VOLUME I: TECHNICAL PROPOSAL

ROUTE 606
LOUDOUN COUNTY
PARKWAY/OLD OX ROAD
RECONSTRUCTION AND WIDENING

STATE PROJECT NO.: 0606-053-983
FEDERAL PROJECT NO.: STP-5A01 (165)
CONTRACT ID NO.: C00097529DB64

MARCH 24, 2014
March 24, 2014

Mr. John C. Daoulas, P.E.
Alternate Project Delivery Office
Virginia Department of Transportation
1401 East Broad Street
Richmond, Virginia 23219

RE: Route 606 Loudoun County Parkway/Old Ox Road Reconstruction and Widening
State Project No.: 0606-053-983; Federal Project No.: STP-5A01 (165);
Contract ID Number: C00097529DB64

Dear Mr. Daoulas:

The Lane Construction Corporation (LANE) is pleased to present our Technical Proposal for the above referenced Design-Build project. Our response contains all information requested in the RFP dated November 26, 2013 and Addendum No. 1. LANE is teamed with Johnson, Mirriran & Thompson, Inc. (JMT), Lead Design Consultant, to provide the Virginia Department of Transportation (VDOT) a team with a solid reputation for completing complex projects innovatively, on time, and often ahead of schedule. Our Team’s experience enables us to deliver a high quality and technically-sound project that VDOT and the public deserve.

4.1.1 Offeror’s Full Legal Name and Address:
The Lane Construction Corporation
90 Fieldstone Court
Cheshire, CT 06410

4.1.2 Declaration of Intent: It is the Offeror’s intent, if selected, to enter into a contract with VDOT for the Project in accordance with the terms of this respective RFP.

4.1.3 120 Day Declaration: Pursuant to Part 1, Section 8.2, we declare that the offer represented by the Technical Proposal will remain in full force and effect for one hundred twenty (120) days after the date of the Technical Proposal is actually submitted to VDOT.

4.1.4 Offeror’s Point of Contact Information: Mr. Richard A. McDonough is the authorized representative and point of contact for the LANE team for all matters associated with this qualifications submittal.

Richard A. McDonough, Senior National Pursuits Manager
14500 Avion Parkway, Suite 200
Chantilly, VA 20151
Tel: (703) 222-5670 Fax: (703) 222-5960
Email: RAMcdonough@laneconstruct.com

4.1.5 Offeror’s Principal Officer Information: Mr. Mark A. Schiller is a Principal Officer of LANE.

Mark A. Schiller, Senior Vice President
14500 Avion Parkway, Suite 200
Chantilly, VA 20151
Tel: (703) 222-5670 Fax: (703) 222-5960
Email: MASchiller@laneconstruct.com
4.1.6 Final Completion Date: In accordance with RFP Section 2.3.1, LANE proposes a final completion date of September 8, 2017.

4.1.7 Proposal Payment Agreement: An executed Proposal Payment Agreement (Attachment 9.3.1) can be found in the Appendix of Volume 1.

4.1.8 Certification Regarding Debarment Forms: Certifications for Debarment for both Primary and Lower Tier Transactions have been completed and executed for the Offeror and all subconsultants, subcontractors, and other entities as identified as members of the LANE Team. These can be found in the Appendix of Volume 1.

4.1.9 Written Statement of Compliance: LANE’s Technical Proposal is fully compliant with the Design Criteria Table included in the RFP Technical Requirements (Part 2) as Attachment 2.2 and all other requirements of this RFP. LANE certifies the proposed limits of construction, to include all stormwater management facilities, are located within the right-of-way limits shown on the RFP plans with the exception of permanent and temporary easements. LANE’s design concept does not require Design Exceptions and/or Design Waivers unless they are identified or included in the RFP or Addendum.

The LANE Team appreciates the opportunity to propose on this critically important project. We look forward to partnering with VDOT to make the Route 606 Loudoun County Parkway/Old Ox Road Reconstruction and Widening project a landmark success for the citizens of Virginia.

Respectfully submitted,

[Signature]

Richard A. McDonough
Senior National Pursuits Manager
The Lane Construction Corporation
4.2 OFFEROR’S QUALIFICATIONS

4.2.1 Confirmation of SOQ Information
LANE confirms all information presented in the Statement of Qualifications (SOQ) remains true and accurate in accordance with Part 1, Section 11.4. As demonstrated in the organizational chart presented on the following page, the Team proposed by LANE, including but not limited to our organizational structure, lead contractor, lead designer, key personnel, and other individuals identified pursuant to Part 1, Section 4.2, will remain intact for the duration of the contract.

4.2.2 Organizational Chart
Under the leadership of our Design-Build Manager, Mr. Robert Portley, the LANE Team is structured to effectively manage and deliver the design and construction of this project. The LANE Team is organized to provide VDOT with a single-source point of contact, responsible for all design and construction activities. Our team organization has a straightforward chain of command, with individual tasks and functional responsibilities clearly identified. This organizational chart identifies key personnel and major functions to be performed for the successful management, design, and construction of the project. Though reporting relationships are rigid, the lines of communication within the team will remain fluid and flexible to meet the requirements of each individual project task. In order to prevent unnecessary project delays, at times it may be prudent for other members within the LANE Team to communicate directly with their counterparts at VDOT. This will be directed and authorized in advance by Mr. Portley and the VDOT Project Manager.
4.2 Offeror’s Qualifications

VDOT

Route 606 Reconstruction and Widening

Third Parties
- Loudoun County
- MWAA
- NOAA
- FAA
- Commercial and Residential Property Owners
- Utility Owners
- Adjacent Roadway Projects

Public Relations Manager
- Tim Kelleher, PE (JMT)

Design Build Project Manager
- Robert Fortley (LANE)

Safety Manager
- Doug Russell (LANE)

Quality Assurance Manager
- John Vicinski, PE (QCS)

Quality Assurance Inspector
- Ahmed Hamdan (QCS)

AMRL Certified QA Lab
- Froehling & Robertson, Inc.

Design Manager
- Bob Reed, PE (JMT)

Construction Manager
- Robert Cross (LANE)

Roadway/Dam Superintendent
- Dennis Rodkey (LANE)

Utility Relocation Manager
- Wayne Lindsey (LANE)

MOT Manager
- David Holmes (LANE)

Subcontractors
- Subcontractors and DBE/SWAM Firms

Design QA
- Bill Schaub, PE (JMT)

Design QC
- Lee Prietolas, PE (JMT)

Lead Geotechnical Engineer
- Ted Lewis, PE (GEO)

Dam Design Specialist
- Mike Leffler, PE (JMT)

Utilities
- Barry Jones, LS (JMT)

Dam Hydraulics
- Paul Clement, PE (JMT)

Environmental
- Ian Frost, CE, AICP (EEE)

Drainage
- Dong Zhao, PE (RJM)

Surveys
- Mike Zuniga, LS, PE (JMT)

Roadway
- Rodney Hayzlett, PE (JMT)

Subsurface Utility Exploration
- Gary Campbell, PE (JMT)

Structures
- Trip Phaup, PE (JMT)

Right of Way
- Lee Cooper, PE, SR/WA (JMT)

Traffic/TMP
- Randy Buice, PE (JMT)

Fee Appraiser
- V. Lynn Kelsey

Review Appraiser
- Appraisal Review Specialists

QC Manager
- Dave Colbert (LANE)

AMRL Certified QC Lab
- GeoConcepts

Dam QC Inspector
- Rebecca Smith-Zakowicz (GEO)

Bridge/Roadway QC Inspectors
- LANE/Subconsultants

Legend
- Reporting Lines
- Communication/Coordination Lines
- Key Personnel
- LANE Personnel/Subcontractors
- JMT Personnel/Subcontractors
- Independent QAM Personnel
4.3 DESIGN CONCEPT

4.3.1 Conceptual Roadway Plans

The LANE Team has made frequent site visits to the project site which is located in close proximity to both our construction and design offices in Northern Virginia. We have attended all planned VDOT meetings on the project and have met with affected utility owners to address impacts to their facilities as a result of this project. The concept presented in our Technical Proposal fully complies with, and meets or exceeds, the Roadway and Dam Design Criteria included as Attachments to the RFP Technical Requirements (Part 2), and all other requirements of this RFP, the Addendum, and other related technical communications from VDOT. Our understanding of these criteria and requirements are provided in more detail in our concept and approach descriptions.

The LANE Team concept has been developed to provide benefits in safety and operations both during construction and over the long term. Additionally, our concept helps to reduce the costs of future expansions and reduce maintenance while promoting public acceptance. The LANE Team certifies that the proposed limits of construction, including the stormwater management facilities, are located within the right-of-way (ROW) limits shown on the RFP plans or Addendum with the exception of permanent and temporary easements. Our concept does not require Design Exceptions and/or Design Waivers unless they are identified or included in the RFP or Addendum.

Volume II of our Technical Proposal contains the 11”x17” Conceptual Project Plans. To further explain our concept and each benefit to the Project, we have provided a narrative addressing the required elements in the RFP.

4.3.1(a) General Geometry

The LANE Team has developed a proposed design for this project meeting the requirements of the RFP. Our innovative and cost effective concept provides the same traffic operations as the RFP design while minimizing impacts to the public during the construction. This concept also greatly reduces the construction impacts and cost to implement the Ultimate Typical Section planned for the future. Our concept incorporates the elements of both Phase A and Phase B to provide the requested infrastructure for vehicular, pedestrian, and bicycle traffic. This proposed concept provides VDOT and the traveling public with the best current and future value alternative.

The project reconstructs the existing 2-lane rural collector roadway into a 4-lane divided Urban Minor Arterial; which increases the roadway capacity and improves safety. The project extends from south of Route 621 to south of Route 267 Dulles Greenway - a total length of over 5 miles. Intersections will be reconfigured as shown in the Concept Plans with provisions made to allow connections for future roads. The project includes separate design plans for the shared-use path (Phase B) and its potential construction within this contract. The shared-use path along the north side of the proposed Route 606 alignment will be located horizontally in the Ultimate Location, based on the RFP Conceptual Plans Ultimate Typical Section.

The roadway design on the RFP Conceptual Plans near Horsepen Dam, roughly Sta 329+00 to 359+00, which is owned by MWAA, is firmly established and is a key component of the dam alterations. The LANE Team’s concept in the dam area matches the design provided in the RFP Conceptual Design Plans.

4.3.1(b) Horizontal Alignments

The LANE Team has reviewed all of the RFP requirements to develop the horizontal geometry of the roadways within the project. This includes the revisions made as part of Addendum 1. Our proposed horizontal geometry generally follows the horizontal geometry provided in the RFP Conceptual Plans and allows for the proposed roadway typical section to be contained within the proposed ROW provided for the project, and as shown on the RFP Conceptual Plans.
4.3.1(c) Maximum and Minimum Grades for all Segments and Connectors

The LANE Team reviewed the provided roadway vertical geometry and has made adjustments to the RFP roadway profiles, applying the required maximum and minimum grades for the roadway classification as required by the RFP and AASHTO/VDOT criteria. Slight modifications are applied to minimize the project’s earthwork requirements and footprint. This unique design provides vertical geometry that is in conformance with all AASHTO/VDOT criteria for the given design speed for each roadway. The minimum grade for all roadways is 0.5% as required.

4.3.1(d) Typical Sections of all Roadway Segments and Connectors

The LANE Team refined the roadway typical sections provided on the RFP Plans which shows a Route 606 Interim Section to be constructed and a future Ultimate Typical Section showing 8 lanes. The RFP Interim Section would have constructed the center two lanes in each direction of the ultimate eight-lane typical section, and would have been an open section roadway with paved shoulders and a depressed, grass median. Under this scenario, constructing the future Ultimate Section would require widening of the roadway on both the median and outer sides of the roadway. This future construction would result in significant impacts to the safety and traffic operations of the traveling public.

The LANE Team studied various alternative concepts to better address the project’s construction impacts now and in the future. **The LANE Team proposes to construct the two interior lanes in each direction of the Ultimate 8-Lane Typical.** The proposed typical section includes a curbed, raised grass median and an open section with 8-foot paved shoulders on the outside. By constructing the LANE Team’s innovative concept, the proposed median and interior two lanes of the ultimate typical section will be constructed now. This provides the ultimate median section including median drainage and cross culverts requirements and offers drivers a roadway similar to what exists on adjacent sections of Route 606. By constructing the Interim Section as proposed by the LANE Team, future construction of the Ultimate Section would only require widening to the outside to complete the Ultimate Typical Section. This eliminates the need for future construction on both sides of traffic and significantly reduces the impacts to maintain future traffic. This provides a major benefit in safety and operations for drivers. The LANE typical section eliminates the need for “throw-away” work that would need to be completely reconstructed in the median of Route 606 (as previously required in the RFP Interim Typical Section). Our typical section not only provides a current future cost effective solution, but also the narrowed width of our typical section will reduce the footprint of the proposed roadway which reduces stormwater management requirements. Future VDOT maintenance will be lessened due to the reduced need for stormwater management, less pavement area, and the provision of a more stable edge on the median side of the pavement.

The LANE Team’s modified typical section extends from the western project limits along the Loudoun County Parkway to just east of Commerce Center Court. From this point to the eastern project limits, the LANE Team’s conceptual design matches the proposed typical section shown on the RFP Conceptual Plans and meets the strict RFP requirements over the Horsepen Dam.

4.3.1(e) Conceptual Hydraulic Design (Drainage, ESC, SWM, SWPPP, H&HA and Scour)

**Roadway Hydraulics.** The LANE concept will design and construct drainage as directed in the RFP and in the VDOT Drainage Manual. Our concept will accommodate a 25-year storm for most components and a 10-year storm for identified lesser streets.

The LANE Team reviewed the proposed major drainage design as shown on the RFP plans and developed a preliminary roadway drainage concept based on our roadway concept. The drainage concept generally consists of a closed storm drain system in the median with curb-opening inlets and storm sewer pipe and an open storm drain system along the outside shoulders using grass lined ditches. In addition, the drainage system will include cross culverts, ditch inlets and bridge deck assemblies and structures. Drainage structure locations provide ease of access for maintenance and provide an outlet with adequate freeboard for under-drain outfalls. Storm drain systems consider, to the extent practicable, the existing conveyance pattern of runoff and convey runoff to
Route 606 Reconstruction and Widening

proposed Stormwater Management (SWM) Best Management Practices (BMPs). Profiles will be provided for storm drains.

Per the RFP, the LANE Team will replace all existing drainage pipes and culverts within the project limits. Following project award the LANE Team will investigate the serviceability and functionality of the affected existing pipes and culverts as detailed in the RFP. If the LANE Team finds existing pipes or culverts in usable or repairable condition the LANE Team will only use the existing pipes or culverts with VDOT approval.

The LANE Team has performed a preliminary analysis to determine the SWM needs for the project. The revised roadway configuration proposes less impervious area than the RFP design thereby reducing the anticipated SWM requirements. We will use Extended Detention Basins for nine (9) of the proposed SWM locations (A – I), Retention Basins for four (4) locations (J – M) and a Bioretention facility (N) as identified in the RFP. Our Team intends use available water quality credits within Horsepen Lake to help meet SWM requirements. In addition, the LANE Team will seek the purchase of nutrient credits as an alternative to Basin H (~80 lbs. of phosphorus are currently commercially available) in order to decrease significant impacts to wetlands and streams at the pond site. Additional benefits to this approach include a reduction in visual impacts as well as health and safety concerns for the adjacent residential housing development to the north, the commercial development (including a day care facility) to the south and Dulles Airport to the east.

Effective use of stormwater management practices will minimize adverse effects to downstream receiving channels and natural drainage systems outside the project limits by controlling increases in pollutants, discharge, runoff volume and erosion thereby protecting aquatic resources. Additional features required for each SWM facility include an access roadway, perimeter chainlink fence/access gate, and riprap lining around the facility perimeter. A wire grid system will be installed as required over the footprint of wet facilities to deter birds from accessing permanent standing water.

The LANE Team will construct the project according to an approved Stormwater Pollution Prevention Plan (SWPPP) incorporating phased erosion and sediment controls. Compliance with MS-19 will be documented. Roadway drainage will have temporary elements to handle the various construction phases to minimize traffic safety hazards associated with flooding risks and ponding of water.

Dam Hydraulics, Bridge Hydraulics & Scour. A preliminary Design Report for the Construction or Alteration of the Horsepen Dam was submitted to DCR by MWAA (the owner of the dam) along with supporting reports that established the understanding between MWAA, VDOT and DCR regarding the proposed alterations to the Horsepen Dam. The permitting agency, DCR found the documents acceptable in their response letter dated July 23, 2013 with a further stipulation that the proposed bridge over the emergency spillway including its piers and foundations should be designed to be safe at the spillway design flood and the worst loading condition. The Alteration Permit would be processed after submittal of the final versions of these documents.

The Horsepen Dam is currently conditionally permitted as a Low Hazard Dam; the alteration permit will reflect the upgrade of this permit to a High Hazard Permit. The changes required to meet this upgrade to a High Hazard Permit include:

- Designing for Probable Maximum Precipitation (PMP) – which is 28 inches of rainfall over 6 hours.
- Raising the crest of the dam to exceed the ponding level for the PMP
- Increasing the mass of the dam
- Extending the principal spillway with no resulting changes to the current design ponding elevations as controlled by the pond riser structure or the secondary control due to the double-box outlet culvert.
- Bridging the emergency spillway so that upgraded Route 606 is not overtopped by the design storm, the full PMP flow in the emergency spillway is conveyed with the 0.8 PMP conveyed below the low chord of the bridge, and structurally designing the bridge and its foundations to resist the full PMP flow conditions.

The LANE Team reviewed the provided HEC-RAS model (attachment to RFP) to assess the proposed conditions hydraulics through the proposed bridge spanning the Horsepen Dam emergency spillway. Results
of this model were used to estimate preliminary scour potential for the bridge abutments and pier as well as the retaining walls RW-1, RW-3, and RW-4. Final predicted scour elevations will be coordinated with the additional geotechnical requirements for minimum scour elevations as defined in the RFP. The LANE concept will address the elements discussed above to obtain final approval of the Alteration Permit.

4.3.1(f) Proposed Right of Way Limits
The LANE Team’s concept will be wholly contained within the ROW limits for Phase A or Phase B work shown on the RFP Conceptual Plans, with the exception of temporary and permanent easements (other than permanent drainage easements for stormwater management facilities). Total impacts to MWAA property will be less than 40 acres.

4.3.1(g) Sound Wall Locations
Sound walls will be located as shown in the RFP Plans. These proposed barriers will consist of precast concrete panels between concrete or steel posts. The posts will be supported by cast-in-place concrete drilled shafts spaced at 20 ft. to 24 ft. Barriers will have a sound absorptive finish on the roadway side. If deviations to vertical or horizontal alignment are recognized, the LANE team will conduct additional noise analysis which will be submitted for review and approval.

4.3.1(h) Other Key Project Features

Geotechnical Materials and Construction

Subsurface Conditions- Our concept incorporates geotechnical techniques to address issues related to unsuitable soils in the construction zone. Soils considered to be unsuitable due to moisture content will be dried in place prior to compaction. Soils classified as CH, MH, OH and OL would be modified to provide suitable CBR for construction.

Cut and fill slopes will be designed to be no steeper than 2H:1V unless project limits require the slopes to be steeper. If slopes need to be steeper than 2H:1V their design will be supported by engineering analyses including global stability. Geotechnical designs will be performed in accordance with Chapter III of the VDOT Materials Division’s Manual of Instructions.

Pavement- The minimum pavement sections provided in the RFP have been evaluated and are expected to meet the needs of this project.

Dam Embankment- Existing Horsepen Dam will be modified to accommodate the widening of the roadway. The LANE Team has established close coordination between the contractor, geotechnical, dam, structural and hydraulic engineers and MWAA representatives for this crucial work. The modifications to the dam will be performed in accordance RFP plans and documents.

Modifications to the dam include the following: Extend the downstream toe and double cell box principal spillway, raise the height of the dam, remove and replace existing double-box culvert for a distance of approximately 60 feet, build retaining walls on the crest of the dam and downstream toe, and construct bridges over the emergency spillway. These modifications are made even more challenging by the need to maintain the permanent pool within Horsepen Lake. The design of the temporary support of excavation as well as the final design for the culvert replacement will provide for seepage control measures, such as internal filters, to collect and discharge the seepage, so it should not impact the integrity of the dam.

The LANE Team will design and construct the Horsepen Dam alterations in full compliance with the current understanding among MWAA, VDOT and DCR. The LANE Team will prepare signed and sealed final versions of the corresponding documents to confirm and establish the final plans to be used for construction of the alterations. Modifications to the dam will be closely monitored by the LANE Team engineer with access provided to MWAA representatives as needed during this crucial work. The LANE Team will submit the final application and associated documents to obtain the DCR permit for the alterations to the dam.
Anticipated Design Exceptions and Waivers and Access Management Waivers

The RFP identified design exceptions, design waivers, and access management waivers required for the final design. The LANE Team anticipates that they will be approved by VDOT. We will document and submit the requests relative to the proposed final design in accordance with the VDOT I&IM LD-227 and S&B 70. No other exceptions or waivers are required for the LANE concept. The RFP listed the following:

- **Design Exceptions:** Mercure Circle South profile – grade break greater than 1%.

- **Design Waivers:**
  - Route 606 at Overland Drive – median cross slope greater than 3%.
  - Route 606 at Thunder Road/Mercure Circle South – median cross slope greater than 3%.

