

## Laboratory Certification Application Packet

Welcome to the ODOT Laboratory Certification Program. To certify your laboratory to test materials for ODOT construction projects, you must submit an application requesting the ODOT Central Laboratory to perform an on-site inspection. The on-site inspection includes an evaluation of the laboratory itself as well as the testing apparatus.

ODOT will certify your laboratory if your laboratory and its equipment are within specification.

**This certification is valid for one year. If your laboratory's certification expires and you have a continued need to test materials for ODOT construction projects, you must apply for recertification.**

### Certification Procedure:

1. Complete the enclosed application.
2. Review the enclosed Request for Certification sheets (Sections 1 through 4) and check the test methods that your laboratory wishes to be certified to perform.
3. Return your completed application and Sections 1 through 4 to one of the following:

Randy FitzGerald Laboratory Certification Coordinator Oregon Department of Transportation Construction Section, Materials Laboratory 800 Airport Road S.E. Salem, OR 97301-4798 Telephone: (503) 986-3087 FAX: (503) 986-3096
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When your completed application packet is received by the ODOT Central Laboratory, a representative will contact you by telephone to schedule an inspection date.

At the conclusion of the inspection, the inspector will leave a preliminary inspection report of findings covering all areas of the inspection. **If deficiencies were noted, you have thirty days to make necessary corrections.** When all deficiencies have been corrected, the laboratory inspector may re-visit your laboratory to confirm the corrective action. A final report and Certificate of Laboratory Certification will be mailed to your laboratory within two weeks following the on-site inspection or when all deficiencies have been corrected.

OREGON DEPARTMENT OF TRANSPORTATION  
CONSTRUCTION SECTION  
CENTRAL MATERIALS LABORATORY

ON-SITE LABORATORY INSPECTION CRITERIA  
FOR QUALITY CONTROL AND QUALITY ASSURANCE LABORATORIES

A laboratory desiring information and/or an application package for ODOT laboratory certification may contact the ODOT Central Laboratory at the following address:

Oregon Department of Transportation  
Construction Section, Materials Laboratory  
Attn: Lab Certification Coordinator  
800 Airport Road SE  
Salem, OR 97310-4798  
Telephone (503) 986-3087

**Laboratories requesting ODOT certification shall make arrangements to receive an on-site inspection.** Forms will be included in the application package to facilitate the laboratory's response to this requirement.

**NOTE: It is the responsibility of the requesting laboratory to have their lab clean, organized and in complete operating order at the time of inspection. All equipment must be readily available and accessible. The ODOT Laboratory Certification Team does not search for stowed equipment. In addition an authorized representative must be present at the time of inspection to answer questions or respond to identify and present equipment. Failure to meet this criteria, or to find unorganized, unkempt facilities may result in a canceled inspection.**

The Lab Certification Inspector will visit each laboratory whose application for certification has been accepted. The laboratory inspector will evaluate the laboratory using criteria A through H listed below. A discussion of the criteria follows:

- A. **Requirement: The laboratory shall maintain facilities (fixed or mobile) for proper control of the laboratory environment.** This criteria is used to evaluate the laboratory's physical ability to provide an appropriate environment in which to test materials. General requirements include: the facility shall be physically able to function as a laboratory (e.g. adequate power, water, lighting, floor space etc.) and have the capability of maintaining temperatures that are specified in the test methods for which the laboratory is seeking certification.
  
- B. **Requirement: The laboratory shall maintain facilities for proper storage, handling, and conditioning of test specimens and samples.** This criteria is used to evaluate a laboratory's physical ability to store samples and keep them organized. The laboratory shall maintain separate areas on its premises to store samples and splits of samples in an organized manner so that samples are not lost or discarded and may be found at a future date. In addition, the laboratory shall have facilities for the conditioning of samples as required by any test method for which the laboratory seeks certification.

