

National Certification of Airport HMA Technicians and Inspectors

AAPT Project 05-05 Draft Final Report

May 1, 2009



Prepared by:

National Institute for Certification in Engineering Technologies (NICET)



ACKNOWLEDGMENT OF SPONSORSHIP

This report has been prepared for Auburn University under the Airport Asphalt Pavement Technology Program (AAPTP). Funding is provided by the Federal Aviation Administration (FAA) under Cooperative Agreement Number 04-G-038. Dr. David Brill is the Technical Manager of the FAA Airport Technology R & D Branch and the Technical Manager of the Cooperative Agreement. Mr. Monte Symons served as the Project Director for this project.

The AAPTP and the FAA thank the Project Technical Panel that willingly gave of their expertise and time for the development of this report. They were responsible for the oversight and the technical direction. The Project Technical Panel was comprised of the following individuals.

- Jeffrey Rapol, Airport Engineering Division, Federal Aviation Administration
- Gene Gutierrez, Transportation Systems Center, U.S. Army Corps of Engineers

DISCLAIMER

The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data presented within. The contents do not necessarily reflect the official views and policies of the Federal Aviation Administration. The report does not constitute a standard, specification or regulation.



TABLE OF CONTENTS

Acknowledgments	vi
Abstract.....	vii
1. INTRODUCTION.....	1
Task 1. Evaluation of Existing Certification/Accreditation Programs.....	1
Task 2. Collection of Operational and Cost/Benefit Information on Functioning Certification/Accreditation Programs.	1
Task 3. Evaluation of Alternative Programs and Processes to Increase Technician Skills and Effectiveness.	1
Task 4. Development of a Detailed List of Airport HMA Technician Functions and Responsibilities.....	1
Task 5. Development of a National HMA Certification/Accreditation Program Operational Requirements.....	2
Task 6. Recommendations.	2
2. EXISTING CERTIFICATION/ACCREDITATION PROGRAMS	3
3. OPERATIONAL AND COST/BENEFIT INFORMATION ON FUNCTIONING CERTIFICATION/ACCREDITATION PROGRAMS	5
4. EVALUATION OF ALTERNATIVE PROGRAMS AND PROCESSES TO INCREASE TECHNICIAN SKILLS AND EFFECTIVENESS.....	13
US Army Corps of Engineers	13
Joint Urban Manpower Program (JUMP).....	14
National Center for Asphalt Technology (NCAT) Professor Training on HMA Technology.....	15
The Transportation Curriculum Coordination Council (TCCC).....	16
The Asphalt Institute Airport Pavement Workshop.....	21
5. DEVELOP DETAILED LIST OF AIRPORT HMA TECHNICIAN FUNCTIONS AND RESPONSIBILITIES.....	23
The Job Task Analysis.....	23
Validation Survey	28
Validation Results.....	29
6. PROPOSED NATIONAL HMA CERTIFICATION/ACCREDITATION PROGRAM OPERATIONAL REQUIREMENTS.....	32
Certification/Accreditation Terminology	32
Current Industry Trends	34
Certification Program Design and Development.....	35
Checklist for Certification Program Development—Inspection of HMA Airfield Construction Operations Technician.....	36



Important Elements of Program Design and Development to Consider	38
<i>Multiple Choice Examination Questions.....</i>	<i>38</i>
<i>Bloom’s Taxonomy Verb List.....</i>	<i>38</i>
<i>Exam Structure and the Number and Distribution of Examination Questions.....</i>	<i>38</i>
<i>Practical and Hands-On Performance Examinations</i>	<i>39</i>
Certification Program Administration	41
<i>The Program Detail Manual</i>	<i>41</i>
<i>Exam Delivery Methods.....</i>	<i>42</i>
<i>Exam Schedule</i>	<i>43</i>
<i>Exam Location</i>	<i>43</i>
<i>Candidate Certification and Re-certification Requirements.....</i>	<i>43</i>
<i>Code of Ethics</i>	<i>44</i>
7. RECOMMENDATIONS FOR A PROCESS TO IMPROVE AIRPORT HMA TECHNICIAN SKILLS AND KNOWLEDGE	46
Need For a National Certification Program.....	47
Comparison of Certificate and Certification Programs.....	47
Recommendations.....	48

LIST OF FIGURES

Figure 1. Sample request for additional cost data submitted to other agencies.	5
Figure 2. Summary of responses to the question: Does a certified workforce enhance a company’s bottom line?	6
Figure 3. Summary of responses to the question: Does certification impact positively on your salary?	7
Figure 4. Summary of responses to the question: Is certification required to bid some contracts?7	
Figure 5. Summary of responses to the question: Do you or your employer measure the cost/benefit of certification?	7
Figure 6. WAQTC - Technician Rights and Responsibilities Agreement.....	10
Figure 7. TCCC Competency Matrix. Domain: HMA Pavement Field Inspection. Task: HMA Compaction.....	18
Figure 8. TCCC-NTTR Advanced Search Page. Training Resources Search Results for HMA – Construction from Iowa DOT.....	19
Figure 9. Checklist and timeline of certification program development process.	37
Figure 10. Drag & Drop Example.....	40
Figure 11. Survey results for the question: Do you think there is a need for a national certification program for "Airfield HMA Placement Operations Inspection and Field Testing Technicians"?47	



LIST OF TABLES

Table 1. Historical Question Performance Statistics.....	12
Table 2. TCCC HMA Field Inspection Competency Matrix.	17
Table 3. Subject Matter Expert Panel Members.	23
Table 4. Airfield HMA placement operations inspection and field testing technician profile. ...	25
Table 5. Competencies summary for airfield HMA placement operations inspection and field testing technician.	26
Table 6. Exam Blueprint by Work Domain.	31
Table 7. Bloom’s Taxonomy Verb List.	39

LIST OF APPENDICES

APPENDIX A

HMA Training/Certification Program Identification Matrix (State)	A-3
HMA Training/Certification Program Identification Matrix (National & Regional)	A-13

APPENDIX B

Certification Benefits Survey.....	B-1
Certification Benefits Survey Results.....	B-5

APPENDIX C

Airfield HMA Placement Operations Inspection and Field Testing Technician Certification Competencies – Final Matrix	C-3
Airfield HMA Placement Operations Inspection and Field Testing Technician Certification Need and Competencies Validation Surveys (Levels I-IV)	C-19
Airfield HMA Placement Operations Inspection and Field Testing Technician Certification Need and Competencies Validation Survey Results (Levels I-IV)	C-91

APPENDIX D

Multiple-Choice Test Question Development Manual	D-3
Proctor Guidelines for Administering the NICET Examinations	D-21

APPENDIX E

Airfield HMA Placement Operations Inspection and Field Testing Technician Certification Program Detail Manual	E-3
---	-----



ACKNOWLEDGMENTS

It is with deep sadness and much appreciation that NICET acknowledges the seminal work and contributions to this project of Co-Principal Investigator — Leonard “Bud” M. Darby, P.E, who passed away in August 2007. We owe much to Bud’s hard work and fervent interest in all aspects of the civil engineering technician’s world, especially in the field of transportation.