- **Access Management Waivers:** Along Trade Center Place for substandard corner clearance.

### 4.3.2 Conceptual Structural Plans and Description

The LANE Team has thoroughly reviewed the project information and investigated a number of bridge alternatives from both design, construction, and continued maintenance perspectives. The alternatives evaluated various structural alternates for materials and bridge span arrangements.

#### Bridges and Structures

Bridges B687 and B686, will be a 2-span continuous bridge using precast prestressed concrete beams (PCBT-69), with equal spans of 128'-4½", a total length of 256'-9". In Phase A, the bridge B686 superstructure will provide one VDOT BR27C-12 concrete parapet with steel railing, one inside shoulder, two 12’ lanes, one ramp lane, one outside shoulder, and one VDOT BR27C-12 concrete parapet with steel railing. In Phase A, the bridge B687 superstructure will provide a deck overhang to tie into Phase B construction, one VDOT BR27C-13 concrete parapet with steel railing, one outside shoulder, one ramp lane, two 12’ lanes, one inside shoulder, and one VDOT BR27C-12 concrete parapet with steel railing. A Type B pedestrian fence will be mounted to the BR27C-13 and BR27C-12 concrete parapets. In Phase B, the bridge will be widened to accommodate a shared use path and concrete fascia curb with a Type C pedestrian fence along the north side of Route 606. The prestressed concrete beams will support a 9” reinforced concrete deck. The beams at the abutments and piers will be placed on laminated elastomeric bearing pads, which require less maintenance than steel bearings.

In Phase A, the proposed abutments and piers will be constructed so as to accommodate Phase B superstructure widening for a shared use path along the north side of Route 606, and a superstructure widening for one additional future lane in each direction of Route 606. Both abutments will be cast-in-place reinforced concrete cantilever abutments with deck slab extensions, founded on concrete drilled shafts.

The pier for each bridge will consist of a low permeability reinforced concrete pier stem wall supporting a concrete cap. The pier stem wall will be founded on concrete drilled shafts.

The proposed bridges will be designed to meet the hydraulic load conditions produced by the Probable Maximum Precipitation event required for the emergency spillway. The LANE Team will deliver to VDOT a final Hydrologic and Hydraulic Analysis and a final Scour Analysis for the proposed bridge design.

Approach slabs will be used to span the abutment backfill zone to eliminate bumps that are typically caused by differential settlement occurring post construction behind standard backwalls. The approach slabs will be reinforced, cast-in-place concrete slabs, with one end resting on the abutment backwall and the other end resting on compacted embankment material, with a length of 20 feet measured along the construction baseline.

#### Aesthetics

The LANE Team will work with VDOT to include context sensitive aesthetic treatments on the Sound Barrier Walls, Retaining Walls, and applicable Bridge elements based on VDOT Guidelines and Special Provisions.

#### Design Life Considerations and Maintenance Expectations

The proposed bridges incorporate innovative features that will contribute to a long design life for the structure while at the same time providing a facility that will require minimum maintenance including:
• Precast prestressed concrete for the superstructure on both bridges - eliminates future maintenance costs related to repainting superstructure elements when compared to a steel structure.

• Laminated elastomeric bearing pads to support precast prestressed beams – virtually maintenance-free, consisting only of a steel sole plate and laminated elastomeric pad.

• Low permeability concrete – meets current VDOT Special Provisions to reduce salt intrusion.

• Corrosion resistant reinforcement – used in accordance with VDOT’s Structure and Bridge Division Instructional and Informational Memorandum IIM - S&B – 81.

• Approach slabs – spanning the abutment backfill zones and minimizing maintenance activities related to the bump caused by differential settlement.

• LRFD Design – promotes superior serviceability and long-term maintainability; provides robust structures with longer service lives and reduced need for major maintenance.

**Proposed Bridge Foundations and Design Parameters.** Based on the subsurface conditions including the soil, underlying rock and the scour conditions at the site, it appears that a deep foundation system is the most suited and economical option to support the bridge abutments and piers. The deep foundation alternatives considered consist of piles or drilled shafts extended below the depth of scour and designing the piles or shafts as unsupported columns for the scour condition. Installing piles or shafts below the depth of scour and providing sufficient embedment for unsupported stability will require that the piles or shafts be socketed into highly weathered rock or bedrock. It will therefore not be possible to install piles by driving. Augured piles and drilled shafts were evaluated; it was determined that it should be more cost efficient and quicker to support the bridges on drilled shafts.

**Horsepen Dam Principal Spillway.** As noted in the RFP, the project will include partial removal, partial replacement, and extension of the concrete box culvert that functions as the dam’s principal spillway. VDOT Standards for Double Box Culverts will be used for new and replacement sections of the double box culvert.

**Retaining Walls.** Retaining Walls RW-1, RW-3 and RW-4 will be cast-in-place concrete cantilever walls. Retaining Wall RW-2 will be a Mechanically Stabilized Earth (MSE) retaining wall. Retaining Wall RW-1 will include a BR27C-12 concrete parapet with steel railing and a BR27C series Type B pedestrian fence mounted to the concrete parapet. Retaining Wall RW-2 will include a BR27C-14 concrete parapet with steel railing. Retaining Walls RW-3 and RW-4 will include a Standard HR-1 handrail. Only retaining walls presenting an essentially vertical concrete face will be used. All components of the retaining walls will be contained within VDOT’s proposed ROW.
4.4 PROJECT APPROACH

The LANE Team has developed a thorough project approach to systematically navigate from start to completion, the planning, design, construction and closeout activities that will occur. All aspects of these four main elements that are part of Phase A and Phase B of the project will receive the utmost attention from our team’s experienced design and construction professionals as they are planned and executed. As this is a highly visible project, emphasis will be made in minimizing the project duration, maximizing efficiency in the aforementioned activities and, at all times, ensuring that the road users and the stakeholders affected by the project are in no manner disrupted while traversing what we expect to be a clearly defined and professionally staged and constructed project. Furthermore the operations associated with the subsequently discussed Utilities (4.4.1), Geotechnical (4.4.2) and QA/QC (4.4.3) will assume well defined and thoroughly executed processes as part of our approach to incorporate these important aspects of the project into the overall approach to the project.

Utilizing the insight and expertise of our team to develop the unique approach and typical section for this project as referenced in our Design Concept (4.3) and the associated plan submittal, we find ourselves able to provide several advantages to the Project. Namely reduced roadway footprint for the required lane configurations (now and in the ultimate build) and fewer utility impacts.

These results as well as other similar considerations given to the Route 606 Project will lead to overall savings significantly benefitting VDOT and the stakeholders.

The Geotechnical (4.4.2) and QA/QC (4.4.3) aspects of our approach will also include commentary regarding the bridges on the north end of the project as well as the modifications to the Horsepen Dam Outlet structure and embankment. Although Sequence of Construction (4.5.1) and Construction of Dam Modifications (4.5.3) will provide the details of these operations, our approach considers the bridge and dam work highly complex components of the project to the point that during the RFP and preliminary design phases they were both given dedicated planning sessions involving the several of the key personnel to be involved in these operations.

By evaluating other aspects of the project such as permitting, storm drainage, MOT and earthwork, in a similar manner, our approach leads us to a better understanding of the project and we feel certain that what may likely have been a significant challenge or risk in plan or construction can now be handled in a routine manner.

4.4.1 Utilities

Identification of Utilities

The LANE Team will identify all known utilities and underground obstructions within the project area that may potentially be impact the construction operations. The LANE Team investigation has determined that most of the utilities anticipated on the project appear to be represented on the utility mosaic supplied. All utilities will be further verified by field investigations during the design phase and verified prior to construction.

The Utility Coordinator will be responsible for coordination between the Design Team and Construction Team and all utilities determined to have facilities affected by the construction. This is important as each utility has its own distinct set of protocols for construction of facility relocations.

The LANE Team proposes a pro-active and partnering approach with utility owners to ensure that conflicts are identified and resolved in a timely fashion that does not delay the project. Our pro-active approach will also ensure that any relocations required are “reasonable” and do not present conditions or limitations that negatively impact the constructability of the project.

The key to LANE’s success with utility companies is attributed to effective and early communication with all parties. Our Team’s personnel are familiar with key personnel at the various regulatory agencies, county, and utility companies involved in this project due to our recent experience on various transportation projects.
Utility Coordination

The LANE Team has longstanding relationships with the facility owners within the project area and realizes the importance of coordination with them during the life of the project. The LANE Team’s Utility Relocation Manager, Wayne Lindsey, will coordinate utility relocation efforts through design and construction, and ensure the relocation agreements and engineering are completed in order to be incorporated in the design and permit documents. A Utility Relocation Conflict Plan will be developed depicting existing and proposed utility alignments and any horizontal conflicts. The LANE Team pre-bid utility relocation research, meetings with Utility owners and field investigations has identified several major utility installations in conflict with construction and needing relocation; these include water, communications, gas and electric.

The LANE Team realizes that utility relocation issues are challenging due to schedule pressure and third party priorities. We are aware that some utility owners have plans for betterments of their facilities and have not included these costs in our bid.

LANE has developed a utility matrix to prioritize and track utilities to be relocated from the design stage through to as-built verification. Persistence and communications with all utility companies and timely delivery of plans are key in successful relocations and construction scheduling. Utility owners will be invited to LANE’s

<table>
<thead>
<tr>
<th>Utility/Owner</th>
<th>Public/ Private</th>
<th>Contact Person</th>
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partnering and constructability review sessions.

Utility Design - Proposed Utility Impacts
JMT’s Subsurface Utility Engineering (SUE) relationship with VDOT and utility owners during its mapping and conflict resolution of utilities is a significant indicator of the level of service that can be expected on this contract. We have contacted 16 facility owners that were within the grid search finding that 11 are in potential conflict. Our Preliminary Utility Matrix documenting our initial utility conflict review is located on the previous page. This review is based on meetings with and/or records obtained from utility companies as well as information contained in the RFP and compared to our proposed design.

Information gained from record research and our pre-proposal meetings with the utilities point of contact have provided valuable insight to determine which utility conflicts can be avoided through design alternates, which utilities must be relocated or where conflict resolution is required. The LANE Team will make all reasonable efforts to design the project to avoid conflicts and/or minimize impacts on existing utilities.

Concept Development and Design Phase - After receiving the Notice-to-Proceed, the Team will verify that the utilities shown on the preliminary plans are correct by field designation, conduct additional record research if required and meet with facility owners. JMT will augment the subsurface utility explorations information provided with the RFP. Test holes will be located and vacuum excavation will be performed and the results documented and used by our in-house staff as needed. The LANE Team will conduct a Utility Field Inspection (UFI) with all utility owners invited to discuss the project. UT-9 forms will be provided to each utility owner to assist in resolving relocation questions and determining relocation costs. A goal of the UFI will be the resolution of “prior rights”. Immediately following the UFI, design of utility relocation plans will commence. The LANE Team will review all utility relocation plans to ensure that relocations comply with the VDOT Utilities Manual of Instruction, Utility Relocation Policies and Procedures and VDOT’s Land Use Permit Manual. The LANE Team’s review of relocations will include analysis that there are no conflicts with the proposed roadway improvements, as well as verify that there are no conflicts between each of the utility’s relocation plans. Within 120 days of the Notice to Proceed the LANE Team will submit a preliminary utility status report identifying all utilities within the project limits; a conflict evaluation and cost responsibility determination for each utility. This report shall include copies of existing easements, as-built plans or other supporting documentation that substantiates any compensable rights of the utility. Relocation plans will be submitted to VDOT for review and approval as required. After approval each utility owner will be notified in writing that relocations can begin. The LANE Team will proactively coordinate with the utility owners to verify relocations and/or adjustments necessary are in accordance with the approved design plans. The Team will continuously monitor the progress to ensure that the schedule is met.

Final Completion Phase - The LANE Team will certify to VDOT that all conflicts have been resolved and relocations completed per VDOT and utility owner requirements. As-built plans indicating the final location of all utilities will be prepared. As part of the utility coordination and relocation efforts associated with this project and in accordance with the latest edition of VDOT’s Utility Manual of Instructions, the Team Utilities Manager or designee will update and maintain utility information in RUMS. Our Team includes multiple members who have the requisite access to RUMS. We will update RUMS to include items such as the date the Plan and Estimate was received and the estimated cost for the D-B Team, VDOT and the utility owners. The Utility Manager or designee will use RUMS for tracking the status of any utility easement acquisitions; both replacement and VDOT joint use. As each phase of the project is completed we will update RUMS.

The LANE Team has demonstrated experience in timely utility coordination, relocations and application of innovative design solutions to avoid relocations to the maximum extent possible. This is evident in the successful completion of our recent design-build projects that involved extensive utility relocations: the I-495 Express Utility Relocation.

LANE recently completed a $112M Dulles Metrorail Utility Relocation project near the Route 606 project. LANE’s familiarity and close coordination with the local utility companies (over 30) made this project a huge success.
Utility - Construction

With multiple overhead and underground utilities present, construction will proceed with careful planning to minimize service disruptions to utility customers and to allow the construction of the project to occur without delay. Frequent coordination with utility owners during construction will take place under the leadership of our Utility Relocation Manager so that a successful outcome is realized for this major element of this project. As construction begins, we will locate and designate precise locations of all existing utilities including service feeds with previously-provided location data, One-Call marking and if necessary, by using JMT’s in-house Subsurface Utility Exploration capabilities to generate supplemental utility location plans. All relocation and new installations will be coordinated with the construction sequence detailed in Section 4.5.1. Throughout construction, continuous coordination with utility owners will take place to promote the exploration of methods to control costs and improve and expedite utility construction. Management of utility construction being performed by facility owners or their subcontractors will also be included.

4.4.2 Geotechnical

Geotechnical Investigation and Engineering

Following a detailed review of existing reports and studies, the LANE Team will plan and conduct a supplemental subsurface investigation and perform geotechnical engineering analyses to provide geotechnical design recommendations for the pavements, foundations for bridge over the emergency spillway, retaining walls, slopes, noise barriers, and culverts; VDOT standards will be used. Geotechnical recommendations and design will be performed in accordance with Chapter 6 of VDOT Manual of Instructions (MOI), RFP Part 2 Sections 2.6 and 2.8 and Attachments 2.4 and 2.5 of the RFP. These analyses will be used to support the final design efforts and preparation of design drawings. Descriptions of the proposed technical approach for the subsurface investigation, geotechnical engineering analysis, and reports are given below.

Subsurface Investigation

The subsurface investigations will consist of performing test borings for the proposed roadways, slopes, Horsepen Dam modifications, bridges, retaining walls, noise barriers and major culverts. A Virginia registered professional geotechnical engineer with more than 30 years of pertinent experience with assistance from a professional geologist (AIPG) with more than 40 years of experience will oversee the subsurface investigation. The test borings and any in-situ testing will be inspected by engineering or geological personnel with at least five (5) years of experience.

Test borings will be performed to supplement the existing data in order to meet or exceed the requirements given in Chapter III of the VDOT MOI. The proposed borings will consist of standard penetration test (SPT) in accordance with the applicable VDOT, 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, and review of historic pavement condition survey information available from Loudoun County and VDOT.

VDOT Memorandum # MD 340-10 defines critical slopes as slopes that are greater than 25 feet high, slopes that affects or supports structures, impounds water, or whose failure would result in significant cost to repair or damage to private property. In order to investigate critical slopes and embankments borings are to be performed at a maximum spacing on the order of 200 feet per VDOT standards. Additional borings will be added as necessary should the field reconnaissance indicate condition and issues specific to each area.

The location of structure foundation borings including bridge over the Horsepen Dam Emergency Spillway was, noise walls, retaining walls, and Horsepen Dam Double-Box Culvert replacement will be determined by the
needs of the individual structure and discussions with the Dam and structural engineer. Test borings for the Horsepen Dam Emergency Spillway Bridge will be performed at each abutment and pier as necessary to augment and supplement the existing boring data. Boring spacing will be in accordance with Table 3.1 in Chapter 6 of VDOT’s MOI manual. Based on this manual, borings for the retaining and noise walls including existing borings will be performed on spacing of 100 and 200 feet, respectively or less. For the spillway replacement we plan on performing 2 borings to supplement the existing boring data, which meets VDOT requirements. Where borings for various structures and roadways overlap, efforts will be made so that the borings can serve dual purposes. All borings will be extended to depths as required by Table 3.1 in VDOT’s manual. Groundwater level measurements will be conducted while the borings are being performed, at the completion and where possible approximately 24 hours after completion of each boring. The need to immediately backfill borings in or near the existing pavement areas will require that they be exempted from measurement of the groundwater table after 24 hours.

Standard penetration tests (SPT) per ASTM D1586 with be performed in all borings with continuous sampling in the top 10 feet and every 5 feet thereafter. Rock coring will be performed to a depth of at least 10 feet below the bottom of the foundations or until suitable rock is encountered. Undisturbed Shelby tubes will be taken in clayey soils for shear and consolidation testing.

A minimum of three permanent water monitoring wells will be installed at STA 349+50 and 350+75 per Attachment 2.5 Section 2.5.12. Additional monitoring wells will be installed as necessitated by the design.

Dynamic Cone Penetrometer (DCP) tests per ASTM D 6951 are planned to be performed at all pavement borings. DCP test data can be used to determine the stability of the subgrade by estimating the in-situ CBR and shear strength of soil strata. The California Bearing Ratio (CBR) is then approximated from the DCP reading in accordance with the procedures outlined in ASTM D 6951.

Laboratory Testing

Laboratory testing will be performed on a sufficient number of representative samples recovered from the borings. The representative samples will be tested for natural moisture contents, AASHTO and USCS soil classifications, Moisture-Density relationships (Proctor, VTM-1), California Bearing Ratio (VTM-8) for pavement support characteristics. The natural moisture contents will be tested for all the soil samples collected. In addition, unconfined compressive tests on rock cores and direct shear and consolidation testing will be performed on representative samples to aid in determining soil and rock design parameters.

Potentially Unsuitable Soils

Based on field observations and preliminary reports, we expect that most of the pavement subgrades along portions of the alignment will be wet, and some will consist of either soft existing fill or highly plastic fat clay (CH) and elastic silt (MH) native soils. These soil types will require replacement or modification to be suitable for direct support of roadway embankment and pavement subgrades. To mitigate the potential for unsuitable soils, the LANE team will perform early phase geotechnical explorations to delineate the lateral extent and depth of unsuitable soils. The early phase exploration will focus on obtaining samples for laboratory testing to include natural moisture contents, Atterberg limits, Standard Proctor tests, CBR tests, and shrink-swell tests. The results of these tests will assist in taking proactive measures to deal with unsuitable soils in the early earthwork construction phase.

Moderate to High Potential for Corrosion of Concrete and Ferrous Materials (i.e. Iron and Steel)

The USDA-NRCS Web Soil Survey for Loudoun County, identifies 14 different soils types along the project alignment that have moderate to high potential for corrosion. To mitigate the potential adverse impact of the concrete and ferrous materials, the LANE team will perform early phase geotechnical exploration and obtain samples for laboratory testing of corrosion potential. Pipe material selection and cathodic protection for utilities will be considered.
Excavation of Shallow Bedrock

The proposed alignment crosses multiple geologic formations, most of which include relatively shallow bedrock. Excavations along the alignment may encounter intermediate geomaterials that contain relic features of the underlying rock. The soils and the intermediate geomaterials can typically be excavated with conventional earthwork equipment without ripping or blasting measures. However, a project risk exists if harder phases of intermediate geomaterials and bedrock are encountered that require ripping or blasting measures for excavation.

To mitigate the potential adverse impact of excavations in shallow bedrock, the LANE team will focus on delineating these shallow bedrock areas with a combination of test pits, test borings, and seismic refraction surveys in expected deep cut areas. Early identification of these areas reduces the risk to the critical path of the project by allowing for a much more efficient earthwork plan and mitigation measures to include specialized earthwork equipment, preparing blasting and ripping protection, etc.

Pavement Design and Analysis

Review of the preliminary geotechnical data shows that the top three (3) feet of the subgrade soils within the project limits consist of primarily LEAN CLAY (CL), SILTS (ML) and Clayey SAND (SC) soils. Based on the laboratory CBR values present in the Geotechnical Engineering Data Report prepared by VDOT these soils should have laboratory CBR values greater than 6 when dried. The Geotechnical Engineering Data Report and experience with geologic formation along the limits of the project, FAT CLAY (CH) soils may be encountered at the pavement subgrades and would have CBR values below the required value of 5. Where these soils are encountered these soils will be either improved in place or undercut and replaced to prove a laboratory CBR value greater than 5.

Geotechnical Design Approach for Horsepen Dam

The LANE Team has extensive experience in Virginia performing geotechnical engineering services related to rehabilitation of existing dams similar to the existing Horsepen embankment dam as well as providing evaluation and remedial recommendations for failed dams and design and construction of new embankment dams. In addition to their design experience, our personnel have extensive experience in construction inspection and testing during the construction and rehabilitation of existing dams. This allows for incorporation of recommendations and warnings into the design documents regarding conditions that should be expected during construction and that could affect the overall cost and duration of the project.

According to the test borings performed in the existing embankment dam, the impervious core, cut-off trench and earth embankment shell were primarily constructed of LEAN CLAY (CL) soils with layers of FAT CAY (CH), Clayey SAND (SC), SILT (ML). The foundation of the dam mainly rests on Diabase rock.

