

CHAPTER 3 GENERAL INSPECTION

3.00 GENERAL INSPECTION INSTRUCTIONS

3.01 INSPECTION PERSONNEL

Inspection is one of the most important processes in any highway project. Even though much care is used in preparing contract documents, the quality of the finished product generally reflects the quality of the inspection performed.

An inspector must be honest and fair, exercising responsibilities with firmness and good nature. Inspectors must work cooperatively with fellow employees, supervisors, and contractors. The inspector must avoid supervising the contractor's work operations or performing any other activity that could be construed as a responsibility of the contractor; otherwise, the contracting authority's position could be jeopardized in the event of a dispute or claim.

Responsibilities

The inspector, as a member of the construction team, must perform assigned duties in a manner that will promote the progress of the project. The inspector should be familiar with the construction schedule and know how the work to be inspected fits into that overall schedule. Completion of the work within the contract time is important to both the contracting authority and the contractor.

Inspectors are accountable to the project engineer for satisfactory performance of their duties. In performing assigned duties, an inspector has the following responsibilities:

- **Plan Familiarity**

An inspector should become thoroughly familiar with project plans, specifications, special provisions, and standard road plans that apply to the work being inspected. The inspector must be capable of recognizing if the work being inspected conforms with the contract requirements.

- **Work Done Without Inspection**

Specifications 1105.07 and 1105.08 discuss appropriate situations where work is done without inspection. Good inspection practices include developing a working arrangement with the contractor that allows for being at the right place at the right time for prompt and adequate inspection.

- **Contract Compliance**

Inspectors must assure themselves that all materials furnished and work performed by the contractor are in compliance with contract requirements. Contractor's operations must be observed and appropriate tests and measurements must be performed to determine the progress and the quality of work. All reasonable facilities for such inspection must be furnished by the contractor. Documentation of inspected work and computations should be complete.

- **Unacceptable Work**

Unacceptable work should be recognized early and reported to the contractor before it develops into expensive and time consuming corrections. Notification should be confirmed in writing if necessary. For example, if the contractor is using wrong sizes or types of materials, the contractor should be informed of this at the first opportunity.

- **Testing**

Materials quality tests should be performed expeditiously and carefully. Test samples should be carefully handled and protected. Test failures should be promptly

reported. The inspector should notify the contractor of failures or when materials are rejected before being incorporated into the work.

- **Daily Diary**

The inspector's daily diary should include a record of the day's happenings, contractor activity on the project, instructions given the contractor, and extra work order agreements made. Daily diaries can assume legal importance.

If a project diary is lost, stolen, or otherwise misplaced, *a new diary should be started immediately*. The first entry in the replacement diary should document the conditions relative to the loss of the original diary and then continue with the usual diary entries for the remainder of the project.

Authority

The inspector has the authority to reject materials or suspend work if the quality of either is in dispute with the contractor. Settlement of a dispute is decided by the project engineer.

An inspector's authority does not extend to modification of any of the provisions of the contract documents, acceptance of the work, acting as a supervisor for the contractor, or improper interference in the contractor's project management.

3.02 SUPERVISION BY SUBCONTRACTOR

Specification 1105.05 discusses the prime contractor's responsibility regarding project supervision. The intent is to require an authorized, knowledgeable, and experienced superintendent to be the prime contractor's representative any time work is being performed.

3.03 COMMUNICATION WITH CONSULTANTS AND CONSULTANT PLAN ERRORS

Both the Office of Design and the Office of Bridges and Structures contract with consultants for the preparation of construction project plans. The contracts with consultants have established fees for services. Any change in service or additional work requested must be negotiated with the consultant by the administering design office. Due to this, it is vitally important that all communications, whether questions, requests for information, or inquiries on possible plan discrepancies, be routed through the consultant coordinator in the respective design office.

Every effort should be made during plan review to discover errors in staking layouts, elevations, reinforcing steel quantities, etc. Any project costs resulting from plan errors, such as the removal and reconstruction of an item built according to an erroneous plan, should be reported to the Office of Construction for recovery from the consultant.

County and city engineers should apply this same philosophy to errors in plans by consultants they hire.

3.04 REMOVING MATERIALS FROM PROJECTS

Contracting authority personnel are not allowed to remove any construction related materials from a project, during or after work hours, for any reason other than official sampling and testing. Such actions could be misconstrued by the public as accepting favors from a contractor or private use of public property.

Construction materials are defined as, but not limited to, pile cut-offs, old plywood, broken tools, piles of aggregate, erosion control materials and plantings, concrete test beams, samples of aggregates or other materials, and the products of project site clearance.

