Locally Administered Projects (LAP) Manual

PART 2
Project Management

Chapter 13

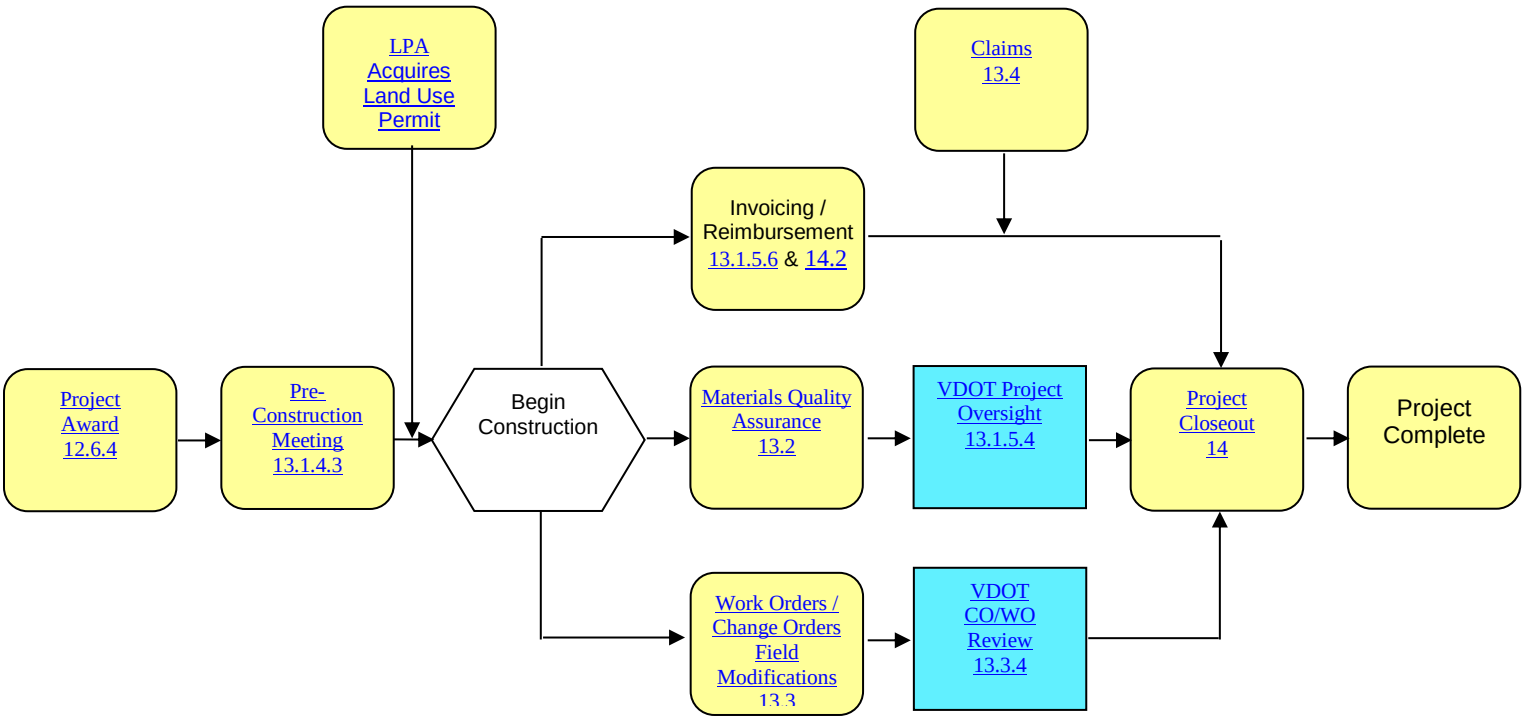
Project Delivery (Construction administration)

CHAPTER 13

CONSTRUCTION ADMINISTRATION

CHAPTER 13.1

CONSTRUCTION ADMINISTRATION AND MATERIALS QUALITY ASSURANCE



Chapter 13.1- CONSTRUCTION ADMINISTRATION

This chapter includes the following topics

APPENDICES

13.1.1 Introduction

Construction administration is the management of all construction activities necessary to ensure the completion of a high quality product meeting all contract specifications, and applicable federal, state, and local laws and regulations. Construction administration is the responsibility of the LPA through its Construction Project Engineer. LPAs and their contractors are responsible for compliance with all applicable federal, state, and local laws and regulations, including, but not limited to, occupational health and safety, environmental compliance, and equal employment.

13.1.2 Applicability

Applicability		
Federal-aid	*State-aid / VDOT Maintained***	*State-aid / LPA Maintained*
*X**	*X*	-

***** All federal-aid projects and projects developed to qualify for federal-aid

****** All projects to be maintained by VDOT, except as noted

13.1.3 Summary

LPAs are fully responsible for the administration of their projects and are required to provide a full time local government employee responsible for the project and an engineer who must be licensed as a professional engineer in Virginia, who may be contracted. Unless otherwise established in the project administration agreement, the LPA is also responsible for providing adequate construction engineering inspection to ensure that the project is constructed in accordance with the contract documents. Also, the LPA's responsibility includes maintaining sufficient documentation to demonstrate that this has been accomplished. VDOT offers a comprehensive library of construction, inspection, and materials documents that are available for LPA use as appropriate.

Federal law provides that VDOT may allow a LPA to perform construction administration for a federal-aid contract; however, VDOT is not relieved of overall project responsibility. VDOT must provide reasonable assurance to FHWA that all federal requirements resulting from the acceptance of federal-aid are met and that the LPA is adequately staffed and suitably equipped to undertake and satisfactorily complete the work. State law does not specifically provide such an oversight requirement; however, VDOT has a responsibility to ensure funds provided to sub-recipients are appropriately spent and, in the case where VDOT will ultimately maintain the project, has a vested interest in the quality of workmanship and materials used for the project. VDOT's oversight role is not to duplicate the actions or responsibilities of the locality; rather, it is to ascertain whether or not the construction project is being performed in reasonable accordance with the contract documents.

Construction administration actually begins prior to the advertisement of the construction project, with the development of bid and contract documents, and, depending on the project's complexity, includes close coordination with VDOT representatives. Considerations regarding materials sources, off-site testing of materials, cost associated with third party Quality Assurance structural materials fabrication inspection (see Table 1 in section 13.2.4), costs for VDOT oversight, civil rights, and environmental monitoring are but a few of the issues that should be discussed while preparing for advertisement, usually in a pre-advertisement meeting.

VDOT's Construction and Inspection Manuals and the Materials Manual of Instructions are the primary resources for LPAs during construction administration. Reasonable conformance to the quality assurance and inspection requirements listed in these Manuals is necessary for all federal-aid projects and projects to be maintained by VDOT, except as otherwise noted within this Manual. When there are significant deviations from these requirements, the LPA must fully document the nature of the deviation and how reasonable quality assurance and

contract conformance was assured, unless previous concurrence has been obtained from the VDOT ACE or designee.

VDOT Responsibilities:

- *Prior to advertisement of the project, the VDOT Project Coordinator will contact the Area Construction Engineer and inform him/her of the upcoming advertisement. The ACE is typically the VDOT employee that will be responsible for LPA Administered projects under construction; however, the District Administrator has discretion to assign that role to other appropriately qualified district staff. The ACE will typically assign a primary VDOT contact, usually a staff engineer, for the project delivery (construction) phase of the project. This person is referred to as the VDOT Construction Project Monitor.*

The assigned VDOT Construction Project Monitor will also:

- *Establish an appropriate level of oversight in accordance with the Guidance provided in Appendix 13.1-B of this chapter, if necessary.*
- *Attend any pre-advertisement meeting and share the determined level of oversight with the LPA.*
- *Facilitate any discussions between other VDOT disciplines and the LPA.*
- *Develop a cost estimate detailing necessary project oversight costs, off site quality assurance and inspections by discipline, and provide to the LPA.*
- *Provide the Local Assistance Division with oversight cost estimate. The Local Assistance Division will amend the Project Administration Agreement if necessary.*

After project advertisement, the Construction Project Monitor will be the primary project contact for the LPA.

13.1.4 Pre-Construction Activities

13.1.4.1 Project Bonding

Before an LPA can begin work on a roadway that is maintained by VDOT as part of the interstate, primary, or secondary system of highways, it must secure a land use permit from VDOT. This permit is issued through the VDOT Residency or District Land Development Office and is usually issued at no cost. In these cases, the costs associated with VDOT inspection/oversight are addressed in the Project Administration Agreement.

In lieu of a surety, the LPA may offer a letter that indicates the locality has a surety bond on file from the contractor that guarantees performance during the project. The letter should be attached to the land use permit and include a copy of the surety. If the LPA is the permittee for the land use permit, the letter simply needs to indicate that the locality will guarantee performance through a resolution of the governing board.

Another option for an LPA is to allow the contractor to provide a dual obligee surety bond that names VDOT as well as the LPA as the obligee. For surety bonds that are already in place, the contractor can execute a dual obligee rider to the existing bond. Appendix 13.1-A to this chapter provides a sample of a dual obligee rider that can be used for this purpose.

13.1.4.2 VDOT Databases

PCES / Dashboard Updates		
Federal-aid	*State-aid / VDOT Maintained**	*State-aid / LPA Maintained**
X	*X*	*X*

** State-aid projects which are not formula funded (e.g. Revenue Sharing, Access, etc.), are not required to use or input data into PCES.*

PCES

VDOT's Project Cost Estimating System (PCES) is VDOT's primary long-range project budgeting tool and is used to ensure that projects are appropriately funded throughout project development and delivery. For projects in VDOT's SYIP, the LPA must coordinate with the CPM to ensure increases in project costs which will be reimbursed through VDOT are reflected in PCES.

Construction Dashboard

VDOT is committed to transparency in all of our operations. As such, all projects in the Six Year Improvement Plan, including those administered by LPAs, are included on VDOT's construction Dashboard.

LPAs are required to ensure that any SYIP/SSYP project is included in Dashboard within 30 days of issuing notice to proceed to their contractor. Note that this does not include projects funded entirely through Revenue Sharing or Access Programs. The project profile will initially include the total project costs and the scheduled completion date. **Quarterly, the LPA is required to update the project profile to include expenses to date.** Projects which are not updated will be reported as late or over expended according to the business rules of Dashboard.

The LPA Construction Dashboard Manual can be found on VDOT's Local Assistance Division web-page at: http://dashboard3/Help/LAP.pdf

Inclusion of SYIP projects in the Construction Dashboard is a requirement of the Project Administration Agreement. Failure to include a project profile in the LPA Construction Dashboard may result in the delay of project reimbursements to the LPA.

13.1.4.3 Preconstruction Conference(s)

A preconstruction meeting is strongly encouraged for all projects. For most projects, a single preconstruction meeting to include the LPA, the LPA-designated

construction project engineer, the contractor, the ACE designee, and other appropriate VDOT staff should be held. However, for complicated projects requiring a high level of planning and coordination with VDOT, the LPA may find it desirable to hold a separate preconstruction meeting with their construction project engineer and VDOT staff. Appendix 13.1-C, to this chapter, contains a list of issues and topics which should be discussed with both VDOT staff and the construction contractor during the preconstruction meeting(s).

For Federal-aid projects, VDOT attendees usually include, the CPM, a District Materials section representative, a District Civil Rights Monitor, and a District Environmental Monitor (when NEPA commitments are required).

VDOT Responsibilities:

- *Review previously agreed upon arrangements to ensure VDOT support to the project and VDOT oversight costs to the project are still valid.*
- *Provide LPA final oversight cost estimate.*

13.1.4.4 Project Schedule

Create and Submit a Project Schedule		
Federal-aid	*State-aid / VDOT Maintained*	*State-aid / LPA Maintained*
X	*	*N/A*

** A formal project schedule is not required; however, a list of significant milestones and approximate dates may be required as determined by the VDOT ACE.*

Within 15 business days after the preconstruction conference, the LPA will provide a project or earnings schedule to the VDOT ACE covering the full duration of the project. The project schedule must include those activities that VDOT has indicated as a critical or hold point at which VDOT must either

inspect the project or be on site during the activity.

Periodically, throughout the project, the schedule must be updated and submitted to the VDOT ACE to ensure major milestones are accurate. VDOT recommends that these updates take place a minimum of every six weeks of construction.

As necessary, the schedule may include diagrams, bar charts, and a tabular schedule report showing start and finish dates. A written narrative of the schedule can be submitted which describes each activity shown. The narrative should list the Contractor's work days per week, holidays, number of shifts per day, and number of hours per shift.

VDOT strongly recommends that a progress schedule also indicate the amount of work to be performed within given time periods as percentages of the contract dollar value. VDOT uses a C-13 form, which is available to LPAs, to document this information. The progress schedule provides a means of measuring the Contractor's progress throughout the life of the project. Early identification of deficient progress is critical to preventing or mitigating delays in project completion. The LPA should be alert to detect delays or lack of progress on the project. Such delays should be brought to the attention of the Contractor and the Construction Manager. This will help prevent the Contractor's progress from becoming deficient.

The LPA and the VDOT CPM must, together, identify critical milestone/activities when VDOT staff will be on-site to observe construction activities and agree as to notification requirements to ensure this occurs.

VDOT and LPAs have greater success during construction when a formal plan of communication is prepared. A template "Guidelines for Construction Activities Interaction" is provided on-line and can be used to document construction

responsibilities during a LPA Administered project. While not necessary for small short-duration projects, the LPA and VDOT ACE should consider the completion of this document for complicated or long-term projects.

13.1.5 Construction Activities

13.1.5.1 Project Documentation / Inspection

Maintain a Daily Diary		
Federal-aid	*State-aid / VDOT Maintained*	*State-aid / LPA Maintained*
X	*X*	*N/A*

Accurate documentation of daily activities including quantity and types of materials on-hand and placed, materials acceptance results, equipment calibration, weight tickets, weigh person's daily summary, conditions delaying project progress, activities of DBE firms, etc. is critical to construction contract administration and is especially important when considering contract changes and dispute or claims resolution.

A daily diary of project activities must be kept for all federal-aid projects or projects to be maintained by VDOT.

An LPA may use any project file documentation system it deems appropriate, including the use of construction management software, as long as an appropriate level of documentation is maintained. Appendix 13.1-D of this chapter contains typical project documentation that is expected to be kept. The VDOT CPM may, at his discretion, review this information over the course of the project and will notify the LPA if any mandatory data is missing from the documentation. Failure to record this information may result in the reduction of federal participation for any claims or the inability for VDOT to support the LPA during other project-related disputes. Missing documentation including material quantities and acceptance which impacts project quality assurance will also affect the ability to provide full reimbursement for those items.

For Recovery Act Projects, the LPA must also complete the Recovery Act Quality Assurance Checklist, and submit it to the ACE.

For non federal-aid projects which will be maintained by the LPA, project documentation supporting all payments for materials, prices adjustments impacting reimbursements, and claims documentation must be kept on file and available for inspection for a minimum of three years after financial closure of the project. VDOT utilizes and can provide various record keeping documents to support the LPA, to include an electronic materials notebook (e.g. TL-142).

An LPA must be willing to provide, or provide access to, project documentation as requested by VDOT or FHWA.