NICET also acknowledges the many organizations and individuals that responded to surveys and otherwise provided information for this project. While they are too numerous to mention individually, their contributions were instrumental in determining the current state of the practice with respect to existing hot-mix asphalt certification/accreditation programs.

This project was performed under the leadership of NICET’s Principal Investigator, Mr. Ahmed Farouki, Senior Director for Technical Services at NICET. The Co-Principal Investigator was Mr. Bud Darby, P.E., Manager of Program Development for NICET’s Civil programs. Other members of the research team contributing to this project include the following:

- Dr. Louise Wehrle, Ph.D., CAE, previously Manager of Program Development for NICET’s Fire Protection programs, and currently the Manager of Certification Programs at ASM International and Chair of the Steering Committee for the Certification Networking Group.
- Ms. Ebony Clark, CAPM, a Certification Development Specialist at NICET, also made extensive contributions to this project.
- Mr. David Peshkin, P.E., of Applied Pavement Technology, Inc. contributed to the project as a subject matter expert in the development of training matrices and as a technical reviewer and editor.

The research team also acknowledges the following NICET staff members: Ms. Melissa Campbell, Certification Test Developer; Mr. Charles “Chip” Hollis, Manager of Marketing; and Mr. Michael Clark, Chief Operating Executive for their invaluable guidance, assistance and support throughout the duration of this project.



ABSTRACT

While the quality of hot-mix asphalt (HMA) highway paving projects around the country benefit from the existence of well established training and certification programs, parallel programs do not exist to address the substantive differences between roadway paving and airfield paving. NICET was awarded AAPTP Project 05-05, *Evaluate the Need and Develop a Plan for National Certification of Airport HMA Technicians and Inspectors*. The primary objective under the project is to evaluate the need for a national airport HMA certification program and develop an approach to increase the skills and abilities of inspectors and testing technicians of HMA airfield pavements.

The research team performed a national search in order to document hot-mix asphalt (HMA) testing technician certification and training activities in each state, including each state Department of Transportation (DOT). Using the resulting information, the team identified the regional and national entities providing related education and/or certification services to the states. As might be anticipated, there are countless programs for education, training, and certification in the field of HMA. However, the quality of programs varies across the US, with most states having their own programs and others sharing programs or using programs of a regional or national entity. Furthermore, the majority of such education and certification programs focus on HMA for highway pavement construction.

Several national organizations provide comprehensive HMA training programs specifically designed for personnel involved in airfield design, construction inspection, and quality control. However, no nationally based career track certification program exists for HMA airfield construction. In order to assess the need for such a program and determine some of its key characteristics, NICET convened a national network of industry subject matter experts (SMEs). These SMEs confirmed the need for an airfield paving-specific HMA certification program, and outlined a national program for airfield HMA placement operations inspection and field-testing technicians. A survey was created from the outline and sent to a wider group of practitioners, whose input further defined the practice at each level of the skills matrix. The participants in the survey also corroborated the need for a national standard for technicians in HMA Airfield Inspection.

This report presents the team's findings and recommendations to enhance the competencies, knowledge, and skills that are necessary for airfield HMA technicians. The research team also presents the foundation and framework of education and training programs designed to lead to a more qualified and mobile workforce, all certified to the same national standard.



1. INTRODUCTION

While the quality of hot-mix asphalt (HMA) highway paving projects around the country benefits from the existence of well established training and certification programs, parallel programs do not exist to address the substantive differences between roadway paving and airfield paving. Under AAPTP Project 05-05, *Evaluate the Need and Develop a Plan for National Certification of Airport HMA Technicians and Inspectors*, tasks were undertaken to determine whether there is a need for such a program and, if so, to outline preliminary steps for its development, design and administration. The project also included the development of an approach to increase the skills and abilities of inspectors and testing technicians of airfield HMA pavements. This document and its appendices represent the draft final report for the project.

To meet the project objectives, the research team completed six tasks as highlighted below:

Task 1. Evaluation of Existing Certification/Accreditation Programs.

An initial review of existing state department of transportation, regional and national HMA technician certification programs was performed. The programs were evaluated to determine their optimal qualifications for selection as national Airport HMA technicians and inspectors certification programs.

Task 2. Collection of Operational and Cost/Benefit Information on Functioning Certification/Accreditation Programs.

Available information was collected from selected functioning certification programs on the benefits and costs associated with certification programs. The key factors that make programs successful, and the basic costs associated with those programs was established.

Task 3. Evaluation of Alternative Programs and Processes to Increase Technician Skills and Effectiveness.

The project team conducted a review of organizations that have training and knowledge requirements that do not include a formal certification program. This task identified and assessed the benefits of a selected group of special programs in enhancing personnel competencies for achieving improved quality results and effective inspection.

Task 4. Development of a Detailed List of Airport HMA Technician Functions and Responsibilities.

A detailed list of functions and responsibilities performed by the airport HMA technician was developed by a panel of Subject Matter Experts. Proficiency levels were defined to provide functional requirements that identify the career path and associated duties and responsibilities of project technicians (both owner and contractor) and the detailed specific skills and/or tests needed for each functional level. In addition, indicators of technician skill and knowledge and the credit that should be given for such items as years of experience, multiple task diversity responsibilities, complexity of assigned projects, and completion of basic and advanced training programs were also addressed. The need and findings were validated by a national group of industry practitioners.



Task 5. Development of a National HMA Certification/Accreditation Program Operational Requirements.

National operational requirements were developed specific to airport HMA technicians. The operational requirements were based on results of tasks 1 through 4. Important elements examined included: the need for a practical hands on tests; the use of multiple choice exams ; exam design and the number of questions; exam centers; exam delivery mechanisms P & P , CBT, IBT etc. The operational requirements were also presented in the form of a draft “*Program Detail Manual*”, i.e. a comprehensive guide for the prospective technicians and inspectors who plan on pursuing training and certification in the subject field.

Task 6. Recommendations.

The researchers under this task present their recommendations considering the pros and cons of implementing a national HMA airport certification program. They also propose an operational framework for a parallel national educational and training program to improve the knowledge and skill level of airfield HMA technicians.



2. EXISTING CERTIFICATION/ACCREDITATION PROGRAMS

The NICET team performed a national scan to identify the existing HMA certification/accreditation program activities in each state, including each state Department of Transportation (DOT). The collected information was also used to identify regional and national entities providing education and/or certification services. As a result of the scan, NICET developed two matrices: the HMA Training/Certification Program Identification Matrix of State Listings and the HMA Training/Certification Program Identification Matrix of National-Regional Listings (Appendix A). These matrices include key information on programs in the fifty states, Puerto Rico, Washington, D.C., and multiple other significant regional and national programs.