Complete cleanup of the construction area or plant site, including test materials, is the responsibility of the contractor.

3.05 SALVAGED PROJECT MATERIALS REPORTING

Many project plans indicate that some removal items shall be stockpiled or salvaged to a nearby maintenance facility. To accomplish documentation of these items, a "Salvaged Project Materials" form has been developed. Copy the form in [Appendix 3-1](#) as needed.

The form shall be completely filled out any time project materials are salvaged to a maintenance facility. The form needs the signature and initials of the project inspector and the maintenance employee who received the material.

Distribute a copy of completed form to project engineer, area maintenance manager, Office of Inventory, and project file. The Office of Inventory will add the salvaged items to the 999 series of inventory for the maintenance facility that received these materials. Include copy of completed form in the final payment packet for the project per [Construction Manual 2.45](#).

3.06 NOTICE OF SUSPENSION OR RESUMPTION OF WORK

The "Notice of Suspension or Resumption of Work" (Form 810036) shall be used to order a contractor to suspend work because of violation of specifications or a dispute regarding the quality of materials or manner of performing the work, as provided in [Specification 1105.09](#). This notice shall include a description of the work to be suspended.

Upon settlement of the question at issue, the "Notice of Suspension or Resumption of Work" (Form 810036) shall be reissued to release the contractor from the work suspension order. Although the work suspension order may be issued by the inspector, the release requires the project engineer's signature.

Copies of the "Notice of Suspension or Resumption of Work" (Form 810036) should be given to the contractor, District Construction Engineer (DCE), and project engineer.

3.07 MATERIALS QUALITY ASSURANCE PROGRAM

It is important that a system be in place to assure that quality materials that meet the requirements of the contract documents are incorporated into all projects. [Materials IM 205](#) establishes a framework for the Quality Assurance Program describing how the quality of materials will be determined. The Quality Assurance Program consists of both an Acceptance program, including both quality control (QC) and verification sampling and testing, as well as an Independent Assurance (IA) program.

QC tests are typically run by a contractor or supplier, and they are the means by which the contractor/supplier control the quality of their work. Verification tests are typically run by the owner, and they either serve as the owner's acceptance test or provide a means to validate contractor's QC test results when used in the acceptance decision. Price adjustments may be assessed for deficient materials based on verification tests or QC tests when used in the acceptance decision.

IA tests are performed to insure that proper sampling and testing procedures, personnel, and equipment are being used for both QC and verification sampling and testing. IA test results are never to be used in the acceptance decision. They are intended solely to aid in identifying deficiencies in sampling and testing procedures, personnel, and/or equipment. IA test results may be used in the dispute resolution process when QC test results are used in the acceptance decision.

[IM 204](#), including the appendices, further goes on to identify the required sampling and testing rates for the various types of work to comply with the Quality Assurance Program. It is very important to remember that all sampling and testing rates are minimums. Additional sampling and testing may be deemed necessary based upon project specific needs or circumstances.

On certified plant inspection projects, it is a requirement for the plant monitor to be a certified technician for the type of work involved. It is imperative that project engineers maintain an adequate staff of trained, experienced plant monitors. This can be accomplished by having employees participate in the appropriate technician training and certification programs and pass the examinations.

QM-A requirements can be considered an expansion of the certified plant program for HMA. In addition to normal certified plant inspection duties, under QM-A the contractor is also required to design and submit their own mix designs for agency approval. At the plant, the contractor is required to analyze and control mix production properties through frequent field testing, based on specified gyratory mix design criteria.

Certified plant inspection will apply to items of work as defined in [Specification 2521.03](#). Any items of work excluded from certified plant inspection will be as noted in contract documents. Work excluded from certified plant inspection will also be excluded from QM-A requirements.

Quality Assurance for Portland Cement Concrete (PCC) Paving

[IM 527](#) describes the plant inspection (Quality Control) requirements that a contractor must follow for a PCC Paving plant. [IM 535](#) describes the plant monitoring (Verification) responsibilities for a PCC Paving plant. [Appendix A](#) in [IM 535](#) lists the minimum monitoring requirements. A plant monitor will normally be assigned to each project with duties split between plant and grade inspection. Plant monitor should schedule work so the plant can be visited daily during production. The amount of time spent at the plant

will depend on the overall quality control at the production plant. A list of all verification and IA responsibilities for PCC paving can be found in [Appendix 3-2](#)

Test beams for determining flexural strengths are to be transported from the grade to the plant site by contracting agency personnel.