VDOT Responsibilities:

- *For LPAs with limited experience or those requesting support, the CPM will provide the LPA with assistance in establishing a Project File.*
- *Periodically, the CPM will inspect project diaries and materials notebooks and provide recommendations for improvement.*
- *Review the Recovery Act Quality Assurance Checklist for completeness and accuracy, as necessary for Recovery Act projects.*

13.1.5.2 Qualifications of On-site Personnel

The LPA is responsible for ensuring that on-site inspection staff is adequately qualified to perform duties assigned. The LPA is also responsible to ensure that other project personnel are appropriately trained, and where applicable, certified to perform duties as identified in the contract documents, referenced specifications, and federal and state

regulations. This includes, but is not limited to, those related to materials testing, work zone safety, traffic management, occupational health and safety, erosion and sedimentation control, and environmental protection. Unless otherwise stated in this Manual or in VDOT's Land-Use Permit Manual, those qualifications will not be reviewed by VDOT.

VDOT's Construction and Inspector's Manuals provide guidance related to many of the necessary qualifications of project inspectors and should be used as a reference by LPAs and their contractors.

The Project's Responsible Charge Engineer (RCE) must be a professional engineer licensed to practice in the Commonwealth of Virginia. The RCE may or may not be directly employed by the LPA; however, if the LPA elects to use a consultant for professional engineering services, a full time local government employee must be responsible for the project.

13.1.5.3 Material Acceptance and Assurance Sampling and Testing

Materials Acceptance Must Meet VDOT Standards		
Federal-aid	*State-aid / VDOT Maintained*	*State-aid / LPA Maintained*
X	*X*	*N/A*

Materials Quality Assurance Sampling and Testing is required in accordance with the contract documents, VDOT Materials Manual of Instructions, and Chapter 13 of this manual, with contract requirements taking precedence, where they are more stringent. For federal-aid projects or for projects that will be maintained by VDOT, the LPA shall submit a materials quality assurance plan (QAP) for review and approval, prior to construction. Approval must be provided before implementation of the QAP. To prevent project delays, it is recommended that QAPs be submitted prior to project

advertisement. The LPA's QAP will outline the requirements and processes that the LPA will follow for materials inspection and quality assurance. The QAP template, QAP template instructions, and a QAP example for completing the Quality Assurance Plan are located on the LAD external forms site.

VDOT understands that LPAs maintaining their own road system have a vested interest in ensuring the quality of construction for their projects and strongly recommends that LPA's develop and follow their QAPs on non federal-aid, locally maintained projects. VDOT can perform an advisory role to the LPAs regarding materials quality assurance on these non federal-aid projects. Materials acceptance and assurance sampling and testing for projects that do not include federal-aid and will be maintained by the LPA will be performed in accordance with the contract documents, which will conform to the LPA's quality assurance plans. However, projects located on Primary routes or on the NHS, and are maintained by VDOT, will be required to meet all VDOT Materials Quality Assurance requirements when receiving federal or state funding support.

VDOT Responsibilities:

- *For federally funded or state maintained review the LPA Quality Assurance Plan (QAP) and approve*

Materials on federal-aid projects or projects that will be maintained by VDOT are required to be from VDOT's pre-approved materials list of products and/or sources.

Materials Technician and Inspector Qualifications

Inspectors on federal-aid projects and projects to be maintained by VDOT are required to be certified by VDOT or another VDOT-recognized and approved highway materials certification program (such as the Mid Atlantic Regional Technician Certification Program) in Asphalt Field, Concrete Field, Soils and Aggregate Compaction, Pavement Marking and Nuclear Safety. Inspection staff for quality assurance sampling and testing

may be directly employed by the LPA or may be employed by a construction engineering inspection firm contracted by the LPA.

LPAs maintaining their own road system have a vested interest in ensuring the quality of construction for their projects and VDOT strongly recommends that only certified technicians be used on their non-federal-aid projects. However, regardless of funding type, certified technicians will be required when these projects are on the National Highway System.

13.1.5.4 Project Monitoring and Oversight

For federal-aid projects, VDOT is not relieved of oversight responsibility for the project's construction, even when administered by an LPA on roads maintained by the LPA.

The LPA should refer to the VDOT Construction and Inspectors Manuals for guidance regarding project inspection and monitoring. Both documents have been prepared to inform and assist VDOT construction inspection personnel. The Construction Manual provides detailed guidance for the specifications contained in the VDOT Road and Bridge Specifications. The Inspectors Manual contains a series of tables which identify the primary inspection duties for major categories of work. Reasonable conformance with these manuals is required for federal-aid projects and any project to be maintained by VDOT. Where substantive deviation with these manuals is expected, the LPA must coordinate with the ACE prior to those activities. Where project situations preclude advanced notice, the LPA must document the extent of the deviation and how quality assurance was maintained.

For projects which will be maintained by VDOT after completion, VDOT has responsibility to ensure that the project is constructed in a reasonable conformance with contract requirements and specifications. As such, VDOT will perform oversight

inspections for these projects. The frequency of these inspections will be in general accordance with Appendix 13.1-B of this Chapter.

VDOT Responsibilities:

- *The VDOT Construction Project Monitor will provide oversight inspections of federal-aid and VDOT maintained projects in accordance with Appendix 13.1-E of this chapter. VDOT's responsibility is to ensure reasonable conformance with contract provisions.*
- *Appendix 13.1-E provides a list of construction activities and specific review items that should, typically, be included during oversight evaluation. It is not expected that every item, or even every construction activity, be reviewed each time an oversight evaluation is made. Instead, the reviewer should focus each evaluation on the specific needs during that phase of work or on questions the Construction Manager may have or on issues that have been brought up during progress meetings. Some items will not be applicable unless the reviewer is on-site during those events.*
- *If the Construction Project Monitor designee determines that it is in VDOT's interest to be on-site during specific events, early coordination between VDOT and the Locality is critical and those discussions need to be made early in the construction process, preferably before construction begins.*
- *The Construction Project Monitor designees will coordinate with other VDOT staff having oversight responsibilities to ensure site visits are coordinated as much as possible in order to minimize impact on construction activities.*

*****No VDOT employee shall direct the actions of an LPA contractor, except in the case of immediate danger to life or health****. All*

requests or direction shall be made to the LPA-designated project manager. Where the project engineer is a contract employee or when the on-site project inspector in charge is a contract employee, VDOT may discuss the issue(s) with that contract employee, make them aware of the recommendation or directives that will be provided to the LPA-designated project manager.

13.1.5.5 Field Modification to Approved Design

The LPA must ensure that project modifications do not require additional NEPA evaluation for federal-aid projects. Any additional work outside the originally identified project "footprint" would require additional evaluation. Additional project needs for any federal-aid project must be coordinated with VDOT staff prior to issuing a notice to proceed to the contractor.

Modifications to the engineering design may require a design exception or, at a minimum, review and approval by the Engineer of Record. Any design modification of this nature must be submitted to the VDOT Construction Project Monitor prior to finalization.

A change order may also be required. Further discussion on change orders is provided in Chapter 13.

13.1.5.6 Project Reimbursement Requests

The LPA must submit a certification along with each monthly payment voucher to the CPM. The LPA's Project Manager must submit each reimbursement request with a statement certifying, as applicable, the following:

- The voucher is accurate and the payment request for satisfactorily

completed work.

- All Civil Rights, Equal Opportunity, and DBE-related documentation, as applicable to the project, has been submitted.
- All applicable environmental controls are in place and are being maintained by the contractor.
- All materials used on the project during the pay period meet FHWA and VDOT requirements, as applicable to federal aid and VDOT maintained projects. (Note: Materials certification is required prior to installation.)
- All iron and steel fabricated materials used on the project during the pay period meet Buy America (23 CFR 635.410) as applicable to federal aid projects.
- A breakdown of current charges for material-on-hand, any price adjustment, fuel adjustment, and change order
- An updated project schedule (when a schedule is contractually required) showing the items completed during the pay period.

Recommended certification language is provided in Appendix 13.1-F. Additional information regarding the processing and reimbursement of such requests will be performed in accordance with Chapter 19 of this Manual.

VDOT Responsibilities:

- *VDOT Construction Project Monitor will review voucher, provide reasonable assurance that activities have been performed or materials are on-site and forward to Residency or District business / accounting staff for processing.*
- *Business / accounting staff will complete the FD-AP-01 and forward to Central Office Fiscal Division for processing.*
- *All reimbursement requests must be processed within 30 calendar days*

Final Payment Voucher

After completion of the final inspection with the contractor and, as necessary, VDOT staff, and the necessary corrections have been completed, the LPA will begin the process to provide VDOT with a final invoice and financially close out the project with VDOT.

The LPA will ensure that the final voucher/estimate has been examined and verified by a qualified independent reviewer or auditor. The reviewer or auditor must be experienced with preparing final construction payments/vouchers and must not be affiliated with the project. She/he may or may not be employed by the locality. A locality may wish to have VDOT perform the final voucher review/verification. In this case, billing and project charge arrangements should be made and the Project Administration Agreement should be amended. Off-site materials inspection costs incurred by VDOT are to be applied to the appropriate charge codes.

The review should include examination of all payments to ensure that any overpayments are identified and reduced from final payment. Additional information on project close-out procedures is provided in Chapter 14, of this Manual. This is to ensure that any overpayments are reduced from final payment.

VDOT's Post-Construction Manual can be used as resource guidance regarding preparation of final invoices. Unless otherwise identified in this manual, LPAs are not required to use the VDOT forms identified in the Post-Construction Manual.

13.1.5.7 Key Submittals / Requirements

Task/Submittal / File Documentation	***Locality Responsibility***	***VDOT Construction Project Monitor Responsibility***	***Submittal Timing / Recordkeeping Requirements***
Materials Quality Assurance Plan (QAP)	Develop and submit to VDOT PC/CPM	Review and approve in coordination with District Materials Engineer	LPA to submit prior to or at advertisement; VDOT to approve and notify LPA prior to Construction start
Source of materials C-25 or equivalent	Submit Form to VDOT ACE	Review and coordinate review with Materials section	Within 7 days after Pre-Construction meeting but no later than 2 weeks prior to using materials on the project
Project / Earnings Schedule	Include Major Milestones; ensure plans to coordinate with VDOT ACE have been made	Concur; ensure milestones which necessitate VDOT staff on-site are identified	Within 15 days after Pre-construction Meeting
Civil Rights Forms	Ensure requirements are met	District CRO will make periodic site visits to ensure compliance	Within 15 days after Pre-Construction Meeting
Dashboard Update	Include project in VDOT's Dashboard prior to initial reimbursement request	At initial reimbursement request, ensure LPA has include project in Dashboard	Project Placed in Dashboard prior to construction and updated every 90 days.
PCES	Update		PCES must be updated every 90 days throughout construction
Project Diary	Ensure daily diary is maintained	Review to ensure adequate / provide support as necessary	Submitted at end of Project for VDOT Maintained Project; Kept on-file for three years for projects maintained by LPA
Materials Notebook	Maintain materials notebook to adequately document all materials on site	Provide assistance as needed to establish; periodically review during inspections	Maintained at Job-site and available for inspection; For projects to be operated by VDOT, a copy of the materials notebook must be submitted prior to project acceptance.
Recovery Act Quality Assurance Checklist	Complete and submit form to VDOT	Review for accuracy and completeness	Submit at end of project as applicable for Recovery Act projects.
Reimbursement Requests	Ensure all items requested are completed and documented; provide appropriate certification language	Review to ensure only eligible items are included	No more than monthly;

Final Project Inspection	Invite VDOT to final punchlist inspection and correct any deficiencies noted	Attend final punchlist inspection and identify major deficiencies;	Prior to final acceptance and final reimbursement payment

13.1.5.8 References

- 23 CFR 635 (non-NHS requirements)
- 23 CFR 637 (NHS requirements)
- FHWA Contract Administration Core Curriculum Participants Manual and Reference Guide
- FHWA Construction Program Management and Inspection Guide http://www.fhwa.dot.gov/construction/cpmi04tc.cfm
- VDOT Construction Manual
- VDOT Inspection Manual
- VDOT Construction Oversight Guide for LAPs
- VDOT Post Construction Manual
- VDOT Post Award Scheduling Guide

Chapter 13.1 – Construction Administration Checklist

These checklists can be found in their entirety in the VDOT on line forms library

CH 13.1 - Construction Administration

Construction administration is the management of all construction activities necessary to ensure the completion of a high quality product meeting all contract specifications, and applicable federal, state, and local laws and regulations. Construction administration is the responsibility of the LPA through its Construction Project Engineer.

SUBMIT	COMPL	F	S-V	S-L	T-A	UCI	Requirement	Reference LAP	Reference Other
	☐	X	--	--			LPA provides full time government employee responsible for the project	13.1.3	
	☐	X	X	--			Significant deviations from Construction Manual and Inspectors Manual identified and documented or prior approval	13.1.3	
	☐	X	X	--			Land-use permit and surety bond obtained	13.1.4.1	
	☐	X	X	X			PCES estimate Updated[1]	13.1.4.2	
	☐	X	X	X			Create Project profile in Dashboard[1]	13.1.4.2	
	☐	X	--	--			Preconstruction meeting held with VDOT Construction Project Monitor, District Civil Rights and others as necessary	13.1.4.3	
	☐	X	*[2]	--			Project schedule & earnings schedule prepared and submitted; includes critical milestones for VDOT participation	13.1.4.4	
	☐	X	X	--			Daily construction diary initiated / maintained throughout project	13.1.5.1	
	☐	X	X	--			Submit Materials Quality Assurance Plan (QAP)	13.1.5.3	
	☐	X	X	--			Submit Field modifications to VDOT Construction Project Monitor	13.1.5.5	

	☐	X	X	X			Submit Reimbursement requests and certify compliance with requirements	13.1.5.6	
	☐	X	X	--			Conduct final inspection with contractor and VDOT staff when necessary		
	☐	X	X	X			Final voucher examined and verified by a qualified independent reviewer or auditor	13.1.5.6	
	☐	X	X	X			Final payment reconciled prior to submittal for reimbursement	13.1.5.6	

[1] Required for projects funded with “formula” funds; NOT required for Revenue Sharing, or Access projects

[2] A formal schedule is not required, however, a list of significant milestones and approximate dates may be required as determined by the VDOT ACE

Appendix 13.1-A

Surety Rider Example

DUAL OBLIGEE RIDER

To be attached to and form a part of contract bond number_____ issued by the _____on behalf of _____

in the amount of_____

Dollars ($ _____) and dated _____

in favor of _____

_____

in consideration of the sum of One Dollar ($1.00), and other good and valuable consideration receipt of which is hereby acknowledged, the Undersigned hereby agree as follows:

VDOT is hereby added to said surety bond as an additional obligee for the purposes of guaranteeing any work associated with the referenced contract performed within VDOT's right of way under the terms of the land use permit for that purpose.

The conditions of this obligation are such that if the said Principal shall in all respects comply with the terms and conditions of said permit(s), and fully meet and perform obligations thereunder in accordance with requirements for permits as set forth in the Land Use Permit Manual in effect at time of permit issuance, and shall satisfactorily complete the work permitted, then this obligation to the Department would be void, otherwise to be and remain in full force and virtue.

The surety bond securing performance on the specified permit may be canceled only upon satisfactory completion of the specified permit, as determined by the VDOT representative.

The surety's obligation to the Department shall be no greater than its obligation to the county, city, or town administering the project, and the amount of the bond is the limit of the surety's obligation to either or both obligees.

