

Maryland Department of Transportation  
State Highway Administration

SOP No.: 5300.100.11  
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Approved by: *Sutapa Samanta*  
Chief Engineer

Date: 5/6/24

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**Electronic Maryland Construction Management System (eMCMS) Management of Documentation, Retention, and Review of Pay Quantities for Construction Projects in Preparation for Final Acceptance and Final Payment Standard Operating Procedure**

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**Purpose**

The purpose of this Standard Operating Procedure (SOP) is to provide the procedures that have been enhanced as the electronic Maryland Construction Management System (eMCMS) has been incorporated into project documentation processes while the legacy Maryland Construction Management System (MCMS) has been phased out for SHA projects. MCMS support ended as of 12/31/21 and all projects moving forward are required to utilize eMCMS to document and enter pay quantities for construction projects. All projects migrated into eMCMS prior to 12/31/21 will have split records, some records being retained in the legacy MCMS system with all other records after the migration date maintained in eMCMS. All records documented before the date of migration into eMCMS shall follow the previous CONSTRUCTION DIRECTIVE 07220.100.12 for documentation and review. An IDR generated on the date of migration within eMCMS for these hybrid projects shall document the date migrated from the Legacy MCMS to the eMCMS system.

Emphasis must be placed on maintaining up-to-date, accurate Project Records at all times by the District/Department and Project Staff. Contract Documentation includes both Construction related and supplementary construction inspection records. Project records are subject to review and audit, internally and externally, during the entire lifespan of a project including years after the construction is completed. Creating, reviewing, and retaining complete and accurate Contract Documents is a critical element to substantiate that the work was performed according to the Contract and all specifications that apply. Contract Documents and Project Records are used in the resolution of claims and may be used in legal proceedings as evidence.

**References**

SHA Standards and Specification for Construction and Materials TC-7.06  
SHA 5300.Manual.1 – Project Closeout: Manual on Project Closeout General Practices and Procedures from Field Operations to Final Package

**Scope**

This SOP is applicable to anyone that collects, creates, and/or records project documentation.

- A. Construction Project Engineer's (CPE) primary duties during construction activities are to ensure that all project documentation is correct, complete, and filed appropriately.
- B. The Field Document Reviewer's (FDR) responsibility is directly related to the delegated authority given by the District Engineer/Director as described in the procedure of this SOP.
- C. The requirements of this SOP supersede the Construction Guide procedures. The Construction Guide will be revised later to incorporate the enhancements from eMCMS. **This SOP replaces the existing Construction Directives 07220.100.11 & 07220.100.12.**

### **Definitions**

- A. Original Source Document – The Approved IDR, along with all attachments, generated by eMCMS from user input giving the user's account of construction activities, providing a chronological history of the project shall be considered the Original Source Document(s) for project Records and generating Contractor Estimates. User IDR input must be clear, concise, comprehensive, correct, and complete whereas the IDR may be admissible as evidence in a court of law. The user input is the foundation in which other documentation is generated by eMCMS and shall be free of opinion and state only facts.
- B. Approved IDR – An Inspector Daily Report generated by eMCMS that shows, within the history tab of the IDR, when the User input was submitted and when it was approved by an Authorized Approver.
- C. Project Records – are all stand-alone documents, electronic or hardcopy, including IDRs, reports, plans and drawings, including installation drawings and schedules, as applicable to construction purposes and as modified during construction, to constitute a complete and accurate as-built of the constructed features of the completed Project.
- D. The Construction Project Engineer is referenced as the Resident Engineer in eMCMS

### **Responsible Party**

Chief Engineer  
Deputy Chief Engineer  
Office of Construction Director

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## **PROCEDURE**

All Project Records must be clear, concise, comprehensive, complete, and correct as they may be admissible as evidence in a court of law. Requirements for safe storage of all documents shall be as follows:

If the project has an Engineer's Office, all hardcopy records shall be stored in a fireproof file cabinet approved by the engineer. If an Engineer's Office is not assigned, the District will provide space at a SHA facility in the vicinity. This could be an Engineer's Office for another project of the same contractor, an SHA maintenance facility, the District Office, etc. Under no circumstances are original documents to be stored in a personal vehicle or residence. Upon Project Completion, all hardcopies of contract documents shall be stored neat and orderly within District or other Offices administering the contracts. All digital documentation shall be saved within digital files and stored on the eMCMS database, which shall be managed on an MDOT server.