Proposed alterations to the dam present risks associated with stability, integrity and performance of the dam and its emergency spillway. The scope includes the partial removal and replacement of an existing spillway pipe through the dam and placement of very large depths of fills over the downstream toe. During construction and design for retrofitting the dam, it will be critical to recognize where seepage paths can develop within the foundation, abutments, embankment fill of the dam or along structures penetrating the dam. Excess seepage can also occur due to unanticipated pervious zones within the embankment, poor compaction adjacent to structures that penetrate the dam and differential settlement. Placement of large depths of fill over the downstream toe and existing spillway culvert may create cracks and weak zones within the dam and hydraulic fracturing.
Of these modifications to the dam, the two that are considered most critical are removal and replacement of a portion of the principal spillway pipe within the downstream toe of the dam and placement of very large fill depths (on the order of 50 feet) to extend the downstream toe of the dam and raise the grades for the proposed roadway. What makes these modifications even more challenging is that they may need to be done while maintaining a permanent pool within Horsepen Lake. If the excavation for removal and replacement of the spillway encounters the phreatic surface within the dam, seepage could occur. The design of the temporary support of excavation as well as the final design for the culvert replacement will provide for seepage control measures, such as internal filters, to collect and discharge the seepage, so it should not impact the integrity of the dam.

The effects of the loading and settlement of the retaining walls and bridge will have on the integrity of the dam will need to be recognized and accounted for in the design of the foundations. Also, scour conditions within the emergency spillway will need to be considered. In order to account for this, the Dam/Geotechnical engineer will provide foundation recommendations to the structural engineer and will work closely with the both the structural and hydraulics engineers to develop the final design of the foundations and scour protection. Since the Dam Design Specialist, structural engineer and hydraulics engineers are all within the same office of JMT this coordination can be done as needed and face to face, which is considered most effective.

Through our team’s experience with the rehabilitation of dams, it has been learned that it is best to keep the disturbance of the dam to a minimum so the integrity of the dam is not jeopardized. It is critical to recognize seepage occurs within the foundation, abutments and embankment fill of the dam and along structures penetrating the dam, such as culverts for principal spillway. If this seepage through the dam is not controlled, it could result in poor performance or even failure of the dam.

Past experience has shown that the conditions of an existing dam and its foundation can be considerably different when exposed than indicated by the borings. The Dam Design Specialist and Geotechnical Design Engineer will be involved in construction to address unanticipated conditions. Also, an engineer working under the direction of the Dam Design Specialist will be on site full time during the dam construction to perform Dam QC inspections and provide feedback to the Dam Design Specialist and Geotechnical Design Engineer. The Dam Design Specialist and the Geotechnical Design Engineer will make field visits during critical stages especially during the removal and replacement of the culvert.

The design approach to the Horsepen Dam Modifications would first include preforming a thorough review of the existing design and construction documents and dam safety inspection reports and performing a dam safety inspection, which would include visual observation of the inside of the existing box culvert by use of video equipment. Subsequently, a subsurface investigation program would be developed to augment and validate the existing subsurface data to gain a thorough understanding soil, rock and groundwater conditions within the embankment dam and it’s the foundation. This could include performing test borings and installing piezometers and performing appropriate geophysical investigations.

Following completion of the subsurface investigation, a geotechnical engineering evaluation and analysis of the existing dam would be performed and would include the dam’s foundation, abutment and embankment for stability and settlement, seepage through and below the dam, existing seepage control features such as cut-off trench, embankment core, internal drains and filters and spillway foundations. Working in coordination with the contractor, each phase of construction would be considered. Based on these evaluations and analyses, recommendations would be made regarding raising the height of the dam, installation of principal and emergency spillways, providing seepage control features and design of bridge and culvert foundations. The geotechnical engineer would be involved in preparation of the design and construction documents and provide analysis of construction phasing and methods. The following features will be considered:

- Provide temporary dewatering as necessary prior to excavation for the partial removal and replacement of the principal spillway, installation of foundations for the bridge and retaining walls and any other excavations that would penetrate the embankment dam.
• Provide seepage control features such as external and internal filters at locations where differential settlement is expected to occur and/or where dissimilar materials are present that would allow piping to occur, if filters are not provided. One such location is the backfilling of the excavation for the partial replacement of the principal spillway culvert. Differential settlement will occur between the new backfill and existing embankment fill, which could result in a potential seepage path. In order to collect any seepage that may occur and discharge it in a controlled manner, a seepage/filter diaphragm will be provided that would extend into the existing embankment and dam foundation.

• Provide adequate compaction against structures within the dam by placing fills adjacent to the structures on slopes of about 6H:1V and possibly slightly sloping structures walls to allow for the wheels of the compaction equipment to be tight against the structure and compaction forces to be directed towards the structure.

• Provide for pre-construction meetings including the designers, LANE and their sub-contractors, and the dam inspection team to clearly explain the design plans, specification, and methods for retrofit construction activities related to the dam.

• Provide an experienced Dam Design Specialist on-site during critical stages of construction, such as the excavation for the partial removal and replacement of the principal spillway culvert, to provide real time refinements to the dam design and temporary dewatering systems for unanticipated conditions that may exist.

• Provide geotechnical instrumentation plan for monitoring vertical and lateral movements with in the dam from construction activities resulting from placement of new loads and temporary excavations.

• Provide an experienced Dam Construction Inspector during all stages of retrofitting of the dam who will report daily activities to the Dam Design Engineer.

• Provide a Construction Superintendent with at least 10 years of experience in dam construction.

During this design process, the LANE Team will involve VDOT, MWAA and DCR at the respective stages of the design and construction process to get their input and feedback on the design.

Retaining Wall RW-2 will be a Mechanically Stabilized Earth (MSE) retaining wall. Preliminary evaluations of external stability (global stability, sliding, and overturning) of the proposed wall have been performed; results indicate the external stability will be adequate. During final design, the external stability of the proposed wall will be evaluated, considering sliding, overturning and global stability in accordance with AASHTO LRFD Bridge Design Specifications (2012). Predicted wall settlements will be calculated using the computer program Foundation Stress and Settlement Analysis (FoSSA) to confirm that long term post-construction settlements of the wall is in accordance with VDOT requirements.

4.4.3 Quality Assurance/Quality Control (QA/QC)

The LANE Team’s approach to QA/QC focuses on the fundamental principal and objective to deliver the highest quality project in accordance with the RFP by providing the necessary human and material resources required by the Project and our Quality Management Plan (QMP). V DOT’s Minimum Requirements for Quality Assurance and Quality Control on Design Build and Public-Private Transportation Act Projects is well understood and the LANE Team will not be content unless these requirements are exceeded. The creation of QMP for design and construction unique to the specific QA/QC aspects of the project will be first and foremost; this will set the stage for our approach to all tasks and operations and when implemented and enforced will lead to the high quality that is to be expected all around. Given several unique aspects to this project, such as the Horsepen Dam modifications, dam riser structure valve replacement, bridge over spillway, etc.; attention to the design and construction QA/QC will be heightened for this project.

Quality is realized at every level, beginning at the project’s design and construction level and making its way to the top with the Design-Build Project Manager. Several key personnel including the Design and Construction
Managers and the Dam QC Inspector are in place together with the QC Inspectors to ensure the highest standards for the project. The mandated QAM independently assures quality and again emphasizes the use of key personnel in addition to the QA Inspector and supporting AMRL Certified Laboratory. Knowledge and familiarity of design-build projects as well as thorough understanding of VDOT’s Minimum Requirements for Quality Assurance and Quality Control on Design Build and Public-Private Transportation Act Projects make it highly unlikely that a high level quality concern would ever be encountered. The LANE Team’s experience supports this and is evidenced by our successful QA/QC programs with minimal VDOT utilization on numerous Design-Build projects including the well-known I-495 Express Lanes and I-95 Express Lanes projects.

All Team members as well as the subcontractors and suppliers for the project will be required to submit corresponding Quality Plans that ensure compliance with respect to the QMP. That the QMP will be diligently monitored and enforced is but an understatement. Any variance from the implemented standards will not be tolerated and as such, continuous audits will be performed to verify that the QMP is being adhered to. The QMP will have a dynamic aspect only in that it will be updated and amended as the project progresses if betterments can be made.

### 4.4.3.1 Design QA/QC

Design quality will be measured by how well we meet the goals established for this project including meeting all criteria defined in the RFP plus abiding by the concept and schedule described in this Technical Proposal. A key component of our design approach is to provide internal QC and QA measures that do not rely on VDOT to insure quality; it’s our job to do it right. These goals are discussed in Project Approach (Section 4.4) and include developing a design that provides safe operations and low maintenance with reduced construction and property impacts while at the same time producing a final product within budget and on schedule. Our concept was specifically developed to help VDOT reduce the costs and impacts of future roadway expansions and reduce long-term maintenance while promoting public acceptance.

As an element of the QMP, an individual Project Quality Plan will be developed to define our process to control design quality. At the initiation of the design effort, qualified staff will be assigned to each technical discipline. Each submittal will have an internal QC check by qualified designers not directly working on the submittal product; this would include reviews by our senior staff, many of which are former VDOT employees with applicable expertise gained within the Department. Tools such as the VDOT Quality Control Checklist, Form LD-436, and other internal checklists with help the QC staff insure that all vital aspects of the design are addressed. The QC and QA roles will be performed independently. Compliance with all QC procedures will be periodically audited by our highly qualified QA staff which is identified in this Technical Proposal. In addition to the audits, the QA staff will provide oversight to insure the criteria and goals established in the RFP are met. One of the great benefits of the design-build process is gained from close coordination between the Design Manager and the Construction Manager for the project; frequent constructability reviews and coordination will take place involving collaboration of the design and construction staff on the LANE Team.

### 4.4.3.2 Design QA/QC for a Unique Project Element: Alterations to the Dam

The most unique aspect of this project relates to the alterations to the Horsepen Dam. In addition to normal processes for QC/QA of each individual discipline of the design, it will be critical that the geotechnical, hydraulic, bridge, and roadway designs are coordinated with the means and methods available to the contractor. Multidisciplinary reviews will be conducted to cross-check the inter-lacing components of the dam. The means and methods of constructing the dam will play a vital role toward the success of the modifications. Constructability reviews will be conducted by senior design and construction staff to take full advantage of the group synergy that is a key benefit of the Design-Build process. Frequent coordination meetings will be held with the internal design and construction staff as design progresses. Many stakeholders are involved with the dam. Staff from VDOT, MWAA, DCR and their dam consultants will be included in periodic meetings to insure that through the Design QA/QC effort the intent of the Horsepen Dam Modifications is retained.
4.4.3.3 Construction QA/QC

Expanding on the QA/QC summary above, construction, much like design has its own QA/QC elements. Construction QC for this project will be LANE’s responsibility. Again referring to our Team’s organization, the QC begins with LANE’s Bridge and Roadway QC inspectors as well as the Dam QC Inspector all of which report to the Construction QC Manager. The overall responsibility resides with the Design-Build PM. All work will be in accordance with the construction portion of the QMP derived from LANE’s in-house construction QC Plan with the exception of the Dam QC Inspector, that will bring a special set of QC requirements to be included. The QC Program will continually assess construction quality and when necessary make adjustments to methods or materials to achieve or exceed the required quality levels. Required, current VDOT certifications will be in place with our QC personnel for this project. This proven and strong QC program is self-contained thus requiring little to no effort of VDOT’s resources.

Construction QA is an independent operation. Led by the QAM, this effort will have oversight of the QC results to confirm all outcomes conform to the specifications, special provisions and construction plans. The independent functions of the QAM provide direct information to the Design-Build Project Manager outside of the Construction QC chain of command. Additionally, the QA operation will monitor and audit QC procedures and activities to verify proper performance. A high level of authority is given the QAM to insure that the Construction QA function does its job and as such minimizes the requirement of resources and involvement by VDOT.

4.4.3.4 Construction QA/QC for a Unique Project Element: Drilled Shaft Caissons

QA/QC procedures for one unique Project element during construction would be the construction of the drilled shaft caissons for the foundation of the bridge over the Horsepen Dam Emergency Spillway. The LANE Team considers this to be one of the most critical aspects of the project given the complexity of the work. This construction operation requires specialized equipment, testing, oversight by the Lead Geotechnical Engineer, Dam QC Inspector and oversight by the Dam Specialists due to emergency spillway encroachment. A diligent QA/QC effort will be developed, activated and enforced during the operation.

Prior to the start of construction for this activity, the Bridge Superintendent, Crew Leader for the drilled shaft subcontractor, and QC Manager and staff will hold a pre-work coordination meeting to review technical specification requirements and work procedures. The QAM, Lead Geotechnical Engineer, Dam Design Specialist, Dam QC Inspector, MWAA and their consultant will also be notified and participate in this meeting. They will review the shaft layout, installation procedures and equipment to be utilized, all testing and inspection requirements and the schedule of the work.

Prior to beginning the installation work, the shaft locations will be staked out by our surveyor and verified by the QC Inspector, with spot checks being completed by the QA Inspector.

The crew then begins by auguring the shafts at the specified locations until reaching rock at the anticipated elevation. The QC Inspector monitors the operation. Spot checks are performed by the QA Inspector to verify compliance in accordance with the approved QA/QC Plan. Where rock sockets are required, the earth auger is then removed and replaced with a rock auger with diameter 6-inches less than the earth auger diameter, and the shaft is continued to the top of competent rock. All spoils are removed from the bottom of the shaft and the Geotechnical Engineer then inspects the bottom of the shaft and determines that the rock is of satisfactory quality to auger the required rock socket. The crew then resumes auguring operations; the QC Inspector continues to monitor the operation along with spot checks from the QA Inspector until completion.

The crew removes all spoils from the bottom of the shaft and the Geotechnical Engineer inspects the shaft to verify soundness and the quality of the rock within the socket meets the intent of the design. If observations reveal that the quality of the rock within the top five feet of the rock socket is not sufficient by any means incremental auguring and inspection of the rock socket continue until a competent result is achieved.
The Geotechnical Engineer and all involved QC personnel will record all findings in daily reports. As the operation continues, weekly report will summarize activities and be submitted to the Quality Assurance Manager. Throughout the operation, the QC Inspector will verify the alignment of each shaft and further determine that each is plumb within the acceptable tolerances. The QC Inspector also verifies that all spoils have been removed from the shaft and that it is acceptable to begin installing the steel reinforcement cage. As with the auguring, the QA Inspector will make spot checks of the completion of the operation. Similar QA/QC procedures are followed for the completion of the drilled shafts including the fabrication, assembly and installation of the steel reinforcement cage, concreting placement, material testing and Crosshole Sonic Logging (CSL).

This example emphasizes the importance of involving multiple Team members during construction operations to implement, monitor and document QA and QC for a unique and complex component of the Route 606 Widening and Reconstruction Project.

Environmental Studies, Investigations, and Permits

Obtaining plan approvals and permits in a timely manner is a schedule and planning priority. Coordinating with regulatory agencies and utilities early in the design process will directly affect the project life-cycle. The design-build delivery method infuses a higher degree of urgency on the process by linking permitting performance with the project budget. To ensure timely permits, the LANE Team has developed a proactive environmental approval/permit schedule for the project that identifies key milestone and submittal dates for coordination and securing of all permits. The LANE Team will track that each permit task throughout the project to ensure that the permits do not impact the project schedule. The following illustrates the LANE Team’s proactive approach to meeting the requirements of RFP Subsection 2.4 and effectively managing the permitting process for the Route 606 reconstruction.

The LANE Team proposes a proactive and partnering approach with the regulatory agencies to ensure that the permits are secured in a timely fashion that does not delay the project. The Lane Team, including EEE personnel, are familiar with key personnel at the various regulatory agencies, Loudoun County, and utility companies involved in this project. We ensure that the permits will meet agency expectations.

Prior to any field investigations, the LANE Team will obtain a Land Use Permit from VDOT and obtain signed letters of permission from private land owners. In addition, all members of the Project Team performing project related work on MWAA property will complete the FAA required training session prior to receipt of the Airport Identification Badge and vehicle operator's permit. A plan of access to conduct investigations and studies, a restoration plan to restore all disturbed areas back to original condition, a traffic control plan will be prepared and submitted for any survey investigations in public ROW and the MWAA property. The LANE Team has developed earlier projects on the airport (such the North Area Roadways) and know their processes and procedures well.

In addition to the DCR Dam Safety Alteration Permit, the principal permits required for the Route 606 Reconstruction are the USACE Section 404 Permit, the Virginia Department of Environmental Quality (DEQ) Virginia Water Protection (VWP) Permit, and the Virginia Marine Resources Commission (VMRC) Subaqueous Bed Permit (SBP).

The LANE Team will apply the following approach to environmental compliance, permit coordination, agency consultation and coordination:

- EEE will complete wetland delineation of the Project Area and request a preliminary jurisdictional determination from the USACE. A copy of the delineation report will be submitted to VDOT and MWAA.
- According to the EA, the Project may impact 3.46 acres of palustrine emergent wetlands, 0.22 acre of palustrine scrub-shrub wetlands, 1.18 acre of palustrine forested wetland, and 0.82 acres of palustrine open water bodies. Our concept includes elements to minimize and avoid impacts to water resources including the forested wetland at proposed Basin H.
• Based on the potential impacts, an Individual DEQ VWPP, an individual USACE Section 404 Permit, and a VMRC SBP will be required covering Phase A and Phase B project elements.

• Stream and wetland compensation will be completed through purchase of credits at an approved mitigation bank or through the Virginia Aquatic Resources Trust Fund.

• The LANE Team will not proceed with work covered by the water quality permits until the VDOT Project Manager releases the work in writing.

• The LANE Team will prepare the construction notification and termination notices to the regulatory agencies and complete any permit compliance monitoring required by the water quality permits. The results of the compliance monitoring will be provided to the permitting agencies, MWAA, and VDOT.

• Sediment removal will be necessary to gain access to and replace the gate valve mechanism of the existing riser structure located in Horsepen Lake. Prior to and during sediment removal, samples will be collected from Horsepen Lake to identify contaminants (if any) and determine suitable disposal procedures pursuant to all local, State, and Federal laws and regulations.

• The LANE Team will prepare the erosion and sediment control plans, and the Virginia Stormwater Management Permit (VSMP) application for the DEQ General Permit for Discharges from Construction Activities. We will also prepare a Stormwater Pollution Prevention Plan (SWPPP) in accordance with the Virginia Stormwater Management Regulations, and a post-construction stormwater management plan.

• The LANE Team will conduct additional pre-construction environmental studies necessary to support the ROW acquisition. Prior to ROW acquisition, a Phase I Environmental Site Assessments (ESAs) will be completed in accordance with the most current ASTM standard (ASTM E 1527-13) and Special Provision for Phase I and Phase II ESAs for Design-Build Projects (June 25, 2013) for all properties to be acquired as project ROW.

• A Preliminary Site Assessment (PSA Report dated August 7, 2012 identified a previous petroleum release at the Exxon Service Station located at 23501 Overland Drive on Parcel 15. Based on the PSA, contaminated groundwater is migrating toward stormwater basin H. However, the PSA did not include investigations of recognized environmental conditions for proposed stormwater management basin (SWMB) locations; we will complete a Phase I ESA for all affected additional locations. Should it be determined later that a Phase II ESA is required, it will be paid, if and when necessary, under a Work Order in accordance with Article 9 of Part 4 (General Conditions of Contract).

• The LANE Team will prepare a project Spill Prevention, Control, and Countermeasure Plan prior to start of construction.

• All solid waste, hazardous waste, and hazardous materials will be managed in accordance with all applicable federal, state, and local environmental regulations.

• The LANE Team will perform environmental response to discoveries or releases of petroleum or any hazardous substances, as required under CERCLA or other applicable federal and or state laws.

• The LANE Team will perform asbestos, lead, and regulated materials inspections of all structures scheduled for demolition or removal for construction of the Project. All materials including asbestos abatement will be managed in accordance with applicable federal, state, and local laws and regulations. Asbestos abatement and abatement monitoring (if necessary) will be paid for, if and when necessary, under a Work Order in accordance with Article 9 of Part 4 (General Conditions of Contract).

• Based on the information provided in the EA from the Loudoun Heath Department there appears to be two existing wells located between Rogerdale and Route 606 which may be in conflict with the proposed Project. If confirmed in the Scope Validation period, the LANE Team will cap and close the wells in accordance with the Virginia Department of Health well abandonment procedures.
ROW Acquisition Approach

JMT, as a prequalified firm on VDOT’s list of ROW Acquisition Consultants, is unique in that we provide complete ROW acquisition services to our clients. Our experts design, manage and deliver an acquisition program for any type of project. We acquire real estate for public utilities, roadways, railways, park-and-rides, wetland mitigation, parks, airports, and capital improvement sites. In particular JMT has a full understanding of how to do Highway work having completed acquisition work for VDOT on various projects throughout the Commonwealth as well as other highway departments throughout the region and various county/local governments. All easements and ROW will be purchased with VDOT funds.

Roadway Design Approach

Roadway design will be conducted in accordance with the VDOT Road Design Manual and the criteria and references listed in the RFP. Submittals will be based on VDOT’s Plan Development Process to allow the use of the form LD-436 Quality Control Checklist as a guide to insure all elements of design are coordinated and documented.