As anticipated, there are myriad programs for education, training, and certification in the field of HMA. However, the content, type, quality, administration processes, and procedures for these programs vary across the United States as shown in Table A-1 in Appendix A. Many states have their own programs, designed specifically to address each individual state's materials testing and construction specifications and requirements. An example is the program administered in Arizona by the Arizona Technical Testing Institute (ATTI) for the Arizona Department of Transportation and its industry partners, and the programs administered by the state highway agencies in Florida, Kentucky, and South Carolina, (i.e., the SETFTTQ regional coalition, as identified in Table A-2 in Appendix A). Other states, such as the ones participating in the New England Transportation Technician Certification Program (NETTCP) coalition, share programs or use the programs of a regional or national entity. Of all the identified state programs, there is only one dealing with airfield pavement HMA. That lone exception is the Washington, DC program, but its hot-mix courses are only for non-commercial airfields.

While none of the regional programs specifically address airfields, there is the capability of creating and fielding such courses and programs, particularly when program design is based on national standards such as those established by ASTM and AASHTO. These include: NETTCP in the northeast, the Mid-Atlantic Regional Training and Certification Program (MARTCP) in the mid-Atlantic region, the Western Alliance for Quality Transportation Construction (WAQTC) in the western region, and the Multi-Regional Training and Certification program (MTRAC) in the central region (Table A-2, Appendix A). Varying degrees of reciprocity relationships exist between states within each cluster, but the strongest relationships appear to be shared within the NETTCP group's coalition, which uses ASTM and AASHTO as a basis in designing all of its programs. Sharing of training resources is a common activity, especially among the groups that participate in the activities of FHWA's Transportation Curriculum Coordination Council (TCCC). However, a certification reciprocity relationship between the coalitions is practically nonexistent.

This review included examples of well established programs offered by organizations such as the Northeast Center of Excellence for Pavement Technology (NECEPT, at Penn State University), the Texas Asphalt Pavement Association (which partners with Texas DOT), the Colorado Asphalt Pavement Association/Rocky Mountain Asphalt Education Center (which partners with Colorado DOT), and the Asphalt Pavement Association of Oregon (which partners with Oregon DOT). The review also included other very important and relevant programs that have great potential to reach a wide audience and have a geographic diversity that would allow participants to practice in a broader geographical range than in just one state. Included are those programs associated with or originating from universities, national associations or national training organizations, such as the following: the National Asphalt Pavement Association (NAPA), the US Army Corps of Engineers (USACE) Transportation Systems Center, the National Center for Asphalt Technology (NCAT), the Asphalt Institute (AI), RedVector, and the National Institute for Certification in Engineering Technology (NICET).

It is important to note that national training programs specific to airport HMA construction are offered by the US Army Corps of Engineers (in cooperation with NCAT) and the Asphalt Institute. Such



programs address the core technology of HMA materials, design, and construction, as well as the relevant specific requirements stipulated by the Federal Aviation Administration's specifications and Advisory Circulars for airport construction, quality control, and quality assurance (as described in Table A-2, Appendix A). Such training programs are periodically updated to reflect the changes in the subject specifications and advisory circulars.

In conclusion, the review indicated that a variety of training and certification programs exist for personnel and/or technicians involved in HMA materials, design, and construction. It also indicated that nationally based training programs do exist for personnel and/or technicians involved in airfield HMA materials, design, and construction. However, no regionally or nationally based career track certification program exists for personnel involved in HMA airfield construction.

3. OPERATIONAL AND COST/BENEFIT INFORMATION ON FUNCTIONING CERTIFICATION/ACCREDITATION PROGRAMS

NICET used public information to investigate the most relevant programs and requested additional information through direct communications with the organizations, using the sample request provided in Figure 1 (which was then customized for each targeted recipient). While the responses to this request for additional information were weak, the HMA Matrix was modified to include received additional data. In general, the cost data which was collected or provided for training and/or certification activity was limited to the cost charged to participants by the administering agency (Table A-2, Appendix A). Data specific to other related costs, such as program development and administration, were neither public nor provided and thus were difficult to identify and collect. More importantly, it was evident that objective data on cost/benefits relationships do not exist. That is, quantifying, assessing, tracking, and documenting the direct benefit of training and certification is a very complicated, if not impossible, task. However, subjective data based on a specific individual or a specific population's long term performance can be identified and collected.

Sample Request for Additional Data
<p>The National Institute for Certification in Engineering Technologies (NICET) has been awarded Airfield Asphalt Pavement Technology Program (AAPTP) Research Project 05-05, <i>Evaluate the Need and Develop a Plan for National Certification of Airport HMA Technicians and Inspectors</i>.</p> <p>One of several parts of the research project is to collect operational and cost/benefit information on functioning certification/accreditation programs. The NICET Research Team has selected the _____ as one of several national training/certification programs that merit including credible detailed operational and cost/benefit information. Congratulations!</p> <p>Your website provides a general outline of your _____ Training/Certificate and Asphalt Inspector Training/Certification Programs. We would appreciate if you could provide us more detailed information on them to include in our research report. Program technical information of the following type is desirable: training course subject/section outline, and the AASHTO, ASTM, or other _____ test methods covered. Test subjects/competencies tested and, if there is a test, is the test written, hands-on or both? Operational information of the following type is desirable: number of courses administered each year, number of certificates or certifications to date, recertification requirements and how many have been recertified. We would also like to know if the courses are essential prerequisites to testing.</p> <p>Cost and Benefit information, especially hard number ratios, and any quantifiable information is usually close to impossible to obtain, but if you have any we would appreciate your sharing them with us so we could let the world know there are some. We really do appreciate your cooperation and help to showcase your _____ education center training/certificate/certification program.</p>

Figure 1. Sample request for additional cost data submitted to other agencies.

Anecdotal evidence indicates that benefits exist and that certification programs are useful. But whether that is because the more interested, dedicated, and intellectually curious are more prone to take advantage of certification opportunities is not readily discernable. Anecdotal evidence suggests that those who attend and pay attention will learn. Whether that learning is demonstrated through an onsite test or through extended practice, it is hard to quantify. One can distinguish learning by exam; however, absent any criteria for an examination, what can be said about the learning that is demonstrated? Further, it is very difficult to determine if learning has occurred that will carry over into the workplace. This latter can be postulated, but cannot be verified absent a long-term, costly program of review and assessment. On a side note, it is partially to address this concern that recently ANSI and the American Society for Testing & Materials (ASTM) began to work on a program for accrediting certificate programs to the same national standard.

