

**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

TECHNICAL PROPOSAL FOR  
**AREAWIDE TOTAL MAXIMUM DAILY LOAD (TMDL) DESIGN-BUILD**

Contract No. AX7665D82  
F.A.P. NO. AC-STBG-000B(276)E

OCTOBER 30, 2018

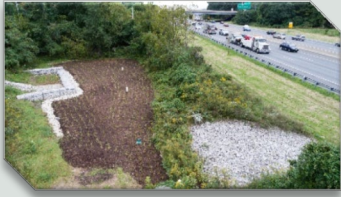
Submitted by:

**CONCRETE GENERAL, INC.** in association with

**RK&K** and **AMT**



# TABLE OF CONTENTS



Cover

Table of Contents

Cover Letter (2.16.01)

## **Design-Builder Capability (2.16.02)**

- i. Key Staff
- ii. Firm Past Performance
- iii. Organizational Chart

## **Project Understanding & Design-Build Approach (2.16.03)**

- i. Understanding of Scope
- ii. Understanding of Relevant & Critical Risks
- iii. Approach to Design-Build

## **Section 4 – Legal and Financial Information**

### **Appendix:**

Appendix A – Addendum Letter and Responses to RFIs

Appendix B – Representative Outfall Stabilization Design Schematics

Appendix C – Representative SWM Facility Design Schematics

Appendix D – Alternative Technical Concepts (ATCs)





# Design-Builder Capability



# Design-Builder Capability

i. Key Staff

i. Key Staff



## MICHAEL HIGGINS, PE

### Design-Build Project Manager | Concrete General

34 Years' Experience

Pennsylvania Registered Professional Engineer #PE044299E

BS/Civil Engineering/1986



Mr. Higgins' experience as Project Manager and Design-Build Project Manager spans more than two decades in heavy construction, cost controls, schedule compliance and procurement for highways, bridges, outfall remediation, SWM retrofits, airports and utilities in Maryland, Virginia, North Carolina, West Virginia, Pennsylvania, Texas and Kentucky. Mike has a proven track record delivering complex, traffic-intensive projects to MDOT SHA, VDOT and others, on-time and on-budget. His past experiences include development of proposals, budgets and contracts to deliver alternate procurement projects for both public and private clients. This experience includes risk analysis and mitigation, cost modeling, value engineering, quantity and cost estimating and contract development and negotiations.

**MD 32 - MD 108 to North of Linden Church Road Design-Build, Howard Co., MD, MDOT SHA Contract No. HO1415170:** Design-Build Project Manager; responsibilities include main point of contact for SHA, oversight of and collaboration with designer (RK&K), ensuring proper allocation of resources for both CGI's labor and equipment along with outside contractor forces, oversight of project management, scheduling, financial and regulatory requirements to meet contractual expectations. Worked with Mark Miller (Cost Estimator) on this \$33M design-build project that provides for the Phase 1 widening of MD 32 from MD 108 to North of Linden Church, for approximately 2 miles and included improvements to the intersections for both MD 108 and Linden Church Road. Several drainage related features such as stormwater management quality and quantity BMPs, outfalls, channels and culverts were also part of the improvements.

**I-270 Innovative Congestion Management Progressive Design-Build, Montgomery Co., MD, MDOT SHA Contract No. MO0695172:** Design-Build Project Manager; responsibilities include main point of contact for MDOT SHA; preconstruction activities, including oversight of, and collaboration with designer (RK&K); management of CAP process; oversight of construction activities and management of the overall contract with MDOT SHA. The purpose of this \$100 million progressive design-build project is to reduce congestion and improve travel time along the I-270 corridor. The Design-Builder is providing implementable, practical, bold and innovative solutions to increase vehicle throughput, reduce delay and increase travel time reliability along I-270 with the contract budget. The project includes approvals for more than 20 SWM facilities and 15 discrete design packages.

**MD 210 Livingston Road/Kerby Hill Road Interchange Design-Build, Prince George's Co, MD, MDOT SHA Contract No. PG7005170:** Design-Build Project Manager; responsibilities include main point of contact for SHA, oversight of designer, ensuring proper allocation of resources for both CGI's labor and equipment along with outside contractor forces, oversight of project management, scheduling, financial and regulatory requirements to meet contractual expectations. Worked with Mark Miller on this \$83M design-build project that consists of a grade-separated interchange at the MD 210 intersection with Livingston Road/Kerby Hill Road to provide safety improvements and congestion relief for this area. The project includes realignment of Livingston and Kerby Hill Road, major utility relocation and coordination, bridge structures, retaining walls, new pavement and existing pavement rehab, stormwater management quality and quantity facilities, signing, lighting and extensive maintenance of traffic, including detours.



**MATTHEW SLAGEL, PE, DBIA, LEED AP**  
**Project Design Manager | RK&K**

16 Years' Experience

Maryland Registered Professional Engineer #51090

LEED AP BD+C #10269551

MS/Environ. Engineering and Science/ 2012

BS/Environ. Science/2002

Mr. Slagel is a Civil/Environmental Engineer with 16 years of experience specializing in site development, H/H modeling, sustainable SWM facility/BMP evaluation and design, ESC design, outfall stabilization, TMDL retrofits, environmental permitting, analyzing sediment sampling cores, development of plans, specifications and cost estimates, and site development design for LEED certification. He has experience in the design and management of multiple Design-Build projects from the proposal through construction completion. He has experience working on a wide range of residential, commercial, mixed-use, highway engineering and remediation projects for federal, state, county, municipal and private sector clients. He holds SHA-Yellow Card and Designer ESC Certs.

**I-270 Innovative Congestion Management Progressive Design-Build, MD:**

The purpose of this \$100M progressive design-build project is to reduce congestion and improve travel time along the I-270 corridor. The Design-Build Team is providing implementable, practical, bold and innovative solutions to increase vehicle throughput, reduce delay and increase travel time reliability along I-270 with the contract budget. Matt is serving as the Design Manager for all SWM, drainage, and ESC tasks. Matt is responsible for coordination amongst all design disciplines and construction team (Concrete General), coordination with review authorities including SHA-PRD for SWM/ESC approvals, strategizing components of discrete design packages, design oversight and quality reviews, construction RFI's, as well as post-construction as-built coordination and certifications. The project includes regulatory approvals for over 20 SWM facilities and 15 discrete design packages. Under Matt's supervision, SWM/ESC approvals were secured within 12 months for multiple design packages (two Concept Packages and 15 Site Development/Final Packages).

**MD 404-US 50 to East of Holly Road Design-Build; Caroline, Queen Anne's Counties, MD:**

The purpose of this \$105M design-build project was to dualize 9.2 miles of roadway from US-50 to Denton within an accelerated 20-month substantial completion window. RK&K was responsible for four miles of the roadway, MOT, drainage, SWM and ESC design. Matt was responsible for coordination amongst the Design Joint Venture's design team, coordination with all design disciplines and construction team, coordination with review authorities (PRD, MDE Wetlands & Waterways), design oversight and quality reviews, and construction RFI's. Under Matt's supervision, SWM/ESC approvals were secured in 11 months for four discrete site dev./final design packages.

**City of Bowie – Midwood Stormwater Management Pond Retrofit:**

Project Engineer for this SWM retrofit that converted an existing dry pond to a wet pond providing both quantity and quality control in support of the City of Bowie TMDL requirements. Responsibilities included H&H analysis, wetland and waterway permitting coordination, local permitting coordination, coordination amongst design disciplines (e.g. Geotechnical, utilities, landscaping, etc.), and participation at public meetings.

**Compliance for the Administration with the State and Federal NPDES Laws for MS4s, Industrial Discharges and Construction Activities, BCS 2010-12A:**

Project Engineer supporting several TMDL-related projects, including site assessments for more than 700 SWM BMP locations, field investigation, BMP location prioritization, and design of more than 70 SWM BMPs in Carroll, Washington, Montgomery and Baltimore Counties.



Mr. Phillips has more than 18 years of experience in the design of civil engineering projects such as storm drains, SWM, ESC, outfall remediation, stream restoration and stormwater planning studies and design for a variety of site development, roadway construction and bridge replacement projects. He has specific expertise in fluvial geomorphology and stream stabilization/restoration/habitat enhancement techniques in urban and rural stream systems in the mid-Atlantic region. He is proficient in preparing construction plans, specifications and engineer's estimates for stream restoration/SWM/drainage projects and project management for both small- and large-scale projects. Steve holds MDE-RPC, SHA-Yellow Card and Designer ESC Certifications.

