are required in order to meet our schedule milestones we are prepared to dedicate the necessary resources to this project to insure its timely completion. By using subcontractors and suppliers that our firm has a long history with, we are confident that scheduling issues and delays related to materials and subcontractor coordination can be avoided.

Change Management - Project scope, as defined in the RFP and this technical proposal, must be strictly controlled to ensure that the project is completed on time and within the allotted cost. However, changes in project scope may become necessary to address various needs, such as differing field conditions or requests by various stakeholders during the partnering process. For this reason, our team will employ and enforce a change control system to secure the necessary authorizations prior to incorporating any scope change with respect to design or construction. All proposed changes in project scope will immediately be referred to the Design-Build Project Manager (DBPM) to make a preliminary assessment of whether such changes warrant further evaluation and verify acceptance of cost-responsibility. If appropriate, the DBPM will initiate development of a change order request to secure final authorizations from the Quality Managers and DBPM. The DBPM will also secure SHA authorization if such changes warrant exceptions to project requirements or if SHA will incur any cost responsibility. All change order requests will include the following information:

- the need for the change
- alternative solutions
- benefits of the change
- effect on project requirements
- effect on other work packages for each alternative
- schedule impact for each alternative
- the cost impact for each alternative
- cost responsibility

When scope changes are authorized, the DBPM will ensure the immediate adjustment of project baselines for cost and schedule and communicate the above information to the entire project team. Our designer, JMT, will develop greenline drawings to document changes to the “issued for construction” drawings and submit to SHA for approval. All changes will be documented in the as-built drawings.

Safety and Health Management - DAB/JMT will control access to work areas at all times through the use of abundant warning signage, and will protect work zones and storage areas with barrier as appropriate. DAB/JMT will design the traffic control plan (TCP) to provide motorists with clear guidance in advance of approaching work zones and lane closures through the use of signage, arrow panels, and channelization devices. Our public relations coordinator will keep travelers informed of future traffic shifts and lane closures via weekly updates. Our construction staff will also keep the pavement clean and free of potholes, road plates, and edge drop-offs exceeding two inches.

DAB/JMT understands that even the best traffic control plan concepts do not always work effectively on the road, so during traffic control placement the Construction Traffic Manager (CTM) will study the traffic control set-up from the perspective of an unsuspecting motorist. DAB/JMT will monitor traffic flows during daylight and night hours for several days after each stage to make additional improvements. The CTM will also make routine inspections of the project on weekends and holidays to ensure that all devices are in proper service and to observe traffic flow for possible problems. Traffic control equipment will be staged at the project, giving the CTM the flexibility to expand the TCP as needed to accommodate changing local conditions.

