

April 2017

Technician certification policy

SCDOT

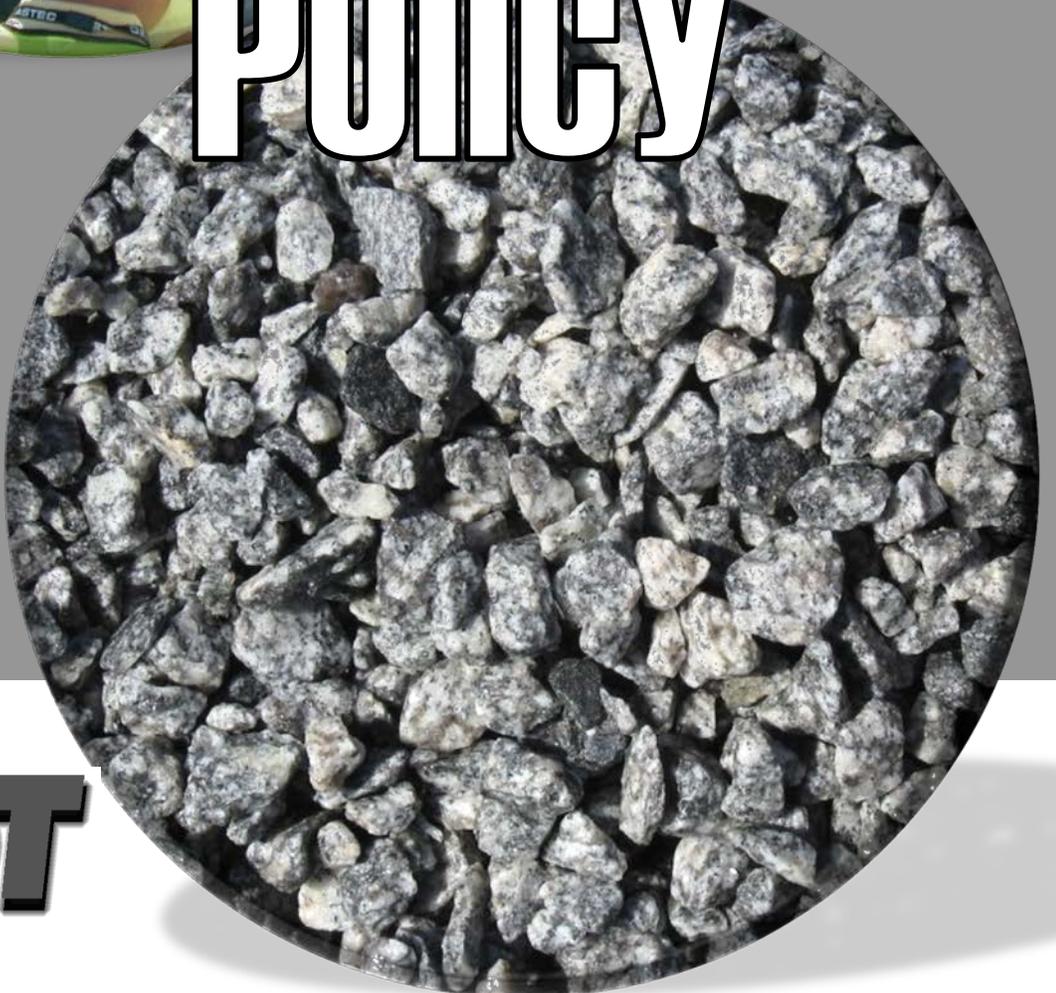


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Introduction and Purpose

A technician's competency and certification is a valuable aspect of the South Carolina Department of Transportation's (SCDOT) construction process. Without the proper training and certifications, technicians are not fully prepared to test and inspect materials for the SCDOT.

The purpose of the technician certification policy is to assure the proper qualifications of all technicians that participate in the SCDOT testing and inspection of materials through set procedures and guidelines. The certification policy provides the necessary requirements of certification needed for the technician to properly and accurately perform tests and inspections in accordance with the required procedures. The use of certified technicians is designed to improve the consistency and quality of both laboratory and field test results.

The technician field certification program falls under the direction of the Technician Certification Board. The certification Board was empowered by the State Highway Engineer on April 4, 1994 to investigate and act on all matters, issues and controversies pertaining to the QC/QA programs. This board is composed of the following members: the Director of Construction, the Materials and Research Engineer, a representative from the Department's Legal section, a District Engineering Administrator (2 year rotation), Chair of the Foundations Certification task force, Chair of the Asphalt Certification task force, Chair of the Concrete Certification task force, Chair of the Earthwork Certification task force, Chair of the Coarse Aggregate task force, Chair of the Pavement Preservation task force, the Technician Certification Program Liaison, and a representative of the FHWA.

