

Section 1014 – Transportation Technician Qualification Program

1014.1 General

The purpose of the Transportation Technician Qualification Program (TTQP) is to ensure quality sampling, testing and inspection during highway construction through the qualification of industry and department personnel. The Construction and Materials quality Assurance Section administer UDOT's qualification program.

Through a cooperative program of training, study and examination, technicians will be able to better ensure satisfactory materials control, identification of poor quality materials, and proper documentation. This program will allow the department to ensure that all tests performed on materials for acceptance are performed in accordance with the specified test procedures by qualified technicians.

1014.1.1 Definition of Qualification (Qualified)

Within the context of this guide and program the term *Qualification* is defined as the end product for someone who has successfully met the requirements, as defined elsewhere in the guide, in one of the technical areas in which UDOT offers such credentials.

These are credentials as defined by UDOT and establish that the recipient has demonstrated a required level of knowledge and is eligible to perform work on certain transportation projects under the jurisdiction of UDOT and/or others that utilize this program. This definition does not in any way suggest an affiliation with any national or other organization to provide for similar credentials, in any like areas to those that are included in the UDOT TTQP / IQP Program.

1014.2 Transportation Technician Qualification Program

1014.2.1 Testing Technician Training

All persons performing sampling and testing for a UDOT project must be trained and qualified in the respective areas of testing. Training provides a basic understanding and knowledge of sampling and testing procedures. Technicians must also be familiar with the equipment that is required for testing and how to operate it correctly.

Prior to qualification, all technicians are to receive training under the direction of UDOT qualified lab supervisors or senior technicians.

Documentation of training is required for qualification registration. The On-the-Job Training (OJT) program, as outlined in 1014.2.2, has been developed as one method to satisfy the training requirement.

Activities involved in On-the-Job Training (OJT) may include; performing the test methods (field operating procedures), visual observation of test procedures, reviewing test methods within the manual, classroom presentations and demonstrations, reviewing how test equipment is used, etc.

Acceptance testing on UDOT projects may only be performed by:

1. A TTQP-qualified technician.
2. A UDOT-employed OJT technician under the immediate supervision and complete control of a present UDOT-qualified Supervisor / Trainer who certifies that the test was performed properly and affixes their own name to the report. The OJT technician may not certify the test.

It is necessary that a technician receives training in all of the test methods that are included in a certification area. Training in only one or two test methods will not adequately prepare the technician for the certification exams.

1014.2.2 On-the-Job Training (OJT)

1. The technician begins supervised training. When the technician has demonstrated proficiency to the supervisor/trainers satisfaction, the supervisor/trainer documents the training by filling out the training form (1014.3) indicating the technician is ready to certify in the area(s) they have been trained.
2. The technician schedules and attends qualification.
 - a. Original training documentation covers the first qualification attempt.
 - b. Additional training is required for subsequent attempts.

The qualifications are administered as outlined in the TTQP Registration, Policy and Information Handbook (RP&IH):

1014.2.3 Testing Technician Qualification

The Quality Assurance program requires individuals who perform Verification, Acceptance and Independent Assurance sampling and testing functions for the agency, contractor, vendor, or private labs be qualified under the UDOT TTQP. Qualifications for Quality Control personnel are not required, however, for Quality Control information to be used in dispute resolution the technicians must be qualified. UDOT TTQP has developed specialized qualification modules utilizing in part the Western Alliance for Quality Transportation Construction (WAQTC) qualification program. Detailed information on training requirements, course outlines and required prerequisites is contained in the UDOT Registration, Policies, and Information Handbook.

The Quality Assurance Section administers the TTQP program:

1. Qualification is tracked through the Quality Assurance database.
2. The qualified technician is included in the UDOT Independent Assurance Program (Section 1012)

3. Qualification is valid for 5 years subject to:
 - a. Revocation, Suspension or Denial of Qualification (Section 1014.2.9)
 - b. Independent Assurance requirements
 - i. Failure to participate in Independent Assurance will result in forfeiture of the subject Qualification.
 - ii. See MOI Section 8-1012 for IA requirements
4. The technician is not qualified to perform any tests for acceptance if the qualification has lapsed. Technicians are only qualified to run materials tests that coincide with the level of qualification they possess. The Resident Engineer is responsible for verifying each technician's level of qualification to ensure that qualified personnel perform all acceptance tests.

