



VIRGINIA DEPARTMENT OF TRANSPORTATION

Minimum Requirements for Quality Assurance and Quality Control on Design Build and Public-Private Transportation Act Projects

July 2018

Minimum Requirements for Quality Assurance and Quality Control on
Design-Build and P3 Projects
July 2018

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Section 1. Introduction

1.1 Purpose

1.1.1 This Guide details the Virginia Department of Transportation (the Department) minimum requirements for Quality Assurance (QA) and Quality Control (QC) for Design-Build (DB) and Public-Private Transportation Act (PPTA or P3) projects. The entity under contract with the Department, referred to herein as “Concessionaire/Design-Builder”, shall implement a Quality Assurance and Quality Control Plan (QA/QC Plan) under a Design-Build contract or a P3 Comprehensive Agreement. The QA/QC Plan is used interchangeably with the Quality Management System Plan (QMSP) for P3 Projects and defines the organization, work processes, and systems necessary to provide confidence and objective evidence that the facilities, components, systems, and subsystems that make up the Project meet the contract requirements. Unless specifically noted otherwise, projects referred to herein as “Design-Build” (DB) apply for both DB and P3 projects.

The production of a QA/QC Plan meeting these minimum requirements forms part of the submittals required under Design-Build Requests for Proposals (RFP) and P3 procurements. This Guide also details procedures for the Department to oversee the proper implementation of a Concessionaire/Design-Builder’s QA/QC Plan.

This Guide establishes criteria for obtaining consistency in the Department’s approach to independent assurance, verification and oversight responsibilities on DB and P3 projects. It is recognized that contract requirements will vary from project to project and therefore project specific contract requirements will always take precedent in case of conflict.

1.1.2 In conforming to these minimum requirements, the Concessionaire/Design-Builder shall satisfy both State and Federal design and construction quality requirements.

1.2 Document Structure

1.2.1 This Guide sets out the required Quality Assurance and Quality Control plan requirements for both the design and construction phases of DB and P3 projects. The Guide is divided into five (5) sections as follows:

Section 1 – Establishes the purpose and document structure and includes a list of publications with which this Guide should be cross-referenced.

Section 2 – Provides a description of QA/QC Plan requirements including an organization chart for a basic Design-Build project.

Section 3 – Identifies a description of QA/QC staff roles and responsibilities including terms of reference for the key roles, reporting lines and key qualifications required.

Section 4 – Describes QA/QC Plan requirements for design including design review, Departmental approvals and design changes. The Design-Build Review, Approval and Quality Management Process is depicted in Figure 4-1.

Section 5 – Describes QA/QC Plan requirements for construction including among other requirements Departmental and Concessionaire/Design-Builder responsibilities, Preparatory Inspection Meetings, DB inspection, sampling and testing requirements, verification and acceptance requirements, and Witness and Hold Points.

1.2.2 The Guide includes four (4) appendices that contain the following information:

Appendix 1: Definitions of Abbreviations, Acronyms and Terms used in this Guide.

Appendix 2: Table A2, Part I – Minimum Requirements for Materials Testing.

Table A-2, Part II – Minimum Requirements for Inspection, Compliance Monitoring and Verification of Contractor Product Installation, Practices and Procedures.

Appendix 3: Table A-3: Owner’s Roles and Responsibilities for Project Inspection

Appendix 4 – Sample Checklists.

1.3 Reference Documents

1.3.1 The Department’s Design-Build Contract Documents should be referenced in conjunction with this Guide. The following Parts are of particular relevance:

- .1 Part 2 – Technical Information and Requirements
- .2 Part 4 – General Conditions of Contract
- .3 Part 5 – Division I Amendments to the Standard Specifications

1.3.2 For P3 projects, applicable sections of the technical requirements and the Comprehensive Agreement should be referenced in conjunction with this Guide.

1.3.3 The Concessionaire/Design-Builder shall take into account the FHWA Construction Program Management and Inspection Guide in developing the QA/QC Plan for federally-funded projects.

Section 2. Description of QA/QC Plan Requirements

2.1 General

2.1.1 These requirements shall be used by the Concessionaire/Design-Builder in the preparation of an acceptable Quality Assurance (QA) Plan and an acceptable Quality Control (QC) Plan. The Quality Assurance and Quality Control Plan (QA/QC Plan) used interchangeably with the Quality Management System Plan (QMSP) for P3 Projects should define a uniform process approach to design and construction quality management; quality procedures, records keeping and document management/control that the Concessionaire/Design Builder shall adhere to throughout the duration of the Project. The QA/QC Plan (QMSP) should further describe the reporting and documentation processes and should outline appropriate responsibilities of the Concessionaire/Design Builder's organization. The QA/QC Plan (QMSP) consists of the Design QA/QC Plan (Design Quality Management Plan – DQMP) and the Construction QA/QC Plan (Construction Quality Management Plan – CQMP).

2.1.2 The QA Plan shall be separate and distinct from the QC Plan for both design and construction efforts. Both the QA Plan and the QC Plan are subsets of the overall QA/QC Plan. The submission of the QA/QC Plan shall be in accordance with the Section 2.2 of this Guide and the Department's RFP or P3 documents.

2.1.3 The QA/QC Plan shall detail:

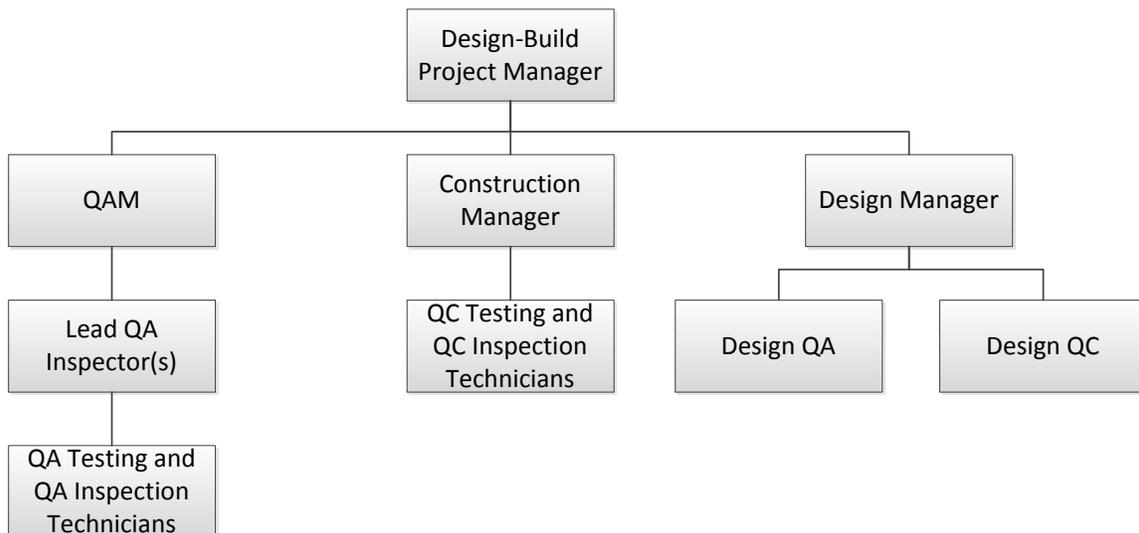
- .1 How the Concessionaire/Design-Builder shall provide QA and QC for both the design and construction elements of the Project, including but not limited to, sampling, testing, inspection, management control, document control, communication requirements, and non-compliant work corrective action plans to ensure that the work conforms to the contract requirements;
- .2 How the Concessionaire/Design-Builder's QA/QC Plan for both the design and construction elements shall be coordinated by a subconsultant, subcontractor, supplier, vendor, agent, or other entity with contractual obligations to complete design or construction elements of the Project;
- .3 How the Concessionaire/Design-Builder's QA/QC organizations function, including a project-specific staffing plan that identifies QA and QC personnel by name, position/role, and organization. The staffing plan shall ensure that at any time an adequate number of QA personnel are available to observe all construction operations and QC activities;
- .4 The relationship between the QA and QC organizations and the design and construction organizations interface to ensure that the decisions made by QA/QC personnel are not based upon the impact such decisions may have on the Project's schedule, contractor's performance or project profitability; and
- .5 QA/QC shall be an integral part of each Work Package in accordance with Section 5.24 of this Guide. The QAM shall verify that all design related Work

Packages submitted for payment have been certified by the Design Manager as being in conformance with the Contract Documents and the Design QA/QC Plan.

2.1.4 To further ensure organizational independence, the Construction QA organization shall be distinct and separate from the QC organization and construction production forces staff. For design, the Design QA or QC functions may be performed by the same design organization. If design QA responsibilities are retained by the design organization the QA plan must show that the original designer is not responsible for the quality assurance of his/her own design work. All key personnel performing QA or QC functions shall be exclusively designated to such and shall not be assigned to perform conflicting duties or production work.

An example organizational chart illustrating the independence of the QA organization in the performance of a basic D-B project is shown in **Figure 2-1**.

Figure 2-1: Minimum QA/QC Organizational Chart for Design-Build Projects



2.1.5 The Department may, on a project specific basis, require additional QA/QC procedures for high-risk or unique elements of a project. Such additional procedures may include, for example, peer reviews by an independent firm, or a higher level of oversight or testing for critical construction elements. Any additional QA/QC procedures will be outlined in the Contract documents. In the event of a conflict between this Guide and the Contract, the requirements set forth in the Contract shall take precedence.

2.1.6 The Department prefers QC testing and inspection be performed by an organization independent of construction activities. In cases where the Design-Builder chooses to self-perform quality control testing, the Design-Builder shall designate an individual(s) to perform quality control testing in the staffing plan. These individual(s) shall not perform dual roles during construction (i.e. Superintendent or Foreman cannot

perform QC). QC testing and inspection shall be performed by individual(s) that meets the required qualifications listed in Sections 3.6 and 3.7 of this Guide.

2.2 Minimum QA/QC Plan Submittal Requirements

2.2.1 The QA/QC Plans for design and construction are dynamic documents and changes to the plan shall be issued as the program is refined and adapted throughout the life of the Project. This is especially true for the construction QA/QC program in which specific testing and inspection requirements cannot be established until the design of a particular work package has been completed.

2.2.2 Concessionaire/Design-Builder shall submit a complete QA/QC Plan for design and an initial QA/QC Plan for construction to the Department for review and approval at the Kick-Off Meeting held after the Concessionaire/Design-Builder's receipt of Department's Notice to Proceed or the date set forth in the Notice to Proceed ("**Date of Commencement**"), unless the parties mutually agree otherwise in writing, as set forth in the Design-Build or P3 Comprehensive Agreement. Along with the QA/QC Plan submittal, the Design Manager and Quality Assurance Manager ("QAM") shall provide a presentation of the QA/QC Plan for both design and construction utilizing Project related scenarios as defined in the Contract Documents. The QA/QC Plan for design shall be developed in accordance with the minimum requirements outlined in Section 4. The initial QA/QC Plan for construction should be developed as a baseline level document that establishes the framework of the entire QA/QC program taken into account the minimum requirements outlined in Section 5. Minimally, the initial QA/QC Plan for construction shall include:

- .1 A project-specific staffing plan that identifies QA and QC Inspectors by name, position/role, and organization. QC and QA Testing Technicians shall be identified by quantity. The staffing plan shall include the anticipated number of hours on the project by both QA and QC personnel per month for the duration of all construction on the project.
- .2 An outline of all work packages that will require a Preparatory Inspection Meeting.

2.2.3 The Construction QA/QC Plan will need to be updated for each Approved for Construction (AFC) work package submittal in accordance with Section 2.2.4 below.

2.2.4 The QA/QC Plan for construction shall be updated to include specific testing, inspection and staffing requirements and estimated quantities for each construction element associated with an AFC work package. Minimum requirements for the updated Construction QA/QC Plan are provided in Section 5.2 of this Guide. This update shall be provided at the time the AFC work package is submitted to the Department for plan approval by the Chief Engineer. Only the updated sections of the Construction QA/QC Plan shall be submitted. The updated Construction QA/QC Plan shall be approved by the Department prior to commencing the Preparatory Meeting for any construction element associated with an AFC work package.

Section 3. Concessionaire/Design-Builder QA/QC Staff Roles and Responsibilities

3.1 General

3.1.1 As part of the QA/QC plan submission process, fully detailed resumes with references shall be submitted to the Department identifying the minimum qualifications and experience of the Concessionaire/Design-Builder’s QCM (if used), QA Lead Inspector(s), and QA and QC Inspectors and Technicians. The persons or organizations performing QA or QC shall have sufficient authority and organizational autonomy to identify quality problems, and to initiate, recommend, and verify implementation of solutions. The Concessionaire/Design-Builder Quality Assurance Manager (QAM) shall have full authority to initiate a work stoppage and be able to recommend to the Department to withhold payment for design and/or construction activities that are not acceptable. This authority must be in writing from the Concessionaire/Design-Builder to the QAM and must be included as part of the QA/QC Plan submitted for Department approval. At a minimum, the Concessionaire/Design-Builder QA and QC staff shall include the following persons holding the required qualifications, as detailed in **Table 3-1**.

Table 3-1: Concessionaire/Design-Builder QA/QC Staff Roles and Responsibilities

| Position | Responsibility | Reports To | Required Qualifications* |
|--|--|---|--|
| Concessionaire/ Design-Builder Project Manager | Responsible for the overall Project design, construction quality management, and contract administration for the Project. | Concessionaire/ Design-Builder at the executive level. | |
| QAM | Overall responsibility for the development and adherence to the Design-Build QA/QC Plan. Responsible for certification of projects compliance to the Contract requirements. | <ol style="list-style-type: none"> 1. Concessionaire/ Design-Builder Project Manager 2. Does not report to production forces. 3. Must be separate and independent to the construction process and the QC team. | <ol style="list-style-type: none"> 1. Professional Engineer licensed by the Commonwealth of Virginia. 2. Supervisory experience in inspection and materials testing on relevant highway transportation projects or as specified in the Contract. |

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| Position | Responsibility | Reports To | Required Qualifications* |
|---|---|--|---|
| Lead QA Inspector | Responsible for observing construction as it is being performed, including all QC and QA activities to ensure that inspection and testing, and correction of non-conforming Work are being performed in accordance with the Contract requirements. Responsible for certifying the Project's compliance with the SWPPP, VPDES and Water Quality Permits and associated updates. | QAM | <ol style="list-style-type: none"> 1. Holds current Department materials certifications or others as noted for each certification listed in Sections 3.6 & 3.7 of this Guide. 2. Holds current DEQ ESC Inspector certification. 3. Supervisory experience in inspection and materials testing on relevant highway transportation projects or as specified in the Contract. |
| QA Testing Technicians | Responsible for QA testing of items of work for conformance with "approved for construction" (AFC) plans and specifications. | QAM/Lead QA Inspector | <ol style="list-style-type: none"> 1. Holds current Department materials certifications or others as noted in Section 3.6 of this Guide for the types of testing that they are assigned to perform. |
| QA Inspectors | Responsible for QA inspection of items of work for conformance with "approved for construction" (AFC) plans and specifications. | QAM/Lead QA Inspector | <ol style="list-style-type: none"> 1. Holds current Department materials certifications or others as noted in Section 3.7 of this Guide for the types of inspection that they are assigned to perform. |
| Concessionaire/ Design-Builder Design Manager | Responsible for the design portion of the Design-Build QA/QC Plan | Concessionaire/ Design-Builder Project Manager | <ol style="list-style-type: none"> 1. Professional Engineer licensed by the Commonwealth of Virginia. 2. Supervisory experience in design on relevant transportation projects. |

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| Position | Responsibility | Reports To | Required Qualifications* |
|--|---|--|---|
| Design QA Design QC | Responsible for QA or QC for design elements of the Project. | Design Manager | <ol style="list-style-type: none"> 1. When applicable, Professional Engineer licensed by the Commonwealth of Virginia in the engineering discipline being reviewed. 2. Design experience in the engineering discipline being reviewed. |
| Concessionaire/ Design-Builder Construction Manager | Responsible for managing all Quality Control activities to verify adherence to the construction portion of the Design-Build QA/QC Plan ensuring that material used and work performed meet contract requirements. | Concessionaire/ Design-Builder Project Manager | <ol style="list-style-type: none"> 1. Supervisory experience in inspection or documentation or materials testing or combination thereof on relevant transportation projects. 2. DEQ Responsible Land Disturber (RLD) Certification and VDOT Erosion and Sediment Control Contractor Certification (ESCCC). 3. Any other requirements specified in the RFP or P3 procurement documents. |
| Quality Control Manager (not a required position – may be included at the discretion of the Design-Builder) | Assists the CM in managing Quality Control activities to ensure compliance with all QC testing and inspection contract requirements. Ensures adequate staffing of qualified QC testing and inspection personnel. | Construction Manager | <ol style="list-style-type: none"> 1. Holds current Department materials certifications or others as noted for each certification listed in Sections 3.6 & 3.7 of this Guide. 2. Supervisory experience in inspection or documentation or materials testing or combination thereof on relevant transportation projects,. |
| QC Testing Technicians | Responsible for QC testing of items of work for conformance with “approved for construction” (AFC) plans and specifications. | Construction Manager/QC Manager | <ol style="list-style-type: none"> 1. Holds current Department materials certifications or others as noted in Section 3.6 of this Guide for the types of testing they are assigned to perform. |

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| Position | Responsibility | Reports To | Required Qualifications* |
|---------------|---|---------------------------------|---|
| QC Inspectors | Responsible for QC inspection of items of work for conformance with “approved for construction” (AFC) plans and specifications. | Construction Manager/QC Manager | 1. Holds current Department materials certifications or others as noted in Section 3.7 of this Guide for the types of inspection that they are assigned to perform. |

* Unless otherwise stated in the RFQ, RFP or the P3 Procurement Documents

3.2 Concessionaire/Design-Builder Quality Assurance Manager (QAM)

3.2.1 The QAM shall be from an independent firm that has no involvement in construction operations for the Project, and shall be responsible for the QA inspection and testing of all materials used and work performed on the Project, to include monitoring of the contractor’s quality control (QC) program.

3.2.2 The QAM shall verify that all Design related Work Packages submitted for payment have been certified by the Design Manager as being in conformance with the Contract Documents and the Design QA/QC Plan.

3.2.3 The QAM (in conjunction with the Lead QA Inspector) shall ensure adherence to environmental permits and commitments and that all work and materials, testing and sampling, and work zones are in conformance with the Contract, and the AFC plans and specifications. The QAM shall be responsible for maintaining and certifying the Materials Notebook as outlined in Section 5.23.2 of this Guide and Section VII of VDOT’s Materials Manual of Instruction (MOI). Maintenance of the Materials Book shall not be delegated to QC personnel.

3.2.4 The QAM shall approve all applications of payment for all Work Packages including verification of the Design Manager’s certification of Design Package submittals.

3.3 Concessionaire/Design-Builder Design Manager

3.3.1 The Concessionaire/Design-Builder Design Manager is the individual with responsibility of coordinating the individual design disciplines to include design subconsultants and ensuring the overall Project design is in conformance with the Contract Documents.

3.3.2 The Design Manager shall be responsible for establishing and overseeing a QA/QC program for all pertinent disciplines involved in the design of the Project, including review of design, working plans, shop drawings, specifications, and constructability of the Project. This individual shall report directly to the Design-Builder’s Project Manager, and is responsible for all of the design, inclusive of QA and QC activities. This individual shall be responsible for implementing, monitoring and, as necessary, adjusting the processes to assure acceptable quality of the design work. Any adjustments that deviate from the written QA/QC Plan should be approved by the Department prior to being implemented.

3.3.3 The Design Manager's QA/QC team shall adhere to the design QA/QC requirements presented in Section 4 of this Guide.

3.4 Design QA and QC

3.4.1 Members of the Design QA and QC team are responsible for review of all design elements to ensure the development of the plans and specifications are in accordance with the requirements of the Contract Documents. Design QA should be performed by one or more member(s) of the lead design team that are independent of the Design QC with no direct involvement in the design. The same member(s) of the lead design team should complete all design QA reviews throughout the duration of the Project.

3.4.2 In general, Design QA shall evaluate whether the designer assessed the problem appropriately, applied the correct analysis, and assigned qualified personnel to the task. Design QC shall include, but not be limited to, review of math and engineering computations, technical accuracy, and conformance to contract requirements to a level commensurate with the complexity of the design approach and the criticality of the design element. The Design QC shall be completed by an independent reviewer who does not have a direct role in the development of the design.

3.5 Concessionaire/Design-Builder Construction Manager

3.5.1 The Concessionaire/Design-Builder Construction Manager is required to be on the Project site full-time for the duration of the construction operations and is responsible for all Quality Control on the Project. This individual shall have responsibility for managing the construction process, to include all QC activities, to ensure the materials used and work performed meet contract requirements and the approved for construction (AFC) plans and specifications. This individual shall be responsible for implementing, monitoring and, as necessary, adjusting the processes to assure acceptable quality of the construction work.

3.6 QA and QC Testing Technicians

3.6.1 QA and QC Testing Technicians are staff who perform on-site materials testing including, but not limited to, density, water content, air content of concrete, slump, and other required materials field tests. QA Testing Technicians shall report directly to the QAM and are not responsible for project production. The QA Technicians shall be employed by a firm that is completely separate of production work and QC testing services. QC Testing Technicians are to fulfill the requirements for materials testing for Quality Control.

3.6.2 Prior to the start of Work associated with the AFC work package:

- .1 The QAM shall identify each QA Testing Technician by name and provide a detailed qualification matrix for each type of materials testing required.
- .2 The Construction Manager shall identify each QC Testing Technician by name and provide a detailed qualification matrix to the QAM for each type of materials testing required.

3.6.3 QA and QC Testing Technicians shall have current Department certifications for the type of material testing they are assigned perform. Such material testing certifications may include:

- .1 Asphalt Concrete, Field
- .2 Hydraulic Cement Concrete, Field
- .3 Soils and Aggregate
- .4 Pavement Marking
- .5 Confined Space
- .6 Nuclear Safety, and
- .7 Others, as identified in the Contract

3.6.4 The qualifications of laboratory technicians employed by a laboratory accredited by the AASHTO Accreditation Program (AAP) may be accepted for AASHTO or ASTM laboratory test methods when confirmed by the laboratory's training and evaluation records and for such tests not covered by the Department's certification program.

3.7 QA and QC Inspectors

3.7.1 Prior to the start of each AFC work package:

- .1 The QAM shall identify each QA Inspector by name and provide a detailed qualification matrix for each type of inspection required.
- .2 The Construction Manager shall identify each QC Inspector by name and provide a detailed qualification matrix to the QAM for each type of inspection required.

3.7.2 QA and QC Inspectors shall have the Department and other certifications applicable to the work to be performed. Such certifications may include:

- .1 Asphalt Concrete, Field
- .2 Hydraulic Cement Concrete, Field
- .3 Soils and Aggregate
- .4 Surface Treatment
- .5 Slurry Treatment
- .6 Guardrail Installation
- .7 Pavement Marking
- .8 Confined Space
- .9 Nuclear Safety
- .10 OSHA 10-Hour
- .11 E&S Inspector (administered by the Department of Conservation and Recreation)
- .12 Work Area Protection, and

- .13 Intermediate Work Zone
- .14 DEQ SWM Inspector
- .15 Others as required by the nature of the Work and/or as identified in the Contract

3.8 Lead Quality Assurance Inspector(s)

3.8.1 The QAM shall assign a Lead QA Inspector(s) to the Project prior to the start of construction, meeting the requirements noted above. This individual(s), who must be on the site full time for the duration of all construction of the Project, shall physically observe construction (including QC and QA activities) as it is being performed and to ensure that inspection, testing and correction of any deficiencies or non-conforming Work are being performed in accordance with the contract requirements. The Lead QA Inspector shall report directly to the QAM.

3.8.2 The Lead QA Inspector shall perform QA inspections as required and, if necessary, be supported by other QA inspectors to ensure the requirements of Section 3.8.1 are satisfied.

3.9 Contact Information for Design Builder QA/QC Staff

3.9.1 The Concessionaire/Design-Builder shall ensure that the contact details and certifications of all QA/QC staff are maintained in a list issued to the Department with the QA/QC Plan and re-issued at each update of the list.

3.9.2 The list shall contain at a minimum the following details:

- .1 Title
- .2 Name
- .3 Reports To
- .4 Work Phone
- .5 Cell Phone
- .6 E-mail

Section 4. Design QA/QC Requirements

4.1 General

4.1.1 The Design QA and QC procedures shall be organized by each type of engineering discipline (e.g., structural, roadway, traffic, geotechnical, hydraulics, and utilities). These procedures shall specify measures to be taken by the Concessionaire/Design-Builder:

- .1 To ensure that appropriate quality standards are specified and included in the drawings, specifications, and other design submittals and to control deviations from such standards, it being understood and agreed that no deviations from such standards shall be made unless they have been previously approved in writing by the Department at the Department's sole discretion;
- .2 Ensure execution of the Design QA and QC requirements defined in the Concessionaire/Design-Builder's Design QA/QC Plan;
- .3 For the selection of suitability of materials, and elements of the Work that are included in the Project;
- .4 To ensure the completed Work is safe and maintainable; and
- .5 To ensure the constructability of design in order to optimize the potential benefits of design-build project delivery.

4.1.2 In general, Design QA shall evaluate whether the designer assessed the problem appropriately, applied the correct analyses, and assigned qualified personnel to the tasks.

- .1 Design QA shall address whether the design solution meets the contract requirements.
- .2 Design QA also shall ensure that the work required by the contract documents is completed applying appropriate skill and experience in accordance with the Design-Build Contract or applicable portions of the Comprehensive Agreement for P3 procurements. At minimum, the following shall apply:
 - .1 Specific standards, methods, and requirements set forth in the contract documents;
 - .2 All legal requirements;
 - .3 All governmental approvals;
 - .4 The application of professional engineering judgment taking into consideration safety, operational requirements, level of service, life cycle costs and the current version of the specific standards, methods, and requirements set forth in the contract documents;
 - .5 Prudent industry practices, methods, techniques and standards and using the degree of care that would be expected to be exercised by a

prudent, skilled and experienced engineer engaged in the same kinds of undertakings as the project under the same or similar conditions at the same time and locality of the Project; and

.6 The requirements of insurance policies required to be maintained in accordance with the contract documents.

4.1.3 Design QA should be performed by one or more member(s) of the lead designer team that are independent of Design QC. The same member(s) of the lead designer team should complete all Design QA reviews throughout the duration of the project.

4.1.4 Design QC may be performed at the office where the work was conducted.

4.1.5 Design QC shall include review of math and engineering computations; technical accuracy; conformance to contract requirements; review of form, content and spelling, and coordination with other disciplines including construction. The Design QC review will be carried out to a level commensurate with the complexity of the design approach and the criticality of the design element.

4.1.6 The Design QA/QC Plan shall specifically include constructability reviews and, as applicable, maintainability reviews.

4.2 Design QA/QC Plan Development

4.2.1 The Design QA/QC Plan shall be prepared such that the requirements for QA and the requirements for QC are detailed in individual plans or in separate sections of the overall plan such that they are capable of being read independently.