- C. **Requirement:** Calibration certificates held by laboratories shall meet the requirements of ISO/IEC 17025 and shall include appropriate statements of uncertainty. Laboratories shall use accredited calibration service providers. The laboratory shall maintain necessary calibration equipment and reference standards. A laboratory shall have, on hand, calibration and verification equipment necessary to ensure the accuracy of its equipment. Such equipment could include calibration weights for scales or balances; manometers for the verification of vacuum pumps; thermometers etc.
- D. **Requirement:** The laboratory shall maintain equipment conforming to specification requirements necessary for the testing performed. This criteria is used to ensure that the laboratory's testing equipment conforms to the specifications listed in the test methods for which the laboratory is seeking certification.
- E. **Requirement:** The laboratory shall demonstrate adequate care when recording and processing data and test results. This criteria is used to evaluate the laboratory's ability to produce accurate test reports. The laboratory shall have procedures in place that facilitate the timely and accurate recording of data and the ultimate accuracy of its test reports.
- F. **Requirement:** The laboratory shall demonstrate proper techniques for selection, identifying, handling, conditioning, storing, and retaining test samples. This criteria is similar to criteria B but is concerned with the laboratory's internal policies and procedures rather than its physical capabilities in regards to the above activities. The laboratory shall have policies and procedures in place to ensure that its personnel and technical staff have the ability to select, identify, handle, condition, store, and retain test samples as required by the test methods for which the laboratory is seeking certification.
- G. **Requirement:** The laboratory shall include the laboratory's name and address and the name(s) of the technician(s) performing the test(s) on their test reports. This criteria is used to ensure that the above information appears on the laboratory's test reports that are submitted to ODOT. In addition to the above, the technician(s) certification card number shall be entered on all test reports.
- H. **Requirement:** The laboratory shall have on site at the time of inspection all equipment (except items listed as mobile equipment) necessary to perform the test methods for which they have requested certification. Mobile equipment for additional test procedures may be added at a later date provided the following conditions are met:
- The laboratory must demonstrate adequate work space and electrical system to operate required equipment.
  - If equipment is new, they must provide copies of invoices that include the make, model and serial number of the equipment.
  - If the equipment is rented or borrowed, it must come from another ODOT certified laboratory and provide the make, model and serial number as well as the number and color of the ODOT inspection tag.

### Mobile Equipment

1. Ignition Oven
2. Gyrotory Compactor
3. Field concrete equipment

### Preliminary Report

The ODOT Lab Certification Inspector will prepare a preliminary report of findings and present it to the laboratory manager at the conclusion of the on-site inspection. The preliminary inspection report will list all discrepancies for each test method in which the laboratory has requested certification. The inspector will discuss each discrepancy noted in the preliminary report with the laboratory manager in sufficient detail so that the laboratory manager understands the scope of the problem(s) and what corrective action is required in order to obtain certification for the test method(s) in question. When the inspector and the laboratory manager have covered all of the deficiencies, both parties will sign the preliminary report. These signatures indicate that both parties have read the report and understand its contents. The inspector will leave the original copy of the report with the laboratory manager and place a copy in the laboratory's permanent file.

The laboratory inspector will immediately (same or next day) FAX or hand deliver a copy of the report to the project manager and the region QA personnel for their files and general information.

Laboratories are expected to correct all deficiencies within thirty-days so that a certification may be issued. If a laboratory needs more than thirty-days to correct deficiencies, the laboratory shall notify the laboratory inspector, in writing, explaining why they need additional time. The laboratory will not be certified until all deficiencies are corrected.

### Final Report

Once all of the deficiencies have been corrected the ODOT Lab Certification Inspector will prepare a final report of findings and mail it to the laboratory.

The laboratory inspector will mail copies of the final report to the project manager and the region QA office.

### Certificate of Laboratory Certification

The ODOT Central Laboratory will prepare a Certificate of Laboratory Certification for a laboratory when the laboratory has met the requirements listed in Appendix A, and has corrected all deficiencies noted by the inspector. The certificate will be mailed to the laboratory with the final report of findings. The Certificate will include the type of certification, laboratory name, test methods the laboratory has been certified to perform, and the Construction Section Manager's signature. This Certificate is proof of a laboratory's ODOT certification for the listed test methods and may be presented as such to any ODOT project manager.

The laboratory inspector will mail copies of the Certification with the final report to the project manager and the region QA office.

Certificates of Laboratory Certification are valid for one-year from the date of the inspection.