1014.2.4 Supervisor Qualification

Supervisors/Trainers are UDOT Level IV technicians or AASHTO accredited lab managers with a minimum of 3-years experience in testing highway construction materials and be qualified for the same levels of UDOT TTQP qualifications as their direct reports. It is the responsibility of the Resident Engineer to verify the materials testing supervisor meets the minimum qualifications.

Approval for other senior technicians to serve as a Supervisor/Trainer in exceptional circumstances must be requested and approved in writing by the Quality Systems Engineer.

1014.2.5 TTQP Qualifications for Materials Testing

Levels of qualification available.

- WAQTC Aggregate Plus Testing Technician (AgTT Plus)
- WAQTC Asphalt II Testing Technician (AsTT II)
- WAQTC Concrete Testing Technician (CTT)
- WAQTC Embankment Plus and Base (EbTT Plus)
- WAQTC Density Testing Technician (DTT)
- TTQP Laboratory Testing Technician (LbTT)
- TTQP Concrete Strength Testing Technician (CsTT)
- TTQP Sampling and Reduction Testing Technician (SRTT)
- TTQP Sampling, Reduction and Density Testing Technician (SRDTT)
- TTQP Superpave Mix Design (SMD)

ACI Concrete Field Testing Grade One Qualification and *ACI Concrete Strength Testing Technician* may be utilized as the basis for CTT and CsTT qualifications respectively. A TTQP Qualification will be issued upon receipt of a copy of ACI qualifications and a completed "Rights and Responsibilities" form. This qualification is subject to the requirements outlined in 1014.2.3.

1014.2.6 Examinations

Qualification is obtained by successful completion of written and performance examinations established for the individual qualification as outlined in the *UDOT Registration, Policy and Information Handbook*.

1014.2.7 Qualification Documentation

Upon the successful completion of the examination(s), the participant's name, qualification number and company affiliation will be registered in the UDOT TTQP database. The Quality Assurance Section will be responsible for maintaining documentation of all individuals qualified under the UDOT Transportation Technician Qualification Program. Documentation retention will be for the life of the qualification.

Documents retained:

- Signed Rights and Responsibilities Agreement
- Written examinations
- Performance Exam Checklists
- Training Evaluation Form (if required)
- Radiation Training and or Safety (if required)

1014.2.8 Qualification Renewal

Qualified technicians are responsible for applying for re-qualification before the expiration date of the current qualification. The procedure for Qualification renewal is the same as for initial Qualification.

1014.2.9 Revocation, Suspension or Denial of Qualification

The Utah Department of Transportation (UDOT) Transportation Technician Qualification Program (TTQP) is intended to assure qualified personnel performing all materials testing on UDOT construction projects. Overall guidelines for qualification and disqualification have been adopted from the WAQTC Administrative manual.

The UDOT Qualification Committee (UQC) of the TTQP may revoke Qualifications it has issued at any time for just cause. Revocation or suspension in one Qualification area will be considered revocation or suspension in all Qualification areas and will be in effect in all member Agencies of the WAQTC.

The process for revocation, suspension or denial is outlined in the *UDOT Registration, Policy and Information Handbook*.

1014.2.10 Out-of State Reciprocity

Reciprocal qualification for a WAQTC Qualification obtained in another WAQTC member state is done on a case-by-case basis. Refer to WAQTC "Registration, Policies, and Information Handbook" for information concerning reciprocity among member states.

1014.3.1 Technician Training and Evaluation Form

Sampling, Reduction & Density (SRDTT)

Technician Name _____ Dept/Region _____

Supervisor/Trainer Name _____

Supervisor/Trainer Qualification # _____

Supervisor/Trainer must sign each FOP (Field Operating Procedure) certifying technician has been trained, demonstrated competency, and is ready to certify.