For information on registering and attending any of the certification courses, please see the specific course requirements contained in this policy. If you need assistance other than for registration of courses, contact:

SCDOT Technician Certification Program Liaison
Ms. Temple K. Short, PE
shorttk@scdot.org
Office of Materials and Research
803-737-6648

Technician Certification Programs

Program Administration

Field technician certifications are required for all personnel testing or inspecting construction projects. This certification requirement applies to SCDOT personnel, all contractor personnel, and all consultant personnel performing testing or inspection on SCDOT construction projects or Design/Build construction projects. Tri-County Technical College (TCTC) and the University of South Carolina (USC) administer the technician field certification programs; exceptions are the Field Welder Certification, Nuclear Gauge Safety Training, and math certification. The following technician certification programs are offered:

TriCounty Technical College



- Asphalt Roadway, Level 1, Level 2, & Level 3 Technician Certification
- Earthwork and Base Course/Nuclear Gauge Technician Certification
- Foundations Certification
- Pavement Preservation
- Coarse Aggregate Technician Certification

Contact: Ms. Myrtle Mraovich
mmraovic@tctc.edu
TriCounty Technical College
864-646-2045

Website: www.tctc.edu/scdot

University of South Carolina



- Concrete Technician Certification

Contact: Ms. Annie Kawamoto
KAWAMOTA@cec.sc.edu
University of South Carolina
803-777-8318

Website: www.ce.sc.edu/scdot

South Carolina Department of Transportation



- Field Welder Certification
- Nuclear Gauge Safety Certification and Recertification (for SCDOT)
- Math Certification

Website: www.scdot.org

Each certification course includes attending class (exceptions noted), receiving a new course book (even if one was received in the past), receiving food if offered, and taking one free exam.

Required Experience

SCDOT Technician Certification Courses are designed to provide a relatively brief overview and review of a particular subject such as asphalt testing, concrete placement, drilled shaft installation, etc., and then test the attendee's competency in that particular subject. The courses are not intended to be training courses. Attendees typically include SCDOT personnel, contractor personnel, and consultant personnel. They are expected to have sufficient knowledge and experience in the subject matter prior to attending the course and seeking certification.

Certain courses have prerequisites, such as a current certification in another area, which must be satisfied before attending the course. All technician certification applicants must have at least 6-months of documented experience in the same area that they are seeking certification prior to attending the course. A signed experience form must be submitted when registering for courses (see below).

Additionally:

- The experience must be obtained and documented prior to attending the course.
- The experience must be documented on the appropriate forms – available on the SCDOT website and at each program administrator's website.
- The forms must have the applicant's signature as well as the signature of a person already certified in that area (referred to as the Rater) who can attest to the applicant's experience level (in the case of asphalt, a Level 3 may sign for Level 1, 2, and asphalt roadway certifications).

Note: If it is determined later that an applicant did not actually obtain the experience listed, that person along with the person who signed the form will be subject to investigation for falsification of records. Persons caught falsifying records may have their certification revoked.

- The completed experience forms must be submitted to the appropriate course administrator (Tri-County Technical College or the University of South Carolina) at least one month prior to the class.

Note: Applicants without the appropriate experience forms submitted by the deadline will have their class space forfeited.

These requirements apply to the certification courses in Asphalt (Roadway, Level 1, and Level 2), Concrete, Earthwork & Base Course, Pavement Preservation, Coarse Aggregate, and Foundations Inspection.

Training Programs

The SCDOT Technician Certification Board will allow an exception to the six months experience requirement with the successful completion of a training program approved by the Board.

Current approved training programs and equivalent experience exceptions:

Pre-highway Construction Inspector/Testing Technician Training

(Tri-County Technical College)

- Successful completion of multi week training course(s),
- Passing grade on SCDOT Asphalt Roadway Technician (ART) and/or SCDOT Earthwork and Base Course certification exams, plus
- Documented 1 month of full time related work experience

Upon completion of the training for Asphalt Roadway and/or Earthwork and Base Course, individuals are eligible to take the applicable exam. Exams will be administered as part of the training course. TCTC may charge a fee for these exams in excess of the training course costs. If the individual does not pass the certification exam, the standard policy on retests applies. If a passing grade is achieved, the individual is given a certification status of "Pending" until the 1 month of work related experience is obtained for each certification; at which time the status will be upgraded and a certification card for the applicable certification will be issued. All requirements for recertification as stated in this policy apply.