Associations, which provide the majority of certification programs, regularly publish internal surveys of their membership that indicate those members with certifications have a higher rate of employment and earn higher salaries than those members who are not certified. Again, whether that is because the certified are more involved in their work and would rise to the top of their profession with or without certification is arguable. A September 2003 press release from the National Organization for Competency Assurance (NOCA), whose membership comprises associations and organizations that have certification programs, was headlined “Poll Indicates Certified Workers Earn More.” According to the results of their poll, 52 percent of the respondents reported that certified persons in their industry received higher compensation than those without certifications. A recent article in the Boston Globe, “Job exam piracy rising” (downloaded from: http://www.boston.com/news/nation/washington/articles/2007/12/26/job_exam_piracy_rising/), indicates that certifications are being sought for professional advancement in ever-increasing numbers and locations.

As part of this project, NICET conducted a survey to assess the benefits of certification to the transportation industry. To do this, NICET sent a short questionnaire (see page B-3 of Appendix B) to 428 senior certified technicians in Asphalt and in Highway Construction; 403 responded, for a remarkable response rate of more than 90 percent. The full results of the survey are presented beginning on page B-5 of Appendix B, and show that the industry is aware of certification, with 93 percent claiming that they or their employer recognizes certification. As summarized in Figure 2, industry sees certification as a positive influence on the workforce with 69 percent of respondents claiming that certification enhances a company’s bottom line through decreasing employee turnover, decreasing the need to redo jobs, increasing the likelihood of the job being done right the first time, decreasing the time and money spent on repairs and increasing the companies’ reputation for competence.

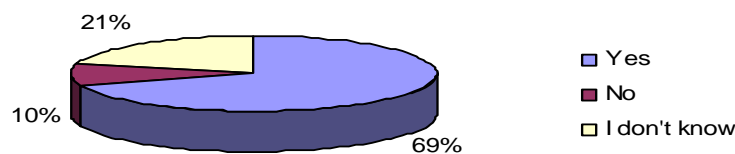


Figure 2. Summary of responses to the question:
Does a certified workforce enhance a company’s bottom line?

On an individual basis, over half the respondents said that certification had a positive impact on their promotion possibilities with 64% indicating that it has a positive impact on their salaries as shown in Figure 3.

Furthermore, 64 percent of the respondents noted that certification is a necessity for bidding on some contracts as shown in Figure 4.

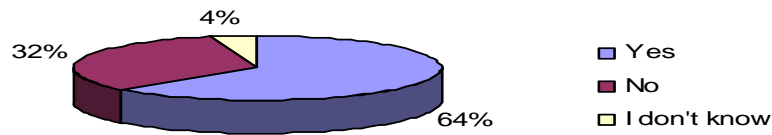


Figure 3. Summary of responses to the question: Does certification impact positively on your salary?

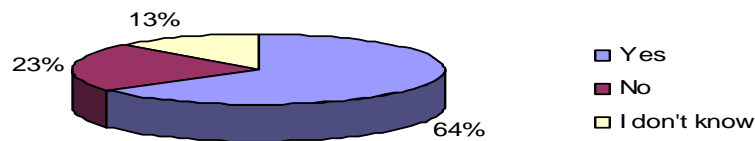


Figure 4. Summary of responses to the question: Is certification required to bid some contracts?

However, as previously noted and shown in Figure 5, when it comes to measuring the cost/benefit of certification, only about 13 percent said that their company does so, although objective information as to how such benefits are measured was not given.

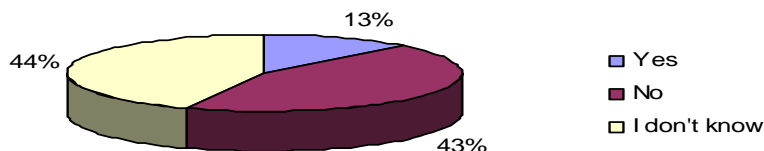


Figure 5. Summary of responses to the question:

Do you or your employer measure the cost/benefit of certification?

For the programs identified in Appendix A, evidence of the long-term benefits is primarily anecdotal. For example, responding to a request for information regarding cost and benefit, Mr. Woodrow Hood,



Division Chief, Materials Management, Office of Materials Technology, Maryland State Highway Administration, and Chairman of the Administrative Team for MARTCP said:

“As for cost and benefit information, we don’t have anything in hard numbers, but I can offer some observations: when we first started the MARTCP HMA Field Technician certification program, we had an approximately 50 to 60 percent failure rate, which indicated to us that we had a lot of inspectors out on the project who didn’t understand what they were doing. A majority of the failing grades were due to participants not having the basic mathematics skills necessary to calculate test results.

At this time MD has an approximately 90 percent passing rate on the HMA Field Technician Certification Program with 98 percent passing when we do an Independent Assurance Audit in the field.”

In summary, several different approaches were used to quantify program costs and benefits, and in particular to evaluate cost/benefit ratios. Direct requests for information submitted to other organizations did not yield useful responses for this analysis. An outreach effort to senior certified technicians provided good responses and suggests that certification provides a benefit, and one that is implied to exceed the associated costs, to both the individual and their employers. Finally, anecdotal input was provided to support the benefit of certification to agencies.

Other Essential Criteria Examined:

During development of the HMA Training/Certification Program Identification Matrix presented in Appendix A, the project team added to the analysis the following criteria that are both essential for the development and implementation of successful certification programs and satisfy American National Standards Institute (ANSI) accreditation requirements:

- Code of Ethics requirements.
- Testing locations and security procedures.
- Proficiency verification requirements and procedures.
- Due process procedures.
- Test repeatability and reliability issues.
- Certification Sanctions and/or Revocation.

The review indicated that several organizations or coalitions which offer certification programs have well established administrative policies and due process procedures accompanied with a hierarchy of certification sanctions or penalties. Administrative policies vary from ones which are elaborate and detail oriented, such as the policies used by NICET, ATTI and WAQTC to others that are in much more simplistic formats. Also, some organizations did not appear to have any administrative policies governing their testing and certification processes. Very few have a separately defined code of ethics requirements. However, many have a quasi code of ethics and performance requirement combined within their due process and sanction structure.

The Arizona Technical Institute (ATTI) and NICET are the only two organizations that the researchers found to have elaborate and separately defined code of ethics, due process and violation sanctions requirements and policies. ATTI’s certified technician code of ethics, for example, is published in the Institute’s Information and Policy Manual and covers the following:



“As an ATTI certified technician you recognize that the services you render have a significant impact on the quality of life for the traveling public. As you perform your duties and responsibilities on behalf of the public, employers and clients, you shall demonstrate personal integrity and competence. Accordingly, certificates shall:

- *Engage in sampling and testing for only those activities for which you are competent by way of your certification and as required by specification and policy.*
- *Perform your duties in an efficient and competent manner with fidelity and honesty.*
- *Admit and accept your errors when proven wrong and never distort nor alter the facts.*
- *Avoid conflicts of interest.*
- *Not engage in bribery in any manner or form.*
- *Strive to maintain your proficiency by updating your technical knowledge and skills in materials sampling and testing.*
- *Have proper regard for the safety, health and welfare of the public in the performance of your duties.”*

The NICET code of ethics is similar to ATTI’s but somewhat more comprehensive. It is further discussed under Chapter 6 “Proposed National HMA Certification/Accreditation Program Requirements – Certification Program Administration” and is shown on page 44 of this report.