FOP		Supervisor Trainer Signature
AASHTO T 2	Sampling of Aggregates	
AASHTO T 248	Reducing Samples of Aggregates to Testing Size	
AASHTO T 168	Sampling Bituminous Paving Mixtures	
AASHTO R 47	Reducing Samples of Hot Mix Asphalt to Testing Size	
AASHTO R 66	Sampling Asphalt Materials	
AASHTO T 310	In-Place Density and Moisture Content of Soil and Soil Aggregate by Nuclear Methods	
AASHTO T 355	In-Place Density of Bituminous Mixes Using the Nuclear Moisture Density Gauge	

I hereby authorize and verify I am competent in the above Field Operating Procedures.

Technician

Date

I hereby authorize and verify the technician is competent in the above Field Operating Procedures.

Supervisor/Trainer

Date

1014.3.2 Technician Training and Evaluation Form Concrete Testing Technician (CTT)

Technician Name _____ Dept/Region _____

Supervisor/Trainer Name _____

Supervisor/Trainer Qualification # _____

Supervisor/Trainer must sign each FOP (Field Operating Procedure) certifying technician has been trained, demonstrated competency, and is ready to certify.

FOP		Supervisor Trainer Signature
WAQTC TM 2	Sampling Freshly Mixed Concrete	
AASHTO T 309	Temperature of Freshly Mixed Portland Cement Concrete	
AASHTO T 119	Slump of Hydraulic Cement Concrete	
AASHTO T 121	Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete	
AASHTO T 152	Air Content of Freshly Mixed Concrete by the Pressure Method	
AASHTO T 23	Making and Curing Concrete Test Specimens in the Field	

I hereby authorize and verify I am competent in the above Field Operating Procedures.

Technician Date

I hereby authorize and verify the technician is competent in the above Field Operating Procedures.

Supervisor/Trainer Date

1014.3.3 Technician Training and Evaluation Form Aggregate Plus Testing Technician (AgTT Plus)

Technician Name _____ Dept/Region _____

Supervisor/Trainer Name _____

Supervisor/Trainer Qualification # _____

Supervisor/Trainer must sign each FOP (Field Operating Procedure) certifying technician has been trained, demonstrated competency, and is ready to certify.

FOP		Supervisor Trainer Signature
AASHTO T 2	Sampling of Aggregates	
AASHTO T 248	Reducing Samples of Aggregates to Testing Size	
AASHTO T 255	Total Evaporable Moisture Content of Aggregate by Drying	
AASHTO T 27	Sieve Analysis of fine and Coarse Aggregates	
AASHTO T 11	Materials Finer than No. 200 Sieve in Mineral Aggregate by Washing	
AASHTO T 335	Determining the Percentage of Fracture in Coarse Aggregate	
AASHTO T 176	Plastic Fines in Graded Aggregates and Soils by the use of the Sand Equivalent Test	
AASHTO T 85	Specific Gravity and Absorption of Coarse Aggregate	
WAQTC TM 19	Bulk Density('Unit Weight') and Voids in Aggregate	

I hereby authorize and verify I am competent in the above Field Operating Procedures.

Technician Date

I hereby authorize and verify the technician is competent in the above Field Operating Procedures.

Supervisor/Trainer Date

1014.3.4 Technician Training and Evaluation Form

Asphalt Testing Technician (AsTT) II

Technician Name _____ Dept/Region _____

Supervisor/Trainer Name _____

Supervisor/Trainer Qualification # _____

Supervisor/Trainer must sign each FOP (Field Operating Procedure) certifying technician has been trained, demonstrated competency, and is ready to certify.