Waivers for Experience

Waivers for experience will only be considered under extenuating circumstances.

An experience waiver may be granted so that an applicant may attend a certification class without having proof of 6-months experience. Any waivers issued will only pertain to the 6-months experience requirement and will not include exemption of other certification requirements.

Additionally:

- Waiver requests must come in writing or email, accompanied by copies of any necessary and relevant documentation (i.e., NICET certificate, ACI certificate, certification from other states, etc.).
- Waivers may be denied, issued for part of the experience requirement, or issued for the entire 6-month requirement.

- The decision concerning issuance of a waiver is final and there is no appeal process.
- Response to experience waiver requests will be attempted to be made within 15 days of receiving the request.
- SCDOT personnel may obtain a waiver for all or part of the experience requirement with approval and signature of the District Construction Engineer or District Maintenance Engineer as indicated on the experience forms.

Waiver requests should be directed to:

<u>Certification</u>	<u>SCDOT</u>	<u>Email</u>
Asphalt (all), Concrete, Earthwork & Coarse Aggregate	Temple Short	ShortTK@scdot.org
Foundations Inspection	David Rister	RisterGD@scdot.org
Pavement Preservation	Keith Frick	FrickKL@scdot.org

Course Availability

All technician certification courses are open to any qualified candidate. Each year, Tri-County Technical College and the University of South Carolina will decide the number of courses to be offered during the next year. If a course is listed as full, call the administrator contact for that course to be placed on the **waiting list**. If at any time during the year, the waiting list for a specific course is equal to or more than the maximum number of participants for that course, efforts will be made to schedule additional courses. The participants for these courses are based on a “first come, first served” basis determined by the waiting lists that are held by Tri-County Technical College and the University of South Carolina.

Reciprocal Certification

Acceptance of SCDOT Certification by other state agencies is at the sole discretion of the other agency. SCDOT will only accept other agency’s certifications towards the Department’s technician certification program on a temporary basis and under special circumstances. See the section of this Policy on *Waiver to Practice*. Additionally, equivalent certifications from other agencies may be deemed acceptable in qualifying an applicant for **exam only** in the certification areas noted in this Policy.

Suspended or Revoked Certification

Certification is deemed to be a privilege that has been earned by an individual. This privilege can be suspended or revoked at any time if, in the opinion of the Technician Certification Board, an individual is thought to have knowingly committed acts that are

detrimental to the integrity of the Certification Program or the industry in general. Acts that may result in suspension or revocation of certification include, but are not limited to, the following:

- falsification of field or quality control test results and/or records
- submitting false information that can be used for field or quality control test results
- failure to perform specified duties
- display of any dishonest behavior during certification or re-certification exams
- unreported knowledge of wrongdoing by other technicians

Recertification

Technician recertification is required every **five years**. Recertification requires full completion of all prerequisites and successful completion of the recertification course.

Exceptions are:

- Qualified candidates obtaining certification by means of the *exam only* option are required to be recertified every 3 years
- Nuclear Gauge Safety Certification is required every 3 years
- Field Welder Certification is required every 2 years
- An exemption from the hands-on portion of the Coarse Aggregate Level 1 & 2 recertification may be granted by the Task Force Chair for active and currently certified instructors who assist with proctoring this portion of the certification courses.
- Asphalt Level 3- Quality Control Manager: these individuals are automatically recertified in ART, Level 1, Level 2, and Level 3 simultaneously and will only be required to attend Level 3 recertification every five years in order to perform these duties. However, these individuals must still adhere to the requirements contained in the body of the policy concerning AMRL (AASHTO Re:source) proficiency samples if they will be submitting job mixes for approval.

Although the administering schools will inform individuals, by way of a letter mailed to the technician's last address of record, when the certification period is nearing the expiration date, it is the responsibility of the individual to keep the schools advised of the current address and to reapply and then attend each recertification course as necessary. Technicians are advised to monitor their certification expiration dates and attend the appropriate recertification course within one year prior to each certification's scheduled expiration date to allow for cancelled classes, full classes, etc. *Certification expiration dates for recertifications obtained within one year prior to the technician's original date of expiration will be issued based on the original expiration date.* For example, if a technician's certification expires August 2017 and that technician passes a recertification exam in August

2016, his/her certification will be extended five years from the original August 2017 date to August 2022. However, if that technician chooses to attend the recertification class in July 2016, and passes the exam, the recertification will be valid from July 2016 to July 2021 because the technician passed the exam *outside of the one-year window*. If that technician does not obtain the recertification before August 2017, then his/her certification expires on that date.