4.2.2 The Design QA/QC Plan shall set forth the following:

- .1 All QA and QC procedures proposed by the Concessionaire/Design-Builder for the design process shall be included in the Design QA/QC Plan. Procedures shall be included for preparing and checking all drawings, specifications, and other design submittals to the Department to ensure that they are independently checked by experienced and qualified professionals prior to submission;
- .2 Procedures to ensure that drawings, specifications, and other design submittals are to be stamped, signed and dated by the responsible Virginia licensed architect or engineer as required under the Contract provisions or by applicable laws. It is anticipated that a substantial portion of the Design QA/QC Plan shall rely upon the design consultant's use of licensed professionals who are governed by statutory requirements and standards of care;
- .3 The level, frequency and methods of review for the adequacy of the design of the Project, including the methods for independent review of the final drawings, specifications, and other design submittals to ensure compliance with Department's functional requirements for the Project as outlined in the Contract Documents;
- .4 Procedures for coordinating work performed by different persons in the same or adjacent area, fabrication shops, casting yards and other pertinent fabrication

- facilities at remote locations, work element or project feature, or in related tasks to ensure that conflicts, omissions or misalignments do not occur between drawings or between the drawings and the specifications and to coordinate the review, approval, release, distribution and revision of documents involving such persons. The Design QA/QC Plan shall also set forth the procedures for ensuring Design QA and QC requirements are met for adequate right of way and avoidance of utility conflicts;
- .5 The Design QA/QC Plan shall include procedures to identify those elements of the Contract, drawings, specifications, and other design submittals, if any, requiring special construction QA and/or QC attention or emphasis, including applicable standards of quality or practice to be met, level of completeness and/or extent of detailing required, or Special Provisions to the Road and Bridge Specifications;
 - .6 Identification by firm, discipline, name, qualifications, duties, responsibilities and authorities for all persons and entities proposed to be responsible for design QA and QC activities, including sub-consultants;
 - .7 Design QA/QC functions, including scheduled activities for design QA and QC, identifying the drawings, specifications, and other design submittals to be delivered to the Department for its review at each stage of the design or work phase of the Project, shall be described in the Design QA/QC Plan. These submittals and the review process shall be in accordance with the Design-Build Contract or P3 Comprehensive Agreement; and
 - .8 Procedures shall be included for preparing and reviewing all working drawings, to ensure that they are independently checked by experienced and qualified professionals prior to submission and/or construction.

4.3 Design QA/QC Plan – Minimum Requirements

4.3.1 The Concessionaire/Design-Builder is responsible for design quality. The Design Manager, assigned by the Concessionaire/Design-Builder, shall be responsible for overall management of the QA/QC programs for design. This individual shall report directly to the Concessionaire/Design-Builder's Project Manager and is responsible for all of the Design QA/QC activities. The quality control function during design is provided by design staff independently checking each other's work. Design production and design leads performing formal and documented coordination reviews at pre-determined times on each submittal and on all *Approved for Construction (AFC)* design packages. All design submittals and AFC plans will have written approval by the Design Manager certifying that he/she has audited and approved the submittal.

4.3.2 The project Design QA/QC Plan shall at a minimum include:

- .1 Written documentation and definition of the project's design criteria, standards, and processes;
- .2 Procedures for the performance of senior experienced engineers' detailed checks of all design reports, calculations, drawings and specifications;

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- .3 Directions for interdisciplinary reviews by technical and management staff to provide coordination and uniformity among section designs;
- .4 Procedures for design-build constructability reviews to facilitate the timely planning of construction activities.
- .5 Procedures for maintainability reviews to ensure feasibility of future maintenance and operation; and
- .6 Quality assurance audit checklists.

4.3.3 Individual design discipline leaders are responsible for the completion of all QC functions within the section and for the coordination of actual audit dates established by the Design Manager. During basic design services, documented internal technical design audits performed by the design discipline leaders determine if calculations, drawings, reports, and specifications meet both professional and contractually required standards.

4.3.4 The Design Manager shall perform audits to verify conformance with the approved Design QA/QC Plan and verify that the required checking and review functions are performed. These quality audits shall be based on project procedures applicable to the area to be audited and shall be documented using a quality assurance checklist.

4.3.5 Concessionaire/Design-Builder shall prepare and update a schedule for audits to reflect changes or refinements in the scope of the project work and the project schedule.

4.3.6 The Concessionaire/Design-Builder shall correct all nonconforming practices before plans are submitted to the Department. Copies of all audit information shall be retained in the Design Manager's QA File.

4.3.7 The Concessionaire/Design-Builder shall provide the Department with necessary verification that the design submittals and plans approved for construction meet all project contract requirements. Documents which are "approved for construction" shall be accompanied by a Form signed by the Design Manager certifying that the "construction items" shown on the plans have been audited for and satisfy compliance with the Design QA/QC Plan, and with all requirements of the contract documents, including the Concessionaire/Design-Builder's Proposal and for P3 procurements, the Comprehensive Agreement.

4.3.8 The Design Manager is responsible for verifying the implementation and effectiveness of the corrective measures using informal observation and review or with a formal audit. The time allowed for such follow-up activities depends on the importance of the corrective action required.

4.3.9 To provide effectiveness, procedure preparation shall be coordinated through the Design Manager and designated staff so that their review and comments can be considered before finalizing the submittals. The Design QA/QC Plan is a dynamic document and changes should be incorporated as the program requires refinement or adaptation. The above-mentioned staff is also responsible for identifying those project activities that require a new procedure, along with preparation and distribution of each procedure, as applicable.

4.3.10 A Table of Contents is provided that illustrates the minimum contents of the Project design QA/QC procedures.

SECTION 1 - GENERAL AND ADMINISTRATION

- 1.1 Preparation and Revision of Design QA/QC Procedures
- 1.2 Terms and Definitions
- 1.3 Quality Assurance Organization, Functions and Responsibilities
- 1.4 Documentation Control
- 1.5 Control of Customer-Supplied Product
- 1.6 Quality Records
- 1.7 Quality Control Coordinators Function and Responsibilities

SECTION 2 - PROJECT MANAGEMENT

- 2.1 Quality Program for Subconsultants
- 2.2 Quality Control and Verification of Computer Software
- 2.3 Preparation and Maintenance of the Project Procedures Manual
- 2.4 Contract Review and Coordination
- 2.5 Internal Quality Audits

SECTION 3 - PLANNING AND DESIGN

- 3.1 Checking of Calculations
- 3.2 Checking of Drawings
- 3.3 Checking of New Specifications. Revisions to Project Specifications and/or Special Provisions
 - 3.3.1 New Specifications, Revisions to Corridor Specifications and/or Special Provisions
- 3.4 Checking of Input to Computer Programs
- 3.5 Review of Studies or Report-Type Documents
 - 3.5.1 Review of Documents Prepared by Others including Working Drawings
- 3.6 Design Coordination Review (DCR) and Technical Coordination Review (TCR) of Interim Submissions
- 3.7 Final Package Review (FPR) of Documents
- 3.8 Quality Audits of Planning and Design Functions
- 3.9 Quality Control of CADD-Produced Documents
- 3.10 Documentation and Transmission of Design Directives and Revisions

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- 3.11 Documentation and Notice of Design Change
- 3.12 Field Design Changes
- 3.13 Implementation of Corrective and Preventive Action
- 3.14 Quality Control of Utility Design
- 3.15 Training

4.3.11 The Design Manager shall maintain close communication with Concessionaire/Design-Builder's Project Manager and shall ensure the Project is completed in accordance with the requirements of the Contract Documents. The Design Manager shall perform all of the design oversight reviews. The Department may participate in these reviews. Unless otherwise set out in the Contract, the Department retains the ultimate approval and disapproval authority for conformance with contract requirements. Under this procedure, the Design Manager will provide the Department with draft design plans for review and approval to confirm that the design work complies with the requirements of the Contract Documents herein prior to initiation of construction activities on the Project.

4.3.12 Plans to be reviewed shall be submitted to the Department's Project Manager in accordance with contract requirements. The Department's Project Manager will distribute plans for review and/or approval. The Department shall have the right to review and comment on all draft plans and specifications for compliance with the requirements of the contract documents and reference documents. The Concessionaire/Design-Builder shall be responsible to satisfy all such requirements.

4.3.13 The Concessionaire/Design-Builder shall revise and modify all draft design plans so as to fully reflect all comments and shall deliver the revised submittal to the Department's Project Manager, who will distribute plans to appropriate staff for review and comments.

4.3.14 Construction Plans are to be submitted to the Department for review and approval by the Chief Engineer prior to construction of that element of work. The schedule for plan review and approval shall be in accordance the requirements of the Contract Documents. The Concessionaire/Design-Builder shall be responsible for the design details and ensuring that the design and construction work are properly coordinated. The Concessionaire/Design-Builder shall be responsible for documenting any design exceptions or waivers that may be needed. The Department will submit the design waivers and design exceptions to the appropriate reviewing authority for review and approval.

4.4 Design Quality Review

4.4.1 Prior to the release of the final drawings, specifications, and other design submittals, the Concessionaire/Design-Builder shall complete review by architects and engineers experienced in the appropriate disciplines(s). Each Contract submission shall be accompanied by a certification from the Design Manager and the appropriate design or technical manager stating that the submission meets the requirements of the Contract and

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has been reviewed in accordance with the Design QA/QC Plan. In addition, the Concessionaire/Design-Builder shall review the submission and confirm the Contract and QA/QC procedures have been followed and properly documented.

4.4.2 The criteria used in such review shall include but not be limited to:

- .1 Conformity of the final drawings, specifications, and other design submittals with the Contract;
- .2 Assurance that all materials, equipment and elements of the Work provided for in such documents meet the Contract requirements and have been designed to perform satisfactorily for the purpose intended;
- .3 The technical and grammatical accuracy, appearance, and organization of such documents;
- .4 Verification that such documents have been checked and signed by the drafter, designer, and reviewers;
- .5 Where required under the Contract, generally accepted architectural or engineering practices or applicable law, verification that such documents have been stamped, signed and dated by the responsible Virginia registered engineer or architect;
- .6 Assurance that such documents fully provide suitable evidence for constructability, compatibility of materials and conformity to acceptance criteria for inspections and tests as provided in the Contract Documents; and
- .7 Documentation is provided, where required and/or appropriate, to demonstrate that life-cycle costs and maintenance requirements have been considered in the design.

4.4.3 Concessionaire/Design-Builder's Design QA/QC Plan shall address interim design submissions and Construction Documents that the Department may require; design review meetings; submittal schedule; publishing and distribution of design review meeting notes and design submission status; and other Design Development Services requirements as set forth in Part 4 of the Design-Build Contract or applicable portions of the P3 Comprehensive Agreement.

4.4.4 The Design QA/QC Plan shall clearly demonstrate that all design-related documents are technically reviewed by competent, independent reviewers; said documents must include procedures to correct errors and deficiencies in the design documents prior to submitting them to the Department for review. Minimally, the Design QA/QC Plan shall identify design engineer, detailer, checker, quality assurance engineer, quality control engineer, and engineer in responsible charge by organization, name and resume, including sub-consultants and interface among design consultants.

4.4.5 The Design QA/QC Plan shall identify other contract submissions that may fall outside the Design Manager's expertise. For each of these submissions, a QA and QC plan shall be developed, with appropriate staff identified for both QA and QC functions. Such other contract submissions may include, but not be limited to: ROW appraisals, data

entry and RUMS, including completeness of contract information, utility agreements, and surplus property data.

4.5 Department Approvals and Review of Design Work

4.5.1 The Design Manager shall oversee the performance of all the design oversight reviews. The Department may participate in these reviews. Under this procedure, the Design Manager will provide the Department with draft design plans for review and (where required) approval to confirm that the design work complies with the requirements of the Contract Documents, especially requirements for design development and any Technical Information and/or Technical Requirements, before the Concessionaire/Design-Builder initiates construction activities on the Project.

4.5.2 Any review comments made by the Department will be provided, in writing, to the Concessionaire/Design-Builder. The Department will provide timely reviews per the Contract and (where required) approvals of interim design submissions, drawings, specifications, and other design submittals consistent with the turnaround times set forth in Concessionaire/Design-Builder's schedule, provided that Department shall have twenty-one (21) days after receipt of such submissions to act upon such submissions unless otherwise provided for in the Contract.

4.5.3 The Concessionaire/Design-Builder shall be solely responsible, at no additional cost to the Department, for the schedule impacts and costs of revisions arising from the Department's review of the drawings, specifications, and other design submittals for consistency with the requirements of the Contract and caused by the Concessionaire/Design-Builder's noncompliance with contract requirements.

4.5.4 In addition to contractual reviews, the Department may conduct regular monthly progress meetings in which quality issues are reviewed, discussed, and addressed.

4.6 Quality Assurance and Quality Control of Design and Field Changes

4.6.1 Changes, including field changes, in the design of the Project or any portion thereof as shown on the Construction Documents, shall be subject to design QA and QC measures and procedures commensurate with those applied to the original design of the portion of the Project being changed. Furthermore, all changes shall be approved in writing by the organization that performed the original design, with the additional written acknowledgement and approval of the change by the Design Manager prior to submission for approval by the Department. Where required, revisions shall be signed and sealed. The Design-Builder shall develop a process for communicating changes within the Design-Builder's organization as well as with the Department in accordance with this Section 4. All changes shall be documented in the final As-Built plans. All changes should be handled using one of the following approaches:

- .1 **Field Design Change (FDC)** is defined as any adjustment made in the field to match project elements with conditions encountered in the field. They are limited to minor dimensional and layout adjustments to AFC documents, and do not alter the design intent or impact the overall project construction and installation. The Department in its sole discretion may require the Design-

Builder to submit FDCs through formal construction plan revision or document the field design changes in the as-built plans. The Department, in its sole discretion, will determine if Field Design Changes can be implemented prior to a formal construction revision or if field changes must be performed following a formal construction plan revision.

- .2 **Notice of Design Change (NDC)** is defined as revisions to AFC documents that involve design changes that are considered to be major in scope or changes that may impact multiple disciplines. Any adjustment requiring signing and sealing of documents shall be through a NDC requiring a formal construction revision. Examples include revisions to major dimensions and layout, materials changes, or design revisions to accommodate adjustments to the work.

4.6.2 Design Request for Information (RFIs) are internal to the Design-Build Team and should not be submitted directly to the Department. The Design QA/QC Plan shall describe how Concessionaire/Design-Builder's internal RFIs will be communicated to the designer of record, how responses will be communicated back to the field personnel, and how and when the information will be communicated to the Department's project management staff. Any design-related RFIs initiated by the Concessionaire/Design-Builder should be transmitted to the designer with the Department copied on the final resolution. Design RFIs that result in changes to the Contract Documents or Approved for Construction Plans shall be transmitted to the designer and the Department concurrently, with the Department having final approval authority.

4.7 Design QA/QC Overview

4.7.1 A flow chart depicting the design review, approval and quality management process is shown in **Figure 4-1**.

Section 5. Construction QA/QC Requirements

5.1 General

5.1.1 The Concessionaire/Design-Builder shall be responsible for the quality of workmanship and materials incorporated into the Project. The Concessionaire/Design-Builder's QA and QC measures shall insure that operational techniques and activities provide workmanship and materials of acceptable quality. Concessionaire/Design-Builder sampling, testing, and inspection shall be performed to control the processes and determine the degree of workmanship and materials compliance with the Construction and Contract Documents.

5.1.2 The Concessionaire/Design-Builder shall develop, operate and update as required a QA/QC Plan which will detail how the requirements of this Section 5 will be achieved.

5.1.3 The Contract may require specific QA and QC measures for certain materials. When so required, the Concessionaire/Design-Builder shall provide all personnel, equipment, supplies, and facilities necessary to perform QA and QC functions, obtain samples, perform tests and inspections required in the Construction and Contract Documents.

5.1.4 The QAM shall certify, as part of each request for payment, that all of the Work has been completed in conformance with the requirements of the approved Construction QA/QC Plan, the Construction Documents and the Contract.

5.2 Construction QA/QC Plan

5.2.1 The Construction QA/QC Plan shall detail how the Concessionaire/Design-Builder will achieve the minimum requirements for Construction QA/QC set out in this Section 5. It is imperative that the Construction QA/QC Plan adequately distinguishes between the separate functions of QA and QC, as described in this Guide. The Construction QA/QC Plan shall therefore be prepared such that the requirements for QA and the requirements for QC are detailed in individual plans or in separate sections of the overall plan such that they are capable of being read independently.

5.2.2 The minimum content requirements for the initial Construction QA/QC Plan submitted at the project Kick-off Meeting are provided in Section 2.2.2.

5.2.3 The minimum content requirements of the updated Construction QA/QC Plan submitted with each AFC work package are as follows:

- .1 Staffing Plan in accordance with Section 5.3.
- .2 Inspection Plan in accordance with Section 5.4.
- .3 Testing Plan in accordance with Section 5.5.
- .4 Construction Inspection Checklists in accordance with Section 5.6.

5.3 Staffing Plans

5.3.1 The Concessionaire/Design-Builder shall provide a project-specific staffing plan that identifies the following:

- .1 Name, position/role, organization and resume of QA and QC Inspectors and Testing Technicians;
- .2 Name, qualifications, duties, responsibilities and authority of Design Team members responsible for construction QA or QC;
- .3 Current and relevant certifications for Inspectors and Testing Technicians;
- .4 Anticipated number of hours on the project by both QA and QC personnel per month for the duration of construction on the project; and
- .5 An organizational chart showing lines of authority and reporting responsibilities.

5.3.2 The staffing plan shall ensure that at any time an adequate number of QA personnel are available to observe all construction operations and QC activities. If the QA and/or QC staffing level is not sufficient to provide testing and/or inspection in accordance with the contract requirements, the Design-Builder must rectify.

5.4 Inspection Plans

5.4.1 During the design of the Project, each item of work shall be reviewed to determine what significant characteristics of the item need to be monitored/inspected during construction in the field. This review is to ensure that the completed Project will function in accordance with the design intent over its expected lifetime. The QAM, in consultation with the Design Manager, shall develop the inspection plan for each element of the Work. Each inspection plan shall include the appropriate criteria, tests, and inspection requirements identified in the Contract and requirements as set forth herein. The inspection plans developed shall be incorporated as part of the Concessionaire/Design-Builder's Construction QA/QC Plan. The following elements shall be addressed within each work item inspection plan:

- .1 Identification – Work items included in the plan.
- .2 Characteristics – What characteristics of the item(s) will be inspected and to identify design team members that are required to be involved in the inspection.
- .3 Acceptance Criteria – Directly or by reference, provide sufficient information for the inspector to use to determine if the item or activity is acceptable or not.
- .4 Inspection – Identify QC and QA staff that will be required to perform the monitoring/inspection.

5.4.2 Maximum use of checklists shall be made for the purpose of QA and QC Inspection. The plan should indicate the actions to be taken for items found to be non-conforming and all the steps necessary to determine the extent of the non-conformance.

5.5 Testing Plans

5.5.1 The Concessionaire/Design-Builder shall provide to the Department a testing plan developed by the QAM for each material type that meets the minimum frequencies referenced above for separate QA (IA and IVST) and QC testing. The testing plan shall be developed using a random selection process such as ASTM D 3665 and shall reflect the estimated quantities calculated using the project drawings, specifications, and/or other design submittals. The test plan shall also include the estimated total number of QC, QAM IA, QAM VST, OIA and OVST tests required based on the estimated quantities and the required minimum and sampling testing frequencies included in this Guide. The testing plan, including quantities, sampling and testing frequencies, and testing estimates along with any assumptions made in development of the plan shall be submitted and signed by the QAM with recommendation for approval by the Department prior to the beginning of production or placement of the material. The process for tracking the delivery of each material to the site and incorporation of each material into the Work shall be identified in the testing plan for each material and documented in the Materials Notebook for the project. This includes all Buy America requirements as applicable.

5.5.2 QA and QC laboratories must be accredited by the AASHTO Accreditation Program (AAP) in the AASHTO and ASTM test methods cited in the frequency tables outlined in the attached Appendix 2, Table A-2 and Appendix 3, Table A-3. This includes any AASHTO and ASTM methods associated with the VTM test methods shown in these tables. For test methods not accredited by AAP, the laboratory must comply with AASHTO R18 (most current Edition) or ASTM C1077 (for concrete test methods), and must be approved by the Department at its sole discretion. The Department will check laboratory records and certifications prior to start of construction. This includes calibration of equipment used in the field supplied by the laboratory (i.e. concrete, asphalt, and soil test equipment).

5.5.3 The Department may elect to allow the QAM to accept small quantities of materials without normal sampling and testing frequencies. The determination to accept materials using this provision rests solely with the Department and must be provided by the Department in writing. Structural concrete will not be considered under the small quantity definition.

5.4.3.1 The Department may consider an item as a small quantity if the proposed project quantity for a specific item is less than one sub-lot or one-half of a sub-lot for mainline paving.

5.4.3.2 Factors that the Department will consider prior to use of small quantity acceptance are:

- .1 Has the material been previously approved?
- .2 Is the material certified?

- .3 Is there a current mix design or reference design?
- .4 Has it been recently tested with satisfactory results?
- .5 Is the material structurally significant?

5.4.3.3 Small quantity acceptance may be accomplished by visual, certification, or other appropriate methods. Acceptance of small quantities of materials by these methods must be fully documented. Documentation of materials under these methods must be provided by the QAM accepting the material. For visual documentation, an entry should be noted on field records, with a statement as to the basis of acceptance of the material and the approximate quantity involved. A separate list of items and quantities accepted on visual inspection shall be maintained by the QAM and included in the Materials Notebook.

5.6 Construction Inspection Checklists

5.6.1 The Concessionaire/Design-Builder’s Construction QA/QC Plan shall include inspection checklists for all anticipated construction operations and/or processes. These checklists shall be used by the Concessionaire/Design-Builder’s QA and QC inspection personnel. The individual checklists shall be approved by the Department as part of the overall approval of the Concessionaire/Design-Builder’s QA/QC Plan. The checklist for each work activity shall include the construction requirements stated in the standard specifications or Contract for that work activity. As a minimum each checklist shall address the following as shown in **Table 5-6**:

Table 5-6: Minimum Requirements for Construction Inspection Checklists

| Checklist Item | Item Description |
|---------------------------------|---|
| Date and Time: | Date and time inspection was performed |
| Location: | .1 Pier or structure component .2 Drainage Structure Number .3 Compaction Report (referenced to Centerline Station and Sub-grade Elevation, etc.) |
| Specification Requirement: | List of applicable specifications for this item |
| Frequency: | Indicated test or inspection frequency, if any |
| Elements or Items Inspected: | List of elements or items inspected |
| Conformation to Specifications: | Check that work and materials meet the appropriate specification/standard |
| Deficiencies Noted: | Note any deficiencies to specifications/standards |

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| Checklist Item | Item Description |
|-----------------------------|---|
| Individual Notified: | Individual notified for corrective action |
| Corrective Action Noted: | What form of corrective action is recommended |
| Action Taken: | What corrective action was taken |
| Material Documentation: | List and attach a copy of all required documentation (test reports—such as, but not limited to, compaction, aggregate gradation, mill tests, manufacture’s certification, and catalog cut or product specifications). |
| Responsible Party Notified: | Name of the foreman or worker responsible for the work |
| Signature of Inspector: | Signature of Inspector who performed inspection |

5.6.2 Appendix 4 contains sample checklists for standard work items commonly used on Department Projects. The Concessionaire/Design-Builder shall confirm the completeness and suitability of the lists for the Project and shall develop the checklists for its QA/QC Plan based upon the style and format of the appended sample checklists.

5.7 Preparatory Inspection Meetings

5.7.1 Prior to the start of any work activity the Concessionaire/Design-Builder shall hold a Preparatory Inspection Meeting to ensure that all project personnel have a thorough understanding of the upcoming Work. The purpose of the Preparatory Inspection Meeting is to facilitate coordination and communication between the Concessionaire/Design-Builder’s production personnel, the appropriate Design Team members, QC personnel and the QA personnel, as well as the Department’s (Owner’s) Independent Assurance (OIA) and Verification Sampling and Testing (OVST) personnel. Work activities and/or Work Packages should generally correspond to the sections of the Department’s Standard Road and Bridge Specifications. The Construction Manager, QAM, Quality Control Manager (if applicable), and appropriate QC testing technicians, QC inspectors, QA testing technicians, and QA inspectors that will be involved in the QA and QC of the Work shall attend the Preparatory Inspection Meeting.

5.7.2 Prior to the start of each work activity, the QAM shall identify the QA Inspector(s) and Testing Technician(s) by name and provide a detailed matrix for each type of inspection and testing required illustrating each technician’s qualifications/certifications and respective inspection(s) and test(s) that is (are) to be performed. The QAM shall also identify the Department’s testing and inspection requirements that are to be performed for each work activity. The Concessionaire/Design-Builder Construction Manager or QCM shall coordinate with the QAM and identify the QC Inspectors and Testing Technician(s) prior to the start of each Work Package and provide a detailed matrix for each type of inspection and testing required illustrating each

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technician's qualifications/certifications and respective inspection(s) and test(s) that is (are) to be performed. The matrix shall also identify any design personnel that may be required (such as the Lead Geotechnical Engineer or qualified representative) and the inspections and/or tests to be performed by the respective design personnel. These qualification matrices shall be submitted to the Department's Project Manager for review and approval and transmitted to all parties prior to the start of each Work Package.

5.7.3 The Preparatory Inspection Meeting shall be led by the QAM and shall not be delegated to others. The Preparatory Meetings shall include discussions of what will be accomplished, by whom it will be performed, and where, when, and how the work will be performed by the contractor, testing technicians, and inspectors. This shall include reviewing the inspection plan for each element of the Work, the testing plan for each material to be incorporated into the Work, all relevant construction inspection checklists, and the list of any QA and QC laboratories that will be involved in the materials testing process. The Preparatory Inspection Meetings are to ensure that all parties have the same understanding of the design intent and to confirm the completeness and suitability of the plans. These inspection meetings also ensure that all parties have the appropriate approved for construction plans, specifications, manufacturer or vendor requirements, and any special details and/or submittals. Any safety regulations and procedures that need to be followed should be addressed at this meeting. At this time, the QA (IA and IVST) and QC-approved inspection checklists for the specific work package or activity shall be reviewed to confirm completeness and suitability.

5.7.4 The Preparatory Inspection Meeting shall be held no more than two weeks prior to the beginning of the scheduled activity once all associated plans have been approved for construction and all permits required to complete the Work have been obtained; all preliminary documents shall be reviewed as outlined in Appendix 2, Table A-2 and Appendix 3, Table A-3. The Department, including the National Pollutant Discharge Elimination System (NPDES) Coordinator and assigned Environmental Compliance Inspector (ECI), shall be invited to attend the Preparatory Inspection Meetings at least seven (7) days prior to the meeting and a representative(s) for the Department will attend. The meetings shall be planned and conducted by the QAM who, in turn, shall arrange for minutes of the meeting to be taken to document any actions, clarifications and understandings related to the construction of the item or definable feature of work that may not otherwise be clearly documented elsewhere. Meeting minutes will be distributed for comment and approval within two (2) business days to all attendees, the Department's Project Manager and Department's OIA and OVST personnel even if they are not present. Minutes shall be finalized no later than five (5) business days after the meeting and prior to start of associated Work activities. Preparatory Inspection Meetings are classified as Hold Points and shall be identified in the Concessionaire/Design-Builder's QA/QC Plan and in the CPM Schedule. Finalized minutes from each Preparatory Inspection Meeting shall be appended to the Construction QA/QC Plan.

5.8 Concessionaire/Design-Builders QA and QC Inspections

5.8.1 The Concessionaire/Design-Builder shall provide both Quality Assurance and Quality Control inspections for all work activities and Work Packages for conformance with the construction requirements in the Construction and Contract Documents.

5.8.2 Both the QA (IA and IVST) and QC components of the Construction QA/QC Plan shall contain separate inspection plans for each construction work item included in the Project. Work items shall be definable features or items of work meeting the requirements set forth in the Design-Build or P3 Contract.

5.8.3 The Construction QA/QC Plan shall use industry standard inspection procedures as well as those outlined in the Department's Construction Manual, Inspection Manual, Materials Manual of Instruction, Road and Bridge Standard Specifications, Survey Manual, Construction Documents, Contract and the minimum requirements outlined in the attached Appendix 2, Table A-2 and Appendix 3, Table A-3.

5.8.4 Inspections shall be performed during all phases of the Project from Notice to Proceed to Final Acceptance in order to assure that the work meets, and is being performed in accordance with Construction Documents and the Contract.

5.8.5 Appropriate follow-up inspections, sampling and testing of materials shall be performed to satisfy, at a minimum, the frequencies shown in Appendix 2, Table A-2 and Appendix 3, Table A-3 as each item of work progresses to assure consistency in workmanship, compliance with contract requirements including design and Construction Documents, and to assure satisfactory performance of the work in service.

5.9 Concessionaire/Design-Builder QA and QC Sampling and Testing

5.9.1 The Concessionaire/Design-Builder field and laboratory sampling and testing shall be performed at frequencies specified in the minimum requirements outlined in Appendix 2, Table A-2, the Department's current Standard Road and Bridge Specifications, Special Provisions, and the Materials Manual of Instruction and other documents as appropriate and approved by the Department and/or as otherwise specified in the Contract. Sampling and testing shall be performed by qualified testing personnel as defined in Section 3 of this Guide. Concessionaire/Design-Builder QA sampling and testing shall consist of both Independent Assurance (QAM IA) and Verification Sampling and Testing (QAM VST).