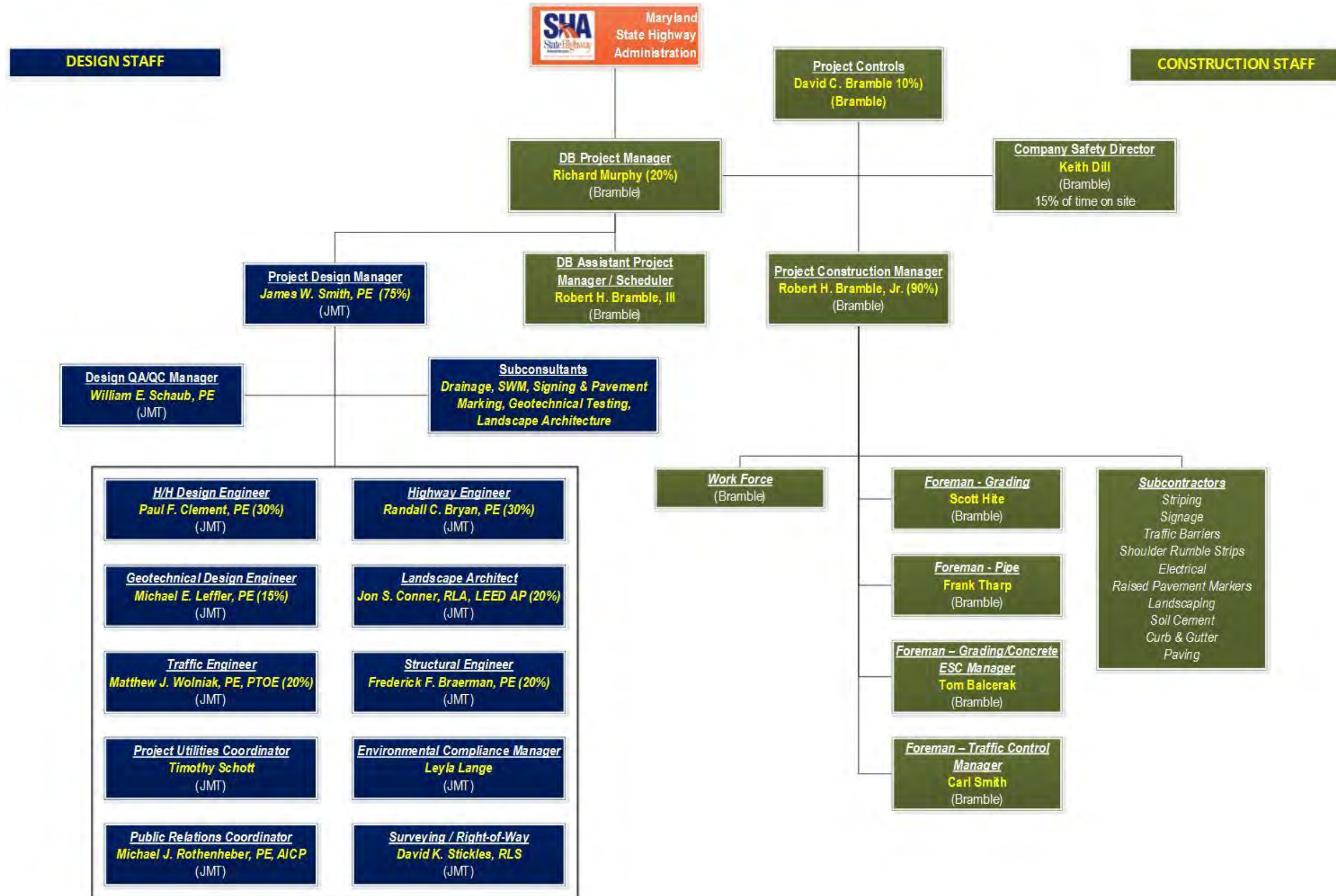
The early construction of frontage roads in the project sequence provides safe and effective pedestrian access to school bus stops. For those school bus stops that are not relocated, we will install additional safety measures, such as construction fencing, to provide safe pedestrian access across the work zone to the school bus stop. Residents will be informed 72 hours in advance of affecting school bus stop locations, closing median openings and relocating driveway and mailboxes. Equipment cabs will be closed and locked daily to prevent unauthorized use, theft, or vandalism.

All personnel on the jobsite will be required to wear hardhats, safety vests, and work shoes or boots. We will require the use of gloves, safety glasses and hearing protection for specific work activities as warranted. Visitors to the site will be directed to the field office, where hardhats and safety vests (compliant with RFP pp. 56-57) will be available for their use. DAB/JMT enforces a drug-free and alcohol-free workplace. Its company safety policy promotes fire prevention and work-zone protection, as well as requires safety training and other specific safety measures for each labor category. A progressive disciplinary action program is enforced to ensure the safety of its employees, visitors, motorists and other users of the facility.

In the event of an accident or other emergency on the project site, the Project Superintendent will immediately assess the situation and take action appropriate to the nature of the emergency. In the event of personal injury or fire, the 911 Emergency Center will be informed of the situation while first aid or fire suppression is conducted by our trained site workers.

We will solicit information from the following agencies regarding pedestrian safety, emergency response, and incident management:

- District Office Worcester County Public Schools
- Atlantic General Hospital
- Worcester County 911 Center
- Newark Volunteer Fire Department
- Worcester County Sheriff's Office
- Maryland State Police Berlin Barrack



Environmental Approach

DAB/JMT has a full understanding of the environmental features associated with the project, which are limited to forests, nontidal wetlands (and buffers), and waterways. DAB/JMT reviewed the recently approved Environmental Re-evaluation for the US 113 project (approved by FHWA in June 2014) and visited the site. A multi-disciplinary team, of engineers, environmental specialists, and construction professionals, conducted the site visit not only to assess the environmental features with respect to the proposed improvements but also to identify potential opportunities for avoidance and minimization of impacts. DAB/JMT utilized the multi-disciplinary team approach to ensure that environmental, highway design and construction concerns are all considered in the formulation and refinement of potential design modifications and Alternative Technical Concepts.