**STEVEN PHILLIPS, PE**  
**Water Resources Engineer | RK&K**

18 Years' Experience  
Maryland Registered Professional Engineer #33341  
BS/Civil Engineering (Focus on Water Resources)  
Minor-Economics/2001

**National Pollutant Elimination Discharge Services (NPDES) Statewide, SHA BCS 2010-12A, (2014-ongoing):**

Project Manager leading SWM/ESC projects/tasks under this contract, including preliminary/final engineering and permitting. Relevant tasks include: **1) Minebank Run Stream Restoration & Water Quality Improvements, Baltimore County, MD:** Project Manager leading SHA stream restoration (2700 LF) and water quality improvements project that will stabilize Minebank Run and several tributaries, repair roadway embankment slope erosion and failing outfalls, and provide additional water quality ESD facility near the Cromwell Bridge Rd/I-695 interchange. Oversaw stream design, lead E&S design, and coordinated SWM/ natural resources/ geotechnical/ structural design and permitting (DNR, MDE, USACE, USFWS, and MHT). Coordinated with Baltimore Co. for sewer realignment and effected property owners to address all stakeholder concerns. Conducted public outreach and provided Phase V services; **2) TMDL SWM Site Searches & Concept Design:** Project Manager who led a team of designers and sub consultants on conducting site searches for potential new SWM BMP locations along SHA-owned roadways an at SHA-owned facilities. Lead the RK&K team on desktop analysis of 5,000 potential BMP locations, over 500 field investigation sites and preparing over 100 concept SWM BMP designs that maximize water quality treatment at the most feasible locations; **3) Drainage Remediation PM / Design/ Permit, District one:** Consultant Project Manager to coordinate with District 1 and determine, investigate and prioritize drainage issues. Assign to designers and oversee the design and permitting process to have sites addressed by on-call contractors. Work includes site investigations, coordination with the District liaisons, HHD, PRD, EPD and consultant designers, review of scopes, hours, and cost estimates, conduct milestone meetings, coordinate survey, utilities, and geotech needs, perform QA/QC, schedules, etc.

**Engineering Design, Support and Construction Management Services (BCS 2012-19C) Statewide (2016-present):**

Project Manager leading SWM/ESC project assignments under this contract, including preliminary/final engineering and permitting. Relevant tasks include: **HHD On-Site Project Reviews and On-Site Support Staff for SHA;** reviewed numerous special projects for SHA Highway Hydraulics Division. Liaison with MDE and PRD for SHA project reviews at MDE/PRD for more than 16 years. Coordinated with other consultants and participated in design meeting to resolve SWM and other drainage related comments. Mentored and managed younger staff to complete reviews.





**JENNIFER TRIMBLE, DGE, PE**  
**Geotechnical Engineer | RK&K**

19 Years' Experience

Maryland Registered Professional Engineer #29202  
MS/Civil Engineering/1999, BS/Civil Engineering/1998

Ms. Trimble is responsible for planning and directing geotechnical explorations in support of highways, buildings, stormwater, water and wastewater facilities, and other civil and environmental engineering projects. Her experience includes evaluation of subsurface conditions, in-situ testing, conducting seismic refraction studies, verifying groundwater levels, evaluating risks in potential sinkhole areas, and providing recommendations with respect to geotechnical engineering considerations, including foundations, earthwork, pavements, stormwater management and slope stability. She also determines and performs the construction inspection required for a project. Ms. Trimble has performed reliability analyses of slopes. She is a registered OSHA Hazardous Material Site Worker, 29CFR 1910.120, a PADOT Level II drilling inspector, and is also Troxler Radiation Safety trained.

**I-270 Innovative Congestion Management Progressive Design-Build, MD:** Geotechnical Engineer; provided geotechnical engineering for an innovative design-build project with a construction budget of \$100 million for improvements along I-270 in Frederick and Montgomery Counties, MD. Project consisted of 15 distinct projects to reduce congestion and improve travel time. Improvements included ramp metering/active traffic management, converting existing shoulders to travel lanes, construction of new full depth pavements, and lane restriping. Responsible for coordination with multiple design disciplines and with construction team (Concrete General). Conducted 92 additional SPT borings some with rock coring, 42 pavement cores, and 35 infiltration tests with laboratory testing. Performed a Falling Weight Deflectometer testing program to determine existing subgrade resistance within a 2-mile stretch. Prepared a geotechnical engineering report for new full depth flexible pavement sections, repair locations, and SWM. Aided in development of construction documents and project specifications.

**MDTA Comprehensive Preliminary and Final Engineering Design Services (AE2545-000-002) I-95 at MP 64.3, White Marsh, MD:** Geotechnical Engineer; conducted site visit to observe surface erosion as well as a slope collapse near milepost 64.3 along SB I-95, south of Rossville Blvd overpass. Observed primary cause of erosion as surface runoff creating concentrated flow channels. Estimated the erodibility factor based on visual manual classification of the soils. Provided recommendations for removal of sediment along SB I-95, construction of a trapezoidal ditch, regrading of the slope, stabilization of non-vegetated areas, and review of the noise barrier foundation.

**On-Call Civil/Environmental Engineering & CM Services Prince George's County, MD:** Geotechnical Engineer for tasks, *Yorkville Road Slope Failure Remediation*—involved emergency geotechnical engineering services for a slope failure causing a crevice ditch/graben about 550 feet long, 6 feet deep and 20 to 60 feet wide adjacent to six single-family houses and a stream. Subsurface exploration consisted of SPT borings, Shelby tube samples, CPT probes, and installation of inclinometers to monitor additional slope movement. Provided geotechnical recommendations to aid the County with FEMA and MEMA applications for grant funds, and design of reconstruction of stream stabilization.

**MDTA Comprehensive Preliminary and Final Engineering Design Services (AE2545-000-002) Canton Viaduct, Baltimore, MD:** Geotechnical Engineer; provided geotechnical engineering for peer review of plans, specifications, and preliminary GER for 25-span, three-lane viaduct in southeastern Baltimore near I-895.



Mr. Earp manages RK&K's GIS Department with 19 years of experience and is an expert in Esri technologies. He has experience managing large-scale Enterprise GIS implementations and GIS web application development projects in Maryland. He has experience leading project teams, gathering requirements and implementing GIS solutions. Mr. Earp has experience designing and maintaining applications utilizing ArcGIS Server. He has experience directing field crews in GIS data collection. His background includes project management, GIS database design and management, geospatial analysis, GIS Needs Assessments, GIS training, floodplain mapping, 3D modeling, QA/QC, cartography and data collection. He has experience with the latest version of ArcGIS (v. 10.x) and Arc SDE.

## **THOMAS EARP, GISP GIS Specialist | RK&K**

19 Years' Experience | GIS Professional #48561  
BS/Geography/2000

**National Pollutant Elimination Discharge Services (NPDES) Statewide, BCS 2010-12A:** GIS Specialist responsible for managing the GIS data for SHA's TMDL program. The data is an Esri geodatabase replica in a versioned environment sourced from SHA's eGIS system. Created versions of the data for use by internal staff and subcontractors. Ensured all edits were reconciled and posted throughout the database hierarchy. Performed QA/QC and database management tasks on a regular basis and prepared the data for periodic deliveries to SHA. Upgraded ArcGIS Server and SQL Server to latest versions.

**Environmental Design & Permitting Services, BCS 2009-04C Statewide, MD:** GIS Coordinator responsible for managing project GIS data for SHA's TMDL program. The data is an Esri geodatabase replica in a versioned environment sourced from SHA's eGIS system. Created data versions for use by internal staff and subcontractors, and ensured all edits are reconciled and posted throughout the database hierarchy. Performed QA/QC and database management tasks on a regular basis and prepared the data for periodic deliveries to SHA.

**Maryland Port Administration Miscellaneous Engineering Services, Statewide, MD:** GIS Coordinator responsible developing the Port's Enterprise GIS, which contains the Port's engineering data and used to maintain facilities. Mr. Earp conducted requirements analysis, developed database architecture and system design, installed and configured ArcGIS Server and ArcSDE on Oracle 11g. He trained Port staff to publish map services and administer ArcGIS Server. Manages RK&K staff who are working on-site to collect and maintain the Port's GIS data.

**Sewage Collection System Improvements, Wilmington, DE:** GIS Coordinator responsible for transitioning the City's combined Sewer Stormwater Enterprise GIS System to an Esri geodatabase schema. This process involves documenting the differences between the current and future schema, identifying changes to applications like CityWorks that utilize the GIS data, and developing an Extract, Transform and Load process model to move the data to the new schema.