5.9.2 The Concessionaire/Design-Builder shall submit copies of QA (IA and IVST) and QC test results electronically into the project's designated document management system within 24-hours of test completion.

5.10 Records

5.10.1 The Concessionaire/Design-Builder shall prepare separate test reports for QA (IA and IVST) and QC activities, meeting the requirements of AASHTO R18, ASTM C1077, or may use the current appropriate Department forms. The Concessionaire/Design-Builder shall also prepare, maintain, and submit to the Department's Project Manager completed test records and final materials certification in accordance with the

requirements of these Minimum Requirements for QA (IA and IVST), QC and the Department's Construction Manual, and Materials Manual of Instruction.

5.11 Department's Independent Assurance (OIA) and Verification Sampling and Testing (OVST)

5.11.1 Department's Independent Assurance (OIA) and Owners Verification Sampling and Testing (OVST) will be performed by the Department to validate Concessionaire/Design-Builder QA/QC sampling and testing program. The results of the Department's OIA and OVST observations and testing will be provided to the QAM by the Department's Project Manager. Failing tests will be communicated immediately to the QAM by the Department's Project manager or designated authorized representative. The Concessionaire/Design-Builder shall immediately take corrective action to resolve any noted deficiencies in accordance with Section 5.12 of this Guide.

5.11.2 An Owner system based approach will be used for Owner Independent Assurance on concrete and soils instead of attempting to track quantities of asphalt, concrete and aggregate/soils placed. Owner Verification Sampling and Testing (OVST) will be based on quantities of material placed. Guidance regarding the Department's system based IA approach is provided in Materials Memorandum MD 414-18.

5.11.3 The Department shall hold final authority for determining the acceptance of materials and workmanship incorporated into the Project. The acceptance decision will consider;

- .1 Results of Concessionaire/Design-Builder QA (IA and IVST) and QC sampling and testing at specified frequencies and locations,
- .2 The Department's Independent Assurance (OIA) and Verification Sampling and Testing (OVST) at specified frequencies and locations,
- .3 Inspection by the Department of the attributes and processes that may affect the quality of the finished product, and
- .4 Any dispute resolution procedures to resolve discrepancies between the Department's Verification Sampling and Testing and the Concessionaire/Design-Builder sampling and testing.

5.12 Resolution of Discrepancies in Test Results

5.12.1 If a discrepancy in the test results occurs, a cooperative effort by the Department and the Concessionaire/Design-Builder to identify the cause of the non-specification material or the discrepancy in the test results will include the following actions:

- .1 Check of test data, calculations and results;
- .2 Observation of the Concessionaire/Design-Builder's sampling and testing by the Department's Project Manager; and
- .3 Check of test equipment by the Department's Project Manager.

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5.12.2 When the source of test result discrepancies between the Concessionaire/Design-Builder and the Department’s laboratories cannot be resolved, a referee split sample shall be obtained and tested; this work will be performed for the Department utilizing an independent laboratory. The testing of the sample will be performed in duplicate by the independent laboratory without knowledge of the specific project conditions such as the identity of the Concessionaire/Design-Builder, the test results of the Department or Concessionaire/Design-Builder, or the specification targets. The results of these tests will be binding on both the Concessionaire/Design-Builder and the Department. The Concessionaire/Design-Builder or its representative may witness the testing if requested. Costs incurred for referee testing will be paid by the party found in error, at the established laboratory rates.

5.12.3 A comparison of tolerances which will trigger the referee and disputes processes are summarized in **Table 5-12**. Some of the referee procedures are presented in the Materials Manual of Instructions.

Table 5-12: Comparison Tolerances for Testing

| Test | IA Comparison Tolerance | Source |
|---|-------------------------|---------------------------------|
| Soil/Aggregate Density using Sand Cone | 2.0 pcf | Values adjusted from ASTM D1556 |
| Soil/Aggregate Moisture determined by oven dry | 14% difference* | ASTM D2216 |
| One Point Proctor – density | 4.5 pcf | AASHTO T 99 |
| Lab Proctor – density | 4.5 pcf | |
| One Point Proctor - moisture | 15% difference* | AASHTO T 99 |
| <p>* Percent difference calculation shall be $\% \text{ diff} \leq (\text{Absolute Value } [W_1 - W_2] / ((1/2) * (W_1 + W_2))) * 100$</p> <p>IA Comparison Tolerances for Soils and Aggregate Density and Depths are listed in the Material Manual of Instruction (MOI) Chapter III (MD 416-18); IA Comparison Tolerances for Hydraulic Cement Concrete tests are listed in the Materials MOI Chapter IV (MD 414-18); IA Comparison Tolerances for Bulk Specific Gravity on identical cores taken from asphalt pavement are listed in the Materials MOI Chapter V.</p> <p>Tolerances for asphalt concrete and hydraulic cement concrete pavement shall be in accordance with Sections 315.07 and 316.06 (k) of the VDOT Road and Bridge Specifications, respectively.</p> <p>Gradation and depth check tolerances for cold central plant recycling material (CCPRM), full depth reclamation (FDR), and cold in-place recycling are provided in the Contract Documents, if applicable.</p> | | |

5.12.4 The testing of referee samples to resolve disputes will be performed as set forth in the Section 5.12.2. In addition to its testing responsibilities, the Department will also perform Owner Independent Assurance and Owner Verification Sampling and Testing

inspections as outlined in Appendix 2, Table A-2 and Appendix 3, Table A-3. The QAM will resolve QAM IA and QAM VST discrepancies with QC. The Department will resolve OIA and OVST discrepancies with the QAM. This represents a Hold Point until the discrepancy is resolved.

5.12.5 Any material deemed unacceptable shall be handled in accordance with Section 5.15 of this Guide.

5.13 Quality Assurance Auditing and Nonconforming Work Recovery Plan Requirements

5.13.1 The Concessionaire/Design-Builder shall establish and maintain a Quality Assurance Auditing and Nonconforming Work Recovery Plan (AR Plan) for uniform reporting, controlling, correction, disposition, and resolution of nonconforming Work (including disputed nonconforming Work) issues that may arise on the Project. Nonconforming Work is any Work performed by the Design-Builder that is not in compliance with contract requirements and may include, but is not limited to, design, R/W, utility relocation, equipment, materials, construction means and methods, quality control, quality assurance, and project management. The AR Plan shall specifically address a recovery plan to:

- .1 Increase QA (IA and IVST) and QC testing frequencies for tests that fail to meet comparison tolerances as set forth in Table 5-12.
- .2 Investigate the cause of nonconforming Work and the corrective action needed to prevent recurrence (such as increased sampling and testing frequencies, etc.).
- .3 Analyze all processes, work operations, concessions, quality records, service reports, and audits necessary to detect and eliminate potential causes of nonconforming Work.
- .4 Initiate preventive actions to deal with problems at a level corresponding to risks/deficiencies encountered.
- .5 Apply controls to ensure that effective corrective actions are taken.
- .6 Implement and recording changes in procedures resulting from corrective action.

5.13.2 Further, the AR Plan shall clearly delineate the Concessionaire/Design-Builder's procedures for addressing construction and design deficiencies in the Work and shall also register submissions which have been delayed by more than 60 days, or are undergoing more than two submissions. The Concessionaire/Design-Builder's deficient work, delays of submissions, and/or repetitively-revised submissions shall be addressed in such a manner as not to cause additional oversight by the Department.

5.13.3 In addition to the requirements outlined in Part 4, Section 2.10 or as otherwise set out in the Comprehensive Agreement for P3 projects, the Concessionaire/Design-Builder's AR Plan shall include recovery measures necessary to commence correction of such nonconforming Work, including the correction, removal or replacement of the nonconforming Work and any damage caused to other parts of the Work affected by the nonconforming Work, at no additional cost to the Department. The timing for the

recovery plan submission shall be in accordance with the requirements of Part 4, Section 2.10.2 or as otherwise set out in the Comprehensive Agreement for P3 projects.

5.13.4 Where nonconforming work can be corrected in accordance with the design approved by the Engineer of Record, the QAM or designee shall cause performance of such corrective action as appropriate. Re-tests or re-inspections shall be made by the QAM or designee to determine the acceptability of the materials after corrective measures have been taken in accordance with VDOT, or in absence therein, industry standards (i.e. ACI, AISC, etc.). Nonconforming Work that is correctable by established means and methods and complies with the contract requirements upon correction shall be considered a Deficiency and documented in a Deficiency Log. Nonconforming Work that is not correctable, such as safety or environmental permit violations, shall be considered a Nonconformance, issued a Nonconformance Report and documented in a Nonconformance Log. In addition, Deficiencies that do not have a corrective action plan agreed upon by the Department at the time of the subsequent application for payment shall be considered a Nonconformance, issued a Nonconformance Report, and documented in the Nonconformance Log. Any items identified as active on the Nonconformance Log shall be ineligible for payment.

5.14 Procedures for Reporting and Documenting Nonconforming Work

5.14.1 The Construction QA/QC Plan shall provide for identification, evaluation, segregation and, when practical, disposition of nonconforming Work and at a minimum shall provide for the following:

- .1 Deficiency Log** – A deficiency log that describes, at a minimum, the deficiency, location, date of occurrence, corrective action narrative, and date of correction shall be utilized to enable tracking of deficiencies. All deficiencies, even those corrected the same day, shall be included within the log for purposes of recognizing systematic quality-related issues. Entries shall include necessary information to trace deficiencies back to initial documentation and to summarize status. The QAM or designee shall be responsible for maintaining the deficiency log throughout the duration of the project. Delegation of the maintenance of the deficiency log shall not relieve the QAM of responsibility for the accuracy of the deficiency log. The log shall be a living document accessible for Department review at all times and shall be included with each monthly report submittal.
- .2 Nonconformance Report and Log** – The Nonconformance Report and Notification Log provided in Appendix 4 shall be utilized to enable tracking of Nonconformances. Include necessary information to trace nonconformance back to initial documentation and to summarize status. The QAM shall be responsible to maintain the Nonconformance Log throughout the duration of the project and provide for the Department’s review along with the monthly application for payment. Among other items, the Nonconformance Report (NCR) shall document the following information:
 - .1 Identification of nonconformance and date of occurrence
 - .2 Documentation

- .3 Evaluations/Recommendations
- .4 Separation/removal/tagging
- .5 Recommendation for “repair” or “use as is” dispositions
- .6 Cause of nonconformance
- .7 Proposed corrective action to prevent recurrence
- .8 Responsibility for accomplishing corrective action
- .9 Schedule for resolution (due date for correction)

- .3 Nonconformance Disposition** – The QAM shall respond to all Nonconformances by the date specified on NCR and include investigative actions, causes of Nonconformances, how Nonconformances were dispositioned, and corrective actions taken. Dispositions of “use as is” and “repair” for nonconforming items require review and acceptance by the Department Project Manager and concurrence by the Concessionaire/Design-Builder Design Manager and the QAM.
- .4 Status Tags** – Define procedures for controlling use, logging, installation, and authorized removal of status tags to track the correction of Deficiencies and Nonconformances.

5.15 Correction of Nonconforming Work

5.15.1 Any Nonconforming Work, whether the result of poor workmanship, use of materials containing defects, damage through carelessness, or any other cause shall be removed and replaced with work and materials which conform to the Construction and Contract Documents or shall be remedied as agreed upon by the Department as noted in Section 5.15.2 of this Guide. In accordance with Part 4, Section 2.10.2 of the Contract, the Department Project Manager may also cause such Nonconforming Work to be remedied or removed and replaced by separate contractors employed by the Department at the Concessionaire/Design-Builder’s expense. In such event, the costs of such removal, remediation and replacement shall be deducted from any monies due or to become due the Concessionaire/Design-Builder under the Contract.

5.15.2 The Department may elect at its sole discretion to accept Nonconforming Work at a reduced price and/or extended warranty. If the Department determines that the Nonconforming Work should be accepted, the Concessionaire/Design-Builder may be required by the Department to initiate a deductive Work Order request which will provide for an appropriate adjustment in the Contract Price in accordance with Part 4, Section 9.4. For P3 projects, payment shall be made to the Department.

5.15.3 In making a determination on the acceptability of Nonconforming Work the Department reserves the following rights:

- .1 Right of Rejection – If damage, defect, error, or inaccuracy is found in any specified item or Work, the Department has the right to put the Concessionaire/Design-Builder on notice of corrective action to bring the

- Nonconforming Work into conformance with the Construction and Contract Documents.
- .2 Correction Costs – Costs incurred in correcting rejected Nonconforming Work will be borne by the Concessionaire/Design-Builder.
 - .3 Investigative Costs – The Department may require the Concessionaire/Design-Builder to provide test apparatus and labor so the QAM and/or Department may investigate, inspect, and test Nonconforming Work. Any investigative costs shall be borne by the Concessionaire/Design-Builder.
 - .4 Negative Price Adjustment – The Department may require the Concessionaire/Design-Builder to initiate a deductive Work Order request which will provide for an appropriate adjustment in the Contract Price.

5.15.4 If the Department so directs at any time prior to Final Acceptance, the Concessionaire/Design-Builder shall remove or uncover such portions of the finished Work as may be directed for reasons including, but not limited to, lack of material documentation or an insufficient amount of QC or QA tests and/or inspection. After examination, the Concessionaire/Design-Builder shall restore such portions of the Work to the standards required by the Construction and Contract Documents. Any costs associated with removing or uncovering Work shall be borne by the Concessionaire/Design-Builder.

5.16 Witness and Hold Points

5.16.1 Witness and Hold Points shall be established where notification of the Department and/or the Concessionaire/Design-Builder's design team (for elements of a project that require design team members certification prior to continuation of Work), is required for observing or visually examining a specific work operation or test.

5.16.2 Witness Points are points identified within the Construction QA/QC Plan and CPM schedule which require notification of the Department and/or design team. Work may proceed beyond a Witness Point with or without participation by the Department provided proper notification has been given. However, Work shall not proceed until certification from the required design team member is obtained.

5.16.3 Hold Points are mandatory verification points identified within the Construction QA/QC Plan and CPM schedule beyond which work cannot proceed until mandatory verification is performed and a written release is granted by the Department. Witness and Hold Points shall be identified in the Construction QA/QC Plan and CPM schedule where critical characteristics are to be measured and maintained, and at points where it is nearly impossible to determine the adequacy of either materials or workmanship once work proceeds past this point.

5.17 Witness and Hold Point Coordination

5.17.1 The QAM shall designate a primary point of contact for notifying the Department at Hold Points and Witness Points. For Hold points, the Department's Project Manager or

designee will provide responses to the Concessionaire/Design-Builder with written reports or releases.

5.17.2 The time necessary to respond to the notification for inspection at Hold and Witness Points shall be no less than three (3) business days, specifically stated in the Construction QA/QC Plan, mutually agreed to by both the Concessionaire/Design-Builder and the Department, and incorporated in the Design-Builder's CPM schedule.

5.18 Hold Points – Minimum Requirements

5.18.1 Project-specific Hold Points may be identified in the Construction and Contract Documents. In addition, the Concessionaire/Design-Builder shall identify all Preparatory Inspection meetings, Design Development Services submissions as identified in Part 4, Section 2.4, or as otherwise set out in the Comprehensive Agreement for P3 projects. Environmental submittals, Certifications, Permits, Governmental Approvals and other Hold Points shall be identified in the Construction QA/QC Plan to allow the Department to perform its OIA and/or OVST functions as identified in Appendix 2, Table A-2 and Appendix 3, Table A-3 and to allow design team certification, where applicable. Among other things, this shall include survey stakeout and environmental delineation prior to beginning construction, installation of erosion and sediment control measures prior to beginning grading activities, proof rolling and approval of subgrade prior to placement of aggregate base or subbase stone, and the placement of reinforcement steel prior to concrete pours.

5.19 Witness Points – Minimum Requirements

5.19.1 Project-specific Witness Points may be identified in the Construction and Contract Documents. In addition, the Concessionaire/Design-Builder shall identify other Witness Points in its QA/QC Plan to allow the Department to perform its OIA and/or OVST functions as identified in Appendix 2, Table A-2 and Appendix 3, Table A-3.

5.20 Performance Verification of Project Geotechnical Elements/Features

5.20.1 The Construction QA/QC Plan shall include QC inspection performed by the Concessionaire/Design-Builder's geotechnical engineer of record (or his/her designated representative that is qualified to review geotechnical elements and develop a report for the geotechnical engineer to use for certification purposes). During construction the geotechnical engineer of record shall determine the integrity of foundation structures and other geotechnical elements and verify that their performance is as anticipated from the design and other geotechnical requirements as set forth in the specifications, special provisions, technical requirements, or as otherwise included in the Construction and Contract Documents. This shall include, but not be limited to slopes/embankments, foundation and pavement subgrade, installation and load testing of deep foundations, installation and monitoring of instrumentation, assessment and treatment for potential weak or unsuitable soils, rock excavation/slopes, and retaining structures that include tie-backs, soil nails, or anchors.

5.20.2 The Concessionaire/Design-Builder's geotechnical engineer of record shall identify the elements of the project in which the geotechnical engineer (or his/her qualified representative) is required to monitor/inspect during construction to ensure that the completed Project will function in accordance with the design intent over its expected lifetime. These items shall be included as part of the Concessionaire/Design-Builder's inspection plan outlined in Section 5.4 of this Guide. In conjunction with the QAM, the geotechnical engineer shall develop an inspection and testing plan prior to initiating each work activity. Inspection of geotechnical elements shall not be delegated to production QC Inspectors.

5.20.3 The Concessionaire/Design-Builder's geotechnical engineer shall:

- .1 Certify that the Work was subjected to the necessary testing and inspection requirements;
- .2 Certify that its representatives were qualified by education, experience and training to conduct the referenced activities;
- .3 Note any non-compliance issues; and
- .4 Certify that the Work meets specifications.

5.20.4 The Concessionaire/Design-Builder's monthly status report to the Department shall include the geotechnical engineer's certification of completed Work.

5.21 Plant Manufactured Materials Acceptance

5.21.1 The Concessionaire/Design-Builder shall identify to the Department any and all off-site fabricated materials such as structural steel, prestressed concrete beams and posts, traffic signal poles, light poles, sign structures, bridge rails, ancillary structures, bearing pads and any items from producers not in an existing Department QA/QC program. Precast Concrete structure and pipe producers must be on existing approved lists #34, #25, #26 or #42. The inspection of project-specific fabricated items will be accomplished by the Department using its own forces and/or Department agent. To facilitate these inspections, the Concessionaire/Design-Builder will promptly notify the Department of the intended fabricator and provide two copies of the Approved Shop Drawings. In addition, the Concessionaire/Design-Builder shall submit a Source of Materials, Form C-25, for those materials the Department retains responsibility for testing. An advanced notice of at least one month shall be provided to allow the Department in order to set up on-site inspection at a Plant or fabricator not having an inspection contract with the Department's structures section. Structural steel fabricating facilities/shops must be AISC certified. Prestressed concrete facilities must be PCI certified plants. Precast concrete and concrete pipe producers must be within 100 miles of Virginia's border and be on list #34 at the time of contract award.

5.21.2 Unless otherwise noted, the Department, using its own resources, will provide quality assurance inspection and/or testing of off-site fabricated materials listed in **Table 5-21**.

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Table 5-21: Testing of Materials by the Department for Off-Site Plant QA Programs

| Item | Point of Contact |
|---|--|
| Prestressed Concrete Structural Elements (beams, girders(AASHTO and bulb-T), and piles | Central Office Materials – Structures Section |
| Metal Traffic Signal and Light Poles and Arms | Central Office Materials – Structures Section |
| Structural Steel Elements (beams and girders) | Central Office Materials – Structures Section |
| Laminated Bridge Bearing Pads | Central Office Materials – Physical Lab |
| Precast Concrete Structures | Central Office Materials – Quality Assurance Section – Approved List #34 |
| Pipe (concrete, steel, aluminum and high density polyethylene) for culverts, storm drains and underdrains | Central Office Materials – Quality Assurance Section – Approved List #25, #26 and #42 |
| Asphalt Concrete QA program | District Materials Section |
| Hydraulic Cement Concrete Plant and Truck Inspections | National Ready Mix Concrete Association (NRMCA) Plant and Truck Certification required |
| Hydraulic Cement Concrete Mix Designs | District Materials Section |
| Aggregate CMA QA program | District Materials Section |
| CCPRM, CIR and FDR Mix Designs | District Materials Section |

5.21.3 The Concessionaire/Design-Builder shall be responsible for acceptance of materials at the time of delivery to the project site. The Department is not responsible for materials approved at the Plant that become damaged during transit or during storage on-site. The Concessionaire/Design-Builder will be responsible to assure all materials are free from damage prior to use in the Work.

5.22 Inspection and Testing Documentation

5.22.1 Each of the Concessionaire/Design-Builder's QA and QC Inspectors shall summarize their daily inspection activities in a daily report. The Department's Inspectors Daily Work Report or a similar form as approved by the Department shall be used for maintaining a written record of inspection results. Copies of the inspector's records shall be submitted electronically into the project's designated document management system within 24-hours from the time the inspection/testing was performed. The report shall consist minimally of the following key points of record:

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- .1 Work performed by the firm, subcontractor, or material supplier, identified by Work Package notation;
- .2 Weather conditions, including daily measured precipitation amount;
- .3 Inspections performed and their results;
- .4 Communications;
- .5 Delays encountered;
- .6 Identification of any safety-related problems and corrective action taken;
- .7 Identification of all non-conforming work and the corrective action taken; and
- .8 Signature of inspector.

5.22.2 Each of the Concessionaire/Design-Builder's QA and QC Testing Technicians shall summarize their daily testing and material sampling activities in a daily report. The Department's Inspectors Daily Work Report or a similar form as approved by the Department shall be used for maintaining a written record of test results. Copies of the Testing Technician's records shall be submitted electronically into the project's designated document management system within 24-hours from the time the testing was performed. The report shall consist minimally of the following key points of record:

- .1 Date and time test performed and time on site (arrival/departure);
- .2 Weather conditions, including daily measured precipitation amount;
- .3 Type, location, and results of all tests performed;
- .4 Signature of Testing Technician.

5.23 Design-Builder's Testing and Inspection Documentation and Reporting Process

5.23.1 The Project shall be constructed in accordance with standards and requirements related to construction, safety, environmental compliance, quality assurance and quality control as required in the Contract Documents, including but not limited to the VDOT Inspection Manual and Appendix 2, Table A-2 of this QA/QC Guide. In the event of a conflict between any of the standards and requirements for quality control and quality assurance identified in the contract, the most stringent shall govern. The objective of Table A-2 is to identify and summarize minimum inspection, sampling and testing coverage and frequencies; verification and observation schemes, and documentation and reporting requirements to be included in Concessionaire/Design-Builder's QA/QC Plan. Any work activities that are not identified in Table A-2 shall conform to the requirements of the VDOT Inspection Manual. The Department's Project Manager will review the Concessionaire/Design-Builder's QA/QC Plan for conformance with the requirements as set forth in the Contract. The Concessionaire/Design-Builder shall not begin any construction activities without the Department's approval of the Concessionaire/Design-Builder's QA/QC Plan.

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5.23.2 The QAM shall maintain the Project's Materials Notebook, recording materials used, source of material, and method of verification used to demonstrate compliance with Department standards. The Materials Notebook shall be maintained and reviewed in accordance with Chapter VII of the Department's Materials Division Manual of Instructions. The QAM shall also maintain project daily reports and shall be responsible for approval of all Inspectors' Daily Reports. The Design-Builder's Construction Manager shall ensure all QC daily field reports and records are submitted electronically into the project's designated document management system within 24-hours from the time the inspection/testing was performed. Inspector Daily reports should reviewed by the QAM daily and shall be certified by the QAM as being correct and complete prior to monthly application for payment.

5.23.3 The QAM shall approve all Materials Test Reports prior to submission to the Department. The QAM's approval of Materials Test Reports shall also include those for which the Department retains responsibility for review and acceptance.

5.23.4 Concessionaire/Design-Builder's QA and QC staff shall be responsible for project documentation, testing, and inspection; the QAM will be responsible for ensuring that the Concessionaire/Design-Builder conforms to its approved QA/QC Plan and maintains appropriate project documentation. The Department will be responsible for administering Independent Assurance (OIA) and Verification Sampling and Testing (OVST) of materials used during construction of the Project. The QAM is responsible for the coordination and scheduling of all OIA and OVST sampling and testing required to be conducted during construction operations.

5.23.5 The Concessionaire/Design-Builder shall provide, prior to Final Application for Payment, a complete set of Project records that included, but are not limited to the following:

- .1 Project correspondence
- .2 Project diaries
- .3 As-built Record Documents
- .4 Test reports
- .5 Invoices
- .6 Materials Notebook
- .7 Certified survey records
- .8 DBE-SWaM/EEO records
- .9 Warranties
- .10 Maintenance Manual
- .11 Buy America Certifications
- .12 Special Tools, etc.

Upon receipt and acceptance of the project records prescribed above, the Concessionaire/Design-Builder will provide the Department with a Final Application for Payment. The information required with submission for Final Application of Payment is outlined in RFP Part 4, Section 6.6.3.

5.24 Progress Payment Certification

5.24.1 Concessionaire/Design-Builder's QA (IA and IVST) and QC shall be an integral part of each Work Package. As part of each application for payment for any completed construction-related Work Packages, Concessionaire/Design-Builder's Quality Assurance Manager shall certify that each Work Package has been completed in accordance with the Construction and Contract Documents, and that the required QA/QC tests, measurements, permits or other requirements have been completed and all non-conformance reports relative to the respective Work Package have been resolved. This includes compliance with Buy America requirements as outlined in the Contract Documents.

5.24.2 All daily reports shall be included with the monthly application of payment. The Department, at its discretion, may withhold payment until all QA and QC reports from the previous month have been submitted. For design-related Work Packages, the Concessionaire/Design-Builder shall submit with each application for payment verifiable evidence from the Concessionaire/Design-Builder's Design Manager of the QA/QC reviews, including any checklists, summary data, high-level/outline calculations or design checks, and evaluations of the work and the qualifications of the responsible personnel that completed the work, etc., which the relevant QA or QC reviewer relied on to make its determination that the work is complete and conforms to the requirements of the Contract Documents. The QAM shall verify that all Design related Work Packages submitted for payment have been certified by the Design Manager as being in conformance with the Contract Documents and the Design QA/QC Plan.

5.25 Department Inspection Validation and Administration Process

5.25.1 As set forth in Part 5, Section 105.03 or as otherwise set out in the Comprehensive Agreement for P3 projects, the Department shall have the right to audit, monitor, inspect and test the Work as it progresses and Concessionaire/Design-Builder shall accommodate this process. Appendix 3, Table A-3 delineates the Department's construction inspection validation for items of work performed by the Concessionaire/Design-Builder during Preparatory, Intermediate, and Completion phases of the Work. Additionally, the Department will perform Owners Independent Assurance (OIA) and Owner Verification Sampling and Testing (OVST), and will observe, oversee, and independently assess and validate work items as set out in this Section 5 and Appendix 3, Table A-3.

5.25.2 Preparatory Inspection - Prior to the start of each new construction phase, type of work or after a change in previously approved types of materials, the Concessionaire/Design-Builder's QAM and Construction Manager shall meet with representatives of the Department for the Preparatory Inspection Meeting in accordance

with Section 5.7 of this Guide. The purpose of the Preparatory Inspection is to verify (1) that the pre-construction activities, such as safety training and the approval of design documents, permits, certifications, reference documents, and materials have been completed; and that (2) construction activities such as scheduled inspections, test types, locations, and frequencies have been satisfactorily identified prior to beginning the work.

All project work activities shall be preceded by a Preparatory Inspection as identified in this Section 5 and Appendix 3, Table A-3.

5.25.3 Intermediate Inspection - Throughout the course of construction, the Concessionaire/Design-Builder shall accommodate Department's performance of Intermediate Inspections. Details regarding the frequency and types of inspections and testing are described in this Section 5 and Appendix 3, Table A-3.

