MICHIGAN DEPARTMENT OF TRANSPORTATION
Office of Aeronautics – Planning and Development Section
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PROJECT ENGINEER'S MANUAL
For Construction

January 29, 2015

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FOREWORD

The primary purpose of this manual is to provide a guide and reference book to which engineers and architects can refer in carrying out their assignment as project managers of airport construction projects in the State of Michigan.

In order to maintain consistency throughout our program, we require all construction supervision contracts to reference this manual and indicate that the project engineer will adhere to all of the guidelines contained herein.

This manual is intended to be used as a guide in carrying out engineering and administrative responsibilities. It is not to be considered a substitute for good engineering judgment; however, when used as intended it will help to professionally accomplish all aspects of the projects.

We look forward to working with you in enhancing the safety and infrastructure of Michigan's aviation system.

_____

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GENERAL PROCEDURES

I. ENGINEER'S AND ARCHITECT'S GENERAL DUTIES AND RESPONSIBILITIES

The project engineer or architect, hereinafter referred to jointly as the Consultant, unless otherwise stated, represents the sponsor (airport owner) on all matters pertaining to the execution of the construction contract. The Consultant shall familiarize themselves completely with the plans, addendums, specifications and supplemental specifications pertinent to the various items of work in the contract.

The Consultant will work directly with the Project Manager, or authorized representatives, of the Michigan Department of Transportation (MDOT), Office of Aeronautics, Planning and Development Section (referred to as Aero in this manual).

The Consultant assignment is essentially to supervise the engineering and inspection required for the project in order to monitor the contractor's conformance with all the terms of the construction contract, including the plans and specifications. In general, the Consultant duties and responsibilities are as follows:

1. To inspect the contractor's performance to determine if the work conforms to the requirements of the contract plans and specifications.

2. Furnish the field equipment and personnel for construction management and project control as required for the project.

3. During construction the Consultant will be immediately available for consultation on project problems.

4. Prepare periodic cost estimates, change orders/contract modifications, start and stop orders, recommendations for changes and construction inspection reports. Copies shall be submitted to the Aero Project Manager within a timely manner.

5. Conduct periodic inspections to determine if the project is within budget and track funding breakdown. Submit recommendations to Aero to adjust the work if, in the Consultant's opinion, it is advisable.

6. Verify all necessary project permits are on site.

7. Perform all quality assurance testing, as required by this manual, to determine the contractor's conformance with plans and specifications.

8. Prepare and maintain an accurate written record of contract time expended on the project by the contractor throughout the life of the contract. This written record may be of paramount importance at the time of closing out the contract in order to determine whether the assessment of liquidated damages is justified in the event the contract time is exceeded by the contractor.

9. Compute all final quantities and prepare complete "as-constructed" plans following the guidelines in Appendix I.

10. Approve shop drawings, catalog cuts and material certifications as required for the project as submitted by the contractor. Copies shall be submitted to the Aero Project Manager in a timely manner.

11. Approve the concrete and/or bituminous mix designs including the required physical tests and submit to Aero prior to paving operations.

12. Prepare a final construction contract report in accordance with the guidelines in Appendix I.

13. Update Airport Layout Plan (ALP) to show any new construction and new runway end elevations and coordinates. All sheets within the ALP set shall be updated, if they were affected by any construction. The Consultant will submit the applicable number of paper and electronic files to the Aero Project Manager.

The Consultant shall manifest the spirit of cooperation at all times and is responsible for the following relationships to other personnel assigned to the project:

1. The Consultant shall act as liaison between the contractor, the airport owner, and Aero.

2. The Consultant shall cooperate with the contractor to the extent of obtaining workmanship conforming to acceptable industry standards, as per the contract plans and specifications.

3. When work is under construction on existing airports, the Consultant shall coordinate the work of the contractor with the activities of the airport in order to ensure safety and a minimum of disruption to all concerned. The Consultant shall inform the contractor any time temporary marking, lighting, flagging or barricading is not in accordance with the "Construction Safety/Phasing Plan." In accordance with Section 50-01 of the General Provisions for Construction on Airports, the Consultant has the authority to suspend work if the contractor fails to comply. In the event additional provisions are necessary or no safety plan is provided, the Consultant, in cooperation with the airport manager, shall designate areas to be closed to traffic, displaced thresholds, relocated thresholds, etc., with the proper markings so as to alleviate any conflict to safe traffic movements during the project, and arrange, through the airport manager, the issuance of appropriate Notices to Airmen (NOTAM's). At lighted airports, the Consultant shall designate those areas where lighted barricades, warning signs, hazard markings, or other types of safety lights shall be placed (General Provisions 70-08 and 80-04).

4. The Consultant shall conduct inspections and engineering supervision in a manner which is both efficient and reliable.

5. The Consultant shall cooperate with the authorized Aero and the Federal Aviation Administration (FAA) representatives and shall be available for consultation during their scheduled periodic construction inspections. The Consultant shall provide the authorized representatives access to all plans, inspection reports, files, notes, and any other information which is pertinent to the project.

6. All important instructions, irregularities, orders, rejection of work, etc., shall be transmitted to the contractor in writing. A copy of this transmittal letter should be forwarded immediately to Aero. In order not to delay the execution of the work, oral instructions may be given to the contractor, with the instructions confirmed promptly in writing.

7. Coordinate activities between all utility companies, other prime contractors or any other authorized personnel in the vicinity.

There are several additional items which are more pertinent to building construction:

1. The Consultant shall check and approve all schedule of values and timeline documents furnished by the contractor in a timely manner. Copies shall be submitted to the Aero Project Manager in a timely manner.

2. The Consultant shall aid the airport owner on such details as selection of the color of paint and other details of similar nature not specifically covered in the documents.

3. The Consultant shall check location of all fixtures, outlets, conduit, etc., to determine that all details conform to the plans and architectural specifications.

4. The Consultant shall observe the contractor on equipment tests and determine that all mechanical, electrical, plumbing, etc., details meet the specifications.

5. The Consultant shall complete "as-constructed" plans showing all plan changes, including all change orders/contract modifications according to Appendix I. The "as-constructed" plans shall show all major equipment with details such as size and manufacturer. The "as-constructed" plans shall show coding, tagging and other detail which will aid the airport owner in tracking down problems and making repairs. The plans shall show location details on all buried cables, conduit, pipe, fuel tanks, sewage system, etc., and their approximate depth below ground.

6. The Consultant shall secure from the contractor copies of equipment operation manuals, roof bonds, guarantees, waivers of lien, etc., as called for in the architectural specifications. One copy of these documents shall be submitted to the airport owner and one copy, if requested, to Aero.

7. The Consultant shall submit a breakdown of all allowance costs, as established by the specifications, to Aero. If the cost of these allowances is more or less than that of the price established by the specifications, a change order/contract modification must be prepared changing the contract price.

II. PRIOR TO NOTICE TO PROCEED

The contractor is responsible for submitting the appropriate Buy American forms, or a request for waiver, that were included in the bidding documents verifying the steel and manufactured goods are produced in the United States. These must be on file with Aero before an MDOT let contract can be awarded and on locally let projects the completed forms must be submitted with bids.

After the construction contract has been executed by the contractor and airport owner, copies of the executed contract shall be distributed by the MDOT. In the case of a local let project, please refer to Appendix II.

Pre-Construction Meeting

A pre-construction meeting will be scheduled by Aero or the Consultant before construction begins. This meeting will be attended by representatives of the contractor, Consultant, FAA (where applicable), subcontractors, airport manager, local officials and any other interested parties. Minutes will be recorded by the Consultant with a typed copy being sent to all in attendance.

The project schedule, as prepared by the prime contractor, shall be submitted in writing at this meeting (see example in Appendix I). The schedule will incorporate any dates or times included in the plans and documents, and the proposed starting and completion dates for major items of work. The schedule may be revised at the pre-construction meeting, in which case a copy of the revised schedule should be submitted to the Consultant and airport owner for approval. Notification shall be given to the Aero Project Manager of any approved changes.

III. NOTICE TO PROCEED

Prior to start of construction by the contractor, an official "Notice to Proceed" will be issued to the contractor, Consultant and airport owner by Aero for MDOT let projects. The "Notice to Proceed" specifies when the contractor is authorized to start work. The contractor is required to start work on this date or within ten calendar days. The Consultant shall begin calculating contract time from the actual starting date or 10 calendar days after the contractor is authorized to begin work, whichever is earliest. The actual starting date should appear on the first weekly report or in FieldManager. The "Notice to Proceed" also specifies the number of calendar days allotted for the completion of the work. (Sometimes the contract time will be a definite calendar date.) Under certain circumstances, specific information concerning contract time allotted to particular items of work in the contract may be included in the "Notice to Proceed." The prime contractor is responsible for submitting all subcontract cover sheets and line item lists to the Consultant or Aero **prior** to the subcontractor working on the project site. The Consultant shall verify the subcontractor's information has been submitted to MDOT either by reviewing file copies or accessing the Contractor Service Center on the web at http://mdotcf.state.mi.us/public/trnsport/.

Start and Stop Orders

Stop Orders shall be issued only when it is in the public interest to stop the work. Stop Orders may be issued for strikes, lockouts, unusual delays in transportation, extensive periods of unsuitable weather conditions, or any unusual delay over which the contractor has no control, or any suspensions ordered by the Consultant for causes not the fault of the contractor.

Stop Orders are numbered in consecutive order. Each Stop Order shall indicate the reason for stopping construction operations, the specific work covered by this order if other phases of work are allowed to continue, and the effective date. The Stop Order shall also state when the work is expected to resume. All copies shall be signed by the Consultant and the contractor. The contractor and Consultant shall each retain one copy with the Consultant forwarding a copy to Aero and the airport owner.

Before the contractor is permitted to resume work which has been stopped by a Stop Order, the Consultant must issue a Start Order. Start Orders are numbered in consecutive order. Each Start Order shall specify the effective date when work shall resume, the number of the Stop Order cancelled by this action, and the number of calendar days remaining for the work completion. All copies shall be signed by the Consultant and the contractor. The contractor and Consultant shall each retain one copy with the Consultant forwarding a copy to Aero and the airport owner.

IV. CONSTRUCTION

Construction Surveying

The Consultant is responsible for the construction surveying required to accomplish the contract work. This includes laying out the job, setting benchmarks and grade stakes, taking cross section elevations, and laying out the location and elevation of runway and taxiway lighting and navigational aids. The

field method of staking is to be determined by the Consultant, as long as adequate project control is provided to allow the contractor to comply with project plans and specifications.

If applicable, permanent runway centerline monuments and approach surface markers shall be placed, by the contractor, at the runway alignment control points, and approach surface locations set by the Consultant. Requirements for the locations and installation of these markers must be shown in the construction plans.

Inspection and Testing

The General Provisions of the contract documents state the authority of the Consultant relative to the quality and acceptability of materials, work performed and rate of progress. Work or materials not meeting specification requirements may be designated for removal and replacement at the contractor's expense.

All operations of the contractor do not require full time inspection. However, the engineer/inspector shall keep informed as to what activities are in progress, and be available in a timely manner when a problem arises or at the site when a major activity is to begin. The Consultant is expected to use good judgment in determining when it is necessary to be on the job.

Throughout the life of the construction contract, the Consultant is required to conduct testing and project control inspections in such a manner that will be both reliable and efficient. The Consultant shall conduct tests and set stakes within a reasonable time after being requested by the contractor and in such a manner that will cause the least amount of delay to the contractor. As soon as tests are completed and results analyzed, the Consultant shall inform the contractor of the test results.

It is not the responsibility of the Consultant to tell the contractor how to do the work, but it is the responsibility of the Consultant to tell the contractor whether the work conforms to the plans and specifications and, consequently, whether the work is accepted or rejected.

The Consultant is responsible for the quality assurance field testing required by this manual in relation to the contract specifications. The Consultant and inspectors shall be familiar with the tests required and the method of performing each test. Lists of tests required, where to find the test procedure and the frequency of testing are included as Appendix III. One copy of each test report, certification, etc., shall be submitted by the Consultant to Aero. Test reports will contain the Consultant approval or disapproval of the results of the tests. Any acceptance of a failing test must be completely and clearly explained in writing. All documentation shall be made available by the Consultant for review when requested by Aero or FAA.

Material samples will be taken by, or in the presence of, the Consultant or approved independent testing laboratory. It is the Consultants responsibility to ensure material test reports and certifications are completed and approved prior to use of the material in the project and prior to the contractor’s payment for this material.

Testing is one of the most important duties and responsibilities of the Consultant. The material testing section of the contract documents details the tests which are the responsibility of the contractor. At the beginning of the project, the Consultant should examine each item of work listed on the plans and specifications and prepare a list of all the tests which are required to be performed. The list should include all the tests, even though some of the tests are the responsibility of the contractor, as denoted in the material testing section. The list of tests will provide a ready reference and check-off list for the Consultant and will ensure that all required tests have been performed.