### Follow Up On-Site Inspections

If at any time during a laboratory's term of certification, the project manager or region QA personnel suspect that any of the contractor's laboratory equipment or the laboratory building itself are out of specification, the project manager or region QA personnel may request an additional on-site inspection. The project manager or region QA personnel will contact the Lab Certification Inspector and schedule the follow up on-site inspection.

### Laboratory Decertification

If the follow up on-site inspection reveals that the laboratory is deficient in one or more areas, the laboratory inspector will immediately decertify the laboratory for those test methods affected by the deficient equipment or facilities. The laboratory inspector will recertify the laboratory following correction of all deficiencies. A laboratory may not perform materials tests using test methods for which it has been decertified.

In addition, any laboratory intentionally misrepresenting the status of their certification or falsifying test results will be subject to disciplinary action up to a one-year suspension of their certification. Any allegations regarding the practices of a certified laboratory will be made in writing to the Certification Advisory Committee. The Certification Advisory Committee will investigate the complaint and decide on appropriate disciplinary action. In all cases, the parties involved in the complaint will be provided an opportunity to appear before the committee before any actions are taken.

**OREGON DEPARTMENT OF TRANSPORTATION**

**CENTRAL MATERIALS LABORATORY**

**APPLICATION FOR LABORATORY CERTIFICATION**

Please print or type

Laboratory Name:	
Laboratory Owner:	
Laboratory Mailing Address: <b>(Street Address, City, State, ZIP)</b>	
Laboratory Telephone:	FAX:
Location of Laboratory: <b>(Street Address, City, State, ZIP)</b>	
Laboratory Manager:	
Name of ODOT construction project:	
Name of Project Manager:	
E-Mail Address:	
When would you like your on-site lab inspection? <b>Specify a time frame.</b>	

**ODOT CENTRAL LABORATORY INSPECTION PROGRAM**

<b>SECTION 1 EMBANKMENT TEST METHODS</b>	<b>Test Number</b>	<b>Place a ✓ to indicate desired certification</b>
Specific Gravity and Absorption of Fine Aggregate	AASHTO T 84	
Specific Gravity and Absorption of Coarse Aggregate	AASHTO T 85	
Moisture Density Relations of Soils Using a 2.5kg Rammer and a 305mm Drop	AASHTO T 99	
Moisture Density Relations of Soils Using a 4.54kg Rammer and a 457mm Drop	AASHTO T 180	
Determination of Moisture in Soils by Means of Calcium Carbide Gas Pressure Moisture Tester	AASHTO T 217	

**ODOT CENTRAL LABORATORY INSPECTION PROGRAM**

<b>SECTION 2 AGGREGATE TEST METHODS</b>	<b>Test Number</b>	<b>Place a ✓ to indicate desired certification</b>
Presence of Wood Waste in Produced Aggregates	ODOT TM 225	
Evaluating Cleanness of Cover Coat Material	ODOT TM 227	
Determination of Flat and Elongated Material in Coarse Aggregates	ODOT TM 229	
Bulk Density ("Unit Weight") and Voids in Aggregate	AASHTO T 19	
Sieve Analysis of Fine and Coarse Aggregates, including Wet Sieve	AASHTO T 27 & T 11	
Plastic Fines in Graded Aggregates and Soils by the Use of the Sand Equivalent Test	AASHTO T 176	
Reducing Samples of Aggregate to Testing Size	AASHTO T 248	
Total Moisture Content of Aggregate by Drying	AASHTO T 255	
Determining the Percentage of Fracture in Coarse Aggregate	AASHTO TP 61	

**ODOT CENTRAL LABORATORY INSPECTION PROGRAM**

<b>SECTION 3 CONCRETE TEST METHODS</b>	<b>Test Number</b>	<b>Place a ✓ to indicate desired certification</b>
Compressive Strength of Cylindrical Concrete Specimens	AASHTO T 22	
Making and Curing Concrete Test Specimens in Field	AASHTO T 23	
Slump of Hydraulic Cement Concrete	AASHTO T 119	
Mass Per Cubic Meter, Yield, and Air Content of Concrete	AASHTO T 121	
Air Content of Freshly Mixed Concrete by the Pressure Method	AASHTO T 152	
Capping Cylindrical Concrete Specimens	AASHTO T 231	
Temperature of Freshly Mixed Portland Cement Concrete	AASHTO T 309	
Moist Cabinets, Moist Rooms, and Water Storage Tanks Used in the Testing of Hydraulic Cements and Concretes	AASHTO M 201	
Sampling Freshly Mixed Concrete	WAQTC TM 2	