5.25.4 Completion Inspection - Some types of work may require inspection and testing by the Department upon substantial completion. Completion Inspection allows the Department Project Manager's verification that all necessary and supporting documentation is available to support Concessionaire/Design-Builder's application for final payment as identified in the approved CPM schedule.

5.26 Punch Out Inspection

5.26.1 Concessionaire/Design-Builder shall be responsible for punch out inspection. The punch list shall be maintained by the QAM and shall be created in coordination with the CM or QCM prior to Final Acceptance. The punch out inspection shall be performed on all Work, against approved Construction Plans, Specifications and other related Construction and Contract Documents and note any discrepancies thereof. The QAM shall review the project records to ensure that all items addressed by non-conformance reports, including areas where Department OIA and OVST testing produced discrepancies, have been corrected or have been included on the punchlist for corrective action.

5.26.2 The Department will monitor the development of the Concessionaire/Design-Builder's punchlist for the Project. The Department will review the Concessionaire/Design-Builder's punchlist documentation prior to the final acceptance walkthrough to determine that all punchlist activities have been performed and shall physically verify correction of no less than 10% of the punchlist items in the field. Discrepancies found in the physical verification by the Department shall be corrected by the Concessionaire/Design-Builder prior to Final Acceptance.

5.27 Project Communications and Submittals

5.27.1 The Concessionaire/Design-Builder shall maintain all project documentation electronically in an online location that is accessible to all personnel associated with the Project (to include contractor personnel, QC personnel, QA personnel, design personnel, right of way personnel, and Department personnel) at all times for the entire duration of the Project. The document management system specified in the Contract Document shall be utilized. A timeline and process for making decisions and managing communications

in the document management system shall be established as part of the QA/QC Plan. These processes are to ensure that required information is provided in a timely and efficient manner and that decisions are made at the lowest appropriate level of authority.

5.28 Quality Assurance and Quality Control Documents Order of Precedence

5.28.1 This Guide together with certain referenced standards and publications details the Department's minimum testing and inspection requirements and frequencies which the Concessionaire/Design-Builder shall perform. It is recognized that contract requirements will vary from project to project and therefore project specific contract requirements will always take precedent in case of conflict. If the QA/QC testing and inspection requirements set forth in this Guide are more stringent than Federal and State QA/QC testing and inspection requirements, then those set forth herein shall govern.

5.28.2 In the event of a conflict among any standard, provision or publication applicable to the Project, the Department shall have the right to determine, at its sole discretion, which requirement applies regardless of the order of precedence of the documents in which such standards, provisions, or publications are referenced. Concessionaire/Design-Builder shall request in writing Department's determination respecting the order of precedence involving the referenced standards, provisions, and publications promptly upon becoming aware of any such conflict.

Appendix 1

Definitions of Terms, Abbreviations and Acronyms

Terms, Abbreviations and Acronyms

Terms, Abbreviations and Acronyms shall be as stated in Section 101.01 of the VDOT Road and Bridge Specifications and Part 4, General Conditions of Contract. Additional or key terms and abbreviations relative to the Department's Requirements for Contractor QA/QC Plans on Design-Build and P3 Projects are as follows:

Approved for Construction (AFC) Documents – All drawings, specifications, revisions thereto, and any other items necessary to construct the Work, sealed by a professional engineer licensed by the Commonwealth of Virginia.

Audit - A documented activity performed in accordance with written procedures or checklists to verify, by examination and evaluation of objective evidence, that applicable elements of the Quality Assurance and Quality Control program have been developed, documented, and effectively implemented in accordance with specified requirements.

Concessionaire/Design-Builder – Any individual, partnership, corporation, or joint venture that contracts with the Department to perform the Contract.

Contract – Any contract, subcontract, or other form of agreement to perform any part of the Work or provide any materials, equipment or supplies for the Project and/or the utility relocations included in the Work, on behalf of the Concessionaire/Design Builder or any other Person with whom any Contractor further subcontracted any part of the Work, at all tiers.

Contractor – As applicable to P3 procurements, means any Person with whom the Concessionaire has entered into any contract to perform any part of the Work or provide any materials, equipment or supplies for the Project and/or the Utility Relocations included in the Work, on behalf of the Concessionaire, and any other Person with whom any Contractor has further subcontracted any part of the Work, at all tiers. The term “Contractor” will include the Design-Build Contractor and the Operations and Maintenance (O&M) Contractor.

Construction Documentation – All Design Documentation, AFC or IFC Documents, and all shop drawings, working drawings, fabrication plans, material and hardware descriptions, specifications, construction quality control reports, construction quality assurance reports and samples necessary for construction of the Project and/or the Utility Relocations included in the Work, in accordance with the Agreement and the other Project Agreements.

Construction QA/QC Plan – Used interchangeably with the Construction Quality Management Plan (CQMP) for P3 Projects. The plan developed by the Concessionaire/Design-Builder that provides the organization, relationship and

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procedures that define clear lines of responsibility and well defined approach for meeting Project requirements and innovation in construction approach, as described in more detail in the Contract Documents.

Deficiency – Nonconforming work that is correctable by established means and methods and will comply with the contract requirements upon correction.

Design Documentation – Such plans, drawings, specifications and other design documentation (including design standards, design or durability reports, models, samples and calculations) in computer readable and written formats prepared by or on behalf of the Concessionaire/Design-Builder for the purposes of the performance of the Work or any component thereof in accordance with the Design Build Contract and /or Comprehensive Agreement.

Design QA/QC Plan – Used interchangeably with the Design Quality Management Plan (DQMP) for P3 Projects. The plan developed by the Concessionaire/Design-Builder that provides the organization, relationship and procedures that define clear lines of responsibility and well defined approach for meeting Project requirements and innovation in design approach.

Hold Point – Mandatory verification points identified within the QA/QC Plan and CPM schedule beyond which work cannot proceed until mandatory verification is performed and a written release is granted by the Department.

Nonconformance – Any deviation from a contract requirement, specification, standard or procedure, a safety or permit violation, or failure to adhere to laws or regulations. A nonconformance might affect subsequent construction activities, warrant destructive sampling or testing, redesign, or reconstruction.

OIA – Owner Independent Assurance (OIA) – Oversight performed by the Department (or agent) to satisfy VDOT and FHWA’s requirements for documenting that proper QC and QA management is being performed. This oversight provides an independent assessment of Concessionaire/Design-Builder’s implementation of and compliance with the approved Quality Control and Quality Assurance plan This may include split samples, calibration checks, certification verification, and/or observations.

Owner Verification Sampling and Testing (OVST) – Oversight performed by the Department (or agent). The focus of owner validation is to verify Concessionaire/Design-Builder’s QC and QA compliance and confirm that the quality characteristics of the products incorporated in the project conform to specifications and are valid for payment in accordance with Part 4, Article 6 or applicable portions of the P3 procurement documents.

Quality Assurance Manager Independent Assurance (QAM IA) – Inspection performed by the QAM to independently evaluate all sampling, equipment, and testing procedures used by quality control that are used in the acceptance program. This may include split samples, calibration checks and/or observations.

Quality Assurance Manager Independent Verification Sampling and Testing (QAM IVST) – Inspection performed by the QAM that serves as an oversight role for the

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Concessionaire/Design-Builder's QA/QC Team. Independent Verification and Testing is performed to satisfy the QAM's verification process for documenting that proper QA/QC is being performed on the Project and to provide adequate assurance that the public is receiving the desired quality in the project undergoing construction.

Punch List – Itemized list of Work which remains to be completed before Final Acceptance, the existence, correction, and completion of which will have no adverse effect on the normal uninterrupted and safe use and operation and which can be performed without shutting down a traffic lane or shoulder.

Quality Assurance (QA) – The overall process performed independently of the construction contractor (contractor's production forces) for the purpose of determining the conformance of the work by examining the QC data and/or providing objective evidence (independent sampling and testing), to verify the contractor's quality control sampling and testing. The QAM will (organizationally through services independent of production forces) provide the QA inspection normally provided by the Department or its consultant on a traditional Design-Bid-Build project.

Quality Assurance/Quality Control Plan (QA/QC Plan) – Used interchangeably with Quality Management System Plan (QMSP) for P3 Projects. The plan developed by the Concessionaire/Design Builder that defines the quality management systems during the design, construction and for P3 procurements, the operations and maintenance phases of the Project. This plan details how the Concessionaire/Design-Builder will provide quality control (QC) and quality assurance (QA) for both the design and construction elements of the project, obtain samples for Design- Builder quality control testing, perform tests for Concessionaire/Design-Builder quality control, provide inspection, and exercise management control (e.g. quality assurance testing) to ensure the work conforms to the contract requirements. This document includes the Design QA/QC Plan (DQMP) and the Construction QA/QC Plan (CQMP).

Quality Control (QC) – Performed by the Concessionaire/Design-Builder to assess and adjust design, production, and construction processes to ensure conformance with contract requirements and to control the level of quality being produced in the Project. The purpose of QC is to measure those quality characteristics and to inspect those activities that affect the production at a time when corrective action can be taken to substantially decrease the likelihood that appreciable non-conforming material will be incorporated in the Project.

Verification – The act of reviewing, inspecting, testing, checking, auditing, or otherwise determining and documenting whether items, processes, services, or documents conform to specified requirements.

VDOT – The Virginia Department of Transportation, “Department”, or a duly authorized representative thereof.

Witness Point – Points where critical characteristics are to be measured and maintained, and/or at points where it is nearly impossible to determine the adequacy of either materials or workmanship once work proceeds past this point. Advance notification is to

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be given to the Department so that it may observe the status of the work at witness points. Work may proceed beyond a witness point with or without participation by the Department provided proper notification has been given.

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| No. | Material Type | Spec. Section | Test Reference | General Contractor | | | Department (Owner) | |
|-----|---|--|---|---|---|---|---|--|
| | | | | Contractor | | OIA Frequency* | OVST Frequency* | |
| | | | | QC Frequency | IA Frequency* | | | VST Frequency* |
| 1. | BACKFILL | 106.03; 302.03, 303.04, 401.03; Contract Special Provisions | | | | | | |
| | SOILS / SUBGRADE / EMBANKMENT | 106.03; 302.03, 303.04, 305.03; Contract Special Provisions | | | | | | |
| | Moisture Density Relations – Standard Proctor, Atterberg Limits, Grain Size Analysis & CBR (All Backfill Types and Borrow Sources submittals) | Density control of Embankments and Backfill Sections 106, 302, 303 and 305 of 2016 Road & Bridge Specification Book (2016 R&B) | VTM-1, VTM-7, VTM-8, VTM-25. AASHTO T 99, AASHTO T 89, AASHTO T 90, AASHTO T 87, AASHTO T 27, AASHTO T 85, AASHTO T 193 AASHTO T 265 | One (1) test per soil type and with change in material. Change in material would be a change in the visual USCS soil classification (e.g. CL to CH) The Contractor shall provide borrow source test results as per VDOT 2016 Road and Bridge Specifications Section 106.03 | Verify Lab accreditation of the QC laboratory to AASHTO test methods by looking at AASHTO Re:Source website | Compare all QC borrow submittals against specifications | Verify Lab accreditation of the QC laboratory to AASHTO test methods by looking at AASHTO Re:Source website | Compare one (1) QC borrow submittal against specifications per ten (10) QC borrow submittals |

* Unless otherwise noted the Concessionaire/Design-Builder's QAM IA/VST and the Owner's (Department's) OIA and OVST testing frequency are relative to QC frequency. QC will be performed in accordance with the requirements of Design Build Manual, Materials Manual of Instruction and Contract Specifications. **A minimum of one (1) test regardless of quantity placed shall be performed unless otherwise noted.** All sampling locations will be selected randomly. VST tests are independent test results taken at independent locations that shall be compared against specification requirements. IA tests include verifying technician certification and procedures, verifying equipment calibration and comparing split sample results against allowable tolerances. OIA and OVST will be performed by a representative of the Department.

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| No. | Material Type | Spec. Section | Test Reference | General Contractor | | | Department (Owner) | | |
|-----|---|------------------------------|--------------------|--|--|-------------------------------------|--------------------|---|-----------------|
| | | | | Contractor | | Quality Assurance Manager | | OIA Frequency* | OVST Frequency* |
| | | | | QC Frequency | IA Frequency* | VST Frequency* | | | |
| 1. | In-Place Density Tests - Box Culverts, Pipes | VDOT 2016 R&B Section 302.03 | VTM-10 | One (1) test per 100 LF, each lift, alternating sides | One (1) test per 1000 LF | One (1) test per 1000 LF | System Based IA | One (1) test per 10,000 LF | |
| | Abutments. Retaining Walls (including MSE Walls) | VDOT 2016 R&B Section 401.03 | | One (1) test per 150 CY | One test per 1500 CY | One test per 1500 CY | | One test per 15,000 CY | |
| | Drainage Structures | VDOT 2016 R&B Section 302.03 | | One (1) test, every other lift around perimeter after bedding layer | One (1) test per five (5) drainage structure | One (1) test per drainage structure | | One (1) test per ten (10) drainage structures | |
| | Soils/Subgrade | VDOT 2016 R&B Section 305.03 | | One (1) test per 500 LF each lift. | One (1) test per 5000 LF | One (1) test per 2500 LF | | One (1) test per 10,000 LF | |
| | Embankment | VDOT 2016 R&B Section 303.04 | | One (1) test per 500 CY, each lift. The average of five (5) nuclear gauge readings comprises one (1) density test | One (1) test per 5000 CY | One (1) Test per 2500 CY | | One (1) test per 10,000 CY | |
| | One point Proctor | | VTM-12 (as needed) | Whenever there is a change in material or compaction equipment/ method perform one point. If change of 4.5 PCF in one point proctor then a new Standard Proctor shall be performed | | | | | |

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|-----|---|---------------------------|-----------------------|---|--|--|--------------------|--|-----------------|
| | | | | Contractor | | Quality Assurance Manager | | OIA Frequency* | OVST Frequency* |
| | | | | QC Frequency | IA Frequency* | VST Frequency* | | | |
| 2. | HYDRAULIC CEMENT CONCRETE (HCC) STRUCTURAL | VDOT 2016 R&B Section 217 | | | | | | | |
| | HCC Entrained | | ASTM C1077 | Test every load | One (1) test per 100 CY | One (1) test per 500 CY | System Based IA | One (1) test per 5000 CY | |
| | 1. Air Content | | ASTM C231 | | | | | | |
| | a) Pressure Meter | | ASTM C173 | | | | | | |
| | b) Volumetric Meter | | ASTM C143 | | | | | | |
| | 2. HCC Slump | | ASTM C138 | | | | | | |
| | 3. HCC Unit Weight | | ASTM C1064 | | | | | | |
| | 4. HCC Temperature | | | | | | | | |
| | HCC Compressive Strength | | ASTM C31 / ASTM C39 | One (1) set of three (3) cylinders per 100 CY; minimum one (1) set of three (3) cylinders per day | One (1) set of three (3) cylinders per 1000 CY | One (1) set of three (3) cylinders per 1000 CY | System based IA | One (1) set of three (3) cylinders per 5000 CY | |
| | HCC Chloride Permeability | | VTM-112 ASTM C1202 | One (1) set of two (2) cylinders per 100 CY; minimum one (1) set of two (2) cylinders per day | One (1) set of two (2) cylinders per 1000 CY | One (1) set of two (2) cylinders per 1000 CY | System Based IA | One (1) set of two (2) cylinders per 5000 CY | |

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| No. | Material Type | Spec. Section | Test Reference | General Contractor | | | Department (Owner) | | |
|-----|---|--|----------------|---|--|---|---|--|-----------------|
| | | | | Contractor | | Quality Assurance Manager | | OIA Frequency* | OVST Frequency* |
| | | | | QC Frequency | IA Frequency* | VST Frequency* | | | |
| 3. | REINFORCING STEEL | VDOT 2016 R&B Section 223 | | | | | | | |
| | Reinforcing Steel (Non-Corrosion Resistant Bar) | VDOT 2016 R&B Section 223.02(a)1 | ASTM A615 | Verify manufacturer's certificates for every shipment for acceptance prior to placement Confirm Buy America by looking at mill test report to see steel has been melted and fabricated at a plant in USA | Verify 10% of the mill certs of the Contractor's QC Confirm Buy America | One (1) sample per manufacturer per most common size per project Test for tensile, yield, elongation and weight per unit length | Verify 10% of the mill certs of the QAM's IA Confirm Buy America by Construction staff | One (1) sample per project. Test for tensile, yield, elongation and weight per unit length | |
| | Corrosion Resistant Bar 1 - Stainless 2 - Stainless Steel Clad 3 - Low Carbon/Chromium | VDOT 2016 R&B Section 223.02 (e), (f), (g), AASHTO M 334 | AASHTO T 375 | | | One (1) sample per manufacturer per most common size per project Test for tensile, yield, elongation and weight per unit length Verify the alloy using X-ray Fluorescence (XRF) Spectroscopy, X-ray Diffraction, Atomic Absorption, spark emission, ICP or other approved chemical test for alloy | | One (1) sample per project. Test for tensile, yield, elongation and weight per unit length Verify the alloy using X-ray Fluorescence (XRF) Spectroscopy, or other approved chemical test for alloy | |

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| No. | Material Type | Spec. Section | Test Reference | General Contractor | | | Department (Owner) | | |
|-----|--|---|------------------------|--|--|--|--------------------|--|-----------------|
| | | | | Contractor | | Quality Assurance Manager | | OIA Frequency* | OVST Frequency* |
| | | | | QC Frequency | IA Frequency* | VST Frequency* | | | |
| 4. | TREATED SUBGRADE / SUBBASE, AGGREGATE BASE MATERIAL, AND CEMENT TREATED AGGREGATE BASE MATERIAL | VDOT 2016 R&B Sections 306.03, 307.05, 308.04, 309.05 | | | | | | | |
| | Depth Checks | | VTM-38B VTM-38A | One (1) test per 0.5 mile per lane width Small quantity not suitable for statistical lots (turn lanes, connections, etc.) | One (1) test per five (5) miles per lane width | One (1) test per two (2) miles per lane width | System Based IA | One (1) test per five (5) miles per lane width | |
| | In Place Density | | VTM-10 | One (1) test per 0.5 miles per lane width Average of five (5) nuclear gauge readings comprises one (1) nuclear density test | One (1) test per five (5) miles per lane width | One (1) test per two (2) miles per lane width, minimum of one (1) test per roadway | System Based IA | One (1) test per five (5) miles per lane width | |

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|-----|---|---------------------------|-----------------------|--|--|--|--------------------|---|
| | | | | Contractor | Quality Assurance Manager | | OIA Frequency* | OVST Frequency* |
| | | | | QC Frequency | IA Frequency* | VST Frequency* | | |
| 5. | ASPHALT CONCRETE PLACEMENT | VDOT 2016 R&B Section 315 | | | | | | |
| | Pavement Density by Nuclear Method with In Place Pavement Density by Cores serving the VST function Roadways with less than 5000 vehicles per day. (Asphalt Pavement) QAM to take possession of QC, IA and VST asphalt cores/plugs taken on project. | | VTM-76, VTM-6, VTM-22 | Establish roller pattern, control strips and test sections. Ten (10) stratified random density test sites per test section (5000 LF) | Observe one (1) control strip per ten (10) control strips established by the QC technician. Reweigh the 3 cores or 6 plugs taken from this control strip Minimum of one (1) control strip per project | Two (2) stratified random cores per 25,000 LF of paver width. Both cores obtained from the same test section Minimum five (5) cores per project | System Based IA | Two (2) stratified random cores per 25,000 LF of paver width. Both cores obtained from the same test section Minimum two (2) cores per project |

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| No. | Material Type | Spec. Section | Test Reference | General Contractor | | | Department (Owner) | |
|-----|--|------------------------------------|-----------------------|--|--|--|--------------------|--|
| | | | | Contractor | | Quality Assurance Manager | OIA Frequency* | OVST Frequency* |
| | | | | QC Frequency | IA Frequency* | VST Frequency* | | |
| 5. | Pavement Density by Nuclear Method with In Place Pavement Density by Cores as the acceptance method. Roadways with more than 5000 vehicles per day (Asphalt Pavement) QAM to take possession of QC, IA and VST cores/plugs taken on project | | VTM-76, VTM-6, VTM-22 | Establish roller pattern, control strips and test sections. Ten (10) stratified random nuclear density test sites per test section (5000 LF) plus five (5) stratified random density test sites per test section (5000 LF) | Observe one (1) control strip per ten (10) control strips established by the QC technician. Reweigh the 3 cores or 6 plugs taken from this control strip Minimum of one (1) control strip per project | Two (2) stratified random cores per 25,000 LF of paver width. Both cores obtained from the same test section Minimum five (5) cores per project | System Based IA | Two (2) stratified random cores per 25,000 LF of paver width. Both cores obtained from the same test section Minimum two (2) cores per project. |
| | In Place Pavement Density – Distances too short for Control Strip Establishment (Asphalt Pavement) | VDOT 2016 R&B Section 315.05 (e) 2 | VTM-6 | One (1) set of two (2) sawn plugs or one (1) core in the first 20 tons and one (1) additional set of two (2) plugs or one (1) core for every 100 tons thereafter | Obtain and reweigh one (1) random core or set of plugs per ten (10) locations Observe one (1) density determination per ten (10) cores weighed by the QC technician | One (1) random core or set of plugs per ten (10) QC locations | System Based IA | One (1) random core or set of plugs per twenty (20) QC locations Minimum one (1) core or set of plugs per project |

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| No. | Material Type | Spec. Section | Test Reference | General Contractor | | | Department (Owner) | |
|-----|--|---------------|----------------|--|--|--|--------------------|--|
| | | | | Contractor | Quality Assurance Manager | | OIA Frequency* | OVST Frequency* |
| | | | | QC Frequency | IA Frequency* | VST Frequency* | | |
| 5. | Depth Checks by Cores (Asphalt Pavement) | | VTM-32 | One (1) core per 0.25 miles per lane width | Select one (1) QC core per five (5) lots and measure thickness. A minimum of one (1) core per project | Obtain one (1) random core per five (5) lots | System Based IA | Obtain one (1) random core per five (5) lots Minimum of three (3) cores per project |

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| No. | Material Type | Spec. Section | Test Reference | General Contractor | | | Department (Owner) | |
|-----|--|---------------------------|----------------|--|--|--|--------------------|---|
| | | | | Contractor | Quality Assurance Manager | | OIA Frequency* | OVST Frequency* |
| | | | | QC Frequency | IA Frequency* | VST Frequency* | | |
| 6. | STONE MATRIX ASPHALT PLACEMENT | VDOT 2016 R&B Section 317 | | | | | | |
| | In Place Pavement Density QAM to take possession of QC, IA and VST asphalt cores/plugs taken on project. | | VTM-6, VTM-22 | Establish trial section and test sections Three (3) stratified random cores or six (6) plugs per trial section Five (5) stratified random density tests per test section (5000 LF) | Observe one (1) trial section per ten (10) trials sections established by the QC technician Reweigh the three (3) cores or six (6) plugs taken from this trial section Minimum of one (1) trial section observed per project and reweighing of cores or plugs from trial section | Two (2) stratified random cores per 25,000 LF of paver width Both cores obtained from the same test section Minimum five (5) cores per project | System Based IA | Two (2) stratified random cores per 25,000 LF of paver width Both cores obtained from the same test section Minimum two (2) cores per project |
| | Asphalt Tack applications | | VTM-137 | One (1) tack plate for every 5000 LF (per lane) | NA | One (1) tack plate per ten (10) QC tests Minimum one per project | System Based IA | One (1) tack plate per twenty (20) QC tests Minimum one per project |

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|-----|--|---------------------------|--|--|--|--|--------------------|--|-----------------|
| | | | | Contractor | | Quality Assurance Manager | | OIA Frequency* | OVST Frequency* |
| | | | | QC Frequency | IA Frequency* | VST Frequency* | | | |
| 7. | HYDRAULIC CEMENT CONCRETE (HCC) - PAVEMENT | VDOT 2016 R&B Section 217 | | | | | | | |
| | HCC Entrained 1. Air Content a) Pressure Meter b) Volumetric Meter 2. HCC Slump 3. HCC Unit Weight 4. HCC Temperature | | ASTM C1077 ASTM C231 ASTM C173 ASTM C143 ASTM C138 ASTM C1064 | Every load | One (1) test per 5000 CY | One (1) test per 1000 CY | System Based IA | One (1) test per 5000 C | |
| | Compressive Strength of Concrete Cylinders (HCC Pavement) | | ASTM C31/ ASTM C39 | One (1) set of three (3) cylinders per 250 CY; minimum one (1) set of three (3) cylinders for each days concreting operation | One (1) set of three (3) cylinders per 5000 CY | One (1) set of three (3) cylinders per 2500 CY | System Based IA | One (1) set of three (3) cylinders per 5000 CY | |

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|-----|--|---------------------------|--|---|--|--|--------------------|--|-----------------|
| | | | | Contractor | | Quality Assurance Manager | | OIA Frequency* | OVST Frequency* |
| | | | | QC Frequency | IA Frequency* | VST Frequency* | | | |
| 8. | HYDRAULIC CEMENT CONCRETE (HCC) – Miscellaneous Items | VDOT 2016 R&B Section 217 | | | | | | | |
| | HCC Entrained | | ASTM C1077 | One (1) test per load | One (1) test per 250 CY | One (1) test per 1000 CY | System Based IA | One (1) test per 10,000 CY | |
| | 1. Air Content a) Pressure Meter b) Volumetric Meter 2. HCC Slump 3. HCC Unit Weight 4. HCC Temperature | | ASTM C231 ASTM C173 ASTM C143 ASTM C138 ASTM C1064 | | | | | | |
| | Compressive Strength of Concrete Cylinders (Miscellaneous Items) | | ASTM C31/ ASTM C39 | One (1) set of three (3) cylinders per 250 CY; minimum one (1) set of three (3) cylinders per day | One (1) set of three (3) cylinders per 2500 CY | One (1) set of three (3) cylinders per 12,500 CY | System Based IA | One (1) set of three (3) cylinders per 25,000 CY | |

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|-----|--|---------------------------|----------------|--|--|--|---|--|
| | | | | Contractor | Quality Assurance Manager | | OIA Frequency* | OVST Frequency* |
| | | | | QC Frequency | IA Frequency* | VST Frequency* | | |
| 9. | PAVEMENT MARKINGS | VDOT 2016 R&B Section 704 | | | | | | |
| | Marking and Bead Application Rate | | VTM-94 | Perform VTM-94 at start up with periodic checks every three (3) hours of operation | Review start up calibrations Ensure one plate sample is taken and tested for thickness, width, bead distribution and embedment Retain sample for further testing if needed. Review all of the C85 reports daily to verify calculated quantities match the application rates and confirm that daily measurements were performed as described in VTM-94 Performed by QAM inspection staff | Randomly select three (3) ten- foot areas at the beginning middle and end of in place sections of markings per day Skip lines and edge lines are considered separately: 1) Inspect PM for correct placement, straightness, edges, thickness, bead distribution and embedment, day and night color and brightness. Inspect structure of tape to insure patterned waffles have not been damaged by roller | Review 5% of the C85 daily reports to verify calculated quantities match the application rates and confirm that daily measurements were performed as described in VTM-94 Performed by Project staff. | Upon completion of pavement markings installation, perform two (2) OVST tests, consisting of one (1) day and one (1) night time visual inspection (examining the brightness and nighttime color while driving along entire Project) review of the marking installation Performed by District Regional Operations once the markings have all been placed |