Exam Only Recertification

Qualified candidates will have the option to attempt recertification in the areas of Asphalt Roadway Technician (ART) and Earthwork and Base Course Technician by attending an *exam only* session. The following policies apply to this option:

- **Qualified candidates:** individuals seeking recertification or applicants that have an equivalent certification from another state. Proof of certification, if other than SCDOT, must be provided at time of registration.
- There will be 2 sessions held in one day: 8am-12pm and 1pm to 5pm. Both ART and Earthwork tests will be offered in the morning and afternoon sessions. Applicants may take both ART and Earthwork tests in the same day if desired. Prior registration required for all tests. Walk-ins will not be accepted.
- The course manual will be available on the TCTC website for reviewing prior to the class. A clean hardcopy manual will be provided to each attendee at the test. No materials may be brought into the test except pencils and calculators. Cell phones will be required to be turned in to the proctor or left outside the testing facility.
- Testing will be limited to the 4 hours allotted for each session. There will be no review session and the test proctor will not be able to answer questions.
- No meals or lodging included.
- If an applicant passes the exam (score of 80% or higher), they will be certified in that area for **3 years**, after which they may elect to take just the re-certification test again to be re-certified for another 3 years or may elect to take the certification course and be certified for 5 years.
- If an individual does not pass the test, they must attend the applicable certification course. No retest will be offered for the EXAM ONLY option.
- All other prerequisites and requirements apply for valid certification.

Special Technician Certification and Recertification Requirement

Each technician is required to complete an *Application for SCDOT Technician Certification*. The purpose of this application is to make technicians aware of rules and regulations regarding the rights and responsibilities of becoming a certified SCDOT technician. This form is available on the SCDOT website.

Math Certification (SCDOT Personnel Only)

In order to establish a minimum level of competency in basic math skills, all SCDOT employees desiring to attend one of the Department's inspector certification schools will be required to pass a one-time math proficiency exam (see exemptions below). It is the intent of this certification to provide the certification school instructors a pool of Department employees who are capable of solving key mathematical problems as they relate to their technically oriented duties. The quality of instruction and learning is greatly enhanced when the instructors are able to concentrate on specific job-related issues instead of teaching basic mathematical concepts.

The math certification requires attending a short refresher class and taking a Department exam administered by the Office of Materials and Research. Those employees who do not pass this exam will be required to re-take the math certification class at another time (classes are typically offered several times each year). When the Districts submit applications for their employees to attend the technician certification schools, the application is to include the math certification status, or reason for exemption, for each applicant submitted. There is no expiration date for math certification. Employees do not have to be math certified to attend recertification courses.

Exemptions include the following:

- Employees with a minimum of two years attendance at a university, college, or technical school, or
- Employees who have previously been certified in any of the Department's construction certification areas (Earthwork and Nuclear Gauge, Foundations, Asphalt, Concrete, Pavement Preservation or Aggregate). For example, an employee who was certified previously as an Earthwork technician would not have to be math certified in order to attend the concrete course.

For additional information on registering and attending the math certification course, please contact:

Aly Hussein, PhD, PE
husseinaa@scdot.org
SCDOT Office of Materials and Research
803-737-6687

Release of Grades

The program requires that the release of any grade be made only to the attendee of the certification course regardless of payer.

Retests

A passing score is 80% for all certifications with the exception of Asphalt Level 3 and

Concrete (see specific requirements in the certification details). Retests are permitted for any technician that fails an exam but scores at least 60%. The retest of any exam must be completed within 60 days of notification of failing. For all certification courses offering an exam retest, only one exam retest is allowed and a fee of \$50.00 will be charged. If a participant fails the retest or scored below 60% on the original exam, full course attendance at the full course fee is required in order to continue pursuit of a certification.

Exception to the retesting policy applies to the *exam only* option for applicable certifications as follows: individuals who do not pass the exam only testing session will not be offered a retest. These individuals must attend the full course for that certification.

Replacement Cards

Replacement cards may be obtained from the appropriate program administrator for a fee of \$10.00. Habitual loss of cards will be dealt with on a case-by-case basis.

Classroom Policies

All individuals will be required to show picture identification prior to taking any SCDOT Technician Certification exam. All cell phones must be either removed from the classroom or turned in to the proctor during exams. Attendees will be allowed to leave the room during exams one at a time only and may retrieve his/her cell phone after completion of the exam.