- 1) Responsibility of District Engineer or Director (DE/D):
  - a. The DE/D will document, record, and audit the estimate and final field quantities.
  - b. The DE/D will complete the Summary of Final Quantities, Semi-final and Final Estimates, and the Final Closeout Package.
  - c. Appointment of Field Document Reviewer (FDR)
    - i. Each DE/D will appoint one or more staff members to assist with a. and b. and to audit pay quantities and other contract documents as directed while the project is in progress and when the Contract Documents are turned in by the Construction Project Engineer (CPE) to the DE/D.
- 2) Duties of the FDR during the project closeout process:
  - a. The FDR has the delegated authority from the DE/D for this specific procedure.
  - b. Audit Estimate quantities for progress payments prepared by the CPE.
  - c. Audit CPE's Final Quantities in preparation for completion and submission of Final Field Quantities to the DE/D.
  - d. Review other Contract Documents as directed by the DE/D.
- 3) Guidelines for FDR: The DE/D will require the FDR to follow guidelines listed below when performing an audit:
  - a. Document each audit with an eMCMS IDR that briefly describes the checks performed and clearly describe the corrections made or to be made by the CPE. A completed OOC10 shall be attached to this IDR submission for each audit.
  - b. Check to verify that measurements and payments for each Contract Item is per Contract Documents.
  - c. Ensure the accuracy of Final Field Quantities against corresponding approved IDRs.
  - d. Check for each item being documented in accordance with procedures outlined in this SOP first then the MDOT SHA Construction Guide.

- e. Randomly sample a minimum of ten (10) percent of items and check the accuracy of computations.
  - i. When corrections need attachments:
    - 1. Download the attachment with the inaccuracy
    - 2. Make corrections in **red**
    - 3. Make the necessary entries to minus out the incorrect payment and input the correct payment into an eMCMS IDR. Attach the marked- up attachment to the item with the corrected payment along with a remark containing a description of the correction made.
  - ii. When other corrections need to be made:
    - 1. Clearly communication within the remarks of an eMCMS IDR what was inaccurate and express the suggested correction to the CPE.
    - 2. If the FDR is making corrections during Project Closeout the inaccuracy and correction made must be clearly described within the item that has the corrected payment associated.
  
- 4) When checking hardcopies, date and initial all checks and make corrections in red. Use the eMCMS audit features for online audits. When correcting a hardcopy, draw one single line through the original entry without eradicating that entry and then insert the correction. **Erasures and alterations are prohibited.** Parts of pages or entire pages may be marked "VOID". Remove no page or parts of pages from any hardcopy. The FDR will initial and date all corrections or entries. Authorized changes or additions to field quantities must be made using eMCMS. FDR will be included in the project personnel, as an Auditor, for each project they are responsible for auditing. The FDR should only submit "Semi-Final" and "Final" estimates for projects, and only submit "Monthly" estimates when necessary, where a Semi-Final or Final would not be applicable.
  
- 5) Audit estimate and final quantities with the auditing tools in eMCMS and/or field visits to projects as work progresses. As a minimum, conduct audits at approximately ten (10) percent completion to ensure proper procedures are being implemented, at approximately fifty (50) percent completion (cost) during the construction phase – (OR) – more frequently to ensure compliance with policy, directives and procedures.
  
- 6) Spot Checks of Progress Estimates:
  - a. The FDR will make random spot checks of Progress Estimates.
  - b. The FDR has full authority to examine all projects records and documentation.