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| No. | Material Type | Spec. Section | Test Reference | General Contractor | | | Department (Owner) | | |
|-----|---|---|--|---|--|---|--|--|-----------------|
| | | | | Contractor | | Quality Assurance Manager | | OIA Frequency* | OVST Frequency* |
| | | | | QC Frequency | IA Frequency* | VST Frequency* | | | |
| 10. | High-Strength Bolts | VDOT 2016 R&B Section 226 | | | | | | | |
| | <p>“Black” bolts are only used for weathering steel or high-strength A490 bolts</p> <p>Documentation for a nut-bolt-washer (NBW) assembly for black bolts includes a raw material certification called a Mill Test report (MTR) for the bolt, a manufacturer’s certification for the bolt which states the manufacture of the bolt was done in the US, a raw material cert (MTR) for the nut, a manufacturer’s cert for the nut, a raw material cert (MTR) for the washer, a manufacturer’s cert for the washer and a rotational capacity test report for the NBW assembly (7 items)</p> <p>If the bolt assembly requires galvanization, then a cert for the galvanization (coating) of each of the three components is also required (10 items total)</p> <p>Occasionally the manufacturer issues a new cert for a product (e.g. bolt or nut) after it is galvanized, so the package of certs may include more than 10 items if galvanized assemblies are required</p> | <p>A Buy America statement is required for bolts. The Buy America statement must be: “the iron and steel was melted, manufactured and coated in the USA”</p> <p>The Information needed to prove Buy America is provided on the Mill Test Report (MTR). The MTR shows that the steel was melted in USA</p> <p>The manufacturers’ certification demonstrates the manufacture process of the bolts, nuts and washers (threading, head stamping and cutting) was performed in USA</p> <p>The galvanization certification shows that the zinc coating was performed in USA</p> | <p>ASTM F606 ASTM A153 VTM-135</p> | <p>Each nut-bolt-washer (NBW) assembly lot shall be sampled and tested (VTM 135) at a minimum rate of 2 assemblies per NBW lot</p> <p>The documentation shall be collected from the bolt supplier and the galvanizer for each lot and supplied along with the samples sent to the QAM. QC personnel shall monitor the storage and conditions of the bolts to insure they remain in good well lubricated condition</p> | <p>Documentation shall be reviewed to insure all parts are present and that the required tests have been performed by the producers and that the markings match the suppliers</p> <p>The results of the Ro-Cap test by producer and QAM-VST on Ro-Cap test shall be reviewed to insure the material passed the tests</p> | <p>A minimum of 10% of the NBW assembly lots shall be tested</p> <p>2 assemblies represent a lot for testing</p> <p>One NBW assembly shall be visually inspected and tested for galvanized coating (ASTM A153) coating (if used)</p> <p>The second assembly shall be either rotational capacity tested (Ro-Cap) as per VTM-135 or tested in direct tension in accordance with the wedge test of ASTM F606</p> <p>The rotational capacity test is performed on bolts up to and including 8 inches long</p> <p>The tension test is performed when bolts are over 8 inches in length</p> | <p>Each Project phase, two of the sampled NBW assemblies representing a lot shall be monitored during QC Rotation capacity testing (VTM 135)</p> | <p>One (1) random sample from the first ten lots shall be sampled and tested for tension, Rotational Capacity and galvanized coating</p> <p>Review the paperwork associated with the lot to verify the origin and physical properties meet the specifications</p> <p>Minimum 2 samples per Project</p> | |

Minimum Requirements for Quality Assurance and Quality Control on Design-Build and P3 Projects
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Appendix 2 Table A-2, Part 1
Minimum Requirements for Materials Testing

| No. | Material Type | Spec. Section | Test Reference | General Contractor | | | Department (Owner) | | |
|-----|---|-------------------|---------------------------------|--|---------------------------------|--|--------------------------------|--|-----------------|
| | | | | Contractor | | Quality Assurance Manager | | OIA Frequency* | OVST Frequency* |
| | | | | QC Frequency | IA Frequency* | VST Frequency* | | | |
| 11. | COLD IN-PLACE RECYCLING | Special Provision | | | | | | | |
| | Test Strip | | Special Provision, Section VIII | One (1) test strip per Job Mix Formula | N/A | Compare QC results against Special Provision | N/A | Compare QC results against Special Provision | |
| | Field Compaction: Nuclear Density Gauge (Direct Transmission) | | VTM-10, VTM-76 | Two (2) stratified random locations per sub lot | One (1) test per lot | Two (2) stratified random locations per lot | One (1) test per five (5) lots | One (1) random location per five (5) lots | |
| | Field Compaction: Field Proctor | | AASHTO T 180 Method D | One (1) random location per lot | One (1) test per five (5) lots | One (1) random location per five (5) lots | One (1) test per five (5) lots | One (1) random location per five (5) lots | |
| | Gradation | | AASHTO T 27 | One (1) at start of day's operation (two speeds) and with change in pavement structure | One (1) test per lot | One (1) random location per lot | One (1) test per five (5) lots | One (1) random location per five (5) lots | |
| | Depth Check | | VTM-38, Method B | Two (2) stratified random locations per lot | One (1) test per lot | One (1) random location per lot | One (1) test per five (5) lots | One (1) random location per five (5) lots | |
| | Stabilizing Agent Dosage Rate | | Calibrated Meter Reading | Ten (10) readings per lot | Observe one (1) reading per lot | Observe one (1) reading per lot | Verify calibration | Observe one (1) reading per 5 lots | |

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Minimum Requirements for Materials Testing**

| No. | Material Type | Spec. Section | Test Reference | General Contractor | | | Department (Owner) | |
|-----|---------------------------|---------------|----------------|--|---------------------------------|--|---|--|
| | | | | Contractor | Quality Assurance Manager | | OIA Frequency* | OVST Frequency* |
| | | | | QC Frequency | IA Frequency* | VST Frequency* | | |
| 11. | In-Place Moisture Content | | AASHTO T 329 | Moisture content shall be measured per AASHTO T 329 on samples (immediately placed in sealed plastic bag) taken from two stratified random locations as determined by the Engineer per each production day Other methods and sampling rates may be used if supplied in the Contractor's Quality Control Plan and approved by the Engineer | One (1) test per production day | One (1) random location per production day | One (1) test per five (5) production days | One (1) random location per five (5) production days |

Minimum Requirements for Quality Assurance and Quality Control on Design-Build and P3 Projects
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Appendix 2 Table A-2, Part 1
Minimum Requirements for Materials Testing

| No. | Material Type | Spec. Section | Test Reference | General Contractor | | | Department (Owner) | |
|-----|--|-------------------|---------------------------------------|---|---------------------------|---|--------------------------------|---|
| | | | | Contractor | Quality Assurance Manager | | OIA Frequency* | OVST Frequency* |
| | | | | QC Frequency | IA Frequency* | VST Frequency* | | |
| 12. | CCPRM PLANT | Special Provision | | | | | | |
| | Quality Control Plan | | Special Provision, Section IV | One (1) per project | N/A | Compare QC Plan against Special Provision | N/A | Compare QC Plan against Special Provision |
| | Recycling Agent Content | | Calibrated Automatic Meter | Printout of stabilizing agent content percentage/ rate with each gradation One (1) daily summary | N/A | N/A | Verify calibration | Review each daily summary |
| | Dry Indirect Tensile Test (Foamed Asphalt) | | AASHTO T 283 (Section 11) | One (1) random sample per 1000 tons per day | N/A | N/A | One (1) test per five (5) lots | One (1) random sample per lot |
| | Moisture Content of Stabilized Material | | | One (1) test with each asphalt content test | N/A | N/A | One (1) test per five (5) lots | One (1) random sample per lot |
| | Marshall Stability (Emulsified Asphalt) | | ASTM D5581, AASHTO T 245 AASHTO T 312 | One (1) random sample per 1000 tons-per day | N/A | N/A | One (1) test per five (5) lots | One (1) random sample per lot |
| | Gradation | | AASHTO T27 | Eight (8) stratified random samples per lot | N/A | N/A | One (1) test per five (5) lots | One (1) random sample per lot |
| | Asphalt Content Testing | | VTM-102 | One (1) random sample per 1000 tons per day | N/A | N/A | One (1) test per five (5) lots | One (1) random sample per lot |

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 Minimum Requirements for Materials Testing**

| No. | Material Type | Spec. Section | Test Reference | General Contractor | | | Department (Owner) | |
|-----|-------------------------------|---------------|---|---|---------------------------|----------------|---|-------------------------------|
| | | | | Contractor | Quality Assurance Manager | | OIA Frequency* | OVST Frequency* |
| | | | | QC Frequency | IA Frequency* | VST Frequency* | | |
| 12. | Expansion Ratio/ Half Life | | Wirtgen 2012 Cold Recycling Manual | Each load of asphalt binder used for foaming | N/A | N/A | Observe one (1) test per five (5) loads | Review QC reports for each |

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Minimum Requirements for Materials Testing

| No. | Material Type | Spec. Section | Test Reference | General Contractor | | | Department (Owner) | |
|-----|---|-------------------|-------------------------------|--|---------------------------------|--|---|--|
| | | | | Contractor | Quality Assurance Manager | | OIA Frequency* | OVST Frequency* |
| | | | | QC Frequency | IA Frequency* | VST Frequency* | | |
| 13. | CCPRM PLACEMENT | Special Provision | | | | | | |
| | Trial Section | | Special Provision, Section VI | One (1) test section per Job Mix Formula | N/A | Compare QC results against Special Provision | N/A | Compare QC results against Special Provision |
| | Depth Check | | VTM-38 Method B | Two (2) stratified random locations per lot | One (1) test per lot | One (1) random location per lot | One (1) test per five (5) lots | One (1) random location per five (5) lots |
| | Field Compaction: Nuclear Density Gauge (Direct Transmission) | | VTM-10, VTM-76 | Two (2) stratified random locations per sub lot | One (1) test per lot. | Two (2) stratified random locations per lot | One (1) test per five (5) lots | One (1) random location per five (5) lots |
| | Field Compaction: Field Proctor | | AASHTO T 180 Method D | One (1) random location per lot | One (1) test per five (5) lots | One (1) random location per five (5) lots | One (1) test per five (5) lots | One (1) random location per five (5) lots |
| | In Place Moisture Content | | AASHTO T-329 | Moisture content shall be measured taken from two (2) stratified random locations (immediately placed in a sealed plastic bag) determined by QAM per each production day | One (1) test per production day | One (1) random location per production day | One (1) test per five (5) production days | One (1) random location per five (5) production days |

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Minimum Requirements for Materials Testing

| No. | Material Type | Spec. Section | Test Reference | General Contractor | | | Department (Owner) | | |
|-----|---|-------------------|---------------------------------------|---|----------------------|--|--------------------------------|---|-----------------|
| | | | | Contractor | | Quality Assurance Manager | | OIA Frequency* | OVST Frequency* |
| | | | | QC Frequency | IA Frequency* | VST Frequency* | | | |
| 14. | FULL DEPTH RECLAMATION | Special Provision | | | | | | | |
| | Trial Section | | Special Provision, Section VIII | One (1) trial section per Job Mix Formula | N/A | Compare QC results against Special Provision | N/A | Compare QC results against Special Provision | |
| | Application Rate of Stabilizing Materials | | Calibrated Automatic Meter VTM-141 | Ten (10) readings per lot | Verify calibration | Two (2) plate/tarp tests at stratified random locations per lot, Monitor consistency of layer Plate/tarp/pan shall have area equal to one square yard (3 feet by 3 feet) for collecting and weighing stabilizing agent according to VTM | Verify calibration | One (1) plate/tarp/test at random location per five (5) lots Plate/tarp/pan shall have area equal to one square yard (3 feet by 3 feet) for collecting and weighing stabilizing agent according to VTM | |
| | Compacted Density (Direct Transmission) | | VTM-10 | Two (2) stratified random locations per sub lot | One (1) test per lot | Two (2) stratified random locations per lot | One (1) test per five (5) lots | One (1) random location per five (5) lots | |
| | Depth Check | | VTM-38 Method B | Two (2) stratified random locations per lot | One (1) test per lot | One (1) random location per lot | One (1) test per five (5) lots | One (1) random location per five (5) lots | |

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 Minimum Requirements for Materials Testing**

| No. | Material Type | Spec. Section | Test Reference | General Contractor | | | Department (Owner) | |
|-----|---------------|---------------|----------------|---|--------------------------------|---------------------------------|--------------------------------|---|
| | | | | Contractor | Quality Assurance Manager | | OIA Frequency* | OVST Frequency* |
| | | | | QC Frequency | IA Frequency* | VST Frequency* | | |
| 14. | Gradation | | VTM-25 | Two (2) stratified random locations per lot | One (1) test per five (5) lots | One (1) random location per lot | One (1) test per five (5) lots | One (1) random location per five (5) lots |

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Minimum Requirements for Materials Testing

| No. | Material Type | Spec. Section | Test Reference | General Contractor | | | Department (Owner) | |
|-----|---|---------------------------------------|----------------|--|--|---|--|--|
| | | | | Contractor | | Quality Assurance Manager | OIA Frequency* | OVST Frequency* |
| | | | | QC Frequency | IA Frequency* | VST Frequency* | | |
| 15. | PROTECTIVE COATING OF METAL STRUCTURES | VDOT 2016 R&B Section 411 (SSPC-PA-2) | | | | | | |
| | Monitor surface preparation and check coating thickness | | | Take three (3) surface profile measurements per day of blasting Five (5) spot measurements (15 individual readings) per day as defined in PA-2 for coating thickness after each layer of applied protective coating at each location. | Two (2) surface profile measurements per month of blasting One (1) spot measurement (3 individual readings) per week as defined in PA-2 for coating thickness after each layer of applied protective coating at each location | One (1) surface profile measurement per week of blasting One (1) spot measurement (3 individual readings) per day as defined in PA-2 for coating thickness after each layer of applied protective coating at each location | Two times a year observe one surface profile and one surface measurement by the contractor Observe a minimum of one profile and measurement per project | One (1) surface profile and measurement per three (3) months; a minimum of one per project |

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Appendix 2 Table A-2, Part 2

Min. Requirements for Inspection, Compliance Monitoring, and Verification of Contractor Product Installation, Practices and Procedures

The Project shall be constructed in accordance with standards and requirements related to construction, safety, quality assurance and quality control as required in the Contract Documents, including but not limited to the VDOT Inspection Manual and Appendix 2, Tables A-2, Parts 1 and 2 of this QA/QC Guide. In the event of a conflict between any of the standards and requirements for quality control and quality assurance identified in the contract, the most stringent shall govern.

| No. | Material Type/ Action | Spec. Section | Test Reference | General Contractor | | | VDOT | |
|-----|--|---------------------------|-------------------|--------------------------|-----------------------------------|---|-----------------------------------|--|
| | | | | Contractor | Quality Assurance Manager | | Intermediate Inspection | Final Inspection |
| | | | | QC Frequency | Intermediate Inspection | Completion Inspection | | |
| 1. | Clearing and Grubbing | VDOT 2016 R&B Section 301 | Table A-2, Part 1 | | | | | |
| | Ensure activities are confined to limits and seeded within 30 days of disturbance | | | Daily | Weekly | Review documentation monthly | Monthly | Verify QAM Documentation for completeness; review 10% for accuracy |
| 2. | Pre-cast Structures | VDOT 2016 R&B Section 404 | | | | | | |
| | Verify bedding material is installed properly and that pre-cast materials are not chipped or cracked | | | Daily | Once per structure or run of pipe | Verify test (density) reports and documentation monthly | 10% of structures or runs of pipe | Verify QAM Documentation for completeness; review 10% for accuracy |
| | Verify pipe layout and check compaction technique | | | Daily per structure run. | 10% of QC checks | Review documentation monthly | 10% of structures or runs of pipe | Verify QAM Documentation for completeness; review 10% for accuracy |

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Appendix 2 Table A-2, Part 2

Min. Requirements for Inspection, Compliance Monitoring, and Verification of Contractor Product Installation, Practices and Procedures

| No. | Material Type/ Action | Spec. Section | Test Reference | General Contractor | | | VDOT | |
|-----|--|---|----------------|-------------------------|---|---|-------------------------|--|
| | | | | Contractor QC Frequency | Quality Assurance Manager Intermediate Inspection | Quality Assurance Manager Completion Inspection | Intermediate Inspection | Final Inspection |
| | | | | 2. | For structures such as box culverts and Bridge structures | | | |
| 3. | Erosion and Siltation Control | VDOT 2016 R&B Section 303.03, VDOT R&B Standard 113, and Current Virginia DEQ Specifications and Certifications | | | | | | |
| | Monitor for correct installation and maintenance | | | Daily | Weekly | Inspection after ¼" or greater rain event | Weekly | Monthly inspection of documentation and verification of certifications |
| | Verify Design-Builder has a person certified through VDOT's Erosion and Sediment Control Contractor Certification (ESCCC) program within the limits of the project during all land disturbing activities | | | Daily | Weekly | Review documentation monthly | Monthly | Verify QAM Documentation for completeness; review 10% for accuracy upon project completion |

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Appendix 2 Table A-2, Part 2

Min. Requirements for Inspection, Compliance Monitoring, and Verification of Contractor Product Installation, Practices and Procedures

| No. | Material Type/ Action | Spec. Section | Test Reference | General Contractor | | | VDOT | |
|-----|--|--|----------------|---|---|---|-----------------------------|---|
| | | | | Contractor QC Frequency | Quality Assurance Manager Intermediate Inspection | Completion Inspection | Intermediate Inspection | Final Inspection |
| | | | | | | | | |
| 4. | Geosynthetics | VDOT 2016 R&B Section 245 | Various | | | | | |
| | Each type | | | 1 set of required tests for each lot of each different type and manufacturer; visually inspect 100% of installed material | 10% of QC | Review documentation monthly | 10% of QC visual inspection | 1 set of required tests for each different type of material per project |
| 5. | Undercut | VDOT 2016 R&B Section 303.04, Contract Documents | | | | | | |
| | Review area to determine need for undercut | | | Prior to start of work at each location | Weekly during production | All reports reviewed by QAM ; QAM to verify qualified inspector and correct equipment | 10% of QA frequency | Verify QAM Documentation for completeness; review 10% for accuracy upon activity completion |

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Min. Requirements for Inspection, Compliance Monitoring, and Verification of Contractor Product Installation, Practices and Procedures

| No. | Material Type/ Action | Spec. Section | Test Reference | General Contractor | | | VDOT | |
|-----|---|---------------------------|-------------------|-------------------------|---|------------------------------|-------------------------|---|
| | | | | Contractor QC Frequency | Quality Assurance Manager Intermediate Inspection | Completion Inspection | Intermediate Inspection | Final Inspection |
| | | | | 5. | Measure undercut area | | | |
| 6. | Excavation and Embankment | VDOT 2016 R&B Section 303 | | | | | | |
| | Ensure material has been tested and approved | | Table A-2, Part 1 | Daily | Weekly during production | Review documentation monthly | Monthly | Verify QAM Documentation for completeness; review 10% for accuracy upon activity completion |
| | Verify placement of fill in lift depths defined in specifications | | | Daily | Weekly during production | Review documentation monthly | Monthly | Verify QAM Documentation for completeness; review 10% for accuracy upon activity completion |

**Minimum Requirements for Quality Assurance and Quality Control on Design-Build and P3 Projects
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Appendix 2 Table A-2, Part 2

Min. Requirements for Inspection, Compliance Monitoring, and Verification of Contractor Product Installation, Practices and Procedures

| No. | Material Type/ Action | Spec. Section | Test Reference | General Contractor | | | VDOT | |
|-----|---|---|-------------------|-----------------------------------|---|------------------------------|--------------------------|---|
| | | | | Contractor QC Frequency | Quality Assurance Manager Intermediate Inspection | Completion Inspection | Intermediate Inspection | Final Inspection |
| | | | | | | | | |
| 7. | Select Material, Subbase & Aggregate Base Course | VDOT 2016 R&B Sections 305, 308, 309 | Table A-2, Part 1 | | | | | |
| | Verify final grade and placement depth | | | Daily | Weekly during production | Review documentation monthly | Monthly | Verify QAM Documentation for completeness; review 10% for accuracy upon activity completion |
| 8. | Asphalt Concrete Pavement | VDOT 2016 R&B Sections 310, 311, 315, 317 | Table A-2, Part 1 | | | | | |
| | Ensure site conditions are within specifications | | | Daily, prior to the start of work | Weekly during production | Review documentation monthly | Weekly during production | Verify QAM Documentation for completeness; review 10% for accuracy upon activity completion |
| | Check proper depth and joint operations | | | Daily | Weekly during production | Review documentation monthly | Weekly during production | Verify QAM Documentation for completeness; review 10% for accuracy upon activity completion |

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| No. | Material Type/ Action | Spec. Section | Test Reference | General Contractor | | | VDOT | |
|-----|---|--------------------------------|-------------------|---|--|------------------------------|---|---|
| | | | | Contractor QC Frequency | Quality Assurance Manager Intermediate Inspection | Completion Inspection | Intermediate Inspection | Final Inspection |
| | | | | 8. | Check mix type, mix temperature, and pavement smoothness | | | |
| 9. | Hydraulic Cement Concrete Pavement | VDOT 2016 R&B Section 217, 316 | Table A-2, Part 1 | | | | | |
| | Verify reinforcing steel and dowel assemblies for conformance with approved plans | | | Prior to the start of work at each location | Prior to the start of work at each location | Review documentation monthly | Prior to the start of work at each location | Verify QAM Documentation for completeness; review 10% for accuracy upon activity completion |
| | Check type of mix and placement operations | | | Daily | Weekly during production | Review documentation monthly | Weekly during production | Verify QAM Documentation for completeness; review 10% for accuracy upon activity completion |

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| No. | Material Type/ Action | Spec. Section | Test Reference | General Contractor | | | VDOT | |
|-----|--|---------------|----------------|-------------------------|---|---|--|--|
| | | | | Contractor QC Frequency | Quality Assurance Manager Intermediate Inspection | Completion Inspection | Intermediate Inspection | Final Inspection |
| | | | | 10. | Load Bearing Piles | VDOT 2016 R&B Section 403 | | |
| | Monitor operation and document blow counts | | | Continuously | Daily | Review documentation weekly | Weekly | Verify QAM Documentation for completeness; review 10% for accuracy upon activity completion |
| | Perform Center of Gravity calculations | | | For each foundation | One (1) for every ten (10) foundations | One (1) for every twenty (20) foundations | One (1) for every hundred (100) foundations corresponding to a QAM Intermediate Inspection check | Minimum three (3) randomly selected per project; one (1) for every one hundred (100) foundations |

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| No. | Material Type/ Action | Spec. Section | Test Reference | General Contractor | | | VDOT | |
|-----|---|---|--|--|---|--|--|---|
| | | | | Contractor QC Frequency | Quality Assurance Manager Intermediate Inspection | Completion Inspection | Intermediate Inspection | Final Inspection |
| | | | | | | | | |
| 11. | Structural Steel | VDOT 2016 R&B Section 407 | | | | | | |
| | <p>Receive Bolts, sample, verify the documentation is complete and perform laboratory Skidmore, tension and galvanized coating testing</p> <p>“Black” bolts are only used for weathering steel or high-strength A490 bolts. Documentation for a nut-bolt-washer (NBW) assembly for black bolts includes a raw material certification called a Mill Test report (MTR) for the bolt, a manufacturer’s certification for the bolt which states the manufacture of the bolt was done in the US, a raw material cert (MTR) for the nut, a manufacturer’s cert for the nut, a raw material cert (MTR) for the washer, a manufacturer’s cert for the washer and a rotational capacity (Ro-Cap) test report for the NBW assembly (7 items)</p> <p>If the bolt assembly requires galvanization, then a cert for the galvanization (coating) of each of the three components is also required (10 items total)</p> <p>Occasionally the manufacturer issues a new cert for a product (e.g. bolt or nut) after it is galvanized, so the package of certs may include more than 10 items when galvanized assemblies are required</p> | <p>VDOT 226.02(h)</p> <p>A Buy America statement is required for bolts</p> <p>The Buy America statement must be: “the iron and steel was melted, manufactured and coated in the USA”</p> <p>The Information needed to prove Buy America is provided on the Mill Test Report (MTR)</p> <p>The MTR shows that the steel was melted in USA. The manufacturers’ certification demonstrates the manufacture process of the bolts, nuts and washers (threading, head stamping and cutting) was performed in USA</p> <p>The galvanization certification shows that the zinc coating was performed in USA</p> | <p>Visual review of documentation and sample for QC/QA testing</p> | <p>Each nut-bolt-washer (NBW) assembly lot shall be sampled at a minimum rate of 2 assemblies per NBW lot</p> <p>The documentation shall be collected from the bolt supplier and the galvanizer for each lot and supplied along with the samples to the QAM</p> <p>Once certification paperwork is verified, NBW assemblies shall be tested as given in Item 10, Appendix 2, Table A-2, Part 1</p> <p>QC personnel shall monitor the storage and conditions of the bolts to insure they remain in a well lubricated condition</p> | <p>The documentation shall be reviewed to insure all parts are present and that the required tests have been performed by the producers and that the markings match the suppliers</p> <p>The results of the QAM Ro Cap VST (Item 10 Appendix 2, Table A-2, Part 1) shall be reviewed to insure the material passed the tests</p> | <p>Review all documentation to insure there is a complete package for each NBW assembly</p> <p>Each NBW assembly lot shall have been tested for galvanized coating (if used)</p> <p>Each NBW assembly lot for bolts up to and including 8” shall have been rotational capacity tested (Ro-Cap) as per VTM-135 Section 226</p> <p>Each NBW assembly lot for bolts over 8” shall have been tested in direct tension in accordance with the wedge test of ASTM F606</p> | <p>At the start of the project and at the beginning of successive construction phases, the testing of two of the sampled NBW assemblies shall be witnessed by VDOT during QC testing according to VTM-135 as required in item 10, Appendix 2, Table A-2, Part 1</p> | <p>Review the certification paperwork and the testing reports to verify the testing was performed and the documentation is complete for the project</p> |

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| No. | Material Type/ Action | Spec. Section | Test Reference | General Contractor | | | VDOT | |
|-----|-----------------------|---------------|----------------|-------------------------|---|---------------------------------|-------------------------|------------------|
| | | | | Contractor QC Frequency | Quality Assurance Manager Intermediate Inspection | Completion Inspection | Intermediate Inspection | Final Inspection |
| | | | | 11. | <p>Verify daily Skidmore testing is performed in accordance with proper procedures for each lot</p> <p>Note: NBW assembly may be reused after Skidmore testing in a connection if no defects are noted in visual inspection and the nut runs freely up the bolt for the full thread length - Only new NBW assemblies may be tested each day</p> | VDOT 2016 R&B Section 407.06(c) | | |

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| No. | Material Type/ Action | Spec. Section | Test Reference | General Contractor | | | VDOT | |
|-----|-----------------------|---------------|----------------|-------------------------|--|------------------------------|-------------------------|------------------|
| | | | | Contractor QC Frequency | Quality Assurance Manager Intermediate Inspection | Completion Inspection | Intermediate Inspection | Final Inspection |
| | | | | 11. | <p>Verify the installation crews are using proper installation procedures IAW specifications to tension the bolts</p> <p>All bolts are brought up to snug condition and checked prior to tightening</p> <p>All bolts are marked after achieving initial tension</p> <p>Bolts are tensioned from the inside of the pattern working to the outside of the pattern</p> <p>Bolts with direct tension indicating washers (DTIs) should be checked to ensure the gaps have closed</p> <p>Turn-of-the-nut (TOTN) tensioned bolts are checked visually to ensure the rotation has been met</p> | VDOT 2016 R&B Section 407.06 | | |

**Minimum Requirements for Quality Assurance and Quality Control on Design-Build and P3 Projects
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Appendix 2 Table A-2, Part 2

Min. Requirements for Inspection, Compliance Monitoring, and Verification of Contractor Product Installation, Practices and Procedures

| | | | | | | | | |
|-----|--|----------------------------------|--|--|--|---|---|--|
| 11. | Verify the bolted connections have been tensioned properly using statistical sampling frequency and a calibrated torque wrench | VDOT 2016 R&B Section 407.06(c)4 | | <p>For each connection, perform a visual inspection noting the bolts have uniform stick-out and the marking are present for Turn of the Nut (TOTN) tightening</p> <p>Test 10% or a minimum of 2 NBW assemblies in each connection verifying the required torque in the TOTN test or the refusal of the feeler gage if Direct Tension Indicators (DTIs) are used</p> <p>Complete testing before the deck formwork is placed</p> <p>A report should be prepared noting the inspections performed that day for later review</p> | Monitor all the torque testing for each main member connection (slip-critical connections) and at the beginning of each period where secondary members are being checked | Review all daily inspection reports to insure the bolts were installed correctly and inspected at the proper rate | Verify the equipment (torque wrench and Skidmore-Wilhelm tension measuring device) is calibrated within the appropriate timeframe (typ. annually) | Check to insure daily inspection reports are completed |
|-----|--|----------------------------------|--|--|--|---|---|--|