FOP		Supervisor Trainer Signature
AASHTO T 168	Sampling Bituminous Paving Mixtures	
AASHTO R 47	Reducing Samples of Hot Mix Asphalt to Testing Size	
AASHTO T 329	Moisture Content of Hot Mix Asphalt (HMA) by Oven Method	
AASHTO T 308	Determining the Asphalt Binder Content of Hot Mix Asphalt (HMA) by the Ignition Method	
AASHTO T 209	Theoretical Maximum Specific Gravity and Density of Hot Mix Asphalt (HMA) Paving Mixtures	
AASHTO T 166	Bulk Specific Gravity of Compacted Hot Mix Asphalt (HMA) Mixtures Using Saturated Surface-Dry Specimens	
AASHTO R 66	Sampling Asphalt Materials	
AASHTO T 30	Mechanical Analysis of Extracted Aggregate	
AASHTO T 312	Standard Method of Test for Preparing and Determining the Density of the Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor	
WAQTC TM 13	Volumetric Properties of Hot Mix Asphalt (HMA)	

I hereby authorize and verify I am competent in the above Field Operating Procedures.

 Technician Date

I hereby authorize and verify the technician is competent in the above Field Operating Procedures.

 Supervisor/Trainer Date

1014.3.5 Technician Training and Evaluation Form

Embankment Plus Testing Technician (EbTT Plus)

Technician Name _____

Dept/Region _____

Supervisor/Trainer Name _____

Supervisor/Trainer Qualification # _____

Supervisor/Trainer must sign each FOP (Field Operating Procedure) certifying technician has been trained, demonstrated competency, and is ready to certify.

FOP		Supervisor Trainer Signature
AASHTO T 255	Total Evaporable Moisture Content of Aggregate by Drying	
AASHTO T 265	Laboratory Determination of Moisture Content of Soils	
AASHTO T 99	Moisture-Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305 mm (12-in) Drop	
AASHTO T 180	Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457 mm (18-in) Drop	
AASHTO T 272	Family of Curves - One-Point Method	
AASHTO T 85	Specific Gravity and Absorption of Coarse Aggregate	
ANNEX T99 / T180	Correction of Maximum Dry Density and Optimum Moisture for Oversized Particles	
AASHTO T 89	Determining the Liquid Limit of Soils	
AASHTO T 90	Determining the Plastic Limit and Plasticity Index of Soils	

I hereby authorize and verify I am competent in the above Field Operating Procedures.

Technician

Date

I hereby authorize and verify the technician is competent in the above Field Operating Procedures.

Supervisor/Trainer

Date

1014.3.6 Technician Training and Evaluation Form Concrete Strength Testing Technician (CsTT)

Technician Name _____ Dept/Region _____

Supervisor/Trainer Name _____

Supervisor/Trainer Qualification # _____

Supervisor/Trainer must sign each FOP (Field Operating Procedure) certifying technician has been trained, demonstrated competency, and is ready to certify.

FOP		Supervisor Trainer Signature
AASHTO T 23	Method of Making and Curing Concrete Test specimens in the field	
AASHTO T 22	Compressive Strength of Cylindrical Concrete Specimens	
AASHTO T 97	Flexural Strength of Concrete (Using Simple beam with Third-Point Loading)	
AASHTO R 231	Capping Concrete Test Specimens	
ASTM C 1231	Use of Unbonded Caps in Determination of Compressive Strength of Hardened Concrete Cylinders	

I hereby authorize and verify I am competent in the above Field Operating Procedures.

Technician Date

I hereby authorize and verify the technician is competent in the above Field Operating Procedures.

Supervisor/Trainer Date

1014.3.7 Technician Training and Evaluation Form

Laboratory Testing Technician (LbTT)

Technician Name _____ Dept/Region _____

Supervisor/Trainer Name _____

Supervisor/Trainer Qualification # _____

Supervisor/Trainer must sign each FOP (Field Operating Procedure) certifying technician has been trained, demonstrated competency, and is ready to certify.