Appendix 13.1 – B

Project Oversight Risk Assessment Scoring

The VDOT Project Coordinator may have evaluated and assigned an oversight score for the project during or before project scoping. That score provides an oversight level of Low, Moderate, or High, which may also be applied during construction. However, the Construction Project Monitor can elect to re-evaluate the initial score and assign a new one prior to construction.

The evaluation table is also contained in Appendix 9-C, however this appendix provides detailed construction-specific discussion as it relates to oversight expectations. The oversight levels are based on the potential adverse impact of contract noncompliance and the likelihood that noncompliance may occur. The following table provides a summary of the oversight levels:

Oversight Level	**Impact/Probability**
High (H)	Significant impact on infrastructure due to non-compliance - Significant effects to quality of construction, cost, & schedule; High probability of non-compliance
Moderate (M)	Moderate impact on infrastructure due to non-compliance - Moderate effects to quality of construction, cost, & schedule; Moderate probability of non-compliance
Low (L)	Minimal impact on infrastructure due to non-compliance - Minimal effects to quality of construction, cost, & schedule; Low probability of non-compliance

Oversight levels will be determined by identifying specific elements applicable to the project. Several elements will be considered more important, and thereby "weighted," more heavily than others. Generally, a Federal Oversight project or a project on the National Highway System will require more oversight than one that is state funded. The Department also has less risk on projects that will be maintained by the locality and those projects are weighted lower than a project where VDOT will be maintaining the final product. The amount of experience a locality has in administrating contracts is another factor that will be considered. These elements, and corresponding weighted values, are depicted on the following chart:

Element	Value (factor)	Check Elements That Apply	Total Factor per Element
Federal Oversight	20		
National Highway System	20		
Design-Build/PPTA	20		
Funding			
Federal Funded (non-Transportation Alternatives)	15		
State Funded	10		
Federal Transportation Alternatives (Impacts R/W)	7		
Federal Transportation Alternatives (Off R/W)	1		
Completed Project Maintenance			
State Maintained Project	10		
Locality Maintained Project	2		
Project Category *			
Category I	2		
Category II	5		
Category III, IV, V	10		
Locality Experience Administering Project			
Low Level	15		
Intermediate Level	10		
High Level	5		
Factor Total			

* See the VDOT Post Award Scheduling Guide, Section I, Item #5 (page 13) for project category descriptions

To obtain the project's score, each applicable element is identified and the corresponding value is transferred to the far right column. All values placed in the far right column are totaled to provide a final score or "Factor Total." The level of oversight is established in accordance with the range on the following chart.

Level of Oversight	Range of Factor Total
High (H)	> 45
Moderate (M)	25-55
Low (L)	< 35

This analysis is a basic attempt to achieve the level of oversight needed. On occasion oversight levels may overlap. When the factor total falls within 2 ranges, the oversight level should be established using sound engineering and professional judgment. This could be based upon several considerations, such as, unusually complicated features associated with the project construction; highly sensitive environmental or socio-economic issues, the Project Manager's experience working on similar transportation projects; or, after the contract is awarded, the contractor's experience with similar projects.

Transportation Alternatives projects off the highway rights-of-way are unique and pose a lower level of risk to VDOT. Most likely, these projects will fall in the low range of oversight.

At anytime throughout the duration of the project, the VDOT Construction Engineer may increase or decrease the frequency or intensity of VDOT's oversight, based on the contractor's job performance and the result of previous VDOT compliance reviews. If there is evidence of deficiencies in the inspection, materials testing, documentation, and/or environmental compliance during construction, the level of oversight may be increased. Conversely, if the District gains a higher level of confidence in the locality's project administration, the level of oversight may be reduced. Changes in the oversight level during construction should be well documented and communicated to the Locality.

Project Evaluation Frequency

The frequency of District reviews should be, generally, in accordance to the following chart. A final review is at the completion of construction.

Oversight Level	Frequency of District Reviews
High (H)	Bi-weekly to Monthly
Moderate (M)	Monthly to Quarterly
Low (L)	Randomly; infrequently

The frequency of oversight evaluations (or "site visits") will depend on many different factors, including duration of construction and the complexity of the construction phases. A good general rule for long-duration projects is to attend the monthly progress meeting and perform a short site visit that same day. Special issues brought up during the progress meeting can be evaluated during the site visit. Not every facet of

construction oversight must be reviewed during every evaluation. The oversight reviewer needs to use his/her professional judgment to determine what is most important and what poses the highest potential risk during that particular construction phase. The Locality Project Manager and/or the Construction Manager should be made aware that VDOT's oversight reviews are also intended to provide assistance, where necessary. In that manner, they may help direct you (the oversight reviewer) to the areas in need of most attention.

As previously mentioned, at any time throughout the duration of the project, the VDOT Construction Engineer may increase or decrease the frequency or intensity of VDOT's oversight based on the contractor's job performance and the result of previous VDOT oversight evaluations. If there is evidence of deficiencies in the inspection, materials testing, documentation, and Environmental compliance during construction, the level of oversight should be increased. Also, if the District experiences a higher level of confidence in the locality's inspection/documentation, the level of oversight may be reduced. Again, any changes in the oversight level during construction should be well documented.

Appendix 13.1 – C

Pre-Construction Meeting; Topics of Discussion

Pre-Construction Meeting; Topics of Discussion

Among the subjects to be discussed at the meeting are the following:

1. Contractor's proposed sequence of construction, operating schedules, computation of workday charges, time schedule, and completion date requirements.

2. Work to be sublet, stipulations to be included in the subcontract agreements, insofar as progress of the job and work to be done, Engineer-Contractor relations and responsibility towards subcontractors, authorized representatives.

3. Labor provisions, necessary posters, Engineer's inspection, and investigating procedures with regard to labor requirements.

4. Legal relations and responsibilities; cooperation with utility owners, the public, and other Contractors; licenses and permits in connection with execution of the work, local ordinances.

5. Special requirements and unusual conditions, conflicts and problems anticipated clarification of construction details and Specification requirements, procedures for assessment of time.

6. Coordination and the scheduling of work between the Contractor and the various utility companies.

7. Inspection procedures, notification to the Engineer of material orders, furnishing samples and the time and place of testing and accepting materials, field office, storage and use of materials.

8. Haul road requirements; location and scheduling of bypass construction, crossroad closures and access facilities; general responsibilities with regard to traffic convenience.

9. Employee and public safety, sanitary provisions.

10. Appointment of the project safety officer(s) for administration of the Construction zone safety requirements and procedures.

11. Delegation of authority by the Contractor and the Engineer, lines of communication, equipment and personnel.

12. A list of suppliers should be furnished the Engineer indicating where the Contractor proposes to obtain materials for the project.

13. Pertinent outlines of the Federal Labor Compliance Regulations.

14. Civil Rights and DBE requirements. Review of Form 1273 Requirements for federal-aid

15. Review of requirements for Contractor's notice of intent to file a claim.

16. Environmental concerns to include applicable permits, compliance with environmental laws and Contractor's responsibilities.

17. VDOT and, where applicable, FHWA oversight inspections and the process of identifying and reconciling inspection findings, to specifically include a communications plan.

18. Contract Requirements varying from the VDOT R&B Specifications.

19. Materials Sources, approved lists and submittal of C-25 to VDOT

20. Quality Assurance Plan (template and instructions are located on the LAD external forms site).

21. Off-site Materials Testing / Laboratory Testing, Coordination with VDOT see Table 1 in section 13.2.4.

22. Review of emergency procedures.

23. Any additional federal-aid requirements.

Appendix 13.1 – D

Typical Project Documentation

Project Record Filing System - Locally Administered Federal-aid Projects

1. Project Personnel
2. Correspondence
    a. Contractor
    b. General
3. Weekly record of working days (if contract time is specified).
4. Materials Data:
5. Engineer's Daily Reports
6. Contract Item Pay Quantity Documents
7. Contract Change Orders
8. Extra Work Reports
9. Progress Pay Estimates and Status of Funds
10. Labor Compliance and EEO records
11. Contractor's Payrolls
12. Final Report
13. DBE Records (need a list or reference to a list in CR Chapter)

Appendix 13.1 – E

Construction Oversight / Field Reviews / Evaluations

The following includes a list of construction activities and specific review items, taken from the Inspection Manual that should, typically, be included during oversight evaluation. It is not expected that every item, or even every construction activity, be reviewed each time an oversight evaluation is made. Instead, the reviewer should focus each evaluation on the specific needs during that phase of work or on questions the ACE designee may have or on issues that have been brought up during progress meetings. Some items will not be applicable unless the reviewer is on-site during those events. If the VDOT ACE designee determines that it is in VDOT's interest to be on-site during specific events, early coordination between VDOT and the Locality is critical and those discussions need to be made early in the construction process, preferably before construction begins.

Project Documentation

Spot check project documentation to see that the records are properly maintained in accordance with this Manual, contract documents, or another pre-approved process.

Materials

Chapter 13.2 provides a description of materials requirements for locally administered projects. While materials acceptance methods and processes outlined in the Materials Manual of Instructions are required for federal aid projects and any project to be maintained by VDOT and recommended for all other locally administered projects, the locality may submit alternative methods and processes for approval.

With the submission of each project reimbursement request to the Department, the locality is to provide a certification (Appendix 13.1.F) that all of the Material used on the project during the pay period meets applicable contract requirements and that all required materials documentation is in place.

The VDOT Project Monitor will conduct periodic reviews of the locality's material acceptance compliance for the contract work, as necessary to review compliance with the contract documents. These reviews may include confirmation of materials inspectors' certifications, confirmation of number and frequency of materials test performed, review of materials' storage and handling procedures, verification that the materials used are from an approved source, etc, in accordance with the requirements of this Chapter 13.2 of this Manual. The Department's primary focus during its review will be on verifying that the locality is maintaining adequate documentation of material acceptance and demonstrates that they are complying with the project's contract

requirements by tracking quantities and testing frequencies in the materials notebook. These reviews will be conducted in accordance with the appropriate project oversight level throughout the duration of the project.

For federal-aid projects and any project that will be maintained by VDOT, the Department requires localities and their contractors to use materials available on VDOT pre-approved list or which are accepted in accordance with accepted practices. Should the locality wish to use materials not on an approved list, the Department will assist the locality to obtain approval for the material. However, if the locality uses materials not on an approved list, it may take up to a year to evaluate for approval. At the end of the evaluation the product may not be approved. The Department reserves the right to apply charges to the project for such approval, when those additional activities will not result in an additional benefit to the Department (i.e. results in a new, approved material that may be utilized by the Department in the future).

The District Construction Engineer, in consultation with the District Materials Engineer and the Locality, should identify Locality and VDOT roles and responsibilities for key activities associated with the materials quality assurance programs. On certain occasions it may be more time and cost effective to use VDOT personnel or VDOT contractors to perform some functions. This decision should be based on mutual needs, available resources, the project risk assessment, and cost or time benefits derived from such an arrangement. These arrangements should be documented within the Project Administration Agreement or within a Project Administration Agreement Amendment.

Roadway Inspections Checklist

Clearing and Grubbing

- Visually review for signs that clearing was, or is being, performed properly;
- Look for obvious signs that the clearing took place outside the right-of-way or construction easements;
- Review documentations that the cleared material is disposed of in accordance with the specifications (i.e. disposal site approval documentation).

Drainage

- Confirm that there is documentation indicating that the subgrade was approved prior

to the placement of bedding material;

- Review documentation that the material for the construction of pipe, end sections, spill-outs, reinforcing steel, grates, frames, bedding material, drainage structures, endwalls, and other incidental items are on VDOT's approved products lists, have been tested or certified, and / or from an approved source;
- Review for sufficient compaction reports on various drainage structures;
- Visually review installed structures for obvious deficiencies.
- Verify pipe inspections are performed according to VTM 123 and the contract documents. Documentation should be sent to the Construction Project Monitor for submission to the Central Office Soils lab for retention if VDOT maintained, or stored locally if maintained by locality or kept in project records.

Earthwork

- Review site work for indications that proper environmental controls are in place;
- Review that minor structure excavation has been measured, documented, and approved;
- Review for documentation indicating that the roadway earthwork has been inspected for conformity with the specified tolerances for line, grade, typical section, and cross section
- Review for documentation that the density testing requirements and frequencies are being met.
- Review for documentation that indicates that the depth of fill embankment layers as per specifications
- Review the disturbed areas to ensure seeding in accordance to specification
- Review undercut of unsuitable material documentation that the approval, excavation, and backfill is performed in accordance with contract documents
- Review for evidence that temporary seeding is provided as soon as practical in accordance with the contract documents.

Base Course

- Check that the material is placed on a prepared and approved subgrade (if present during placement), and that an approved mechanical spreader is used when

practical.

- Check for documentation that the depth of the material has been placed in accordance with the contract documents
- Confirm that the minimum density testing requirements and frequencies are being met.
- Confirm Approved Mix design is used
- Verify Collection of Delivery Tickets and weigh person's daily summary (TL-102A) forms

Asphalt Concrete Pavement

- Check for documentation that shows that the control strip and test section were constructed for each lift of each course and that the required number of tests were taken; check that cores/plugs were obtained and tested to verify an acceptable control strip
- Check for records that density testing requirements and frequencies are being met;
- Verify that depth tests (cores) were performed and that they meet plan requirements
- Visually inspect for surface irregularities.
- Confirm Approved Mix design is used
- Verify Collection of Delivery Tickets and weigh person's daily summary (TL-102A) forms

Structural Inspection

- VDOT and the Locality Project Manager should coordinate prior to construction to determine the need for VDOT staff to be on-site during activities associated with the construction of major structures (i.e. major pours).
- Check pile driving records –look for documentation on load test piles; check documentation that piles driven to the required bearing, including center of gravity check
- Review documentation for indication that piles, footings, piers, abutments, girders, prestressed concrete beams and superstructure elements, etc. have been inspected prior to placement of concrete. To include off-site Quality Assurance inspection and testing related to Structural Steel girders, poles, sign structures or prestressed

concrete fabrication.

- Check visual appearance of completed concrete pours or structures - look for patterns that might indicate a defective pour or obvious signs of irregularities;
- Review concrete test reports to ascertain if adequate frequency and results have been met.
- If on site during concrete pour, perform a cursory check for proper placement of concrete and/or reinforcing steel.

Miscellaneous

Pavement Markings: Visual review that final placement is in accordance with contract requirements. Review collection of Contractor's Daily Log and Quality Control Report for Pavement Markings (C-85).

Signalization/Signs: Visually review final installation for proper placement per contract requirements.

APPENDIX 13.1 - F

Recommended Language/Format to be submitted with LPA requests for reimbursement

MEMORANDUM

TO: VDOT Construction Project Coordinator / Area Construction Engineer

FROM: Local Government Contact; Project Manager; or Responsible Charge Engineer

RE: Reimbursement Request

In accordance with the requirements of the Local Public Agency Manual and federal and state requirements, and contract requirements for (Project # _____, UPC _____, Project Name) the following documentation is submitted:

- *(The Locality) hereby certifies that all Civil Rights, Equal Opportunity, and DBE documentation has been submitted by the contractor (a completed checklist is attached);*
- *(The Locality) hereby certifies that all applicable Environmental Controls are in place and are being maintained by the contractor;*
- *(The Locality) hereby certifies that all materials used on the project during the pay period meet FHWA and VDOT requirements, as applicable to federal aid and VDOT maintained projects. (Note: Materials certification is required prior to installation.)*
- *(The Locality) hereby certifies that all iron and steel fabricated materials used on the project during the pay period meet Buy America requirements (as applicable for federal aid projects);*
- *(The Locality) hereby certifies that that the invoice is accurate and that the items being requested for payment have been installed on the project;*
- *An updated progress schedule (where required by the contract documents) showing the items completed during the pay period;*
- *Documentation submitted by the contractor when he requested payment from the Locality;*
- *A breakdown of current charges relative to materials on-hand, any price adjustments, and change orders, where applicable.*

Questions regarding this correspondence should be directed to (Local Contact) at (phone number).