Waiver to Practice – Temporary Certification

Waivers to practice will only be considered under extenuating circumstances and must be approved by the SCDOT Director of Construction’s Office.

To be temporarily certified for sampling, testing, and inspection of SCDOT work, a technician must meet the following requirements and the SCDOT Form WAIV1 *Request for Temporary Certification – Waiver to Practice* (located on the SCDOT website) must be completed and submitted with all necessary documentation. **Please review the requirements carefully prior to submitting the form.**

- The technician must hold a current certification in good standing from another state transportation agency, NICET, or other certifying organization in the applicable area of inspection. ACI Field Grade 1 Certification is required prior to applying for a waiver for concrete inspection. Proof of certifications must be submitted with the form.
- The technician will not have been de-certified by another state transportation agency or other accrediting body in any area for any reason other than expiration of certification.
- The technician should be proficient in the applicable SCDOT procedures and policies related to sampling, testing, and inspection.

- The technician must be enrolled in the applicable SCDOT technician certification course(s) at the University of South Carolina or Tri-County Technical College to be held within six months of the signature date of the form. Proof of registration should be submitted with the form:
 - For courses administered by Tri-County Technical College, include a copy of the confirmation faxed to you;
 - For Concrete Certification administered by USC, request an email confirmation at kawamota@cec.sc.edu
- The technician will only perform sampling, testing, and inspection of SCDOT work under the direct responsibility of a **SC Licensed Professional Engineer** until such time that they are duly certified by the SCDOT in the appropriate area of competency.

Liability of the responsible SC Licensed Professional Engineer:

- Direct responsibility is defined by the South Carolina Code of Laws Section 40-22-20(9) as: *(9) 'Direct responsibility', 'direct supervisory control', 'direct supervision', and 'responsible charge' all mean that there is a clear-cut personal connection to the project or employee supervised, marked by firsthand knowledge and direct control and assumption of professional responsibility for the work.*
- The PE signing Form WAIV1 assumes all reasonable responsibility for the technician's activities in this regard until valid SCDOT certification has been obtained or written notice has been provided to the SCDOT Director of Construction stating that the PE is no longer responsible for their activities.
- Any falsification or negligence under the responsibility of the PE on record may result in being reported to the South Carolina State Board of Registration for Professional Engineers and Surveyors for investigation and possible sanctions against their license.

All certification waiver requests must be approved by the SCDOT Director of Construction and **will expire** at the earlier of six months from the date authorized by the Director of Construction **OR** the technician's unsuccessful completion of the applicable SCDOT certification course to include one retest attempt.

Requests and additional questions concerning this process should be directed to:

Claude Ipock, State Construction Engineer
IpockCR@scdot.org
 SCDOT Director of Construction, Room 330
 955 Park Street
 Columbia, SC 29201
 (803) 737-1308

Specific Course Requirements and Prerequisites

Where applicable, the tests covered in the certification course or those that are required prior to the course, as indicated, are listed.

Earthwork and Base Course/Nuclear Gauge Technician Certification

Must have 6 months related experience prior to the course, including the following test procedures:

- SC-T 1 Methods of Sampling Coarse Aggregates
- SC-T 2 Methods of Sampling Fine Aggregates
- SC-T 22 Moisture Content Carbide Gas Method
- SC-T 29 One Point Proctor Method
- SC-T 30, 31, or 32 Nuclear Gauge Density and Moisture (depending on gauge type)

Nuclear Gauge Safety Training Program (SCDOT Employees only)

For compliance to 49CFR 172, Subpart H - Nuclear Gauge Safety Training Program:

- Required for SCDOT employees every 3 years to maintain nuclear gauge certification

For additional information on registering and attending this certification and recertification course please contact:

Mr. Chris Lybarker
LybarkerCL@scdot.org
SCDOT Office of Materials and Research
803-737-6703

Foundations Technician Certification

Must be SCDOT Concrete Level 2 certified (which includes ACI Field Grade 1 certification) and have 6 months drilled shaft and pile driving experience prior to the course. The experience requirements must be documented on the Foundations Job Site Documentation form and must include a minimum of 30 days each of SCDOT drilled shaft job site experience and SCDOT pile driving job site experience.