Structure Design Approach

The bridges will be designed in accordance with the AASHTO LRFD Bridge Design Specifications, 6th Edition, 2012; the VDOT Manuals of the Structure and Bridge Division – Volume V Series including Instructional and Informational Memoranda, and VDOT Modifications to AASHTO LRFD Bridge Design Specifications.

The preliminary bridge design includes design of the bridges for AASHTO HL-93 loading, 15 psf for future wearing surface on the bridge deck, and 20 psf for construction tolerances. Provisions for a ½ inch integral wearing surface provide additional corrosion protection to the reinforcing steel in the deck. A Load and Resistance Factor Rating (LRFR) for the bridge will be performed in accordance with VDOT’s Structure and Bridge Division Instructional and Informational Memorandum IIM - S&B - 86, and the AASHTO Manual for Bridge Evaluation (MBE, 2nd Edition). Approach slabs will conform to the requirement of the VDOT Manual of the Structure and Bridge Division Vol. V – Parts 2 and 3.

The bridges will be designed using the Load and Resistance Factor Design (LRFD) methodology and load rated using the LRFR methodology. Elements of the bridges will be analyzed using conventional, elastic structural analysis methods and will be performed using the following software: CONSPAN, a LEAP Bridge Component Design Module, for analysis, design and load rating of bridge systems; AASHTOWare Bridge Rating software for load rating of bridge structures; MSEW by Adama Engineering for analysis and design of mechanically stabilized earth (MSE) walls; STAAD by Bentley for analysis of piles and minor bridge elements; LPILE by Ensoft for analysis of drilled shafts subject to lateral loading; and Microsoft Excel spreadsheets and Mathcad worksheets for design of the reinforced concrete deck, bearings, expansion joints, and other minor bridge elements.

Stormwater and Drainage Design Approach

The LANE Team has staff recognized as leaders in their field for Drainage, ESC and SWM design. We have engineers certified by the DCR (DEQ) to perform ESC and SWM plan reviews which will facilitate VDOT, MWAA and FAA approval. Team members have previously conducted training workshops to VDOT staff on the current VSMP Construction Permit requirements, use of the Technology-Based, Performance-Based and Runoff Reduction SWM Methodologies, including the proper use of tables, forms, spreadsheets and performing calculations for water quality and quantity control compliance. We have also instructed VDOT staff on the proper evaluation of site constraints for locating and selecting SWM facility types. This experience is invaluable to ensuring a productive and efficient design and approval processes as well as long term SWM facility sustainability.
We have reviewed the Dam Safety Analysis Technical Report for Horsepen Dam as well as the HEC-HMS and HEC-RAS hydrologic / hydraulic analysis (H&HA) modeling supplied as attachments to the RFP. Our team has extensive experience with preparing H&HA reports and working with these models to ensure that dams and bridges are safe and sustainable, including their effect on upstream and downstream flood control as well as stream channel stability. We will provide updates to the report and models as necessary as the design progresses and obtain the required approvals from VDOT, MWAA and DCR under the LANE Team seal and ownership of the documents.
4.5 Construction of the Project
4.5 CONSTRUCTION OF THE PROJECT

The construction of the Route 606 Project will be a well thought out process that is diligently planned and coordinated, employing the most appropriate means and methods to efficiently and safely complete all work while maintaining existing traffic patterns. Subsequent to Notice to Proceed, the design process begins and focuses on delivering VDOT approved Released for Construction Plans via a series of Work Packages. These Work Packages will be broken down by Roadway, Dam and Bridge and will be sequenced for approval in a manner consistent with our construction schedule with all critical path activities in mind; including the breakdown of Phases A and B work in accordance with the RFP. We fully recognize and understand that due to budget constraints, Phase B may not be constructed by us, however, we are to complete the design for the same in a stand-alone document capable of being bid by a third party under a separate design-build contract. The construction of the project will utilize plans that take into consideration all aspects of the project approach including inter-discipline coordination, all aspects of safety including the stability of Horsepen Dam, Maintenance of Traffic (MOT) and utility services and constructability. As plans are released for construction, the appropriate pre-construction coordination meetings will occur and operations commence.

4.5.1 Sequence of Construction

Construction operations will follow a logical, systematically staged sequence. Each stage is specifically established to achieve, without delay, the clear goals set forth in the RFP. Staging the project allows us to incorporate the elements of our design and project approach to manage resources required to work through permitting, ROW, stakeholder coordination, safety and the complexities of the geotechnical and utility relocations (prior or concurrent) expected in Phases A & B of the Project. MOT will be developed to function with each specific construction sequence. The following highlights the sequence of construction with a logic to construct the new east and westbound lanes out of traffic Additional details may be found in the Proposal Schedule in Section 4.7.

The following narrative on our sequence of construction is based on the knowledge that the geotechnical investigation, design, ROW, and permits have been obtained, approved and the project is ready for construction. Generally every project will encounter unforeseen impacts or delays that must be addressed as work progresses. We are confident our plan allows the flexibility to be able to handle such issues due to the extended work zones we are establishing. Should an area develop with an issue such as an unforeseen undercut, subsurface water or obstructions, we have afforded ourselves a large work zone to shift our forces ahead to allow time to resolve the issues and avoid impacts to the schedule. Our team will have a staff engineer on site, full time delegated to tracking and updating the schedule on a weekly basis. Our Construction Manager has the authority and ability to change work hours and/or obtain additional workforces to alleviate significant delays.

Phase A Stage 1 Mainline Construction – This Phase is primarily the relocation of conflicting utilities, to include the Loudoun County Water Main which runs parallel to the entire project centerline and the extensive communications services. Early activities will include installation of project wide temporary construction signage, MOT and Erosion and Sediment controls. At this point, Clearing and Grubbing will commence to clear the ROW and easements for the related utilities and storm water management facilities. Since the water main is in conflict for the entire length of the project and involves extensive restrictions when wet connections may occur, this will be a critical path activity worked with multiple crews to ensure the roadway construction is not impacted. Night work will occur during permissible hours for the waterline connections and other utility work that would impact traffic movements during regular business hours.

Phase A Stage 1 Early Mainline Construction – Under the previously installed MOT and E&S, Stage 1 Early involves clearing and grubbing for the MWAA security fence and patrol road relocations, plus spot portions of
the new eastbound lanes. The goal for this early stage is to clear any conflicts between the existing roadway and the new westbound lane (WBL) to make it available for unobstructed construction in the next phase. To accomplish this, we will perform spot widening of the existing roadway, both permanent and temporary, for the new eastbound lanes (EBL) at the following stations: 80+00 to 155+00, 249+00 to 262+00, 277+00 to 318+00 and 333+00 to 341+50. The work involved with this sequence will include earthwork, drainage, fine grading, stone base and asphalt paving. The water main and communication utility relocations work will continue throughout this phase. Offline work includes relocation of the water sampling station at the dam outfall channel.

**Phase A Stage 1 Late Mainline Construction** – Upon completion of Stage 1 Early, traffic will be re-aligned onto the newly constructed EBL pavement to make available the entire WBL for construction out of traffic (with exception to the cross road entrances into the housing developments and businesses along the corridor). We believe this to be the safest construction practice for the traveling public, nearly eliminating any interfacing with construction equipment. The roadway realignment onto the newly constructed EBL areas will be seamless and not restrict traffic flow in any category. The construction of the entire WBL will now occur to include: all storm drainage (including phase I of the box culvert at Sta. 158+00±), grading, stone base, curb/gutter sound wall installations, asphalt paving through the intermediate course, signage and traffic signals are completed throughout the corridor. Stage 1 Late also includes the modifications to the Horsepen Dam described in Section 4.5.3 and the construction of the westbound bridge over the Horsepen Dam Spillway. Phase B work will be performed in this phase for the trail and the WBL bridge, if the work is performed under this contract. All utility relocation work will be completed in this phase including the water main.

**Phase A Stage 2 Mainline Construction** – Upon completion of Stage 1 Late, all traffic operations will be switched onto the new westbound lanes of Route 606 to make available all of the EBL area for reconstruction. All remaining earthwork, drainage (including phase II of the box culvert at Sta. 158+00±), grading, stone base, curb/gutter and asphalt paving through the surface course, permanent signage and traffic signals throughout the corridor. Stage 2 also includes the construction of the eastbound bridge over the Horsepen Dam Spillway and widening and raising of the Horsepen Dam to the east (lake side).

**Phase A Stage 3 Mainline Construction** – Upon completion of Stage 2, all traffic is shifted to operate entirely in the new permanent alignment of Route 606. Since the final asphalt surface for the WBL has not been placed, it will be performed in this phase, under traffic, utilizing appropriate temporary lane closures. All final finishes, seeding, landscaping and punchlists will occur in this Stage.

**Phase B** – As previously described, all work in Phase B, if awarded, will be included into the appropriate stages above; primarily in Stage 2. This includes the shared use path and the widening of the bridge over Horsepen Dam Spillway.

As described above, we represent our construction phasing to be the safest approach for the public and our workforce. Separating construction from the traveling public is the right plan of operation. However, when we have to interface with the public at side streets, business entrances etc. we will provide flagman to safely control construction traffic as it crosses and/or re-enters the public roadway.

To further enhance public safety, understanding of the project, changes to MOT, utility interruptions (i.e. – water main tie-ins that require temporary shutdowns, telephone line outages to cut lines over, etc.) we will hold public outreach meetings prior to the start of construction and any major project events such as traffic switches; we will provide weekly progress updates, and notifications through a project website, flyers and social media. Early warning message boards will provide advance notices of MOT changes at least one week in advance.

The success of this project will be measured by public perception, high quality design, workmanship and functionality; our plan/sequence of operation will make it happen.
4.5.2 Transportation Management Plan

A project of the magnitude requires an in-depth and well-orchestrated Traffic Management Plan (TMP) for construction activities to safely exist in harmony with normal traffic operations. When projects exhibit inadequate pavement markings, improper signage and lack of maintenance it leads to confused motorists, dissatisfied stakeholders, accidents, unsafe conditions, and extreme traffic queues. The LANE Team’s TMP as described below will proactively inform motorists of the travel situations, mitigate incidents and in general allow unimpeded travel through a well-marked project corridor all in an effort to minimize delay, maintain access and prevent unsafe conditions. The continuous efforts of Mr. David Holmes, MOT Manager, and his assigned staff, in the implementation and management of the TMP will eliminate the need for VDOT to expend resources on this aspect of the project.

Maintain Traffic through All Phases of Construction

Our design greatly minimizes the construction impacts of the widening of Route 606 upon the traveling public and the local communities and businesses. We have planned all major construction operations to occur out of traffic with exception to interface points of crossing streets into businesses and subdivisions. Our experienced team understands that the development of an accurate and complete Transportation Management Plan (TMP) establishes the essential foundation for a safe and successful project for all users, including motorists, bicycles, pedestrians, as well as the construction, inspection and VDOT staff.

The LANE Team’s approach is to maintain traffic through work zones and minimize disruptions to existing traffic and pedestrian patterns while completing the construction as expeditiously as possible. The maintenance of traffic (MOT) phases will be developed to minimize lane closures and will keep all major construction activities outside of traffic, to include the dam construction. Any necessary closures will be in accordance with VDOT Work Area Protection Manual and Northern Region Operations policies and procedures on all roadways within the project limits. This will ensure that any access restrictions, traffic shifts, etc. are communicated to local residences, facilities, businesses, and coordinated with other construction work including the Dulles Phase II Maintenance Facility project.

The Type C TMP developed for this project will be based on the VDOT Instructional and Informational Memorandum I&IM-241/TE-351, TED 351.3. VDOT, through this directive, affirms the commitment to providing safe and efficient movement of motorized and non-motorized traffic through or around roadway work zones as well as providing protection for workers and equipment located within work zones. The LANE Team shares in this commitment to provide a safe work area for both the public and our workforce. We will accomplish the shared goals of VDOT and our team through our innovative approach to reconstructing the Route 606 widening.

The TMP is made of three components; each of these is further broken down in areas of emphasis:

- **Temporary Traffic Control Plan (TCP)** - Major components will consist of Detailed Plans, Typical Sections, and as necessary Special Details/Cross Sections/Profiles. The TCP includes a detailed sequence of construction, general notes, typical section and special details for implementing over various phases of construction.

- **Public Communications Plan** - The Public Communications Plan is the means by which all information regarding the construction schedule, temporary road closures, and other information is relayed to the public and among contractors engaged in other active projects in the area. This will be presented in a narrative format as part of the TCP.

- **Transportation Operations Plan** - The Transportation Operations Plan will include several strategies including notifying Regional Smart Traffic Center of closures, provide contact list of local...
emergency response agencies, and procedures to respond to traffic incidents that may occur in the work zone.

The Type C TMP for this project involves assessing the Work Zone Traffic Impact using an operational-level traffic analysis software simulation program. The current design of the MOT phases will require shoulder closures as well as lane closures during non-peak travel periods. The operations of the MOT phases will be analyzed and modeled using HCM and SYNCHRO software to assess impacts and to highlight areas where alternative construction methods may need to be employed. The Team’s traffic engineering staff responsible for the development of the TMP are trained and VDOT certified for Advanced Work Zone Traffic Control.

When applicable, all assumptions made with respect to traffic volumes used in the model and those provided in the RFP will be verified by performing AM/PM peak period turning movements or portable counts at impacted intersections and along affected roadways. Forecasted traffic volumes will be obtained or coordinated from VDOT or other appropriate sources. Other Measures of Effectiveness such as approach level of service and queuing information along local roadways, as applicable, will also be provided to offer a complete profile of the expected conditions under construction. Our team recognizes that this project is located in the western outer suburbs of the major employment centers of DC and northern Virginia and as a result the peak periods tend to extend over a longer time frame than other less densely populated areas. This verification will assure that the TMP is reflecting the true existing conditions.

A successful public and stakeholder information sharing campaign is critical to the success of this project. Dulles International Airport and associated businesses, fire and rescue responders from the surrounding area stations, the traveling public, local schools, residents, government, and VDOT all have a stake in the successful and timely completion of this project. Our team has balanced the information needs for this project and we will employ our approach to ensure a successful project.

**Approach to Proposed Lane or Ramp Closures, Temporary Detours, Time of Day Restrictions, Flagging Operations, Minimum Lane Widths and Work Zone Speed Reductions**

Any lane closures envisioned for completing the work will be temporary in nature and will be scheduled and conducted per the restrictions outlined in the RFP Part 2, Section 2.11 to maintain the minimum lane and shoulder widths and time of day restrictions. Our team does not anticipate requiring any ramp closures or work zone speed reductions. Temporary detours will not be required, where “temporary detours” is defined to mean diversion routes around the work area due to a full road closure and not simple lane shifts onto temporary roadways. Flaggers will be required for short term lane closures for placement of temporary barrier service and other work required for the safety of the public. The use of flaggers will not extend into peak travel periods.

**Impacts to Major Project Stakeholders**

Advance notification will be provided prior to any significant work activity or temporary lane closures to help reduce adverse impacts to mobility through the work area. These will be communicated through Citizen Information Meetings/Pardon our Dust sessions, website updates, social media, press releases, 511 updates through the Regional Traffic Operations Center, and special meetings for specific groups/concerns. Our goal is to mitigate the inevitable, yet expected, impacts of the construction project for all major stakeholders.

- Dulles International Airport, Surrounding Businesses, and Government Activities – Access to businesses and government interests, such as NOAA, will be maintained throughout the construction period. While the airport does not have direct access to Route 606 within the project area, the access to the northeast of the project is heavily used during the peak periods. Route 606 will have minimum lane widths of 12’ with a minimum of 2’ between the travel lane and any necessary traffic barrier service or channelizing devices. For roadways off of Route 606 but impacted by the construction, such as Mercure Circle, the minimum
lanewidth maintained will be 11’ with a minimum of 1’ between the travel lane and any necessary traffic barrier service or channelizing devices.

- **Local Residents –** Access for local residents will be maintained throughout the construction period. For roadways off of Route 606 but impacted by the construction the minimum lane width maintained will be 11’ with a minimum of 1’ between the travel lane and any necessary traffic barrier service or channelizing devices to include: Evergreen Mills Road, Arcola Road, Freeport Place, and Stukely Drive. Route 606 will have minimum lane widths of 12’ with a minimum of 2’ between the travel lane and any necessary traffic barrier service or channelizing devices.

- **Dulles Greenway –** Access to the Dulles Greenway will have minimum lane widths of 12’ with a minimum of 2’ between the travel lane and any necessary traffic barrier service or channelizing devices. Full directional movements at the interchange will be maintained.

- **Emergency Responders –** Coordination will be required with the fire and rescue staff as well as County and State Police to provide advance notification of short-term lane restrictions during off-peak periods. Overall, the work is not anticipated to generate delays in response times for the Fire Rescue Departments that cover the surrounding area.

- **Loudoun County Schools –** School bus routes use the Route 606 corridor through the work zone. Our team will coordinate with the school district, particularly the individual schools directly impacted by the construction activities, to assure that they are aware of the impending work. Since the school bus operations typically run during the peak periods when work will not be conducted in the roadway, delays to normal operations are not anticipated. Of more concern for our coordination efforts will be the after school activities which may involve generated traffic through the work area.

- **Traveling Public –** The general population will be impacted by the human factors phenomena known as “rubbernecking” through the construction activities on Route 606. These reactions from drivers who are interested in the progress of the work and new elements of the Project which are visible to traffic tend to cause congestion and additional delay. Maintaining work behind barriers and limiting work to off-peak periods will help reduce delays associated with work during peak periods. Temporary lane closures will only occur in off-peak periods in accordance with the lane closure restriction times identified by VDOT in the RFP.

### 4.5.3 Construction of Dam Modifications

Construction of MWAA’s Horsepen Dam Modification involves several components; substantially increasing the earth mass of the dam, constructing twin bridges over the emergency spillway, replacing the sluice gate valve onto the dam outlet riser structure; partial reconstruction and extension of the twin cell outlet culvert which serves as the principle spillway; widening and raising the dam’s embankment and retaining walls to accommodate the widened of Route 606. Each of these elements is closely related to the requirements of the DCR Dam Alteration Permit and requires oversight by MWAA and other agencies as construction progresses. See Exhibit 1 (pg. 33) illustrating the dam alteration work required.

Our approach to this element of the project will begin with detailed coordination with the three main regulatory stakeholders for the dam (VDOT, MWAA and DCR) to ensure that the design process and construction sequencing will meet all RFP requirements and prior agreements. The goal is to prepare and acquire the approval of the Dam Alteration Permit based on the Final Design Report for Dam Alteration to be prepared by the LANE Team in close coordination with the three main regulatory stakeholders. Our construction sequence, safety, QA/QC and any necessary mitigation plans will be presented for compliance to the regulatory agencies. All coordination meetings with the agencies will be led by our Design Build Project Manager and include our team’s Design Manager, Dam Design Specialist and Lead Geotechnical specialists as well as Safety and QA/QC.
leadership. Key milestone events will be established with the stakeholders so that interim inspections and verifications can be performed by MWAA’s oversight engineer in conjunction with our Dam Design Specialist and Lead Geotechnical Engineer as discussed earlier in Section 4.4.2.

The required environmental protection BMP’s will be in place as a safeguard prior to beginning the work. Main construction will begin with the partial demolition, reconstruction and extension of the twin cell outlet culvert including associated end wall or retaining wall work. A Professional Engineer designed shoring system will be installed to access the section of the culvert to be removed and reconstructed. Once the shoring is in place, we will remove and salvage the existing rip rap and excavate all of the materials over and around the culvert to fully expose the section to be removed. Prior to removal we will have to temporarily stop the flow of the lake outfall water through the culvert. This will be accomplished by utilizing large pumps to keep the lake water level just below the orifice of the dam outlet structure so no water enters the culverts. The pumps will discharge the water into outlet pipes that go around the work zone and deposit the water downstream of the culvert. However, should a large storm event occur and the pumps not be able to control the water level of the lake, the overflow water will still be able to flow into the outlet structure and through the culvert as it does now. Work would resume once the pumps can control the water level of the lake.

Once the excavation to expose the section of the culvert to be removed is complete, the existing concrete culvert will be removed to the required limit utilizing hydraulic demolition hammers and handheld air driven jack hammers. The new culvert bed will then be prepared to rock, filling the crevices and voids with A-3 concrete, followed immediately by the construction to replace and extend the culvert to its new design location. Once the culvert is in place, the excavation will be backfilled, the salvaged rip rap replaced to its original condition and the shoring system abandoned in place. This critical construction operation within the prism of the dam will be performed under the watchful eye of our team’s Dam Design Specialist, geotechnical engineer, construction engineers and QC experts and will apply the utmost caution during our work to mitigate the risk of compromising the dam embankment.

At this point a simultaneous operation will begin to retrofit a new sluice gate valve onto the dam outlet structure. This will be done by creating a dry worksite to access the existing sluice gate mounted to the exterior of the vertical outlet structure. To achieve this, a sheet pile coffer dam will be installed to isolate the principal spillway riser outlet structure from the lake. The top of the sheet pile cofferdam will be established in relation to the control riser so that if a storm event occurs the cofferdam will not cause the lake to overfill. The lake level will be maintained. The work area within the cofferdam will be kept dry by pumping. A crew will access the outside bottom of the riser structure, test for contaminants, and remove any earthen silts and debris that are likely impeding the existing sluice gate and orifice, remove the existing gate, and install the new gate per the manufacturer’s directions. Once all work is complete inside the cofferdam, the worksite will be allowed to fill with water, remove the sheet piling and dress-up the site.