**Red Line Transit Study/GEC/Design Baltimore, MD:** GIS Coordinator; created a GIS database of soil sampling measurements to analyze site contamination. He created 3D soil contaminate plume models using Esri ArcGIS software to visualize and calculate the volume of soil contamination.



Mr. Kirsch has extensive experience in heavy civil construction as a Construction Manager on projects, specifically for Montgomery County DOT, MDOT SHA and MDTA, to bring valuable construction management leadership skills to the project. He has participated in many roles, including Project/Construction Manager, where he was responsible for managing schedules and coordination of highway construction projects, including several design-build procurement projects. He has overseen numerous large highway projects involving bridge construction, major earthwork, utility relocation, streetscapes and paving construction.

## **CHRISTOPHER KIRSCH** **Construction Manager | Concrete General**

**TMDL SWM Retrofits – Group 1 – District 4 Contract No. AX7665182 - Baltimore & Harford Counties, MD:** Project/Construction Manager for \$3.2M TMDL SWM retrofit project located in Harford and Baltimore counties for MDOT SHA. For this project, multiple sites were constructed simultaneously to meet the schedule resulting in the need for ongoing work throughout the year, regardless of the weather conditions. To ensure delivery of efficient and concurrent construction activities, Mr. Kirsch strategically scheduled subcontractors and specialty crews utilizing staggered work schedules so all sites had the correct personnel when needed. Mr. Kirsch was responsible for the development of and updates to the project CPM schedule to ensure the project delivery schedule was met. The widespread site locations resulted in the need for alternate material suppliers along with the associated supplier approval through the OMT MMS system. Mr. Kirsch developed a wealth of knowledge of local material suppliers and vendors throughout the project areas. Mr. Kirsch was also responsible for submitting all project modifications in the MDOT SHA OED Toolkit, along with ensuring approvals of the SWM As-Builts. For all project locations, Mr. Kirsch acquired MOT permits and scheduled MOT setups/patterns such that site access did not adversely impact construction efforts. Mr. Kirsch led monthly project meetings with MDOT SHA Professional Engineers, designers, subcontractors and the REC field representative to ensure contract compliance during construction was sustained. Mr. Kirsch worked with Mr. Michael Higgins on this project.

**Waldorf Park and Ride, Charles County, MD (MDOT MTA Contract No. T-1038-0140R):** Project Manager for this \$5M project to construct a 550-space park-and-ride lot in Waldorf, Maryland, at the SE corner of MD 925 and Smallwood Drive. The design used pervious concrete pavement to minimize environmental impacts while the entrance/exit loop designs used PCC pavement to withstand heavier loadings. The work included bus shelters, lighting and appurtenances along with ADA-compliant parking and pedestrian platforms. The project required widening of MD 925 and signalization work to handle the increased traffic volume. He was responsible for managing and coordinating multiple crews, subcontractors and suppliers while ensuring contract compliance. He developed and updated the project schedule along with providing daily and weekly lookaheads. Besides attending all project workshops and meetings, he ran the bi-weekly progress meeting with the owner (MTA), designers, and key subcontractors and suppliers to ensure the project stayed on schedule. Mr. Kirsch managed the specialty subcontractors hired for utility relocation (water/sewer lines, interconnect, lighting and signal). He also coordinated with utility owners for their self-performed utility relocations to ensure the work was done within the project schedule. He helped sequence the project with the utility providers to ensure all utility outages required for the relocations were done at the times of the year allowed due to severe weather spikes in usage. Mr. Kirsch worked with Mr. Michael Miller on this project.





# Design-Builder Capability

## ii. Firm Past Performance



**Owner:** MDOT SHA

**Point of Contact:**

Mitukumar Dalwadi  
410.229.2431  
mdalwadi@sha.state.md.us

**Project Delivery Method:**

Design-Bid-Build

**Environmental Permits**

**Required:**

MDE SWM and ESC Approval, NPDES Permit, Non-Tidal Wetland & Waterways Permit (MDE/COE), Roadside Tree Permit (RTP)

**Permittee:** MDOT SHA

**Involvement:**

Implementation of Permit obligations during construction

**Construction Cost:**

\$3,327,202 (*initial*)

\$3,732,153 (*final*)

Reason: Contractor Quantities Overran Initial Estimates

**Schedule**

**Performance:**

August 1, 2018

(*initial completion date*)

August 1, 2018

(*final completion date*)

**TMDL SWM RETROFITS – GROUP 1 – DISTRICT 4  
CONTRACT NO. AX7665182  
Baltimore & Harford Counties, MD**

CGI was the selected contractor for the TMDL SWM Retrofits Project in District 4 for MDOT SHA. This bid-build project, located in Baltimore and Harford Counties, included construction of three new SWM facilities and retrofit of nine existing structural SWM facilities to provide water quality management.

The work consisted of:

- Implementation of traffic control
- Installing temporary construction access to facilities
- Clearing and grubbing, tree trimming and root pruning
- Re-grade of existing facilities to provide for proposed submerged gravel wetlands and wet ponds
- Re-grade existing side ditches to provide for grassed swales
- CIPP Liner for existing outfall pipes
- New SWM Outlet Structures
- Vegetative stabilization and landscaping of the re-graded areas within the Limit of Disturbance (LOD) as specified on the Contract Documents, or as directed by the Engineer
- Erosion and Sediment Control
- Minor roadway improvements, including concrete curb and gutter, asphalt pavement, new traffic barrier, adjustments to existing traffic barrier and fence
- Permanent Access Roads with Cellular Support
- Turfgrass/Meadow/Turfgrass Sod Establishment
- Tree, Shrub and Perennial Installation and Maintenance
- SWM Facility As-Built Inspection, Survey and Certifications

The contract requirements for the construction of the new SWM facilities and for the retrofit of the existing SWM facilities are very similar to the construction required for the SWM facilities for the Areawide TMDL Design-Build Project. CGI is very experienced in constructing these types of facilities with MDOT SHA as shown in the successful delivery of this TMDL project.

**SUCCESSFUL METHODS APPROACHES & INNOVATIONS:**

One goal of the TMDL SWM Retrofits Project was to provide improvements to all 12 of the facilities within the original budget of the contract, and within the Contract Work Day Duration. The MDOT SHA/CGI Project Team met on a weekly basis to discuss the status of the current SWM facility under construction, along with identifying and resolving

construction and design issues in a timely manner. The project team, along with the MDOT SHA Designers, met monthly to review the schedule for the remaining facilities along with similar issue identification and resolution. **Why Relevant?** A strong working relationship with the entire project team is key to a successful Project.



**Owner:** MDOT SHA

**Point of Contact:**

Brian Pickens  
301.674.4531  
bpickens@sha.state.md.us

**Project Delivery Method:**

Design-Build

**Environmental Permits**

**Required:** Reforestation Permit, Non-Tidal Wetland & Waterways Permit modification (MDE/COE)

**Permittee:** MDOT SHA  
**Involvement:**

**Construction Cost:**

\$10.6M *(initial)*  
\$10.7M *(final)*  
Reason: Owner Initiated Changer Order

**Schedule**

**Performance:**

November 2013  
*(initial completion date)*  
November 2013  
*(final completion date)*

**MD 32/LINDEN CHURCH ROAD INTERCHANGE  
DESIGN-BUILD HO3915170, Howard County, MD**

CGI and RK&K, were selected for this \$10.6M design-build project located in Clarksville, Howard County, MD. The purpose of the MD 32 at Linden Church Road was to enhance the safety and operations along this section of MD 32 and integrate with the ultimate MD 32 corridor improvements. The project consisted of design and construction of a full diamond interchange at MD 32 and Linden Church Road, replacing two existing intersections to improve safety and alleviate traffic; construction of a roundabout at the proposed intersection of Linden Church Road and the northbound ramp termini; a new bridge over MD 32 to provide improved access to the local roadway network; and realignment of Linden Church Road west of MD 32 to form a new T-intersection with Ten Oaks Road; and construction of a 700-ft section of Ten Oaks Road.

Additional improvements included installing closed drainage systems, SWM facilities (nine grass swales, 26 bioswales, four bioretentions and one extended detention basin), ESC, perennial and intermittent stream channel work within the Middle Patuxent watershed, landscaping, signing, pavement marking, utility location, MOT, and preparation of a Traffic Management Plan, including public information and outreach. Natural resource efforts to support permitting requirements for the project included a tree inventory, coordination with CGI and the design team on resource avoidance/minimization, development of an Ash Disposal Plan, and preparation of a wetland permit modification. The design was broken into smaller packages to employ a “rolling” process of design, review, and construction.