An example of a combined code of ethics, due process and violation sanctions policy and process worth noting is that used by the Western Alliance for Quality Transportation Construction (WAQTC) and also by its partner the Asphalt Pavement Association of Oregon (APAO). The policy and processes are published in WAQTC’s Administration Manual. Violations are generally categorized as caused by negligence or abuse, i.e. unintentional or intentional actions. Sanctions range from reprimand to varied periods of suspension to total revocation of certification. Such policies are similar to those administered by other groups. However, it is worth noting that the alliance also requires that each candidate sign the “Rights and Responsibilities Agreement” shown in Figure 6. In accordance with the WAQTC Manual:

“All Qualifications will be contingent upon the technician signing a Rights and Responsibilities Agreement. This agreement will inform the technicians of the rights and responsibilities along with the consequences of the violation of these responsibilities. The technician will submit a signed agreement with their registration for Qualification. A copy of the agreement is included in this manual. Agencies may add their name to this form and may change the wording from “Qualification” to “Certification” as needed. The form may need to be tailored to conform to legal requirement of the qualifying agency.”



**TRANSPORTATION TECHNICIAN QUALIFICATION PROGRAM
RIGHTS AND RESPONSIBILITIES AGREEMENT**

This document affirms that (*technician's name*) _____,
hereinafter the Technician, desires to be Qualified by the Transportation Technician Qualification Program (TTQP)
as a (*name of Qualification desired*) _____.

Qualification carries inherent rights and responsibilities. These rights include being exclusively sanctioned along with others so Qualified by TTQP to perform sampling, testing, and reporting of test results for quality control and quality assurance programs. These responsibilities include performing and reporting tests with the accuracy and precision expected of the Technician in accordance with the required test procedures. By signing this document the Technician agrees to abide by all of the terms of the TTQP included in the Registration, Policies, & Information Handbook and as set forth by the contracting Agency.

Findings of negligence or abuse of these rights and responsibilities will be penalized upon recommendation by the Agency Qualification Committee (AQC) and any appeal to the AQC Chair. Penalties, as prescribed herein, may be assessed for Technician abuse or negligence. Negligence is defined as unintentional deviations from approved procedures which may or may not cause erroneous results, or deviations to the TTQP Program. The first finding of negligence will result in a letter of reprimand being sent to both the employee and the employer, the second will result in a thirty (30) day suspension of Qualification, the third in a one hundred eighty (180) day suspension of Qualification, and the fourth in permanent suspension of Qualification. Abuse is defined as intentional deviations from approved procedures, or deviations to the TTQP Program. The first finding of abuse will result in a one (1) year suspension to permanent revocation of an individual's Qualification. Any subsequent finding of abuse will result in permanent revocation of Qualification. Revocation or suspension of one Qualification will be considered a revocation or suspension of all Qualifications held by the Technician. Permanent revocation of Qualification will result in that person being ineligible for any TTQP Qualification. The penalties are guidelines and the AQC may impose harsher penalties if warranted for findings of abuse or negligence.

The Technician should also be aware that both State and Federal laws may govern construction projects, including Title 18, United States Code, Section 1020, that in brief states that anyone making falsifications on Federal-aid projects,

“Shall be fined not more than \$10,000 or imprisoned not more than five years, or both.”

I, _____, have read, understand, and agree to abide by the rights,
(print name)
responsibilities, and penalties associated with receipt of this **Qualification**.

Signature

Date

Revised by WAQTC OCT 2005

Figure 6. WAQTC - Technician Rights and Responsibilities Agreement.

Most of the certification organizations examined offer the training, testing and certification activities within their home states or within the geographical region of the state coalition which encompasses their activity. Some organizations offer the training and testing in a single dedicated location. Such locations are usually designed and specially equipped for such activities, such as ATTI, APAO, Colorado Asphalt Pavement Association (CAPA), the New Mexico Department of Transportation and The Associated General Contractors of New Mexico (TTCP). NICET offers the pencil and paper testing through a national network of centers generally located at local community colleges, universities or similar educational facilities. NICET computer based testing is also offered nationally at dedicated test centers through contracts with well established exam delivery companies.



In the model used by the majority of state organizations and alliances, certification is generally awarded after the candidates successfully complete both a written exam (pencil and paper) and a performance verification component. Performance verification by most organizations is determined through an actual “Hands-On” performance exam. The candidate is evaluated by a qualified examiner, usually a subject matter expert, as he actually performs the test procedure or procedures as required. Examiners generally use a preset task checklist to record the results of the evaluation. NICET certification is awarded after the candidate meets:

- The examination requirement for the specific area and level of certification.
- The experience requirement for the specific area and level of certification.
- The verification requirement by the qualified immediate supervisor, usually a Professional Engineer, who has monitored and approved the applicant’s repeated and correct performance of the tasks or the application of the knowledge required under a variety of conditions for the specific level of certification.
- The character reference requirement (or personal recommendation) from a qualified person other than the subject verifier.

The NICET certification model was developed in 1977 as a result of a cooperative project between The National Society of Professional Engineers, The Institute for the Certification of Engineering Technician, The American Association of State Highway and Transportation Officials (AASHTO), The Federal Highway Administration and The National Highway Institute. The purpose of the project was to develop a national program for certifying transportation engineering technicians. The model used by most of the other organizations examined follows the principles of testing and certification which were initially developed by the American Concrete Institute in 1983. Advantages and disadvantages of both certification models and others are presented and further discussed in Chapter 6 of the report.

It is not clear if any of the organizations reviewed, except for NICET, follow the full checklist for testing and certification program development and implementation as outlined in Figure 9 on page 37 in Chapter 6. It appears that most of the organizations follow the process partially by selecting and convening a respective group of subject matter experts (SMEs) to identify the program content and develop the exam question data base and the checklists for the practical tests. However development steps such as program validation by actual practitioners, use of validation survey data to develop the exam content outline (blue print), beta testing the exam, analysis of the results and the development of the cut (passing) scores in accordance with established psychometric principles do not appear to be included in the processes they follow. Most organization probably track the exam and respective question performance during the life of the program. An example of NICET’s historical tracking of question performance is shown in Table 1.

Collected results for the selected state, regional and national programs are summarized and presented in the HMA Matrix, presented as A-2 in Appendix A. The data includes information on offered training programs; certification and recertification requirements; hands-on and written test requirements; testing and training prerequisites; certification or proficiency levels; related costs; technical scope and other pertinent data. It clearly indicates which of the reviewed programs include national program elements and which do not. None of the programs examined, as listed in Appendix A, appear to be accredited by the American National Standards Institute (ANSI) or any other similar organization.