Quality Assurance for Ready Mix Concrete

[IM 528](#) describes the plant inspection (Quality Control) requirements that a contractor must follow for a PCC Ready Mix plant. [IM 535](#) describes the plant monitoring (Verification) responsibilities for a PCC Ready Mix plant. [Appendices B and C](#) in [IM 535](#) list the minimum monitoring requirements. A list of all verification and IA responsibilities for Ready Mix Concrete can be found in [Appendix 3-3](#).

Test beams for determining flexural strengths are to be transported from the grade to the plant site by contracting agency personnel. The certified plant inspector is responsible for curing and storage of the beams. Contracting agency personnel are responsible for testing and reporting results.

Quality Assurance for Hot Mix Asphalt (HMA) Paving

[IM 508](#) describes the plant inspection (Quality Control) requirements that a contractor must follow for an HMA Paving plant. [IM 511](#) and [IM 511 - Appendix A](#) describe the plant monitoring (Verification) responsibilities and minimum monitoring requirements for an HMA Paving plant. A list of all verification and IA responsibilities for HMA paving can be found in [Appendix 3-4](#).

A plant monitor will normally be assigned to each project with duties split between plant and grade inspection. For HMA projects, individual monitoring responsibilities may be shared between the plant monitor, grade inspector, and materials personnel. Materials engineers and project engineers may mutually coordinate and shift responsibilities between personnel on an individual project basis to achieve the most efficient use of their respective personnel. The plant monitor should schedule work so that the plant can be visited daily during production. The amount of time spent at the plant, beyond minimum requirements, will depend on the overall quality control at the production plant.

Core samples for determining HMA density (field voids) are transported from the grade to the plant site by contracting agency personnel (non-agency personnel may transport with tamper-proof identification/security measures in place). Agency personnel (plant monitor or project inspector) are responsible for performing the density testing and reporting results. The project inspector will also be providing production and placement information to be entered on the daily plant report.

Plant Reports

The project engineer should make arrangements with the certified technician for timely distribution of plant reports. On QM-A projects, the contractor shall deliver a copy of the daily plant report and QM-A Summary Sheet to the District Materials Engineer on a daily basis. The original and all copies of the plant report shall be kept at the plant until all documentation is completed. Normally, this will be the day following the end of the reporting period. Review and distribution of the reports will be made by the project engineer. This distribution will include a copy to be returned to the certified technician. Prompt consultation with the certified technician and monitor shall follow any significant error or omission.

Documentation

A separate field book should be set up on each project to document plant inspection. Some flexibility in the suggested format may be necessary depending on project size, type of plant, and if QM-A applies. It is important to document discrepancies and corrective action taken by the contractor.

A copy of this documentation must be furnished to the District Materials Engineer (DME) at the time of project acceptance. Also include the certified technician's name, certificate number, and statement from the monitor regarding the work performance of certified technician. A sample format for providing this documentation is contained in [Appendix 3-6](#).

Specification Violations

Failing test results are to be recorded on the daily plant report by the plant inspector. Verbal notification of such failing results shall precede completion of paperwork to assure timely changes.

The plant monitor will convey to the responsible project inspector all specification violations, discrepancies in results with the plant inspector, and improper procedures and equipment used by the plant inspector. The project inspector will issue noncompliance notices for failing test results and inadequate testing procedures or equipment.

In order to use the contractor quality control test results for the acceptance decision, they must be validated by agency verification tests. It is important to notify the contractor and the DME when the results do not compare within the validation criteria in the Materials IM. The lot of material cannot be accepted until the validation issue is resolved by the DME.

All improper procedures, unresolved test discrepancies, or failure to perform inspection duties will be considered by the DME for possible decertification or other appropriate corrective action.

The role of the plant monitor is vital in assuring the DME is aware of any deficient or otherwise unsatisfactory work of the certified technician.

Testing Equipment & Supplies

Certain testing equipment is available for purchase from Department stock. Producers should refer to HMA and PCC Plant Inspection Manuals for specific information and Office of Materials Lab contacts. A list of equipment suppliers is included in the plant manuals.

Necessary plant inspection forms will be furnished to the producer at no cost. The producer can request these through the DME or project engineer. It is a good idea for the plant monitor to carry a supply of forms and make these available to the producers as needed.

The plant monitor can utilize contractor-furnished equipment for testing required at the plant site. HMA core density testing will most likely be done using the same balance, water bath, and thermometer as the contractor. Verification gradation testing should be done at a separate laboratory from the contractor's if possible.

Samples

Verification samples are to be taken by agency personnel or by contractor personnel when directed and witnessed by agency personnel. *Materials IM 204* will indicate when contractor sampling assistance is required.

Verification samples that are not tested should be retained until the lot has been accepted.

If required by contract documents, transportation of secured verification samples to the District Materials Lab shall be performed by the contractor.