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Appendix 2 Table A-2, Part 2

Min. Requirements for Inspection, Compliance Monitoring, and Verification of Contractor Product Installation, Practices and Procedures

| No. | Material Type/ Action | Spec. Section | Test Reference | General Contractor | | | VDOT | |
|-----|---|---------------|----------------|---|---|---|--|--|
| | | | | Contractor QC Frequency | Quality Assurance Manager Intermediate Inspection | Completion Inspection | Intermediate Inspection | Final Inspection |
| | | | | 12. | Protective Coating of Metal Structures | VDOT 2016 R&B Section 411 SSPC-PA-2 | | |
| | Monitor surface preparation and check coating thickness | | | Take three (3) surface profile measurements per day of blasting. Five (5) spot measurements (15 individual readings) per day as defined in PA-2 for coating thickness after each layer of applied protective coating at each location | Two (2) surface profile measurements per month of blasting. One (1) spot measurement (3 individual readings) per week as defined in PA-2 for coating thickness after each layer of applied protective coating at each location. | One (1) surface profile measurement per week of blasting One (1) spot measurement (3 individual readings) per day as defined in PA-2 for coating thickness after each layer of applied protective coating at each location | 10% of QAM Intermediate Inspection frequency Observe a minimum of one (1) per project | One (1) per three (3) months, minimum of one (1) per project |

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Appendix 2 Table A-2, Part 2

Min. Requirements for Inspection, Compliance Monitoring, and Verification of Contractor Product Installation, Practices and Procedures

| No. | Material Type/ Action | Spec. Section | Test Reference | General Contractor | | | VDOT | |
|-----|---|---------------------------|-------------------|---|--|---|---|---|
| | | | | Contractor QC Frequency | Quality Assurance Manager Intermediate Inspection | Quality Assurance Manager Completion Inspection | Intermediate Inspection | Final Inspection |
| | | | | | | | | |
| 13. | Underdrains | VDOT 2016 R&B Section 501 | Table A-2, Part 1 | | | | | |
| | Inspect to ensure no deficiencies per VTM 108 | | | All accessible outlet locations; Additionally a minimum of 10% of longitudinal sections | Observe 10% of outlet locations; Additionally a minimum of 1% of longitudinal sections | One (1) every twenty-five (25) outlet locations A minimum of one per project independent from Intermediate Inspection | Observe one (1) every five (5) QAM Intermediate IA Inspection; Minimum of one (1) per project | Verify QAM Documentation for completeness; review 10% for accuracy upon activity completion |
| 14. | Storm Sewer and Culvert Post-Installation Inspection | VDOT 2016 R&B 302.03(d) | VTM-123 | | | | | |
| | Various | | | Per VTM-123 | Take place of VDOT Representative in VTM-123 who must be present for 100% of QC | Review each post-installation report | 10% of QAM Inspection | Verify QAM Documentation for completeness; review 10% for accuracy upon completion |

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| No. | Material Type/ Action | Spec. Section | Test Reference | General Contractor | | | VDOT | |
|-----|--|---------------------------|-------------------|-------------------------|---|---|--|--|
| | | | | Contractor QC Frequency | Quality Assurance Manager Intermediate Inspection | Completion Inspection | Intermediate Inspection | Final Inspection |
| | | | | | | | | |
| 15. | Guardrail | VDOT 2016 R&B Section 505 | Table A-2, Part 1 | | | | | |
| | Verify that guardrail is installed per specifications and at proper height | | | Daily | Spot-check every fifty (50) LF for proper height, minimum one (1) per run | Spot-check every five hundred (500) LF, minimum one (1) per run | Observe QAM Completion Inspection one (1) per every five hundred (500) LF, a minimum of five (5) per project | Select five (5) independent site per phase |
| 16. | Fencing | VDOT 2016 R&B Section 507 | Table A-2, Part 1 | | | | | |
| | Verify fencing type, height and location | | | Daily | Weekly | Review documentation monthly | Field inspection with final payment | Verify QAM Documentation for completeness; review 10% for accuracy upon project completion |
| 17. | ROW Monuments | VDOT 2016 R&B Section 503 | Table A-2, Part 1 | | | | | |
| | Verify monument type and location | | | 10% of ROW monuments | 1% of ROW monuments | Review paperwork monthly during installation | 10% of QAM Intermediate Inspection frequency; minimum of one (1) per project | Verify QAM Documentation for completeness; review 10% for accuracy upon project completion |

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| No. | Material Type/ Action | Spec. Section | Test Reference | General Contractor | | | VDOT | |
|-----|---|---------------------------|-------------------|-------------------------|---|--|------------------------------|---|
| | | | | Contractor QC Frequency | Quality Assurance Manager Intermediate Inspection | Completion Inspection | Intermediate Inspection | Final Inspection |
| | | | | | | | | |
| 18. | Maintenance of Traffic | VDOT 2016 R&B Section 512 | Table A-2, Part 1 | | | | | |
| | Monitor installation and maintenance and use Work Zone Safety Checklist | | | Daily | Weekly | Review documentation every two (2) weeks | Review documentation Monthly | Verify QAM Documentation for completeness; review 10% for accuracy on each site visit |
| 19. | Sound Barrier Walls | VDOT 2016 R&B Section 519 | Table A-2, Part 1 | | | | | |
| | Verify location and installation with shop drawings | | | Daily | Weekly | Review documentation every two (2) weeks | Bi-Monthly | Verify QAM Documentation for completeness; review 10% for accuracy upon activity completion |

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Appendix 2 Table A-2, Part 2

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| No. | Material Type/ Action | Spec. Section | Test Reference | General Contractor | | | VDOT | |
|-----|--|----------------------------------|-------------------|-------------------------|---|------------------------------|---------------------------|---|
| | | | | Contractor QC Frequency | Quality Assurance Manager Intermediate Inspection | Completion Inspection | Intermediate Inspection | Final Inspection |
| | | | | | | | | |
| 20. | Pavement Markings and Markers | VDOT 2016 R&B Section 704 | Table A-2, Part 1 | | | | | |
| | Verify surface conditions meet specifications | | | Daily | Weekly | Review documentation monthly | Weekly | Verify QAM Documentation for completeness; review 10% for accuracy upon activity completion |
| | Verify layout is in accordance with approved plans | | | Daily | Weekly | Review documentation monthly | Weekly | Verify QAM Documentation for completeness; review 10% for accuracy upon activity completion |
| 21. | Topsoil and Seeding | VDOT 2016 R&B Sections 602 & 603 | Table A-2, Part 1 | | | | | |
| | Verify proper material is utilized at application rates from plans | | | Daily | Weekly | Review documentation monthly | Review final installation | Verify QAM Documentation for completeness; review 10% for accuracy upon project completion |

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| No. | Material Type/ Action | Spec. Section | Test Reference | General Contractor | | | VDOT | |
|-----|---|---------------------------|-------------------|-------------------------|---|------------------------------|---------------------------|--|
| | | | | Contractor QC Frequency | Quality Assurance Manager Intermediate Inspection | Completion Inspection | Intermediate Inspection | Final Inspection |
| | | | | 22. | Planting | VDOT 2016 R&B Section 605 | | |
| | Verify that proper plants are installed at correct locations per plans | | | Daily | Weekly | Review documentation monthly | Review final installation | Verify QAM Documentation for completeness; review 10% for accuracy upon project completion |
| | Monitor that plants are cared for during establishment period | | | Daily | Weekly | Review documentation monthly | Monthly | Verify QAM Documentation for completeness; review 10% for accuracy upon project completion |
| 23. | Traffic Signs | VDOT 2016 R&B Section 512 | Table A-2, Part 1 | | | | | |
| | Verify that signs meeting current standards are utilized in locations per plans | | | Daily | Weekly | Review documentation monthly | Weekly | Verify QAM Documentation for completeness; review 10% for accuracy |

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Appendix 2 Table A-2, Part 2

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| No. | Material Type/ Action | Spec. Section | Test Reference | General Contractor | | | VDOT | |
|-----|---|---------------------------|-------------------|---|---|---|---|--|
| | | | | Contractor | Quality Assurance Manager | | Intermediate Inspection | Final Inspection |
| | | | | QC Frequency | Intermediate Inspection | Completion Inspection | | |
| 24. | Traffic Signals | VDOT 2016 R&B Section 703 | Table A-2, Part 1 | | | | | |
| | Monitor installation for conformance with plans and specifications | | | Continuously | Daily | Review documentation monthly | Minimum one (1) check per intersection per week | Verify QAM Documentation for completeness; review 10% for accuracy |
| 25. | Water and Sewer Facilities | VDOT 2016 R&B Section 520 | Table A-2, Part 1 | | | | | |
| | Monitor installation for conformance with plans and specifications. | | | Daily | Weekly | Review documentation monthly | Weekly | Review documentation upon completion |
| 26. | Specialty Contract Items | | | | | | | |
| | Various | Various | Various | Monitor at rates set forth in QA/QC plan. | Monitor at rates set forth in QA/QC plan. | Monitor at rates set forth in QA/QC plan. | 10% of QAM frequency or as determined by VDOT Project Manager | Verify QAM Documentation for completeness; review 10% for accuracy |

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| No. | Material Type/ Action | Spec. Section | Test Reference | General Contractor | | | VDOT | |
|-----|--|---------------------------|----------------|--------------------|---|-------------------------------|--|---|
| | | | | Contractor | Quality Assurance Manager | | Intermediate Inspection | Final Inspection |
| | | | | QC Frequency | Intermediate Inspection | Completion Inspection | | |
| 27. | Reinforcing Steel | VDOT 2016 R&B Section 406 | | | | | | |
| | Verify reinforcing steel is the correct size and is placed properly and tied at the proper frequency | | | Daily | Verify proper placement prior to placement of concrete | Review documentation | Verify placement prior to placement of concrete | Verify QAM Documentation for completeness; review 10% for accuracy upon project completion |
| 28. | Hydraulic Concrete Operation Placements | VDOT 2016 R&B Section 404 | | | | | | |
| | Performs inspection of forms assuring alignment and that forms meet contract dimensions and are rigid and mortar tight | | | Daily | Verifies forms are correct dimension and proper rigidity prior to concrete placement. | Reviews documentation monthly | Reviews forms for acceptability Dimension and rigidity prior to placement of concrete. | Reviews structures and Verify QAM Documentation for completeness; review 10% for accuracy upon project completion |

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Min. Requirements for Inspection, Compliance Monitoring, and Verification of Contractor Product Installation, Practices and Procedures

| No. | Material Type/ Action | Spec. Section | Test Reference | General Contractor | | | VDOT | |
|-----|--|---------------------------|----------------|-------------------------|--|------------------------------|--|--|
| | | | | Contractor QC Frequency | Quality Assurance Manager Intermediate Inspection | Completion Inspection | Intermediate Inspection | Final Inspection |
| | | | | | | | | |
| 29. | HCC Placements for structures | VDOT 2016 R&B Section 404 | | | | | | |
| | Assures that concrete is placed in proper lifts and is consolidated properly for all structures during placement | | | Daily | Review vibration, finish and curing during concrete pour for all structures | Review documentation monthly | Reviews vibration, finish and curing during concrete pour for all structures | Review final finish and alignment of structures at end of project |
| 30. | Incidental concrete | VDOT 2016 R&B Section 502 | | | | | | |
| | Verify form alignment and concrete placement when work is being performed | | | Daily | Review vibration, finish and curing during concrete pour at least once daily | Review documentation monthly | Review vibration, finish and curing during concrete pours daily | Verify QAM Documentation for completeness; review 10% for accuracy |

Minimum Requirements for Quality Assurance and Quality Control on Design-Build and P3 Projects
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Appendix 3, Table A-3
Owner's Additional Roles and Responsibilities for Project Inspection

| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|--|---|---|---|
| 1. | Clearing and Grubbing (C&G) VDOT 2016 R&B Section 301 | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Monitor that the QAM is confining effort to C&G activities and to areas so designated for C&G within the plans and scheduled within the next 30 days. Areas not worked within 30 day period should be temporarily seeded. | Physical field inspection performed with final payment. |
| | | Verify design documents that relate to the work to be performed have been approved. | Refer to Table A-2, Part 1 for testing requirements. | OVST Final document review. |
| | | Verify the Quality Assurance (QAM IA & VST) and Quality Control (QC) requirements as specified in the Design-Builder's QA/QC Plan. | | |
| | | Identify items of work and the frequency of OIA and OVST Inspections. | | |

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Appendix 3, Table A-3
Owner's Additional Roles and Responsibilities for Project Inspection

| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|--|---|---|---|
| 2. | Excavation and Backfill of Structures | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Verify by observation or review of the QAM's records, that each foundation has been probed or tested and has been accepted by the QAM. | Review TL-124(s), to verify that the appropriate frequency of testing was performed during the operation. Verify quantities are documented in Materials Notebook. |
| | VDOT Contract Special Provisions and VDOT 2016 R&B Sections 303/304/401 | Verify design documents that relate to the work to be performed have been approved. | Verify that proper lift depths and density tests are being performed as required. Review the completed TL-124(s) to verify that the appropriate frequency of testing was performed. | Physical field inspection performed with final payment. |
| | | Verify the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | Refer to Table A-2, Part 1 for testing requirements. | |
| | | Identify items of work and the frequency of OIA and OVST Inspections and tests. | Refer to Table A-2, Part 1 for testing requirements. | |
| | | Verify backfill material has been approved and density requirements for backfill established. Verify estimated depth and quantity of excavation. Verify estimated quantity of backfill material. Changes in backfill material shall be similarly reviewed/approved. Discuss criteria for establishing a change in fill materials. | Provide written notice of non-compliant materials to the Design-Builder's QA Manager. | |

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Appendix 3, Table A-3
Owner's Additional Roles and Responsibilities for Project Inspection

| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|---|---|--|--|
| 3. | Pipe Culverts, Storm Drains and Pre-cast Structures | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Verify QAM and QC personnel's inspection of pipe culverts, storm drains and pre-cast structures to ensure that bedding material is properly placed and shaped. | Verify that all structures are accurately documented in the QA/QC personnel's diaries. |
| | VDOT Contract Special Provisions and | Verify design documents that relate to the work to be performed have been approved. | Verify that pipe is not damaged, joints are properly sealed and bell/spigot ends are at the proper orientation. | Physical field inspection performed with final payment. |
| | VDOT 2016 R&B Section 302/404 and VTM-10/VTM-123 | Verify the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | Verify proper installation (pipe joints, cover height limits, backfill density and thickness) per QC. Verify that proper lift depths and density tests are being performed as required by QC. Review the completed TL-124(s) to verify that the appropriate frequency of testing was performed. Insure inspection and testing personnel have a Soils and Aggregate Field certification. Verify nuclear gauges have been calibrated in the last year. | Contractor completes post-installation inspection. QAM IA inspector present at post-installation inspection. Post-installation inspection report included with project file and sent to VDOT Central Office for permanent storage. Review post installation report to make sure imperfections are noted and recommended corrections have been completed. |
| | Identify items of work and the frequency of OIA and OVST Inspections and tests. | Refer to Table A-2, Part 1 for testing requirements. | | |
| | Verify material to be used has been approved. | Refer to Table A-2, Part 1 for testing requirements. | | |
| | Verify by observation or review of the QAM's records, that each foundation has been probed or tested in another manner and accepted by the QAM. | | | |

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Owner's Additional Roles and Responsibilities for Project Inspection

| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|---|---|--|--|
| 4. | Cast-In-Place Structures | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Verify formwork and rebar conforms to the plans and specifications and is free of debris. | Monitor curing based on the current and forecasted weather conditions. Control cylinders cast should be cured in the same manner as the in-place concrete. |
| | VDOT Contract Special Provisions and VDOT 2016 R&B Section 302 | Verify design documents that relate to the work to be performed have been approved. | Verify that two (2) Certified Concrete Field QC Inspectors are present during placement and that proper testing methods are being implemented. Very testing equipment is calibrated and in good operating condition. | Physical field inspection performed with final payment. |
| | Verify the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | Verify that the proper frequency of testing and material samplings is performed by the QAM and QC personnel. Observe some of the placement operation and testing. | | |
| | Review items of work and the frequency of OIA and OVST Inspections and tests. | Test results on the TL-28 Coding Form – Concrete Batch Report at the frequency previously approved. | | |
| | Verify by observation or review of QAM's records, that each foundation has been probed or tested in another manner and accepted by the QA Manager. | Refer to Table A-2, Part 1 for testing requirements. | | |
| | Verify hydraulic cement mix design has been approved for applications. Review any special design requirements. | Provide written notice of non-compliant materials to the Design-Builder's QA Manager. | | |
| | Review concrete strength requirements prior to the placement of superimposed concrete or backfill. | Refer to Table A-2, Part 1 for testing requirements. | | |

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Owner's Additional Roles and Responsibilities for Project Inspection

| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|--|--|---|--|
| 5. | Erosion and Siltation Control VDOT 2016 R&B Sections 107.16(a)/245/303 and VA DEQ E&SC Handbook | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. Prior to start of any land disturbing activities, verify that all applicable permits are on file, as required, per contract documents. Insure inspection personnel certified. | Conduct weekly inspections of all Erosion and Sedimentation control, and as otherwise required by Specification 107.16(a). | Verify that temporary erosion and siltation control devices are removed at the completion of and prior to acceptance of the Project. |
| | | Ensure silt fence has test results from GRI certified laboratory. Review approved list of materials for E&S control. | Monitor the Design-Builder's Erosion and Siltation Control devices for proper installation and maintenance. | Physical field inspection performed with final payment. |
| | | | Verify that proper incremental seeding is performed. | |
| | | | Monitor Design-Builder's completion of Form C-107 for proper completion and signatures of both the Design-Builder's QAM and Construction Manager. | |

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Owner's Additional Roles and Responsibilities for Project Inspection

| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|--|---|--|---|
| 6. | Embankments VDOT Contract Special Provisions and VDOT 2016 R&B Section 303 and VTM-10 | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Verify by observation or review of the QAM's records that density testing was performed as required. | Review the completed TL-124(s), Report of Nuclear Embankment Densities, to verify that the appropriate frequency of testing was performed during the operation. |
| | | Verify design documents that relate to the work to be performed have been approved. | Visually observe the placement of embankment material and monitor that proper nuclear density testing and depth of placement of the material is being performed by the QAM and QC personnel. | Monthly or at conclusion of (Work Package) Operation. |
| | | Verify the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | Review the completed TL-124(s), Report of Nuclear Embankment Densities, to verify that the appropriate frequency of testing was performed during the operation. | Monthly or at conclusion of (Work Package) Operation. |
| | | Verify items of work and the frequency of OIA and OVST Inspections and tests. | Monitor that the QAM and QC Inspectors utilize a nuclear density gauge, which had been calibrated within the previous 12 months by an approved calibration service. | |
| | | Verify embankment fill material has been approved and density requirements have been established. | Refer to Table A-2, Part 1 for testing requirements. | |
| | | Verify approval and density requirements for any backfill material changes during the operations. | Refer to Table A-2, Part 1 for testing requirements. | |

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Owner's Additional Roles and Responsibilities for Project Inspection

| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|--|--|---|--|
| 7. | <p style="text-align: center;">Undercut Excavation</p> <p style="text-align: center;">VDOT Contract Special Provisions</p> <p style="text-align: center;">and</p> <p style="text-align: center;">VDOT 2016 R&B Section 303</p> | <p>Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work.</p> | <p>Continuously monitor and document the location, conditions, equipment used, personnel used and hours worked for undercut operation. Upon completion of the excavation, verify the quantity of material removed.</p> | <p>Review the completed TL-124(s), Report of Nuclear Embankment Densities, to verify that the appropriate frequency of testing was performed during the operation.</p> |
| | | <p>If the undercut excavation is claimed as a differing site condition, review the area and document the condition prior to start of work. Verify area and quantity claimed to be removed.</p> | <p>Intermittently monitor the operation. Review the QAM's daily records for any undercut operations to ensure that they adequately document the location, conditions, equipment used, personnel used and hours worked for the undercut excavation and backfill.</p> | <p>Review the completed TL-124(s), Report of Nuclear Embankment Densities, to verify that the appropriate frequency of testing was performed during the operation.</p> |
| | | <p>If the undercut excavation is claimed as a differing site condition, review the area and document the condition prior to start of work.</p> | <p>Monitor that nuclear density tests are performed by the Design-Builder's QAM and QC personnel in accordance with the Embankment Fill procedures.</p> | <p>Review the completed TL-124(s), Report of Nuclear Embankment Densities, to verify that the appropriate frequency of testing was performed during the operation.</p> |

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| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|--|---|--|---|
| 8. | Aggregate Base Material VDOT Contract Special Provisions and VDOT 2016 R&B Sections 304/305/308/309 | Verify Design-Builder's QAM has scheduled and conducted preparatory Inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Verify that subgrade has been accepted by the QAM. Monitor that the subgrade material has been graded to proper tolerances and properly scarified. | Ensure that 10% of the completed nuclear density test reports for the whole project have been reviewed. Verify that the correct numbers of depth checks have been performed. |
| | | Verify design documents that relate to the work to be performed have been approved. | Verify that each lift has been accepted by the QAM. | Physical field inspection performed with final payment. |
| | | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | Intermittently observe the placement of aggregate base material and monitor that proper nuclear density testing of the material is being performed by the QAM and QC personnel. Insure inspection and testing personnel have a Soils and Aggregate Field certification. Verify nuclear gauges have been calibrated in the last year. | |
| | | Review items of work and the frequency of OIA and OVST Inspections and tests. | Monitor each Control Strip and Test Section for compliance with approved procedures. | |
| | | Verify the material to be used has been approved. | Review 10% of the completed nuclear density test reports, to verify appropriate frequency of testing was performed during the operation. | |
| | | | Refer to Table A-2, Part 1 for testing requirements. | |

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Appendix 3, Table A-3
Owner's Additional Roles and Responsibilities for Project Inspection

| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|---|---|---|---|
| 9. | Cement Treated Aggregate Base Material | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Verify that subgrade has been accepted by the QAM. Monitor that the subgrade material has been graded to proper tolerances and properly scarified. | Review 10% of the completed nuclear density test reports during the operation. Verify that the correct numbers of depth checks have been performed. |
| | VDOT Contract Special Provisions and | Verify design documents that relate to the work to be performed have been approved. | Verify that each lift has been accepted by the QAM. Verify depth checks have been performed. | Physical field inspection performed with final payment. |
| | VDOT 2016 R&B Sections 304/305/307/308/309 | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | Intermittently observe the placement of cement treated aggregate base material to monitor that compacting and finishing operations are within specified time limits and allowable moisture content range as well as monitoring that the curing procedures are being followed. Also monitor that proper nuclear density testing of the material is being performed by the QAM and QC personnel. Insure inspection and testing personnel have a Soils and Aggregate Field certification. Verify nuclear gauges have been calibrated in the last year. | |
| | | Review the items of work and the required frequency of OIA and OVST Inspections and tests. | Monitor each Control Strip and Test Section for compliance with approved procedures. | |
| | | Verify the material to be used has been approved. | Review 10% of the completed nuclear density test reports, to verify appropriate frequency of testing was performed during the operation. | |
| | | | Refer to Table A-2, Part 1 for testing requirements. | |

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| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|---|--|--|--|
| 10. | Soil Stabilization – Lime & Cement | Verify Design-Builder's QA Manager has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Monitor that roadbed has been graded to proper tolerances and properly scarified. Verify acceptance by the QAM after application of soil stabilization material. | Monitor that the material is being properly cured on a weekly basis. |
| | VDOT 2016 R&B Sections 304/305/306/307 | Verify design documents that relate to the work to be performed have been approved. | Perform check of tolerances, scarification and installed to the specified depth. Verify depth checks have been performed. | Physical field inspection performed with final payment. |
| | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | Review the completed nuclear density test reports. | | |
| | Review items of work and the frequency of OIA and OVST Inspections and tests. | Monitor (visually) that the material is being properly cured or by review of the QAM and QC documentation. | | |
| | Review application rate calculations. | Monitor that the QAM and QC Inspectors are certified and utilize a nuclear density gauge, which has been calibrated within the previous 12 months by an approved calibration service. Ensure proper and uniform rate of application of cement or lime. | | |
| | | Refer to Table A-2, Part 1 for testing requirements. | | |

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| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|------------|---|---|--|---|
| 11. | Stabilized Open-Graded Material | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Verify through direct observation or review of QAM documents that the material has been accepted by the QA Manager after placement. | Verify material has been accepted by the QAM after placement. |
| | VDOT 2016 R&B Sections 304/305/307 | Verify design documents that relate to the work to be performed have been approved. | During placement of hydraulic cement concrete Stabilized Open-Graded Material, verify that Certified Soils and Aggregate Field Inspector(s) are present. | Physical field inspection performed with final payment. |
| | | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | Refer to Table A-2, Part 1 for testing requirements. | |
| | | Review items of work and the frequency of OIA and OVST Inspections and tests. | | |
| | | Verify material proposed for use has been approved. | | |

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| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-------------|--|---|--|---|
| 11a. | Asphalt Stabilized Open-Graded Drainage Layer | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Verify through direct observation or review of QAM documents that the material has been accepted by the QA Manager after placement. Verify depth checks have been performed. | Verify material has been accepted by the QAM after placement. |
| | | Verify design documents that relate to the work to be performed have been approved. | During placement of asphalt stabilized open graded drainage layer verify that an Asphalt Field Technician is present. | Physical field inspection performed with final payment. |
| | | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | Refer to Table A-2, Part 1 for testing requirements. | |
| | | Review the items of work and the required frequency of IA and VST Inspections at the plant. | | |
| | | Verify material proposed for use has been approved. | | |

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| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|---|---|--|--|
| 12. | Asphalt Surface Treatment VDOT Contract Special Provisions and VDOT 2016 R&B Section 314 | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Monitor and verify that one (1) Certified Field Slurry Seal or Surface Treatment Technician is present during the entire operation. Monitor and verify that one (1) Certified Field Slurry Seal or Surface Treatment inspector is present during the entire operation. | Verify that the each section of asphalt surface treatment has been accepted by the QA Manager. The QA Manager's records should indicate proper rate of application of liquid asphalt and cover material. |
| | | Verify design documents that relate to the work to be performed have been approved. | Verify that the each section of asphalt surface treatment has been accepted by the QAM. The QAM records should indicate the proper rate of application of liquid asphalt and cover material. | Physical field inspection performed with final payment. |
| | | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | Refer to Table A-2, Part 1 for testing requirements. | |
| | | Review items of work and the frequency of OIA and OVST Inspections and tests. | | |
| | | Verify materials proposed for use has been approved. | | |

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| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|--|---|---|---|
| 13. | Asphalt Concrete Pavement VDOT Contract Special Provisions and VDOT 2016 R&B Sections 315/317/515 | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Review the subbase for conformity with the requirements of the contract and proper surface grading of the material. If the subbase is an existing surface which required pavement planning, visually verify proper depth of planing. | Verify, either through direct observation or through review of the QA Manager's records, that each lift has been accepted by the Quality Assurance Manager. |
| | | Verify design documents that relate to the work to be performed have been approved. | Verify that two (2) Certified Asphalt Field Technician QC Inspectors are present during the entire placement and that proper testing methods are being implemented. Performed yearly system based IA evaluation on the asphalt density technician. | Physical field inspection performed with final payment. |
| | | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | Verify, either through direct observation or through review of the QAM's records, that each lift is being accepted by the Quality Assurance Manager. | |
| | | Review items of work and the frequency of OIA and OVST Inspections and tests. | Intermittently observe the placement of asphalt concrete material and monitor that proper nuclear density testing or cores/plugs of the material is being performed by appropriate QAM and QC personnel. Provide written notice of discrepancies to Design-Builder's QA Manager. | |
| | | Verify the asphalt concrete mix design to be used has been approved. Any need for proof rolling? | Monitor the creation of each control strip and test section for compliance with approved procedures. | |
| | | | Review 10% of forms TL-56, 57, 58, and 59. Looking for QAM or lead QA technician initials on testing they observed. | |

