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# Section 4 – Construction and Inspections

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## **4.01 General**

### **Standard**

All construction within the existing or proposed County right-of-way shall be inspected and approved by the Department of Public Works or by VDOT when the proposed construction is within VDOT maintained right-of-way.

Unless otherwise specified on the approved construction plans or road permits, all materials, construction methods, installations, specifications, and standards shall conform to the latest edition of the VDOT Road and Bridge Specifications and Standards.

A minimum of 24 hours in advance notice shall be required on all construction inspection requests. Depending on the scope of work, additional advance notification may be required.

### **Applicability of the Standard**

This standard applies to all types of development, including subdivisions, PODs, and CIPs.

### **Design Requirements**

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## **4.02 Materials**

### **Standard**

All materials shall be in accordance with the VDOT Road and Bridge Specifications and Standards. Concrete, asphalt concrete and aggregate shall be obtained from VDOT approved plants and quarries and shall be produced in accordance with VDOT approved mix designs. Construction materials are to be from approved VDOT sources as published by VDOT Materials Division.

### **Material Testing, Monitoring and Inspections (Field)**

#### **A. Scope of Work**

The Contractor shall contract the services of an independent Geotechnical firm licensed by the State of Virginia to perform the Quality Control Field Testing on construction activities and materials incorporated into this project. The type of tests, the frequency of tests and method of testing shall be in accordance with the requirements of the Virginia Department of Transportation's Manual of Instruction for Materials, the Virginia Test Methods (VTM) and the Association Society for Testing and Materials (ASTM).

The Geotechnical firm shall provide resumes for their staff members that will be involved in the project and provide evidence that their technicians are certified by the Virginia Department of Transportation (VDOT) to perform the required testing. Applicable certifications are, but not limited to the following: "Nuclear Safety for Density Devices", "Asphalt Field", "Concrete Field", "Soil & Aggregate Compaction" and "Pavement Markings".

The contractor shall be responsible for scheduling and coordinating the testing, monitoring and inspecting services with applicable construction activities. The contractor and Geotechnical firm shall consult with County's field representatives on a daily basis to ensure compliance with VDOT requirements. The contractor shall be responsible for ensuring that all construction activities are planned, scheduled and conducted in a manner that will facilitate the construction testing and ensure that the testing and monitoring are being performed in a timely manner and required by VDOT regulations. The contractor shall ensure that the Geotechnical firm has the capabilities to furnish and appropriate number of technicians to satisfy the contractor's and/or subcontractors' construction operations and progress. Should it become necessary to delay or postpone a construction activity because of the unavailability of certified technicians, no consideration for an extension of contract time will be allowed.

The Geotechnical firm shall be responsible for furnishing all testing equipment, transportation and documentation. A representative of the Geotechnical firm shall attend all monthly progress meetings on the project to report the status of tests from previous month and their plan activities for the following month to correspond with the contractor's

activities. The Geotechnical firm shall keep the contractor and the County apprised of the status of tests at all times and shall provide the County with all tests results, reports and supporting documentation on the same day, unless otherwise approved.

The frequency of tests, as shown in VDOT's Manual of Instruction for Materials, are considered minimum and are based on obtaining acceptable test results on consistent basis. Should tests reveal unacceptable or inconsistent results, the Geotechnical firm shall immediately notify the contractor and the County's field representative. The contractor shall take immediate action to correct the problem to ensure compliance with the contractor requirements. If the tests yield unacceptable and/or inconsistent results, additional tests will be required as directed by the County. The testing and retesting of materials and construction operations shall have the full cooperation of the contractor and/or their subcontractor.