Question Performance									
Question ID	Times Answer Chosen						No. Passed	% Passed	Discrimination Index
	1	2	3	4	5	Blank			
6791	210	319	3581	96	69	23	3581	83.3	0.49
9964	2397	459	146	70	52	40	2397	75.8	0.61
9964	809	209	51	28	18	14	809	71.7	0.6
14550	125	153	135	2943	101	27	2943	84.5	0.48
14550	34	51	49	637	28	10	637	78.7	0.53
9965	655	652	1987	426	398	175	1987	46.3	0.44
4709	78	2033	1419	215	516	32	1419	33.1	0.34 #
477	10	33	45	585	56	0	585	80.2	0.56
9982	9	38	526	56	98	2	526	72.2	0.57
1214	6	6	23	148	3	2	149	78.8	0.54
1214	19	28	55	425	9	4	425	78.7	0.55
14549	73	450	69	81	54	2	450	61.7	0.63
11889	3	11	22	41	13	4	41	43.6	0.3
11889	40	55	89	336	108	7	336	52.9	0.52
885	7	10	108	6	17	1	108	72.5	0.63
1210	12	23	98	9	6	1	98	65.8	0.55
1137	93	5	10	5	34	2	93	62.4	0.74
14548	20	8	84	22	13	2	84	56.4	0.44
4532	16	5	60	53	14	1	53	35.6	0.15 #

#: Question, respective correct answer & distracters need review by program committee.

Table 1. Historical Question Performance Statistics.

It is important to note that some training and certification program issues and requirements will need to be addressed to better suit the needs of local, regionally based or smaller geographically isolated airports projects. Such requirements may include construction challenges, special construction materials types and properties, extreme weather and temperature conditions, special design and/or construction requirements, special equipment, etc. However, the researchers believe that the initial focus must be on the development of a national training, testing and certification program for airport HMA technicians and inspectors. The program content needs to address the requisite core competencies and career track progression for such personnel. The competencies must be based on national industry standards and practices. Smaller or geographically isolated airport project needs can be addressed through the addition and exposure to specific training, testing and certification modules which are specifically designed to address such cases. It is quite probable that the host state, for the smaller or isolated project, has already addressed the special issue and has the experience and required training expertise and material. Such resources can be used as is or modified to better suite the respective airport construction project. It is also important to note that designing a program with a hierarchy of training and certification will result in a tiered pool of qualified personnel that can be managed and allocated to serve where their level of expertise can be used most effectively.



4. EVALUATION OF ALTERNATIVE PROGRAMS AND PROCESSES TO INCREASE TECHNICIAN SKILLS AND EFFECTIVENESS

So far the focus has been on formal certification programs. However, it is recognized that there are a number of organizations that have well established training and knowledge requirements that do not meet rigorous national certification program requirements. These programs typically include a combination of formal classroom training, hands-on and/or written testing, and on-the job training. While these programs may not function as independent certification programs, their value is both intrinsic and extrinsic in that they provide valuable education that can be used as preparation for the certification examinations and as continuing education for those successful certification candidates.

As part of the data collection for this project, the project team collected information about selected independent programs. Each one of the programs selected provides a unique type of training service to the industry. The results are summarized in Table A-2 in Appendix A and in this chapter additional information is provided about the following programs.

- United States Army Corps of Engineers (USACE).
- Joint Urban Manpower Program (JUMP).
- National Center for Asphalt Technology (NCAT).
- Transportation Curriculum Coordination Council (TCCC).
- The Asphalt Institute's Airport Pavement Workshop.

US Army Corps of Engineers

HQUSACE policy requires the Transportation Systems Center (TSC) to conduct on-site Airfield Paving Workshops for all Corps-constructed airfield projects over 5 million dollars, or when specifically requested by the Corps District or customer. Workshops are also provided for Air Force and Navy constructed projects upon request. The typical outline for the Hot Mix Asphalt (HMA) Airfield Paving Workshop is provided below:

- Introduction.
- Asphalt Mix Design.
- Hot Mix Plants.
- Surface Preparation.
- HMA Laydown.
- HMA Compaction.
- Quality Control and Quality Assurance (QC/QA).
- Performance Problems.
- Unified Facilities Guide Specification (UFGS 02749) Review.

Regarding the benefit of this training, Terry Sherman, P.E., Director, USACE Transportation Systems Center, USACE, offered the following remarks:

“It is difficult to quantify cost/benefit information. Our one-day HMA workshops cost about \$8,000 for a single workshop and about \$5,000 when combined with a 2-day PCC Airfield Paving workshop. They have been well received by the contractors, the Corps, and our customers (Air Force, Army, and Navy). Many have indicated that the workshops are well worth the cost and have resulted in higher quality HMA airfield pavement construction.”



It is acknowledged that this training is successful at taking technicians and inspectors who may not be familiar with airfield HMA paving requirements, specifications and processes according to Air Force, Army, or Navy criteria, and providing them with the information needed for successful projects in a “just-in-time” manner.

Instruction is provided by a team of subject matter experts from the USACE Transportation Systems Center and the National Center for Asphalt Technology (NCAT).

Joint Urban Manpower Program (JUMP)

The Joint Urban Manpower Program (JUMP) is a cooperative effort by the New York State Department of Transportation (NYS-DOT), New York City College of Technology (City Tech), and the New York consulting engineering community. JUMP’s mission is to provide a pathway for historically excluded groups, the disadvantaged, females and minorities, to enter the field of civil engineering. The program is funded by NYSDOT and is governed by an independent board of directors.

New York City's JUMP uses NICET certification to establish a career path for its trainees while qualifying them for employment with engineering firms that have NYSDOT engineering agreements in state regions 8, 10 and 11. The program recruits and pre-screens women, minorities, and disadvantaged individuals, and refers them for interviews with participating New York area engineering firms. Recruitment is accomplished through community outreach, orientation sessions and by word of mouth. All candidates must complete a personal interview, a Test of Basic Adult Education (TABE) and must read and perform mathematical computations equivalent to a 10th grade level of education. Each firm, which must meet contractual equal opportunity and affirmative action training requirements as part of its NYS-DOT engineering agreements, selects the candidate who best fulfills its needs. Upon completing a specialized course of classroom instruction at City Tech and on-the-job training in the field, the JUMP graduate continues his/her position as an entry-level engineering technician with the firm.

JUMP trainees receive full salary and benefits throughout the two-part training course. City Tech provides intensive 10 to 11 weeks of classroom instruction in highway construction inspection and computer-aided drafting, basic math, and life skills. The employer provides on-the-job training under the direct supervision of a construction inspector, engineer, or senior drafter. The college dispenses ongoing counseling to the trainees and maintains contact with their employers throughout the program.

JUMP helps the trainees and their employers fulfill another NYS-DOT consultant contract requirement: NICET Level II technician certification. At minimum, a NICET Level II certification is required for employment with a firm working on a NYS-DOT contract. JUMP participants are expected to complete their NICET Level I and Level II requirements within 2 years from starting the training program in order to reach a level of marketability in their field.