CHAPTER 13.2 – MATERIALS QUALITY ASSURANCE

SECTION / TOPIC

APPENDICES

13.2.1 Introduction

The topics addressed in this chapter include source of materials submissions, material certifications for inspectors/technicians, laboratory qualifications, Quality Assurance (QA) / Quality Control (QC) requirements, Independent Assurance (IA) requirements for NHS projects, Materials Notebook usage, and materials certification (TL -131LAP).

Materials testing and documentation is the responsibility of the LPA through its Project Manager (PM) and the Project Construction Engineer (PCE). Required inspections and tests shall comply with this guide, Appendix 13.2-G, contract requirements, approved plans, VDOT Road and Bridge Specifications, VDOT Materials Division Manual of Instructions (MOI), as necessary.

13.2.1.1 Applicability

Applicability		
Federal-aid	*State-aid / VDOT Maintained*	*State-aid / LPA Maintained*
*X**	*X***	*N/A*

* Federal-aid projects on the NHS may have additional requirements not specifically identified in this Manual and additional requirements will be identified during preliminary planning and the development of the Project Administration Agreement.

** The requirements of this chapter apply to VDOT-funded projects which will be maintained by VDOT and any federal-aid project.

13.2.2 Material Approvals

Materials Acceptance Must Meet VDOT Standards		
Federal-aid	*State-aid / VDOT Maintained*	*State-aid / LPA Maintained*
X	*X*	*N/A*

For federal-aid projects or projects to be maintained by VDOT, within seven (7) business days after the preconstruction conference but no later than two (2) weeks prior to using materials on the project, the LPA is required to submit documentation of the source of materials to the Construction Project Monitor (CPM), including the source of each material to be incorporated into the project and the acceptance method that will be used for the material. A VDOT Form C-25 (Source of Materials) must be used to meet this requirement. A sample form is located in Appendix 13.2 – C

Acceptance methods are found in Appendix 13.2 - C, D and G to this Chapter, the VDOT Road and Bridge Specifications, and the VDOT Materials Division Manual of Instructions.

For federal-aid projects or projects to be maintained by VDOT, project materials and materials sources must be pre-approved by VDOT. ***Where a product or source is not on a VDOT approved products list or has not been previously approved, the LPA may submit a request for approval to the ACE, so that it may be evaluated and approved by VDOT.*** VDOT will attempt to process these requests in a timely manner, however it may take up to one year to evaluate and approve the request. At the end of the evaluation the source or product may not be approved. Manufacturer certification that materials meet specifications may also be accepted for some pre-manufactured materials. The LPA should recognize that approvals may take a significant amount of time depending on the product, material source, and availability of VDOT staff; therefore, use of pre-approved materials and sources is highly encouraged. Where this is not possible, early coordination and accounting for VDOT evaluation time in the project schedule is paramount.

VDOT Responsibilities:

- *The CPM, with the Materials QA section support will review the submitted Source of materials document C-25 (or equivalent) to ensure proper testing of VDOT approved sources have been identified and that proper acceptance methods are listed. Where discrepancies are found, the CPM will immediately contact the LPA to discuss corrective actions.*

13.2.3 Source / Plant Inspections

Source inspection is acceptance testing of manufactured and/or prefabricated materials at locations other than the job site. Materials requiring source inspection will be identified on the C-25. **The LPA must identify if they are requesting that VDOT perform source inspections for those materials.** Source inspections that are necessary for all projects and performed by the department through Plant QA programs are identified in Table 1 below. These inspections are performed by the structures sections, central office physical testing laboratory or the district materials sections. Structural steel, metal poles and pre-stressed concrete elements must be fabricated in a shop certified by the American Institute of Steel Construction (AISC) or the Prestressed Concrete Institute (PCI) respectively where they are inspected to AASHTO design specifications and codes. These shop inspections are provided by an inspection agency using certified inspectors under contract to VDOT. Inspection fees are charged to the project. Laminated Bearing pads are tested in the central office physical lab. The testing is also charged to the project. Plant QA programs handled by the district materials sections for asphalt and central mix aggregate are performed on a system basis and there is a testing cost charged to the project. **The LPA project manager is responsible for ensuring that the contractor informs the asphalt and aggregate suppliers that their project will be handled the same as a VDOT project that requires testing and submission of TL-102A for documentation**. The QA programs for precast concrete, concrete pipe, metal pipe, plastic pipe and miscellaneous suppliers

are handled by the central office QA section and there is no charge to the project for this inspection.

Table 1 - Testing of Materials by the Department for Off-Site Plant QA Programs

Item	Responsibility
Prestressed Concrete Structural Elements[1] (beams, girders (AASHTO and Bulb-T), and piles	C. O.[2] Materials - Structures Section
Structural Steel Elements[1] (beams and Girders)	C. O. Materials - Structures Section
Metal Traffic Signal poles, Light poles and Arms	Central Office Materials - Structures Section
Laminated Bridge Bearing Pads	C.O. Materials – Physical Lab
Precast Concrete Structures[3]	C.O. Materials – Quality Assurance Section – Approved list #34
Pipe (concrete, steel, aluminum and high Density polyethylene) for culverts, storm Drains and Underdrains[3]	C.O. Materials – Quality Assurance Section – Approved list #25, #26 and #42
Asphalt Concrete QA program[3]	District Materials Section
Aggregate CMA QA program[3]	District Materials Section
Hydraulic Cement Concrete Mix Designs	District Materials Section
Hydraulic Cement Concrete Plant and Truck Inspections	National Ready Mix Concrete Association (NRMCA) Plant and Truck Certification required

[1] Structural Steel and Prestressed Concrete Elements must either have a Quality Assurance Inspection performed by AWS certified inspector or PCI level II inspector according to VDOT specifications. VDOT has inspection agencies on call to provide these inspections at over 100 fabrication locations around the United States. VDOT structures section will contract for this service and pass the inspection cost on to the project. The structures section is staffed with professional staff to assist with all fabrication Requests For Information (RFI) and decisions related to structural welding and prestressed concrete codes.

[2] C.O. = Central Office Materials

[3] Asphalt Concrete, Aggregates, Precast Concrete Structures and Pipe are accepted at the plant under a QA program. There is a testing charge associated with the asphalt and aggregate programs

for Independent Assurance and verification. The plant must be informed that this local project will be treated exactly the same as a VDOT project.

Where possible, VDOT will incorporate other plant inspections not contained in Table 1 within their normal plant approval inspection schedule; these inspections are not charged directly to the project budget. However, when project requirements necessitate additional plant inspections, resources necessary to perform those inspections may be charged to the project budget. VDOT will provide the LPA with an estimated cost after submittal of the C-25.

The inspection of project-specific fabricated items will typically be accomplished by a consultant to the LPA or the VDOT Materials QA or Structures section staff. If the LPA chooses to use their own consultant services, **the LPA must submit the inspectors' qualifications along with the C-25 to the CPM for review and approval.** The LPA may request that VDOT perform these inspections. The LPA must make this request when submitting their C-25 and VDOT will provide a cost estimate to perform the inspection. Where a request of this nature is made, the LPA must provide the name of the intended fabricator and provide two copies of the approved shop drawings.

Common highway construction items and materials which are inspected at the source by qualified and certified inspectors are listed in Table 1. The inspection fee is charged to the project. Other highway construction items such as pavement marking materials, road delineators, sign sheeting materials and structural steel coatings can be accepted through VDOT approved QA programs and lists.

VDOT Responsibilities

- *The VDOT Construction Project Monitor will submit any LPA source inspector qualifications to the appropriate staff in the Materials QA section for review and approval.*
- *The VDOT Construction Project Monitor will submit any LPA requests for VDOT to perform source testing to the Materials QA section for review and approval.*
- *Approvals and/or comments associated with inspector qualifications,*

VDOT source testing along with associated a cost estimate to perform inspection(s) will be prepared and will be submitted to the LPA, within seven (7) business days of the initial LPA request.

13.2.4 Materials Acceptance/Quality Assurance Technicians

Materials technicians are staff employed by or contracted by the LPA who perform on-site materials testing including, but not limited to, soil density, moisture, asphalt density, air content of concrete, slump, and other required materials field tests. Quality control technicians are employed by the contractor's production forces to perform quality control testing. Quality assurance technicians must be a third party unaffiliated with the contractor. Quality Assurance (QA) technicians perform acceptance testing, independent assurance (IA) testing and verification sampling and testing (VST). The technician performing IA test must be a different individual from the technician performing acceptance or quality control testing. These Acceptance/QA technicians are typically employed by a separate Construction Engineering Inspection (CEI) consultant, or may be employed by the LPA. Materials testing technicians must be qualified in accordance with the VDOT Road & Bridge specifications.

Prior to beginning work, the LPA or the contractor is required to prepare a list of all materials certification requirements necessary for the duration of the project. At this point individual technicians are not required to be identified; however, the name, qualifications, and work performed for each materials technician that subsequently performs on-site inspections must be recorded in a readily accessible single file and maintained in the project records. This list must be kept in the project files and will be submitted to VDOT when construction is complete. The list must be available for inspection by VDOT or FHWA during construction.

13.2.5 Qualified Laboratories

All sampling and testing shall be performed by a qualified laboratory that is either:

A. Accredited in the applicable AASHTO procedures by the AASHTO Accreditation Program (AAP): or

B. Complies with the requirements of AASHTO R18 (18th edition) for those tests to be performed and compliance with R18 for those tests not covered by AASHTO Material Reference Laboratory (AMRL): or

C. A laboratory approved by VDOT's Materials Division or other accreditation program meeting the requirements of R18.

Laboratory technicians shall be required to have the appropriate material testing certifications, some of which can be found in 13.2.5. If a VDOT certification program does not exist, a training and evaluation record from an AASHTO accreditation program can be substituted.

13.2.6 Materials Notebook

When construction begins, a materials notebook must be initiated. This notebook must be a separate document and not part of the projects Daily Work Reports or Diary, this will allow for easier completion and reconciliation. It is recommended that a TL-142 (available on the Department's website) be used for this purpose. As materials are accepted within the project, the quantity of each material and the method of measurement shall also be documented within the materials notebook. The Materials Notebook is also used to furnish the list of estimated quantities together with the specification designation and test report for each material placed on the project. The notebook must contain a full description and all pertinent information on all materials used in the project, whether covered by test report, inspection report, certification, mill analysis, catalog cuts, quality assurance program, approved list or visual inspection. The "Source of Materials Letter" (C-25 or equivalent) is the reference document for the acceptance method of materials. The information contained in the materials notebook is used to support final certification to VDOT that all project materials were accepted and placed in accordance with applicable contract provisions and specifications and can be used to reconcile materials payments at the end of the project.

The notebook must be kept up-to-date at all times and must be made available to VDOT or FHWA personnel upon request during normal business hours. VDOT's Materials Notebook Resource Document provides additional guidance on the upkeep of a materials notebook.

VDOT uses the TL-142 as the project materials notebook and it is available for the LPA's use. The TL-142 notebook template which includes instructions for completing the notebook is available from VDOT's on-line forms website, here.

At the end of the project and immediately after final project acceptance, a copy of the completed notebook shall be provided to VDOT for any project which will be maintained by VDOT. VDOT District Materials Section will retain the completed notebook for three years after financial closeout of the project. For projects which will be maintained by the LPA, the completed notebook must be retained in the project records for three years after financial closeout of the project.

VDOT Responsibilities:

- *The VDOT Construction Project Monitor shall assist the LPA with the establishment of a materials notebook, as necessary, depending on the LPA's abilities.*
- *During routine site inspections, the VDOT Construction Project Monitor is expected to periodically inspect the materials notebook to ensure that it meets expectations and adequately documents the quantity and quality of all materials used on the project.*
- *Where deficiencies are noted, the VDOT Construction Project Monitor will provide support to correct the deficiencies and will also notify the LPA in writing of such deficiencies and a timeline for corrective action. Typically, corrective actions are expected within thirty (30) days.*

13.2.7 Testing

It is the LPA's responsibility to verify that field and laboratory sampling and testing are performed using the proper procedures and at frequencies specified in the minimum requirements outlined in the contract specifications, this Chapter Appendix 13.2 G, the current VDOT Materials Manual of Instructions (MOI), and other documents specified in the Contract or approved by the Department, as may be applicable to the project.

For materials identified in the contract or Road and Bridge Specifications as being subject to acceptance with a price adjustment, standard VDOT price adjustment procedures may be identified in the contract and may be followed based upon actual field quantities placed and prices stated in contract. This data can be obtained from VDOT District Materials office, upon request.

Material failures shall be handled in accordance with the contract requirements, the VDOT Road & Bridge Specifications, and the Materials Manual of Instruction. Duly qualified VDOT staff, such as the District Materials Engineer, will make the final determination with regard to disposition of materials on VDOT maintained roadways.

13.2.8 Non-Statistical Acceptance of Small Quantities of Materials

The Department may elect to allow the LPA 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. Structural Concrete will not be considered under the small quantity definition (MOI Section 207.02).

An item can be accepted as a small quantity if the proposed project quantity for a specific item is less than one sublot or one-half of a sublot for similar materials. Factors that the Department will consider prior to use of small quantity acceptance are:

A. Has the material been previously approved?

B. Is the material certified?

C. Is there a current mix design or reference design?

D. Has it been tested with satisfactory results within one year?

E. Is the material structurally significant?

Small quantity acceptance may be accomplished by visual, certification, or other 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 PM 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 LPA.

13.2.9 Records

Materials Notebook

A materials notebook must be maintained in accordance with this chapter.

Materials Test Reports

For federal-aid projects or any project which will be maintained by VDOT, the LPA (consultant or contractor) shall record individual reports for all materials tests, meeting the requirements of AASHTO R18 (Establishing and implementing a quality management system for construction materials testing laboratories), VDOT's Construction Manual, and the MOI (Chapter 8 Reports and Forms), as applicable.

Sign Inventory

For all projects which will be maintained by VDOT, the LPA shall provide a list of all installed signs and include location, installation date, brand, and any other pertinent information.

Manufacturer's Certifications / Local Tracking Numbers

For products that are not accepted through an acceptance test or are on an approved materials / products list, VDOT accepts the material by manufacturer's certification. The certification is provided as a statement, signed by an officer of the supplier/manufacturer, that the material meets the applicable specifications, special provisions, approved drawings, other job requirements and/or Road and Bridge specifications. The certification is supported and accompanied by specific details such as project number, specification designation and bid item number. In addition, the copy of the certificate accompanying the material to the project site will include a shipping document, manifest, shipping list, and invoice. Appendix 13.2-D provides a list of materials typically accepted in this manner.

LPAs must inform manufacturers of this requirement and obtain a copy of the materials certification and confirm the certification's compliance with contract requirements upon receipt of the materials/products. The LPA will maintain a copy of all materials certifications on the job site and will become a part of the project records that will be maintained by the LPA or submitted to VDOT, as necessary.