Major quantities of work for the project include 118,000 CY of excavation/borrow, 14,000 tons of asphalt, 2000 LF of storm drainage pipe and 8,000 LF of underdrain.

CGI’s experience and success working with RK&K on projects like this one is verification of our strong, effective working relationship with one another as a Design-Build team, which is critical to delivering Design-Build projects with aggressive schedules.

**SUCCESSFUL METHODS APPROACHES & INNOVATIONS:** A major project objective was the implementation of an effective ESC plan, including the installation of initial and interim ESC measures that were required during the construction phasing. Another major objective was the inspection and maintenance of the ESC that were in place to ensure environmental compliance during construction. The ESC measures, along with the significant number of SWM facilities, were installed within a limited ROW. CGI met and exceeded the ESC compliance requirements throughout the construction and maintenance period. This

experience of design and construction of the SWM facilities within a limited ROW qualifies us to work with MDOT SHA in minimizing the private property required for environmental resource management.





## I-270 INNOVATIVE CONGESTION MANAGEMENT PROGRESSIVE DESIGN-BUILD MO0695172 Montgomery & Frederick Counties, MD

**Owner:** MDOT SHA

**Point of Contact:**

Sean Campion  
410.545.8863  
scampion@sha.state.md.us

**Project Delivery Method:**

Progressive Design-Build

**Environmental Permits**

**Required:** PRD SWM and ESC Approvals (12); NPDES NOI Permits (6); Roadside Tree Permits (7); Reforestation Permits (3); Statewide Letter of Authorization (1)

**Permittee:** MDOT SHA

**Involvement:** Design, Permit Coordination, and Implementation of Permit obligations during construction

**Construction Cost:**

\$2.3M *(initial)*  
\$2.3M *(final)*

**Schedule Performance:**

Dec. 15, 2017  
*(initial completion date)*  
Dec. 15, 2017  
*(final completion date)*

CGI and RK&K were the selected Design-Builder for the I-270 Innovative Congestion Management (ICM) Progressive Design-Build (PD-B)— the first transportation project to use PD-B as an alternate delivery method in Maryland, as well as across the United States.

The project’s purpose is to reduce recurring and non-recurring congestion and improve travel time reliability along the I-270 Corridor between I-495 and Frederick, MD. The CGI Team is providing practical, bold, and innovative solutions to increase vehicle throughput, reduce delay and increase travel time reliability along I-270 within the maximum \$100M contract budget. The CGI Team’s corridor-wide solutions move the most vehicles in the fastest time along I-270.

The project includes design and approvals for over 20 SWM BMPs and ESC distributed throughout 15 discrete design packages, spread across two 8-digit watersheds. Concept packages were prepared at the 8-digit watershed level for water quality purposes. After receiving Concept Approval, packages were broken down into a manageable size to allow construction to commence in specific projects while design concluded in the remaining projects. The order in which project approvals/permits were completed resulted from a coordinated effort between the design and construction teams to ensure that construction scheduling needs were met. The Design team secured early support of this approach from PRD to ensure a seamless approval process. Because of the early coordination, strategic design packaging, and efficient and high-quality designs, SWM/ESC approvals were secured within 12 months for all design packages (Two Concept Packages and 15 Site Development/Final Packages).

Additional project elements include development of construction plans and specifications, including roadway, traffic, utilities, MOT, and landscaping; preparation of an IAPA, NEPA documentation, and other permitting documents, and environmental mitigation needs; ROW acquisition documentation, utility coordination, and participation in a public outreach program; DBE and subcontractor plans, design and construction schedule, development of a design and construction quality control plans, material sourcing plan and worker and public safety plan.

**SUCCESSFUL METHODS APPROACHES & INNOVATIONS:** A

goal of the I-270 ICM was to provide all improvements within the limited budget. The team of CGI, RK&K and MDOT SHA developed standard processes for plan development, timely review, and constructive feedback to provide cost competitive and innovative designs. Cross-discipline coordination meetings, discipline-specific meetings, over-the-shoulder reviews, and upper management meetings allowed for efficient input from all team members and stakeholders. **Why Relevant?** A strong working relationship with the Designer is key to a successful Design-Build project. CGI’s experience working with RK&K on projects like I-270 is verification of our ability to develop the strong, effective working relationships critical to delivering Design-Build projects with aggressive schedules.

## BCS 2010-12A & BCS 2005-06D- NPDES PROGRAM SERVICES, Statewide, MD



**Owner:** MDOT SHA

**Point of Contact:**

Dana Havlik  
410.545.8418  
ldhavlik@sha.state.md.us

**Project Delivery Method:**

Design-Build

**Environmental Permits**

**Required:** Shown in Text

**Permittee:** MDOT SHA

**Involvement:** Shown in Text

**Construction Cost:**

RK&K Contract  
Design Fee \$6M

**Schedule Performance:**

Ongoing  
*(initial completion date)*  
Ongoing  
*(final completion date)*

RK&K has been providing all facets of watershed design and assessment services through many consecutive open-end/on-call contracts for MDOT SHA's Highway Hydraulics Division (HHD) and Office of Environmental Design (OED) since 2005. More than 70 tasks have been assigned, which encompassed a comprehensive range of Phase I & II NPDES/ MS4 /TMDL services for SHA roadway network including SWM program management support services, drainage inventory, evaluation and design of drainage infrastructures; SWM BMP design/retrofits; field studies of storm drains/outfalls; SWM permits support; long-term pre- and post-construction stream & outfall monitoring; and natural resources permitting. Two sample tasks included: **Outfall Structure & Stream/Channel Stabilization Projects along MD 210, PGO, MD:** RK&K performed field studies, analysis, design, and prepared construction documents for seven degraded SWM outfalls. Three outfalls included highly degraded stream systems that required geomorphic studies, including stream surveys, stability analysis, monitoring, stream bank soil nutrient sampling, bulk density testing, and TMDL credit computations. All seven sites included drainage system improvements, including drop manholes, endwalls, preformed scours holes, and concrete channel replacement with naturalized materials. Performed H/H analyses using TR-20, streammetrics and HEC-RAS on design alternatives. NRIs were performed to locate WOUS, wetlands, and buffers. Impact plates and a supporting delineation report were prepared to support permitting efforts. The project is under construction and RK&K is providing Phase V services. **NDPES/MS4 Program Management Support Services:** RK&K has been involved with several programmatic aspects of MDOT SHA NPDES/MS4/TMDL program: I) SWM Project Management & Support for planning, design, TMDL coordination, and related permit support for numerous statewide projects; II) Lead Advertisement Coordinator: for preparation of plans, IFBs, specification, cost estimates, assembly and delivery of PS&E bid documents; III) Lead Constructability Review Coordinator: to

contribute to the quality and efficiency of MDOT SHA TMDL Program Project Delivery, review of TMDL water quality designs, ESC staging/access, natural resources (NR) impact minimization, coordination with District construction, utility engineers & inspectors, and addressing constructability and permitting issues; and IV) SWM BMP Treatment Determination team: for review of base information, field reconnaissance, DA verification, BMP water quality analysis and TMDL credit computation per MDE guidelines; and GIS TMDL data population per MDOT SHA NPDES protocols.

**SUCCESSFUL METHODS APPROACHES & INNOVATIONS:** For cost effectiveness and natural design purposes, our design of MD 210 outfall stabilization prioritized the use of trees cut during construction in the outfall stabilization design in place of large, expensive stone. The design also prioritized floodplain reconnection and establishment of riparian wetlands to expand TMDL credit potential.