Examples of required field testing, material inspections and their frequencies for Quality Control are , but not limited to the following:

- 1) Central Mix Aggregate (Subbase / Base Material):
  - a) Depths: In accordance with the Materials Manual and VTM-38B.
  - b) Density: In accordance with The Materials Manual and VTM-10.
- 2) Asphalt Concrete Pavement:
  - a) Density by Nuclear Method: In accordance with the Materials Manual and VTM-76.
- 3) Miscellaneous Concrete Hydraulic Cement: In accordance with Materials Manual and ASTM.
  - a) Compressive Strength: ASTM C31 and C39.
  - b) Air Content: ASTM C173 and C231.
  - c) Consistency (slump): ASTM C143.
  - d) Temperature: ASTM C1064.
- 4) Embankments:
  - a) Density: In accordance with Materials Manual and VTM-10.
- 5) Finished Subgrade (Cuts and Fills)
  - a) Density: In accordance with Materials Manual and VTM-10.
- 6) Backfill for Pipes and Box Culverts:
  - a) Density: In accordance with Materials Manual and VTM-10.
- 7) Backfill for Drop Inlets:
  - a) Density: In accordance with Materials Manual and VTM-10.

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- 8) Post Construction Inspection of Underdrains, Cross Drains, and edgedrains: In accordance with VTM-108.
  - 9) Post Installation Inspection of Buried Storm Drain Pipe and Pipe Culverts: In accordance with VTM-123.

In addition to performing the actual tests on concrete and density tests on various types of materials (soils, aggregate and asphalt) in the field, the Geotechnical firm shall be responsible for the continuous monitoring of the placement and compaction of aggregate base materials, asphalt concrete pavement and the placement and compaction of earthwork and backfill of trenches and structures to ensure compliance with the Specifications. The Geotechnical firm shall be responsible for the testing and monitoring of pavement markings and the video inspection of underdrains / edgedrains as required by the specifications.

In accordance with VDOT Road and Bridge Specifications, the contractor shall be responsible for the quality control requirements for asphalt pavement. The contractor shall also responsible for the Quality Control for pavement markings and the video inspection of storm drainage pipes, underdrains, and edgedrains as required by VDOT's Road and Bridge Specifications.

#### Applicability of the Standard

This standard applies to all types of development, including subdivisions, PODs, and CIPs.

#### Design Requirements

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## **4.03 Drainage**

### Standard

All storm drainage facilities installed in right-of-way and/or easements, must be inspected and approved by the Department of Public Works.

No backfilling is permitted on any pipe installation until it has been inspected and approved by the Department of Public Works.

Vertical and horizontal alignment shall be verified visually or with the aid of mirrors to ensure that the alignment is true and no pipe is misplaced.

All storm sewer pipes shall be flushed and thoroughly cleaned prior to a final inspection.

Any field revisions affecting the drainage design, location, and type of construction of structures shall be approved in writing by the Department of Public Works, and sent to the field as a plan revision. No drainage work of any kind shall be allowed without approved construction plans

### Applicability of the Standard

This standard applies to all types of development, including subdivisions, PODs and CIPs

### Design Requirements

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## **4.04 Roads and Streets**

### Standard

All roads and streets shall be constructed in accordance with the approved construction plans and current editions of the Henrico County Design Manual, VDOT Road and Bridge Specifications and VDOT Road and Bridge Standards, where applicable. The Department of Public Works shall inspect the subgrade prior to any stone installation to evaluate the existing conditions as set forth in the Pavement Design Section of this Manual, See Section 2.26. Should a revision be required to the pavement design because of the soil conditions, the Department of Public Works will determine the appropriate adjustments to the minimum pavement design requirements or the owner's engineer may submit a revised pavement design for review and approval. The Department of Public Works will work with the owner and engineer to determine a suitable solution and any appeals will be handled as stated in Section 1.04 of this Manual. Prior to paving, stone grade and density checks shall be performed by an independent testing firm provided by the developer. The results of these checks must meet VDOT requirements.

### Applicability of the Standard

This standard applies to all types of development, including subdivisions and PODs, and CIPs.

### Design Requirements

## **4.05 Final Inspections**

### Standard

All final inspections will be scheduled at least 48 hours in advance. It is the responsibility of the owner to have all necessary persons in attendance at the final inspection. When the final inspection is complete, a written punch list will be sent to the owner and the contractor. Once all punch list items are complete and the necessary defect bond posted (subdivisions only), the Department of Public Works will prepare the required documentation to recommend acceptance of the road into the County road system

### Applicability of the Standard

This standard applies to all types of development, including subdivisions and PODs.

### Design Requirement