The Consultant is required to perform the project control field testing as construction progresses for each item of work before allowing another item of work to start which would cover up the particular item of work being tested. No work shall be approved by the Consultant unless all of the required testing and inspection has been performed and it has been determined that the work conforms to all of the requirements of the contract documents, plans and specifications.

If the Consultant is in doubt about acceptability of a test result or has a question regarding a construction issue/problem, the Consultant should immediately contact the Aero Project Manager to discuss possible alternatives.

Aggregate Subbase and Base Inspection

The inspector shall have a thorough knowledge of the specification requirements. Testing shall include gradations, physical material test requirements and density. Field inspection shall include, but not be limited to, proper elevations and thickness determinations.

Bituminous Inspection

To maintain good quality control of asphalt production and construction, the Consultant shall have a sufficient number of experienced inspectors (field and plant) for the project during paving operations. A prompt system of communication shall exist between the Consultant's plant and field inspectors and the Contractor's quality control personnel.

Prior to paving operations, the Consultant shall receive from the Contractor all of the applicable material acceptance test reports and certifications. This includes coarse and fine aggregate physical tests, mineral filler certification, and asphalt cement certification and/or test results.

No bituminous mixture shall be produced for payment until a job mix formula prepared specifically for this contract has been approved by the Consultant. The job mix formula shall be submitted by the Contractor at least 10 days prior to paving operations. All test data used to develop the job mix formula shall also be submitted.

A test section using a quantity of bituminous mixture meeting the job mix formula specifications shall be placed as directed by the Consultant. The section shall be tested by the Consultant as outlined in the bituminous specification. Until the plant is producing the desired mix consistency, frequent testing may be necessary. The test section offers the contractor and the Consultant an opportunity to determine the quality of the mixture in place, as well as performance of the plant and paving equipment.

Material acceptance and testing requirements for bituminous pavement are listed in Appendix III in tabular form and in the bituminous specification.

Concrete Inspection

To maintain good quality control of concrete production and construction, the Consultant shall have a sufficient number of inspectors for the project during paving operations. Prior to paving operations, the Consultant shall receive from the Contractor all of the applicable material acceptance test reports and certifications. This includes coarse and fine aggregate physical tests, cement certification, approval of admixtures, joint filler, steel reinforcement, calcium chloride, and curing compound.

No concrete shall be produced for payment until a job mix formula prepared specifically for this contract has been approved by the Consultant. The job mix formula shall be submitted by the Contractor at least 10 days prior to paving operations. All test data used to develop the job mix formula shall also be submitted.

Material acceptance and testing requirements for concrete pavement are listed in Appendix III in tabular form and in the concrete specification.

Material Acceptance

Before any material is used at the project site, the proper independent laboratory test or manufacturer's material certification shall be submitted by the contractor. The Consultant shall review the documentation submitted by the contractor for compliance with the specifications, and issue approval to proceed. Delivery and weight slips for materials shall be retained by the Consultant in the project records. Any equipment which is part of the FAA Airport Lighting Equipment Certification Program must be verified by the Consultant prior to installation.

Reports and Records

The Consultant is responsible to approve and submit all test documentation and material certifications to Aero. The acceptance of any test or material not within specification must be documented. Each test report or summary should be signed and approved for submission by the Consultant. This documentation must be submitted as part of the final construction contract report and also upon request by the Aero Project Manager.

Every project must have daily inspection records completed by the Consultant or Consultant's Inspector including the date and their signature. These need not be submitted but must be available at the time of the field inspections by Aero or upon request. They will be included in the project records at the end of the project and be retained by the Consultant. Entries should include:

a. Daily weather conditions and temperatures.
b. Communications with Aero, FAA, contractor, airport owner, etc.
c. Items of work in progress, estimated quantities, difficulties encountered and methods used in correcting them.
d. Information concerning disputes with the contractor over quality or quantity of materials or work performance.
e. List of equipment in use, number and types of personnel, number of inspectors on job.
f. Starting and completion dates of major items of work and note any delays in progress and reason for the delays.
g. Tests performed and locations.

All test documentation, reports, daily inspection records, letters, etc., must be retained by the Consultant for a period of six years from the date of the last payment to the Consultant.

Weekly reports (FAA Form 5370-1) or FieldManager Inspector's Daily Reports (IDR) are to be submitted by the Consultant to Aero as part of the final construction contract report and as requested by the Aero Project Manager. Both forms are included in Appendix I. The one selected is to be completed in its entirety. If a comment is not applicable, or no comment is necessary, please indicate in each block with "None" or "Not Applicable."

Payments to Contractors

The Consultant shall prepare periodic contractor pay estimates, typically on a biweekly basis. Pay estimates must be processed using FieldManager (see Appendix I) for MDOT let projects. For locally let projects, please refer to Appendix II. The Consultant will not include any item of work for payment unless the required test reports and material certifications have been received from the contractor for that item of work and are considered acceptable by the Consultant. The Consultant shall verify that the results of these test reports conform to the specifications.

Contract Modification (Change Orders)

In the event of a need for changes to the construction contract time, quantities or unit prices, the Consultant shall prepare the proper contract modification. The Consultant shall submit three (four are needed for primary airports since they will need to go to the ADO for approval) original contract modifications signed by the contractor, airport owner and the Consultant to Aero for approval and processing. Major changes to scope or budget shall have prior approval by Aero before the work is accomplished. For more specific instructions on creating contract modifications in FieldManager, refer to Appendix I.

Payroll Compliance

On contracts with federal participation, the Consultant shall submit certified payrolls for the time period covered by the pay estimate. The instructions for completing payroll records are given in Appendix I.

V. AFTER CONSTRUCTION

Final Inspection

Upon notice from the Contractor of substantial completion of the contract, the Consultant shall conduct a pre-final inspection with the Contractor to assure that all of the contract requirements have been performed, in accordance with the plans and specifications. If the pre-final inspection discloses any unsatisfactory work, the Consultant will give the contractor the necessary written instructions. Upon correction of the unsatisfactory work or if the pre-final inspection shows that the Contractor has completed all work in accordance to the contract, the Consultant will schedule the final inspection with the Aero Project Manager, airport owner, contractor, and FAA (specifically for primary airports as defined by the National Plan of Integrated Airport Systems). All inspection reports, test reports, material certifications, shop drawings, etc., must be submitted to Aero in the final construction contract report if they have not been submitted already. Once the project is accepted, the Consultant shall provide the airport owner with the Sponsor Certification for Construction Project Final Acceptance form for signature (see Appendix I). A signed original of the Certification form shall be submitted to Aero.

If PAPI’s are installed or moved as part of the construction project, the Aero project manager will coordinate a reimbursable agreement with FAA prior to construction starting to pay for Flight Check. After PAPI construction is compete, the Airport Manager, Consultant or Aero Project Manager will need to contact the FAA non-federal NAVAID coordinator to request a flight check. Once completed, the non-federal NAVAID coordinator will notify the contact person of commissioning and confirm the PAPI's can be turned on. Additional information is available in Appendix II (B) of this manual under Guide for PAPI Flight Check.

Final Payment to Contractor

After the contractor's work has been approved and all contract requirements have been met, the Consultant should submit a final contract modification, the Contractor's final payment request, and any other supporting documentation previously not submitted. Upon completion of Aero's review of the final project documentation, final payment to the contractor will be processed.

Final Payment to Consultant & Project Closeout

Final payment to the Consultant will be processed by Aero after all project documentation has been submitted and approved by Aero. The final construction contract report and "as-constructed" plans shall be prepared in accordance with the guidelines in Appendix I.

APPENDIX I

(A)

AIRPORT
PROGRESS SCHEDULE

CONTRACT ID	FEDERAL NUMBER	☐ INITIAL ☐ UPDATE
PROPOSAL ITEM NUMBER	**LETTING DATE**	

OUTLINE OF PROPOSED ORDER OF WORK FOR CONTROLLING WORK ITEMS – when approved, this outline will become part of the contract.

CONTROLLING WORK ITEM ☐ CALENDAR DAY ☐ CALENDAR DATE	ATTACHMENT ☐ CRITICAL PATH ☐ BAR CHART ☐ LINEAR SCHEDULE ☐ N/A	DURATION OF CONTROLLING OPERATION START (Date/Work Day)	 COMPLETE (Date/Work Day)

REMARKS

CONTRACTOR NAME (PRINT)		PROJECT ENGINEER (PRINT)	
CONTRACTOR SIGNATURE	**DATE**	**PROJECT ENGINEER SIGNATURE**	**DATE**

(B)

AIRPORT PROJECT ENGINEER/ARCHITECT STATEMENT

Complete and Submit to Airport Services Division Project Manager PRIOR to preconstruction meeting

The _____ has selected _____
(Airport Sponsor) *(Consulting Firm)*

for construction supervision for the _____ project.

I, _____, as the Project Engineer/Architect, shall be the contact and consultant responsible for the project. This responsibility shall not be delegated to anyone else.

In this regard I, as the Project Engineer/Architect, shall (at a minimum):

1) Be considered in responsible charge of the project as outlined in the current Project Engineer's Manual.

2) Sign all construction documents requiring a licensed professional engineer/architect signature.

3) Attend the pre-construction meeting or delegate to other experienced representative.

4) Be available for meetings with the Michigan Department of Transportation, the airport sponsor, the inspectors and/or the contractor.

5) Assure that the plans, specifications and proposal are followed and to approve any changes or modifications to the plans, specifications or proposal.

6) Assure that the construction inspectors are experienced and trained, as needed.

7) Be a licensed professional engineer/architect in the State of Michigan.

8) Be in attendance at the final project review or delegate to other experienced representative.

Signed: _____ _____
(Date)

Registration Number: _____ _____
(Expiration Date)

Address: _____

_____

Phone No.: _____

(C)

CONSTRUCTION MANAGEMENT PROGRAM

On all contracts involving federal funds having paving work with costs in excess of $500,000 the Consultant shall provide, in report form, the following information to Aero and FAA (if applicable) at/or prior to the pre-construction meeting. The $500,000 shall apply to the entire paving section from subgrade through surface course. This document shall detail the measures and procedures to be used to comply with the quality control provisions of the construction contract, including, but not limited to, all quality control provisions and tests required by the specifications. The program shall include as a minimum:

- The name of the individual from the consulting firm representing the sponsor that will have responsibility for contract administration for the project and the authority to take necessary actions to comply with the contract.

- Names of testing laboratories and consulting engineering firms with quality control responsibilities on the project, together with a description of the services to be provided.

- Provide documentation for determining testing laboratories meet the requirements of a recognized program such as the MDOT testing program or a national authority such as the American Society of Testing and Materials. This documentation is evidence of their competence to complete the required tests referenced in the contract specifications.

- A listing of and the qualifications of engineering supervision and construction inspection personnel that will be working on this contract (i.e., Education, Professional License, certificates including date and issuing agency, experience, etc.)

- A listing of all tests required by the contract specifications, including the type and frequency of tests to be taken, the method of sampling, the applicable test standard, and the acceptance criteria or tolerances permitted for each type of test.

- Provide procedures for ensuring that the tests are taken in accordance with the program, that they are documented as required, and that the proper corrective actions, where necessary, are undertaken.

The FAA or MDOT, at its discretion, reserves the right to conduct independent tests and to reduce payments accordingly if such independent tests determine that the Consultant test results are inaccurate.

(D)

INSTRUCTIONS FOR COMPLETING PAY ESTIMATES AND CONTRACT MODIFICATIONS USING FIELDMANAGER

All projects bid through MDOT's bid letting process must use FieldManager to manage the project and process all pay estimates and contract modifications. FieldManager may be obtained from Info Tech (352) 381-4400, website http://www.fieldmanager.com, email: info@infotechfl.com. Training is available through ACEC (American Council of Engineering Consultants) (517) 332-2066 or email: mail@acec-mi.org. There is also a FieldManager's User Group sponsored by ACEC.

Many preset inquiries are available in FieldManager and are very informative. FieldManager also has the capability to electronically file Inspector's Daily Reports (IDRs) and it is recommended that this capability be used for daily project documentation. If used for daily documentation, the Construction Weekly Report FAA Form 5370-1 will not be needed. The box for "Inspector's Initials – Name" on the IDR should reflect the Inspector in the field.

Within 2-3 business days after the award of the contract, the Consultant will:

- Receive a startup file in Field Manager FN Mailbox from Contract Data (from CAS).

- **Import** the startup file into FieldManager by double clicking on the file.