In order to track and verify products that are accepted according to this process, the LPA is required to establish a "Locality Tracking" (LT) number for each materials/product used on a federal aid project or project to be maintained by VDOT. The nomenclature for this tracking system shall be the current year followed by the UPC and LT Number(s) in sequential order (i.e. 08-85914-01), as each material is accepted. This will enable both the Locality and Department to clearly identify and review those items that require a LT Number to ensure the materials meet the requirements specified in the Contract Documents for the particular project(s).

This information is required to be recorded on an inventory list containing the name of the product, the manufacturer, and the supplier. A template Database has been developed by the Department which captures such

information for VDOT Administered Projects. This information will become a component of the materials notebook and project records.

13.2.10 Independent Assurance Sampling and Testing (IAST)

In accordance with 23 CFR 637.205, an Independent Assurance Program, to include independent verification testing, is required for any Federal-aid construction project on the NHS. It is also a VDOT requirement for any project that is maintained by VDOT. When an LPA has been authorized to administer a federal-aid project on the NHS or on a Primary Route that will be maintained by VDOT, the LPA will act as VDOT's designated agent and shall be responsible for all IA testing for the project. The LPA will be required to submit a project-specific quality assurance plan that includes how IAST will be accomplished.

The frequency of independent assurance sampling and testing shall be in accordance with the VDOT Materials Manual of Instructions (MOI), if not otherwise stated in this manual. Appendix 13.2-G of this chapter provides independent assurance sampling frequencies for many materials. Appendix 13.2-E, identifies testing tolerances which must be met for IA samples. Where tolerances are not met, corrective actions shall be taken.

13.2.11 TL–131LAP Materials Certification

A TL-131LAP (Certification of Materials) shall be completed by the LPA for all federal-aid projects and projects to be maintained by VDOT. A sample TL-131LAP form can be found in Appendix 13.2-F. The TL-131LAP is used to certify that all materials used on the project have been placed and tested in reasonable accordance with contract specifications. When applicable, it is also used to certify that proper IA testing was completed and that the results of the IA testing compared favorably with the QA/QC testing, when necessary. It also certifies that all test reports have been issued and the

location that the reports are stored. The form must include failed materials and corrective actions taken, including pay adjustments. This form must be completed after construction is finished but prior to final inspection and acceptance by VDOT. It will be addressed to the VDOT District Administrator provided to the VDOT ACE for review and verification who will forward it to the District Materials Engineer for final verification/review. For federal-oversight projects, this form is forwarded to the FHWA Division Office.

13.2.12 Miscellaneous References

- VDOT Construction Manual
- VDOT Road and Bridge Specifications
- VDOT Materials Manual of Instructions:
- http://www.virginiadot.org/business/resources/bu-mat-MD299-07.pdf
- VDOT Forms
- Source of Materials Resource Document
- Materials Notebook Resource Document

Chapter 13.2 Materials Quality Assurance Checklist

These checklists can be found in their entirety in the VDOT on line forms library

CH 13.2 - Materials Quality Assurance

Materials testing and documentation is the responsibility of the LPA through its Project Manager (PM) and the Project Construction Engineer (PCE). Required inspections and tests shall comply with this guide, contract requirements, approved plans, VDOT Road and Bridge Specifications, VDOT Materials Division Manual of Instructions (MOI), as necessary.

SUBMIT	COMPL	F	S-V	S-L	T-A	UCI	Requirement	Reference LAP	Reference Other
	☐	X	X	--			Develop and Submit Quality Assurance Plan to include Independent Assurance Sampling and Testing as required	13.1.5.3 13.2.3 13.2.11	23CFR637.205
	☐	X	X	--			Source of materials documentation (C-25 or equivalent)	13.2.3	
	☐	X	X	--			Identify need for VDOT to perform source/plant inspections (fees may apply)	13.2.4 Appx 13.2 B-1	
	☐	X	X	--			Certified inspectors records maintained	13.2.5	
	☐	X	X	--			Materials notebook initiated and maintained throughout project	13.2.7 13.2.10	23CFR635.123
	☐	X	X	--			Materials test reports maintained	13.2.10	
	☐	X	X	--			Sign inventory created and submitted	13.2.10	
	☐	X	X	--			Manufacturers Certifications and Local tracking numbers established for materials accepted by manufacturer certification	13.2.10	
	☐	X	X	--			Independent assurance plan developed and samples collected for NHS projects and projects on Primary Routes	13.2.11	23CFR637.205
	☐	X	X	--			Complete and maintain TL-131 Materials Certification	13.2.12	

Appendix 13.2 – A
Definitions

- Acceptance Testing (AT) – Sampling, testing, and the assessment of test results to determine whether or not the quality of produced material or construction is acceptable in terms of the specifications. Acceptance tests are compared to the specifications for compliance with material or construction specification limits. They may be the average of several tests as is the case in testing performed on a lot/sublot basis, rather than individual sample results. The acceptance tests may be one of the quality control tests, but should be considered differently.

- Hold Point – Mandatory verification points identified within the Contract, QA/QC Plan, and/or LAP manual beyond which work cannot proceed until mandatory verification is performed and a written release is granted by the Department.

- Independent Assurance (IA) – A management tool that requires an independent party, not directly responsible for quality control or acceptance testing, to provide an independent assessment of the product and/or the reliability of test results obtained from the quality control or acceptance testing. The independent party requirement may be satisfied through the use of different CEI consultants or different individuals within one or more of the CEI firms, the LAP, or VDOT. The results of independent assurance tests are not to be used as a basis of product acceptance. Independent assurance samples are used to evaluate the accuracy of acceptance sampling and testing, operations and equipment. Independent assurance sampling and testing is generally performed on split samples to eliminate variability of results that would be expected from testing different samples. The results are to be compared with the results from the acceptance test performed on the split sample to ensure those test results are reasonable. The IA results are not compared to the specification limits.

- Quality Assurance (QA) – All those planned and systematic actions necessary to provide confidence that a product or service will satisfy given requirements for quality. It is the process of determining the accuracy of sampling and testing results by examining the data and/or providing objective evidence to verify the quality control sampling and testing which is used in the acceptance decision.

- Quality Control (QC) – also called “process control” are those actions and considerations necessary to assess production and construction processes so as to control the level of quality of the end product. This concept of quality control includes sampling and testing to monitor the process in addition to acceptance sampling and testing. Quality control testing and monitoring may be done on various processes from the beginning until the final step where the acceptance sample is the last stage of quality control. It should be a formalized process to ensure compliance with specifications when acceptance testing is performed. Quality control demands that the process be displayed and updated on a continuing basis. Quality Control Charts are valuable tools in demonstrating compliance to specifications.

- Verification Sampling and Testing (VST) - All sampling and testing performed to validate the quality of the product. The sample is taken independently from QC or IA testing (including equipment and personnel) and the result is compared to the specification. VST is performed to validate the sampling and testing program.

Appendix 13.2 – B
Summary of Requirements Table & Regulatory References

Task/Submittal File Documentation	*LPA Responsibility*	*VDOT Responsibility*	***Submittal Timing / Recordkeeping Reqts***
• Project QAP – if LPA has developed their own	Submit to VDOT P.C.	Review / Approve with PS&E	Prior to PS&E; typically during final plan review; Maintain with Project Records
• C-25 (Source of Materials)	Prepare / ensure only approved products / sources listed	Review and approve within 10 business days;	Within 7 days after Pre-Construction meeting but no later than 2 weeks prior to using materials on the project
• Request for Source Inspection for manufactured materials at locations other than job site	Provide Document on C-25	Review and approve within 10 business days; provide cost estimate	With the C-25
• Inspector Qualifications for fabricated Items or Request that VDOT perform inspection	Provide Inspector qualifications or details on fabricated items	Review and approve within 10 business days; provide cost estimate	With the C-25
• Materials Notebook	Maintain materials notebook to adequately document all materials on site	Provide assistance as needed to establish; periodically review during inspections	Maintained at Job-site and available for inspection; For LPA's operating their own highway system – materials notebook to be maintained and available for inspection 3 years after financial closure of project; For projects to be operated by VDOT, a copy of the materials notebook must be submitted prior to project acceptance.
• Materials Acceptance Technician Records	Document the names and qualifications of all testing technicians	Review prior to final acceptance	Submitted with Materials Notebook
• TL – 131 (LPA Materials Certification)	Submit final certification of materials used on site	N/A	Prior to project acceptance / after final inspection

Regulatory References

- 23 CFR 635 (non–NHS) Requirements)
- 23 CFR 637 (NHS requirements)

Appendix 13.2 – C

C-25 Example

VIRGINIA DEPARTMENT OF TRANSPORTATION
SOURCE OF MATERIALS

SUBMITTED _____

PROJECT NUMBER EN97-080-115, C502 (UPC 103495) CONTRACT ID. NO. Hanging Rock Trail

PROJECT LOCATION 1.27 Mi. E Rte 795 DISTRICT Salem COUNTY Roanoke

PRIME CONTRACTOR with ADDRESS	SUBCONTRACTOR with ADDRESS	NAME and TELEPHONE NO. of CONTACT PERSON
Joe Smith		Joe Smith
4321 Expansion Drive		804-555-9999
Richmond, VA 231219		

ITEM NO.	SPEC. NO.	ITEM DESCRIPTION	MANUFACTURER and/or SUPPLIER	COMPLETE ADDRESS	VDOT USE INSP/TEST BY:
27505	303	Temporary Silt Fence	A.H. Harris	3535 Brandon Ave. Roanoke, VA. 24018	VDOT Supplier QA Approved List 44 – tested material
		Structural Steel Plate Girder Material Shear Studs	Nelson Stud Welding	7900 West Ridge Rd Elyria, OH 44036	Approved List 15
64110	403	Steel Piles, 12”	Skyline Steel	7426 Alban Station Springfield VA 22150	LT Number Required
		4” N 12 HDPE Pipe	ADS	510 Factory Street Buena Vista VA 24416	Approved List 42
22501	242	1047-6-11 Class 3 Woven Wire	Stephens Pipe and Steel	2224 HWY 619 Russell Springs KY 42642	Approved List 69
50204	700	6” X 8” Wood Post Pressure Treated	Acme Wood Preserving	PO Box 1717 Princeton WV 24740	Approved List 45
00596	302	Precast EW-12 and Precast Items	Permatile Concrete	260 Shanks Road Blountville TN 37617	VDOT Precast QA Program Approved List 34
13310	505	Guardrail Terminal GR-6 NCHRP 350	Gregory Industries	4100 13th St Canton OH 44708	Approved List 12 and L&D NCHRP 350 list
16242	308 & 309	Aggregate Base Material 21B	Luck Stone Corporation	Po Box 687 Keswick VA 22902	Culpeper Materials will perform plant testing when requested by LPA.

1126	302	Concrete Pipe	Hanson Pipe and Products	2725 Roanoke Ave Roanoke VA 24105	VDOT Concrete Pipe Program Approved List 26
40161	520	8",12",16" DI Water Main 12 " sanitary Sewer Pipe	Consolidated Pipe and Supply	225 11th St Roanoke VA 24013	LT Number Required
65013 60404	404	Class A3, A4 Concrete	Boxley Concrete	15580 Lynchburg Turnpike Roanoke VA 24064	Approved Mix Design Salem Materials Cylinders to be made by locality or their representative.
10612 10636	315	Asphalt Concrete TY BM-25.OA, SM-9.5D	L. H. Sawyer Paving Company	2101 Salem Industrial Drive Salem VA 24153	Approved Mix Design Salem Materials will perform plant testing when requested by LPA.
27250	603	Lime	Rockydale Quarries	4754 Old Rocky Mount Road Roanoke VA 24019	Approved List 6
24505	ATTD	Sign Panel	Interstate Highways	7415 Lindesy Road Little Rock AK 72206	LT Number Required
51180	703	Electrical and Signalization Items	Atlantic Technical Sales	14555 Lee Road Chantilly VA 20151	LT Number Required
51347	700	Signal Poles and Mast Arms	Atlantic Technical Sales	14555 Lee Road Chantilly VA 20151	Request Inspection from C.O. Structures section.
68125	407	Structural Steel Rolled Beams	Hirschfeld Industries Bridge	Po Box 20888 Greensboro NC 27420	Request Inspection from C.O. Structures section
68100	406 & 412	Reinforcing Steel	Transcon Supply	2565 John Wayland Highway Harrisonburg VA 22803	Accepted on Manufactures Certification
61115	405	Prestressed Concrete Bulb T Girders	Bayshore Concrete Products	Cape Charles VA	Request Inspection from C.O. Structures section

Items listed are for materials quality acceptance and do not include contract requirements such as BUY AMERICIA

Appendix 13.2 – D

List of Products Requiring LT

LT item	Required Documentation
Anchor Bolts for Str. Steel Plate Girder ASTM A709M	Mill reports, Galv. Cert
Anchor Bolts, Nuts & Washers	Cert. of Conformance or Mill reports, Galv. Cert
Bolts ASTM A 307 General use	Mill report, Galvanization Certification
High strength bolts A325, A449, A490	Mill reports, Galv. Cert, (Rotational Capacity), field testing
Fabricated Aluminum Structures	Shop inspected
Bend, Branch, Plug or Cap, Reducer	Cert and or approved catalog cuts
Blow-off Valve & Box	Cert and or approved catalog cuts
Bridge Incidentals Fender System (Bolts)	Mill reports
Cable Terminal Enclosure CTE-2 Ty. C	Cert and or approved catalog cuts
Conduit Bored	Cert and or approved catalog cuts
Conduit Supports	Cert, mill report
Control Center CCW-1	Cert and or approved catalog cuts
Deflection/Expansion Fittings	Cert and or approved catalog cuts
DI Sanitary Sewer Pipe	Cert and or approved catalog cuts
DI Water Main	Cert and or approved catalog cuts
Elastomeric Expansion Dam	Independent Test data for rubber, Mill report steel
Elastic Inclusion	Cert and analysis
Elastomeric Bearing Pads	Test by CO Materials – 2 pads per design
Expansion Plates	Mill reports
F. R. P. Jacket	Cert, Physical analysis
Fire Hydrant	Cert and or approved catalog cuts
Fixed Bollard, Hinged Bollard	Certification
Gabions	Certification, catalog cuts
Galvanized Pyramid Trash Rack	Cert, mill, galv cert
Galvanized Steel Channels	Cert, mill report, galv cert
Galvanized Swedge Bolt, Nut, Plate Washer	Mill reports, Galv. Cert
Gas Main	Cert and or approved catalog cuts
Gas Main Steel	Cert and or approved catalog cuts
Gas Service Line	Cert and or approved catalog cuts
Handrail	Shop inspected
HDG Steel Plate	Mill report, Galv cert
Hydro Control Feature	Certification
Impact Attenuator	Certification