DAB/JMT's approach to address the environmental technical elements of this project emphasizes environmental stewardship, regulatory compliance, context sensitivity, and innovation in design and construction techniques. DAB/JMT has refined this approach over the course of the four previous US 113 projects and looks forward to implementing it for Phase 3. Through hands-on experience working with SHA and the regulators, DAB/JMT fully understands what is required to achieve the environmental project goals and how to most efficiently meet them.

The information in this section presents our approach to the environmental components of the project and how DAB/JMT proposes to coordinate throughout design and construction with SHA and the regulatory agencies to ensure successful project delivery. DAB/JMT's overarching goal is to minimize or avoid impacts to forests, wetlands and waterways while meeting the functional requirements of the new roadway. We pride ourselves in the efforts over the last four projects and believe that our past performance demonstrates our commitment to environmental stewardship.

Permit Acquisition, Compliance, and Coordination with Permitting Agencies

Permits are the critical links to ensure compliance with current regulations. As such, DAB/JMT will implement a coordinated approach to securing any new permits or modifications to existing permits that may be required from Federal, State, and Local agencies, and will do so in accordance with SP 3.20.06. Once DAB/JMT receives the Limited NTP for the project, we will request SHA schedule the pre-permitting meeting to discuss the SWM concepts, ESC concepts and other permitting issues with MDE and other agencies. DAB/JMT's Environmental Compliance Manager (ECM), Leyla Lange, and H/H Design Engineer, Paul F. Clement, P.E., will present DAB/JMT's preliminary designs with a focus on areas where environmental resources will be impacted by the project as well as efforts that have been made to further avoid or minimize impacts to resources.

This meeting will also provide an opportunity to review the project's environmental performance specification and NEPA commitments, conditions of the USACE Section 404 Authorization (CENAB-OP-RMN 1997-63647) and the MDE Nontidal Wetlands and Waterways Permit (14-NT-2027/201460434), as well as to identify any areas of concern SHA or other agencies may have regarding environmental compliance. DAB/JMT is aware of the wetland/waterway impact reduction incentive of \$8,000 per 0.10 acre saved, as specified in Special Provisions 3.20.08.04.03.

DAB/JMT will work through the Independent Environmental Monitor (IEM) and SHA to track and secure all necessary permits before commencement of work. All new permits and permit modification request packages will be prepared by DAB/JMT and submitted by either the ECM or the Design Engineer through SHA's IEM and will be copied to the SHA Project Manager and Environmental Program Division's Team Leader. In addition to acquiring ESC and Stormwater Management Permits, modifications to USACE/MDE

authorizations may be necessary, as well as securing approval from DNR for compliance with the Maryland Reforestation Law.

To ensure compliance with the Maryland Reforestation Law, DAB/JMT will coordinate with SHA's IEM and with Joel Bush, SHA's Forester in the Landscape Operations Division throughout the design and construction process to ensure that the construction adheres to the requirements outlined in the Reforestation Law Project Review Form located on page 64HHH of Addendum Number 4. This form indicates that this phase will clear 13.39 acres of forest land. DNR's approval includes conditions requiring 5.64 acres of on-site reforestation, and 7.75 acres of off-site reforestation, both of which must occur within one year of completion of construction. DAB/JMT will work collaboratively with SHA's IEM and Forester, Joel Bush to further minimize forest clearing and provide the maximum amount of reforestation on-site that is feasible. DAB/JMT is aware of the incentive bonus, specified in Special Provisions 3.20.08.05.03, of \$2,500 per 0.5 acre of on-site upland reforestation provided in addition to the 5.64 acres required.

DAB/JMT recognizes the importance of environmental compliance and therefore takes a proactive approach to ensure the potential for non-compliance is minimized. Compliance begins by conveying a thorough understanding of the environmental resources that exist in the project area. DAB/JMT has already created a comprehensive Environmental Summary Table for this RFP and educated our design and construction leads on all resources, issues, and requirements associated with this project. This will be repeated periodically throughout the project to ensure understanding among the complete team. We perform environmental design reviews of all major project elements to ensure that compliance and stewardship measures are carried forward. To ensure boots-on-the-ground implementation, we provide environmental sensitivity training for construction workers and implement pre-activity meetings addressing environmentally sensitive features. This includes information about potential cultural resources and indicators to look for during excavation and earth-moving activities.