Once the twin culvert reconstruction and extension is complete, the dam widening operations will begin. Risks associated with these operations involve maintaining the integrity of the existing dam due to factors such as compaction of earthen embankment, groundwater seepage controls, settlement of the fills and retaining walls and bridge construction over the emergency spillway. Careful staging and monitoring of the fill will be in place to control all operations. Prior to the start of earth embankment operations, the blanket drain filter system will be installed onto the existing downstream face of the dam to be followed immediately by the placement of the new embankment. Strict attention to detail will be observed to ensure proper soil moisture controls, fill lift depths and compaction tests meet the required specifications. Our Dam Design Specialist, construction manager, geotechnical engineer and QA/QC experts will be involved with the embankment operations to ensure proper construction procedures, means and methods and in place results are met. These operations are expected to involve the participation of staff from the regulatory stakeholders.
The bridge over the spillway imparts further challenges and must be carefully constructed to achieve and provide long term stability and scour prevention. Our team has determined the best foundation design to address the stability of the bridge during very large storms as required by DCR and to meet scour protection requirements is to install the foundations on drilled shaft caissons. Caissons will provide fewer dam penetration points and better withstand scour concerns than encased steel H-pile. The excavation for each caisson will be performed by augering/drilling to the calculated scour depths. We will perform bottom of drilled hole inspections, installation of the rebar cage and install the cast in place concrete. All of the caisson construction will meet the current specifications/special provisions to include cross sonic log testing. The remainder of the bridge construction will meet standard bridge construction techniques. Our design will comply with all of the spillway opening parameters including conveyance of the design storms and stability during the probable maximum flood so that the emergency spillway is not obstructed by a bridge failure during a large storm event.

All of the dam construction activities will involve careful and constant QA & QC monitoring so that large earthmoving and other required equipment can accomplish construction with no harm to the existing dam. In addition to the close observation of our team’s dam construction experts, QA/QC monitoring, VDOT, MWAA and DCR oversight and coordination as discussed above will assure the required results for all of the dam embankment, bridge and retaining wall construction.

The primary risk associated with the dam construction is compromising the integrity of the earthen embankment. This risk may be exposed in many ways: improper control of water levels behind the dam; new earth embankments improperly placed against the existing dam by any of the following conditions – poor quality fill, failure to protect the new blanket drain filter, improper compaction control, failure to control ground water seepage; and failure to maintain the proper spillway design. Our team’s dam experts are fully aware of these risks and others. Our QC team will develop and extensive monitoring and control plan for all dam related work to be shared with our QA and our engineers for concurrence and compliant installation. Pre-construction meetings with our work crews will be held to insure proper controls and techniques are employed at all times. We will deliver the dam modifications per the specifications and permit requirements, no exceptions.
Exhibit 1. Typical Section
4.6 Disadvantaged Business Enterprises (DBE)
The LANE Team embraces and supports VDOT’s DBE program and is committed to meeting or exceeding the 14% goal for the design and construction of this project. Furthermore, we will take all necessary and reasonable steps to provide SWaM firms with the maximum opportunity to compete for and perform services on this contract.

**DBE Subconsultants.** The LANE Team includes the highly-qualified DBE subconsultants, Quinn Consulting Services, Inc. (QA Management/Inspections/Testing), GeoConcepts Engineering, Inc. (Geotechnical/QC Testing), RJM Engineering, Inc. (Environmental), necessary for the successful completion of this D-B project.

**Subcontracting Plan.** LANE implements a subcontracting plan on all of our projects to confirm the maximum opportunity for DBE and SWaM subcontractors to qualify for and provide services. The first step is source selection. LANE researches the capabilities of a wide range of subcontractors. This includes an evaluation of past performance, socioeconomic status, financial condition, current availability, and safety performance. Based on this research, a list of potential subcontractors is developed. The second step is the outcome of the proposal process. Once a solicitation for pricing has been set, potential subcontractors have the opportunity to respond with their site-specific worker protection program and best price proposals. LANE reviews the price proposal to determine price reasonableness. The final selection of the subcontractor is made by combining the results of the safety and price evaluations to determine the proposal that provides the best value to VDOT and LANE.

Safety is an integral part of any scope of work performed on this project. Accordingly, a subcontractor’s safety approach is a key component of our evaluation process. All subcontractors must meet our stringent safety requirements to be a member of the Team.

LANE also conducts a technical evaluation of the qualifications presented in the subcontractor’s proposal, as well as an independent review of their past performance. References provided with their price proposal are contacted and questioned regarding the subcontractor’s past performance. The topics covered include safety, schedule and cost compliance, and quality of work. If the potential subcontractor has worked for LANE before, their past performance and safety record for LANE will be evaluated. If the potential subcontractor is required to submit a Quality Control Program or Worker Protection Program with their proposal, these documents will also be evaluated. If the subcontractor has not worked for LANE previously, a project interview will be required.

LANE solicits subcontractor and supplier price proposals and evaluates for award of a subcontract or purchase order based on quality, past performance, and competitiveness. Once these reviews are complete, our evaluation team members discuss the results and select the subcontractors and suppliers that best satisfy the requirements of the contract. Any subcontractor that fails to meet these requirements will be eliminated without further consideration.
**4.7 PROPOSAL SCHEDULE**

Integral to the Design-Build process is the development and creation of a working Critical Path Method (CPM) schedule. The LANE Team is utilizing Primavera P6 Project Management® software, release 7.0 for the Proposal Schedule, and furthermore in the development of the Preliminary and Baseline Schedule in accordance with Part 3, Section 11.1 of the Technical Requirements. The LANE Team has developed a Proposal Schedule that represents the plan to execute the work in accordance with the contract documents. The detailed work plan includes a Work Breakdown Structure (WBS), milestones, Scope Validation Period, permitting and ROW acquisition activities, utility relocations, design and construction including the sequencing of the comprehensive work on the Project and reviews by VDOT, FHWA and other regulatory agencies, and the Critical Path (based on the longest path calculations).

**4.7.1 Proposal Schedule**

The Proposal Schedule is located at the end of this section.

**4.7.2 Proposal Narrative**

The LANE Team has developed the Proposal Schedule narrative illustrating our overall plan to successfully execute the work in accordance with the contract documents. The narrative also provides an overall description and explanation of the sequencing, proposed means and methods, Critical Path, and assumptions relative to our schedule philosophy.

**Project Milestones**

The Route 606 Proposal Schedule defines the LANE Team’s plan for all facets of the Design-Build process based on the following key project milestones:

<table>
<thead>
<tr>
<th>Key Milestones</th>
<th>Milestone Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notice of Intent to Award</td>
<td>April 30, 2014</td>
</tr>
<tr>
<td>CTB Approval / Notice of Award</td>
<td>May 14, 2014</td>
</tr>
<tr>
<td>Design-Build Contract Execution</td>
<td>June 18, 2014</td>
</tr>
<tr>
<td>Notice to Proceed</td>
<td>June 19, 2014</td>
</tr>
<tr>
<td>Scope Validation Period Complete</td>
<td>October 16, 2014</td>
</tr>
<tr>
<td>Authorization of Phase B Work</td>
<td>December 16, 2014</td>
</tr>
<tr>
<td>Start of Construction</td>
<td>March 1, 2015</td>
</tr>
<tr>
<td>Final Completion Date</td>
<td>September 8, 2017</td>
</tr>
</tbody>
</table>

**Work Breakdown Structure**

The WBS is a multi-level, hierarchical arrangement of the work to be performed on the project. The LANE Team has laid out the WBS to enable identification of design, permitting, ROW acquisitions, utility relocations, and construction phases of the project (see Figure 1 below). Design has been further broken down into various components such Scope Validation, Survey, Geotechnical, ROW, Utilities, Environmental and Permits, Final Design and Construction Support. Construction also has been subdivided to include: the two phases, A and B, with various stages of work appropriate for the construction zones.
Level 1 and 2 of the WBS depicted in the Proposal Schedule is as follows:

- **Scope Validation Period:** Includes the Scope Validation Period activity for the Project.
- **Design:** Includes preliminary engineering services, plan development, QA/QC reviews, and VDOT review and approval of the plans. This section includes a second level to the WBS, grouping the design activities by type of design submission packages including:
  - Survey
  - Geotechnical
  - Roadway
  - Hydraulics
  - Drainage
  - Bridge
  - Retaining Walls
  - Traffic Engineering
  - Horsepen Dam Modifications
  - Phase B Independent Design Package (If elected not to be executed by VDOT)
- **ROW Acquisitions:** This section of the schedule details the acquisition process for the ROW required for this project; such as title searches, appraisals, appraisal review, offers, negotiations, and settlements.
- **Environmental / Permitting:** Comprises the activities required to obtain the necessary environmental permits such as the Water Quality Permit and Stormwater Monitoring, Noise Evaluations, in addition the permits required for the modification at Horsepen Dam.
- **Utility Coordination and Relocations:** Includes the activities for UFI meetings, preparation of preliminary engineering (PE) estimate, approval of PE estimates, utility relocation design by utility owner, approval of the utility design, and relocation of utilities for construction.
- **Construction:** Includes all the components of the roadway and bridge construction, including but not limited to MOT, signals, and drainage. The construction section is sub-divided by phase and related work activities.

Additionally, an activity coding structure will be utilized in the project schedule to facilitate the organization of the CPM schedule data output in respective disciplines.
Calendars

The LANE Team used six (6) different calendars to represent a variety of work scenarios based on VDOT Standard Construction Specifications:

<table>
<thead>
<tr>
<th>Calendar</th>
<th>Non-Work Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-Day</td>
<td></td>
</tr>
<tr>
<td>5-Day Admin (No Weather)</td>
<td></td>
</tr>
<tr>
<td>5-Day Typical</td>
<td></td>
</tr>
<tr>
<td>5-Day Subbase &amp; Grading</td>
<td>December – February</td>
</tr>
<tr>
<td>5-Day Asphalt Paving – Base/Interim Courses</td>
<td>December – February</td>
</tr>
<tr>
<td>5-Day Asphalt Paving – Surface Course</td>
<td>November - March</td>
</tr>
</tbody>
</table>

The LANE Team’s approach to adverse weather differs depending on the type of work being performed. Any schedule acceleration attempts to remediate adverse weather impacts will occur first on Saturdays and then during the winter months.

The amount of adverse weather days to be expected has been calculated utilizing data from the National Oceanic and Atmospheric Administration’s (NOAA) National Climate Data Center at Washington Reagan Airport. Using daily data from the past ten (10) years, adverse weather days were determined by using the following scenarios in Tables 1 through 4.

<table>
<thead>
<tr>
<th>Probability &lt; 32°F</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lost Days</td>
<td>10</td>
<td>7</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>5</td>
<td>25</td>
</tr>
</tbody>
</table>

*Table 1: Typical Weather for Washington Reagan Airport based on data from NOAA.*

<table>
<thead>
<tr>
<th>Probability</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lost Days</td>
<td>20</td>
<td>17</td>
<td>8</td>
<td>3</td>
<td>6</td>
<td>8</td>
<td>5</td>
<td>2</td>
<td>6</td>
<td>7</td>
<td>5</td>
<td>17</td>
<td>104</td>
</tr>
</tbody>
</table>

*Table 2: Subbase & Grading (Average Temp Below 40°F and/or Precip Greater than 0.50”)*

<table>
<thead>
<tr>
<th>Probability</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lost Days</td>
<td>20</td>
<td>17</td>
<td>7</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>16</td>
<td>79</td>
</tr>
</tbody>
</table>

*Table 3: Asphalt Paving - Base & Interim. Courses (Average Temp Below 40°F and/or Precip Greater than 0.75”)*

<table>
<thead>
<tr>
<th>Probability</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lost Days</td>
<td>29</td>
<td>26</td>
<td>20</td>
<td>6</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>6</td>
<td>14</td>
<td>28</td>
<td>141</td>
</tr>
</tbody>
</table>

*Table 4: Asphalt Paving - Surface Course (Average Temp Below 50°F and/or Precip Greater than 0.75”)*
Plan and Strategy

**Design.** Design will begin immediately, at the LANE Team’s risk, upon Notice of Intent to award. The design phase includes; investigative activities such as supplemental field surveys, geotechnical borings and laboratory analysis; preparation of roadway and bridge plans including preliminary engineering, final plan development, hydrological and hydraulic analysis, drainage and stormwater management design, development of the Transportation Management Plan; and VDOT review and approval of plans and reports, and the release for construction plans.

Upon receipt of Notice to Proceed (NTP), the design and construction teams will work on scope validation in conjunction with VDOT. During this time frame, supplemental field surveys will be performed along with additional soil borings required to supplement the geotechnical design. Furthermore, during this time frame, field work and initial coordination of construction permits will begin. These permits include Environmental Assessments, VWP Permit, SWPPP and VA SWM Permit, and the Horsepen Dam Alteration Permit.

Once ROW review and approval by VDOT has been obtained, acquisition will begin in conjunction with the development of final construction documents. At this time, final details will be included in the documentation for each permit, and construction permits will be obtained. We anticipate one comprehensive plan submitted for the entire project. The traffic management plan and maintenance of traffic plans will correspond to the flow of work in four (4) distinct stages allowing work in areas as ROW is acquired.

**ROW Acquisitions.** ROW acquisition will be performed in accordance with VDOT requirements and the RFP. The initiation of the ROW acquisition phase is dependent on our team obtaining Notice to Commence ROW Acquisition from VDOT. Our project schedule reflects the necessary durations need to perform all acquisition tasks including Title Reports, Appraisals, Appraisal Reviews, Submittal of Offers, Negotiations, and Settlement/Closing. The LANE Team has minimized schedule risk due to ROW acquisition by preparing our construction phasing in a manner that minimizes the reliance of early construction phases on ROW acquisition.

**Utility Relocations.** The project schedule incorporates all utility relocation activities necessary to clear existing utilities from the work area. Utility related activities include utility designation and location, UFI meetings, utility plan and estimate preparation by utility owners, review and approval of plan and estimates, authorization to relocate, and the relocation of utilities by utility owners. The schedule risk due to utility relocations have been minimized by a design approach that minimizes utility conflicts, and sequencing the construction around identified conflicts.

**Construction.**

**Phase A Stage 1 Early Mainline Construction** – Construction of the project will commence with the installation of the Stage 1 MOT, along with the Erosion and Sediment Controls project wide. As the E&S in being installed concurrently the Clearing and Grubbing will begin, followed by the relocation of the Loudoun County Water Main, including tie-in at number locations along the alignment. Stage 1 Early also includes the sequence of earthwork, drainage, grading and paving in several locations along the existing travel lanes as well as the eastbound shoulder widening for Traffic/MOT in subsequent stages of work. Offline work includes the relocation of the water sampling station.

**Phase A Stage 1 Late Mainline Construction** – At the completion of Stage 1 Early, MOT is shifted and traffic will operate on the newly widened portions of Route 606. Earthwork, drainage; including the box culvert replacement at Sta. 158+00±, grading, sound wall installation, paving, and curb/gutter is completed throughout the corridor. Stage 1 Late also includes the modifications to the Horsepen Dam and the construction of the westbound bridge over the Horsepen Dam Spillway.
Modifications to the Horsepen Dam involve several components; installation of a new sluice gate valve onto the dam outlet structure; partial reconstruction and extension of the twin cell outlet culvert; and widening and raising the dam’s embankment to accommodate the widening of Route 606. Construction will begin with the partial demolition, reconstruction, and extension of the twin cell outlet culvert including associated end wall or retaining wall work. A shoring system will be installed to allow access to the section of the culvert to be removed and reconstructed, followed by the excavation of material to full expose the culvert sections. The demolition, reconstruction, and extension of the twin cell culvert will be done in two stages. Once the culvert is in place, the excavation will be backfilled, with the shoring system abandoned in place, followed by placement of the encapsulated natural graded filter on top of the existing rip rap. At this point a concurrent operation will begin to retrofit a new sluice gate valve onto the dam outlet structure.

**Phase A Stage 2 Mainline Construction** – Upon the completion of Stage 1 Late, MOT is shifted and traffic operates on the new westbound lanes of Route 606. Earthwork, drainage; including the box culvert replacement at Sta. 158+00±, grading, paving, and curb/gutter is completed throughout the corridor. Stage 2 also includes the construction of the eastbound bridge over the Horsepen Dam Spillway and widening of the Horsepen Dam to the east.

**Phase A Stage 3 Mainline Construction** – Once Stage 2 is complete, all traffic is shifted and traffic will operate entirely on the new alignment of Route 606. All remaining final asphalt paving, landscaping and finish work will occur in Stage 3.

**Phase B** – All work in Phase B, if awarded, will be included into the appropriate stages above. This includes the shared-use path and widening of the bridge over Horsepen Dam Spillway.

**Potential Impact.** The following risk issues have been identified as having the potential to cause impacts to the project schedule:

- Obtaining the required permits to perform the work at Horsepen Dam
- Utility relocations
- Delay in the acquisition of required ROW
- Unsuitable Soils
- Unseasonably Wet Summer and Fall

**Critical Path**

The Critical Path of the Project is shown on the included schedule. It includes various design activities, permits, ROW acquisition tasks, utility relocation and the subsequent phased construction activities.

**Assumptions**

The LANE Team made the following key assumptions on which the Proposal Schedule is based:

- Normal weather patterns for the area
- Minimal impacts will be incurred due to unforeseen circumstances
- Effective partnering and coordination with VDOT, MWAA, DCR, utility agencies and other third-party stakeholders

**Schedule Management**

Effective management and control of a construction project of this scope requires the use of a proven software package for scheduling, documentation control, cost control, and design functions of the integrated team concept.
to the Design-Build approach. As previously mentioned, the LANE Team uses Primavera P6 (P6) scheduling software to plan, schedule, and monitor its construction projects. This software is an industry standard of practice for scheduling projects allows us to plan, organize, and control the project with the Precedence Diagram Method (PDM) of scheduling. As a management tool, P6 is powerful and flexible enough to handle all project scheduling needs, including the following capabilities:

- CPM scheduling
- Cost management
- Resource management
- Data exchange
- Reporting capabilities
- Networking

P6 also has tools to assist the project management team in tracking and forecasting the project performance from the milestone level to the smallest work activity.

LANE will coordinate the scope of all project-related activities to establish a timely CPM job schedule that will help identify potential risks and ensure an on-time completion. LANE’s Project Controls will be coordinated from the on-site project office. The Project Engineer is responsible for scheduling, cost engineering, and cost forecasting. The Design-Build Project Manager, supported by the Construction Manager, is ultimately responsible for the implementation of the project controls system.

Upon award of the contract, the LANE Team will collaborate to develop the entire Project Preliminary Schedule and Baseline Schedule based on the design plans, in accordance with Part 3, Section 11.1 of the Technical Requirements. To control time spent on activities, LANE will develop a detailed, time-phased CPM project schedule, prepared with timelines outlined within the scope of work. The P6 software program is used to generate a time-scaled logic diagram reflecting the interdependencies of all the activities incorporated into the schedule. In addition, other various tabular reports are produced, as required, for submission to the owner.

This schedule will indicate the necessary procurement and construction activities for each section or phase of the project. Various calendars will be incorporated into the project schedule to reflect holidays, seasonal work, temperature and precipitation restrictions, owner requirements, etc. The activities within the CPM schedule will be organized according to a WBS that has been developed for the project. An activity coding structure will be utilized in the project schedule to organize data output. The project schedule will be the tool used for coordination by both on and off-site LANE management. Schedule updates are used by managers to review progress and coordinate the efforts of all entities involved. A full-time on-site engineer is tasked with the responsibility to track schedule progress on a daily basis and provide monthly updates.

Detailed schedules are used to plan and monitor specific items of work and will be prepared as necessary to deal with individual work packages or smaller work activities as the need arises. As the work progresses, start dates, finish dates, percent complete, and remaining durations will be updated to report the progress of each work activity. The Construction Manager will incorporate updated data into the CPM schedule on a monthly basis, review the results internally and with the owner, and prepare the required reports for submittal. Monthly updates of the CPM schedule provide the foundation of progress reports utilized by the project team.

When changes or unforeseen circumstances arise that impacts the project schedule, the LANE Team will immediately notify VDOT (and other appropriate stakeholders) and begin incorporating changes into the “live” CPM schedule. If changes to any task or phase in the schedule result in schedule slippage, the Design-Build
Project Manager will divide the task into its components to determine the reason(s) for falling behind. LANE will develop and implement a recovery plan to put the project back on track. Progress can then be tracked daily via the schedule compared to the previously accepted schedule. LANE’s management will evaluate any slippage to determine if additional manpower, equipment, multiple shifts, a change in subcontractor, or additional subcontractors is required. If so, the necessary resources will be mobilized to correct the slippage and maintain the schedule. Scheduling practices and concerns will be clearly communicated to all subcontractors and key suppliers. Delays and schedule slippage will not be tolerated.

Summary

The LANE Team has developed a Proposal Schedule and Proposal Schedule Narrative that demonstrates our understanding of the complexities and interrelationships of the technical elements of the project. Additionally, our Proposal Schedule takes into account: internal plan reviews, VDOT plan reviews and approvals, environmental permitting, ROW acquisitions, utility relocations, and construction activities.