**ODOT CENTRAL LABORATORY INSPECTION PROGRAM**

<b>SECTION 4 ASPHALT TEST METHODS</b>	<b>Test Number</b>	<b>Place a ✓ to indicate desired certification</b>
Resistance to Deformation of Bituminous Mixtures by Means of Hveem Stabilometer	ODOT TM 303	
Preparation of Field Compacted Marshall Specimens	ODOT TM 325	
Preparing and Determining the Density of Hot-Mix Asphalt (HMA) Specimens by Means of the Superpave Gyrotory Compactor	ODOT TM 326	
Mechanical Analysis of Extracted Aggregate	AASHTO T 30	
Bulk Specific Gravity of Compacted Bituminous Mixtures	AASHTO T 166	
Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures	AASHTO T 209	
Preparation of Test Specimens of Bituminous Mixtures by Means of California Kneading Compactor	AASHTO T 247	
Resistance of Compacted Asphalt Mixture to Moisture Induced Damage	AASHTO T 283	
Determining the Asphalt Binder Content of Hot Mix Asphalt (HMA) by the Ignition Method	AASHTO T 308	
Moisture Content of Bituminous Mixes by Oven	AASHTO T 329	

## Equipment Checklist Embankment - Section 1

	Within Spec	T 84 - Specific Gravity & Absorption of Fine Aggregate
		An electronic balance w/ a min. 1500g cap., readable to 0.1g
		A volumetric flask w/ a 500ml capacity
		A metal cone mold (40 +/- 3mm inside dia. @ the top, 90 +/- 3mm inside dia. at the bottom, 75 +/- 3mm height and 0.8mm min. thickness)
		A metal tamper (340 +/- 15g w/ a tamping face 25 +/- 3mm in dia.)
		Oven capable of maintaining 110 +/- 5°C
		Ability to maintain water temp at 23.0 +/- 1.7°C

	Within Spec	T 85 - Specific Gravity & Absorption of Coarse Aggregate
		An electronic balance w/ a min. cap. of 5kg, readable to 1g
		A water bath container w/ an over-flow device
		A 4.75mm (No. 4) sieve, 2.36mm (No. 8) sieve
		Suspension apparatus
		Sample container (wire basket of 3.35mm or smaller mesh, w/ a cap. of 4 to 7L for aggregate of 37.5mm max, larger basket for larger aggregate)
		Oven capable of maintaining 110 +/- 5°C
		Ability to maintain water temp at 23.0 +/- 1.7°C

	Within Spec	T 99 - Moisture Density Relations of Soils Using a 2.5kg Rammer and a 305mm Drop
		An electronic balance w/ a 12kg cap., readable to 5g
		An electronic balance w/ a 2kg cap. readable to 0.1g
		A 101.6mm (4") and a 152.4mm (6") cylindrical metal mold w/ a detachable collar
		A 2.5kg (5.5 lbs) rammer w/ a 305mm (12") drop
		Sample extruder for removing the compacted specimen from the mold quickly and w/ little disturbance
		Oven capable of maintaining 110 +/- 5°C
		A steel straight edge at least 250mm (10") long, having one beveled edge
		A 4.75mm (No. 4) sieve for methods A & B, and a 19.0mm (3/4") sieve for methods C & D
		A compaction base (200lbs min)
		Mechanical compactor - Certificate of calibration required annually <b>Expiration:</b>

	Within Spec	T 180 - Moisture Density Relations of Soils Using a 4.54kg Rammer and a 457mm Drop
		An electronic balance w/ a 12kg cap., readable to 5g
		An electronic balance w/ a 2kg cap., readable to 0.1g
		A 101.6mm (4") and a 152.4mm (6") cylindrical metal mold w/ a detachable collar
		A 4.54kg (10 lbs) rammer w/ a 457mm (18") drop
		Sample extruder for removing the compacted specimen from the mold quickly and w/ little disturbance
		Oven capable of maintaining 110 +/- 5°C
		A steel straight edge at least 250mm (10") long, having one beveled edge
		A 4.75mm (No. 4) sieve for methods A & B, and a 19.0mm (3/4") sieve for methods C & D
		A compaction base (200lbs min)
		Mechanical compactor - Certificate of calibration required annually <b>Expiration:</b>