**Owner:** MDOT SHA

**Point of Contact:**

Todd Nichols  
410.545.8628  
tnichols@sha.state.md.us

**Project Delivery**

**Method:**

Mixed (Design-Bid-Build  
& Design Build)

**Environmental**

**Permits Required:**

Shown in Text

**Permittee:** MDOT SHA

**Involvement:** Shown in  
Text

**Construction Cost:**

\$29M (Design Fee Total)

**Schedule**

**Performance:**

*(initial completion date)*

Ongoing

*(final completion date)*

Ongoing

## **WETLAND DELINEATION & PERMITTING SERVICES (BCS 2009-04C / BCS 2012-03E / BCS 2014-09B), Statewide, MD**

RK&K is providing natural resources (NR) and related stormwater (SWM) permitting services to MDOT SHA on these consecutive on-call contracts. Over 75 tasks were assigned encompassing a wide range of permitting/mitigation services. Sample assignments include: **Permitting/Design Review:** RK&K is in its 10th consecutive year providing MDOT SHA with expedited MDE wetland/waterway permit reviews, which includes close coordination with SHA, MDE, BPW, USACE, MHT, DNR and USFWS, review of delineated wetlands and waterways to determine MDE jurisdiction, assessment of avoidance and impact minimization efforts, review and approval of H/H reports, participation at pre-application and interagency review meetings, mitigation and planning project review and preparation of authorization documents for MDE approval and issuance. Our NR scientists work closely with our in-house SWM and ESC approved reviewers for MDE and MDOT SHA/PRD approvals; **Natural Resource Assessments:** RK&K provided a NRI for proposed roadway improvements for MD 32 from MD 99 to Amberwoods Way, MD 281/Muddy Lane intersection, and MD 272/MD 273 intersection. Services included significant tree survey, wetland delineation, NRI report and mapping preparation. We provided GIS-based invasive species inventory at MDOT SHA wetland mitigation sites under a separate task resulting in control recommendations, maps and GIS layers used by MDOT SHA to develop invasive control contract documents. **TMDL Tree Planting:** RK&K is currently providing statewide program management for MDOT SHA's TMDL Tree Planting efforts, including planning, design, implementation support and monitoring of all TMDL planting sites. Our public outreach role is vital—to educating the public about the TMDL planting program; and to avoid conflicts with adjacent landowners. The RK&K Team is responsible for development of all planting contract documents, and our team leads the Pre-Bid coordination and provides construction support to MDOT SHA staff. **Construction Management**

**Services for Outfall & Stream Projects along MD 210:** RK&K provided continuation of Phase V construction management services for seven storm drain outfalls along MD 210. This included on-site designated stream specialist services, as-built review, and coordination with the contractor to ensure careful avoidance of sensitive natural resources; **Mitigation Banking Instrument:** RK&K staff worked closely with MDOT SHA, USACE, and MDE to establish MDOT SHA's first umbrella mitigation banking instrument (UMBI), including mitigation banking technical consultation, agency meetings and presentations, and UMBI preparation. The UMBI received final USACE approval in February 2017.

**SUCCESSFUL METHODS APPROACHES & INNOVATIONS:** Our natural resources field approach incorporates innovative practices to streamline our efforts and improve quality control. We employ iPads with GPS capability for use in the field to collect data during wetland/stream delineations, and tree inventories. We found that iPads are the most cost-effective way to collect/report data using the iGIS HD app and Google Earth to create mapping, and the PDF Expert app to complete data forms in the field.



## MDOT SHA NPDES TERM CONTRACT Statewide, Maryland



**Owner:** MDOT SHA

**Point of Contact:**

Karen Coffman

410.545.8407

[kcoffman@sha.state.md.us](mailto:kcoffman@sha.state.md.us)

**Project Delivery Method:**

Design-Bid-Build

**Environmental Permits**

**Required:**

PRD SWM and ESC

Approval; MDE Dam

Safety, Non-Tidal Wetland

& Waterways Permit

(MDE/COE), DNR Blanket

Roadside Tree Permit,

NPDES NOI Permit, PCE

**Permittee:**

SHA-OED/HHD

**Involvement:**

Designed, Acquired,

Reviewed, Project

Management

**Construction Cost:**

Varies

**Schedule Performance:**

*(initial completion date)*

Ongoing

*(final completion date)*

Ongoing

AMT is providing both project design and consultant Project Manager services to MDOT SHA Water Programs Division (WPD) to assist with bringing their highways into compliance with Maryland's Watershed Implementation Plan (WIP), the NPDES MS4 Phase I and II permits, and numerous local TMDL's.

AMT is managing design consultants for TMDL projects that include pond retrofits of existing MDOT SHA facilities in District 3 (AX7665682, AX7665E82, AX766A29), District 6 (AX7665582), and new facilities (bioretention, bioswales, submerged gravel wetlands, and grass swales) in District 7 (FR6635382). AMT is also managing three contracts for grass swales in District 2 and 7.

Typical duties performed by the AMT Project Manager's include project initiation; field investigation to confirm environmental features such as wetlands, significant trees, and drainage area boundaries; inspection of existing BMP's; concept development; coordination of survey, right of way, geotechnical, and subsurface utility requests through other MDOT SHA departments; review Preliminary Investigation, Final Review, and PSE plans, reports, specifications, and cost estimate; oversight of wetland and waterway permitting; review all SWM reports and plans to make sure they are in conformance with MDOT SHA's Plan Review Division (PRD) format and MDE design criteria, perform constructability reviews, review and coordinate small pond approvals through MDE Dam Safety (assist with providing dam breach analysis to help consultants obtain approvals), process all bidding documents, addendum, and red line revisions; justify bids; attend all construction progress and partnering meetings; answer RFI's; modify projects due to field conditions; review as-built documents; update MDOT SHA GIS database with accurate drainage areas and amount of new treatment provided by constructed BMP's; and close out projects.

AMT also provided outfall repair, stabilization and replacement design; stream restoration; H/H modeling; storm drain design; culvert analysis, rehab and replacement; drainage improvements; erosion and sediment control; and outfall step-pool energy dissipation structures. AMT also designed and permitted (PRD) roadside bioretention and grass swales to treat existing pavement for both the MDOT SHA Water Quality Bank and for TMDL projects.

**SUCCESSFUL METHODS APPROACHES & INNOVATIONS:** 1. provide practical design solutions that are cost effective and treat significant amounts of MDOT SHA-owned impervious area; 2. for pond retrofits, perform dam breach analysis and hazard

classifications at PI and initiate MDE Dam Safety permit reviews immediately after PI meeting; and 3. for outfalls, identify construction access and ROW impacts prior to PI.