In Field Manager, **Fill** in appropriate fields under General, Administrators and R/O Distribution:

a. Project Engineer: Consultant's PE responsible for the project
b. Construction Engineer: Aero project manager
c. Managing Office: Consultant Firm
d. Notice to Proceed Date: Defaults to Contract Award date, change to actual Notice to Proceed date
e. Construction Started Date: First day work started
f. Add LANAERO to R/O Distribution tab and add contractor if requested.

Contract Modification:

Contract modifications shall have approval by the Contractor, Aero, and the Sponsor prior to processing for budget and scope justification.

1. **Four signed original Contract Modifications must be submitted to Aero-Project Manager**. Contract Modifications must have the original signatures of the Consultant, Contractor, Airport Sponsor and FAA for primary airports.

2. Once **approved and processed** by Aero, one approved original will be retained by Aero and the other three will be mailed to the Airport Sponsor and the Contractor, and FAA, if applicable, with copies sent to others. An email will be sent to the Consultant FieldManager Coordinator who must then:

   a. **Approve** the contract modification in FieldManager. Once approved contract modifications may not be changed or deleted.

b. **Create** a regular read-only copy of the contract.

c. **Transmit** the read-only copy using the Field Manager FN Mailbox to the Aero FieldManager Coordinator.

Pay Estimates:

1. Work Items quantities must be recorded in FieldManager IDRs as postings and then generated.

2 All estimates should be estimate type Semi-Monthly except the Final-Regular Contract which releases the work items remaining on the contract. For end of fiscal year payments, Consultant should be sure to separate pay estimates prior to and after October 1st so old year and new year pay estimates are clearly separated.

3. FieldManager will automatically collect information from generated IDRs and compile into a pay estimate. Review estimate and make sure items are correct, if okay then generate pay estimate. NOTE: Once generated, pay estimates may not be changed or deleted.

4. A read-only copy of the contract is automatically generated.

5. **Transmit** the read-only pay estimate file using the FieldManger FN Mailbox to the Aero FieldManager Coordinator

6. **Submit** a signed copy of the pay estimate to the Aero project manager for approval.

Miscellaneous:

Any questions or problems should first be directed to Aero. If Aero does not have the answer, you will be directed to contact the FieldManager Helpdesk at (517) 322-1556.

(E)

INSTRUCTIONS FOR COMPLETING CERTIFIED PAYROLL RECORDS

Applicable for federally funded projects only

After the Notice to Proceed is issued to a contractor it is their responsibility to submit certified payroll records from the date they are authorized to commence work to the date work is actually completed. Payrolls will be sent to the consultant and reviewed only for completeness. Any projects bid through MDOT's bid process will have certified payrolls forwarded to Aero for review. The Consultant may submit these payrolls to Aero either electronically with valid electronic signatures or by paper with original signatures. Payrolls for locally let jobs will be reviewed by the Consultant and kept on file. When work has been completed, "FINAL PAYROLL" should be written on the last payroll form submitted to the Consultant.

Payrolls must be submitted on Form WH-347 or on another form of the contractor's choosing, providing a statement of compliance with respect to the wages and fringes paid to each employee engaged in the work is attached. This statement must be identical in wording to the statement of compliance on the back of Form WH-347. Payroll form WH-347 can be obtained from Aero or at www.dol.gov./whd/govcontracts/ where WH-347 payroll forms and interactive instructions are available.) Each contractor or subcontractor shall submit consecutively numbered payrolls for all weeks worked and "FINAL PAYROLL" should be written on the last payroll form and submitted to the Consultant. Payroll records are to be retained for a period of three years from date of completion of the contract.

Form WH-347 will satisfy the requirements of Regulations, Parts 3 and 5 (29 CFR, Subtitle A) as to payrolls submitted in connection with contracts subject to the Davis-Bacon and related acts. The web page to access current Davis-Bacon wage rates is www.wdol.gov. The contractor and subcontractor must pay their employees Davis-Bacon prevailing wages or more plus fringe benefits as stipulated in the Construction Contract. . A poster and wage rate listing is distributed to the contractor with the notice to proceed and must be displayed at the site at the time the contractor starts work. The poster can be found at www.whdwww.dol.gov./whd/govcontracts/.

Detailed interactive instructions concerning the preparation of Certified Payrolls can be found at www.dol.gov./whd/govcontracts/. Any additional questions can be directed to Aero.

(F)

SPECIAL INSTRUCTIONS FOR BITUMINOUS PAVING PROJECTS

SECTION 1. MATERIALS TESTING

1.1 Aggregates: All aggregate samples required for testing are to be furnished by the contractor. Under the terms of each contract, the contractor is responsible for making arrangements with an independent laboratory to perform material acceptance tests. The contractor is obligated to pay all charges incurred in performing these tests, including shipping expenses to transport the test samples to the laboratory. The Consultant should verify that samples are taken by the contractor in accordance with procedures established in ASTM D75 (coarse and fine aggregates) and ASTM C183 (mineral filler).

No aggregate should be used in the production of mixtures unless it meets the specification requirements and the laboratory test reports have been approved by the Consultant. The Consultant should verify that all applicable test results have been indicated. Each report furnished must contain a definite statement by the testing laboratory indicating that the material tested does or does not meet the applicable specification.

The aggregate section of the bituminous mix design data form, which is following, shall be completed by the Consultant and given to the contractor prior to or at the preconstruction meeting. The Consultant should submit the data form, the laboratory mix design, physical aggregate and asphalt cement test reports to Aero prior to the start of full production.

1.2 Asphalt Cement: During each day of production, the Consultant should obtain a minimum of one 16-ounce sample of the asphalt cement. The sample should be drawn from the plant by the contractor. The Consultant should direct the contractor to place the samples in sealed containers. The containers should be labeled as follows: Date, Airport Name, Project No., Contract No., Contractor, Supplier, Grade of AC.

The Consultant should properly store the samples for a period of twelve months beyond the date of final acceptance of the contract. The samples will be held, should verification of the asphalt physical properties be necessary.

SECTION 2 JOB MIX FORMULA (CONSULTANT'S RESPONSIBILITIES)

No bituminous mixture should be produced for payment until the contractor obtains and submits a job mix formula and it is approved by the Consultant and acceptable to Aero. The job mix formula should be developed following the procedures for the Marshall Method of Mix Design in the Asphalt Institute's Manual Series No. 2 (MS-2) – Mix Design Methods with the following modifications:

> Compaction of the Marshall Specimen shall be by means of a flat-faced, mechanical hammer. The optimum asphalt content shall be determined in accordance with Section 3.2 of the applicable specification.
>
> The testing laboratory used to develop the job mix formula must meet the ASTM D3666 requirements, be a MDOT certified laboratory or be accredited by some other nationally recognized organization.

The Consultant should complete the appropriate section of the Bituminous Mix Form and present it to the contractor prior to or at the preconstruction meeting. After the Consultant has approved the bituminous mix design, this form shall be attached to the laboratory mix design report and submitted to Aero prior to paving.

SECTION 3. JOB CONTROL

3.1 Field Extraction: Extraction tests for bitumen content and gradation of aggregates will be required twice daily. The Consultant will perform these tests in accordance with ASTM D2172 for bitumen content and AASHTO T30 for aggregate gradation.

The aggregate gradation and bitumen content of the mixture should be maintained within the Range 1 limits in accordance with Table V of Specification P-411. Should a test indicate values outside of these limits, the contractor should be advised that modifications may be needed. Should two consecutive tests on one sieve or bitumen content fall outside of the Range 1 limits, the contractor should be directed to suspend full production. Paving should not begin again until the contractor can provide a mixture within the acceptable limits of the applicable specification.

In instances where the Consultant recommends rejection of a bituminous mixture determined to be outside of specification tolerances, the contractor will be permitted to verify the test results at his expense. Only test data provided by the approved mix design laboratory will be accepted as verification of the test results. If the approved mix laboratory is owned by the contractor, an independent laboratory shall verify test results. Where the Consultant's field data conflicts with the laboratory data, the independent laboratory data will be the basis for acceptance. It is recommended that a 30 lb. sample be taken for the extraction to permit at least 3 extraction tests to be run from one sample. Although a minimum of one test for each half day's production is required, this will provide sufficient material to permit verification of the original test results.

3.2 Verification of Marshall Criteria: On projects funded in part by grants from the FAA, the Consultant will be required to test bituminous mixtures for conformance with the specified Marshall criteria (i.e. stability, flow, air voids, and VMA). Marshall testing will not be required on mixtures designed for aircraft weights of 12,500 lbs. or less.

3.2.1 Frequency of Testing: The frequency of Marshall testing will be as follows:

a. One sample from the first day of full production. Two Marshall specimens shall be prepared from the sample and the test values averaged.

b. One sample taken each day when mixture extractions are determined outside specification tolerances (Range 2). Two Marshall specimens shall be prepared from each sample and the test values averaged.

3.2.2 Preparation and Testing Procedure: Samples for the Marshall specimens should be taken at the plant or job site from the hauling units. The Marshall specimens will be prepared and tested in accordance with the procedures contained in Chapter V of the Asphalt Institute Manual Series No. 2 (MS-2) – Mix Design Methods, current edition. Compaction of the Marshall specimen shall be by means of a flat-faced mechanical hammer.

3.2.3 Purpose and Intent: The purpose of testing bituminous mixtures for Marshall properties is twofold. First, it gives the Consultant a check on whether the materials submitted for the mix design were representative of that being used during production. It is not intended that data obtained from field

Marshalls is to be used as acceptance criteria of the mixture. However, large discrepancies between field data and that of the mix design should be investigated by the Consultant. If the discrepancy is due to a change in materials, the contractor shall be required to provide a new mix design which is representative and which meets specification criteria.

A second purpose of Marshall testing is to provide qualitative data on material produced outside of specification tolerances for gradation and/or bitumen content. The Marshall test data can be useful in determining the suitability of "out of spec" material to remain in-place.

3.2.4 Reporting of Data: The Consultant will report Marshall test data to Aero as soon as it is available. The information can be included with the weekly inspection report.

3.3 Compactions:

3.3.1 In-Place Air Voids (Pavements Designed for Aircraft Weights 12,500 lbs. and Over): The compaction of pavements designated for aircraft weights of 12,500 lbs. and over will be determined on the basis of percent air voids in the completed pavement. Each bituminous paving project will be tested on a lot basis, as defined by the specification. Acceptance and payment of each lot is based upon the percentage of material within the in-place air voids specification limits (1%-7%). Since the specification is statistically based, it is mandatory that all material sampling be done at random.

Sampling Procedures for Determination of Mixture Maximum Specific Gravity: Samples for determining the maximum specific gravity of the mixture should be taken from trucks delivering material to the job site. The maximum specific gravity of each sample will be determined in accordance with ASTM D2041 (Rice Test), using Type C or D containers.

Two tests shall be run on each sample taken from the first lot. If the results of the two tests run on each sample fall within the tolerance listed in ASTM D2041 for single operator precision, it is not necessary to run two tests on each sample taken from subsequent lots. If the tests do not fall in this tolerance without retesting, two tests shall be run on each sample taken from the next lot and so on until the technician doing the testing is able to show consistency in running the test for an entire lot. These procedures shall be followed for each technician running ASTM D2041 tests for this contract.

Selection of the hauling unit from which the sample is to be taken shall be based upon the procedures described in ASTM D3665 as is described below:

1. Determine the anticipated tonnage for a given lot and divide this tonnage into four equal parts.

2. Determine the anticipated number of truckloads of mixture which will deliver a completed sublot.

   To determine which truck to sample, randomly pick a number from a computerized random number generator within the range of anticipated number of trucks needed. This will be the truck that will be sampled.

Example: There are eight truck loads which make up one sublot for this example; therefore, enter the range of 1 through 8 in a random number generator. The number 5 comes up so the fifth truck load would be sampled.

The following method may be used to obtain samples from the designated truckloads of material:

1. From two of the conical piles of mixture within the truck, two furrows 3 to 6 inches in depth will be dug extending from the top to the bottom of the pile. Each furrow will follow the slope of the pile and be formed as near its center as possible. Sampling in areas between piles will be avoided because of possible segregation.

2. Three scoops of approximately equal volumes of material will be taken from each furrow, representing the top third, center third, and bottom third of the pile, and placed in a suitable container. The material will then be thoroughly mixed together to form one sample. When ready for use, very carefully remove the material so as to keep the sample representative.

3. All samples used for acceptance testing must be identified as to the time, date, and truck number from which they were taken.

   Sampling Procedure for Obtaining Bulk Specific Gravity of the In-Place Pavement. Locations of sampling sites for determining the compaction of in-place pavement shall be taken in accordance with the procedures listed in the Asphalt Institute Manual. An acceptable procedure is outlined as follows:

4. From the contract specification, determine the lot size and the number of sublots per lot (n=4).

5. Determine the total length and width of the individual paving lanes placed in the sublot.

6. Using a computerized random number generator, select a random number to represent the length of paving sublot to be tested and another number to represent the width. These are the longitudinal sampling points from the beginning of the sublots measured from the left edge of the paving lane. This process can be repeated until the required number of test locations have been generated.