## Equipment Checklist Embankment - Section 1

	<b>Within Spec</b>	<b>T 217 - Determination of Moisture in Soils by Means of Calcium Carbide Gas Pressure Moisture Tester</b>
		A calcium carbide pressure moisture tester w/ a 20g or 26g capacity
		Balance as provided by the manufacturer w/ a pan and cradle
		Two 1.25" steel balls
		Cleaning brush
		Calcium carbide reagent
		Scoop for measuring the calcium carbide reagent
		10g or 13g weight
		Gauge accurate to 0.2%
		An electronic balance w/ a minimum capacity of 2kg, readable to 0.1g

## Equipment Checklist Aggregate - Section 2

	<b>Within Spec</b>	<b>TM 225 - Presence of Wood Waste in Produced Aggregates</b>
		Sample splitter or quartering cloth
		An electronic balance readable to 0.1g w/ the cap. to meet the minimum masses
		Drying source operated per T 255
		Container of size to permit covering the sample w/ 76.2mm (3in) to 101.6mm (4in) of water
		U.S. Standard Sieve sizes: No. 40, No. 200

	<b>Within Spec</b>	<b>TM 227 - Evaluating Cleanness of Cover Coat Material</b>
		An electronic balance readable to 1g
		A funnel to hold nested No. 10 & No. 200 sieves and neck down to rest in a 500ml graduate
		U.S. Standard Sieve sizes: No. 10 and No. 200
		Plastic wide-mouth one gallon jars w/ lids
		Sand Equivalent cylinder, rubber stopper and timer
		Graduated cylinders of 10ml & 500ml cap.
		Sand Equivalent stock solution
		Splitter or quartering cloth
		Syringe or spray attachment
		Oven capable of maintaining 110 +/- 5°C
		Distilled or demineralized water
		Test Temperature 18 - 28°C

	<b>Within Spec</b>	<b>TM 229 - Determination of Flat and Elongated Material in Coarse Aggregates</b>
		An electronic balance readable to 0.1g w/ the cap. to meet the minimum masses
		Proportional caliper measuring device meeting the requirements of ASTM D 4791-95 and approved by the Agency

	<b>Within Spec</b>	<b>T 19 - Bulk Density ("Unit Weight") and Voids in Aggregate</b>
		An electronic balance readable to 0.1g w/ the cap. to meet the minimum masses
		Tamping rod 15.9mm (5/8) x 609.6mm (24in) w/ a hemispherical tip
		Measure appropriate for the aggregate size being tested, see test method
		A strike-off plate of glass at least 0.25" thick and at least 1" greater than the pot, and chassis or pump grease

## Equipment Checklist Aggregate - Section 2

	<b>Within Spec</b>	<b>T 27/11 - Sieve Analysis of Fine and Coarse Aggregate, including Wet Sieve</b>
		An electronic balance readable to 0.1g w/ the cap. to meet the minimum masses
		U.S. Standard Sieve sizes: Various sizes per ODOT specifications
		Mechanical sieve shaker
		Suitable drying source per T 255
		Splitter per T 248

	<b>Within Spec</b>	<b>T 176 - Plastic Fines in Graded Aggregates and Soils by the Use of the Sand Equivalent Test</b>
		Graduated plastic cylinder
		Rubber stopper
		Irrigator tube w/ two No. 60 drill holes at end
		Weighted foot weighing 1000 +/- 5g
		Siphon assembly w/ a one gallon bottle on a shelf 36 +/- 1" above the working surface
		85ml measuring can
		Wide-mouth funnel
		Quartering cloth
		Straight edge or spatula
		Timer reading in minutes and seconds
		Stock calcium chloride solution
		Working solution in a work area, w/ both A/C & heat to maintain working solution at a temp. of 72 +/- 5°F
		U.S. Standard Sieve: No 4
		Calibrated thermometer readable to 0.1°C

	<b>Within Spec</b>	<b>T 248 - Reducing Samples of Aggregates to Testing Size</b>
		Mechanical sample splitter
		Quartering cloth