Includes knowledge of the following:

- SCDOT pile driving specifications Section 711 and checklists
- Proficient in proper completion of applicable pile driving forms:
 - Pile Driving Log (form 700.15)
 - Pile Driving Continuation Log
- SCDOT drilled shaft specifications Section 712, 727, and checklists
- Proficient in proper completion of applicable drilled shaft forms:
 - Drilled Shaft Log (form 700.14)
 - Drilled Shaft Excavation Log (form 700.12)

- Slurry Inspection Log (form 700.09)
- Drilled Shaft Inspection Log (form 700.13)
- Drilled Shaft Concrete Placement Log (form 700.10)
- Drilled Shaft Concrete Volumes Log (form 700.11)

Concrete Technician Certification

Completion of **both** the Concrete Technician Certification course offered by the University of South Carolina (Level 1 and/or 2) and the ACI Field Grade 1 Certification are required for SCDOT Concrete Technician Certification. Technicians must also have 6 months related experience prior to the USC course. Only ACI Field Grade 1 Certification is required for technicians working on concrete *paving* projects.

Prior ACI Field Grade 1 Certification is not required in order to attend the Concrete Technician Certification course offered by USC. However, those technicians not providing proof of ACI Field Grade 1 Certification to USC within 1 year of successful completion of the USC course will be required to retake the course in order to continue seeking SCDOT Concrete Technician Certification. Certified technicians are responsible for keeping their record of ACI certification current with USC; otherwise, the Concrete Certification will be invalid.

Concrete Technician Certification (USC)

Level 1 – Batching Certification: designed for the batch plant technicians. Must have thorough understanding of and experience with filling out the SCDOT 700.04 form. Level 1 is a prerequisite for Level 2 certification.

Level 2 – Inspector Certification: designed for any technician that will be doing inspection or testing on SCDOT projects. Required for all SCDOT employees that are seeking or maintaining concrete certification. Thorough knowledge of SCDOT specifications and construction practices is required.

A score of at least 70% on the tests for each level is required for successful certification.

ACI Concrete Field Grade 1 Certification

Technicians need to be familiar with and able to demonstrate the following ASTM test procedures:

- ASTM C-1064 Standard Test Method for Temperature of Freshly Mixed Portland Cement Concrete
- ASTM C-138 Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
- ASTM C-31 Standard Practice for Making and Curing Concrete Test Specimens in the Field

- ASTM C-172 Standard Practice for Sampling Freshly Mixed Concrete
- ASTM C-143 Standard Test Method for Slump of Hydraulic-Cement Concrete
- ASTM C-173 Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
- ASTM C-231 Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method

For additional information on registering and attending this certification course, please contact:

American Concrete Institute (ACI), 704-588-9601
www.aci-carolinas.org

Coarse Aggregate Technician Certifications

Level 1 - Requires knowledge of SCDOT aggregate specifications, and documented (see experience form) handling and testing experience in the following:

- AASHTO T-2 - Sampling of Aggregates
- AASHTO T-27 - Sieve Analysis of Fine and Coarse Aggregate
- AASHTO T-248 - Reducing Field Samples of Aggregate to Testing

Demonstration of test procedures must be witnessed and signed by an SCDOT Level 2 Aggregate Technician who does NOT work for the same employer as the applicant. The documented demonstration is required for certification AND recertification. The applicant must also successfully pass a written exam to achieve Level 1 certification.

Level 2 – Must complete Level 1 prior to this class. Technicians are expected to know and be able to demonstrate:

- AASHTO T-85 Specific Gravity and Absorption of Coarse Aggregate
- AASHTO T-96 Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
- AASHTO T-104 Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
- AASHTO T-176 Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test
- SC-T-77 Method for Determining Flat and Elongated particles in Coarse Aggregate

Level 2 certification consists of a hands on demonstration during class as well as a written exam.

Field Welder Certification

Field Welder Certification is obtained in accordance with the most current edition of the South Carolina Department of Transportation's Standard Specifications for Highway Construction and Qualified Product Policy (QPP) 41. Certification involves being tested and approved by an independent laboratory listed on Qualified Product Listing (QPL) 26,

“Independent Testing Labs Qualified to Administer Field Welding Tests to Certify Field Workers for SCDOT Field Welding” and then having the qualification information forwarded to the Office of Materials and Research (OMR) contact listed on QPP 41. Each Welder will be issued an SCDOT Certification and assigned a unique lab number and listed on QPL 41. Requalification is required as detailed in QPP 41.

For additional information on this certification, contact the person listed on QPP 41 on the SCDOT website.

Asphalt Technician Certifications

In addition to any prerequisite indicated below, the technician must have 6 months related experience prior to attending any course.

Asphalt Roadway Technician Course (ART)

The ART course is intended to assure competency in proper roadway paving testing procedures and everyday field tasks. The participants are required to perform mathematical problems that occur while working as a roadway technician.