# Design-Builder Capability

## iii. Organizational Chart

# ORGANIZATIONAL CHART

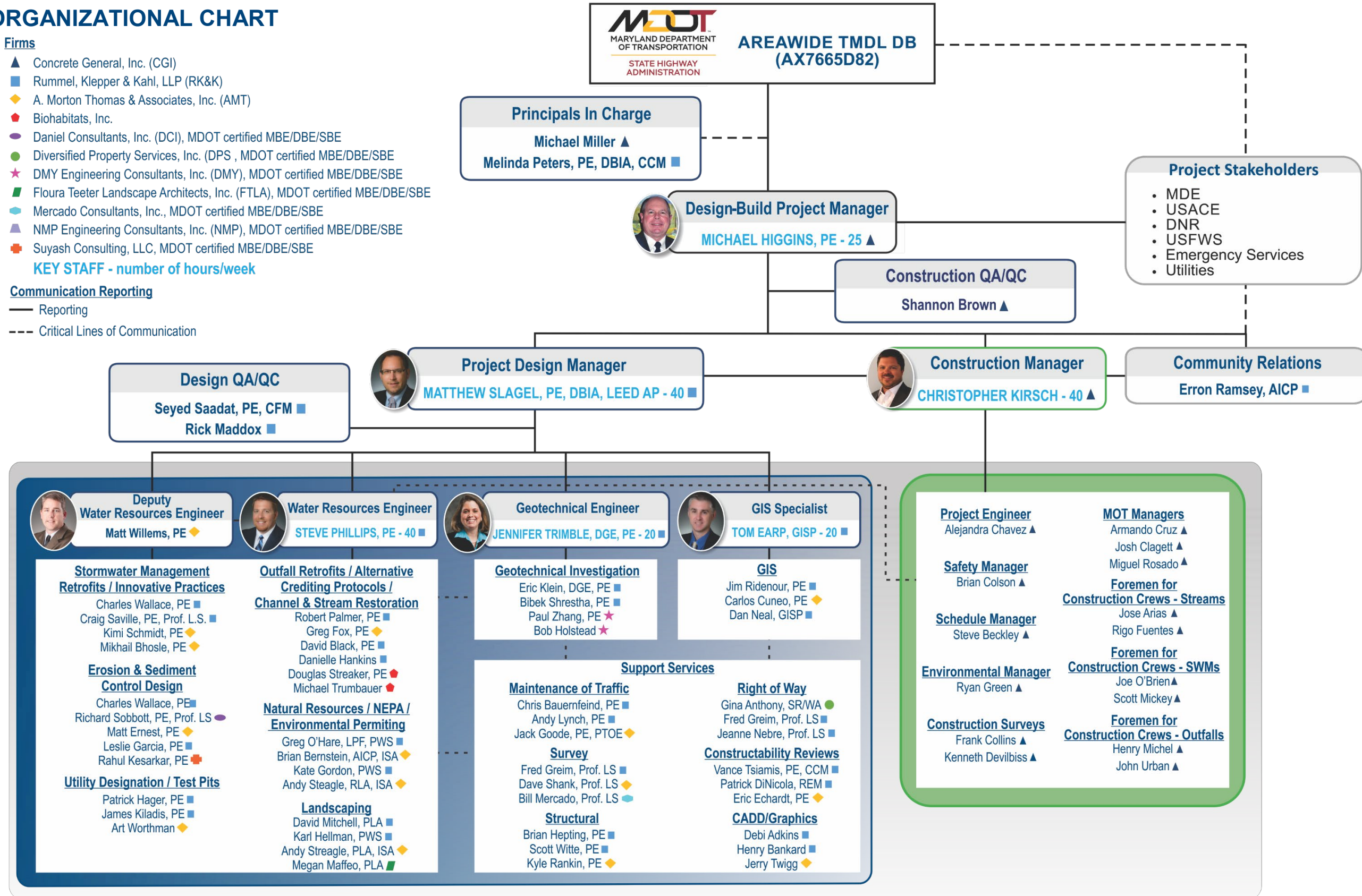
## Firms

- ▲ Concrete General, Inc. (CGI)
- Rummel, Klepper & Kahl, LLP (RK&K)
- ◆ A. Morton Thomas & Associates, Inc. (AMT)
- ◆ Biohabitats, Inc.
- ◆ Daniel Consultants, Inc. (DCI), MDOT certified MBE/DBE/SBE
- Diversified Property Services, Inc. (DPS), MDOT certified MBE/DBE/SBE
- ★ DMY Engineering Consultants, Inc. (DMY), MDOT certified MBE/DBE/SBE
- Floura Teeter Landscape Architects, Inc. (FTLA), MDOT certified MBE/DBE/SBE
- Mercado Consultants, Inc., MDOT certified MBE/DBE/SBE
- NMP Engineering Consultants, Inc. (NMP), MDOT certified MBE/DBE/SBE
- Suyash Consulting, LLC, MDOT certified MBE/DBE/SBE

## KEY STAFF - number of hours/week

## Communication Reporting

- Reporting
- - - Critical Lines of Communication







# Project Understanding & Design-Build Approach

## PROJECT UNDERSTANDING & DESIGN-BUILD APPROACH

### i. Understanding of Scope

The CGI Team recognizes that the Maryland Department of Transportation State Highway Administration (MDOT SHA) faces significant challenges in meeting its Total Maximum Daily Load (TMDL) targets set forth in the State's Watershed Implementation Plan. The CGI Team understands the importance of this contract to deliver 500 TMDL Credit Acres for \$50 million lump sum cost by October 2020. Our approach will provide SHA with the **maximum number of TMDL Credit Acres as cost effectively as possible**. We are proposing a three-pronged approach: 1) **outfall stabilization**, 2.) **stream channel restoration**, and 3) **stormwater management (SWM) facility retrofits**, while prioritizing minimization of environmental resource impacts, creating safe and easily maintainable facilities, and substantially reducing property acquisition.

**Project Scope:** The project scope consists of inspection, design and construction of SWM facilities for retrofits, stabilization of outfalls and restoration of respective channels to achieve TMDL credits throughout 11 Maryland counties. The scope of services includes: • topographic surveys, • utility designation and coordination, • impact avoidance, • geotechnical analyses and engineering, • hydraulic analyses, • SWM and outfall stabilization design, • as-built certifications, • erosion and sediment control (ESC) design, • environmental resource investigations, • permit authorizations, • ROW acquisitions and associated plat development, • NEPA document coordination, • traffic control design and implementation, • roadside and SWM landscape design, • reforestation design, • environmental mitigation/remediation, • coordination with SHA and other stakeholders via partnering, • community relations, • construction of all designed SWM facilities and outfalls, • project site maintenance, and • environmental compliance. **SWM Retrofits:** The CGI Team analyzed the 178 SWM facilities for maintenance and 25 SWM facilities for innovation for credit potential/cost efficiency and is proposing upgrades to at least five SWM facilities. Retrofit elements may include dry pond to wet pond/submerged gravel wetland conversion, innovative CMAC technologies, forebay creation, principal spillway upgrades, landscaping and embankment upgrades, and access road installation. **Outfall Stabilization:** We analyzed the 2,851 outfall locations provided and prioritized the 290 outfalls that will generate the most TMDL credit. These locations were investigated in the field, and outfalls that were stable, under construction, or otherwise not feasible to address under the project scope and schedule were eliminated. The best 149 outfalls were moved to conceptual design, bringing the elevation and outfall flow to a sustainable slope and location using pipe extensions and/or drop manholes with an endwall and plunge pool at the ultimate outfall. For locations where perennial channels will be impacted, the pipe length was minimized and step pools were proposed to bring the elevation of the outfall to a sustainable location and stabilize flows. We will calculate the provided TMDL credits using the 100-ft of outfall stabilization/stream restoration = 1 acre TMDL credit, or, as deemed appropriate, the Alternative Headwater Channel and Outfall Crediting Protocols for even greater credit. **Stream Channel Restoration:** The CGI Team has also identified potential locations immediately downstream of SHA-owned outfalls, within public ROW, where stream restoration is feasible and TMDL credit can be achieved.

**Project Roles:** The CGI Team will be active participants in partnering with SHA representatives. After the kick-off workshop, we will prioritize attendance at monthly partnering meetings and any necessary follow-ups. In addition to partnering, our Team will be responsible for each of the items listed above in the Project Scope. We understand that SHA will be responsible for attending partnering, pre-construction, and progress meetings, facilitating timely SHA reviews, providing small pond expedited reviewers, submitting NEPA documents and NOI permit requests, providing an Environmental Monitor, and issuing ROW certifications, as necessary.

**Environmental Permitting:** There will be impacts to regulated natural resources during the course of the work. We will conduct **desktop natural resources identification and detailed environmental studies; and develop required permit packages**. Impacts/alterations to Waters of the U.S. and wetlands require approvals and/or permit authorizations from USACE, MDE, and MDNR. Our Team will prepare the Federal/State Joint Permit Application (JPA) that requests authorization from MDE and

USACE for resource impacts. In addition to wetland/waterway permitting, our Team will perform the necessary forest services for SHA in compliance with the Forest Conservation Act, Reforestation Law and Roadside Tree Law, including Forest Stand Delineations (FSD) and Forest Conservation/Reforestation plans per MDNR requirements. We will also coordinate with MHT to identify any historic or archaeological resources within project areas; and MDNR Wildlife & Heritage Program and Project Review Division, and USFWS to determine if any Rare, Threatened or Endangered (RTE) species or fisheries resources are present within or adjacent to the project site.

**Ensuring Environmental Compliance During Construction:** The CGI Team recognizes the importance of a well-managed and well-implemented ESC plan and will achieve an “A” rating on all independent quality assurance inspections throughout the project’s duration. To achieve this rating, we will design and implement an ESC plan that is a top priority throughout the project’s duration. Communication, innovation, quick response, and cooperation are vital to an effective ESC plan. We have a strong commitment to pro-active coordination and collaboration between design and construction team members. Team participation in pre-construction and progress meetings to stay engaged on project schedule and construction means and methods allows internal compliance inspections to focus in on critical environmental activities. We will develop an environmental compliance schedule and database that will include resource locations, construction schedule, design status, projected changes, and locations of potential conflicts. This database will be updated weekly generating quarterly Environmental Compliance Reports that will be discussed during Partnering meetings. Our design-build staff will identify and document impacts and monitor the protection of regulated resources outside the Limits of Disturbance (LOD). Distribution and review of plans, sequence, and permit plates will be key to accomplishing this task. We recognize that internal compliance inspections on environmentally sensitive projects need to occur at a greater frequency to ensure resource impacts, best management practices (BMPs), and ESC are compliant with the approved plans, specifications and project permits. Our ongoing projects with SHA have successfully used this partnering approach, along with our open communication process, to ensure that potential issues are identified and corrected prior to construction, and that the work is being performed in accordance with approved plans and permits. During construction, we stress the importance to all project personnel to perform work within the approved sequence of construction, and will hold weekly meetings with the site supervisor, site ECM, and our designers to address any current site issues and provide a two-week look ahead schedule for each site. Additionally, our Team will provide a 3<sup>rd</sup> Party ECM to oversee work to further ensure environmental compliance during construction.