	<b>Within Spec</b>	<b>T 255 – Total Moisture Content of Aggregate by Drying</b>
		An electronic balance readable to 0.1g
		Containers capable of being sealed
		Thermometer w/ a range to 205°C (401°F)
		At least one of the following:
		Oven capable of 110 +/- 5°C
		Propane burner, hot plate, fry pan or any other device that will dry the sample without altering the material being dried

	<b>Within Spec</b>	<b>TP 61 - Determining the Percentage of Fracture in Coarse Aggregate</b>
		An electronic balance readable to 0.1g w/ the cap. to meet the minimum masses
		U.S. Standard Sieve sizes: 37.5mm (1 <sup>1/2</sup> ), 25.0mm (1in), 19mm (3/4), 12.5mm (1/2), 9.5mm (3/8), 6.3mm (1/4), 4.75mm (#4), 2.36mm (#8), 2.0mm (#10)
		Splitter as per T 248

## Equipment Checklist Concrete - Section 3

	Within Spec	T 22 - Compressive Strength of Cylindrical Concrete Specimens
		Certificate of calibration for the compression testing machine, interval of every 12 months <b>Expiration:</b>
		Spherically seated upper bearing block plane to .001", bottom bearing block at least 0.9" thick, plane to .001"
		Load indicator of sufficient length to reach the graduation marks equipped w/ a zero adjustment
		The specimen shall be loaded at a rate of 20 – 50 psi / second (1000 pounds / second is a good rate)
		Neoprene cap bottoms plane to .002"
		Measuring device to measure cylinder dia. readable to .25mm - .01 inches
		Note: Neoprene caps are not a substitute for bearing plates. Neoprene pads shall not test more than 100 cylinders * Min. Dia. = 6.18" or 4.12" * If dia. is > 13mm of specimen dia. then concentric circles are required

	Within Spec	T 119 - Slump of Hydraulic Cement Concrete
		A slump cone free from dents and interior protrusions
		Tamping rod 5/8" x 24" w/ a hemispherical tip
		A level, rigid, non-absorbent base to set the slump cone on
		Scoop
		Tape measure

	Within Spec	T 152 - Air Content of Freshly Mixed Concrete by the Pressure Method
		A pressure type B air meter
		Tamping rod 5/8" x 24" w/ a hemispherical tip
		Rubber mallet weighing 1.25 +/- 0.5lbs
		Scoop
		A strike-off plate of glass or acrylic at least 1/2" thick or steel plate at least 1/4" thick, all w/ a length and width at least 2" greater than the pot
		Rubber syringe
		Calibration Device / Brass Calibration Vessel
		Calibration Log (every 3 months)

	Within Spec	T 23 - Making & Curing Concrete Test Specimens in Field
		Single use 6" x 12" plastic cylinder molds
		Tamping rod 5/8" x 24" w/ a hemispherical tip
		Single use 4" x 8" plastic cylinder molds
		Tamping rod 3/8" x 12" w/ a hemispherical tip
		Rubber mallet weighing 1.25 +/- 0.5lbs
		Scoop
		Trowel or float
		A Coleman type cooler capable of holding water
		Thermometer capable of registering min/max temperatures during the initial cure.

	Within Spec	T 121 - Mass Per Cubic Meter, Yield, and Air Content of Concrete
		A platform type scale accurate to 0.3% of the mass required
		The pot from a pressure type air meter
		Tamping rod 5/8" x 24" w/ a hemispherical tip
		Rubber mallet weighing 1.25 +/- 0.5lbs
		Scoop
		A strike-off plate of glass or acrylic at least 1/2" thick or steel plate at least 1/4" thick, all w/ a length and width at least 2" greater than the pot
		Calibration record log (once a year)

	Within Spec	T 231 - Capping Cylindrical Concrete Specimens
		Alignment device such as guide bars or bulls-eye level
		Cube mold w/ a cover plate to determine the compressive strength of the capping compound
		Capping compound shall be maintained at 129°C to 143°C when capping cylinders
		Caps should be approximately 1/8" to 5/16" thick
		Caps shall be plane to .002" checked daily
		Capping compound break log
		Bearing blocks that meet T 106