The LANE Team is committed to improve the enclosed Proposal Schedule to better serve VDOT, all associated stakeholders, and the traveling public. Once we receive NTP, all team members will actively work to make this project a success for VDOT and the citizens of Virginia.
<table>
<thead>
<tr>
<th>Activity ID</th>
<th>Activity Name</th>
<th>Original Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1010</td>
<td>Prepare QA/QC Plan for Design</td>
<td>19-Jun-14</td>
<td>3-Jul-14</td>
</tr>
<tr>
<td>D1020</td>
<td>Submit QA/QC Plan - Present to VDOT</td>
<td>03-Jul-14</td>
<td>3-Jul-14</td>
</tr>
<tr>
<td>D1030</td>
<td>VDOT Review of QA/QC</td>
<td>04-Jul-14</td>
<td>3-Jul-14</td>
</tr>
<tr>
<td>D1040</td>
<td>Revise and Re-submit QA/QC Plan</td>
<td>25-Jul-14</td>
<td>3-Jul-14</td>
</tr>
<tr>
<td>D1050</td>
<td>Receive VDOT Approval of QA/QC Plan</td>
<td>01-Aug-14</td>
<td>3-Jul-14</td>
</tr>
<tr>
<td>D1060</td>
<td>Boring Logs and Lab Work for Scope Validation</td>
<td>25-Jul-14</td>
<td>3-Jul-14</td>
</tr>
<tr>
<td>D1070</td>
<td>Geotech Design &amp; Submit Structure Reports - Bridges</td>
<td>25-Jul-14</td>
<td>3-Jul-14</td>
</tr>
<tr>
<td>D1080</td>
<td>Geotech Design &amp; Submit Structure Reports - Retaining &amp; Noise Walls</td>
<td>25-Jul-14</td>
<td>3-Jul-14</td>
</tr>
<tr>
<td>D1090</td>
<td>Agency Review and Approval of Exceptions/Waiver</td>
<td>25-Jul-14</td>
<td>3-Jul-14</td>
</tr>
<tr>
<td>D1100</td>
<td>Agency Review and Approval of Access Management Waiver</td>
<td>25-Jul-14</td>
<td>3-Jul-14</td>
</tr>
<tr>
<td>D1110</td>
<td>Revise and Resubmit QA/QC Plan</td>
<td>25-Jul-14</td>
<td>3-Jul-14</td>
</tr>
<tr>
<td>D1120</td>
<td>Receive VDOT Approval of QA/QC Plan</td>
<td>25-Jul-14</td>
<td>3-Jul-14</td>
</tr>
<tr>
<td>D1130</td>
<td>Complete Boring Location Plan</td>
<td>15-Jul-14</td>
<td>3-Jul-14</td>
</tr>
<tr>
<td>D1140</td>
<td>Complete Geotechnical Boring Locations</td>
<td>15-Jul-14</td>
<td>3-Jul-14</td>
</tr>
<tr>
<td>D1150</td>
<td>Prepare Property Owner Notification Letters for Surveys</td>
<td>15-Jul-14</td>
<td>3-Jul-14</td>
</tr>
<tr>
<td>D1160</td>
<td>Surveys Subsurface Investigations</td>
<td>15-Jul-14</td>
<td>3-Jul-14</td>
</tr>
<tr>
<td>D1170</td>
<td>Supplemental Field Surveys</td>
<td>15-Jul-14</td>
<td>3-Jul-14</td>
</tr>
<tr>
<td>D1180</td>
<td>Set ROW Management Plan by Completion</td>
<td>15-Jul-14</td>
<td>3-Jul-14</td>
</tr>
</tbody>
</table>

**Scope Validation**

- **A1000** Scope Validation Period: 15-Jun-14 - 30-Sep-14

**Design**

- QA/QC Plan for Design
- Field Inspection, ROW (FR/FR), Line & Grade, & LOD
- Design Exceptions and Waivers (If Required)
- Field Surveys
- Geotechnical Engineering
- Subsurface Investigations
- Analysis and Reports

**Remaining Level of Effort**

- **M** Milestone
- **W** Work
- **C** Critical Work
- **E** Emerging Work
- **D** Remaining Work

**Final Completion**

- September 08, 2017

**Route 606 Loudoun County Parkway/Old Ox Road Reconstruction and Widening**

**Activity**

- **A1000** Notice of Intent to Award: 30-Sep-14
- **A1010** CTB Approval Notice to Award: 18-Sep-14
- **A1020** Design Build Contract Execution: 18-Sep-14
- **A1030** Notice to Proceed NTP: 19-Sep-14
- **A1040** Authorization of Phase B Work: 18-Nov-14
- **A1050** Final Completion - September 08, 2017: 08-Sep-17
<table>
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<tbody>
<tr>
<td>D1350</td>
<td>VDOT &amp; MWAA Review Report - Heronspen Dam</td>
<td>21-02-14</td>
<td>22-Oct-14</td>
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</tr>
<tr>
<td>D1390</td>
<td>Resolve Review Comments and Submit Final Report - Pavement</td>
<td>02-Oct-14</td>
<td>05-Nov-14</td>
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<tr>
<td>D1420</td>
<td>Resolve Review Comments and Submit Final Report - Roadway, Utility and Miles</td>
<td>02-Oct-14</td>
<td>05-Nov-14</td>
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<tr>
<td>D1440</td>
<td>Resolve Review Comments and Submit Final Report - Bridges</td>
<td>02-Oct-14</td>
<td>05-Nov-14</td>
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<tr>
<td>D1430</td>
<td>Resolve Review Comments and Submit Final Report - Storm Water</td>
<td>02-Oct-14</td>
<td>05-Nov-14</td>
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<tr>
<td>D1410</td>
<td>Resolve Review Comments and Submit Final Structure Report - Retaining &amp; Noise Walls</td>
<td>02-Oct-14</td>
<td>05-Nov-14</td>
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<tr>
<td>D1440</td>
<td>Resolve Review Comments and Submit Final Report to MWAA and VDOT - Heronspen Dam</td>
<td>02-Oct-14</td>
<td>05-Nov-14</td>
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### Noise Evaluation (If Required)

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<tr>
<td>D1450</td>
<td>Receive Existing TMM Model from VDOT</td>
<td>03-Mar-14</td>
<td>23-Jan-14</td>
<td>23-Jan-14</td>
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<tr>
<td>D1460</td>
<td>Evaluate Existing Data and TMM Model</td>
<td>15-Mar-14</td>
<td>24-Jan-14</td>
<td>15-Jul-14</td>
</tr>
<tr>
<td>D1470</td>
<td>Obtain Supplemental Study Data</td>
<td>06-Mar-14</td>
<td>16-Jul-14</td>
<td>08-Oct-14</td>
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<tr>
<td>D1480</td>
<td>Incorporate Proposed Alignments in Noise Model and Evaluate</td>
<td>03-Mar-14</td>
<td>28-Oct-14</td>
<td>05-Nov-14</td>
</tr>
<tr>
<td>D1500</td>
<td>VDOT Review and Comment</td>
<td>04-Jan-15</td>
<td>19-Jan-15</td>
<td>08-Jan-15</td>
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<tr>
<td>D1510</td>
<td>Develop, QA/QC &amp; Submit Plan and Acoustic Profile, Full NADR and Model</td>
<td>04-Feb-15</td>
<td>20-Feb-15</td>
<td>05-Feb-15</td>
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<tr>
<td>D1520</td>
<td>Resolve VDOT Approval and Correspondence Letter on Plan and Acoustic Profile, NADR &amp; Model</td>
<td>06-Feb-15</td>
<td>26-Feb-15</td>
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<tr>
<td>D1530</td>
<td>Plan Submitted with Certification from DB Team</td>
<td>27-Feb-15</td>
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### Roadway

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<tr>
<td>D1540</td>
<td>Horizontal and Vertical Geometry, SC, Typical Sections</td>
<td>12-Aug-14</td>
<td>10-Dec-14</td>
<td>05-Dec-14</td>
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<tr>
<td>D1550</td>
<td>Cross Sections and Limit of Disturbance</td>
<td>26-Aug-14</td>
<td>25-Nov-14</td>
<td>25-Nov-14</td>
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<tr>
<td>D1570</td>
<td>Submit Preliminary Roadway Plans to VDOT &amp; Other Review Entities</td>
<td>11-Dec-14</td>
<td>11-Dec-14</td>
<td>11-Dec-14</td>
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<tr>
<td>D1580</td>
<td>VDOT &amp; Other Entities Review Preliminary Roadway Plans</td>
<td>12-Dec-14</td>
<td>01-Jan-15</td>
<td>01-Jan-15</td>
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<tr>
<td>D1610</td>
<td>Submit Final Roadway Plans to VDOT &amp; Other Review Entities</td>
<td>07-Apr-15</td>
<td>07-Apr-15</td>
<td>07-Apr-15</td>
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<tr>
<td>D1630</td>
<td>Address Review Comments and Resolve VDOT &amp; Other Entities Approval on RFC Roadway</td>
<td>08-May-15</td>
<td>30-May-15</td>
<td>30-May-15</td>
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<tr>
<td>D1640</td>
<td>Address Review Comments and Resolve VDOT &amp; Other Entities Approval on RFC Roadway</td>
<td>03-May-15</td>
<td>05-May-15</td>
<td>05-May-15</td>
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<tr>
<td>D1650</td>
<td>Final Report Submittal to VDOT &amp; Other Entities Winter Terminal to Sta. 338+92</td>
<td>19-May-15</td>
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### Hydraulics

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<tr>
<td>D1660</td>
<td>35% H &amp; HA Analysis, incl. Scour Analysis</td>
<td>16-Oct-14</td>
<td>16-Oct-14</td>
<td>10-Dec-14</td>
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<tr>
<td>D1670</td>
<td>Design QA/QC of 50% H &amp; HA and Retain</td>
<td>24-Oct-14</td>
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<tr>
<td>D1680</td>
<td>VDOT &amp; Other Entities Review of 50% H &amp; HA, incl. Scour Analysis</td>
<td>28-Oct-14</td>
<td>17-Nov-14</td>
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<tr>
<td>D1690</td>
<td>Design QA/QC of 75% H &amp; HA and Retain</td>
<td>08-Oct-14</td>
<td>08-Oct-14</td>
<td>08-Oct-14</td>
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<tr>
<td>D1700</td>
<td>VDOT &amp; Other Entities Review of 75% H &amp; HA, incl. Scour Analysis</td>
<td>17-Nov-14</td>
<td>17-Nov-14</td>
<td>17-Nov-14</td>
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<tr>
<td>D1710</td>
<td>100% H &amp; HA Analysis, incl. Scour Analysis</td>
<td>07-Oct-14</td>
<td>07-Oct-14</td>
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<tr>
<td>D1730</td>
<td>VDOT &amp; Other Entities Review and Approval, as applicable, of 100% H &amp; HA, incl Scour Analysis</td>
<td>19-May-15</td>
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### Drainage, SWM, and ESC Plans

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<tr>
<td>D1740</td>
<td>Drainage and SWM Design, Post Construction SWM Plan and MS19 ID</td>
<td>03-Mar-14</td>
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<td>31-Jul-14</td>
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<tr>
<td>D1750</td>
<td>Design QA/QC Review Concept ESC and Post-Construction SWM (FAA Review) &amp; SWPPP</td>
<td>01-Aug-14</td>
<td>21-Aug-14</td>
<td>21-Aug-14</td>
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<tr>
<td>D1770</td>
<td>Multi-Phased ESC Plans &amp; Narrative &amp; SWPPP</td>
<td>23-Dec-14</td>
<td>23-Dec-14</td>
<td>23-Dec-14</td>
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<tr>
<td>D1780</td>
<td>Design QA/QC Review of Preliminary Drainage, SWM and ESC Plans</td>
<td>26-Feb-15</td>
<td>02-Mar-15</td>
<td>02-Mar-15</td>
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<tr>
<td>D1790</td>
<td>Preliminary Drainage, SWM and ESC Plans Submittal</td>
<td>25-Feb-15</td>
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<tr>
<td>D2180</td>
<td>VDOT, MWAA &amp; Other Entities Review of Plans, Specs. &amp; Construction Permit Package</td>
<td>21</td>
<td>20-Mar-15</td>
<td>05-Jun-15</td>
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<td>Riser / Spillway Gate Valve Mechanism</td>
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<td>D2190</td>
<td>Inspect Riser Spillways</td>
<td>5</td>
<td>07-Jul-14</td>
<td>15-Jul-14</td>
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<tr>
<td>D2200</td>
<td>Develop Preliminary Plans for Gate Valve Mechanism Replacement</td>
<td>20</td>
<td>19-Aug-14</td>
<td>16-Oct-14</td>
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<tr>
<td>D2210</td>
<td>Design QA/QC Review of Submission &amp; Submit to VDOT, MWAA &amp; Other Entities</td>
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<td>17-Oct-14</td>
<td>21-Oct-14</td>
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<tr>
<td>D2220</td>
<td>Receive VDOT, MWAA &amp; Other Entities Review Comments on Preliminary Plans</td>
<td>21</td>
<td>09-Nov-15</td>
<td>29-Nov-15</td>
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<tr>
<td>D2230</td>
<td>Address Comments &amp; Develop Submission Plans, Specs. &amp; Construction Permit Package</td>
<td>45</td>
<td>30-Mar-15</td>
<td>02-Apr-15</td>
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<tr>
<td>D2240</td>
<td>Design QA/QC Review of Submission Plans and Specifications &amp; Submit</td>
<td>5</td>
<td>03-Apr-15</td>
<td>09-Apr-15</td>
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<tr>
<td>D2250</td>
<td>VDOT, MWAA &amp; Other Entities Review of Plans, Specs. &amp; Construction Permit Package</td>
<td>21</td>
<td>10-Apr-15</td>
<td>30-Apr-15</td>
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| Spillway Culvert Extension | | | | | |
| D2260 | Inspect Existing Spillway Culverts | 5 | 07-Jul-14 | 15-Jul-14 | Qtr 2 |
| D2270 | Develop Preliminary Plans for Spillway Culvert Extension | 30 | 05-Sep-14 | 16-Oct-14 | Qtr 3 |
| D2280 | Design QA/QC Review of Submission & Submit to VDOT, MWAA & Other Entities | 3 | 09-Jan-15 | 15-Jan-15 | Qtr 1 |
| D2290 | Receive VDOT, MWAA & Other Entities Review Comments on Preliminary Plans | 21 | 14-Jan-15 | 21-Jan-15 | Qtr 1 |
| D2300 | Address Comments & Develop Submission Plans, Specs. & Construction Permit Package | 44 | 04-Feb-15 | 07-Apr-15 | Qtr 1 |
| D2310 | Design QA/QC Review of Submission Plans and Specifications & Submit | 5 | 08-Apr-15 | 14-Apr-15 | Qtr 1 |
| D2320 | VDOT, MWAA & Other Entities Review of Plans, Specs. & Construction Permit Package | 21 | 15-Apr-15 | 05-May-15 | Qtr 2 |

| Phase B - Independent Design Package (If Not Executed) | | | | | |
| D2340 | Develop Preliminary Phase B Design Package | 20 | 18-Jan-16 | 16-Jan-16 | Qtr 1 |
| D2350 | Design QA/QC of Preliminary Phase B Design Package | 10 | 19-Jan-16 | 30-Jan-16 | Qtr 1 |
| D2360 | Submit Preliminary Phase B Design Package to VDOT | 1 | 02-Feb-16 | 02-Feb-16 | Qtr 2 |
| D2370 | VDOT Review Preliminary Phase B Design Package | 21 | 03-Feb-16 | 15-Feb-16 | Qtr 2 |
| D2380 | Address VDOT Comments & Develop Final Phase B Design Package | 44 | 24-Feb-16 | 27-Apr-16 | Qtr 2 |
| D2390 | Design QA/QC of Final Phase B Design Package | 10 | 28-Apr-16 | 15-May-16 | Qtr 3 |
| D2400 | Submit Final/Phase B Design Package to VDOT | 1 | 12-May-16 | 12-May-16 | Qtr 3 |
| D2410 | VDOT Review Preliminary Phase B Design Package | 21 | 15-May-16 | 02-Jun-16 | Qtr 3 |
| D2420 | Address VDOT Comments & Submit Preliminary Phase B Design Package | 20 | 03-Jun-16 | 30-Jun-16 | Qtr 3 |

| Right of Way Acquisitions | | | | | |
| R1050 | Prepare and Submit Acquisition and Relocation Plan incl. Proposed Appraisals & Reviews | 20 | 24-Jun-14 | 22-Jul-14 | Qtr 2 |
| R1040 | VDOT & MWAA Review and Approve Acquisition and Relocation Plan, Incl. EQ-201 Re-Evaluation - Hold Point | 21 | 23-Jul-14 | 12-Aug-14 | Qtr 2 |
| R1010 | Complete ROW Plan and Profile, DW's, Right of Way Data Sheet Per BLM-301 Checklist, Plats and Notes & Bounds | 20 | 08-Sep-14 | 03-Oct-14 | Qtr 2 |
| R1020 | Rec. ROW Plan Approval for Perk & Tamp Easements, Utility Easements-VDOT & Other Entities | 21 | 04-Oct-14 | 24-Oct-14 | Qtr 3 |
| R1050 | VDOT Issue Notice to Proceed for ROW Acquisitions- Hold Point | 0 | 24-Oct-14 | 0 | Qtr 3 |
| R1120 | Request Right of Entry from MWAA & NOAA | 41 | 27-Oct-14 | 30-Oct-14 | Qtr 3 |
| R1105 | Post Appraisal & Approval Reviews to RUMS | 100 | 24-Nov-14 | 15-Nov-15 | Qtr 3 |
| R1100 | VDOT Review of Approval Packages, Just/Compensation, Relocation Benefits and Administrative Settlements-As-Quoted | 100 | 25-Dec-14 | 15-May-15 | Qtr 3 |
| R1180 | VDOT Concurrence on ROE-MWAA & NOAA Property | 11 | 01-Mar-15 | 20-Mar-15 | Qtr 4 |
| R1180 | Initiate ROW/Emmauls/Requisitions, Acquisition incl. RW24's | 10 | 01-Nov-15 | 12-Nov-15 | Qtr 4 |
| R1100 | Make Offers to Property Owners | 80 | 29-Nov-15 | 20-May-15 | Qtr 5 |
| R1130 | Request Right of Entry-As Necessary | 80 | 20-Feb-15 | 04-Mar-15 | Qtr 5 |
| R1110 | Property Owner Accepts Offer | 80 | 26-Feb-15 | 15-Mar-15 | Qtr 5 |
| R1170 | VDOT Issue Certificate of Take and Files in Court, If Impasse is Reached | 80 | 27-Feb-15 | 25-May-15 | Qtr 5 |
| R1140 | Property Owner Accepts ROE | 21 | 05-Mar-15 | 25-Mar-15 | Qtr 5 |
| R1180 | VDOT Process Vouchers & Issue State Warrants for Payments to Contractor for Acquisitions | 21 | 26-Mar-15 | 15-Apr-15 | Qtr 5 |
| R1150 | VDOT Concurrence on ROE-As Necessary | 21 | 26-Mar-15 | 15-Apr-15 | Qtr 5 |
### Route 606 Loudoun County Parkway/Old Ox Road Reconstruction and Widening

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<th>Duration</th>
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<tbody>
<tr>
<td>P1190</td>
<td>Closing and Settlement Payment Disbursement &amp; Indemnifiable Title to VDOT-Acquisitions</td>
<td>60-30-Apr-15</td>
<td>29-Jun-15</td>
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### Environmental / Permits

#### Horsepen Dam Permitting

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<tbody>
<tr>
<td>P1020</td>
<td>Request &amp; Hold Conference with DCR to Review Proposed Documents</td>
<td>5-02-Jan-15</td>
<td>08-Jan-15</td>
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<tbody>
<tr>
<td>P1050</td>
<td>DCR Review and Comment of Design Report for Alteration of Horsepen Dam Sta. 338+92 to East Terminus</td>
<td>60-16-Jun-15</td>
<td>14-Jun-15</td>
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<tr>
<td>P1060</td>
<td>Address Comments on Design Alteration Report and Resubmit to DCR</td>
<td>30-15-Jun-15</td>
<td>27-Jul-15</td>
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<tr>
<td>P1070</td>
<td>Receive VA Soil and Water Conservation Board Approval of Horsepen Dam Alteration Permit Sta. 338+92 to East Terminus</td>
<td>60-28-Jul-15</td>
<td>24-Nov-15</td>
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### Endangered Species

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<tr>
<td>P1080</td>
<td>Update Documentation and Coordinate with VA DEQ, DGIF and USFWS</td>
<td>30-24-Jan-16</td>
<td>05-Aug-16</td>
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### Environmental Site Assessments & Hazardous Material Investigations

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<tr>
<td>P1090</td>
<td>Complete and Submit Phase I Environmental Assessment</td>
<td>45-30-Jan-16</td>
<td>02-Sep-16</td>
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<tr>
<td>P1100</td>
<td>Boundary-Mental Inventory Report (if needed)</td>
<td>0-03-Jul-16</td>
<td>05-Jul-16</td>
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<tbody>
<tr>
<td>P1110</td>
<td>VDOT Review and Approval of Hazardous Materials Reports - Hold Point</td>
<td>20-01-Jul-16</td>
<td>28-Jul-16</td>
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<tbody>
<tr>
<td>P1100</td>
<td>VDOT Review and Approval of Phase I Environmental Site Assessment - Hold Point</td>
<td>21-03-Sep-16</td>
<td>23-Sep-16</td>
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<tbody>
<tr>
<td>P1130</td>
<td>Prepare and Submit Phase II Environmental Site Assessment (TIB)</td>
<td>0-24-Sep-16</td>
<td>24-Sep-16</td>
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### Water Quality Permitting & Stormwater Monitoring