- c. The FDR will document each visit or audit to projects on form OOC10 to be included with their user input into eMCMS along with descriptions of checks performed and any corrections that were made or have to be made by CPE and field staff. All Hardcopies checked or corrected shall be initialed in **red**. Initials must be adjacent to all entries reviewed. For online audits utilize the audits features of eMCMS.
  
- 7) eMCMS Document Retention: Digital documentation is retained in the eMCMS database, <https://emcms.mdot.maryland.gov>. Access can be gained to these records through User Credentials, which can be acquired through the eMCMS system administrators at [SHA\\_OOC\\_eConstruction\\_DG@mdot.maryland.gov](mailto:SHA_OOC_eConstruction_DG@mdot.maryland.gov).
  
- 8) eMCMS personnel record: The eMCMS program shall maintain a record of all parties assigned to each project within that project's database.
  
- 9) Setting up any Changes to the Item Ledger/Summary of Final Field Quantities: CPE will utilize eMCMS to prepare an Item Summary Sheet for each item number, description, unit, unit price, and all other information required on the Item Summary Sheet. The CPE will prepare Final Field Quantities concurrently with the contract progress and, as each item of work is completed, the necessary final measurements, sketches when necessary, and computations will be completed and included within the user input to generate an IDR for that reporting day (12:00:00.00 AM to 11:59:59.99 PM). The CPE must verify all work shown on the plans is included in the item summaries. In addition, field changes, Green Line Revisions (field modifications) and Red Line Revisions (design modifications) must be added to the appropriate item of work. This is done so the DE/D and FDR will be able to immediately identify changes to the plans and relate those changes to the As-Built Plans. Approved Change Orders are manually input into eMCMS by each District or Office. The FDR will audit the Final Field Quantities and prepare a Summary of Final Field Quantities to be submitted to the Contractor for review as specified in Standard Specifications section TC-7.06(a)(3).
  
- 10) Additional Work Request: When Additional Work is necessary, it shall be documented and processed through the Change Order Process.
  
- 11) Verification of Change Orders: The CPE will check to verify the information on the approved Change Order coincides with: Item No., negotiated price, quantity, and dollar amount of the Change Order entered into eMCMS.

- a. eMCMS Contract Managers and Change Order Managers of each District/Office must work together to assure that Change Order items can be input into eMCMS once approved without errors, before being submitted for final approval.
- 12) Final Field Measurements and Degree of Precision: Final Field Measurements and computations of quantities that are input into eMCMS are original documentation for final pay quantities. Record and input measurements and quantities into eMCMS to generate an IDR, sign (physical before scanning or digitally) before attaching to user input. All unit price-pay quantities must be input with two (2) decimals of precision, measurements should be measured to an accuracy of (2) decimals and computations should use (2) or more decimals whenever possible. All quantities input must carry out to or round that quantity to (2) decimals of precision. Lump Sum items must be rounded as a percent to one (1) decimal. The degree of precision applies to estimated and final pay quantities entered into eMCMS.
  - 13) Cross-Reference Payment Entries: eMCMS will generate Final Field quantities that include a cross-reference to the IDR number of the summary sheet for the entry on the quantity on the item Ledger/Summary of the Final Field Quantities.
  - 14) For Items Where Delivery Tickets are Used as a Justification of Payment: Payments based on tickets (i.e., Liquid asphalt material, HMA, WMA, Stone, etc.) must cross-reference the quantity entries to the ticket number range and the file that contains the tickets that document the quantities.
  - 15) Reconciliation of Item Ledger Quantities/Final Quantities: Reconcile discrepancies between the Final Field Quantities and the estimated quantities as the Items are completed and the Final Field Quantities become available. When an item is satisfactorily completed, and the Final Field Quantities agree with the Item Ledger quantities no adjustment will be necessary. When there is a discrepancy between the Final Field Quantities and the Item Ledger quantities. Make an entry in eMCMS, of a new IDR, to subtract all previously estimated pay quantities and enter the final pay quantities as another entry into eMCMS for the program to generate a Final Field Quantity Summary Sheet. The Item Ledger and Final Field Quantities must agree for each item in eMCMS. The estimate (monthly, semi-final, or final) will then be calculated and processed by eMCMS.
  - 16) Timely Closeout of Contract: All parties are expected to work together to expedite the timely Final Acceptance and Final Payment of the Contract.