## Equipment Checklist Concrete - Section 3

	<b>Within Spec</b>	<b>T 309 - Temperature of Freshly Mixed Portland Cement Concrete</b>
		Container – Nonabsorptive material, large enough to provide a minimum of 75mm (3") of concrete in all directions
		Thermometer readable to .5°C (1°F)
		Reference thermometer readable to .2°C (.5°F) and a report of calibration / verification to ASTM E77

	<b>Within Spec</b>	<b>M 201 - Moist Rooms</b>
		All openings shall be provided w/ tight fitting doors and windows
		Room temperature shall be thermostatically controlled, maintaining a temperature of 73.4+/- 3°F
		All cylinders in storage shall have free water on entire surface area at all times
		Moist rooms shall be equipped w/ a chart temperature recorder
		Specimens shall not be exposed to dripping or running water

	<b>Within Spec</b>	<b>M 201 - Water Tanks</b>
		The curing tank shall be made of a non-corroding material
		The water in the tank shall be maintained at 73.4+/- 3°F, w/ automatic temperature controls for heating and cooling
		The water in the tank shall be lime saturated
		The curing tank shall be equipped w/ a chart temperature recorder
		The curing tank shall be located in an area w/ air conditioning

	<b>Within Spec</b>	<b>TM 2 - Sampling Freshly Mixed Concrete</b>
		Wheelbarrow
		Plastic, canvas or burlap to cover the wheelbarrow
		Shovel

## Equipment Checklist Asphalt - Section 4

	Within Spec	TM 303 – Resistance to Deformation of Bituminous Mixtures by Hveem Stabilometer
		Hveem Stabilometer w/ a current Certificate of Calibration, interval every 12 months <b>Expiration:</b>
		Calibration cylinder a hollow metal cylinder 101.6 +/- 0.13mm OD by 100mm (min.)
		Metal follower 101.2mm dia. (max) by 125mm min.
		Compression testing machine w/ min. cap. of 4.5kN (10,000lbf) w/ a current Certificate of Calibration, interval every 12 months <b>Expiration:</b>
		Oven capable of maintaining 60° +/- 3°C

	Within Spec	TM 325 - Preparation of Field Compacted Marshall Specimens
		Mold cylinders, 4" dia. by 3" (mold ID 3.995 - 4.005) in height, base plates and extension collars
		Specimen extractor (dia. of disk at least 100mm, thickness not less than 12.7mm)
		Compaction hammer having a flat, circular face and a 4536 +/- 9g sliding weight w/ a free fall of 18" +/- .06"
		Compaction pedestal consisting of a 8" x 8" x 18" wooden post capped w/ a 12" x 12" x 1" steel plate, post should be plumb and cap level
		The compaction pedestal shall be bolted to a concrete slab w/ min. dimensions of 12" x 24" x 8", placed on the ground. If mounted in a trailer, it shall be further supported by a load transfer device between the underside of the floor and the ground
		Specimen mold holder shall hold the mold, collar and base plate securely
		Oven and hot plate for heating mix and molds
		Thermometer w/ a range from 50 to 400°F readable to 5°F
		An electronic balance w/ a min. 2kg cap. readable to 0.1g
		Table fan for cooling the Marshall specimens

	Within Spec	TM 326 – Preparation of Field Compacted Gyrotory Specimens Determination of Average G <sub>mb</sub> for HMAC Volumetric Calculations
		Specimen Molds inside dia. 149.9 to 150.0mm and be at least 250mm high and 7.5mm thick
		Electronic balance w/minimum cap. of 6kg, readable to 0.1g
		Oven capable of maintaining 176°C +/- 3°C
		Ram and base plate ground flat
		Annual calibration certificate for calibration kit which includes: an angle jig assembly, 1,2,3 block and a load cell or proving ring <b>Expiration:</b>
		Lab shall maintain ambient air temp of 74 +/- 20°F

	Within Spec	T 30 – Mechanical Analysis of Extracted Aggregate
		An electronic balance readable to 0.1g w/ the cap. to meet the min. sample sizes
		Sieves as per ODOT specifications
		Mechanical sieve shaker
		Suitable drying equipment operated per AASHTO T 255 (110 +/-5°C)
		Misc. containers and utensils