7. When a location indicates the test will be taken at less than 2 feet from a joint, the test shall be taken at a reasonable distance from the joint using engineering judgment.

   Example: A 12-1/2 foot paver places a 1600 foot lot of material in three adjacent lanes (See Figure 1). The contract specifications require four core measurements per lot (one per sublot). Divide the lot into four equal sublots (1600 divided by 4). Then select a random number between 0 and 400 for the longitudinal location and between 0 and 12.5 for the offset location each of the sublots. The sampling locations are as follows:

Sublot	Longitudinal Section (From the Beginning) of the Sublot	Offset *
1	400’ x Random number = 128'	12.5’ x Random number = 3'
2	400’ x Random number = 195'	12.5’ x Random number = 10'
3	400’ x Random number = 217'	12.5’ x Random number = 4'
4	400’ x Random number = 61'	12.5’ x Random number = 2'

* Station offsets referenced from left side of lanes.

Referring to Figure 1, sample increment #1 would be taken 128' from the start of sublot 1; #2 would be taken 195' from the start of sublot 2; #3 would taken 217' from the start of sublot 3, and #4 would taken 61' from the start of sublot 4.

3.3.2 Pavement Density (Pavements Designed for Aircraft Weights Under 12,500 lbs.): The density of pavements designed for aircraft weights under 12,500 lbs. will be determined by comparing the density of cores taken from the compacted pavement to the Theoretical Density of the bituminous mixture. The Theoretical Density shall be computed as follows:

$$\text{Theoretical Density} = \frac{100}{\frac{\%\ \text{Aggregate by Weight}}{\text{Effective Sp. Gr. of Agg.}} + \frac{\%\ \text{Bitumen by Weight}}{\text{Sp. Gr. of Bitumen}}}$$

The effective specific gravity of the aggregate shall be calculated based upon the maximum specific gravity of the mixture designated by the job mix formula.

The Consultant should follow procedures listed in the Asphalt Institute Manual to determine the core sampling locations. The procedure previously described in this manual (Section 4.3.l b) is acceptable.

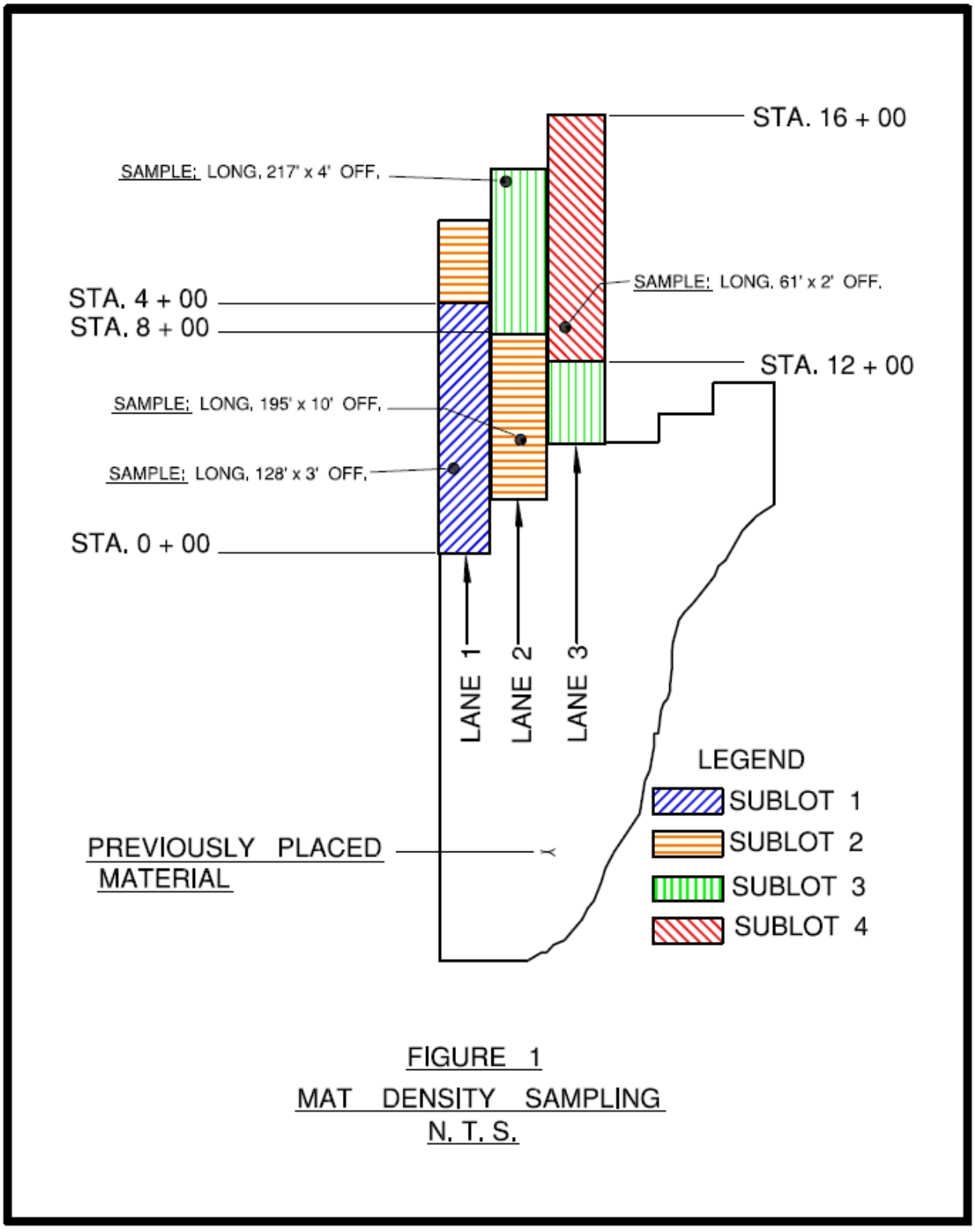

FIGURE 1

MAT DENSITY SAMPLING

N. T. S.

BITUMINOUS MIX FORM

THIS SECTION TO BE COMPLETED BY PROJECT ENGINEER

Airport _____

Project No. _____ Contract No. _____

Project Engineer/Address _____

_____ Telephone No. _____

MARSHALL TEST REQUIREMENTS

	Type of Mixture (s)	Specification	Gross Loadings	No. Blows	Stability lb.	Asphalt Cement Grade
1.	_____	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____	_____

PHYSICAL TESTS NEEDED ON AGGREGATES

Coarse Aggregate:	_____	L.A. Abrasion	_____	Sodium Sulfate Soundness
	_____	% Crushed	_____	Flat and Elongated
	_____	Soft Particles	_____	Unit Weight (Slag)
Fine Aggregate:	_____	Liquid Limit	_____	Plasticity Index
	_____	Presence of Clay and Silt		
RAP:	_____	Extraction Test	_____	Recovery Test
	_____	Viscosity	_____	Physical Testings on
	_____	Penetration		Extracted Aggregate

THIS SECTION TO BE COMPLETED BY CONTRACTOR

To Laboratory _____ Attention _____
Contractor/Address _____
_____ Telephone No. _____

Mix Design Needed By: _____ (Date)

MATERIALS SUBMITTED FOR DESIGN TESTS

	Aggregates	Pit No.	Producer	Estimate % In Mix
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
Mineral Filler		_____ -- _____	_____	_____
Reclaimed (RAP)		_____ -- _____	_____	_____

Asphalt Cement Supplier _____

Date Shipped _____ Via Carrier _____

Engineer's Signature _____ Date _____

Contractor's Signature _____ Date _____

REPORT OF BITUMINOUS MIX DESIGN

COVER SHEET

1. Date of report.
2. Name, address, telephone number of contact person for testing.
3. Material designation and source description of mixture components.
4. Statement regarding design method and procedures used.
5. Marshall design criteria and identification by the bituminous specification used (P-411).
6. Target placement temperature.

REPORT OF BITUMINOUS MIX DESIGN

DATE _____

CONTRACTOR _____

TYPE OF MIX

_____

PROJECT NO. _____ CONTRACT NO. _____

SPECIFICATION NO. _____

_____

SOURCE OF MATERIALS

Material	Source

_____

MARSHALL PROPERTIES AT OPTIMUM ASPHALT CONTENT

_____

JOB MIX FORMULA

Sieve Size	Percent Passing

Asphalt Content (Percent) _____

_____

AGGREGATE GRADATION - PERCENT PASSING

Sieve Size	Coarse	Fine	Sand	Filler	Blend	Specification Limits
Bulk Sp. Gr.	_____	_____	_____	_____	_____	_____--_____

REPORT OF BITUMINOUS MIX DESIGN (cont'd)

AGGREGATE AS USED IN LABORATORY TRIAL MIXES

Final Blend

_____

General Characteristics _____

Weight Loose (lbs/Cu.Ft.) _____	Specific Gravity _____	Wear (%) _____
Fractured Particles (%) _____	Absorption (%) _____	Liquid Limit _____
Plasticity Index _____	Elongated Particles (%) _____	
Resistance to Stripping _____	Swell Test % _____	

_____

BITUMEN DATA

Type _____ Source _____ Specific Gravity, 77/77° F. _____

_____

AVERAGE MARSHALL TEST RESULTS: Mixed at °F; _____ Blow Compaction

Bitumen	Sp. Gr. at 77° F.		Voids			Flow	Stability
% by Wt.	Actual	Th. Max	Mix	VMA	Filled	0.01"	@ 140°F. lb.

_____

Target Placement Temperature_____ ºF.

Laboratory Name _____

Signature _____ P.E. No. _____

Please attach the test property curves for the hot mix design data by the Marshall Method.

(G)

U. S. Department of Transportation
Federal Aviation Administration

CONSTRUCTION PROGRESS AND INSPECTION REPORT
AIRPORT GRANT PROGRAM

Period Ending

Project Number

Airport Name

Project Description	Contractor's Name

1. Rough Estimate of Percent Completion to Date of Construction Phases
(Include items such as clearing, grading, drainage, base, surface, lighting, etc.)

2. Work Completed or in Progress this period

3. Brief Weather Summary This Period Including Approximate Rainfall and Periods of Below Freezing Temperature
(On earthwork jobs include soil conditions)

4. Contract Time

No Days Charged To Date	Last Working Day Charged (Date)

5. Summary of Laboratory and Field Testing This Period *(Note failing tests and any retests. Summarize out-of-tolerance material. Identify material subject to pay reduction.)*

6. Describe Anticipated Work by Contractor for Next Period

7. Problem Areas/Other Comments *(Revisions to plans and specifications approved or denied, delays, difficulties, etc. and actions taken.)*

SPONSOR'S INSPECTOR OR REPRESENTATIVE

Date	Typed of Printed Name and Title	Signature

FAA Form 5370-1 (8-89) Supersedes Previous Edition

Inspector's Daily Report

Michigan Department of Transportation-Aeronautics

9/26/2008 11:38 AM

FieldManager 4.7a

Contract: 00001-00001, I-69 RECONSTRUCTION WARNER RD TO BEARDSLEE ROAD

IDR Date	Day of Week	Seq. No.	Import Date	Project Engineer	Resident Engineer
9/26/2008	Friday	1	N/A	Carol Aldrich, PE	

Inspector's Initials-Name	Federal Project Number	Elec. Attachments
RB Roxi Burnham	STP 9776(001)	None

Prime Contractor

INTERSTATE CONTRACTING COMPANY

Entered By	Revised By	Revision Date	Revision No.
RB, Roxi Burnham			

Temperatures	Weather
Low: 50 ° C High: 70 ° C	Fair

Comments

Stockpile test

Item Postings

Item/Material Description	Item Code	Prop. Line	Project	Category	Quantity	Unit	Location	Brkdwn ID	Attn
Backfill, Swamp	2050001	0025	00001A	0001	8.000	m3	Sta 1+000 to Sta 2+000		
Contractor: INTERSTATE CONTRACTING COMPANY									

Reviewed By: _____ _____

(Signature) (Date)

(H)

FINAL CONSTRUCTION CONTRACT REPORT

The final contract report is required on all airport projects with the State of Michigan and shall be submitted prior to final payment to the Consultant.

The final construction contract report includes important information and documentation on each project and shall be prepared in a way that will benefit those who review it in the future. It will provide vital information if questions arise after the project was completed, and will evaluate construction methods & techniques, materials used, and any benefits or problems that may be useful information for other projects.

Conclusions and recommendations expressed in the text of the report must be supported by appropriate test data and/or recorded factual data. Referenced data should be incorporated into the body of the report or attached as an appendix.

The items needed for an electronic final construction contract report are listed below. Aero will insert the documents that are shown in light gray, unless it is a locally let project then please insert as needed.