Required Work Experience

- Knowledge of paving equipment, including the paver and rollers, as well as the techniques used in laying and compacting HMA.
- Compacting and sampling roadway mixtures
- Calculating tack and mix rates
- An understanding of SCDOT specifications.

Level 1 - Asphalt Quality Control Technician Course

The Asphalt Level 1 Quality Control Technician Course is intended to ensure an understanding of the proper testing procedures and requirements for asphalt plant testing and responsibilities. All participants in this class are expected to have laboratory experience at the asphalt plant and should be familiar with the related SCDOT specifications. The course consists of a performance exam portion and written exam portion. Technicians are expected to know and be able to demonstrate the following test procedures:

- SC-T-1 & SC-T-2 Aggregate Sampling
- SC-T-68 Determination of Percent Air Voids in Mineral Aggregate in Compacted Gyratory Specimens
- SC-T-75 Determination of Asphalt Binder Content for Asphalt Paving Mixtures by the Ignition Oven
- SC-T-76 Determination of Washed Aggregate Gradation of HMA Extracted Aggregates
- SC-T-83 Determination of Maximum Theoretical Specific Gravity
- SC-T-96 Field Determination of Stability of HMA Mixtures by Gyratory Method
- SC-T-103 Field Procedure for Preparing Gyratory Specimens on Asphalt Mixtures Using the Gyratory Compactor

Additional Required Experience and Knowledge

- Knowledge of aggregate and asphalt mix testing and all calculations
- Random Asphalt Sampling
- Potential Problems with Mixes
- Hydrated Lime and LASA
- Maximum Gravity, Bulk Gravity, % Air Voids, % VMA, % VFA, Stability, TSR

Level 2: Asphalt Job Mix Technician

Technicians are required to be Level 1 Asphalt Quality Control Technician certified prior to taking the Level 2 class.

Required Experience

- Knowledge in aggregate and asphalt mix testing, asphalt job mix formula (JMF) preparation, and all calculations.
- Familiarity with the gyratory compactor test procedures and calibration (angle, pressure, height, rotation)
- LA Abrasion, coarse & fine aggregate angularity, flat & elongated particles, clay content, soundness, deleterious materials
- PG grading, physical properties of binder, safety
- Bulk and maximum gravity, % Air Voids, % VMA, % VFA
- Volumetric mix properties
- Moisture susceptibility
- SCDOT specifications

Special Instructions:

Upon satisfactory completion of the Level 2 course and written exam, the participants must attend a two-day session at the Office of Materials and Research in Columbia, SC to demonstrate the JMF Preparation procedures. This must be done **within sixty (60) days** of receiving notice of passing the written exam. Level 2 Asphalt Job Mix Technician certification will not be granted until both requirements have been met.

In order to be eligible to submit JMFs for SCDOT approval, the individual must maintain Level 2 certification, must be enrolled in the AMRL Gyratory Proficiency Sample Program and have satisfactory results from annual participation. Acceptable AMRL results require each technician to individually complete the AMRL gyratory proficiency sample round each year and receive at least a 3 rating or higher on each individual test procedure. Results completed as a group or with multiple technician names listed will not be accepted. If a 2 rating or lower is received, the technician must provide full detail of the investigation into cause of the low rating and the corrective action taken. After two consecutive low ratings, the technician may be placed on probation or have their certification revoked. Results of the AMRL testing and any low rating justifications must be provided to the OMR Mix Design Unit within 30 days of receipt in order to remain eligible to submit job mixes for SCDOT projects.

If a Level 2 certified technician's job duties change to include submission of asphalt job mixes to the Department, enrollment into the AMRL Gyration Proficiency Sample Program must be done immediately to become eligible to submit JMFs. At the discretion of OMR, the technician may be required to repeat the two-day demonstration at OMR prior to being considered eligible. All other requirements for JMF submittal will apply as previously described.

The laboratory used for preparing job mixes must conform to SC-M-405 and must be certified by an authorized SCDOT official. The JMFs will then be submitted to the Department's Asphalt Unit for approval. After JMFs have been approved, the Level 2 technician will then be responsible for submitting the proper forms (Lab Form 310) to specify which mix they would like to be approved for specific projects.

Level 3: Asphalt Quality Control Manager

Prior to attending the Level 3: Asphalt Quality Control Manager course, individuals are required to be SCDOT certified in Asphalt Roadway Technician, Level 1, and Level 2.