**\*\* Labs performing asphalt tests must have oven capacity of at least 16 cu. ft. minimum. \*\***

## Equipment Checklist Asphalt - Section 4

	Within Spec	T 166 - Bulk Specific Gravity of Compacted Bituminous Mixtures
		An electronic balance w/ a minimum cap. a of 5kg, readable to 0.1g
		A water bath container w/ an over-flow device
		Thermometer w/ a minimum range of 19-27°C (66-80°F) graduated in 0.1°C (0.2°F)
		Suspension apparatus w/ wire basket
		Oven capable of maintaining 110 +/- 5°C (230 +/- 9°F)

	Within Spec	T 209 - Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
		An electronic balance w/ a minimum cap. of 10kg, readable to 0.1g
		A container of glass, metal or plastic, or a volumetric flask capable of holding a 2kg sample and withstanding a partial vacuum
		Vacuum pump capable of maintaining a partial vacuum of 30mm Hg – 25mm Hg
		Residual pressure manometer or vacuum gauge traceable to NIST
		A glass, metal or plastic lid w/ a hose connection
		Thermometer readable to 0.5°C
		Timer or clock
		Inline bleeder valve
		Mechanical Agitator
		Oven capable of maintaining temperature +/- 5°C

	Within Spec	T 247 - Preparation of Test Specimens of Bituminous Mixtures by Means of California Kneading Compactor
		California Kneading Compactor w/ a current Certificate of Calibration, interval every 12 months <b>Expiration:</b>
		Specimen molds and mold holder
		Oven capable of maintaining 110°C +/- 3°C
		Compression testing machine w/ min. cap. of 222kN (50,000lbf) w/ a current Certificate of Calibration, interval every 12 months <b>Expiration:</b>
		Electronic balance 5k minimum capacity, readable to .1g
		Round nose steel rod, 9.5mm (3/8") in dia., 406mm (16") long
		Heavy paper disks, 102mm (4") in dia.
		Steel Shim, 6.4mm (1/4") thick, 19mm (3/4") wide, 64mm (2.5") long
		A device for measuring the height of specimen to the nearest 0.3mm (0.01")

	Within Spec	T 283 - Resistance of Compacted Asphalt Mixtures to Moisture Induced Damage
		Equipment from TM 325
		An electronic balance w/ a min. cap. of 5kg, readable to 0.1g
		Water bath and suspension apparatus from T 166
		Water bath capable of maintaining 60 +/- 1°C (140 +/- 1.8°F)
		Plastic film for wrapping, heavy-duty leak proof plastic bags
		Forced air draft oven capable of maintaining a temp. of 60 +/- 1°C
		Loading jack and ring dynamometer from T 245 or a mechanical or hydraulic testing machine from T 167
		Certificate of calibration for testing machine or proving ring, interval of every 12 months <b>Expiration:</b>

**\*\* Labs performing asphalt tests must have oven capacity of at least 16 cu. ft. minimum. \*\***

## Equipment Checklist Asphalt - Section 4

	Within Spec	T 308 - Determining the Asphalt Binder Content of Hot Mix Asphalt (HMA) by the Ignition Method
		Forced air ignition furnace, capable of maintaining the temperature at 578°C (1072°F)
		A min. of two tempered stainless steel mesh or perforated baskets
		One stainless steel catch pan large enough to hold sample trays
		Oven capable of maintaining 125 +/- 5°C (257+/-9°F)
		An electronic balance w/ a min. 8kg capacity, readable to 0.1g
		Thermometer w/ a range from 50 to 500°F readable to 5°F
		Initial oven temperature of 538 +/- 20°C
		Certificate of calibration for the ignition furnace scales and temperature controls, interval of every 12 months <b>Expiration:</b>

	Within Spec	T 329 - Moisture Content of Bituminous Mixes by Oven
		An electronic balance w/ a min. 2kg capacity, readable to 0.1g
		An oven capable of maintaining a temperature of 163 +/- 14°C
		Sample container, not affected by heat, of sufficient size to hold a sample of at least 1000g
		Thermometer w/ a range from 50 to 500°F

**\*\* Labs performing asphalt tests must have oven capacity of at least 16 cu. ft. minimum. \*\***