Lighting Pole (Bases)	Cert, mill report
Lumi Trak System O/H 1	Cert, Catalog Cuts
Luminaire H.P.S	Cert and or approved catalog cuts
Magnetic Detector Amplifier	Cert and or approved catalog cuts
Magnetic Detector Sensing Element TD-2	Cert and or approved catalog cuts
Metal Pipe Steel Sleeve	Cert, mill report
O/H Sign Structure Anchor Bolts	Cert & Mill report & galvanization cert.
Overlay Sign Panel	Mill report, sheeting certification
Pedestal Pole	Cert & Mill report
Pedestrian Actuation PA-2	Cert and or approved catalog cuts
Prefabricated Steel: Anchor Rods, Nut and Washers	Cert & Mill report & galvanization cert.
PVC Pipe	Cert and or approved catalog cuts
PVC San. Sewer Pipe	Cert and or approved catalog cuts
Railing, Aluminum	Shop Inspected
Retaining Wall Gabion Wire	Certification, catalog cuts
Road Edge Delineator Post	Cert and mill report
S.S. Rods with Nuts & Washers	Cert and mill report
Sanitary Service Lateral Connection	Cert and or approved catalog cuts
Sanitary Service Lateral Connection	Cert and or approved catalog cuts
Sanitary Sewer Force Main	Cert and or approved catalog cuts
Scupper & Grate, Downspouts	Certification
Sign Panel	Cert & Mill report, sheeting certification
Sign Post Steel	Cert & Mill report
Signal Poles and or Light Poles	Shop Inspected.
Silicone Joint Sealant	Cert and analysis
Soil Nailed Wall	Cert to special provisions (Break down of material)
Sole Plates	Cert & mill report
Soundwall Steel Plates	Cert & Mill report
Split Mega-Lugs	Cert and or approved catalog cuts
Spread Spectrum Radio	Cert and approved catalog cuts
Steel Encasement Pipe	Certification
Fabricated Structural Steel	Shop inspected
Steel Piles	Cert, mill report (Heat number on Invoice)
Steel Pipe Pile	Cert, mill report (Heat number on Invoice)

Steel Sheet Piling	Cert, mill report (Heat number on Invoice)
Storm Water Management Drainage Str. SWM-1 (Orifice Plate)	Cert , mill report
Structural Steel Paint	Certification with product numbers
Tapping Sleeve and Valve	Cert and or approved catalog cuts
Toggle Bolts	Cert, mill report
Traffic Sign Bridge Mounted Sign Structure	Shop Inspected. If not cert and mill report
Traffic Sign Flashing School Zone	Cert and or approved catalog cuts
Traffic Sign Illum. Street Name	Cert and or approved catalog cuts
Traffic Sign Post USP	Cert, mill report, galv. Cert
Traffic Signalization Antenna Cable	Cert and or approved catalog cuts
Traffic Signalization Antenna Mast	Cert and or approved catalog cuts
Traffic Signalization Camera	Cert and or approved catalog cuts
Traffic Signalization Emergency Preempt Detector Cable	Cert and or approved catalog cuts
Underbridge Lighting System	Cert and or approved catalog cuts
Video Detection Equipment	Cert and or approved catalog cuts
Wall/ H-Pile	Cert, mill report
Water Service Line	Cert and or approved catalog cuts

Appendix 13.2 – E

Independent Assurance Tolerances

Test	IA Comparison Tolerance	Source
Soil/ Aggregate Wet Density using Nuclear gauge in Direct Transmission	CL Soil – 1.91 pcf ML Soil – 2.15 pcf SP Soil – 1.86 pcf	AASHTO T-310 / VTM 10
Soil/Aggregate Density using Sand Cone	2.0 pcf	ASTM D1556 / AASHTO T-217
Soil/Aggregate Moisture using Nuclear gauge (backscatter)	CL Soil – 1.44 pcf ML Soil – 1.63 pcf SP Soil – 2.10 pcf	AASHTO T-310 / VTM 10
Soil/Aggregate Moisture determined by oven dry	14% difference*	ASTM D2216 / AASHTO T-265
One Point Proctor - density	4.5 pcf	AASHTO T-99 Method A
One Point Proctor - moisture	15% difference*	AASHTO T-99 Method A
Concrete Slump	0.82 inch for 1” to 2” slump 1.10 inch for 3” to 4” slump 1.50 inch for 5” to 6” slump	ASTM C143
Concrete Air-	0.8% points using pressure meter 32% difference using roller meter	ASTM C 231 ASTM C 173
Concrete Temperature	1 degree F	ASTM C 1064
Concrete Unit Weight	2.31 pcf	ASTM C 138
Concrete Permeability	51% difference*	VTM 112
Concrete Strength	8% difference on the average of 3 cylinders	ASTM C39 ASTM C31
Asphalt Bulk Specific Gravity	0.02	AASHTO T-166 / VTM 6
* Percent difference calculation shall be % diff ≤ ({absolute value[W1-W2]} / ((1/2) * (W1+W2)))*100		

*These IA tolerances are meant to be used when comparing split samples tested independently by QC tester with their test equipment and IA tester with his/her test equipment. These tolerances are based on the D2S rating between laboratories. Example: the QC test for slump on concrete sample taken out of a wheel barrow is 5 ¼ “. The IA test on that same sample (out of the same wheel barrow should be within 3 ¾” to 6 ¾” to be considered confirming the test equipment and procedures between the two tester is the same.

Appendix 13.2 – F

Materials Certification Statement

Example TL - 131LAP

CERTIFICATION OF MATERIALS

VDOT District Administrator

Route:	7900	Project Number:	7900-029-363, C501
County:	Fairfax	FHWA Number:	CM-5401(701)

Description:

Dear Sir/Madam:

This letter certifies that:

The results of the tests used in the acceptance program indicate that the materials incorporated in the construction work, and the construction operations controlled by sampling and testing, were in conformity with the approved plans and specifications.

All independent assurance samples and tests that are evaluated on a project basis were within tolerance limits of the samples and tests that are used in the acceptance program. Independent assurance comparisons for plant produced hot mixed asphalt and central mix aggregates are assessed on a system basis and reported annually by VDOT Materials Division[1].

Appropriate reports covering tests or certifications as to conformity with specifications of materials used on the project are on file by project number in the office of the (insert Locality and office location)

Exceptions to the plans and specifications are explained in the enclosed.

Sincerely,

LPA Construction Project Manager

cc: VDOT Project Coordinator
VDOT Contract Administrator
District Materials Engineer

[1] Delete this sentence if VDOT QA program is not used and insert Independent assurance comparisons for plant produced hot mixed asphalt and central mix aggregate were evaluated at the plant by Locality according to their IA program outlined in their QA Plan.

Appendix 13.2– G

Materials Testing Methods and Frequencies

Locally Administered Projects using:

1. Design-Bid-Build model where the locality is providing:
    a. The inspection and testing staff
    b. Requesting VDOT to provide inspection and testing
    c. Hiring an Engineering consultant firm for inspection and testing*

        *The consultant must be independent from the contractor performing the construction work.

Shall use the Acceptance/VST/IA Frequency tables included in this appendix for acceptance and Independent Assurance (IA) testing. If a testing method or frequencies is not cited, the Materials Manual of Instruction test method and frequencies shall be used. Some Quality Assurance programs depend on project samples to be tested for verification. These are denoted as verification samples and tests (VST) in the tables.

Locally Administered Projects using:

1. Design-Build model
2. Public-Private Partnership delivery model
3. Contractor performs testing (QC testing)

Shall use the Tables of Minimum Requirements for Quality Assurance and Quality Control on Design-Build and P3 Projects published in the latest Minimum Requirements for Quality Assurance and Quality Control on Design Build and Public-Private Transportation Act Projects.

Acceptance/VST/IA Frequency - Soil & Aggregate

Material Type	Spec Section	Test Reference	Acceptance Testing	VST	IA
Backfill	Contract Special Provisions				
Moisture Density Relations-Standard Proctor, Atterberg Limits & Grain Size Analysis (All Backfill Types)		VTM-1, VTM-7, & VTM-25	Done during project development	NA	Non required if performed in VDOT or AMRL accredited laboratory
One Point Proctor Check Compare to Nuclear Gauge		VTM 012	As needed.	NA	Run split sample when needed. 1 test per project to check procedure and equipment.
In Place Density Tests:					
Box Culverts, Pipes & other Drainage Structures	302,303	VTM-10	A minimum of one (1) test shall be performed per lift on alternating sides of the structure for each 300 linear ft. or portion thereof in structure length. This test pattern shall begin after the first 4-in. compacted layer above the structure's bedding and shall continue to one (1) foot above the top of the structure.	NA	One IA shall be conducted on each compaction technician once per project regardless of the structure or material type (box culvert, pipe, Abutment, retaining wall or embankment). IA shall consist of a split density test in situ, observing technician technique, checking equipment calibrations and calculations.

Abutments, Retaining Walls and MSE Walls	Sections 303,401	VTM-10	A minimum of two (2) tests every other lift up to 100 linear ft. shall be performed. Testing shall be performed behind these structures at a distance from the heel no farther than a length equal to the height of the structure plus 10 ft. For MSE Walls, Less than 100 linear ft. a minimum of one (1) test every other lift shall be performed. The testing shall be performed a minimum distance of 8 ft. away from the face of the wall, to within three feet of the back edge of the zone of the reinforced fill area. Test sites shall be staggered throughout the length of the wall to obtain uniform coverage. Testing shall begin after the first two (2) lifts of reinforced fill have been placed and compacted. Walls more than 100 linear ft., a minimum of two (2) tests every other lift not to exceed 200 linear ft. shall be performed.	NA	One IA shall be conducted on each compaction technician once per project regardless of the structure or material type (box culvert, pipe, Abutment, retaining wall or embankment). IA shall consist of a split density test in situ, observing technician technique, checking equipment calibrations and calculations.
SOILS/ EMBANKMENT					

Moisture Density Relations-Standard Proctor, Atterberg Limits & Grain Size Analysis (Soils/Embankment)		VTM-1, VTM-7, & VTM-25	Done during project development	NA	1 test per year during production; minimally perform one (1) in first five (5) tests taken for QA
One Point Proctor Check Compare to Nuclear Gauge (Soils/Embankment)		VTM 012	As needed.	NA	1 test per year during production; minimally perform one (1) in first five (5) tests taken for QA
Embankment in Place Density (Soils/Embankment)	Sect. 303	VTM-10	The minimum number of field density tests required shall be one for each 2500 yd^3 or less of fill material placed, with the following additional requirements: (a) For fill areas less than 500 ft. in length, a minimum of one (1) field density test for every other 6-in. compacted layer from the bottom to the top of fill starting with the second lift. (b) For fills 500 to 2000 ft. in length, a minimum of two (2) field density tests for each 6-in. compacted layer within the top five (5) ft. of fill. (c) For fills greater than 2000 ft. in length, break into equal sections not to exceed 2000 ft. and test each section in accordance with (b) above.	NA	One IA shall be conducted on each compaction technician once per project regardless of the structure or material type (box culvert, pipe, Abutment, retaining wall or embankment). IA shall consist of a split density test in situ, observing technician technique, checking equipment calibrations and calculations
Subgrade	Sec. 305	VTM-10	In the finished subgrade in both cut and fill sections, a minimum of one (1) test represented by the average of five nuclear density	NA	One IA shall be conducted on each compaction technician once per project regardless of the structure or material type (box culvert, pipe, Abutment,

			readings shall be performed for each 2000 linear ft. of subgrade for each roadway (full width).		retaining wall or embankment). IA shall consist of a split density test in situ, observing technician technique, checking equipment calibrations and calculations
Aggregate Base and Subbase Material	VDOT Sections 306, 307, & 309				
Depth Checks		VTM-38	For Method VTM-38A, one (1) depth test shall be conducted for each one-half (1/2) mile of stabilization per paver (mixer) application width. In other words, each separately applied width of stabilization, regardless of roadway width, shall require a series of tests. For method VTM-38B, the project shall be divided into lots, with each lot stratified, and the location of each test within the stratified section determined randomly. A lot of material is defined as the quantity being tested for	NA	Minimum of one per project, unless quantity of individual material(Base, sub-base, etc.) is less than 500 tons per project, in which case no IA test required for that material

			acceptance, except the maximum lot size shall be two (2) miles for each paver application width. The randomization procedure used shall be at the direction of the Engineer. (See VTM-38 for example.) Samples shall be taken from the lot at the following rate: Lot Size No. of Samples Required 0 - 1 Mile 2 1 - 1 1/2 Miles 3 1 1/2 - 2 Miles 4		
In Place Density		VTM-10	When the subgrade, consisting of material-in-place or imported material other than aggregate base, subbase, or select material, is stabilized with cement or lime, one density test (average of 5 readings) shall be conducted for each one-half (1/2) mile of stabilization per paver (mixer) application width. In other words, each separately applied width of stabilization, regardless of roadway width, shall require a separate series of tests.	NA	One test per project, consisting of the average of 5 readings. Minimum of 5 readings per project, unless total quantity of individual material(Base, sub-base, etc.) is less than 500 tons per project, in which case no IA test

Treated Subgrade/Subbase, Aggregate Base Material, and Cement Treated Aggregate Base Material	VDOT Sections 306, 307, & 309				
Depth Checks		VTM-38	For Method VTM-38A, one (1) depth test shall be conducted for each one-half (1/2) mile of stabilization per paver (mixer) application width. In other words, each separately applied width of stabilization, regardless of roadway width, shall require a series of tests. For method VTM-38B, the project shall be divided into lots, with each lot stratified, and the location of each test within the stratified section determined randomly. A lot of material is defined as the quantity being tested for acceptance, except the maximum lot size shall be two (2) miles for each paver application width. The randomization procedure used shall be at the direction of the Engineer.	NA	Minimum of one per project, unless quantity of individual material(Base, sub-base, etc.) is less than 500 tons per project, in which case no IA test required for that material

			(See VTM-38 for example.) Samples shall be taken from the lot at the following rate: Lot Size No. of Samples Required 0 - 1 Mile 2 1 - 1 1/2 Miles 3 1 1/2 - 2 Miles 4		
In Place Density		VTM-10	When the subgrade, consisting of material-in-place or imported material other than aggregate base, subbase, or select material, is stabilized with cement or lime, one density test (average of 5 readings) shall be conducted for each one-half (1/2) mile of stabilization per paver (mixer) application width. In other words, each separately applied width of stabilization, regardless of roadway width, shall require a separate series of tests.	NA	One test per project, consisting of the average of 5 readings. Minimum of 5 readings per project, unless total quantity of individual material(Base, sub-base, etc.) is less than 500 tons per project, in which case no IA test
Clearing and Grubbing	VDOT Section 301				
Ensure activities are confined to limits and seeded within 30 days of disturbance		N/A	Daily		Weekly

Erosion and Siltation Control	VDOT Section 303.03 & Current Virginia DCR Specifications				
Monitor for correct installation and Maintenance		N/A	Daily		After rain event
Undercut	VDOT Section 303.04				
Review area to determine need for undercut		N/A	Prior to start of work at each location	All reports reviewed by Locality Project Manager to verify qualified inspector and correct equipment	One (1) report reviewed per month during production to verify qualified inspector and qualified personnel
Measure undercut area		N/A	Prior to backfill at each location	All calculations/reports checked/reviewed by Locality Project Manager to verify qualified inspector and correct equipment	One (1) calculation/report checked/reviewed to verify qualified inspector and correct equipment
Overlay Sands					
Grade D Silica Sand	Special Provision		One bag per project tested in AMRL lab.	NA	NA