Classroom instruction is provided by a mix of City Tech full time faculty, adjunct faculty, continuing education instructors, consulting firm civil engineering staff and volunteers from the Port Authority of New York and New Jersey. Field training is performed by the supervising consulting firm staff.

After training, JUMP graduates are encouraged to advance in their career paths by achieving advanced NICET certification and taking classes in Civil Engineering/Construction Technology. Since its creation in 1968 by a group of civic minded civil engineers, JUMP has prepared over 850 disadvantaged but motivated adults for careers as engineering technicians in highway construction inspection and computer-aided drafting. More than 57 New York area consulting firms participate in the program. It is also sponsored



by the New York Society of Professional Engineers (Metropolitan Chapters), The New York Association of Consulting Engineers, The American Society of Civil Engineers (Metropolitan Section), and The American Institute of Architects (New York Chapter).

The program offers a perfect example of a successful joint effort between a State government, the engineering community, and academia in creating pathways for the employment and credentialing of women, minorities and the disadvantaged in the field of transportation engineering technology. It is a program which can be tailored to produce qualified personnel with portable credentials in multiple other specialties, such as the one for airport HMA technicians and inspectors. The model should be considered for replication across the country.

National Center for Asphalt Technology (NCAT) Professor Training on HMA Technology

The National Center for Asphalt Technology (NCAT) was created in 1986 through an agreement between the National Asphalt Pavement Association (NAPA) Research and Education Foundation and Auburn University. NCAT offers a series of training courses in the areas of binder and HMA technology as detailed in table A-2 in Appendix A. The listing includes:

- Asphalt Technology
- Superpave Mix Design
- Professor Training in Asphalt and HMA Technology
- Superpave Binder Technician Training and Certification
- Stone Matrix Asphalt (SMA) and Open-Graded Friction Courses (OGFC) Mix Design and Construction
- Aggregate Technology (for Alabama DOT)
- Asphalt Level I Technology (for Alabama DOT)
- Radiation Safety (for Alabama DOT)
- Roadway Technology (for Alabama DOT)

The Center also offers a series of video short courses on HMA. Topics includes: Asphalt Pavement Preservation & Rehabilitation, Hot Mix Asphalt Mix Design and Hot Mix Asphalt Pavement Construction.

The listing of courses offered is comprehensive and of high quality. However, a unique course offered, in cooperation and support of the National Asphalt Pavement Association (NAPA), is the “Professor Training in Asphalt and HMA Technology” program. It is a comprehensive training program for college and university civil engineering faculty that equips them to offer undergraduate and graduate courses in asphalt technology. This program is designed to help increase the pool of qualified civil engineers and technologists for the future. It is also designed to provide graduates with an educational background in HMA and asphalt technology, and to encourage more students to pursue a career in civil engineering and construction.

NCAT conducted its first Professor Training Course on HMA technology in 1988. The course encouraged and facilitated the inclusion of asphalt technology in the civil engineering curriculum of many universities. Personnel from several state DOTs and the Federal Highway Administration (FHWA) have also attended.

This 8-day course, held every year in June, consists of intensive lectures, laboratory exercises, and discussions to investigate all phases of asphalt technology, including the following:

Asphalt Cement

- Crude oil.



- Types of asphalt.
- Asphalt specifications and new SHRP tests.

Aggregates

- Aggregate characteristics.
- Quarrying operations.
- Processing and blending aggregates for HMA.

Hot Mix Asphalt

- Desirable HMA properties.
- Types of mixes.
- Philosophy of mix design.
- Mix design methods.
- SHRP tests.
- Criteria for selection of a job mix formula.
- Mix characterization tests.

Construction

- HMA facility operations.
- Equipment for production and placement.
- Laydown methods.
- Compaction methods.
- Quality control/quality assurance.

Design and Rehabilitation

- Design.
- Maintenance.
- Rehabilitation.
- Recycling.

Laboratory exercises include asphalt cement characterization tests, aggregate characterization tests, and HMA mix design and analysis. Each participant is provided a copy of the HMA textbook and other supporting documents, leaving the course with materials needed to teach a course in asphalt technology.

All course materials, laboratory supplies, and lectures are provided at no cost to participants. In addition, eligible participants receive a stipend to cover some of their costs for housing, food and transportation. Provided funds are raised by the NAPA Young Leaders and the NAPA Research and Education Foundation. Further information about the program and funding can be obtained through NCAT or the NAPA Research and Education Foundation office in Lanham, Maryland, at (301) 731-4748.

The Transportation Curriculum Coordination Council (TCCC)

The Transportation Curriculum Coordination Council (TCCC) education and training programs and resources are one of the most comprehensive and congruent with the competencies identified in the job/task analysis and the progressive career path certification model offered by NICET.

The TCCC was established in 2000. It brought together five state highway regional training and certification groups, i.e. MARTCP, M-TRAC, NETTCP, SETFTTQ and WAQTC, the Federal Highway Administration (FHWA), the National Highway Institute (NHI), the American Association of State Highway and Transportation Officials (AASHTO) and industry associations such as NICET, ACI and others. The partnership's goal was to develop core curriculums that State/local highway agencies could use as a basis for their overall training and development programs, while offering enough flexibility to accommodate different departmental structures and operations.



The TCCC pooled fund project (TPF 5-(046) was established in 2002 to financially support the development of the Core Curriculum Matrices, the training courses that may be used by the State DOTs/Local Agencies/Industry at little to no cost and the National Transportation Training Resource database.

Core Curriculum Competency Matrices

The core curriculum matrix was developed to include the five major program areas of Materials, Construction, Maintenance, Safety/Work Zones, and Employee Development. The matrix provides training competencies for a wide variety of disciplines within each subject area at four different skill levels from entry level to the project manager/administrator level. The Curriculum Matrix is designed to be used by State and local DOT's in their efforts to establish training programs and to develop specific courses for their technical personnel. It is also being utilized by the TCCC to guide its development of course materials to be shared nationwide. The Curriculum competency matrices are designed to be a living document that will grow as the program continues to evolve; accordingly, the curriculum will be maintained on the TCCC website (www.nhi.fhwa.dot.gov/tccc) through an interactive, dynamic database and will be updated periodically as new disciplines, course materials, and technologies emerge.