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| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|--|---|---|-----------------------|
| 13. | Asphalt Concrete Pavement (Continued) | Review the subbase for conformity with the requirements of the contract and proper surface grading of the material. If the subbase is an existing surface which required pavement planning, visually verify proper depth of planing. | Review 10% of the completed density test section reports to verify that the appropriate frequency of testing was performed during the operation. | |
| | | | Monitor that the QC Inspectors utilize a calibrated nuclear density gauge (within last 12 months) and calibrated laboratory scales for verifying density. | |
| | | | Refer to Table A-2, Part 1 for testing requirements. | |

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| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|---|--|--|--|
| 14. | <p align="center">Hydraulic Cement Concrete Pavement</p> <p align="center">VDOT 2016 R&B Sections 217/316/515</p> | <p>Verify Design-Builder’s QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work.</p> | <p>Visually review the subbase for general conformity with the requirements of the contract and proper surface grading of the material.</p> <p>If the subbase is an existing surface which required pavement planing, visually check for proper depth of planing.</p> | <p>Verify, either through direct observation or through review of the QA Manager’s records, that each section has been accepted by the Quality Assurance Manager.</p> |
| | | <p>Verify design documents that relate to the work to be performed have been approved.</p> | <p>Monitor the QA/QC operations and verify that two (2) Certified Concrete Field QC Inspectors are present during the entire placement and that proper testing methods are being implemented. Perform yearly system based IA evaluation on QA and QC personnel actively testing.</p> | <p>Monitor that the in-place concrete is properly cured based on the current and forecasted weather conditions. Control cylinders and flexural beams cast should be cured in the same manner as the in-place concrete.</p> |
| | | <p>Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder’s QA/QC Plan are consistent with the quantities needed to perform the Work package.</p> | <p>Verify that the proper frequency of testing and material sampling is performed by the QAM/QC personnel.</p> <p>Monitor the installation of joint reinforcement material.</p> | <p>Physical field inspection performed with final payment.</p> |
| | | <p>Review items of work and the frequency of OIA and OVST Inspections and tests.</p> | <p>Monitor that the in-place concrete is properly cured based on the current and forecasted weather conditions. Control cylinders and flexural beams cast should be cured in the same manner as the in-place concrete.</p> | |
| | | | <p>Intermittently monitor the sealing of joints and any required repairs of cracks and honeycombs.</p> | |
| | | | <p>Refer to Table A-2, Part 1 for testing requirements.</p> | |

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| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|---|---|---|--|
| 15. | <p style="text-align: center;">Load Bearing Piles</p> <p style="text-align: center;">VDOT 2016 R&B Section 403</p> <p style="text-align: center;">and</p> <p style="text-align: center;">2005 Construction Manual</p> | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Verify by observation or review of the QAM's records, that each pile foundation has been accepted by the QA Manager. | Review the completed pile driving records and center of gravity calculations to verify that the appropriate QA/QC monitoring was performed during the operation. |
| | | Verify design documents that relate to the work to be performed have been approved. | Monitor the pile driving operation and verify that one (1) QC Inspector is present while piles are driven and results are documented for each pile. | |
| | | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | Refer to Table A-2, Part 1 for testing requirements. | |
| | | Review items of work and the frequency of OIA and OVST Inspections and tests. | | |
| | | Verify the material to be used has been approved. | | |
| | | Verify the equipment to be used has been approved. | | |
| | | The OIA and OVST Manager shall verify, either through direct observation or through review of the QAM's records, that each pile foundation has been accepted by the QAM. | | |

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| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|--|---|---|--|
| 16. | Bridge Hydraulic Cement Concrete Operations | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Verify formwork and rebar conforms to the plans and specifications and is free of debris.. | Monitor that the in-place concrete is properly cured based on the current and forecasted weather conditions. Control cylinders cast should be cured in the same manner as the in-place concrete. |
| | VDOT 2016 R&B Sections 217/404/406/412 | Verify design documents that relate to the work to be performed have been approved. Obtain Mill Test Reports for reinforcing steel before placement. | Monitor the QA/QC operations and verify that two (2) Concrete Field Certified QC Inspectors are present during the entire placement and that proper testing methods are being implemented. Verify that the proper frequency of testing and material samplings is performed by appropriate QA and QC personnel. Perform yearly system based IA evaluation on QA and QC personnel actively testing. | Physical field inspection performed with final payment. |
| | | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | Refer to Table A-2, Part 1 for testing requirements. | |
| | | Review items of work and the frequency of OIA and OVST Inspection and tests s. | Monitor that the in-place concrete is properly cured based on the current and forecasted weather conditions. Control cylinders cast should be cured in the same manner as the in-place concrete. | |
| | | Verify the material to be used has been approved. | Refer to Table A-2, Part 1 for testing requirements. | |
| | | Verify the equipment to be used has been approved and calibrated. | | |

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| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|--|--|---|---|
| 17. | <p style="text-align: center;">Hydraulic Cement Concrete Items</p> <p style="text-align: center;">VDOT 2016 R&B Sections 217/404/412/502</p> | <p>Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work.</p> | <p>Greater than 25 cubic yards - monitor the QAM VST and QC operations and verify that two (2) Certified Concrete Field QC Inspectors are present during the entire placement and that proper testing methods are being implemented.</p> <p>Incidental concrete placements less than 25 cubic yards - monitor the QAM VST and QC operations and verify that one (1) Certified Concrete Field QC Inspector is present during placement activity placement and that proper testing methods are being implemented.</p> <p>Verify that the proper frequency of testing and material samplings is performed by the QA/QC personnel. Perform yearly system based IA evaluation on QA and QC personnel actively testing.</p> | <p>Monitor that the in-place concrete is properly cured based on the current and forecasted weather conditions. Control cylinders cast should be cured in the same manner as the in-place concrete.</p> |
| | | <p>Verify design documents that relate to the work to be performed have been approved.</p> <p>Obtain Mill Test Reports for reinforcing steel before placement if used in concrete items.</p> | <p>Provide written notice of non-compliant materials to the Design-Builder's QA Manager.</p> | <p>Physical field inspection performed with final payment.</p> |
| | | <p>Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package.</p> | <p>Monitor that the in-place concrete is properly cured based on the current and forecasted weather conditions. Control cylinders cast should be cured in the same manner as the in-place concrete.</p> | |
| | | <p>Review items of work and the frequency of OIA and OVST Inspections and tests.</p> | <p>Refer to Table A-2, Part 1 for testing requirements.</p> | |
| | | <p>The hydraulic cement concrete mix design to be used has been approved.</p> | | |

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| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|--|---|---|--|
| 18. | <p style="text-align: center;">Structural Steel</p> <p style="text-align: center;">VDOT 2016 R&B Section 407</p> | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Verify by observation or review of the QAM's records, that the structure has been accepted by the Quality Assurance Manager. | Verify, either through direct observation or through review of the QAM's records, that each structure has been accepted by the QAM. Review percentage of bolt connections cited in Table A-2, Part 1 |
| | | Verify design documents that relate to the work to be performed have been approved. | <p>Monitor structural steel erection operations and observe the QC Inspections of weld quality and bolt testing.</p> <p>Directly observe the QC inspections of weld quality and bolt testing – each 4 hour shift.</p> | Physical field inspection performed with final payment. |
| | | Review the shop drawings and/or erection drawings and verify they have been approved. Ensure Steel fabricator is AISC certified. Inform Materials Division for fabrication inspection at plant. Mill Test reports and galvanization reports for Nuts, Bolts and Washers. Rotational Capacity Testing. | | |
| | | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | Refer to Table A-2, Part 1 for testing requirements. | |
| | | Review items of work and the frequency of OIA and OVST Inspections and tests. | Refer to Table A-2, Part 1 for testing requirements. | |
| | | Verify the material to be used has been approved. | QC – review bolt documentation – Mill test reports, galvanization and Rotational capacity test reports. | |

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| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|--|--|--|--|
| 19. | Protective Coating of Metal in Structures VDOT 2016 R&B Section 411 | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Monitor the surface preparation of the structure prior to application of protective coatings and during the coating operation to verify that proper QAM and QC Inspection procedures are followed. | Spot check coating thickness on the structure at a rate determined by the QAM IA and VST requirements but no less than once per structure. |
| | | Verify design documents that relate to the work to be performed have been approved. Verify contractor certifications (SSPC, CIH, PE) and reference documents/specifications such as SSPC, NACE etc. are available. Environmental plan where needed. Review coating system and application plan including SSPC surface preparation, number of coats, QC thickness and adhesion, tests. | | Physical field inspection performed with final payment. |
| | | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | Refer to Table A-2, Part 1 for testing requirements. | |
| | | Review items of work and the frequency of OIA and OVST Inspections and tests. | Refer to Table A-2, Part 1 for testing requirements. | |
| | | Verify the coating system to be used has been approved. | | |

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| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|---|---|---|--|
| 20. | <p style="text-align: center;">Underdrains</p> <p style="text-align: center;">VDOT 2016 R&B Section 501</p> | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Check cut areas for springs and seepage after heavy rains. If problems are found, an investigation by the designer is required. | Verify that QAM has checked pipe outlets to ensure they are not been crushed or displaced during construction. |
| | | Verify design documents that relate to the work to be performed have been approved. | | Physical field inspection performed with final payment. |
| | | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | Refer to Table A-2, Part 1 for testing requirements. | |
| | | Verify items of work and the frequency of OIA and OVST Inspections and tests. | Refer to Table A-2, Part 1 for testing requirements. | |
| | | Verify the material to be used has been approved. | | |

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|-----|--|---|--|---|
| 21. | Guardrail VDOT 2016 R&B Section 505 | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Verify that the operation is monitored by a QC Inspector with at current GRIT certification. | Review the installation and report noted deficiencies to the QAM. |
| | | Verify design documents that relate to the work to be performed have been approved. | | Physical field inspection performed with final payment. |
| | | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | Verify that the operation is monitored by a QC Inspector with at current GRIT certification. | |
| | | Review items of work and the frequency of OIA and OVST Inspections and tests. | Refer to Table A-2, Part 1 for testing requirements. | |
| | | Verify the material to be used has been approved. NCHRP 380 for end treatments. | Verify end treatments and material documentation. MTR or other documentation necessary for steel items based on the contract requirements. | |

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|-----|--------------------------------------|---|--------------------------|---|
| 22. | Fencing | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | N/A | Review the final installation and document that installation and material type is acceptable; report noted deficiencies to the QAM. |
| | VDOT 2016 R&B Section 507 | Verify design documents that relate to the work to be performed have been approved. MTR or other documentation necessary for steel items based on the contract requirements. | N/A | Physical field inspection performed with final payment. |

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| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|---|---|--|---|
| 23. | Right-of-Way Monuments VDOT 2016 R&B Section 503 | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | N/A | Review the final installation and document that installation, location and material type is acceptable; report noted deficiencies to the QAM. |
| | | Verify design documents that relate to the work to be performed have been approved. | | Physical field inspection performed with final payment. |
| | | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | Refer to Table A-2, Part 1 for testing requirements. | |
| | | Review items of work and the frequency of OIA and OVST Inspections and tests. | Refer to Table A-2, Part 1 for testing requirements. | |
| | | Review the material to be used has been approved. | | |

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| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|---|---|--|--|
| 24. | Maintenance of Traffic VDOT 2016 R&B Section 512 | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Monitor that Flaggers are certified and properly attired. | Review the site to make sure that signs are removed after completion of the operation. |
| | | | Review the weekly Work Zone Safety Checklists completed by the QAM and QC personnel for completeness and accuracy. | Physical field inspection performed with final payment. |

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|-----|--|---|---|---|
| 25. | Pavement Marking VDOT 2016 R&B Section 704 and VTM-94 | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | During Operations, verify that one (1) Certified Pavement Marking Technician is present and conducting application thickness and bead rate testing. | Review the completed installation for uniformity and conformance with the requirements of the specifications. Conduct two visual rides through the project to observe markings. Once during the day and once at night. Make sure the color and visibility is acceptable. Strongly encourage Traffic Engineering section participation. |
| | | Verify design documents that relate to the work to be performed have been approved. | | Physical field inspection performed with final payment. |
| | | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. Review VTM-94 and VDOT Form C-85 requirements | Refer to Table A-2, Part 1 for testing requirements. | |
| | | Review items of work and the frequency of OIA and OVST Inspections and tests. | Refer to Table A-2, Part 1 for testing requirements. | |
| | | Verify the material to be used has been approved. | | |

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| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|--------------------------------------|--|--|---|
| 26. | Sound Barrier Walls | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | N/A | Review the final installation and document that installation and material type is acceptable; report noted deficiencies to the QAM. |
| | VDOT 2016 R&B Section 519 | Verify design documents that relate to the work to be performed have been approved. | Ensure foundation types correct and to proper depth. | Physical field inspection performed with final payment. |
| | | Review shop drawings and verify they have been approved. | | |
| | | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | | |
| | | Review items of work and the frequency of OIA and OVST Inspections and tests. | | |
| | | Verify the material to be used is coming from an approved source with a certification that the precast item has met the precast producer's QC standards. An agreed upon acceptable sample sound wall panel should be at the site for inspector reference. Sound Wall panels are visually accepted at the job site by the QC and QAM. | | |
| | | Ensure Geotechnical investigation for Sound wall foundation has been completed. | | |

Minimum Requirements for Quality Assurance and Quality Control on Design-Build and P3 Projects
July 2018
Appendix 3, Table A-3
Owner's Additional Roles and Responsibilities for Project Inspection

| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|---|---|--|--|
| 27. | Topsoil and Seeding VDOT 2016 R&B Sections 303/602/603 | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | N/A | Review the final installation and report noted deficiencies to the QAM. Inspect for proper growth establishment. |
| | | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | Ensure seeding and mulching of slopes performed in time frames. | Physical field inspection performed with final payment. |
| | | Review items of work and the frequency of OIA and OVST Inspections and tests. | Verify that proper material is utilized at application rates specified in plans. | |
| | | Verify the material to be used has been approved. | | |

Minimum Requirements for Quality Assurance and Quality Control on Design-Build and P3 Projects
July 2018
Appendix 3, Table A-3
Owner's Additional Roles and Responsibilities for Project Inspection

| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|--|---|---|---|
| 28. | <p style="text-align: center;">Planting</p> <p style="text-align: center;">VDOT 2016 R&B Section 605</p> | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Monitor that plants are properly cared for during the establishment period. | Inspect for damaged plantings and report noted deficiencies to the QAM. |
| | | Verify design documents that relate to the work to be performed have been approved. | | Physical field inspection performed with final payment. |
| | | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | | |
| | | Review items of work and the frequency of OIA and OVST Inspections and tests. | | |
| | | Verify the material to be used has been approved. | | |

Minimum Requirements for Quality Assurance and Quality Control on Design-Build and P3 Projects
July 2018
Appendix 3, Table A-3
Owner's Additional Roles and Responsibilities for Project Inspection

| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|--|---|--|---|
| 29. | <p style="text-align: center;">Traffic Signs</p> <p style="text-align: center;">VDOT 2016 R&B Sections 700/701</p> | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Verify that all messages and symbols are correct and conform to the requirements of the MUTCD and sign stands are properly rated and stamped as such according to the contract (i.e. NCHRP 350). | Inspect traffic signs prior to ensure that the finished sign panels are free from cracks, gaps, streaks, wrinkles, blisters, discoloration, buckles and warps and have a smooth surface of uniform color. |
| | | Verify design documents that relate to the work to be performed have been approved. | | Physical field inspection performed with final payment. |
| | | Review shop drawings and verify they have been approved. | | |
| | | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | | Conduct two visual rides through the project to observe signs. Once during the day and once at night. Make sure the color and visibility is acceptable. Strongly encourage Traffic Engineering section participation. |
| | | Review items of work and the frequency of OIA and OVST Inspections and tests. | | |
| | | Verify the material to be used has been approved. Sign Sheeting Materials must have Virginia warranty. MTR on Aluminum sign blanks. Large interstate Sign Structure fabricated at AISC shop. | | |

Minimum Requirements for Quality Assurance and Quality Control on Design-Build and P3 Projects
July 2018
Appendix 3, Table A-3
Owner's Additional Roles and Responsibilities for Project Inspection

| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|---|---|---|--|
| 30. | <p style="text-align: center;">Traffic Signals</p> <p style="text-align: center;">VDOT 2016 R&B Sections 700/703</p> | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Monitor the installation of traffic loop detectors for proper installation procedures. | Verify that all traffic signals are functioning properly and that the Contractor furnished instructions for installing and maintaining the equipment and that the condition of the material is acceptable. |
| | | Verify design documents that relate to the work to be performed have been approved including foundation design parameters. | Review signal equipment invoices for controllers, cabinets, panels, switches, cameras, detectors, power supplies, etc. to ensure compliance with design/plan, | Physical field inspection performed with final payment. |
| | | Review shop drawings and verify they have been approved. | | Signature of Traffic signal designer with a statement that Traffic signals are as designed and according to code or VDOT standard. |
| | | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | | |
| | | Review items of work and the frequency of OIA and OVST Inspections and tests. | | |
| | | Verify the material to be used has been approved. | | |

Minimum Requirements for Quality Assurance and Quality Control on Design-Build and P3 Projects
July 2018
Appendix 3, Table A-3
Owner's Additional Roles and Responsibilities for Project Inspection

| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|--|---|---|---|
| 31. | Water and Sewer Facilities VDOT Contract Special Provisions and VDOT 2016 R&B Section 520 and VDOT Road & Bridge Standards EP-1 | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Monitor pipe installation including bedding material and joint connections. | Verify, that each line has been disinfected, if required, tested for leaks and accepted by the QAM. Verify documentation for water lines, sewer facilities match AWWA specification cited on plans/drawings or in specifications. Verify that the utility company responsible for maintenance has approved any exceptions and signs off on the final utility package. |
| | | Verify design documents that relate to the work to be performed have been approved. | Refer to Table A-2, Part 1 for backfill testing requirements. | Physical field inspection performed with final payment. |
| | | Review shop drawings and verify they have been approved. | | Signature of Utility designer with a statement that utilities are as designed and according to code. |
| | | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | | |
| | | Review items of work and the frequency of OIA and OVST Inspections and tests | | |
| | | Verify the material to be used has been approved. Verify certifications for water service lines, sewer facilities match those specified on the drawings or plans. Impress on contractor the requirement to obtain proper documentation before installation. Steel mill test reports. Utility compliance with material specifications. | | |

Minimum Requirements for Quality Assurance and Quality Control on Design-Build and P3 Projects
July 2018
Appendix 3, Table A-3
Owner's Additional Roles and Responsibilities for Project Inspection

| No. | Item of Work Spec. Section | Preparatory Inspection | Intermediate Inspections | Completion Inspection |
|-----|----------------------------|---|--|---|
| 32. | Specialty Contract Items | Verify Design-Builder's QAM has scheduled and conducted preparatory inspection meeting (hold point) to review work prior to beginning construction activity on feature of Work. | Monitor installation of work, as agreed. | Physical field inspection performed with final payment. |
| | | Verify design documents that relate to the work to be performed have been approved. | | |
| | | Review the Quality Assurance (QAM IA & VST) and Quality Control (QC) testing and inspection requirements as specified in the Design-Builder's QA/QC Plan are consistent with the quantities needed to perform the Work package. | | |
| | | Review items of work and the frequency of OIA and OVST Inspections | | |

Minimum Requirements for Quality Assurance and Quality Control on Design-Build and P3 Projects
July 2018
Appendix 3, Table A-3
Owner's Additional Roles and Responsibilities for Project Inspection

PUBLICATIONS

Publications are available from the residency and district offices. All inspection personnel should have available the following items:

1. *VDOT Road and Bridge Specifications, 2007, including all revisions*
2. *VDOT Road and Bridge Standards, Volumes I and II (2008) including all revisions*
3. *VDOT Construction Manual, 2005*
4. *VDOT Construction Inspection Manual, April 2008*
5. *Manual of Instruction for Materials Division*
6. *VDOT 2011 Work Area Protection Manual*
7. *DCR Virginia Erosion and Sediment Control Handbook, Third Edition 1992*
8. *VDOT Guardrail Installation Training Manual ("GRIT"), May 2011.*
9. *Current VDOT Instructional & Information Memorandums*
10. *VDOT Post-Construction Manual, May 2011*
11. *VDOT Survey Manual (2010 Edition)*
12. *Materials Division MD 414-18, May 01, 2018*

WEB SITES

The following web sites are available to assist in the performance of Inspection duties:

1. <http://virginiadot.org/business/const/default.asp>
2. <http://coweb/MaterialsNet/>
3. http://coweb/construction/saap_Manual/INSPECTION_MANUAL_DEC2001.PDF
4. <http://www.virginiadot.org/business/const/resources/2005%20Construction%20Manual.pdf>

Appendix 4

Sample Checklists

The following checklists may be used as a guide for the Design-Builder in developing the checklists and forms required for the project QA/QC Plan.

CLEARING AND GRUBBING INSPECTION FORM

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|---|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN REVIEWED & APPROVED | | | |
| INTERMEDIATE | | | |
| EROSION CONTROL INPLACE | | | |
| CHECK CLEARING LIMITS | | | |
| VERIFY AREA STAKED AND MARKED IS IAW PLANS | | | |
| CHECK FOR BURN PERMITS | | | |
| IF BURNING PERMITTED CHECK WEATHER FOR WINDS AND DRY CONDITIONS | | | |
| STUMPS LEFT IN PLACE MAXIMUM 6" ABOVE EXISTING GROUND SURFACE | | | |
| STUMPS REMOVED IN SHALLOW FILLS | | | |
| CLEARED MATERIAL DISPOSED OF PROPERLY | | | |
| CHECK FOR DAMAGE OUTSIDE R/W | | | |
| AREA OF CLEARING CALCULATED | | | |
| DAMAGED EROSION CONTROL ITEMS REPAIRED | | | |
| TEMPORARY SEEDING WITHIN 15-DAYS (IF NECESSARY) | | | |
| COMPLETION | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |

REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|--|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN APPROVED | | | |
| BACKFILL MATERIAL APPROVED & TESTING REQUIREMENTS ESTABLISHED | | | |
| STRUCTURES INSPECTED PRIOR TO BACKFILL | | | |
| INTERMEDIATE | | | |
| PERIMETER FILLS PLACED IN 6" LIFTS | | | |
| FLOWABLE BACKFILL IN PLACE IAW PLANS & SPECS | | | |
| EACH LIFT COMPACTED AT ±20% OPTIMUM MOISTURE | | | |
| EACH LIFT COMPACTED TO MINIMUM 95% DENSITY | | | |
| DENSITY TEST IAW ESTABLISHED REQUIREMENTS | | | |
| PROCTORS PERFORMED IAW ESTABLISHED REQUIREMENTS | | | |
| PERFORM INDEPENDENT VERIFICATION/ASSURANCE TESTING AS REQUIRED | | | |
| COMPLETION | | | |
| VERIFY TESTING DOCUMENTATION FOR COMPLETION AND ACCURACY | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |
| | | | |

REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|--|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| MATERIALS APPROVED AND CERTIFICATIONS VERIFIED | | | |
| QA/QC PLAN APPROVED | | | |
| INTERMEDIATE | | | |
| VERIFY LAYOUT | | | |
| MINOR STRUCTURE EXCAVATION CALCULATION (IF APPLICABLE) | | | |
| CHECK TRENCH WIDTH/SHORING | | | |
| CHECK FOUNDATION | | | |
| DEWATERING | | | |
| BEDDING MATERIAL (DEPTH AND SHAPING IAW PLANS & SPECS) | | | |
| VERIFY PIPE/STRUCTURE ALIGNMENT AND GRADE | | | |
| JOINING/SEALING OF PIPE | | | |
| STRUCTURE INVERT | | | |
| PIPE/STRUCTURE BACKFILL AND DENISTY TESTING | | | |
| WEEP HOLES | | | |
| STRUCTURE TOP | | | |
| COMPLETION | | | |
| TL-124'S REVIEWED FOR COMPLETION AND ACCURACY | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |

ADDITIONAL PIPE/STRUCTURE INFORMATION:

STRUCTURE TYPE: _____ PIPE SIZE: _____
 STRUCTURE ID.: STR. # _____ PIPE ID: STR# _____ TO STR# _____
 ACTUAL INV. ELEVATION: _____ PLAN LENGTH: _____
 FINAL DI HEIGHT: _____ ACTUAL LENGTH: _____
 DENSITY TESTS RECORD NO'S: _____

REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|--|---------------------|------|---------|
| PREPARATORY | | | |
| APPROVED MATERIALS SOURCE | | | |
| APPROVED MIX DESIGN | | | |
| QA/QC PLAN APPROVED & TESTING REQUIREMENTS ESTABLISHED | | | |
| INTERMEDIATE | | | |
| STRENGTH REQUIREMENTS IAW PLANS & SPECS FOR PRECEDING WORK | | | |
| PROPER SUBSURFACE & BEDDING IAW PLANS & SPECS | | | |
| PROPER FORMWORK & REINFORCING STEEL IAW PLANS & SPECS | | | |
| AREA FREE OF DEBRIS, WATER, & MUD | | | |
| 2 INSPECTORS PRESENT DURING ENTIRE PLACEMENT OF CONCRETE | | | |
| PROPER TESTING METHODS PERFORMED & RECORDED | | | |
| PROPER PROTECTION & CURING METHODS IAW PLANS & SPECS | | | |
| CONTROL CYLINDERS CURED IN SAME MANNER AS IN-PLACE CONCRETE | | | |
| VERIFY 28-DAY STRENGTH TESTS RESULTS IAW PLANS & SPECS | | | |
| PERFORM INDEPENDENT VERIFICATION/ASSURANCE TESTING AS REQUIRED | | | |
| COMPLETION | | | |
| VERIFY TESTING DOCUMENTATION FOR COMPLETION AND ACCURACY | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |

REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____

PROJECT NO.: _____ CONTRACTOR: _____

LOCATION: _____

PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|--|---------------------|------|---------|
| PREPARATORY | | | |
| VERIFY ALL APPLICABLE PERMITS ARE ON FILE PER CONTRACT DOCUMENTS | | | |
| INTERMEDIATE | | | |
| ARE ALL CONTROLS SHOWN ON PLAN IN PLACE, & WITHIN SPECIFICATIONS | | | |
| DENUDED AREAS STABILIZED | | | |
| DO SEEDED AREAS REQUIRE MAINTENANCE FERTILIZER, SEED, OR MULCH | | | |
| IS SEDIMENT LEAVING SITE | | | |
| PERIMETER TRAPS IN PLACE | | | |
| CUT AND FILL SLOPES STABILIZED | | | |
| EVIDENCE OF INCREASED OFF-SITE EROSION SINCE BEGINNING OF JOB | | | |
| CHANNELS AND OUTLETS STABILIZED | | | |
| INLETS PROTECTED FROM SEDIMENT | | | |
| WORK ONGOING IN LIVE STREAMS THAT REQUIRES STABILIZATION | | | |
| UTILITY TRENCHES BACKFILLED AND STABILIZED | | | |
| MUD ON PUBLIC ROADS | | | |
| ANY CONTROLS THAT CAN BE REMOVED | | | |
| CONTROLS THAT REQUIRE REPAIR OR CLEAN OUT | | | |
| ANY DEFICIENCIES NOT CORRECTED FROM LAST REPORT | | | |
| COMPLETION | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |

 REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____

PROJECT NO.: _____ CONTRACTOR: _____

LOCATION: _____

PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|---|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN ACCEPTED | | | |
| MATERIAL ACCEPTED & TESTING REQUIREMENTS ESTABLISHED | | | |
| INTERMEDIATE | | | |
| VERIFY EMBANKMENT MATERIAL BEING USED IS CONSISTENT WITH APPROVED & TESTED MATERIAL (CHECK FOR MUD, MUCK, ROOT MAT, FROZEN MATERIAL, BOULDERS.) | | | |
| VERIFY INSTALLATION PROCEDURES ARE ADEQUATE (COMPACTION EQUIPMENT, BENCHING, LIFT THICKNESS) | | | |
| EACH LIFT COMPACTED AT $\pm 20\%$ OPTIMUM MOISTURE | | | |
| EACH LIFT COMPACTED TO MINIMUM 95% DENSITY | | | |
| FINAL GRADE AND SLOPES FORMED IAW PLANS, SPECS & TYPICAL SECTION | | | |
| EROSION & SILTATION CONTROLS MAINTAINED & TEMP OR FINAL SEEDING IAW PLANS & SPECS | | | |
| PERFORM INDEPENDENT VERIFICATION/ASSURANCE TESTING AS REQUIRED | | | |
| COMPLETION | | | |
| VERIFY TESTING DOCUMENTATION FOR COMPLETION AND ACCURACY | | | |