Acceptance/VST/IA Frequency - Hydraulic Cement Concrete

Material Type	Spec Section	Test Reference	Acceptance Testing	VST	IA
Cast-In-Place Structures and Bridge Concrete	VDOT Section 217				
Concrete Entrained Air Content (CIP Concrete)	217.08	ASTM C231 or C173	Test every load, except for bridge decks, in which case one test per truck-load for the first 3 trucks and then one test for every third truckload thereafter, provided results remain within 1.0% of median of design range. Test also required when making compressive specimens	NA	One test shall be made on the same batches of concrete from which cylinders are taken
Slump of Hydraulic Cement Concrete (CIP Concrete)	217.08	ASTM 143	Test every load and when making compressive specimens	NA	One test shall be made on the same batches of concrete from which cylinders are taken
Temperature of Concrete (CIP Concrete)	217.10	ASTM C1064	Test every load and when making compressive specimens	NA	One test shall be made on the same batches of concrete from which cylinders are taken

Compressive Strength of Concrete Cylinders (CIP Concrete)	217.08	ASTM C31 & C39	One set of three cylinders per every 100 CY and at least two sets of cylinders per structure per class of concrete.	NA	Minimum of one set per 1000 cubic yards of structural concrete. Not required for projects having less than 300 cubic yards. Cylinders should be from the same load as acceptance samples.
Chloride Permeability Concrete Cylinders (CIP Concrete)	Check Plan sheets	VTM-112	One set of two cylinders per every 100 CY and at least two sets of cylinders per structure per class of concrete.	NA	Non required if performed in VDOT or AMRL accredited laboratory
Concrete Reinforcing Steel (CIP Concrete) elongation, yield strength and ultimate strength	223	ASTM A615	Accepted based on certification provided by the fabricator. Verify manufacturer's certificates for every shipment for acceptance prior to placement.	One sample per project per manufacturer per most common size bar.	Non required if performed in VDOT or AMRL accredited laboratory
Pavement	VDOT Section 217				
Concrete Entrained Air Content (Pavement)	217.08	ASTM C231 or C173	One test per hour & when casting flexural specimens	NA	One test per four roadway miles or fraction thereof, with a minimum of one per project

Slump of Hydraulic Cement Concrete (Pavement)	217.08	ASTM 143	Two tests daily & when making flexural specimens	NA	One test shall be made on the same batches of concrete from which cylinders taken
Temperature of Concrete (Pavement)	217.10	ASTM C1064	One test per hour & when casting flexural specimens	NA	One test shall be made on the same batches of concrete from which cylinders taken.
Compressive Strength of Concrete Cylinders (Pavement)	217.08	ASTM C31 & C39	If pavement is accepted based on cylinder strength. One (1) set of three (3) cylinders cast for every 100 cy and at least one for each days concreting operation	NA	Minimum one set per 1000 cubic yards of structural concrete, except that IA will not be required for projects having less than 300 cubic yards.
Flexural Strength Beams	316.04	ASTM C293	If pavement is to be used as haul road or prior to 14 days then, At least one beam cast for each days concreting operation.	NA	NA
Concrete Reinforcing Steel (pavement) elongation, yield strength and ultimate strength	223	ASTM A615	Accepted based on certification provided by the fabricator. Verify manufacturer's certificates for every shipment for acceptance prior to placement.	One sample of two pieces 24 inches long from the most prevalent bar size per structure, with no two samples being the same size	Non required if performed in VDOT or AMRL accredited laboratory
Miscellaneous Concrete	VDOT Section 217				
Concrete Entrained Air Content (Miscellaneous Concrete)	217.08	ASTM C231 & C173	One test per day and when making compressive specimens	NA	NA

Slump of Hydraulic Cement Concrete (Miscellaneous Concrete)	217.08	ASTM C143	One test per day and when making compressive specimens	NA	NA
Temperature of Concrete (Miscellaneous Concrete)	217.10	ASTM C1064	One test per day and when making compressive specimens	NA	NA
Compressive Strength of Concrete Cylinders (Miscellaneous Concrete)	217.08	ASTM C31 & C 39	One (1) set of three (3) cylinders per every 250 CY and at least one set per day	NA	One (1) set of three (3) cylinders per every 25,000 CY (cumulative) minimum 1 per project.
Concrete Reinforcing Steel (Miscellaneous Concrete)	223	ASTM A615	Accepted based on certification provided by the fabricator. Verify manufacturer's certificates for every shipment for acceptance prior to placement.	One sample of two pieces 24 inches long from the most prevalent bar size per structure, with no two samples being the same size	Non required if performed in VDOT or AMRL accredited laboratory
Concrete Curing Materials	VDOT Section 220				
Burlap		AASHTO M182, class 3	Verification of LM # and lot numbers if from QA supplier Approved list 44, if not test one sample per lot number	NA	Non required if performed in VDOT or AMRL accredited laboratory
White liquid membrane Curing Compound		VTM - 2	Verification of LM # and batch numbers if from QA supplier Approved list 44, if not test one sample per batch number	NA	Non required if performed in VDOT or AMRL accredited laboratory
Fugitive Dye Liquid Membrane Curing Compound		VTM - 2	Verification of LM # and batch numbers if from QA supplier Approved list 44, if not test one sample per batch number	NA	Non required if performed in VDOT or AMRL accredited laboratory

Polyethylene Film		AASHTO M171	Verification of LM # and lot numbers if from QA supplier Approved list 44, if not test one sample per lot number	NA	Non required if performed in VDOT or AMRL accredited laboratory

QC/VST/IA Frequency - Asphalt

Material Type	Spec Section	Test Reference	Contractor QC Testing	VST	IA
Asphalt Concrete Pavement	VDOT Section 315				
Pavement Density by Nuclear Method with In Place Pavement Density (Asphalt Pavement)		VTM-76, VTM-6	Establish Roller pattern, control strips and test sections, 10 stratified random density test sites per test section (5,000 ft.)	VST is performed on Twenty (20) percent of QC lots. Obtain two cores in one randomly selected QC lot out of five lots to verify in place density. Minimum one VST sample per project.	IA=10%*QC Readings Locality representative observe and witness QC testing to assure gauge is calibrated and accurate. Observe and verify test sites are random and match selected sites. Verify that QC tests are done using proper procedures. Observe one control strip per density technician and obtain all cores from control strip for reweighing in laboratory (randomly select a minimum 10% of cores) to confirm field density testing.

In Place Pavement Density (for all asphalt except Stone Matrix Asphalt (SMA))		VTM-006; VTM-32	**Density** - min. 1 core per location not long enough to establish roller pattern/control strip	**Density -** One (1) random core per 10 QC locations. Independent of contractor cores.	Obtain cores taken for density. Reweigh at least 10% of these cores in laboratory to confirm density. Observe one (1) density determination per ten (10) locations performed by QC technician. Minimum 1 per project.
Depth Checks		VTM-32	Depth checks of surface and intermediate material required only if specific plan depths are called for, not when plans specify rate of application. One (1) per 1/2 mile per lane width, minimum one (1) test per roadway, maximum lot size 2 mile (4 tests)	NA	Select one (1) QC core per five (5) lots and remeasure thickness. A minimum of one (1) per project.
In Place Pavement Density and Depth Checks by cores for Stone Matrix Asphalt (SMA)		VTM-006	Establish trial section and test sections. Minimum of one (1) sample per 1,000 feet with a maximum of 5 samples per day/night's production for density and depth for test sections. Three (3) cores for test strip.	Two (2) stratified random cores per one day/ night production obtained independently of contractor. Minimum two (2) per project.	Locality Representative Independently weigh and measure a minimum of one (1) QC core per day/night's production Locality representative will observe the taking of these cores and will maintain control of these cores once obtained
Permanent Pavement Marking	VDOT Section 512		**Contractor QC Testing**	**VST**	**IA**

Permanent Pavement Marking - Preformed Tape		VTM-94	Daily perform VTM 94 at start up with periodic checks every three hours of operation	Randomly select three (3) ten foot in place sections of markings per day and measure thickness and width. Skip lines and edge lines are considered separately. Inspect PM for correct placement, straightness and edges. Observe the bead embedment, color (night and day) and brightness/reflectivity Inspect structure of tape to ensure patterned waffles have not been damaged by roller	Review all C-85 reports during production to verify that plan quantities match application quantities and that daily measurements are performed according to VTM 94.
Permanent Pavement Marking - Liquid Materials (Paint, thermoplastic and epoxy)		VTM-94	Daily perform VTM 94 at start up with periodic checks every three hours of operation	Randomly select three (3) ten-foot in place sections of markings per day and measure thickness and width. Skip lines and edge lines are considered separately. Inspect PM for correct placement, straightness and edges. Observe the bead embedment, color (night and day) and brightness/reflectivity. Review application rates to ensure proper thickness has been applied	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 C-85 reports during production to verify that calculated quantities match application rates and that daily measurements are performed according to VTM 94.

QC/VST/IA Frequency - Misc Roadway and Structure

Material Type	Spec Section	Test Reference	QC Testing	VST	IA
Pre-cast Structures	VDOT Section 404				
Verify bedding material is installed properly and that pre-cast materials are not chipped or cracked		N/A	Daily and when shipment arrives on project	Inspect Precast structure before backfilling operations begin.	Inspect Pre-cast structures when received on job site. Inspect bedding before setting structure.
Load Bearing Piles	VDOT Section 403				
Monitor operation and document blow counts		N/A	Continuously	Review documentation weekly.	Daily
Perform Center of Gravity Calculations		N/A	For each Foundation	one out of every twenty (20) foundations	one out of every ten (10) foundations
Structural Steel	VDOT Section 407				
Receive Bolts, sample, verify the documentation is complete and perform laboratory Skidmore, tension and galvanized coating testing	VDOT 226.02(h)		Each nut-bolt-washer (NBW) assembly lot shall be sampled at a minimum rate of 2 assemblies per NBW lot. The documentation	Ea. NBW assembly lot shall be tested, one bolt in direct tension, one assembly for galvanized coating and one nut and bolt for rotational capacity testing (Rot-	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

			shall be collected from the bolt supplier and the galvanizer for each lot and supplied along with the samples to the QAM. QC personnel shall monitor the storage and conditions of the bolts to insure they remain in good well lubricated condition.	Cap) as per section 226	suppliers. The results of the VST shall be reviewed to insure the material passed the tests.
Verify daily Skidmore testing is performed IAW (in accordance with) proper procedures for each lot 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	VDOT 407.06(c)		Ea. Day & Ea. NBW lot (3 bolts per lot) used shall be Rot-Cap tested in the Skidmore device IAW proper procedures	Minimum three (3) NBW assemblies for each lot being installed shall be observed by the IA inspector	Three NBW assemblies from each lot shall be Rot-Cap tested at the QAMs lab independently each week during erection
Verify the installation crews are using proper installation procedures IAW specs. to tension the bolts	VDOT 407.06		Monitor ea. Crew (2-3 workers) during erection to insure proper technique (TOTN – turn-of-the-nut or DTI – direct tension indicating washers) is followed	NA	Monitor ea. Crew (2-3 workers) for a half dozen NBW assemblies once at the beginning of each four hour work period
Verify the bolted connections have been tensioned properly using statistical sampling frequency and a calibrated torque wrench	VDOT 407.06(c)4	ASTM 325	For each connection, test 10% or a minimum of 2 NBW assemblies verifying the required torque. Complete testing before the deck is formed.	Test 2 NBW assemblies in 25% of the slip critical connections (minimum of 2 connections per transverse line of splices) and 2 NBW assemblies in 10% of the secondary member connections	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.

Rebar Splicer (Tension Test)		ASTM A615	1 sample per manufacturer per most common size per structure (Contractor is to install pieces)	NA	Verify Machine Calibration annually
Protective Coating of Metal Structures	VDOT Section 411		**Contractor QC testing**	**VST**	**IA**
Monitor surface preparation		SSPC-PA	Three surface profile measurements per day of blasting.	Review all reports showing the preparation protocols	Two (2) surface profile measurements per week of blasting.
check coating thickness according to SSPC -PA		SSPC-PA	Five(5) spot measurements (15 Readings) per day as defined in PA-2 for coating thickness after each layer of paint at each location	Review all reports showing-painting application rates including the tests performed on profiles and thicknesses.	One spot measurement (3 readings) as defined in PA-2 for coating thickness after each layer of paint at each location
Underdrains	VDOT Section 501				
Inspect to ensure no deficiencies		VTM 108	All accessible outlet locations; Additionally a minimum of 10% of longitudinal sections	One (1) every twenty-five (25) outlet locations. A minimum of one per project independent of IA.	Observe 10% of outlet locations; Additionally a minimum of 1% of longitudinal sections
Guardrail	VDOT Section 505				
Verify that guardrail is installed per specifications and at proper height			Daily	Spot-check every 500 linear feet for proper height	Spot-check every 50 linera feet for proper height.

Fencing	VDOT Section 507				
Verify fencing type, height and location		N/A	Daily	Weekly	
Barbed Wire	VDOT Section 242	ASTM A121	One sample every 50 rolls or spools	NA	NA
Chainlink Fence	VDOT Section 242	AASHTO M181	One sample from 3 rolls for every 50 rolls.	NA	NA
ROW Monuments	VDOT Section 503				
Verify monument type and location		N/A	10% of ROW monuments	1% of ROW monuments	
Maintenance of Traffic	VDOT Section 512				
Monitor installation and maintenance and use Work Zone Safety Checklist		N/A	Daily (Locality Inspector)	Weekly (Locality Project Manager)	
Sound Wall Barriers	VDOT Section 519				
Verify location and installation with shop drawings		N/A	Daily	Weekly	
Topsoil and Seeding	VDOT Section 602/603				

Verify proper material is utilized at application rates from plans		N/A	Daily	Weekly	
Traffic Signs	VDOT Section 512				
Verify that signs meeting current standards are utilized in locations per plans		N/A	Daily	Weekly	
Traffic Signals	VDOT Section 703				
Monitor installation for conformance with plans and specifications		N/A	Daily	Weekly	
Water and Sewer Facilities	VDOT Section 520				
Monitor installation for conformance with plans and specifications		N/A	Daily	Weekly	
Electrical and Signal Components	VDOT Section 238				
Tether Wire		ASTM A475	One sample per project	NA	NA
Span Wire		ASTM A475	One sample per project	NA	NA
Masonry	VDOT Section 202				
Wall Units			one sample consisting of 10 units per 10,000	NA	NA

			units		

- Verification testing shall be required if contractor's workforce performs QC testing that is used for Acceptance testing. If Locality or its consultant performs Acceptance testing, Verification testing shall not be required.
- IA testing shall be conducted by different personnel and different equipment than used for the QC/acceptance testing, QC/acceptance sampling or Verification testing.

13.3 CHANGE ORDERS

13.3.1 Introduction

A Change Order is a written addendum to the contract that is developed during construction for the purpose of establishing an agreement between the contractor and the LPA to add, modify, or delete pay items, contract time, or other terms of the contract.

The LPA must develop a process for managing change orders and include the process within their contract documents for any federal-aid project. Subsequently, any change order must follow the process specified in their contract. The LPA shall notify the VDOT CPM when processing Change Orders, as outlined below. When applicable, typically for federal oversight projects, the VDOT ACE will notify and receive concurrence from the Federal Highway Administration (FHWA) on federally funded projects as required.

It is not acceptable to use contracting methods such as alternate bids, speculative amounts, change orders, etc., as a replacement for complete and thorough design/investigations during project development.

13.3.2 Applicability

Change Orders		
Federal-aid	*State-aid / VDOT Maintained*	*State-aid / LPA Maintained*
X	*	*

* State-aid projects that require additional state funding or a design exception or waiver

13.3.3 Change Orders – Summary

Change orders amend the contract by adding or deleting work, making reimbursement for additional costs incurred, making material substitutions, and changing specifications. Only work necessary to complete the project as originally intended may be added by change order and be eligible for reimbursement.