We include all permit requirements in the comprehensive Commitment Tracking & Wetlands/Waters Impacts Database for the project, which is updated bi-weekly and used to inform our internal quarterly Compliance Reports. Our environmental compliance team and landscape architect will conduct pre-construction surveys to personally attest that all reasonable avoidance and minimization efforts are made to avoid wetlands, waterways, and individual specimen trees. Often, additional savings of trees can be accomplished in this manner instead of simply relying on design plans and construction stakeouts. DAB/JMT will also use this activity as an opportunity to identify individuals (or populations) of rare and endangered species associated with Wetland 12, perform a ground search for wildlife, and ensure that all orange protective fencing is in place around sensitive habitats and buffers.

Compliance during construction activities will be ensured through routine site inspections in addition to standard erosion and sediment control inspections that must be performed following rain events. Pre-storm inspections will also be conducted to ensure that all perimeter controls and protective measures are in place and functioning as designed. DAB will designate an Erosion and Sediment Control Manager (ESCM) that holds a Yellow Card to perform inspections and document the results.

Non-compliance issues are taken seriously and will be investigated by DAB/JMT's ECM to determine the cause, identify any environmental impacts and/or remediation measures that can be taken immediately to prevent additional impacts from occurring, and determine what actions must be taken to prevent future occurrences. There will be zero-tolerance and immediate dismissal will occur if it is determined that a worker has willfully or intentionally acted to violate any permit condition or environmental commitment. This will be clearly stated to all workers in the Environmental Sensitivity Training received prior to entering the job site.

Implementation and Maintenance of Erosion and Sediment Control

To achieve an effective erosion and sediment control (ESC) plan, DAB/JMT will first need to develop ESC plans and details that meet or exceed the design criteria. DAB/JMT will perform the ESC analysis and design, including obtaining approvals for ESC from the MDE, per the requirements of Special Provisions 3.05.18 and 3.08.01.6, Terms and Conditions TC 3.17, Category 300 items, and prepare the reports per the format of Section 3.07.03.3. ESC design will be in accordance with the MDE, 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control and the 2004 Erosion and Sediment Control Guidelines for State and Federal Projects, the ESC design will comply with the Code of Maryland Regulations (COMAR) Title 26.17.01 – Erosion and Sediment Control, Title 26.08.04 – National Pollutant Discharge Elimination System General Permit for Construction Activity and Title 26.08.02.10 – Water Quality Certification.

Summary of ESC Documents Required to Obtain Approval Modifications

- **MDE Transmittal Form**
- **Modification Cover Letter and Response to Comments**
- **Final ESC Computations and Report**
- **Final ESC Plans and Details (by Phases)**
- **Modified Notice of Intent Form (by Phases)**

DAB/JMT is committed to being proactive in its handling of ESC throughout the lifecycle of the project and these objectives will be incorporated into the ESC Plan. The ESC Plan will utilize perimeter controls such as earth dikes wherever possible to divert off-site clear water around the work areas to reduce the amount of sediment laden water generated. In environmentally sensitive areas, such as Non-Tidal Wetlands and associated buffers, DAB/JMT will use clear water diversions to minimize impacts. In other areas, the earth dikes and diversions will be used to convey sediment laden runoff to sediment traps and basins.

DAB/JMT will develop ESC plans that are acceptable to the MDE and will implement the ESC plans, including the stake-out of the Limits of Disturbance (LOD) and any environmental protection devices (tree protection and orange safety fence) prior to any earth grading activities within the project limits. Typically, the Stabilized Construction Entrance (SCE) and perimeter controls will be installed as clearing proceeds. The Environmental Site Design (ESD), SWM practices will be installed once all of the upstream contributing drainage area is stabilized in order to minimize contamination of SWM facilities. Offsite (clear water) runoff will be diverted around the ESC devices, as practicable. Once the ESC perimeter controls are installed the grubbing and other earth disturbance activities can proceed.



As the work progresses, it is anticipated that additional ESC devices (silt fence (SF); super silt fence (SSF)) will be used to treat the runoff prior to entering the stabilized ditches. DAB/JMT will stabilize areas (with temporary or permanent seeding/mulch, sod, or aggregate) as the final grades are achieved to reduce the area of disturbed earth open at any given time. Sediment laden runoff from installation of structures will be pumped through ESC devices (portable sediment tanks or sediment bags) prior to leaving the site. Other disturbed areas will be treated using temporary stone outlet structure (TSOS); temporary gabion outlet structure (TGOS), SF, SSF and inlet protection (IP). No disturbed earth areas will be left unstabilized at the end of the work day unless the areas are directed to a properly designed, installed and maintained ESC device. Same day stabilization methods will also be utilized throughout the construction process.