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<tbody>
<tr>
<td>P1140</td>
<td>Field Delineation of Wetlands and Coordinate Web VDOT, USACE, and DEQ</td>
<td>5-24-Jun-16</td>
<td>30-Jun-16</td>
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<th>End Date</th>
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<tbody>
<tr>
<td>P1150</td>
<td>Complete Wetland Delineation:Develop/Submit for Jurisdictional Approval</td>
<td>41-01-Jul-16</td>
<td>03-Sep-16</td>
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<tbody>
<tr>
<td>P1160</td>
<td>Receive Jurisdictional Approval</td>
<td>30-04-Aug-16</td>
<td>15-Oct-16</td>
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<tr>
<td>P1170</td>
<td>Prepare and Submit Joint Permit Application</td>
<td>30-04-Aug-16</td>
<td>15-Oct-16</td>
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<tr>
<td>P1180</td>
<td>USACE Issues Section 404 Permit</td>
<td>180-16-Oct-16</td>
<td>15-Oct-16</td>
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### Storm Water Permit

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<tbody>
<tr>
<td>P1210</td>
<td>VDOT Review &amp; DCR Issues VSPM Hold Permits for Stormwater Management Districts</td>
<td>60-23-Dec-16</td>
<td>18-Mar-16</td>
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<tr>
<td>P1210</td>
<td>Complete Drainage Design and SWM &amp; ESC Plan</td>
<td>45-25-Mar-16</td>
<td>27-May-16</td>
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<tbody>
<tr>
<td>P1220</td>
<td>VDOT Review &amp; DEQ Issues VSPM Hold Permits for Stormwater Management Districts</td>
<td>90-17-Jul-16</td>
<td>14-Oct-16</td>
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### Well Closures

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<tr>
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<tbody>
<tr>
<td>P1240</td>
<td>Well Closure Investigations</td>
<td>13-26-Nov-16</td>
<td>17-Dec-16</td>
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<tr>
<td>P1250</td>
<td>Develop Permit Application and Letter Report for Well Closures and Submit VSHP</td>
<td>1-18-Dec-16</td>
<td>24-Dec-16</td>
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### Utility Coordination & Relocations

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<tr>
<td>U1010</td>
<td>Prepare Property Owner Notification Letter for (SUE)</td>
<td>1-10-Nov-16</td>
<td>19-Nov-16</td>
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<tr>
<td>U1020</td>
<td>Perform SUE Designations and Test Holes</td>
<td>30-26-Jan-16</td>
<td>01-Feb-16</td>
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<tr>
<td>U1040</td>
<td>Meet with VDOT Regional Utility Office 45 days after NTP</td>
<td>1-04-Aug-16</td>
<td>06-Aug-16</td>
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<tr>
<td>U1050</td>
<td>Prepare Test Hole Data Sheets, UT-9’s, and UT-9’s</td>
<td>28-04-Aug-16</td>
<td>29-Aug-16</td>
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<tr>
<td>U1060</td>
<td>Determine Prior Rights, Update UT-9’s, Update RUMS</td>
<td>15-05-Aug-16</td>
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<td>U1070</td>
<td>Prepare Preliminary Status Rept 120 days after NTP</td>
<td>1-12-Sep-16</td>
<td>16-Sep-16</td>
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<td>U1080</td>
<td>Utility Field Inspection (UFI) Meet with Utility Owners</td>
<td>20-08-Sep-16</td>
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<tr>
<td>U1090</td>
<td>Update Documentation and Letter Report for Well Closures and Submit VSHP</td>
<td>13-17-Sep-16</td>
<td>07-Oct-16</td>
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### Design (By Others)

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<tr>
<td>U1270</td>
<td>DB Team Received Written Approval from VDOT to commence Relocations</td>
<td>21-04-Oct-16</td>
<td>24-Oct-16</td>
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<td>U1090</td>
<td>Utility Design Starts</td>
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<td>Start Date</td>
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<tr>
<td>U310</td>
<td>Dominion Virginia Power (No Conflict)</td>
<td>06-Oct-14</td>
<td>06-Oct-14</td>
<td>16-Jan-15</td>
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<tr>
<td>U1500</td>
<td>Verizon South GFE Plan and Estimate</td>
<td>06-Oct-14</td>
<td>06-Oct-14</td>
<td>30-Dec-14</td>
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<tr>
<td>U1250</td>
<td>Loudoun County Service Authority Plan and Estimate</td>
<td>06-Oct-14</td>
<td>06-Oct-14</td>
<td>30-Dec-14</td>
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<tr>
<td>U2240</td>
<td>Columbia Gas of Virginia Plan &amp; Estimate</td>
<td>06-Oct-14</td>
<td>06-Oct-14</td>
<td>30-Dec-14</td>
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<tr>
<td>U2240</td>
<td>Dulles Airport - MWAA Plan and Estimate</td>
<td>06-Oct-14</td>
<td>06-Oct-14</td>
<td>30-Dec-14</td>
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<tr>
<td>U1180</td>
<td>Sumitomo Communications Plan and Estimate</td>
<td>06-Oct-14</td>
<td>06-Oct-14</td>
<td>30-Dec-14</td>
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<tr>
<td>U1130</td>
<td>Northern Virginia Electric Plan and Estimate</td>
<td>06-Oct-14</td>
<td>06-Oct-14</td>
<td>30-Dec-14</td>
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<td>U1140</td>
<td>AT&amp;T Long Distance Plan and Estimate</td>
<td>06-Oct-14</td>
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<td>30-Dec-14</td>
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<tr>
<td>U2200</td>
<td>Comcast (NiSource) Plan and Estimate</td>
<td>06-Oct-14</td>
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<td>30-Dec-14</td>
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<tr>
<td>U1200</td>
<td>D.C. Water and Sewer Authority (Potomac Interceptor) Plan and Estimate</td>
<td>06-Oct-14</td>
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<td>30-Dec-14</td>
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<td>U2140</td>
<td>Verizon Virginia Plan and Estimate</td>
<td>06-Oct-14</td>
<td>06-Oct-14</td>
<td>30-Dec-14</td>
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<tr>
<td>U2210</td>
<td>Dominion Virginia Power Transmission (No Conflict)</td>
<td>06-Oct-14</td>
<td>06-Oct-14</td>
<td>30-Dec-14</td>
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Utility Relocations:

- Kickoff meeting with VDOT
- Initial mobilization
- Submittal, Review & Approval Safety plan
- Submittal, Review & Approval QA/QC plan
- Start of Construction
- Construction Mobilization

Construction:

- Site Preparation
- Installation of Water Line (Loudoun Co. Water & Sewers) - 2 crews
- Earthwork at Loudoun Co. Water & Sewers
- Water Tie-Ins at 7 Locations

Phase A - Mainline Construction

- Stage 1 - Early
  - Installation of MOT
  - Subgrade Prep - EB Sta. 80+00 to 155+00 Stage 1 Early
  - Place Gravel Roadbase - EB Sta. 80+00 to 155+00 Stage 1 Early
  - Install Airport Security Fence (12000 ft) - Airport Security Road Stage 1 Early

Critical Path Activities:

- Kickoff meeting with VDOT
- Initial mobilization
- Submittal, Review & Approval Safety plan
- Submittal, Review & Approval QA/QC plan
- Start of Construction
- Construction Mobilization

Milestones:

- Kickoff meeting with VDOT
- Installation of MOT
- Initial mobilization
<table>
<thead>
<tr>
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<th>Original Description</th>
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<th>End Date</th>
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<tr>
<td>11190</td>
<td>Subbase - EB Sta. 249+00 to Sta. 262+00 Stage 1 Early</td>
<td>2 May-15</td>
<td>21 May-15</td>
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<tr>
<td>11230</td>
<td>Base &amp; Interim. Asphalt Coarse - EB Sta. 249+00 to Sta. 262+00 Stage 1 Early</td>
<td>22 May-15</td>
<td>26 May-15</td>
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<tr>
<td>11250</td>
<td>Temp. Pavement Markings - EB Sta. 249+00 to Sta. 262+00 Stage 1 Early</td>
<td>1 Mar-15</td>
<td>29 May-15</td>
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<tr>
<td>11106</td>
<td>Earthwork - EB Sta. 277+00 to Sta. 318+00 Stage 1 Early</td>
<td>1 Jun-15</td>
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<tr>
<td>11140</td>
<td>Subgrade Prep - EB Sta. 277+00 to Sta. 318+00 Stage 1 Early</td>
<td>11 Jun-15</td>
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<td>11200</td>
<td>Subbase - EB Sta. 277+00 to Sta. 318+00 Stage 1 Early</td>
<td>7 Jun-15</td>
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<td>11280</td>
<td>Base &amp; Interim. Asphalt Coarse - EB Sta. 277+00 to Sta. 318+00 Stage 1 Early</td>
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<td>29 Jun-15</td>
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<td>11310</td>
<td>Temp. Pavement Markings - EB Sta. 277+00 to Sta. 318+00 Stage 1 Early</td>
<td>3 Jul-15</td>
<td>2 Jul-15</td>
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<td>11190</td>
<td>EB Sta. 333+00 to Sta. 341+50 Stage 1 Early</td>
<td>4 Jun-15</td>
<td>11 May-15</td>
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<td>Subgrade Prep - EB Sta. 333+00 to Sta. 341+50 Stage 1 Early</td>
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<td>10 May-15</td>
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<td>Base &amp; Interim. Asphalt Coarse - EB Sta. 333+00 to Sta. 341+50 Stage 1 Early</td>
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<td>3 May-15</td>
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<td>11240</td>
<td>Temp. Pavement Markings - EB Sta. 333+00 to Sta. 341+50 Stage 1 Early</td>
<td>1 May-15</td>
<td>1 May-15</td>
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</tbody>
</table>

**Shoulder Widening:**

- 11160 | EB Sta. 489+00 to Sta. 529+68; Sta. 80+00 to 366+75 Stage 1 Early | 16 May-16 | 16 May-16 |
- 11180 | EB Sta. 489+00 to Sta. 529+68; Sta. 80+00 to 366+75 Stage 1 Early | 18 Jun-15 | 18 Jun-15 |

**Water Testing Station @ the Downstream of Horsepen Dam:**

- 11050 | Pervious Brick Shoring & Instrumentation | 60 May-15 | 02 Sep-15 |

**Route 606 Loudoun County Parkway/Old Ox Road Reconstruction and Widening**

**Stage 1 - Late**

- A1510 | Switch Traffic to New Widening / Proposed / Existing Rdy | 15 Sep-15 | 21 Sep-15 |

**WB Sta. 489+00 to Sta. 529+68; Sta. 80+00 to 366+75 Stage 1 - Late**

- A1440 | Earthwork - WB Sta. 489+00 to 539+48; Sta. 80+00 to 366+75 Stage 1 Late | 10 May-16 | 10 May-16 |
- A1490 | Installation of Storm Water Management Ponds (5 ea) - WB Sta. 489+00 to 539+48; Sta. 80+00 to 366+75 Stage 1 Late | 10 Nov-15 | 20 Apr-16 |
- A1540 | Construct Box Culvert (at Sta. 158+00) - 2 Crews - Stage 1 Late | 21 Jan-16 | 21 Jan-16 |
- A1470 | Subgrade Prep - WB Sta. 489+00 to 529+68; Sta. 80+00 to 366+75 Stage 1 Late | 12 Feb-16 | 24 May-16 |
- A1390 | Construct Soundwalls - WB Sta. 489+00 to 529+68; Sta. 80+00 to 366+75 Stage 1 Late | 17 Feb-16 | 17 Feb-16 |
- A1460 | Subbase - WB Sta. 489+00 to 529+68; Sta. 80+00 to 366+75 Stage 1 Late | 26 Mar-16 | 26 Mar-16 |
- A1350 | Place Tar & Gravel - WB Sta. 489+00 to 529+68; Sta. 80+00 to 366+75 Stage 1 Late | 15 Apr-16 | 15 Apr-16 |
- A1490 | Base Asphalt Course - WB Sta. 489+00 to 529+68; Sta. 80+00 to 366+75 Stage 1 Late | 29 Apr-16 | 29 Jul-16 |
- A1520 | Intermediate Asphalt Course - WB Sta. 489+00 to 529+68; Sta. 80+00 to 366+75 Stage 1 Late | 18 Mar-16 | 18 Mar-16 |
- A1550 | Temp. Pavement Markings - WB Sta. 489+00 to 529+68; Sta. 80+00 to 366+75 Stage 1 Late | 30 Jul-16 | 15 Aug-16 |

**WB Horsepen Dam Widening**

- A20 | Install Gravel 7" & Tie-Backs - Stage 1 Late | 21 Nov-15 | 02 Dec-15 |
- A10 | Construction CP Rounding Wall (BF) @ Tres de Embankment - SSW - Stage 1 Late | 25 Nov-15 | 25 Nov-15 |
- A30 | Excavate to Uncover Existing Box Culvert - Stage 1 Late | 04 Dec-15 | 04 Dec-15 |
- A40 | Demo and Remove Existing 59' of Twin Box Culvert (Half of the Box Culvert) - Stage 1 Late | 18 Dec-15 | 18 Dec-15 |
- A50 | Replace & Extend Existing Twin Box Culvert - 157' - Stage 1 Late | 15 Jan-16 | 15 Jan-16 |
- A60 | Demo and Remove Existing 59' of Twin Box Culvert (Half of the Box Culvert) - Stage 1 Late | 18 Jan-16 | 18 Jan-16 |
- A70 | Replace & Extend Existing Twin Box Culvert - 157' - Stage 1 Late | 15 Feb-16 | 15 Feb-16 |
- A80 | Backfill & Place Rip-Rap within Limits of Distributed Area - Stage 1 Late | 17 Mar-16 | 17 Mar-16 |
- A90 | Encapsulated Natural Graded Filter on Top of Existing Rip-Rap - Stage 1 Late | 17 Mar-16 | 17 Mar-16 |
- A100 | Earthwork (200,000 CY) - 2 Crews - Stage 1 Late | 01 Mar-16 | 01 Mar-16 |

**WB Bridge Over Horsepen Dam Spillway**

- A1550 | Structure Excavation - WB Bridge Stage 1 Late | 22 Sep-15 | 22 Sep-15 |

The table above lists various construction activities along Route 606 Loudoun County Parkway/Old Ox Road, including excavation, base and intermediate asphalt courses, subbase, and the installation of various structures and drainage systems.
### Route 606 Loudoun County Parkway/Old Ox Road Reconstruction and Widening

**Activity ID** | **Activity Name** | **Original Duration** | **Weeks** |
---|---|---|---|
A156 | Drive 15-Pi, WB Bridge Stage 1 Late | | |
A157 | Construction Foundations - WB Bridge Stage 1 Late | | |
A158 | Construct Abutment A Substructure - WB Bridge Stage 1 Late | | |
A159 | Construct Pier - WB Bridge Stage 1 Late | | |
A160 | Construct Abutment B Substructure - WB Bridge Stage 1 Late | | |
A161 | Site Grinders - B/W Bridge Stage 1 Late | | |
A162 | Place Bridge Decks - WB Bridge Stage 1 Late | | |
A163 | Construct Bridge Rails - WB Bridge Stage 1 Late | | |
A164 | Install Pedestrian Fence - WB Bridge Stage 1 Late | | |

**Stage 2**

- **A170** Switch Traffic to New WB Traffic Lanes
  - EB Sta. 489+06 to Sta. 529+68; Sta. 80+00 to 366+75

- **A160** Earthwork - 2 Crews - EB Sta. 489+06 to 529+68; Sta. 80+00 to 366+75 Stage 2
  - 01-Mar-17

- **A250** Installation of Storm Water Management Ponds (4 ea) - 2 Crews - EB Sta. 489+06 to 529+68; Sta. 80+00 to 366+75 Stage 2
  - 03-Oct-16

- **A350** Earthwork Shared-Use Path
  - EB Sta. 489+06 to Sta. 529+68; Sta. 80+00 to 366+75 Stage 2

- **A360** Subbase - 2 Crews - EB Sta. 489+06 to 529+68; Sta. 80+00 to 366+75 Stage 2
  - 03-Oct-16

- **A370** Subgrade Prep - 2 Crews - EB Sta. 489+06 to 529+68; Sta. 80+00 to 366+75 Stage 2
  - 03-Oct-16

- **A380** Place Curb & Gutter - 2 Crews - EB Sta. 489+06 to 529+68; Sta. 80+00 to 366+75 Stage 2
  - 03-Oct-16

- **A390** Base & Interim. Asphalt Courses - 2 Crews - EB Sta. 489+06 to 529+68; Sta. 80+00 to 366+75 Stage 2
  - 03-Oct-16

- **A400** Final Surface Asphalt Course & Pavement Markings - 2 Crews - EB Sta. 489+06 to 529+68; Sta. 80+00 to 366+75 Stage 2
  - 03-Oct-16

- **A410** Drive 15-Pi, EB Bridge Stage 2 | | |
- **A420** Construction Foundations - EB Bridge Stage 2 | | |
- **A430** Construct Abutment A Substructure - EB Bridge Stage 2 | | |
- **A440** Construct Pier - EB Bridge Stage 2 | | |
- **A450** Construct Abutment B Substructure - EB Bridge Stage 2 | | |
- **A460** Set Grinders - B/E Bridge Stage 2 | | |
- **A470** Place Bridge Decks - EB Bridge Stage 2 | | |
- **A480** Construct Bridge Rails - EB Bridge Stage 2 | | |
- **A490** Install Pedestrian Fence - EB Bridge Stage 2 | | |

**Stage 3**

- **A1820** Switch Traffic to Final Configuration | | |
- **A1830** Final Surfacing Asphalt Course & Pavement Markings - Stage 3 | | |
- **A1840** Landscaping & Finesse - Stage 3 | | |

**Phase B - Shared Use Path & Superstructure Widening**

- **A2020** Earthwork Shared-Use Path | | |
- **A2030** Winson Horsepower Storm Drain Bridge Superstructure | | |
- **A2040** Grade Shared-Use Path | | |
- **A2050** Setbase Shared-Use Path | | |
- **A2070** Paving Shared-Use Path | | |

---

**Milestone**

- **A2020** Schedule to Final Configuration
- **A2030** Earthwork Shared-Use Path
- **A2040** Winson Horsepower Storm Drain Bridge Superstructure
- **A2050** Grade Shared-Use Path
- **A2070** Paving Shared-Use Path

---

**Remaining Level of Effort**

- **Red** Remaining Work
- **Green** Critical Remaining Work
- **Blue** Milestone
## Technical Proposal Checklist and Contents

Offerors shall furnish a copy of this Technical Proposal Checklist, with the page references added, with the Technical Proposal.