To create your final report please combine your documents in the following order and insert them after the last page of the pdf document. Fillable final report file and instructions on how to populate and submit it can be requested from Aero.

1. Cover Page (Optional)

2. Project Summary: Include airport name, location, project number, contract number, general description of the project, name of Consultant representative, name of Aero representative, list of contractors and subcontractors, bid price and final construction cost. If the final project cost was significantly higher or lower than the original bid price, include comments to explain this. Include an explanation of any construction issues or unexpected construction events that took place.

3. Summary of Contract Time: Include start date, completion date, start/stop orders, total contract days allotted and total contract days used. If the project went over the allotted contract days originally set up, include comments to explain this. Also include the amount of any liquidated damages assessed.

4. Safety Plan Compliance Document

5. FAA Airspace Comments

6. Engineer's Estimate

7. Addenda

8. Recommendation to Award (Include Bid Tabs)

9. Pre-construction Meeting Minutes & Attendance Sheets

10. Project Progress Schedule

11. Executed Notice to Proceed

12. Weekly Reports or Field Manager IDRs: FAA Form 5370-1, OR FieldManager IDRs. If FAA weekly reports are used, paper copies shall be included in this report. If IDRs are used, the electronic FieldManager file will suffice.

13. Important Correspondence and Progress Meeting minutes, if applicable

14. Final Inspection Notes, Attendance Sheet, and Punch List

15. Contract Modifications: Include a summary of changes for any unusual circumstances, large changes in quantities not related to normal balancing of as-constructed items, or extra items which were added to the project.

16. Sponsor Certification for Construction Final Acceptance: Include an original copy with signatures from both the Sponsor and Consultant. A scanned copy may be accepted as part of this report as long as the signed original is also submitted to Aero separately.

17. Project Photos: 2 or 3 photos showing an overview of the project site pre and post construction.

18. Material Certifications (Include a summary listing of all material certifications required for the project, followed by the forms filled out by the contractor and approved by the Consultant.)

19. Approved Mix Design(s), if applicable

20. Material Testing & Test Reports: Include a summary listing of all tests required for the project according to the specifications, followed by actual test reports highlighting any tests that failed or did not meet the applicable test standard. Explain the reasons for accepting the failed test and any penalties or pay reductions applied. Also give reasons for accepting any out-of-tolerance material. An interim test and quality control report shall be submitted, if requested by the Aero or FAA.

21. Shop Drawings/Catalog Cuts: Include a summary listing of all shop drawings required for the project, followed by actual shop drawings approved by the Consultant.

22. Material Certifications: Include a summary listing of all material certifications required for the project, followed by the forms filled out by the contractor and approved by the Consultant.

23. Construction Contract

24. Post Certification of Sub-Contract Compliance (Form 1386)

25. Subcontracts & Purchase Orders

26. Construction Management Report (for Paving Projects over $500,000)

27. Executed Consultant Agreements: Executed Construction Administration contract and subconsultant agreements, if applicable

28. Executed subconsultant agreements

29. Buy American Certificate or Waiver

30. Additional Miscellaneous Information

(I)

PREPARATION OF "AS-CONSTRUCTED" PLANS

Documenting what was constructed in the field is a very important task of the consultant. This information will serve the airport for many years.

The following information must be submitted to Aero:

One full-size electronic copy of the "as-constructed" contract plans (paper copy when requested)
Four full-size paper copies of the ALP Update (when an update is required). These four are to be distributed to the FAA, MDOT, the Sponsor, and the Consultant. Five disks with the CADD and pdf files for the ALP Update.

Procedures for "As Constructed" Plans

Title Sheet
The following information shall be shown:

1. Name and address of prime contractor and all subcontractors
2. The type of work each contractor performed
3. The start and completion dates for construction

The title sheet shall also include the following statement and the Project Engineer's signature:

"AS-CONSTRUCTED" CERTIFICATION

All construction performed under this contract has been completed in full conformity with the drawings, notes and specifications contained in these plans. All changes from plans, as bid, have been noted.

Project Engineer: Date:

Contract Modifications
The final "as-constructed" plans should reflect the changes in quantities of all items of work covered by the contract. All contract modifications shall be listed on the summary of contract quantity sheet. Also, the quantity sheet should show the final contract quantities and the final breakdown of federal and non-federal quantities.

All addendums and changes from the original contract shall be noted on **each** sheet of the plans where the change occurred. This area of change should be enclosed by a prominent identifier and the contract modification number noted, if applicable. Contract modifications adjusting final quantities need only be shown on the quantity sheet and other sheets where the original quantity had been shown. This may be done by striking out the original plan figure and writing in the revised figure for a simple dimension change. More extensive revisions may require a detail to be struck out and redrawn. Larger changes may require additional details to be added to the plans, or in some cases, a new sheet may be required to be added to the "as-constructed" plans. Under no circumstances shall items shown on the "as-bid" plans be erased from the "as-constructed" plans.

Cross-Sections

Cross-sections shall be revised to reflect all changes made from the original design cross-sections so that an accurate determination of final quantities can be determined by the Consultant. It is not necessary to submit final cross-sections with the "as-constructed" plans, unless part of original plans.

Soils & Materials

Unusual features of soil conditions (or different soil conditions from the original plans) encountered on the project shall be noted on the "as-constructed" plans for future reference. Plans shall reflect the encountered soil along with any plan changes. Borrow pits and waste area locations shall be noted on the plans and elevations given, if critical.

If the original plans allowed the contractor to make a choice from several alternatives in paving materials, such as gradation of materials for subbase, base, concrete, bituminous or any other alternate this shall be noted. The Consultant shall indicate on the "as-constructed" plans the actual alternate used for the project.

Earthwork

The Consultant is not required to take final elevations on earth grade where these earth grades were constructed within the tolerances of the plans and specifications, as originally bid by the contractor. The Consultant must record "as-constructed" elevations and compute final earthwork on borrow areas, areas where muck was removed, areas where stripping of unsuitable material was removed, areas where changes in grade or limits of work were made from that on the bid plans and specifications, and any other areas where a question could arise as to the true amount of excavation to be paid the contractor. Also, the Consultant is required to record "as-constructed" elevations and compute final earthwork figures on all earth grades where the original cross-sections were inadequate to determine a true figure for the excavation item or where, for one reason or another, a doubt exists as to the true quantity of earth excavated.

Pavement

The Consultant is not required to take final "as-constructed" elevations of pavement sections if the pavement was constructed within the tolerances of the plans and specifications, as originally bid by the contractor. The Consultant is required to take final pavement elevations in those areas where a change in grade was made from the original plans and in those areas where, for one reason or another, the final grade is not within the tolerance of the specifications or a question arises as to what the final pavement elevation is in any designated area.

Drainage

The Consultant is not required to record the “as-constructed” information of drainage structures and pipes unless these structures and pipes have not been constructed to the slope, elevation and location as shown on the original plans, and within the tolerance of the specifications.

Survey Data

Descriptions of all witness to control points and permanent bench marks should be noted on the final "as-constructed" plans. The Consultant should indicate the exact location and elevation of all permanent runway center-line monuments and approach surface markers.

Utilities and Other Structures

Drawings must accurately locate all utilities and associated structures with reference to permanent unconcealed reference points including identifiable depths and be shown clearly on the plans. Use of permanent buildings and pavement as reference points is preferable. Field structures on unpaved airports should also be located.

Lighting/Electrical

All changes from the original plans in the location of underground duct, cable, runway and taxiway light fixture, floodlight, etc., shall be shown on the "as-constructed" plans. All changes in vault equipment or location of vault equipment shall be shown on the "as-constructed" plans.

The Consultant shall list the manufacturer's name and serial number (if applicable) of each piece of electrical equipment used for the contract. The Consultant shall verify an "as-built" wiring diagram was placed in the vault.

Buildings

The architect shall show on the "as-constructed" plans all major equipment with the details, such as size, manufacturer and serial number. These final plans shall show coding, tagging and other details which will aid the owner in tracking down problems and making repairs. The location of all buried cables, conduit, pipe, fuel tanks, sewage systems, etc., and their approximate depth below ground, should be shown. Special attention should be given to the location of mechanical items such as heat ducts, risers, radiators, vents, conduit, electrical circuits and outlets and water supply fixtures on the final "as-constructed" plans.

Airport Layout Plans

The Consultant is required to update each sheet of the Airport Layout Plan (ALP) to show the construction accomplished under the project. If there is more than one contract in the project, then the Consultant should update the ALP within 30 days after all the contracts have been completed in the project. The "as-constructed" Airport Layout Plan may be submitted separately from the "as-constructed" plans for each contract. A copy of the ALP is to be submitted to Aero along with the electronic file if CADD is available. If no CADD is available, then one mylar copy and/or one paper copy should be submitted. In addition, a copy shall be submitted to the airport sponsor.

If the Consultant did not design the current ALP on file, then the Consultant shall request the set of original drawings of the ALP from Aero. The original drawings shall be returned to Aero upon completion.

Should any of the constructed development differ in location, dimension, or height from the development as was proposed on the ALP, the Consultant shall reference the Airspace Case Number, indicating FAA approval of the development, which would result from FAA's review of the project safety/phasing plan.

QA/QC

It is the responsibility of the Consultant to perform QA/QC review of their “as-constructed” plans prior to submitting to Aero. The Consultant shall review the "as-constructed" plans, sheet by sheet, to determine that all of the information for the final estimate, contract modifications, cross-sections, computations, field notes, and any other source, has been correctly noted on these final plans. The final "as-constructed" plans shall show the condition of the field as it actually is at the completion of the project.

(J)

SPONSOR CERTIFICATION FOR CONSTRUCTION PROJECT FINAL ACCEPTANCE

Sponsor's Name	Airport	Project Number

Project Description	Contract ID

Title 49, United States Code, section 47105(d), as amended (herein called the ACT), authorizes the Secretary to require certification from sponsors that they will comply with statutory and administrative requirements in carrying out a project under the Airport Improvement Program. The following list of certified items includes major requirements for this aspect of project implementation. However, the list is not comprehensive, nor does it relieve sponsors from fully complying with all applicable statutory and administrative standards. Every certified item must be marked. Each certified item with a "no" response must be fully explained in an attachment to this certification. If the item is not applicable to this project, mark the item "N/A." General standards for final acceptance and close-out of federally funded construction projects are in 49 CFR 18.50. The sponsor shall determine that project costs are accurate and proper in accordance with specific requirements of the Grant Agreement and contract documents.

1. Daily construction records were kept by the Consultant. These records document work in progress, quality and quantity of materials delivered, test locations and results, instructions provided the contractor, weather, equipment use, labor requirements, safety problems, and changes required.

   Yes _____ No _____ N/A _____

2. All tests specified in the plans and specifications were performed and the test results documented. A summary of test results has been made available to FAA.

   Yes _____ No _____ N/A _____

3. For any test results outside allowable tolerances, appropriate corrective actions were taken.

   Yes _____ No _____ N/A _____

4. Payments to the contractor were made in compliance with contract provisions and verified by the sponsor's internal audit of contract records kept by the Consultant. If appropriate, pay reduction factors required by specifications were applied in computing final payments and a summary of pay reductions has been made available to FAA.

   Yes _____ No _____ N/A _____

5. The project was accomplished without significant deviations, changes, or modifications from the approved plans and specifications, except where approval was obtained from FAA.

   Yes _____ No _____ N/A _____

6. A final project inspection was conducted with representatives of the sponsor and the contractor. Project files contain documentation of the final inspection.
   Yes _____ No _____ N/A _____

7. Weekly payroll records and statements of compliance were submitted by the prime contractor and reviewed for federal labor and civil rights requirements (Advisory Circulars 150/5100-6 and 150/5100-15).
   Yes _____ No _____ N/A _____

I certify that, for the project identified herein, the responses to the foregoing items are correct as marked, and that the attachments, if any, are correct and complete.

_____ _____ _____
Lic. Project Engineer/Architect Signature Printed Name Date

8. The personnel engaged in project administration, engineering supervision and construction inspection and testing were determined to be qualified and competent to perform the work.
   Yes _____ No _____ N/A _____

9. Complaints regarding the mandated federal provisions set forth in the contract documents have been submitted to FAA.
   Yes _____ No _____ N/A _____

10. Work in the Grant Agreement was physically completed and corrective actions required as a result of the final inspection were completed to the satisfaction of the sponsor.
    Yes _____ No _____ N/A _____

11. The as-built plans and an updated airport layout plan will be submitted to Aero.
    Yes _____ No _____ N/A _____
    As-built plans will be held on file by MDOT/Aero.

12. Applicable close-out financial reports will be submitted to FAA by the Sponsor, if applicable.

I certify that, for the project identified herein, the responses to the foregoing items are correct as marked, and that the attachments, if any, are correct and complete. Based on reasonable close conformance to all contract requirements, the work is considered acceptable and sufficient in all aspects and is hereby accepted.