DAB/JMT is dedicated to ensuring that no sediment laden water will leave the site without first passing through an ESC device. The ESC plans will be coordinated with the Maintenance of Traffic (MOT) plans and drainage plans to ensure that the runoff is safely conveyed to the ESC devices and that proper drainage is achieved throughout the construction process.

DAB/JMT will implement a comprehensive ESC Program that allows for the timely and efficient movement of earth within the project corridor, while going above and beyond the requirements for protecting waterways and other sensitive environmental resources. We will conduct a Pre-Construction Meeting to review our ESC Program in coordination with SHA, including the Quality Assurance Inspector (QAI), MDE and the IEM. Implementation of the ESC Program, including construction and maintenance of ESC facilities, will be under the direction of the ESCM, Mr. Thomas Balcerak, and the Project Construction Manager (PCM), Robert Bramble, Jr., who have completed MDE Green Card and SHA Erosion and Sediment Control (Yellow Card) Certification Programs. The ESCM will be responsible for compliance with the ESC Program, as well as MDE requirements and will have the authority to direct or halt construction to gain compliance.

- DAB will have a foreman to oversee the installation, monitoring, and maintenance of the ESC devices designed for the project. This foreman will work under the supervision of the ESCM, Mr. Balcerak. This foreman will be assigned sufficient craft foremen, craft personnel, equipment, and subcontractors to perform all ESC work. Other DAB foremen working under his control will possess ESC Training Green Cards. Further, we will have our excavation, drainage, utility, and other necessary craft foremen obtain the Erosion and Sediment Control Green Card.
- The ESC crew will have access to the resources of DAB necessary to perform their duties and to maintain the highest ratings possible. Their job will be to understand the designed controls for the particular operations and phases of work scheduled. They will understand and utilize the best management practices for the installation and maintenance of the designed ESC devices and provide feedback to the ECM on the performance and applicability of the various ESC devices and control schemes. The ESC crew will have the necessary tools to make DAB/JMT aware of upcoming weather events. Preplanning and preparedness will be necessary for DAB/JMT to maintain the highest level of rating. By dedicating a field crew to ESC we feel we can achieve our goals.
- ESC work on this project shall be subject to ESC Quality Assurance Ratings outlined in section 308.01.03. ESC compliance will be monitored to ensure compliance with the approved ESC Program by SHA. DAB intends to maintain an A Rating throughout the life of the project. We consider a B Rating unacceptable and will immediately correct minor deficiencies to restore our A Rating. ESC work is subject to incentives and/or liquidated damages, as outlined in Section 308.01.04 and we intend to collect the maximum incentive allowed under this contract.
- DAB will provide more than adequate resources and efforts to ensure that all required ESC is provided. The ESCM will be responsible for performing the daily ESC inspections. Daily Inspection Reports will be performed as the work progresses. DAB/JMT shall provide two hard copies and one electronic version (PDF format) of the various reports.

Measures for Ensuring a Proactive Approach to Maintaining Effective ESC Devices: The ESCM will perform daily inspections (usually in the morning) of the installed ESC devices with the IEM (and others as appropriate) to ensure that all environmental controls are installed per the approved plans and sequence of construction, are properly maintained and functioning properly. If additional controls or additional actions are required, this will be identified and documented in the Daily Inspection Reports (including implementation dates). At no time will the ESCM or the IEM leave the site until the required remedial work is identified and

documented. For work that must be completed by the end of the day, the ESCM will remain on site until all work is completed and documented.

Any revisions to the approved ESC will first be presented to the MDE Compliance Inspector for determination as to whether they can be approved as a field revision or require submittal to the MDE, Plan Review Division. For the latter scenario, the H/H Design Engineer will be immediately contacted to initiate the plan revisions. Plan revisions will be sent directly to the MDE for approval with copies submitted to the Administration. DAB/JMT recognizes that any revisions to the ESC plan are the responsibility of the design build team.