<table>
<thead>
<tr>
<th>Technical Proposal Component</th>
<th>Form (if any)</th>
<th>RFP Part 1 Cross Reference</th>
<th>Included within page limit?</th>
<th>Technical Proposal Page Reference</th>
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<tbody>
<tr>
<td>Technical Proposal Checklist and Contents</td>
<td>Attachment 4.0.1.1</td>
<td>Section 4.0.1.1</td>
<td>no</td>
<td>Appendix</td>
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<tr>
<td>Acknowledgement of RFP, Revisions, and/or Addenda</td>
<td>Attachment 3.6 (Form C-78-RFP)</td>
<td>Sections 3.6, 4.0.1.1</td>
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<tr>
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<td>Appendix</td>
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<td>yes</td>
<td>Appendix</td>
</tr>
<tr>
<td>Authorized representative’s original signature</td>
<td>NA</td>
<td></td>
<td>yes</td>
<td>Appendix</td>
</tr>
<tr>
<td>Declaration of intent</td>
<td>NA</td>
<td></td>
<td>yes</td>
<td>Appendix</td>
</tr>
<tr>
<td>120 day declaration</td>
<td>NA</td>
<td></td>
<td>yes</td>
<td>Appendix</td>
</tr>
<tr>
<td>Offeror’s Point of Contact Information</td>
<td>NA</td>
<td></td>
<td>yes</td>
<td>Appendix</td>
</tr>
<tr>
<td>Principal Officer Information</td>
<td>NA</td>
<td></td>
<td>yes</td>
<td>Appendix</td>
</tr>
<tr>
<td>Final Completion Date</td>
<td>NA</td>
<td></td>
<td>yes</td>
<td>Appendix</td>
</tr>
<tr>
<td>Proposal Payment Agreement or Waiver of Proposal Payment</td>
<td>Attachment 9.3.1 or 9.3.2</td>
<td>Section 4.1.7</td>
<td>no</td>
<td>Appendix</td>
</tr>
<tr>
<td>Certification Regarding Debarment Forms</td>
<td>Attachment 11.8.6(a)</td>
<td>Section 4.1.8</td>
<td>no</td>
<td>Appendix</td>
</tr>
<tr>
<td>Written statement Technical Proposal fully compliant with RFP requirements</td>
<td>NA</td>
<td>Section 4.1.9</td>
<td>yes</td>
<td>Appendix</td>
</tr>
<tr>
<td>Technical Proposal Component</td>
<td>Form (if any)</td>
<td>RFP Part 1 Cross Reference</td>
<td>Included within page limit?</td>
<td>Technical Proposal Page Reference</td>
</tr>
<tr>
<td>-----------------------------------------------------------------</td>
<td>---------------</td>
<td>-----------------------------</td>
<td>----------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>Certification of ROW limits and Design Waivers/Exceptions</td>
<td>NA</td>
<td>4.1.9</td>
<td>yes</td>
<td>2</td>
</tr>
<tr>
<td>Offeror’s Qualifications</td>
<td>NA</td>
<td>Section 4.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confirmation that the information provided in the SOQ submittal remains true and accurate or indicates that any requested changes were previously approved by VDOT</td>
<td>NA</td>
<td>Section 4.2.1</td>
<td>yes</td>
<td>3</td>
</tr>
<tr>
<td>Organizational chart with any updates since the SOQ submittal clearly identified</td>
<td>NA</td>
<td>Section 4.2.2</td>
<td>yes</td>
<td>3, 4</td>
</tr>
<tr>
<td>Revised narrative when organizational chart includes updates since the SOQ submittal</td>
<td>NA</td>
<td>Section 4.2.2</td>
<td>yes</td>
<td>N/A</td>
</tr>
<tr>
<td>Design Concept</td>
<td>NA</td>
<td>Section 4.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conceptual Roadway Plans and description</td>
<td>NA</td>
<td>Section 4.3.1.1</td>
<td>yes</td>
<td>5 and Volume II</td>
</tr>
<tr>
<td>Conceptual Structural Plans and description</td>
<td>NA</td>
<td>Section 4.3.1.2</td>
<td>yes</td>
<td>9 and Volume II</td>
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<tr>
<td>Project Approach</td>
<td>NA</td>
<td>Section 4.4</td>
<td></td>
<td></td>
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<td>Utilities</td>
<td>NA</td>
<td>Section 4.4.1</td>
<td>yes</td>
<td>11</td>
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<td>Geotechnical</td>
<td>NA</td>
<td>Section 4.4.2</td>
<td>yes</td>
<td>14</td>
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<tr>
<td>Quality Assurance/ Quality Control (QA/QC)</td>
<td>NA</td>
<td>Section 4.4.3</td>
<td>yes</td>
<td>18</td>
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<tr>
<td>Technical Proposal Component</td>
<td>Form (if any)</td>
<td>RFP Part 1 Cross Reference</td>
<td>Included within page limit?</td>
<td>Technical Proposal Page Reference</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>---------------</td>
<td>----------------------------</td>
<td>----------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>Construction of Project</td>
<td>NA</td>
<td>Section 4.5</td>
<td></td>
<td></td>
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<tr>
<td>Sequence of Construction</td>
<td>NA</td>
<td>Section 4.5.1</td>
<td>yes</td>
<td>25</td>
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<tr>
<td>Transportation Management Plan</td>
<td>NA</td>
<td>Section 4.5.2</td>
<td>yes</td>
<td>27</td>
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<tr>
<td>Dam Construction</td>
<td>NA</td>
<td>Section 4.5.3</td>
<td>yes</td>
<td>29</td>
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<td>Disadvantaged Business Enterprises (DBE)</td>
<td>NA</td>
<td>Section 4.6</td>
<td></td>
<td></td>
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<tr>
<td>Written statement of percent DBE participation</td>
<td>NA</td>
<td>Section 4.6</td>
<td>yes</td>
<td>33</td>
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<td>DBE subcontracting narrative</td>
<td>NA</td>
<td>Section 4.6</td>
<td>yes</td>
<td>33</td>
</tr>
<tr>
<td>Proposal Schedule</td>
<td>NA</td>
<td>Section 4.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proposal Schedule</td>
<td>NA</td>
<td>Section 4.7</td>
<td>no</td>
<td>S-8 -- S-15</td>
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<tr>
<td>Proposal Schedule Narrative</td>
<td>NA</td>
<td>Section 4.7</td>
<td>no</td>
<td>S-1</td>
</tr>
<tr>
<td>Proposal Schedule in electronic format (CD-ROM)</td>
<td>NA</td>
<td>Section 4.7</td>
<td>no</td>
<td>CD located inside the back cover of proposal</td>
</tr>
</tbody>
</table>
ATTACHMENT 3.6 (FORM C-78-RFP)
ACKNOWLEDGEMENT OF RECEIPT OF RFP, REVISIONS, AND/OR ADDENDA
ATTACHMENT 3.6

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION

RFP NO. C00097529DB64
PROJECT NO.: 0606-053-983

ACKNOWLEDGEMENT OF RFP, REVISION AND/OR ADDENDA

Acknowledgement shall be made of receipt of the Request for Proposals (RFP) and/or any and all revisions and/or addenda pertaining to the above designated project which are issued by the Department prior to the Letter of Submittal submission date shown herein. Failure to include this acknowledgement in the Letter of Submittal may result in the rejection of your proposal.

By signing this Attachment 3.6, the Offeror acknowledges receipt of the RFP and/or following revisions and/or addenda to the RFP for the above designated project which were issued under cover letter(s) of the date(s) shown hereon:

1. Cover letter of November 26, 2013

2. Cover letter of February 21, 2014

3. Cover letter of

SIGNATURE: ____________________________

DATE: 3/7/2014
ATTACHMENT 9.3.1
PROPOSAL PAYMENT AGREEMENT
ATTACHMENT 23.1

PROPOSAL PAYMENT AGREEMENT

THIS PROPOSAL PAYMENT AGREEMENT (this “Agreement”) is made and entered into as of this 17th day of March, 2014, by and between the Virginia Department of Transportation (“VDOT”), and The Lane Construction Corporation (“Offeror”).

WITNESSETH:

WHEREAS, Offeror is one of the entities who submitted Statements of Qualifications (“SOQs”) pursuant to VDOT’s July 12, 2013 Request for Qualifications (“RFQ”) and was invited to submit proposals in response to a Request for Proposals (“RFP”) for the Route 606 Loudoun County Parkway/Old Ox Road Reconstruction and Widening, Project No. 0606-053-983 (“Project”), under a design-build contract with VDOT (“Design-Build Contract”); and

WHEREAS, as part of the procurement process for the Project, Offeror has already provided and/or furnished to VDOT, and may continue to provide and/or furnish to VDOT, certain intellectual property, materials, information and ideas, including, but not limited to, such matters that are: (a) conveyed verbally and in writing during proprietary meetings or interviews; and (b) contained in, related to or associated with Offeror’s proposal, including, but not limited to, written correspondence, designs, drawings, plans, exhibits, photographs, reports, printed material, tapes, electronic disks, or other graphic and visual aids (collectively “Offeror’s Intellectual Property”); and

WHEREAS, VDOT is willing to provide a payment to Offeror, subject to the express conditions stated in this Agreement, to obtain certain rights in Offeror’s Intellectual Property, provided that Offeror submits a proposal that VDOT determines to be responsive to the RFP (“Offeror’s Proposal”), and either (a) Offeror is not awarded the Design-Build Contract; or (b) VDOT cancels the procurement or decides not to award the Design-Build Contract to any Offeror; and

WHEREAS, Offeror wishes to receive the payment offered by VDOT, in exchange for granting VDOT the rights set forth in this Agreement.

NOW, THEREFORE, in consideration of the mutual covenants and agreements set forth in this Agreement and other good and valuable consideration, the receipt and adequacy of which are acknowledged by the parties, the parties agree as follows:
1. **VDOT's Rights in Offeror's Intellectual Property.** Offeror hereby conveys to VDOT all rights, title and interest, free and clear of all liens, claims and encumbrances, in Offeror's Intellectual Property, which includes, without restriction or limitation, the right of VDOT, and anyone contracting with VDOT, to incorporate any ideas or information from Offeror's Intellectual Property into: (a) the Design-Build Contract and the Project; (b) any other contract awarded in reference to the Project; or (c) any subsequent procurement by VDOT. In receiving all rights, title and interest in Offeror's Intellectual Property, VDOT is deemed to own all intellectual property rights, copyrights, patents, trade secrets, trademarks, and service marks in Offeror's Intellectual Property, and Offeror agrees that it shall, at the request of VDOT, execute all papers and perform all other acts that may be necessary to ensure that VDOT's rights, title and interest in Offeror's Intellectual Property are protected. The rights conferred herein to VDOT include, without limitation, VDOT's ability to use Offeror's Intellectual Property without the obligation to notify or seek permission from Offeror.

2. **Exclusions from Offeror's Intellectual Property.** Notwithstanding Section 1 above, it is understood and agreed that Offeror's Intellectual Property is not intended to include, and Offeror does not convey any rights to, the Escrow Proposal Documents submitted by Offeror in accordance with the RFP.

3. **Proposal Payment.** VDOT agrees to pay Offeror the lump sum amount of Forty Thousand and 00/100 Dollars ($40,000.00) ("Proposal Payment"), which payment constitutes payment in full to Offeror for the conveyance of Offeror's Intellectual Property to VDOT in accordance with this Agreement. Payment of the Proposal Payment is conditioned upon: (a) Offeror's Proposal being, in the sole discretion of VDOT, responsive to the RFP; (b) Offeror complying with all other terms and conditions of this Agreement; and (c) either (i) Offeror is not awarded the Design-Build Contract, or (ii) VDOT cancels the procurement or decides not to award the Design-Build Contract to any Offeror.

4. **Payment Due Date.** Subject to the conditions set forth in this Agreement, VDOT will make payment of the Proposal Payment to the Offeror within forty-five (45) days after the later of: (a) notice from VDOT that it has awarded the Design-Build Contract to another Offeror; or (b) notice from VDOT that the procurement for the Project has been cancelled and that there will be no Contract Award.

5. **Effective Date of this Agreement.** The rights and obligations of VDOT and Offeror under this Agreement, including VDOT’s ownership rights in Offeror’s Intellectual Property, vests upon the date that Offeror’s Proposal is submitted to VDOT. Notwithstanding the above, if Offeror’s Proposal is determined by VDOT, in its sole discretion, to be nonresponsive to the RFP, then Offeror is deemed to have waived its right to obtain the Proposal Payment, and VDOT shall have no obligations under this Agreement.
6. **Indemnity.** Subject to the limitation contained below, Offeror shall, at its own expense, indemnify, protect and hold harmless VDOT and its agents, directors, officers, employees, representatives and contractors from all claims, costs, expenses, liabilities, demands, or suits at law or equity ("Claims") of, by or in favor of or awarded to any third party arising in whole or in part from: (a) the negligence or willful misconduct of Offeror or any of its agents, officers, employees, representatives or subcontractors; or (b) breach of any of Offeror’s obligations under this Agreement, including its representation and warranty under Section 8 hereof. This indemnity shall not apply with respect to any Claims caused by or resulting from the sole negligence or willful misconduct of VDOT, or its agents, directors, officers, employees, representatives or contractors.

7. **Assignment.** Offeror shall not assign this Agreement, without VDOT's prior written consent, which consent may be given or withheld in VDOT's sole discretion. Any assignment of this Agreement without such consent shall be null and void.

8. **Authority to Enter into this Agreement.** By executing this Agreement, Offeror specifically represents and warrants that it has the authority to convey to VDOT all rights, title, and interest in Offeror’s Intellectual Property, including, but not limited to, those any rights that might have been vested in team members, subcontractors, consultants or anyone else who may have contributed to the development of Offeror’s Intellectual Property, free and clear of all liens, claims and encumbrances.

9. **Miscellaneous.**

   a. Offeror and VDOT agree that Offeror, its team members, and their respective employees are not agents of VDOT as a result of this Agreement.

   b. Any capitalized term used herein but not otherwise defined shall have the meanings set forth in the RFP.

   c. This Agreement, together with the RFP, embodies the entire agreement of the parties with respect to the subject matter her eof. There are no promises, terms, conditions, or obligations other than those contained herein or in the RFP, and this Agreement shall supersede all previous communications, representations, or agreements, either verbal or written, between the parties hereto.

   d. It is understood and agreed by the parties hereto that if any part, term, or provision of this Agreement is by the courts held to be illegal or in conflict with any law of the Commonwealth of Virginia, validity of the remaining portions or provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the Agreement did not contain the particular part, term, or provisions to be invalid.

   e. This Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Virginia.
IN WITNESS WHEREOF, this Agreement has been executed and delivered as of the day and year first above written.

VIRGINIA DEPARTMENT OF TRANSPORTATION

By: ______________________
Name: _____________________
Title: ______________________

The Lane Construction Corporation

By: ______________________
Name: Richard A. McDonough
Title: Senior National Pursuits Manager
ATTACHMENT 11.8.6 (a)
CERTIFICATION REGARDING DEBARMENT FORMS
PRIMARY COVERED TRANSACTIONS
ATTACHMENT 11.8.6(a)
CERTIFICATION REGARDING DEBARMENT
PRIMARY COVERED TRANSACTIONS

Project No.: 0606-053-983

1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

   a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency.

   b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; and have not been convicted of any violations of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification, or destruction of records, making false statements, or receiving stolen property;

   c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1) b) of this certification; and

   d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.

[Signature] 3/7/2014  Senior National Pursuits Manager
Signature  Date  Title

The Lane Construction Corporation
Name of Firm
ATTACHMENT 11.8.6 (b)
CERTIFICATION REGARDING DEBARMENT FORMS
LOWER TIER COVERED TRANSACTIONS
ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0606-053-983

1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.

[Signature]  3/20/14  [Vice President]
[Date]  [Title]

[Johnson, Mirmiran & Thompson]
[Name of Firm]
ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0606-053-983

1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.

[Signature] 3/20/14
President

[Signature]
3/20/14
Signature

[Signature]
3/20/14
Date

[Signature]
3/20/14
Title

GeoConcepts Engineering, Inc.
Name of Firm
ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0606-053-983

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The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.

[Signature] 3/20/14 [Title]

[Name of Firm]
ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0606-053-983

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The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.

[Signature] [March 20, 2014] [Vice President]
[Date] [Title]

RJM Engineering, Inc.
Name of Firm
Project No.: 0606-053-983

1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.

Elizabeth Quinn
Signature
March 18, 2014
Date

Quinn Consulting Services, Inc.
Name of Firm

President
Title
ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0606-053-983

1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.

[Signature] 3/20/2014  
Signature  Date  President  Title

Froehling & Robertson, Inc.
Name of Firm
ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0606-053-983

1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.

[Signature] 3/20/2014 [Date] [Title]

Name of Firm
ATTACHMENT 11.8.6(b)  
CERTIFICATION REGARDING DEBARMENT  
LOWER TIER COVERED TRANSACTIONS  

Project No.: 0606-053-983  

1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.  

2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.  

The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.  

Signature  
3/13/2014  
Date  
Managing Partner  
Title  

Appraisal Review Specialists, LLC  
Name of Firm
ROUTE 606 - DUAL TURN LANES

ROUTE 606 - SOUND BARRIER WALL

ROUTE 606 - STEEP SLOPES & WALLS ALONG PATH
TRAFFIC DATA PROVIDED BY VDOT

THESE PLANS ARE UNFINISHED
AND UNAPPROVED AND ARE NOT
TO BE USED FOR ANY TYPE
OF CONSTRUCTION OR THE
ACQUISITION OF RIGHT OF WAY.
NOTES:

1. THIS SEQUENCE OF CONSTRUCTION AND MAINTENANCE OF WORK MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT.

2. THIS SEQUENCE OF CONSTRUCTION AND MAINTENANCE OF WORK IS CONCEPTUAL IN NATURE AND ONLY INTENDED TO PROVIDE A GENERAL UNDERSTANDING OF THE PHASING OF THE PROPOSED PROJECT. SEQUENCING AND PHASING WILL BE DEVELOPED DURING FINAL DESIGN.

3. PHASE B-1 SHOWS THE POTENTIAL PHASING OF THE REMAINDER OF THE PROJECTS. ACTUAL PHASING MAY BE DIFFERENT THAN SHOWN HERE.

ROUTE 606 - TYPICAL M.O.T.

PHASE A-1

PHASE A-2

PHASE A-3

PHASE B-1

NOTES:

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY.

REVISED STATE PROJECT SHEET NO.

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO control of traffic may be subject to change in design and are not final.

PROJECT NO.

ACQUISITION OF RIGHT OF WAY.
V = 20 mph
PISTA 731+62.52
S.E. = 2.00%
Curve No. 10
Radius = 1500'
S.E. = 7.67%

ATMOSPHERIC ADMINISTRATION

EXIST. R/W
PROP. NS FENCE (6' W/BARBED WIRE)

32

(FO) (VZN) (AAATF)

Rip-Rap
Prop. 8' Paved Shoulder

END CONSTRUCTION
STADIA LS MERCURE CIRCLE

THUNDER ROAD
MERCURE CIRCLE

LOCATION
-14

(TZ) (VZN) (AAATF)

Bit. Conc.
3

12' LANE

Rip-Rap

DB 1850 PG 458

0.5' Conc. Ret

Cong. (AT&T)
Mixed Woods

32

2.5' Conc. C & G Wall

CONSTRUCTION LIMITS IN CUTS

(METRO) (VZN)

12' Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

DB 1033 PG 161

151

147

333

4° Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

DB 1009 PG 973

0.5' Conc. Ret

Cong. (AT&T)
Mixed Woods

32

4° Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

DB 1009 PG 973

0.5' Conc. Ret

Cong. (AT&T)

3° Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

DB 1009 PG 973

0.5' Conc. Ret

Cong. (AT&T)

Mixed Woods

32

4° Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

DB 1009 PG 973

0.5' Conc. Ret

Cong. (AT&T)

3° Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

DB 1009 PG 973

0.5' Conc. Ret

Cong. (AT&T)

Mixed Woods

32

4° Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

DB 1009 PG 973

0.5' Conc. Ret

Cong. (AT&T)

3° Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

DB 1009 PG 973

0.5' Conc. Ret

Cong. (AT&T)

Mixed Woods

32

4° Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

DB 1009 PG 973

0.5' Conc. Ret

Cong. (AT&T)

3° Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

DB 1009 PG 973

0.5' Conc. Ret

Cong. (AT&T)

Mixed Woods

32

4° Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

DB 1009 PG 973

0.5' Conc. Ret

Cong. (AT&T)

3° Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

DB 1009 PG 973

0.5' Conc. Ret

Cong. (AT&T)

Mixed Woods

32

4° Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

DB 1009 PG 973

0.5' Conc. Ret

Cong. (AT&T)

3° Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

DB 1009 PG 973

0.5' Conc. Ret

Cong. (AT&T)

Mixed Woods

32

4° Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

DB 1009 PG 973

0.5' Conc. Ret

Cong. (AT&T)

3° Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

DB 1009 PG 973

0.5' Conc. Ret

Cong. (AT&T)

Mixed Woods

32

4° Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

DB 1009 PG 973

0.5' Conc. Ret

Cong. (AT&T)

3° Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

DB 1009 PG 973

0.5' Conc. Ret

Cong. (AT&T)

Mixed Woods

32

4° Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

DB 1009 PG 973

0.5' Conc. Ret

Cong. (AT&T)

3° Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

DB 1009 PG 973

0.5' Conc. Ret

Cong. (AT&T)

Mixed Woods

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4° Cedar

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4° Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

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0.5' Conc. Ret

Cong. (AT&T)

3° Cedar

(TZ) (VZN) (AAATF)

Rip-Rap

DB 1009 PG 973

0.5' Conc. Ret

Cong. (AT&T)
TRANSVERSE SECTION

Note: All dimensions measured radial to BRt. 606 at C bearing Abutments and C Pier.

Bridge Nos. B686 & B687

Preliminary Plans
These Plans Not To Be Used For Construction

Commonwealth of Virginia
Department of Transportation

Structural and Bridge Division

TRANVERSE SECTION

Bridge Nos. B686 & B687

Scale: 3/4" = 1'-0"
Bridge Nos. B686 & B687

Preliminary Plans
These plans not to be used for construction.

Notes:
1. Drilled shafts will be designed for maximum factored axial compressive resistance.
2. All drilled shafts will be adequately extended below maximum scour depth.

Scale: 1" = 1'-0"

ABUTMENT A DETAILS

ELEVATION
Scale: 1/8" = 1'-0"
Note: All dimensions measured radial to B Rte. 606

PLAN
Scale: 1/8" = 1'-0"
Note: All dimensions measured radial to B Rte. 606
Notes:

1. Drilled shafts will be designed for maximum factored axial compressive resistance.

2. All drilled shafts will be adequately extended below maximum scour depth.

Typical Pier Section

- C Pier
- L Pier
- Shaft
- 3'-0" dia. drilled shaft, typ.
- Staggered drilled shaft, typ.
- 6" dia. drilled shaft, typ.
- 4'-0" typ.
- 1'-3" typ.
- 2'-6" typ.
- 4'-0" typ.
- 1'-3" typ.

Exist. ground elev. 270.56

- Elev. 270.53
- Elev. 270.56
- Elev. 266.55
- Elev. 266.61

Sta. 355+51.40

- Sta. 169'-0"
- Sta. 173'-0"
- Sta. 70'-4"
- Sta. 102'-8"
- Sta. 2'-6"
- Sta. 4'-0"

PIER DETAILS

- C Pier
- L Pier
- Shaft
- 3'-0" dia. drilled shaft, typ.
- Staggered drilled shaft, typ.
- 6" dia. drilled shaft, typ.
- 4'-0" typ.
- 1'-3" typ.
- 2'-6" typ.
- 4'-0" typ.
- 1'-3" typ.

Drilled shafts will be adequately extended below maximum scour depth.