## ii. Understanding of Relevant & Critical Risks

**Significant Issues and Risks:** Identifying and reducing risk is essential to the project’s success. The CGI Team has developed robust risk management identification and mitigation processes to enable successful project delivery for SHA. In partnership with SHA and all stakeholders, we will use our local expertise to minimize/manage risks as follows: a) identify, and log on a risk register, the potential risks and issues for the project; b) identify the party (CGI Team, SHA, stakeholders) most appropriate to manage the risk; c) develop strategies to minimize or eliminate the risk; and d) develop the necessary mitigation and contingency plans for risks that cannot be eliminated. Our Team will minimize project risks through close collaboration with SHA and the stakeholders, and by ensuring that the selected sites avoid or minimize risk. Critical risks to achieving the project goals and our proposed mitigation follows: **Environmental Permits:** The CGI Team will avoid or minimize resource impacts to the extent practicable as required by law; and will partner with SHA and the regulatory agencies to obtain permits, perform mitigation, and verify compliance during construction. Our Team will accurately delineate wetlands/waterways and respective buffers within the LOD of each project area and engage the regulatory agencies as soon as NTP is issued to consider its concerns before submitting permit applications. **ESC/SWM Design/Approval/ Implementation:** ESC and SWM design and approval will be a critical driver in meeting the project objectives and schedule. The CGI Team understands the challenges in preparing SWM/ESC plans and submitting to SHA-Plan Review Division (PRD) for review and timely approval. There are significant risks when retrofitting an existing SWM facility to provide additional treatment that could unintentionally require upgrades to the facility for compliance with latest codes/standards. To limit risk during the design process, we will complete thorough as-built reviews



and coordinate early with PRD/MDE to clarify the requirements for upgrading a facility. We will develop designs that are constructible, feasible and work in concert with the Team’s construction approach and ESC needs. We will monitor the site post-construction and ensure stability until satisfactory growth/acceptance is obtained. We will use our vast knowledge of PRD reviews to ensure that submittals are of high quality and meet expectations to ensure a smooth approval process. We will proactively seek advance agreements and “buy-ins” from PRD on ESC/SWM items that are repetitive on multiple sites. **Credit Acceptance:** The applicability of credits is not definitively defined within the TMDL Guidelines. Our Team will seek agreement on credits attained for each site with SHA as early in the design phase as possible to ensure that committed credits are delivered within the schedule. **Time of Year Restrictions (TOYR):** Time of year restrictions to protect special status species in waterways will influence the schedule on a number of project sites during construction. TOYR will be identified early with sites designed/permitted and advanced to construction before deadlines take effect. We will work on multiple stream sites at one time and adjust workforce during non-closure periods. For sites that cannot be completed before restrictions take effect, semi-permanent bypass channels will be considered and/or TOYR waivers will be sought from permitting agencies early in the construction process. **Unknown Field Conditions:** Unexpected or unknown field conditions, such as subsurface issues or changes in outfall condition from time of proposal to time of design/construction are risks to the CGI Team. We have worked during the proposal stage to minimize these risks by reviewing prior as-built and geotechnical information. Soil borings/test pits will be performed, where warranted, to further minimize risk. Sites that are actively evolving due to instability will be inspected after extreme weather events to quickly identify field condition changes. Once issues are identified, we will work with SHA, utilities and the regulatory agencies to modify our design and permits accordingly. **Property Impacts/Right-of-Way:** The CGI Team has focused on sites that will avoid ROW impacts to reduce the significant time and cost involved in obtaining ROW. Work that can be completed without ROW will be prioritized; however, we are experienced in SHA’s property acquisition process and preparing plats and property mosaics for any unavoidable ROW needs; time will be included in the project schedule for any needed acquisitions.

We will develop a **risk register** to prioritize selected sites based on identified risks and allow time to mitigate risks. We will start construction of low risk projects while addressing high risk projects. Additional risks identified by the Team are summarized below:

RISK	SUMMARY OF RISK	MITIGATION MEASURES	RISK	SUMMARY OF RISK	MITIGATION MEASURES
Site Access	<ul style="list-style-type: none"> <li>Steep grades and significant clearing</li> </ul>	<ul style="list-style-type: none"> <li>Choose sites with flatter slopes &amp; smaller/less trees</li> <li>Longer access roads to mitigate steep slopes</li> <li>Multiple access points</li> </ul>	Acceptance of Innovation	<ul style="list-style-type: none"> <li>Innovative SWM treatment approaches not yet accepted by MDE</li> </ul>	<ul style="list-style-type: none"> <li>Use already approved MDE innovative measures</li> <li>Provide Redundant treatment credit locations</li> <li>Alternative treatment approaches considered</li> </ul>
Weather	<ul style="list-style-type: none"> <li>Schedule delays due to weather</li> </ul>	<ul style="list-style-type: none"> <li>Start construction during correct season</li> <li>Working extended hours during good weather</li> <li>Weather proofing sites</li> <li>Alternative construction methods</li> </ul>	Coordination with Other Projects	<ul style="list-style-type: none"> <li>Anticipated credit at sites already completed or under construction</li> <li>Adjacent work that inhibits access to site</li> </ul>	<ul style="list-style-type: none"> <li>Early identification of sites and coordination of known projects with SHA</li> </ul>

RISK	SUMMARY OF RISK	MITIGATION MEASURES	RISK	SUMMARY OF RISK	MITIGATION MEASURES
Maintenance of Traffic	<ul style="list-style-type: none"> <li>Limiting time to work at site</li> </ul>	<ul style="list-style-type: none"> <li>Using barrier wall to extend work time.</li> <li>Work on multiple sites under single MOT set up</li> <li>Use shoulder closures instead of lane closures</li> <li>Identify sites that will have limited to no MOT</li> <li>Work on weekends, and/or extended hours</li> </ul>	Utility Impacts	<ul style="list-style-type: none"> <li>Utility coordination/conflict/relocation could impact schedule</li> </ul>	<ul style="list-style-type: none"> <li>Create utility mosaic</li> <li>Meet with utility companies</li> <li>Conflict Identification</li> <li>Protection of Utilities</li> <li>Avoid utility impacts</li> </ul>
			Maintenance of Stream Flow / Dewatering	<ul style="list-style-type: none"> <li>Work lost due to improper MOSF</li> <li>Delays due to wet work zone</li> </ul>	<ul style="list-style-type: none"> <li>Use adequate pumps/sumps/dirt bags</li> <li>Implement diversions &amp; keep offsite water out of work area</li> <li>Prepare project sites if anticipating severe weather</li> </ul>

### iii. Approach to Design-Build

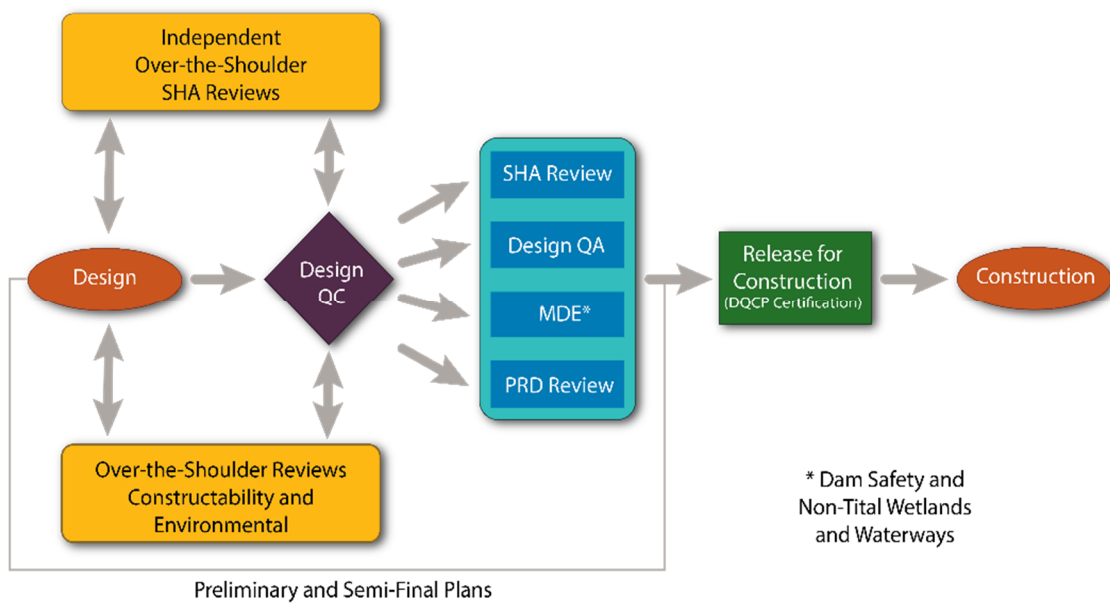
**Design and Construction Development** - We will use a task force approach to project design development comprised of traditional design and construction disciplines. Designated Task Force leaders will be responsible for coordination and collaboration between disciplines and empowered to resolve issues quickly and involve stakeholders, as required. Task Force Leaders will report to the Project Design Manager and the Design-Build Project Manager.