_____ _____
Sponsor's Signature Date

_____
Printed Name & Title

APPENDIX II

(A)

GUIDE FOR PROJECTS BID BY LOCAL LETTING

Note: All projects funded under the State Block Grant program (Non-Primary General Aviation airports) should use the MDOT bid letting process. The Sponsor has the option to deviate from the normal letting process under any of the following circumstances:

- The subject airport is identified with a current DBE goal of 0%.
- It is a non-construction project (e.g. snow removal equipment or equipment building, terminal building, hangars, fuel farms).
- The project does not include federal Airport Improvement Program (AIP) funding; a State/Local funded project.

Projects at Primary airport sites should follow the same guidelines for letting but have more flexibility for letting a project locally.

For projects bid by a local letting, the following procedures should be followed:

1. Consultant submits preliminary plans (90% complete) and/or proposals to Aero for review (proposals only are sufficient for snow removal equipment or small contracts with 8 ½" x 11" plan sheets). This also includes submitting the construction safety phasing plan for Aero review. Allow three weeks for Aero review and comments.

2. Submit an electronic copy of the Construction Safety phasing (CSP) plan (11" x 17" acceptable if readable) after preliminary review by Aero. These should be submitted at least ten weeks prior to the letting date. The CSP should be entered into the OEAAA database directly at https://oeaaa.faa.gov/oeaaa/external/portal.jsp. If a primary airport, the CSP should be sent directly to the FAA ADO Program Manager.

3. The Consultant is responsible for assembling final plan and proposal packages for bidding. If Aeronautics General Provisions are used all references to MDOT must be removed. Refer to the proper proposal requirements attached that are based on funding type.

4. The Consultant or Sponsor is responsible for advertising the project on MDOT's website and/or, in the local paper and/or any widely distributed publication. Projects must be let competitively and awarded to the lowest responsible bidder.

5. The Consultant or Sponsor is responsible for checking the federal website System for Award Management (SAM) for status of contractors excluded from work prior to awarding a low bid at https://www.sam.gov/portal/SAM/#1 .

6. The Consultant or Sponsor is also responsible for assuring the Contractor's bonds are current through the project and no liens exist at the end of the project.

7. Once the project is bid and bids are reviewed, a letter of recommendation to award should be submitted by the Consultant to the Sponsor with a copy sent to Aero. For projects directly let by the airport owner, the letter of recommendation to award would be sent directly to Aero for concurrence.

8. A concurrence of award letter will be submitted to the Sponsor by Aero with a copy to the Consultant, if applicable. This signals the notice to award.

9. A Notice of Award is issued by the Consultant or Sponsor to the Contractor. The Contractor signs the Notice of Award and returns it to the Consultant or Sponsor. A copy is distributed to the Sponsor, Aero, and the Contractor.

10. The Consultant or Sponsor prepares the construction contracts and reviews the insurance and bonding documentation and companies submitted by the Contractor. The Consultant or Sponsor submits original contract documents to the Sponsor, Aero, and the Contractor.

11. A Notice to Proceed is issued by the Consultant or Sponsor after the Construction Contract including the bonds and insurance are accepted and executed. Copies are submitted to all parties.

12. A pre-construction meeting will be scheduled by Aero or the Consultant before the project begins. This meeting will be attended by representatives of the Contractor, Consultant, FAA (where applicable), subcontractors, Sponsor, local officials and any other interested parties.

13. All certified payrolls will be reviewed by consultant for compliance with federal wage requirements (see Appendix I, E).

14. Daily project management and submittals are as specified in the General Procedures of this manual.

Proposal requirements

A. Proposal must include the following if there are **FEDERAL FUNDS** in the project:

- Work items and estimated plan quantities
- Requirement for DBE/WBE*
- Sponsor's insurance requirement (can elect to use MDOT's insurance requirements)
- Special Provision for Taxes*
- Special Notice for W9 submittal*
- Notice to Bidders – Certified Payrolls*
- Buy American Forms*
- Federal Requirements* (or Attachment "F" Non-Construction Contract for projects not involving construction activities. Example: Snow removal equipment procurement).
- Project specifications*
- Non-Discrimination in State Contracts (Appendix A)*
- Federal wage rates (Davis-Bacon)**
- Sponsor's bonding requirements – bid, lien, and performance bonds (can elect to use MDOT's bonding requirements)
- Other requirements of the Sponsor, if applicable
- Special Provision Industrial By-Products

B. Proposal must include the following if there are **NO FEDERAL FUNDS** in the project:

- Work items and estimated plan quantities
- Sponsor's insurance requirement (can elect to use MDOT's insurance requirements)

- Special Provision for Taxes*
- Special Notice for W9 submittal*
- Project specifications*
- Non-Discrimination in State Contracts (Appendix A)*
- State Prevailing Wage Rates* Send Aero a request with the Project # (if applicable), Project Description/Type of work, and County
- Sponsor's bonding requirements – bid, lien, and performance bonds (can elect to use MDOT's bonding requirements)
- Other requirements of the Sponsor, if applicable
- Special Provision Industrial By-Products

* Available in electronic format from Aero.

** Access website http://www.access.gpo.gov/davisbacon/ for federal wage rates and obtain on-line. State prevailing wages are available through Aero by request.

Payment and Contract Modification Processes:

PAYMENTS

1. The Consultant shall prepare periodic contractor pay applications, typically on a biweekly basis. An original pay estimate application should be submitted for processing. For locally-let projects, Aero does not require that pay estimates be submitted using FieldManager. Other formats will be acceptable as approved by Aero.

2. The Consultant will not include any item of work for payment unless the required test reports and material certifications have been received from the contractor for that item of work. The Consultant shall verify that the results of these test reports conform to the specifications.

CONTRACT MODIFICATIONS

1. Contract modifications with major changes shall have approval by Aero and the Sponsor prior to processing for budget and scope justification. For locally-let projects, Aero does not require that contract modifications be submitted using FieldManager. Other formats will be acceptable, as approved by Aero.

2. Four (4) original contract modifications should be submitted to Aero for approval. The Contract Modifications must have signatures from the Consultant, the Sponsor, and the Contractor prior to submitting to Aero.

3. Contract Modifications will be approved by Aero and FAA where required and copies will be distributed to the Contractor, the Consultant, and the Sponsor.

MISCELLANEOUS DOCUMENTATION

1. The Consultant should follow the same guidelines as listed for projects let through MDOT. This includes procedures outlined for project inspection, construction surveying, material testing, approval of shop drawings, catalog cuts, and material certifications, "as-constructed" plans, and preparation of a Final Construction Contract Report.

2. For contracts with federal participation, the Consultant shall submit certified payrolls for the time period covered by the pay estimate. The instructions for completing payroll records are given in Appendix I.

(B)

GUIDE FOR PAPI FLIGHT CHECK

For projects requiring a Precision Approach Path Indicator (PAPI) the following guidelines should be followed.

Prior to Construction

- Submit a plan and profile sheet with the design plans to verify the Obstacle Clearance Surface is clear of any obstructions. At design completion, submit an NF4 form.

- Determine the person who will be the point of contact to schedule the flight check with FAA. This person will also share any follow-up information regarding the flight check. This can be the consultant, the Aero project manager or the airport manager.

- The Aero project manager will coordinate with FAA to set up a Reimbursable Agreement to fund the FAA flight check. This will be included on the sponsor contract.

After Construction is complete

- Verify that the PAPI's are functioning and are built according to the construction plans.

- The point of contact calls FAA Flight Procedures to schedule a PAPI commissioning flight check. A contact name, usually the airport manager, will need to be given to FAA as contact for the day of the flight check to turn the PAPI's on.

- Flight check date is to be distributed to the Contractor, Consultant, Sponsor, and Aero project manager. The Contractor and Consultant are to be present during FAA's flight check. A Stop Order can be issued to adhere to contract time if necessary.

After Flight Check

- When the PAPI's pass flight check, they can be put into commission and the contractor can be paid in full for this portion of the work.

- A PAPI data sheet is to be submitted to the Aero project manager after the PAPI is operational.

- If Flight Check occurs and the PAPI's fail, the Contractor and Consultant are responsible for determining why they failed.

    a. If failure is due to a manufacturer or constructability issue the contractor is responsible for correcting the issue and a follow-up flight check is to be requested as described above. Costs for any additional flight check or related expenses will be the responsibility of the contractor.

    b. If failure is not a manufacture or constructability issue the consultant is to coordinate with the Aero Project Manager prior to proceeding with a solution. Once the solution is in place, a follow-up flight check is to be requested as described above. Contractor costs are to be reimbursed for their time for the previous flight check. Either the Sponsor, or the responsible party for the failed flight check/s, is required to pay for all related costs of the failed flight check/s since only one flight check is eligible for entitlement funding.

APPENDIX III

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-152	**EXCAVATION AND EMBANKEMENT**	(All Testing Requirements are ASTM unless noted otherwise.)		
	Items Requiring Material Testing By Independent Laboratory			
	None			
	Items Requiring Certification			
	None			
	Items Requiring Field Testing			
	Density:			
	Under Pavement Areas	As specified on plans	Min 1/3000 S YD/Layer	
	Outside of Pavement Areas	95% Non-Cohesive - AASHTO-T99 90% cohesive AASHTO-T99	Min 1/3000 S YD/Layer	
	Surface Tests	± 1/2" when measured with 16'	As Required straightedge	

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-154	**SUBBASE COURSE**	(All Testing Requirements are ASTM unless noted otherwise.)		
	Items Requiring Material Testing By Independent Laboratory			
	Gradation	See Table 1 - Also, not more than 3% shall be finer than 0.02mm in diameter, D422	1/Source	
	Liquid Limit	25 Max - D423	1/Source	
	Plasticity Index	6 Max - D424	1/Source	
	Items Requiring Certification			
	None			
	Items Requiring Field Testing			
	Density/Moisture:			
	Less than 12.5K GAW	AASHTO T99 - 95% Density Min	1/3000 S YD/layer	
	Less than 30K GAW	AASHTO T99 - 100% Density Min	1/3000 S YD/layer	
	30K or more GAW	AASHTO T180 - 100% Density Min	1/3000 S YD/layer	
	Gradation	See Table 1	1/6000 S YD/layer	
	Thickness	Deficiencies in excess of 1/2" must be corrected	1/3000 SYD	
	Surface Test	± 1/2" when measured with a 16' straight edge	As Required	

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
F-160	**WIRE FENCE WITH WOOD POSTS**	(All Testing Requirements are ASTM unless noted otherwise.)		
	Items Requiring Material Testing By Independent Laboratory			
	None			
	Items Requiring Certification			
	Wire	See Specification	1/Source	
	Gates and Hardware	See Specification	1/Source	
	Posts	See Specification	1/Source	
	Items Requiring Field Testing			
	None			

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
F-161	**WIRE FENCE WITH STEEL POSTS**	(All Testing Requirements are ASTM unless noted otherwise.)		
	Items Requiring Material Testing By Independent Laboratory			
	None			
	Items Requiring Certification			
	Wire	See Specification	1/Source	
	Posts, Gates, Rails, Braces and Accessories	Federal Spec RR-F-183	1/Source	
	Items Requiring Field Testing			
	None			

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
F-162	**CHAIN LINK FENCE**	(All Testing Requirements are ASTM unless noted otherwise.)		
	Items Requiring Material Testing By Independent Laboratory			
	None			
	Items Requiring Certification			
	Fabric	See Specification	1/Source	
	Barbed Wired	See Specification	1/Source	
	Post Rails and Braces	See Specification	1/Source	
	Gates	See Specification	1/Source	
	Wire	See Specification	1/Source	
	Items Requiring Field Testing			
	None			

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-208	**AGGREGATE BASE COURSE**	(All Testing Requirements are ASTM unless noted otherwise.)		If slag is used, it must be aircooled blast furnace slag
	Items Requiring Material Testing By Independent Laboratory			
	Liquid Limit*	AASHTO T89 - 25 Max	1/Source	
	Plastic Limit*	AASHTO T90 - See PI	1/Source	
	Plasticity Index*	AASHTO T90 - 6 Max	1/Source	
	Abrasion:			
	Uncrushed CA	AASHTO T96 - 45 Max @ 500 Revolutions	1/Source	
	Crushed CA	AASHTO T96 - 50 Max @ 500 Revolutions	1/Source	
	Unit Weight (Slag)	AASHTO T19 - 70 lbs/C FT Min	1/Source	
	Gradation	AASHTO T11, T27 - Specification	1/Source	Obtain Composite Sample
	Material Finer than .02 mm	D422 - Max 3%	1/Source	Only required when specified on plans
	Fracturing	Specified on plans	1/Source	
	*Not applicable to slag			
	Items Requiring Certification			
	None			