DAB/JMT will develop a Storm Response Plan to respond to severe weather events comprising 3” of rainfall over a 24-hour period. The key element in our Storm Response Plan will be our Severe Weather Action Team (SWAT). This will be a dedicated work group with the sole responsibility of inspecting and repairing ESC facilities installed throughout the project. Whenever a severe storm event is forecasted, the SWAT will inspect and clear all ESC facilities and drainage facilities including ditches, storm drains, culverts, and outfalls in preparation for the storm. Any disturbed areas will be stabilized to the maximum extent possible. Following the storm, the SWAT will repair and/or restore the ESC facilities and drainage facilities within 48 hours of the end of the event but prior to the next storm. The SWAT will consist of a dedicated foreman, work crew, and equipment necessary to inspect, maintain and repair ESC and drainage facilities. The SWAT will be expanded as needed to service multiple EDAs. When not acting in response to severe weather events, the SWAT will be used to provide maintenance of ESC facilities on a daily basis, including removal of sediment, containment of sediment spills and restoration of sediment contaminated areas.

DAB/JMT is committed to ensuring that the required ESC devices shall be maintained in operable condition at all times.

Environmental Compliance and Cultural Resources

Overall environmental compliance starts with a thorough review of the recently approved Environmental Re-evaluation for the US 113 project (approved by FHWA in June 2014) as well as all supporting documentation. We then produce a comprehensive Commitment Tracking & Wetlands/Waters Impacts Database for the project that identifies all environmental commitments from the NEPA document as well as permit requirements. The ECM updates these documents bi-weekly and generates internal quarterly Compliance Reports for the management team.

All workers will receive Environmental Sensitivity Training so that they understand the sensitive environmental resources associated with the project area as well as the environmental commitments for the project. Recent agency consultation for the NEPA Re-Evaluation indicates that three archaeological sites (not NHRP-eligible) for the previously are recorded within the project limits associated with Phase 3. While correspondence indicates that the area has low potential for additional archaeological resources, the Environmental Sensitivity Training will inform workers on potential indicators for archaeological resources and what to do in a discovery situation.



Should a discovery situation occur during construction, DAB will immediately notify the Project Engineer and halt all activities involving subsurface disturbances within the vicinity of the potential archaeological resource as well as within the surrounding area where further remains may be expected to occur. Construction will not proceed until the site has been inspected by SHA and MD State Historic Preservation Officer (SHPO) or their designated representatives to define the archaeological resource zone. If the discovery is determined to be significant, construction within the area will not resume until a plan for data recovery or other mitigation measures is developed and implemented. DAB/JMT includes a cultural resources expert to assist with development of training materials and, upon SHA's request, would be available to assist with any further documentation and consultation.

In addition to informing workers of environmental resources and commitments, the Environmental Sensitivity Training will also clearly present the various permit conditions, what actions to take if a situation arises that compromises compliance, and potential ramifications to the project as a result of non-compliance. As previously stated, non-compliance issues will be taken seriously and will be investigated by DAB/JMT's ECM to determine the cause, identify any environmental impacts and/or remediation measures that can be taken immediately to achieve compliance, and determine what actions must be taken to prevent future occurrences.

Innovations and Practices to Reduce Environmental Impacts

SHA's commitment to stewardship, protection, and enhancement of the natural and human environment for the US 113 projects has produced a host of innovative requirements and design features that will avoid and minimize impacts to wildlife, habitat, and communities in the US 113 corridor. SHA has worked with community groups, regulatory agencies, and political entities to develop a design that achieves this outcome. DAB/JMT desires to advance the work SHA has performed to date; our goal will be to fulfill their environmental requirements and commitments and go beyond those, by providing additional stewardship opportunities wherever possible.

One of DAB/JMT's goals on all projects is to minimize fish mortality during stream relocation or permitted in-stream work, and prevent the injury or death of any animals during construction. Prior to stream work, we seek to relocate fish and other aquatic organisms downstream of any impacted areas using hand nets if possible, and install netting to prevent re-entry to the impacted reach. Also, prior to clearing and grubbing, we conduct intensive ground searches focusing on slow-moving animals such as reptiles and amphibians, and relocate them to nearby locations outside of the construction zone. We conduct periodic monitoring of the site and perimeter controls to prevent re-entry of specimens.

Some of the innovative methods we have used to minimize environmental impact and waste generation on previous US 113 projects, and may use on this project, include:

- Use of recycled concrete as stabilization material for maintaining access to residential and commercial driveways
- Use of turf grass sod as a means of immediate stabilization and minimizing sediment pollution
- Use of recycled paving materials
- Repurposed forest clearing waste to use as mulch stabilization
- Solar-powered message boards and arrow panels
- Minimization of LOD
- Warm-mix asphalt
- Throttle culvert to facilitate fish passage
- Tier 4 emission standard equipment