REMARKS: _____

UNDERCUT EXCAVATION INSPECTION FORM

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|---|---------------------|------|---------|
| PREPARATORY | | | |
| AREA OF UNDERCUT REVIEWED & DOCUMENTED | | | |
| INTERMEDIATE | | | |
| VERIFY WITH CONTRACTOR THE UNSUITABLE SOIL CONDITIONS DICTATING UNDERCUT EXCAVATION | | | |
| MONITOR & RECORD LOCATIONS, CONDITIONS, EQUIPMENT USED & MANPOWER HOURS FOR UNDERCUT OPERATIONS | | | |
| INSPECT, MEASURE AND RECORD EXCAVATED AREA PRIOR TO PLACEMENT OF APPROVED BACKFILL MATL | | | |
| BACKFILL IAW PLANS & SPECS | | | |
| PROPER DENSITY TESTS PERFORMED AND RECORDED | | | |
| MEASUREMENT & PAYMENT IAW PLANS, SPECS & CONTRACT PROVISIONS | | | |
| | | | |
| | | | |
| COMPLETION | | | |
| VERIFY TESTING DOCUMENTATION FOR COMPLETION AND ACCURACY | | | |
| | | | |
| | | | |

REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|--|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| APPROVED MATERIALS | | | |
| INTERMEDIATE | | | |
| EXISTING SURFACE (SUBGRADE) PREPARED IAW PLANS & SPECS | | | |
| BASE COURSE MATL MIXED IAW APPROVED METHODS | | | |
| VERIFY INSTALLATION PROCEDURES (USE OF SPREADER BOX, WATER TRUCK, SMOOTH DRUM ROLLERS) | | | |
| CONTROL STRIP & TEST SECTION PERFORMED IAW PLANS & SPECS | | | |
| MAXIMUM 6" LIFT THICKNESS OBSERVED (UNLESS OTHERWISE APPROVED) | | | |
| PROPER DEPTH & DENSITY TESTS PERFORMED AND RECORDED | | | |
| PROPER COMPACTION BETWEEN LIFTS | | | |
| FINAL SURFACE PROTECTION IAW PLANS & SPECS | | | |
| PERFORM INDEPENDENT VERIFICATION/ASSURANCE TESTING AS REQUIRED | | | |
| COMPLETION | | | |
| VERIFY TESTING DOCUMENTATION FOR COMPLETION AND ACCURACY | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |
| | | | |

REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|--|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| APPROVED MATERIALS | | | |
| INTERMEDIATE | | | |
| EXISTING SURFACE (SUBGRADE) PREPARED IAW PLANS & SPECS | | | |
| BASE COURSE MATL MIXED IAW APPROVED METHODS | | | |
| VERIFY INSTALLATION PROCEDURES (USE OF SPREADER BOX, WATER TRUCK, SMOOTH DRUM ROLLERS) | | | |
| CONTROL STRIP & TEST SECTION PERFORMED IAW PLANS & SPECS | | | |
| MAXIMUM 6" LIFT THICKNESS OBSERVED (UNLESS OTHERWISE APPROVED) | | | |
| PROPER DEPTH & DENSITY TESTS PERFORMED AND RECORDED | | | |
| PROPER COMPACTION BETWEEN LIFTS | | | |
| FINAL SURFACE PROTECTION IAW PLANS & SPECS | | | |
| PERFORM INDEPENDENT VERIFICATION/ASSURANCE TESTING AS REQUIRED | | | |
| COMPLETION | | | |
| VERIFY TESTING DOCUMENTATION FOR COMPLETION AND ACCURACY | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |
| | | | |

REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|--|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| APPROVED MATERIALS | | | |
| INTERMEDIATE | | | |
| PROPER SURFACE CONDITIONS OBSERVED IAW SPECS | | | |
| 2 INSPECTORS PRESENT DURING ENTIRE PLACEMENT | | | |
| STABILIZATION MATL PROPORTIONING APPLIED IAW APPROVED PLANS, SPECS & CONTRACT PROVISIONS | | | |
| TEMPERATURE REQUIREMENTS IAW PLANS & SPECS | | | |
| EQUIPMENT USED IS ADEQUATE | | | |
| PROPER TESTING PROCEDURE PERFORMED AND RECORDED | | | |
| CURING PROCEDURES OBSERVED IAW PLANS & SPECS | | | |
| COMPLETION | | | |
| VERIFY TESTING DOCUMENTATION FOR COMPLETION AND ACCURACY | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |

REMARKS:

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|---|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| APPROVED MATERIALS | | | |
| INTERMEDIATE | | | |
| PREPARATION OF EXISTING SURFACE IAW PLANS & SPECS | | | |
| MATERIAL SCARIFIED & PULVERIZED IAW PLANS & SPECS | | | |
| CEMENT & OTHER APPROVED ADMIXTURES APPLIED IAW APPROVED PROCEDURES (MIX-IN-PLACE OR CENTRAL PLANT METHOD) | | | |
| COMPACTION AND FINISHING PROCEDURES PERFORMED IAW PLANS & SPECS | | | |
| CONSTRUCTION JOINTS IAW PLANS & SPECS | | | |
| DENSITY & THICKNESS TESTING PERFORMED AND RECORDED | | | |
| PROPER PROTECTION & CURING PROCEDURES OBSERVED IAW PLANS & SPECS | | | |
| COMPLETION | | | |
| VERIFY TESTING DOCUMENTATION FOR COMPLETION AND ACCURACY | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |
| | | | |

REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|--|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| MATERIALS FROM APPROVED SOURCE | | | |
| EQUIPMENT PROPERLY CALIBRATED | | | |
| INTERMEDIATE | | | |
| SURFACE PREPARATION IAW PLANS & SPECS | | | |
| LIQUID ASPHALT APPLICATION RATE IAW APPROVED PLAN, SPECS & CONTRACT PROVISIONS | | | |
| COVER MATERIAL APPLICATION RATE IAW APPROVED PLAN, SPECS & CONTRACT PROVISIONS | | | |
| COMPLETION | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |

REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|--|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| ASPHALT MIX DESIGN APPROVED | | | |
| INTERMEDIATE | | | |
| FINAL SUBBASE INSPECTION FOR PROPER LINE, GRADE, AND CONFORMITY IAW PLANS, SPECS AND CONTRACT PROVISIONS | | | |
| 2 INSPECTORS PRESENT DURING ENTIRE PLACEMENT OPERATIONS | | | |
| EQUIPMENT CALIBRATION OBSERVED AND APPROVED | | | |
| CONTROL STRIPS PERFORMED, OBSERVED, TESTED AND APPROVED | | | |
| ROLLER PATTERNS PERFORMED, OBSERVED, TESTED AND APPROVED | | | |
| TACK PLACEMENT AND APPLICATION RATE IAW PLANS & SPECS | | | |
| PROPER MATERIAL LIFTS OBSERVED AND APPROVED | | | |
| DENSITY TESTING PERFORMED | | | |
| RE-TEST WHERE COMPACTION TESTS VARY GREATER THAN 2% | | | |
| PERFORM INDEPENDENT VERIFICATION/ASSURANCE TESTING AS REQUIRED | | | |
| COMPLETION | | | |
| VERIFY TESTING AND MATERIALS DOCUMENTATION FOR COMPLETION AND ACCURACY | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |

REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|---|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| APPROVED MIX DESIGN | | | |
| INTERMEDIATE | | | |
| FINAL SUBBASE INSPECTION FOR PROPER LINE, GRADE AND CONFORMITY IAW PLANS, SPECS AND CONTRACT PROVISIONS | | | |
| WHERE APPLICABLE, PROPER REINFORCEMENT STEEL PLACEMENT AND TIED IAW PLANS & SPECS | | | |
| 2 INSPECTORS PRESENT DURING ENTIRE PLACEMENT OPERATIONS | | | |
| PROPER FIELD TESTING BEING PERFORMED AND RECORDED | | | |
| JOINT CONSTRUCTION IAW PLANS & SPECS | | | |
| PROPER CURING PROCEDURES OBSERVED | | | |
| CONTROL CYLINDERS CURED IN SAME MANNER AS IN-PLACE CONCRETE | | | |
| JOINT SEALS INSTALLED IAW PLANS & SPECS | | | |
| PERFORM INDEPENDENT VERIFICATION/ASSURANCE TESTING AS REQUIRED | | | |
| COMPLETION | | | |
| VERIFY TESTING AND MATERIALS DOCUMENTATION IS COMPLETE AND ACCURATE | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |

REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|---|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| MATERIALS APPROVED | | | |
| EQUIPMENT APPROVED | | | |
| INTERMEDIATE | | | |
| VERIFY TYPE PILE TO BE USED IN STRUCTURE FROM PLANS | | | |
| ENSURE TESTING REQUIREMENTS OF PILING HAVE BEEN MET. (HEAT #'S, QA STAMPS, ETC) | | | |
| VERIFY THAT DRIVING HAMMER IS APPROVED AND REQUIRED HAMMER BLOWS FOR REFUSALS | | | |
| CHECK ELEVATION OF EXCAVATION TO ENSURE PROPER ELEVATION | | | |
| CHECK PILING LOCATIONS AFTER CONTRACTOR HAS PERFORMED LAYOUT | | | |
| VERIFY LOCATIONS OF VERTICAL AND BATTERED PILING | | | |
| OBSERVE PILE DRIVING OPERATIONS TO VERIFY BLOW COUNTS | | | |
| ENSURE WELDING AT SPLICES ON STEEL PILES IS PERFORMED BY CERTIFIED WELDER (OBTAIN CERTIFICATION) | | | |
| VERIFY CORRECT NUMBER AND LENGTH OF SPLICES | | | |
| CALCULATE TOTAL LENGTH OF PILING DRIVEN FROM CUTOFF ELEVATION | | | |
| VERIFY CORRECT LOCATION OF PILINGS WHEN DRIVING IS COMPLETE. COMPUTE CENTER OF GRAVITY AS NEEDED. | | | |
| COMPLETE | | | |
| VERIFY TESTING AND MATERIALS DOCUMENTATION IS COMPLETE AND ACCURATE | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |

REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|---|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| OBTAIN AN APPROVED MIX DESIGN FOR ALL CONCRETE MIXES TO BE USED | | | |
| EQUIPMENT APPROVED | | | |
| INTERMEDIATE | | | |
| VERIFY DIMENSIONS AND ELEVATIONS OF FORM WORK | | | |
| FORMWORK AND REINFORCEMENT STEEL (CORRECT SIZE, TYPE, GRADE AND PLACEMENT) IAW PLANS, SPECS & CONTRACT PROVISIONS | | | |
| SHOP DRAWINGS SUBMITTED AND APPROVED FOR SIP METAL DECK FORMS | | | |
| CHECK DECK SCREED FOR PROPER OPERATION AND GRADE | | | |
| VERIFY WEATHER / TEMPERATURE LIMITATION REQUIREMENTS ARE IAW PLANS AND SPECS | | | |
| ENSURE AUTHORIZATION FOR PUMPING OF CONCRETE IS APPROVED BY ENGINEER | | | |
| VERIFY PLACEMENT SEQUENCE IAW PLANS, SPEC, AND CONTRACT PROVISIONS | | | |
| 2 INSPECTORS PRESENT DURING ENTIRE PLACEMENT OF CONCRETE | | | |
| OBSERVE PLACEMENT AND TESTING OF CONCRETE DURING PLACEMENT AND PERFORM INDEPENDENT VERIFICATION TESTING AS REQUIRED | | | |
| VERIFY LOCATION OF CONSTRUCTION JOINTS ARE IAW PLANS, SPECS, & CONTRACT PROVISIONS | | | |

REPORT NO.: _____ DATE OF WORK: _____ PAGE NO.: 2

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|--|---------------------|------|---------|
| INTERMEDIATE - Continued | | | |
| ENSURE PROPER BONDING AND WATERPROOFING OF CONSTRUCTION JOINTS | | | |
| CHECK AND ENSURE REQUIREMENTS FOR FORM REMOVAL ARE MET | | | |
| ENSURE PROPER PROTECTION AND CURING METHODS ARE USED | | | |
| OBSERVE OVERDEPTH PROBES OF DECK CONCRETE AND VERIFY RECORDKEEPING OF SAME | | | |
| CONTROL CYLINDERS CURED IN SAME MANNER AS IN-PLACE CONCRETE | | | |
| VERIFY 28-DAY STRENGTH TESTS RESULTS IAW PLANS & SPECS | | | |
| CHECK DECK FOR IMPERFECTIONS AND REPAIR IF NECESSARY | | | |
| CHECK BRIDGE SEAT BEARING AREAS FOR LIMITS OF TOLERANCE | | | |
| COMPLETION | | | |
| VERIFY TESTING DOCUMENTATION FOR COMPLETION AND ACCURACY | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |

REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____

PROJECT NO.: _____ CONTRACTOR: _____

LOCATION: _____

PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|--|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| MIX DESIGN APPROVED | | | |
| INTERMEDIATE | | | |
| PROPER SUBSURFACE & BEDDING IAW PLANS & SPECS | | | |
| PLACEMENT IAW PLANS & SPECS | | | |
| 1 INSPECTOR PRESENT DURING ENTIRE PLACEMENT OF LESS THAN 25 CY | | | |
| 2 INSPECTORS PRESENT DURING ENTIRE PLACEMENT OF GREATER THAN 25 CY | | | |
| REQUIRED ON-SITE TESTS TAKEN AND RECORDED | | | |
| PROPER CURING PRECEDURES OBSERVED | | | |
| CONTROL CYLINDERS CURED IN SAME MANNER AS IN-PLACE CONCRETE | | | |
| PERFORM INDEPENDENT VERIFICATION/ASSURANCE TESTING AS REQUIRED | | | |
| COMPLETION | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |
| | | | |

REMARKS: _____

STRUCTURAL STEEL INSPECTION FORM

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|--|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| VERIFY APPROVED SHOP DRAWINGS | | | |
| MATERIALS APPROVED | | | |
| INTERMEDIATE | | | |
| ENSURE PROPER STORAGE OF STRUCTURAL ITEMS (4" ABOVE GROUND) | | | |
| HOLES REAMED 1/8" MAXIMUM DURING ALIGNMENT | | | |
| VERIFY PROPER STRENGTH BOLTS USED | | | |
| ENSURE PROPER TORQUE OF BOLT TIGHTENING | | | |
| SPOT CHECK WELDS, BOLTED CONNECTIONS, ETC. FOR COMPLIANCE | | | |
| VERIFY PROPER PAINT SYSTEM IS USED | | | |
| COMPLETION | | | |
| VERIFY ACCEPTANCE BY QAM | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |

REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|--|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| MATERIALS APPROVED | | | |
| ENSURE THAT CONTRACTOR HAS ALL REQUIRED CERTIFICATIONS TO PERFORM PROTECTIVE COATINGS AND COATING REMOVAL OPERATIONS | | | |
| VERIFY PE CERTIFICATIONS REQUIREMENT FOR STRUCTURES WITH CONTAINMENT | | | |
| INTERMEDIATE | | | |
| INSPECT STRUCTURAL MEMBERS TO ENSURE PROPER REMOVAL OF EXISTING COATINGS AS REQUIRED | | | |
| INSPECT STRUCTURAL MEMBERS TO ENSURE PREP WORK IS SUFFICIENT (CLEANING/REMOVAL OF RESIDUE) | | | |
| ENSURE PROPER COATING SYSTEM AND COMPONENTS ARE USED | | | |
| VERIFY APPLICATION LIMITATIONS (TEMPERATURE, HUMIDITY, ETC.) | | | |
| VERIFY APPLICATION PROCEDURES IAW PLANS & SPECS | | | |
| CHECK MIL THICKNESS OF COATING | | | |
| COMPLETION | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |

REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|---|---------------------|------|---------|
| PREPATATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| APPROVED MATERIALS | | | |
| INTERMEDIATE | | | |
| INSTALLED IAW PLANS, SPECS & CURRENT STANDARDS | | | |
| SLOPES CHECKED AFTER HEAVY RAINFALL FOR SEEPAGE | | | |
| CORRECTIONS TAKEN IF NECESSARY | | | |
| VERIFY UPSTREAM ENDS RECEIVE PLUGS | | | |
| CHECK GEOTEXTILE FABRIC FOR PROPER INSTALLATION | | | |
| VERIFY PROPER AGGREGATE SIZE USED AND AGGREGATE MATERIAL IS CLEAN & FREE OF FOREIGN MATERIALS | | | |
| OUTLET PIPES VISUALLY CHECKED FOR CRUSHED, CLOGGED OR DISPLACEMENT | | | |
| VERIFY ENDWALL PLACEMENT HAS CORRECT ALIGNMENT AND IS BELOW FINAL SHOULDER ELEVATION | | | |
| COMPLETION | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |
| | | | |

REMARKS: _____

GUARDRAIL INSPECTION FORM

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|---|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| MATERIALS FROM APPROVED SOURCE | | | |
| INTERMEDIATE | | | |
| GUARDRAIL INSTALLED IAW PLANS, SPECS, CURRENT STANDARDS, & SPECIAL PROVISIONS | | | |
| DAILY INSPECTION BY A GRIT CERTIFIED INSPECTOR | | | |
| VERIFY LON (LENGTH OF NEED) CALCULATIONS FOR END TREATMENTS | | | |
| SPOT CHECK HEIGHT AND ALIGNMENT | | | |
| COMPLETION | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |
| | | | |
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REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|--|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| MATERIALS FROM APPROVED SOURCE | | | |
| INTERMEDIATE | | | |
| FENCE INSTALLED IAW PLANS, SPECS, STANDARDS & SPECIAL PROVISIONS | | | |
| | | | |
| COMPLETION | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |
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REMARKS:



RIGHT OF WAY MONUMENTS INSPECTION FORM

REPORT NO.: _____ DATE OF WORK: _____
PROJECT NO.: _____ CONTRACTOR: _____
LOCATION: _____
PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|--|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| MATERIAL CONFORMS TO THE SPECS | | | |
| INTERMEDIATE | | | |
| VERIFY LOCATION STAKEOUT IS CORRECT | | | |
| MONUMENTS PLACED IAW PLANS OR AS DIRECTED BY THE ENGINEER | | | |
| PROPER BACKFILL COMPACTION TO AVOID DISPLACEMENT OF MONUMENT | | | |
| COMPLETION | | | |
| FINAL FIELD INSPECTION REVIEW PERFORMED | | | |
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REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|--|---------------------|------|---------|
| PREPARATORY | | | |
| TRAFFIC CONTROLS APPROPRIATELY DESIGNED TO MAINTAIN TRAFFIC | | | |
| INTERMEDIATE | | | |
| MATERIALS CONFORM TO THE SPECS | | | |
| SIGNALIZATION, BARRICADES, CHANNELIZING DEVICES, SAFETY DEVICES & PAVEMENT MARKINGS CONFORM TO SPECS, VIRGINIA WORK AREA PROTECTION MANUAL & MUTCD STANDARDS | | | |
| SIGNS PLACED IAW VIRGINIA WORK AREA PROTECTION MANUAL & MUTCD STANDARDS | | | |
| CERTIFIED FLAGGERS | | | |
| CONTRACTOR PROPER MAINTENANCE OF TRAFFIC CONTROL DEVICES | | | |
| COMPLETION | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |
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REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|---|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| MATERIALS FROM APPROVED SOURCE | | | |
| INTERMEDIATE | | | |
| INSTALLED IN LOCATIONS SHOWN ON THE PLANS | | | |
| INSTALLED IAW VIRGINIA WORK AREA PROTECTION PLAN | | | |
| INSTALLED IAW MANUFACTURER'S RECOMMENDATIONS | | | |
| CERTIFIED PAVEMENT MARKING TECHNICIAN PRESENT AND OBSERVING APPLICATION | | | |
| COMPLETION | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |
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REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____

PROJECT NO.: _____ CONTRACTOR: _____

LOCATION: _____

PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|---|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| MATERIALS APPROVED | | | |
| SHOP DRAWING SUBMITTALS REVIEWED AND APPROVED | | | |
| INTERMEDIATE | | | |
| PILE INSTALLATION IAW PLANS & SPECS | | | |
| BARRIER WALL INSTALLED IAW PLANS, SPECS, & STANDARDS FOR TYPE SPECIFIED | | | |
| SPOT CHECK TOP FACE ALIGNMENT IS WITHIN DEVIATION ALLOWANCES | | | |
| COMPLETION | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |
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REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|---|---------------------|------|---------|
| PREPARATORY | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| MATERIALS APPROVED | | | |
| INTERMEDIATE | | | |
| SITE LOCATION IAW PLANS | | | |
| TOPSOIL CLASSIFICATION IAW THE PLANS & SPECS | | | |
| BRUSH, ROOTS, STUMPS, LITTER REMOVED | | | |
| AREAS PROPERLY PREPARED TO RECEIVE SEED (SLOPES ARE COMPACTED AND GROOVED) | | | |
| AREA SEEDING TIME LIMITS ARE IAW PLANS, SPECS, CONTRACT PROVISIONS, & VIRGINIA DCR REQUIREMENTS | | | |
| SEED MIXTURE APPLIED IAW ROADSIDE DEVELOPMENT PLANS (INCLUDING SEED, LIME, FERTILIZER) | | | |
| MULCH APPLIED IAW PLANS & SPECS | | | |
| COMPLETION | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |
| | | | |

REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____

PROJECT NO.: _____ CONTRACTOR: _____

LOCATION: _____

PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|--|---------------------|------|---------|
| PREPARATORY | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| MATERIALS APPROVED | | | |
| INTERMEDIATE | | | |
| PLANTS PROPERLY IDENTIFIED AND INSPECTED PRIOR TO PLANTING | | | |
| INSTALLATION IAW PLANS, SPECS, & CURRENT STANDARDS | | | |
| MULCHING, STAKING & GUYING, WRAPPINGS, WATERING, ETC. IAW PLANS, SPECS, & CURRENT STANDARDS | | | |
| PROPER DOCUMENTATION & CONTRACTOR NOTIFICATION OF ESTABLISHMENT PERIOD BEGIN AND END DATES IS COMPLETE | | | |
| AT THE END OF THE ESTABLISHMENT PERIOD, DEAD & DEFECTIVE PLANTS ARE REPLACED IAW PLANS, & SPECS | | | |
| COMPLETION | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |
| | | | |

REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____

PROJECT NO.: _____ CONTRACTOR: _____

LOCATION: _____

PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|--|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| MATERIALS APPROVED | | | |
| SHOP DRAWING SUBMITTALS REVIEWED AND APPROVED | | | |
| INTERMEDIATE | | | |
| SIGN LOCATION LAYOUT IAW PLANS | | | |
| MESSAGES & SYMBOLS ARE CORRECT AND IAW MUTCD STANDARDS | | | |
| SIGN FOUNDATIONS AND POSTS INSTALLED IAW APPROVED SHOP DRAWINGS | | | |
| INSTALLATION IS IAW PLANS, SPECS, CURRENT STANDARDS, CONTRACT PROVISIONS & MUTCD STANDARDS | | | |
| SIGN PANELS ARE FREE OF CRACKS, GAPS, STREAKS, WRINKLES, BLISTERS, DISCOLORATIONS, BUCKLES, WARPS AND HAVE A SMOOTH SURFACE OF UNIFORM COLOR | | | |
| COMPLETION | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |
| | | | |

REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____

PROJECT NO.: _____ CONTRACTOR: _____

LOCATION: _____

PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|--|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| MATERIALS APPROVED | | | |
| SHOP DRAWING SUBMITTALS REVIEWED AND APPROVED | | | |
| INTERMEDIATE | | | |
| ENSURE ALL FOUNDATIONS, DEVICES, ETC. ARE CONSTRUCTED WITHIN THE R/W SHOWN ON THE PLANS | | | |
| FOUNDATIONS AND POLES INSTALLED IAW APPROVED SHOP DRAWINGS | | | |
| INSTALLATION IS IAW PLANS, SPECS, CURRENT STANDARDS, CONTRACT PROVISIONS & MUTCD STANDARDS | | | |
| VERIFY TRAFFIC LOOP DETECTORS INSTALLED IAW PLANS & SPECS | | | |
| SYSTEM TESTING IS COMPLETE AND ACCEPTABLE | | | |
| ALL SIGNALS ARE FUNCTIONING AS DESIGNED | | | |
| COMPLETION | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |
| | | | |

REMARKS: _____

REPORT NO.: _____ DATE OF WORK: _____
 PROJECT NO.: _____ CONTRACTOR: _____
 LOCATION: _____
 PLAN PAGE: _____ INSPECTOR: _____

| ITEM | INSPECTOR (INITIAL) | DATE | REMARKS |
|---|---------------------|------|---------|
| PREPARATORY | | | |
| DESIGN DOCUMENTS APPROVED | | | |
| QA/QC PLAN REVIEWED & ACCEPTED | | | |
| MATERIALS APPROVED | | | |
| SHOP DRAWING SUBMITTALS REVIEWED AND APPROVED | | | |
| INTERMEDIATE | | | |
| WATER & SEWER HORIZONTAL & VERTICAL MINIMUM SEPARATION REQUIREMENTS IAW PLANS & SPECS | | | |
| TRENCH EXCAVATION IAW SECT. 302 | | | |
| PIPE & FITTINGS INSPECTED FOR CRACKS AND DEFECTS BEFORE LOWERED INTO TRENCH | | | |
| FOUNDATION APPROVED & BEDDING MATERIAL IAW PLANS & SPECS | | | |
| BACKFILL MATERIAL APPROVED AND INSTALLED IAW PLANS, SPECS & CURRENT STANDARDS | | | |
| VERIFY DISINFECTING, LEAK TESTING, AND SYSTEM TESTING IS COMPLETE AND APPROVED BY THE QAM | | | |
| COMPLETION | | | |
| PROPER DOCUMENTATION IS ON FILE WITH LOCALITY (IF APPLICABLE) | | | |
| FINAL FIELD INSPECTION PERFORMED | | | |

REMARKS: _____

Date _____

Page No: _____ of _____

Contract No: _____

Contractor: _____

Hours: From: _____ To: _____

Weather: Low: _____ High: _____ Condition: _____

WORK CONDITIONS: **GOOD** **FAIR** **POOR** **UNWORKABLE**

VISITORS:

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WORK IN PROGRESS:

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Communications and instructions given to the Contractor and its QA/QC Team:

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PLAN CHANGES:

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REMARKS

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|---|
| Submittals Received |
| Independent Verification tests performed: |
| Independent Assurance performed: |
| Preparatory Inspections attended: |
| Intermediate Inspections performed : |
| Final Inspections performed : |
| Non-conformance reports received: |
| Reports of corrected and pending actions to correct Non-conformance Reports |
| Other Comments: |
| |

SIGNED

NAME

TITLE

TO CONTRACTOR: _____ NOTIFICATION NO: _____

PROJECT: _____ PROJECT NO: _____

OWNER: _____ TIME: _____ AM/PM

ENGINEER: _____ OBSERVER: _____

Pursuant to the GENERAL CONDITIONS of the Contract, you are hereby notified of the following noncompliance violation:

Specification Section: _____ Paragraph: _____

Violation:

Contract Requirement:

Violation Detected by: Test Inspection Observation

Noncompliance Work is: Defective Rejected

Contractor's Proposed Recommendation

Engineer: _____
Authorized Representative

Date: _____

Received by:

Contractor

Title

Date

Distribution:

- 1. Engineer
- 2. Owner
- 3. Field File

TO _____ PREVIOUS NOTIFICATION NO: _____ DATE: _____

PROJECT: _____ PROJECT NO: _____

OWNER: _____

ENGINEER: _____

The below listed nonconformance work has been re-inspected and the results of the Contractor's corrective actions have placed the work in compliance with the Contract Documents.

Description of Violation:

Description of Correction:

Engineer: _____
Authorized Representative

Date: _____

- Distribution:**
- 1. Engineer
 - 2. Owner
 - 3. Field File