- 17) Expediting Final Payment by CPE: Review Final Payments with the Contractor for work done by the Contractor and subcontractors as the work progresses and before submitting Final Field Quantities to the DE/D Office.
- 18) Disputed Final Field Quantities: Make every good faith effort to resolve Contractor disputes concerning final field measurements and quantities for work done by the Contractor and subcontractors before submitting the eMCMS Summary of Final Quantities to the DE/D.
- 19) District Engineer or Director Review: Conduct final review of Summary of Final Field Quantities in a timely sequence that will provide final quantities to the Contractor at a date as early as possible, but no later than 60 days as specified in TC-7.06(a)(3). When submitting final quantities for Contractor's review, any changes to total items quantities other than those shown on the last progress estimate must be identified with the reason for changes.
- 20) Disputed Quantities: Final quantities disputed by the Contractor must be submitted to the DE/D in the time allowed by TC-7.06(b)(1) & (2) with detailed documentation.
- 21) Overruns/Underruns: Project Engineers are to submit an explanation for all individual items that overrun or underrun by an amount greater than \$5,000.00. Explanations for any overrun/underrun covered by a Change Order are not required.
- 22) Issue of Final Reports: Federal Highway Administration (FHWA) aid Contracts
  - a. Non-Exempt Contracts: For FHWA to issue a Final Report on Non-Exempt or **Project of Division Interest (PODI)** contracts, FHWA must have a completed Form OOC3 District Engineer's Certification of Completion of Work (DECCOW), and the explanation of overruns/underruns as noted in 21 above. Contract Payments Division will forward all required final package documents prepared by the FDR to FHWA as a package with a letter of Transmittal to the FHWA Division Engineer.
  - b. Exempt Contracts: OOC must have a completed Form OOC3 DECCOW, a State Materials Certification, Regional Construction Engineers Final Inspection Report, and the Explanation or overruns/underruns as noted in 21). The Director, Office of Construction will then issue a Memorandum of Action with a copy to FHWA.



- c. Filing Records at District Office: Keep all hardcopy original source document records in the District or other Offices administering the contracts neat and orderly. File these documents in folders by date of the IDR or under the Item number, use one method or the other, not both, for an individual projects filings system that best fits the project needs, for State or Federal auditors. All eMCMS original documentation shall be stored virtually on a server in MDOT Office(s) with access given to State and Federal auditor through personal eMCMS credentials.

23) Retention Period for Project Documentation: Five (5) years

- a. State-Funded with no Federal-aid involved: The eMCMS Summary of Final Field Quantities, all approved IDRs, and hardcopy original source documents (“As-Builts”, tickets, material clearance documents, etc.) shall be stored on the server at TSO (digital documents) and the corresponding District Office (hardcopies) must be retained for at least five years after the date of final payment is made.
- b. Federal-Funded: The five-year retention period begins on the date on which FHWA has cleared the Final Voucher and closed in Federal FMIS. The listing of Final Voucher clearance dates from FHWA for each contract will be provided by the Administration’s Division Manager, Capital Programs Division @ 410-545-5789 for this status of the Final Voucher clearances.

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**ADDITIONAL AUTHORIZED DOCUMENTS**

District Engineer’s Certificate of Completion of Work 5300.100.11 S.D.01  
OOC 102 Record Submission Check 5300.100.11 S.D.02

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**ADDITIONAL INFORMATION**

**Other Divisions Impacted:**

SHA Districts and Offices that administer SHA contracts.

**Contact Information:**

Office of Construction Director