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-208 (contd.)	**AGGREGATE BASE COURSE**			
	Items Requiring Field Testing			
	Density/Moisture:			
	Less than 30K GAW	AASHTO T99 - 100% Density Min	1/3000 SYD/Layer	
	30K GAW or more	AASHTO T180 - 100% Density Min	1/3000 SYD/Layer	
	Materials:			
	Gradation	AASHTO T11, T27 - Specifications	1/1500 CYD	
	Liquid Limit*	AASHTO T89 - 25 Max	As required by change in material	
	Plastic Limit*	AASHTO T90 - See PI	As required by change in material	
	Plasticity Index*	AASHTO T90 - 6 Max	As required by change in material	
	Thickness	Depth Check - Specification	1/3000 SYD	
	Smoothness	16' Straightedge or String ± 3/8"	As required for acceptance	

*Not Applicable to Slag

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-209	**CRUSHED AGGREGATE BASE COURSE**	(All Testing Requirements are ASTM unless noted otherwise.)		If slag is used, it must be air-cooled blast furnace slag
	Items Requiring Material Testing By Independent Laboratory			
	Thin and Elongated Aggregate	D693 15% Max	1/Source	
	Abrasion	C131 - 45 Max @ 500 Revolutions	1/Source	
	Soundness	C88 - 12% Max Loss, 5 CU Cycles	1/Source	
	Liquid Limit*	D4318 - 25 Max	1/Source	
	Plastic Limit*	D4318 See PI	1/Source	
	Plasticity Index*	D4318 - 6 Max	1/Source	
	Sand Equivalent	D4219 - 35 Min	1/Source	
	Unit Weight (Slag)	C29 - 70 lbs/C FT Min	1/Source	
	Gradation	C117 and C136 - Specification	1/Source	Obtain Composite Sample
	Fracturing	Lab - Retained #4:		
		100% 1 Fractured Face	1/Source	
		90% 2 Fractured Face	1/Source	
	Particle Size Analysis	D422 - Max 3% Smaller than .02mm	1/Source	
	*Not Applicable to Slag			

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-209 (contd.)	**CRUSHED AGGREGATE BASE COURSE**			
	Items Requiring Certification			
	None			
	Items Requiring Field Testing			
	Density/Moisture:			
	Less than 60K GAW	D698 Method D - 100% Density Min	1/3000 SYD/Layer	Acceptance testing may be accomplished using a nuclear gauge if done in accordance with Section 3.5 of the Specification
	60K GAW or More	D1557 Method D - 100% Density Min	1/3000 SYD/Layer	
	Thickness	Cores shall not be deficient by more than 1/2"	1/3000 SYD	
	Materials:			
	Liquid Limit*	D4318 - 25 Max	As required by change in gradation	
	Plastic Limit*	D4318 - See PI	As required by change in gradation	
	Plasticity Index*	D4318 - 6 Max	As required by change in gradation	
	Gradation	C177 - C136	1/1500 C YD	The job mix tolerances in Table I shall be applied to the job mix gradation determined by an independent laboratory. This will establish a job control grading band.
	Smoothness	16' Straightedge or String Line ± 3/8"	As Required for Acceptance	

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-304	**CEMENT TREATED BASE COURSE**	(All Testing Requirements are ASTM unless noted otherwise.)		
	Items Requiring Material Testing By Independent Laboratory			
	Water	AASHTO T26	1/Source	Only required if quality of water is questionable
	Aggregates:			
	Sulfates	C295	1/Source	Only required if injurious quantities of sulfates are suspected
	Gradation	Table 1 in Specification	1/Source	
	Liquid Limit	D423 - 25 Max	1/Source	
	Plasticity Index	D424 - 6 Max	1/Source	
	Cement Content	Minimum compressive strength should be 750 psi when molded, broken, and cured in accordance with D560 and D1633	1/Source	
	Items Requiring Certification			
	Portland Cement	C150 Type 1	1/Source	
	Bituminous Material:			
	Cutback	D2088	1/Source	

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-304 (contd.)	**CEMENT TREATED BASE COURSE**			
	Emulsified:			
	RS-2, SS-1	D977	1/Source	
	CRS-1	D2397	1/Source	
	Items Requiring Field Testing			
	Atmospheric Temperatures	Min 40°F	Daily	
	Density	Min 98% of Lab Field Density - D558 Lab Density - D1556 or D2167	4/Lot (Lot = 1200 SYD)	
	Moisture Content:			
	Optimum	D558	1/Source	
	Field	±2% of Optimum	4/Lot	
	Aggregate Gradation	See Table 1 in Specification	1/1500 CYD	
	Surface Tolerance	Finished surface shall not vary more than 3/8" when tested with a 16' straight edge.	As Required	

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-402	**POROUS FRICTION COURSE**	(All Testing Requirements are ASTM unless noted otherwise.)		
	Items Requiring Material Testing By Independent Laboratory			
	Aggregate:			
	Flat or Elongated	Max 15% by Weight D693	1/Source	
	Percentage of Wear	Max 30% C131	1/Source	
	Weighted Average Loss	Max 9% after 5 Cycles in Sodium Sulfate C88	1/Source	
	Coated Area	Min 95% D1664	1/Source	
	Crushed Content	Min 75% Two Face	1/Source	
		Min 90% One Face	1/Source	
	Unit Weight - Slag Only	Min 70 lbs/C FT - C29	1/Source	
	Gradation	See Table 1 in Specification C136	1/Source	
	Mineral Filler	D242	1/Source	
	Job Mix Formula (JMF)	The contractor is responsible for supplying the materials to an independent testing laboratory for preparation of the JMF. The PE is responsible for approving the JMF prior to production.		

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-402 (contd.)	**POROUS FRICTION COURSE**			
	Items Requiring Certification			
	Latex	See Section 2.4 of the Specification	1/Source	
	Bituminous Material	See Table 1(A) of the Specification	1/Carload or equivalent shipped to the site	
	Items Requiring Field Testing			
	Placement Temperature	± 20°F of JMF Target Temperature	Periodically throughout the paving operation	
	Bituminous Content of Mix	±.4% of JMF - D2179	Once for plant run of 30 min or less. Twice for each 5 hours of plant operation.	
	Aggregate Gradation of Mix	AASHTO T30 No. 4 Sieve ±7% of JMF Target No. 8-30 ±4% of JMF Target No. 20 ±2% of JMF Target	Same as Bit Content	
	Gradation of Aggregate in Bin	C136 No. 4 Sieve ±7% of JMF Target No. 8-30 ±4% of JMF Target No. 20 ±2% of JMF Target	Twice Daily	
	Pavement Thickness	3/4" Aggregate - Target 1" (Max 1.5", Min .75") 1/2" Aggregate - Target .75" (Max 1.25", Min .50")	1/10000 SYD	

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-411	**BITUMINOUS BASE, LEVELING AND TOP COURSES**	(All Testing Requirements are ASTM unless noted otherwise.)		The contractor is responsible for acquisition of all samples not acquired by independent testing laboratory. All materials shall be determined acceptable prior to use by contractor. Sample selection per ASTM D75. If slag is used it must be air cooled blast furnace slag.
	Items Requiring Material Testing By Independent Laboratory			
	Aggregates (Coarse):	All aggregate requirements apply to aggregate mixture if blended.		
	Flat & Elongated Pieces	Laboratory - 8% Max	1/Source	
	Soft Pieces (Top Course Only)	Laboratory 5% Max	1/Source	
	Clay Balls, etc.	Laboratory - None	1/Source	
	Crushed Content	See Table III in P-411 Specification	1/Source	Depends on the type of material specified in the plans.
	Abrasion (+8 Screen):			
	Base Course	C131 - 50 Max @ 500 Revolutions	1/Source	
	Leveling/Top	C131 - 40 Max @ 500 Revolutions	1/Source	
	Slag - Base/Leveling/Top	C131 - 50 Max @ 500 Revolutions	1/Source	
	Soundness (+8 Screen):			
	(5 Cycle Sodium Sulfate)	C88 - 9% Max Loss	1/Source	

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-411 (contd.)	**BITUMINOUS BASE, LEVELING AND TOP COURSES**			
	Unit Weight (Slag)	C29 - 75 lb/C FT Min	1/Source	
	Bulk Specific Gravity	C127 - None	1/Source	For VMA Calculation
	Gradation	C136, C117 - See Table III	1/Source	Obtain Composite Sample
	Aggregate Coating	D1664 - 95% Min	1/Source	
	Aggregates (Fine):			Samples Selection per D75
	Foreign Materials	Laboratory - None	1/Source	
	Liquid Limit	D423 - 25 Max	1/Source	Including Blended Filler
	Plastic Limit	D424 - See PI	1/Source	Including Blended Filler
	Plasticity Index	D424 - 6 Max	1/Source	Including Blended Filler
	Gradation	C136, C117 - See Table III	1/Source	Obtain Composite Sample
	Specific Gravity	C128 - None	1/Source	For VMA Calculation
	Aggregates (Mineral Filler)	D242 - MDOT Certification for fly ash is acceptable	1/Source	
	Bituminous Material:			
	Asphalt Cement	See Specification Table I	1/Source	

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-411 (contd.)	**BITUMINOUS BASE, LEVELING AND TOP COURSES**			
	Bituminous Mixture	Marshall Requirements - See Section 3.2 of the Specification	An approved independent testing laboratory will develop a job mix formula (JMF) that will yield the required Marshall properties shown in Tables II & III of the Specification.	
	Items Requiring Certification			
	None			
	Items Requiring Field Testing			
	Plant Inspection	Specifications	Continuous Monitor	Daily Reports
	Temperature at Plant	325°F Max - Asphalt Cement	Record at least every 2 hours	
		350°F Max - Dried Aggregate	Record at least every 2 hours	
	Extractions	D2172/AASHTO T30 - Job Mix Formula (See Table IV of Specification)	2/Day	Report All Screens JMF
		All mixtures furnished shall conform to the job mix formula within the tolerances listed in Table IV of the Specification.		
	Materials:			
	Aggregates Stockpiles	Specification (JMF) AASHTO T11/AASHTO T27	As Required	Daily Report

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-411 (contd.)	**BITUMINOUS BASE, LEVELING AND TOP COURSES**			
	Thickness	Specifications		
	Temperature at Placement	±20°F Target in JMF (Temperature of paver shall not fall below 250°F)	Continuous Monitor	Checked at Paver
	Surface Tests	±1/4" from Plan Grade (Top and Leveling)	Continuous Monitor	16' Straight Edge or String Line. Record finding in daily report.
		±3/8" from Plan Grade (Base)		
	Quantity	Tonnage Used	Continuous Record	Record gross and tare of trucks. Periodically verify tare. (Weigh Slips)
	* Air Voids (12,500 lbs. GAW and over)	See Section 4.12	4/Lot	
	* Density (Under 12,500 lbs. GAW)	D2726 - 92% Theoretical	4/Lot	
	Test Section	See Section 3.4 of Specification		

* Contractor responsible to cut cores.