**Work Package Development:** Proposed outfall structures chosen for stabilization will be strategically grouped within work packages with other outfalls identified as having similar design and permitting timeframes. These geographic groupings will allow for more cost-efficient construction and safer Maintenance of Traffic operations. Grouping work packages in this manner will allow for rolling design, review, and construction activities to ensure we meet the October 2020 deadline. Our Team expects that SWM facility retrofit projects will be created as stand-alone work packages due to its distinct MDE Dam Safety permitting requirements and anticipated widespread geographical distribution. **Design Initiation:** Task Force Leaders will be empowered to identify and coordinate design needs and risks for individual sites in the project's initial stages. These needs may include natural resource inventories (NRI), topographic surveys, utility designations, metes & bounds surveys, soil borings, test pits and/or storm drain inspections. We will begin field reconnaissance immediately after NTP to inform development of the work packages. **NEPA/MEPA:** NEPA/MEPA documentation will be developed for each work package, and we will avoid and/or minimize impacts to resources whenever possible. We will provide all NEPA documentation and collaborate with all stakeholders to allow SHA to obtain approvals. **Design QA/QC:** The CGI Team will develop and use a project-specific Design Quality Control Plan (DQCP) to achieve design excellence. The DQCP is discussed in further detail in the Design Quality Management Section. **Schedule:** The CGI Team will maintain a master CPM schedule using Primavera P6 showing design, review, stakeholder coordination, and construction activities for the improvements. We will also maintain a 4-Week-Look-Ahead schedule, allowing easy identification of upcoming tasks, meetings, review responsibilities and construction activities. Work packages will be prioritized to allow construction to begin on straight-forward packages while work packages with longer lead times for design/permitting are developed and finalized. **Safety and Maintenance of Traffic:** Maintaining a safe environment for workers and the traveling public on SHA roadways is a commitment we take seriously. During the design phase, our traffic control approach will include close collaboration with SHA and all relevant stakeholders. Construction impacts to traffic will be localized since our projects are smaller and locations diverse. We will coordinate with stakeholders and conduct public outreach to minimize inconvenience to the traveling public, whenever necessary. We will implement our MOT designs and continue collaboration during construction, adjusting (as necessary) to accommodate changing conditions.

**Permitting** - Avoidance and/or minimization (A/M) of impacts to resources will be required to obtain permit authorizations, and our emphasis on A/M will ensure that permit authorizations are expedited and construction schedules are met. Our environmental scientists will work with the design and construction staff early to reduce impacts by avoiding resources whenever possible and minimizing unavoidable impacts. The close working relationship between CGI and RK&K from previous work on several projects, and knowledge on reducing resource impacts early, and communicating to the regulators will ensure streamlined collaboration with those agencies. We conducted an extensive GIS screening of resources at each project location and have adjusted our locations to reflect those results. Impacts to forest/trees or wetlands that cannot be avoided will be mitigated on-site whenever possible following state and federal requirements.

**Design Quality Management** - SHA is a primary client for all of our team members, and we will maintain the high standard of quality that SHA is accustomed to receiving from us. The CGI Team will develop and use a project specific Design Quality Control Plan (DQCP) to achieve design excellence. This plan is based on implementing best practices identified through our vast experience and applying those best practices with the project goals and crucial decisions in mind. In addition to the checks, balances, and certifications typically used for design-build projects, we will implement the following specific features: **Preferred Teaming Selection:** The firms and key staff for the CGI Team have been specifically selected for their proven ability to produce design excellence on similar projects, and their understanding of the design-build process. Our key staff have design-build expertise with significant SHA experience obtaining the full range of environmental approvals and permits. Our subconsultants will be active members of our Team and will be fully engaged in the QA/QC program. **Independent Over the Shoulder Reviews:** In addition to formal QA/QC plan reviews, our Team will use frequent over-the-shoulder reviews to verify contract conformance and design quality. These reviews will be performed by independent staff not actively engaged in performing the work. **Constructability and Environmental Reviews:** As leaders in the design-build industry, our Team members understand that a major component of design excellence includes providing plans that are easily constructed with minimal impacts to environmental resources, stakeholders and constituent mobility. Our leadership will exercise good judgment and reliable decision-making to ensure that the design supports the construction means and methods, work sequencing, and environmental compliance and restrictions. **MDE/PRD/Permitting Agency Reviews:** The CGI Team will schedule sufficient time in the design process to allow for MDE, PRD, and other agencies to review and approve plans and issue permit authorizations. The CGI Team will actively build on existing relationships with these agencies during the design QA/QC process to ensure concerns are met. **DQCP Certifications:** Design packages will not

be released for construction without a DQCP Certification. This certification ensures that all elements to be constructed have been designed in conformance with the DQCP and meet SHA expectations. The work flow and key element descriptions that follow demonstrate how our DQCP has been optimized to improve quality and efficiency.





**Coordination and Decision-Making** - The CGI Team will focus on proactively identifying all stakeholders to ensure feedback is incorporated into the project. Individual Task Force Leaders will be responsible for identifying and facilitating all necessary coordination activities. To accommodate specific issues, stakeholders, review authorities, or other adjacent projects, the CGI Team will conduct meetings or attend meetings held by others to achieve appropriate levels of coordination. **Coordination with SHA:** SHA will be an integral partner in the continued development and construction of the improvements by participating in monthly Partnering Meetings and individual Task Force meetings, as necessary. **Coordination between Construction and Design Teams:** Our design and construction staff will rely on the close working relationship we have built together from recent shared project endeavors (I-270 ICM Progressive Design Build and MDTA Outfall Repair). The collaborative work ethic built during these prior successful pursuits and strengthened during this proposal process will be maintained and further enhanced upon contract award. The CGI Construction and Design Teams will organize bi-weekly task force meetings to collaborate and discuss constructability issues, risk analysis, schedule and project needs. **Interdisciplinary Coordination:** The Task Force Leaders will ensure consistent coordination and frequent collaboration between disciplines, in addition to attendance at bi-weekly task force meetings and partnering meetings. Task Force Leaders will be empowered to resolve issues quickly and to involve SHA/Permit Authority stakeholders, as required. **Environmental Permits and Third-Party Coordination:** We will use a tracking matrix to identify and track all environmental permits and approvals along with any necessary third-party coordination elements. The tracking matrix will identify the following elements for each BMP and/or structure number: required permits, permit linkages/hierarchy, projected and actual submittal dates, and anticipated review periods. **Decision Making Plan:** We will develop a decision-making plan early in the process in collaboration with SHA to ensure rapid issue resolution.

**Right-of-Way Acquisition** - The CGI Team has specifically selected outfall and SWM Retrofit locations that will remain within the existing ROW, or any existing easement. If unexpected ROW impacts arise, our Team is prepared (and experienced in) assisting SHA with the property acquisition.

**Change Management - Design Period Changes:** Our approach to change management is to identify all project risks early and mitigate and/or minimize potential changes. As a lump-sum design-built contract, our Team does not anticipate changes within the scope of work, and we have integrated the components identified in the scope into our cost proposal. We will proactively coordinate with all project stakeholders through partnering to prevent and reduce the risk of changes outside of the scope. However, changes in the scope may arise through stakeholder requests during partnering, unforeseen changes to design and/or credit accounting standards. Necessary approvals will be obtained prior to integrating any scope change regarding design or construction. The CGI Team will review any potential change with SHA to collectively agree on the most advantageous project solutions. **Construction Period Changes:** If changes occur during construction, our Team will work with SHA to identify an appropriate resolution prior to any change to the approved "Released for Construction" (RFC) documents. Once the change and associated solution are defined, our Design Project Manager will acquire all required SHA and/or third-party approvals by preparing and submitting through the Construction Manager, a redline revision to SHA's Project Engineer (via OED-Toolkit), for review and approval by the necessary SHA staff and/or third-parties. Only construction drawings that are stamped as RFC will be used for construction. **As-Built Drawings:** During construction, all RFC plans will be updated in accordance with all field changes and field surveys. Additionally, all redline revisions will be integrated into as-built drawings. After review and approval by our Construction Manager and Design-Build Project Manager, each set of RFC plans will be incorporated into an overall set of consecutively numbered as-built drawings, then submitted to SHA for review and approval. Upon approval, a hard copy of the signed and sealed set of as-built drawings will be submitted to SHA and posted electronically to ProjectWise. The SWM Facility as-builts will be submitted separately (via OED-Toolkit) and in accordance with Section 3.05.15.5 of the RFP.