A change order is prepared and processed for any of the following reasons:

- An increase or decrease in any of the contract pay items;
- Changes in the work which were not originally delineated in the contract such as revised design considerations;
- The addition of a new or modified pay item required to complete the work in accordance with the contract;
- Changes caused by outside agencies such as utilities, railroads, etc.;
- Payment adjustments due to contract provisions;
- Quantity changes to meet field conditions;
- Plan errors;
- Suspension of Work;
- Final measurements/calculations; and

- Settlement of a dispute or claim resulting from any of the above reasons.

The LPA must receive concurrence from the VDOT CPM for any change order which:

(1) Will result in the need for additional federal or state-aid beyond the funding identified in the project administration agreement; or
(2) Requires a design exception or waiver; or
(3) Is federal-aid and may result in work outside the project limits identified in environmental documentation (the NEPA documentation); or
(4) When a previously approved pay-item is being removed or replaced.

Should the LPA direct the contractor to perform added work prior to approval by VDOT, reimbursement may be denied. When it is not reasonable to wait for a formal approval by VDOT due to emergencies or other site conditions, the LPA shall attempt to contact the CPM, the District Construction Engineer, or other VDOT Construction representative to obtain verbal approval for the change order.

13.3.4 Change Order Approval Process

For non-emergency change orders, the LPA PM, as soon as he/she recognizes that a change order may be necessary, is required to submit a "conceptual change order request" to the VDOT CPM. This request outlines the general nature and the justification for the anticipated change order. After consultation with the CPM, a final change order request is submitted. The final change order will specify the final estimated costs and will provide any additional information requested by VDOT during the conceptual change order review.

The final change order must provide sufficient explanation to ascertain that the work is necessary, consistent with specifications, within the scope and intent of

the LPA agreement and approved by the CPM. If the change order is approved by VDOT and FHWA and /or State funds are available above current VDOT project encumbrances, but under the project capped amount, funding may be permitted. Funding of change orders not approved or for which no FHWA and/or State funds remain, is the sole responsibility of the LPA.

VDOT Responsibilities:

- *The Construction Project Monitor will review the conceptual change order and determine the following:*
  (1) If additional funds are needed. If so, the CPM will begin processing the request for additional funds and agreement modification.
  (2) If a design exception or waiver will be necessary. If so, the CPM will coordinate with the LPA to have appropriate design exception request submitted.
  (3) If the change order will impact any areas outside the original project footprint as identified in the environmental documentation, for federal-aid projects. If so, additional environmental evaluation(s) may be necessary prior to any work.
- *The Construction Project Monitor will notify the LPA PM, in writing of the approval or denial of the change order request. Change order request reviews, that do not require additional design or environmental evaluation, should generally take no longer five business days.*
- *For federal oversight projects, the Construction Project Monitor must coordinate and receive concurrence from the FHWA Area Engineer.*

Note that the performance of extra work or additional quantities of work may warrant an extension of contract time. Extensions of contract time may result in additional direct project overhead cost. Once the need to perform extra work on

a project has been identified, a basis of payment for this work must be established.

13.3.5 Change Order Pricing / Evaluation

The two types of pricing for extra work are usually Agreed Unit Price or Force Account Price.

Agreed Unit Price is used when the extra work can be broken down into measurable units. The number of units necessary to perform the work is estimated and a unit price determined and agreed upon. The agreed upon unit price should be a unit price already established in the contract or comparative pricing may be used. The PM may refer to VDOT's website of average bid prices to assist with this effort.

Force Account Price is used when the work cannot be broken into measurable units or when a unit price cannot be agreed upon. This method reimburses the contractor the actual costs of labor, equipment and materials incurred in the performance of the work including allowable overhead and markup. This method requires a significant amount of record keeping.

The records required for force account pricing of extra work must accurately depict all labor, equipment and materials used by the contractor to perform the work. The Blue Book for heavy Highway Equipment costs with the VDOT procedure for establishing appropriate equipment costs shall be utilized as per the VDOT Road and Bridge Specifications. The items that are necessary to record are shown below:

- Description of Work
- Contractor's Work Force
- Employee Name
- Classification

- Hours Worked - Regular and Overtime
- Contractor Equipment
- Type
- Model
- Age
- Capacity
- Hours Worked
- Hours Idle
- Materials
- Description
- Quantity
- Invoices

13.3.6 Quantity Measurements

The PM shall record the measurements of the quantities of work in the units prescribed by the plan actually performed by the contractor. Change orders must be prepared to make adjustments for any differences between contract quantities and the quantities actually performed.

Issues of efficiency or other similar factors may arise that may impact unit costs when the quantities actually performed differ significantly from those shown in the plan. For these occurrences the quantity records shall be thorough enough to determine actual production rates and other such items.

13.3.7 Force Account

If the LPA and the Contractor are not in agreement on the amount to be paid for the work, the Project Manager may set up a unit price or may require the work to be performed on a Force Account basis. This approach, however, must be utilized only as a last resort after all efforts to negotiate a change order with the contractor have been exhausted. Under Force Account provisions, the LPA pays

up to allowable costs of the Contractor's equipment and labor necessary to do the work. The Contractor is compensated for the work on the basis of records kept by the Inspector and the invoices for materials.

If additional funding will be requested from VDOT, the LPA PM must provide pertinent information to the CPM for review and approval. Information should include a brief but complete description of the work to be performed, a definite location by station numbers, a listing of all anticipated classifications of labor and rate for each classification, a listing of materials and equipment to be used, giving the weekly and hourly rates. The project manager must document any equipment not covered by the current "Blue Book" and which rates have been agreed upon based on prevailing area rates or those being paid by the Contractor at the time of the authorization. A statement is to be prepared which sets forth reasons for the extra work.

Force Account work is paid for in accordance with the Specifications. The Project Manager should keep accurate daily records of the work as it is accomplished. At the end of each day the Contractor's representative and the Inspector should compare records of the work performed.

All bills for materials used must be properly supported by copies of the invoices for the materials received on the job. Freight costs and taxes are considered to be part of the cost of the material used on Force Account work.

Payrolls for labor on Force Account work are required and must show the name of the employee, job classification, the rate of pay actually paid by the Contractor, the dates on which the work was performed and the number of hours worked daily by each employee on Force Account.

Bills for equipment used on Force Account must show the number of hours each piece of equipment worked each day, the dates on which the work was performed and sufficient description of the equipment so that the rate of pay can

be determined. At the conclusion of the work, the entire Force Account charge is to be summarized. The Contractor must furnish invoices, payrolls, freight bills, etc. to support the charges.

All documentation records are to be furnished to the LPA for final cost verification. Cost verification is to be part of the Final Review operation and should be accomplished immediately following the completion of each Force Account authorization. Verification of such costs is the responsibility of the LPA.

13.3.8 References

Change Orders Checklist
23 CFR 635
§2.2-4309 of the Code Virginia
Construction Directive Memorandum – Contract Change Management CD-2010-1

Chapter 13.3 Change Orders – Checklist

These checklists can be found in their entirety in the VDOT on line forms library

CH 13.3 - Change Orders

A Change Order is a written addendum to the contract that is developed during construction for the purpose of establishing an agreement between the contractor and the LPA to add, modify, or delete pay items, contract time, or other terms of the contract.

SUBMIT	COMPL	F	S-V	S-L	T-A	UCI	Requirement	Reference LAP	Reference Other
	☐	X	--	--			LPA develops process for managing change orders and includes with contract documents	13.3.1	23CFR635.120
	☐	X	--	--			Submit conceptual change order / obtain approval	13.3.4	23CFR635.120
	☐	X	--	--			Force account reasons documented	13.3.7	23CFR635.120
	☐	X	--	--			Submit final change order (including cost analysis) / obtain approval / approvals documented	13.3.4	23CFR635.120
	☐	X	--	--			Extension in Project Times must be approved by VDOT and subject to FHWA concurrence	13.3.4	23CFR635.121

13.4 CLAIMS

13.4.1 Introduction

The LPA is subject to claims by the contractor who performs the work. The stated terms of the project between the LPA and the contractor exist in the contract, the specifications and the plans. There are certain terms that are not stated in the contract documents. These are known as implied terms. For instance there is an implied warranty that the plans and specifications are free from defects and, unless stated otherwise, that there will be safe and continuous access to all areas within the project's boundaries. Claims arise from both stated and implied terms. **A claim is a dispute between the LPA and the contractor. While VDOT must be informed of any claim, VDOT is not a party to the claim.** If the LPA plans to utilize federal or state aid to resolve a claim, coordination with VDOT must be made in accordance with this chapter.

13.4.2 Applicability

- **Any claim which will involve the utilization of federal or state aid.**

13.4.3 LPA's Claims Management Process

The LPA's Claims Management Process must meet the general framework and intent of VDOT's Claims Process. The VDOT Claims Management Process requires progressive administrative reviews of a contractor's claim prior to a filing

in the Court of Claims. By requiring administrative reviews beginning at the project level, construction contract claims have been reduced. Likewise, a process for the fair hearing of a claim or dispute reduces a contractor's risk and ultimately results in more competitive bids.

It is required that the LPA formalize a claims management process that includes progressive administrative reviews prior to formal legal action by the contractor or the LPA. The LPA's Claims Management Process must be prepared and approved by VDOT prior to contract award. Preferably, the Claims Management Process would be included in the LPA's bid documents. Resolution of all claims must be according to the project's approved Claims Management Process and approved by the DCE or designee if the resolution affects the contract completion date and/or increases project costs.

13.4.4 Who Can Make A Claim?

The only entity that may assert a claim against the LPA is the legal contractor of record. If the project is being performed by a joint venture, then only the joint venture may assert a claim. A single party to the venture cannot assert a claim. Likewise, a subcontractor may not assert a claim against the LPA, but may make a claim against the Prime contractor who, in turn, may assert a claim against the LPA for damages incurred by the subcontractor.

13.4.5 Elements of a Claim

Every claim has two distinct elements, entitlement and damages. Entitlement is the theory under which the contractor asserts the claim. The contractor must prove entitlement. Examples are work not shown on plans, conflict between plans and specifications, third party delays, and unforeseen conditions. Damages are the cost impacts incurred by the contractor which are over and above normal costs and which are caused by the claim event. Each claim must have both of these elements. If a contractor encounters a situation where there would be an entitlement but incurs no monetary impact, there is no claim.

Likewise, a contractor may state that he has incurred additional costs but cannot establish an entitlement, then there is no claim.

13.4.6 Types of Claims

The contractor shall make a reasonable effort to mitigate damages. Mitigation might include re-sequencing, reducing, re-mobilizing or changing manpower. The contractor is entitled to recover the costs of mitigation. Certain types of disputes by their nature may result in a claim. Claims may be due to plan discrepancies or omissions, allowable costs in calculating change orders, unforeseen site conditions, quantity variations, interferences, and delays. Delays require careful analysis to determine who is responsible. The contractor must demonstrate that the delay was critical. It should be demonstrated that the delay in question affected the overall project schedule and was a controlling operation with respect to project completion. Delays that are unforeseeable and beyond the control of the contractor are excusable delays. Excusable delays may be either compensable or non-compensable. Delays caused by the LPA, such as lack of site access, late approval of shop drawing, and redesign, may be compensable. Delays caused by third parties outside the contractor's control, such as floods, transportation industry delays, fire and vandalism may be non-compensable. Inexcusable delays are always non-compensable. These delays, such as subcontractor delay, late mobilization, production longer than scheduled, and equipment breakdowns are caused by the contractor or under his control. Very often delays may occur from various sources at the same time. These delays are known as concurrent delays. The LPA caused compensable delay occurring at the same time as an excusable delay that is non-compensable should result in a time extension but no recovery of costs. The LPA caused delay occurring at the same time as a contractor delay should result in a time extension but no recovery of costs. Both cases relieve the contractor from liquidated damages for the time in question. The contractor is entitled to plan and pursue the work in order to finish ahead of the contract completion date. If the LPA delays the contractor, the contractor may be entitled to impact costs.

13.4.7 Proof of Claim

Proof of entitlement and proof that additional costs were incurred rests solely with the contractor. The contractor should notify the LPA through the PM of each instance where there is an intent to file a claim. This notice requirement allows the LPA the opportunity to mitigate the claim situation and to begin to keep careful and specific records of the contractor's activities, manpower, equipment and materials that are related to the claim.

13.4.8 Analyzing a Claim

To analyze a claim the following steps should be taken:

1. Determine the element of Entitlement

- Was the claim filed timely and was the LPA given the required notice?
- Identify the contractor's position.
- What does the contract plans and specifications say about it?
- What do the contract documents say?
- Determine the actual conditions giving rise to the claim.
- Identify each specific claim issue. What is the position of both sides on each issue?
- Identify responsibility. If delay related, is it excusable vs. non-excusable, compensable or is there an issue of concurrent delay?
- Was there actually an impact?

At this point of the analysis if there is no entitlement, then there is no claim. If there is entitlement then continue on.

2. Determine the element of Damages

- Review the contractor's cost
- Compare with the LPA records
- Analyze the damages

13.4.9 Claim Avoidance

The avoidance of claims is best affected by proper contract management practices. The LPA can help prevent claims by practicing the following activities:

- Constructability Reviews;
- Prequalification of Contractors;
- Proper Scheduling;
- Prompt Resolution of Change Orders;
- Pre-bid and Pre-con Meetings; and
- Partnering.

13.4.10 Local Government Responsibilities / Submittals

The LPA will notify the VDOT Project Coordinator if a contractor files a notice of intent to file a claim during the project.

The LPA will advise the VDOT Project Coordinator if a contractor files a claim at the completion of the project.

The LPA will advise the VDOT Project Coordinator of the resolution of the claim.

13.4.11 VDOT Responsibilities / Approvals/Timeframes

No VDOT approvals required.

For Federally funded projects on the NHS, the ACE or VDOT Project Coordinator will inform the Construction division so that they can advise FHWA of the claim.

The VDOT Project coordinator or ACE will ensure that the project is not closed until all claims have been resolved.

13.4.12 References

- Claims Checklist
- § 33.2-1101 Code of Virginia
- 23 CFR 635.124
- 23 CFR 630 Subpart J - Work Zone Safety and Mobility
- 23CFR 635.105 – Supervising Agency
- 29 CFR 1926 – Safety and Health Regulations for Construction

Chapter 13.4 Claims - Checklist

These checklists can be found in their entirety in the VDOT on line forms library

CH 13.4 - Claims

A claim is a dispute between the LPA and the contractor. While VDOT must be informed of any claim, VDOT is not a party to the claim. If the LPA plans to utilize federal or state aid to resolve a claim, coordination with VDOT must be made in accordance with this chapter.

SUBMIT	COMPL	F	S-V	S-L	T-A	UCI	Requirement	Reference LAP	Reference Other
	☐	x	x	--			Notify VDOT in writing of any pending claim which may involve VDOT/FHWA funds	13.4.2	
	☐	x	x	--			The LPA's Claims Management Process prepared and approved by VDOT prior to contract award	13.4.3	
	☐	x	x	--			Project shall remain open until all claims are resolved	13.4.11	

Locally Administered Projects (LAP) Manual

PART 2

Project Management

Chapter 14

Project Close-out