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-501	**PORTLAND CEMENT CONCRETE PAVEMENT**	(All Testing Requirements are ASTM unless noted otherwise.)		
	Items Requiring Material Testing By Independent Laboratory			
	Aggregates:			
	Fine:			
	General	C33	1/Source	
	Gradation	See Table 1 - Specification	1/Source	
	Course:			
	General	C33	1/Source	
	Gradation	See Table 2 - Specification	1/Source	
	Percentage of Wear	40% Max - C131 and C535	1/Source	
	Flat and Elongated	8% Max	1/Source	
	Mixed Proportions	Contractor shall submit test results from an independent lab verifying the proposed mix meets the requirements of Section 3.6 in the Specification.		
	Items Requiring Certification			
	Cement	C150 Types 1, 1A and 1P	1/Delivery to job site	

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-501 (contd.)	**PORTLAND CEMENT CONCRETE PAVEMENT**			
	Premolded Joint Filler:			
	Expansion Joints	D1751	1/Delivery to job site	
	Contraction joints	D1752	1/Delivery to job site	Resin-Impregnated
	Tie Bars	A615 or A616		See Section 2.7 for tie bars to be bent during construction.
	Dowel Bars	A615 or A617	1/Delivery to job site	
	Items Requiring Certification			PE may require the contractor to submit complete test reports.
	Cover Material for Curing:			
	Liquid Membrane - Forming Compound	C309 Type 2	1/Delivery to job site	
	White Polyethylene Film	C171	1/Delivery to job site	
	White Burlap-Polyethylene Sheeting	C171	1/Delivery to job site	
	Waterproof Paper	C171	1/Delivery to job site	
	Items Requiring Field Testing			
	Admixtures:			
	Pozzolanic	C618	1/Delivery to job site	Maximum loss of ignition will be 6%
	Air-Entraining	C260	1/Delivery to job site	
	Water-Reducing	C494 Type A or Type D	1/Delivery to job site	

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-501 (contd.)	**PORTLAND CEMENT CONCRETE PAVEMENT**			
	Items Requiring Field Testing			
	Flexural Test Beams-Molding	C31	8/Day(4/a.m.-4/p.m.)	
	Flexural Test Beams-Testing	C78	4/Day (one at 7 days from a.m. one at 28 days from a.m. one at 7 days from p.m. one at 28 days from p.m.) (Save other four molds in case of bad sample.)	
	Pavement Thickness - Coring	C174	1/1200 SYDS	
	Slump	C143	One per 2 loads	More, if problem
	Air Content	C173 or C231	One per 2 loads	More, if problem
	Surface Smoothness	P-501, Section 3.22	Random	.25 In./16 FT Horizontal

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-602	**BITUMINOUS PRIME COAT MATERIALS**	(All Testing Requirements are ASTM unless noted otherwise.)		
	Items Requiring Material Testing By Independent Laboratory			
	None			
	Items Requiring Certification			
	RC-70/MC-70/SC-70	AASHTO M81/M82/M141	1/Vendor Tank	The contractor shall submit to the PE samples of the bituminous materials to be used on the project. The PE may require the samples to be tested by an independent lab.
	RC-250/MC-250/SC-250	AASHTO M81/M82/M141	1/Vendor Tank	
	RT-1/RT-3	AASHTO M-52	1/Vendor Tank	
	Emulsified Asphalt - MS - OP	D244	1/Vendor Tank	
	Items Requiring Field Testing			
	Application Temperature	As Specified in Section 2.1	Per Application	Record
	Application Rate	.25 to .50 GAL/S YD	Per Application	Record

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-603	**BITUMINOUS TACK COAT MATERIALS**	(All Testing Requirements are ASTM unless noted otherwise.)		
	Items Requiring Material Testing By Independent Laboratory			
	None			
	Items Requiring Certification			
	Emulsified Asphalt:			
	SS-1	D977	1/Vendor Tank	
	SS-1h	D977	1/Vendor Tank	
	CSS-1	D2397	1/Vendor Tank	
	CSS-1h	D2397	1/Vendor Tank	
	Cutback Asphalt:			
	RC-70	D2028	1/Vendor Tank	
	Tar:			
	RTCB5, RTCB6	AASHTO M52	1/Vendor Tank	
	Items Requiring Field Testing			
	Application Temperature	As Specified in Section 2.1	Per Application	
	Application Rate	.05 to .15 GALS/SYD	Per Application	

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-605	**JOINT SEALING FILLER**	(All Testing Requirements are ASTM unless noted otherwise.)		
	Items Requiring Material Testing By Independent Laboratory			
	None			
	Items Requiring Certification			
	Joint Sealing Material	See Section 2.1 for various requirements	1/Lot Delivered to Job Site	
	Lubricant:			
	Average Weight	7.8 lbs		
	Solids (Percent by Weight)	22-28 D1644 Method A	1/Lot Delivered to Job Site	
	Film Strength, psi	2300 Min D412		
	Elongation, Percent	750 Min D412		
	Storage Temperature	50°F - 80°F		
	Items Requiring Field Testing			
	Pavement Temperatures:			
	Preformed Joint Sealant	Minimum 40°F	1/Day	
	Poured Joint Sealant	Minimum 50°F	1/Day	

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-609	**SEAL COATS AND BITUMINOUS SURFACE TREATMENTS**	(All Testing Requirements are ASTM unless noted otherwise.)		
	Items Requiring Material Testing By Independent Laboratory			
	Aggregates:			
	Elongated or Flat Pieces	Max 8%	1/Source	
	Percent Wear	Max 40 @ 500 Revolutions AASHTO T96	1/Source	
	Soundness	12% - 5 Cycles AASHTO T104	1/Source	
	Gradation	See Table 2 - AASHTO T11 and T27	1/Source	Specific aggregate to be used should be designated on the plans.
	Stripping	No Stripping - AASHTO T182	1/Source	
	Slag	Shall not weigh less than 70 lbs/C FT AASHTO T19	1/Source	
	Items Requiring Certification			
	Bituminous Material	See Section 2.2	1/Lot or Batch	The specific bituminous material to be used shall be designated on the plans.
	Rubber Compound:			
	Total Rubber Solids	45-72% by Weight	1/Source	
	Allowable variations From Target Value for Total Rubber Solids	± 1%	1/Source	

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-609 (contd.)	**SEAL COATS AND BITUMINOUS SURFACE TREATMENTS**			
	Ash, % by Total Rubber Solids	Max 3.5 D297	1/Source	
	Viscosity	Max 2000	1/Source	
	Items Requiring Field Testing			
	Atmospheric Temperature	Min 70°F	1Day	
	Quantity of Material Per Square Yard	See Table 1		Exact amount should be specified on plans.

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-610	**STRUCTURAL PORTLAND CEMENT CONCRETE**	(All Testing Requirements are ASTM unless noted otherwise.)		
	Items Requiring Material Testing By Independent Laboratory			
	Aggregate:			
	Course:	AASHTO M80		
	Percentage of Wear	Max 45 @ 500 Revolutions AASHTO T96		
	Gradation	See Table 1 AASHTO T27		
	Absorption	AASHTO T85		
	Fine Aggregate:	AASHTO M6		
	Gradation	See Table 3 AASHTO T27		
	Absorption	AASHTO T85		
	Water	If Not Potable - AASHTO T26		
	Items Requiring Certification			
		When this specification is used for fence post footing, manholes, catch basins, inlets, headwalls, light bases, windcone and beacon footings, electrical duct, sidewalk, curbing, cable markers, and other non-critical structures, the requirements for testing will be waived if either the concrete is furnished by a reputable transit mix firm approved by the PE, or the materials are approved by the PE when the concrete is mixed on the site. However, when any items, such as electrical duct or poured manholes are placed in or under a pavement intended to support aircraft of 60,000 pounds or more gross weight, such tests may be required if so indicated on the plans.		
		When tests are waived the concrete shall be a standard 6 bag mix, with 1" maximum coarse aggregate, unless otherwise specified, and shall have a slump range of 2-5 inches.		

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-610 (contd.)	**STRUCTURAL PORTLAND CEMENT CONCRETE**			
	Cement:			
	Portland Cement	AASHTO M85	1/Delivery to Job Site. (Typical for all certification items under P-610)	
	Air-Entraining Portland Cement	AASHTO M134		
	Portland Blast Furnace Slag	AASHTO M151		
	Air-Entraining Portland Blast Furnace Slag Cement	AASHTO M151		
	Admixtures:			
	Pozzolanic Admixtures:			
	Flyash	C350		
	Raw or Calcined Natural Pozolansq	C350		
	Air-Entraining Admixtures	AASHTO M154		
	Water-Reducing	C494 Type A or D		
	Premolded Joint Material	AASHTO M33 or M90 or M153 or M213		
	Joint Filler	See Specification P-605		
	Steel Reinforcement:			
	Deformed Bars:	AASHTO M137		
	Structural, Intermediate or Hardgrade Billet Steel	AASHTO M31		

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-610 (contd.)	**STRUCTURAL PORTLAND CEMENT CONCRETE**			
	Rail Steel	AASHTO M42		
	Welded Wire Fabric	AASHTO M55		
	Calcium Chloride	AASHTO M144		
	Curing Materials:			
	Cotton Mats	AASHTO M73		
	Waterproof Paper	AASHTO M139		
	Polyethylene Sheeting	AASHTO M171		
	Burlap Cloth	AASHTO M182		
	Liquid Membrane-Forming Compound	AASHTO M148		
	Items Requiring Field Testing			
	Air Content	3%-6% AASHTO T121 or T152		
	Concrete Cylinders	Made in accordance with AASHTO T23		
	Slump Test	Tested in accordance with AASHTO T119		Strength and slump requirements will be designated on the plans.
	Temperature	50°F - 100°F	Periodically during placement	The structure is to be maintained at 50°F until it reaches 60% of the design strength.

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
P-625	**COAT-TAR PITCH EMULSION SEALCOAT**	(All Testing Requirements are ASTM unless noted otherwise.)		
	Items Requiring Material Testing By Independent Laboratory			
	Coal-Tar	Federal Specification R-T-143	1/Vendor Tank	
	Coal-Tar Pitch Emulsion	Federal Specification R-D-355 (Except water content shall not exceed 50%)	1/Vendor Tank	
	Water	If known to be potable, then testing is not necessary		
	Items Requiring Certification			
	Latex Rubber	See Section 2.4	1/Vendor Tank	
	Items Requiring Field Testing			
	Aggregate Gradation	Sieve Size Percent Passing No. 16 97-100 20 85-100 30 15-85 40 2-15 100 0-2		
	Application Rate	See Table 2		Specific rate to be designated on Plans.
	Friction Test	Min 50 Mu Reading - E670	1/Job Site	Mu meter test should be done on test section if P-625 is going to be placed on runway.

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
D-701	**PIPE FOR STORM DRAINS AND CULVERTS**	(All Testing Requirements are ASTM unless noted otherwise.)		
	Items Requiring Material Testing By Independent Laboratory			
	None			
	Items Requiring Certification			
	Pipe	See Section 2.1 of the Specification for applicable testing requirements.	1/Source	
	Items Requiring Field Testing			
	Field Review of Joint Materials			

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
D-705	**PIPE UNDERDRAINS FOR AIRPORTS**	(All Testing Requirements are ASTM unless noted otherwise.)		
	Items Requiring Material Testing By Independent Laboratory			
	None			
	Items Requiring Certification			
	Pipe	See Sections 2.2-2.12 of the Specification for applicable testing requirements.	1/Source	
	Items Requiring Field Testing			
	None			

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
D-751	**MANHOLES, CATCH BASINS, LEACHING BASINS, INLETS AND INSPECTION HOLES**	(All Testing Requirements are ASTM unless noted otherwise.)		
	Items Requiring Material Testing By Independent Laboratory			
	None			
	Items Requiring Certification			
	Brick and Block	See Section 2.1 of the Specification	1/Source	
	Precast Units	See Section 2.4 of the Specification	1/Source	
	Frames, Covers, Grates	See Section 2.6 of the Specification	1/Source	
	Items Requiring Field Testing			
	None			

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
D-752	**CONCRETE CULVERTS, HEADWALLS AND MISCELLANEOUS DRAINAGE STRUCTURES**	(All Testing Requirements are ASTM unless noted otherwise.)		
	Items Requiring Material Testing By Independent Laboratory			
	None			
	Items Requiring Certification			
	None			
	Items Requiring Field Testing			
	None			

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
D-754	**CONCRETE GUTTERS, DITCHES AND FLUMES**	(All Testing Requirements are ASTM unless noted otherwise.)		
	Items Requiring Material Testing By Independent Laboratory			
	None			
	Items Requiring Certification			
	None			
	Items Requiring Field Testing			
	None			

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
T-901	**SEEDING**	(All Testing Requirements are ASTM unless noted otherwise.)		
	Items Requiring Material Testing By Independent Laboratory			
	None			
	Items Requiring Certification			
	Seed	Federal Specification JJJ-S-181	1/Lot	See Section 2.1 for information to be supplied on Certification.
	Items Requiring Field Testing			
	None			

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
T-904	**SODDING**	(All Testing Requirements are ASTM unless noted otherwise.)		

Items Requiring Material Testing By Independent Laboratory

None

Items Requiring Certification

None

Items Requiring Field Testing

None

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
T-905	**TOP SOILING**	(All Testing Requirements are ASTM unless noted otherwise.)		
	Items Requiring Material Testing By Independent Laboratory			
	Top Soil:			
	pH Range	5.5 to 7.6	1/Source	The contractor is not responsible for any tests, chemical or mechanical analysis or the results of such test or analyses for topsoil obtained "on site" or "owner" furnished. Material Testing Requirements may be waived by the PE if they are satisfied with the quality the contractor proposes to use.
	Organic Content	3%-20% (Wet-Combustion Method Chromic Acid Reduction)	1/Source	
	Gradation	20%-80% Passing the 200 Sieve C117	1/Source	
	Items Requiring Certification			
	None			
	Items Requiring Field Testing			
	None			

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
T-907	**TILLING**	(All Testing Requirements are ASTM unless noted otherwise.)		

Items Requiring Material Testing By Independent Laboratory

None

Items Requiring Certification

None

Items Requiring Field Testing

None

SPEC	TITLE	REQUIREMENT	MINIMUM SAMPLE SELECTION	REMARKS
T-908	**MULCHING**	(All Testing Requirements are ASTM unless noted otherwise.)		

Items Requiring Material Testing By Independent Laboratory

None

Items Requiring Certification

None

Items Requiring Field Testing

None