This course is primarily intended for those who are in a managerial position. Individuals that attend the Asphalt Quality Control Manager's course should have at least two years of asphalt field laboratory experience, along with experience in Job Mix Formula preparation. The Asphalt Quality Control Manager must be able to demonstrate the ability to maintain compliance with all requirements pertaining to the quality of asphalt mixes produced for the SCDOT. Responsibilities will include selection of aggregates, overseeing JMF preparation, monitoring the entire production and laydown process, and correcting any quality control problems that may arise.

Knowledge and Experience

- Responsibilities of the Asphalt Quality Control Manager
- QC/QA Plans for asphalt production and construction
- Aggregates: Physical Properties; Sampling; Testing Procedures; 0.45 Power Curve; Blending; Problem Solving
- Binder & Asphalt Mixtures: PG Grading; Mix Design; Sampling; Safety; Polymers; Problem Solving
- Drum Mix Plants, Batch Plants
- SCDOT Specifications
- Determining LOT Pay Factor (SC-M-400)

The participants of this class must take a written final exam with a passing grade of 85% or higher.

Asphalt Course Qualification Table

Qualification Level	Responsibilities and Duties	Prerequisite	Specific Tests Performed in Level (List AASHTO or State SC-T Procedure Number)	Test for Initial Qualification			Test for Re-qualification		
				Written	Demonstration of Proficiency	Other Requirements	Written	Demonstration of Proficiency	Other Requirements
Asphalt Roadway Technician (ART)	Performs QC testing and inspection on the roadway on HMA paving projects	Must be certified by nuclear gauge manufacturer(SCDOT only), 6 months experience required	SC-T: 65, 84, 85, 86, 87, 101	Yes	No	No	Yes	No	No
Level 1 - Asphalt QC Technician	Performs QC (Contractor personnel) and QA (State personnel) tests at the HMA plant	6 months experience required	AASHTO T11 SC-T: 3, 4, 61, 62, 68, 70, 71, 72, 75, 78, 83, 84, 87, 96, 98, 101, 102, and 103	Yes	Yes - in class	No	Yes	No	No
Level 2 - Asphalt Job Mix Technician	Prepares Asphalt Job Mix Formulas	Level 1 certification and 6 mos. Job Mix preparation experience required.	AASHTO T11 SC-T: 68, 70, 80, 83, 88, 90, 91, 96, and 103	Yes	Yes - 2 days at SCDOT lab (OMR)	No	Yes	No	Maintain satisfactory participation in AMRL proficiency sample program <i>to submit JMFs</i>
Level 3 - Asphalt Quality Control Manager	Oversight and troubleshooting of Asphalt mix design, production, and placement	Level 1, Level 2 and ART Certifications with recommended 2 years managerial experience	All Asphalt SC-T-Tests	Yes	No	No	Yes	No	No

Pavement Preservation Level 1 Certifications

SCDOT employees will be required to be certified in all three areas of Level 1. Industry and contractor personnel may elect to obtain certification in just their specialty area. A minimum of 6 months related experience is prerequisite for all attendees with exceptions or equivalent experience noted for each area. Additional prerequisites may apply as noted.

Pavement Preservation Level 1: Asphalt Seal Coats

Minimum of 6 months related experience in asphalt seal coat construction and testing. Current ART technician certification is an acceptable equivalent for the experience. Additionally, all attendees are encouraged to complete the TCCC/NHI online course **FHWA-NHI-131132, Chip Seal Best Practices** prior to the class.

Required Work Experience

- Knowledge of paving equipment, including the paver and rollers
- Monitoring ambient air and binder temperatures
- Calculating binder and aggregate rates
- An understanding of the current SCDOT standard specifications sections 406, 407, and 408.

Pavement Preservation Level 1: Micro/Slurry Seals

Minimum of 6 months related experience in Micro Surfacing and slurry seal construction and testing. Current ART technician certification is an acceptable equivalent for the experience.

Required Work Experience

- Knowledge of asphalt emulsions, dry additive/mineral filler, and aggregate calibration procedures
- Monitoring ambient air temperatures, relative humidity, and wind velocity
- Proper use of scratch coat and rut boxes
- An understanding of the current SCDOT supplemental specification for Micro Surfacing, Section 410

Pavement Preservation Level 1: Concrete Pavements

Minimum of 6 months related experience in concrete pavement construction. Current ACI Field Grade 1 technician certification is an acceptable equivalent for the experience. Additionally, all attendees are encouraged to complete all modules of the TCCC/NHI online course **FHWA-NHI-131126, Concrete Pavement Preservation Series (modules A-J)** prior to the class.

Required Work Experience

- Knowledge of placement and finishing of concrete
- Knowledge of placement and inspection of reinforcing steel
- An understanding of the current SCDOT standard specifications sections 501-505