FOP		Supervisor Trainer Signature
WAQTC TM 19	Bulk Density ("Unit Weight") and Voids in Aggregate	
AASHTO T 21	Organic Impurities in Fine Aggregate for Concrete	
AASHTO T 84	Specific Gravity and Absorption of fine Aggregate	
AASHTO T 96 / ASTM C 353	Resistance to Abrasion of Small-Size and Large-Size Coarse Aggregate by use of the Los Angeles Machine	
AASHTO T 104	Soundness of Aggregate by use of Sodium Sulfate of Magnesium Sulfate	
AASHTO T 112	Clay Lumps and Friable Particles in Aggregates	
AASHTO T 113	Lightweight Pieces in Aggregate	
AASHTO T 193	California Bearing Ratio of Soils	
AASHTO T 304	Uncompacted Void Content of Fine Aggregate	

I hereby authorize and verify I am competent in the above Field Operating Procedures.

Technician
Date

I hereby authorize and verify the technician is competent in the above Field Operating Procedures.

Supervisor/Trainer
Date

1014.3.8 Technician Training and Evaluation Form Superpave

Technician Name _____ Dept/Region _____

Supervisor/Trainer Name _____

Supervisor/Trainer Qualification # _____

Supervisor/Trainer must sign each FOP (Field Operating Procedure) certifying technician has been trained, demonstrated competency, and is ready to certify.

FOP		Supervisor Trainer Signature
AASHTO R 30/ UDOT MOI 8-988	Guidelines for Laboratory Mixing of Hot Mix Asphalt (HMA) and Mixture Conditioning of HMA	
AASHTO T 312	Standard Method for Preparing and Determining the Density of hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyrotory Compactor	
AASHTO M 323	Standard Specification for Superpave Volumetric Mix Design	
AASHTO R 35	Standard Practice for Superpave Volumetric Mix Design	
AASHTO T 283	Resistance of Compacted Bituminous Mixtures to Moisture Induced Damage	
AASHTO T 324/ UDOT MOI 9-990	Hamburg Wheel-Track Testing of Compacted Hot Mix Asphalt (HMA)	
AASHTO M 325	Standard Specification for Stone Matrix Asphalt (SMA)	
AASHTO R 46	Standard Practice for Designing Stone Matrix Asphalt (SMA)	
AASHTO T 305	Standard method of Test for Determination of Draindown Characteristics in Uncompacted Asphalt Mixtures	

I hereby authorize and verify I am competent in the above Field Operating Procedures.

Technician Date

I hereby authorize and verify the technician is competent in the above Field Operating Procedures.

Supervisor/Trainer Date

1014.3.9 Technician Training and Evaluation Form

In-Place Density (DTT)

Technician Name _____ Dept/Region _____

Supervisor/Trainer Name _____

Supervisor/Trainer Qualification # _____

Supervisor/Trainer must sign each FOP (Field Operating Procedure) certifying technician has been trained, demonstrated competency, and is ready to certify.

FOP		Supervisor Trainer Signature
AASHTO T 99	Moisture-Density Relations of Soils Using a 2.5-kg(5.5-lb)Rammer and a 305-mm(12in.) Drop	
AASHTO T 180	Moisture-Density Relations of Soils Using a 4.54-kg(10-lb)Rammer and a 457-mm(18in.) Drop	
AASHTO T 272	Family of Curves-One Point Method	
ANNEX T99 / T180	Correction of Maximum Dry Density and Optimum Moisture for Oversized Particles	
AASHTO T 255 / T 265	Total Moisture Evaporable Content of Aggregate by Drying / Laboratory Determination of Moisture Contents of Soils	
AASHTO T 85	Specific Gravity and Absorption of Coarse Aggregate	
AASHTO T 209	Maximum Specific Gravity of Hot Mix Asphalt (HMA) Paving Mixtures	
AASHTO T 166	Bulk Specific Gravity of Compacted Hot Mix Asphalt (HMA) Using Saturated Surface-Dry	
AASHTO T 310	In-Place Density and Moisture Content of Soil and Soils-Aggregate by Nuclear Methods (Shallow Depth)	
AASHTO T 355	In-Place Density of Asphalt Mixtures Using the Nuclear Moisture-Density Gauge	

I hereby authorize and verify I am competent in the above Field Operating Procedures.

Technician Date

I hereby authorize and verify the technician is competent in the above Field Operating Procedures.

Supervisor/Trainer Date