HMA Pavement Field Inspection				
Disciplines	Competencies by Skill Levels			
	Level I	Level II	Level III	Level IV
Surface Preparation	Assists in performing inspections of surface preparation	Inspects surface for proper preparation in accordance with contract documents	Recommends acceptance or corrective action based on inspection results	Determines contract decisions related to surface preparation acceptance and payment.
			Documents and follows up on corrective actions	Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
Hauling	Assists in performing inspections of hauling vehicles	Inspects trucks for proper loading and protection of Hot Mix Asphalt material	Recommends acceptance or corrective action based on inspection results	Determines contract decisions related to hauling vehicle acceptance and payment
			Documents and follows up on corrective actions	Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
Laydown	Assists in performing inspections related to laydown of HMA	Inspects laydown of material to meet job specific requirements	Recommends acceptance or corrective action based on visual inspection and results of jobsite tests	Determines contract decisions related to HMA laydown acceptance and payment.
			Documents and follows up on corrective actions	Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
Compaction	Describes basic compaction principles and roller patterns	Determines adherence to roller operation and roller plan	Recommends acceptance or corrective action based on visual inspection and results of jobsite tests	Determines contract decisions related to laydown and compaction acceptance and payment.
	Identifies types of compaction equipment		Documents and follows up on corrective actions	Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
Smoothness	Explains how the types of compaction equipment are used	Interprets printouts of smoothness readings		
	Recognizes the factors that control smoothness and how equipment is used to measure smoothness		Calculates pay factors for incentive/disincentive where appropriate	Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
Documentation	Assists in laying out roadway sections to be measured for smoothness	Performs basic mathematical calculations		
		Selects correct inspection forms to be used for different layers and types of HMA	Reports out inspection results	Interprets data
				Recommends corrective action on a program basis to managers

Table 2. TCCC HMA Field Inspection Competency Matrix.

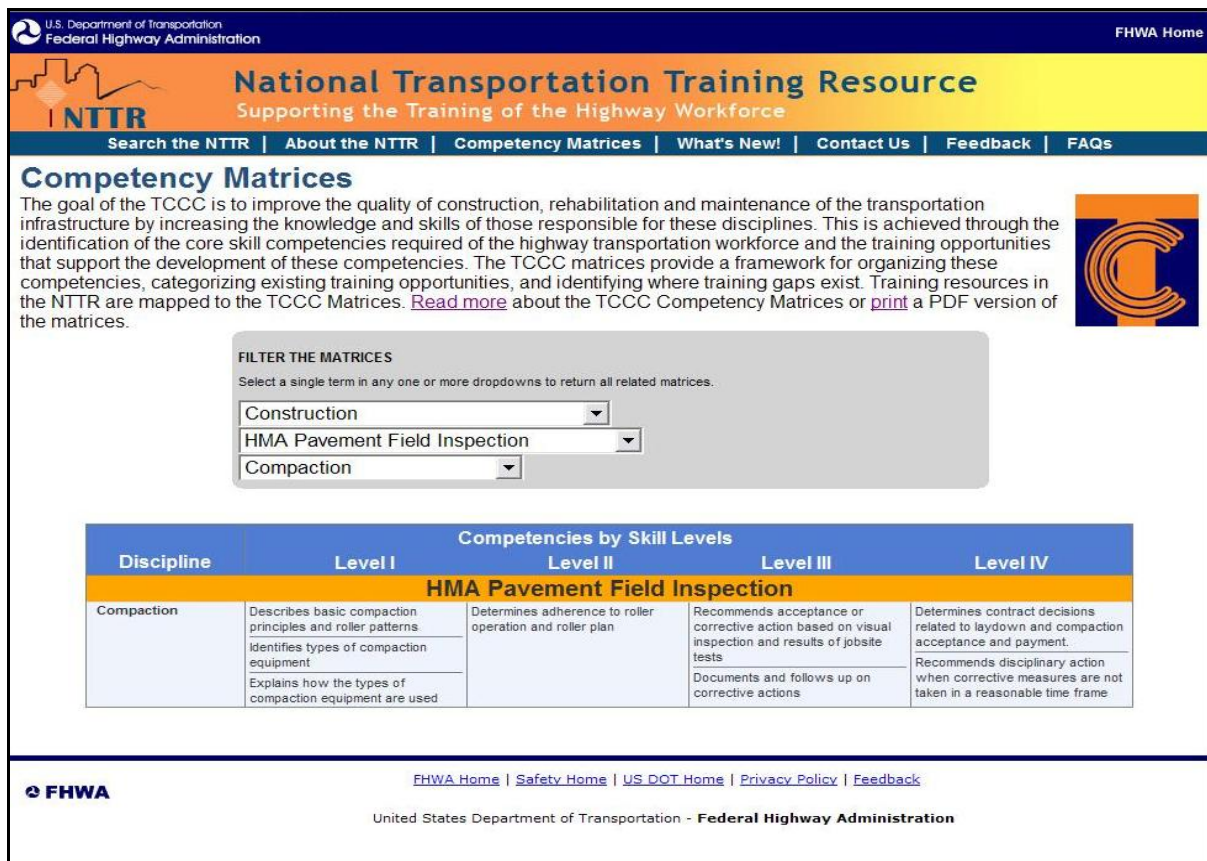
Table 2 shows the competencies required for the various task normally performed under the work domain of HMA field inspection in the program area of construction for the various skill levels.

National Transportation Training Resource (NTTR)

The National Transportation Training Resource (NTTR) is a database application that collects, stores, and manages training resources for the highway workforce. The application provides a central platform for exchanging and evaluating training information, and helps resource users identify transportation disciplines to meet their training needs. Individuals can use resource information in the NTTR to:

- Inform and guide the development of new resources
- Learn about training approaches unique to specific transportation disciplines
- Identify peer experts who can offer input into resource development
- Make use of existing resources and avoid re-creating new course content

NTTR is supported by the TCCC through the FHWA, NHI, State DOTs, local highway agencies, the Local Tribal Technical Assistance Program (LTAP/TTAP) Centers, AASHTO, the Associated General Contractors of America (AGC), the American Concrete Pavement Association (ACPA), the American Road & Transportation Builders Association (ARTBA) an NAPA.



Competency Matrices

The goal of the TCCC is to improve the quality of construction, rehabilitation and maintenance of the transportation infrastructure by increasing the knowledge and skills of those responsible for these disciplines. This is achieved through the identification of the core skill competencies required of the highway transportation workforce and the training opportunities that support the development of these competencies. The TCCC matrices provide a framework for organizing these competencies, categorizing existing training opportunities, and identifying where training gaps exist. Training resources in the NTTR are mapped to the TCCC Matrices. [Read more](#) about the TCCC Competency Matrices or [print](#) a PDF version of the matrices.

FILTER THE MATRICES
Select a single term in any one or more dropdowns to return all related matrices.

Construction
HMA Pavement Field Inspection
Compaction

Discipline	Competencies by Skill Levels			
	Level I	Level II	Level III	Level IV
HMA Pavement Field Inspection				
Compaction	Describes basic compaction principles and roller patterns Identifies types of compaction equipment Explains how the types of compaction equipment are used	Determines adherence to roller operation and roller plan	Recommends acceptance or corrective action based on visual inspection and results of jobsite tests Documents and follows up on corrective actions	Determines contract decisions related to laydown and compaction acceptance and payment. Recommends disciplinary action when corrective measures are not taken in a reasonable time frame

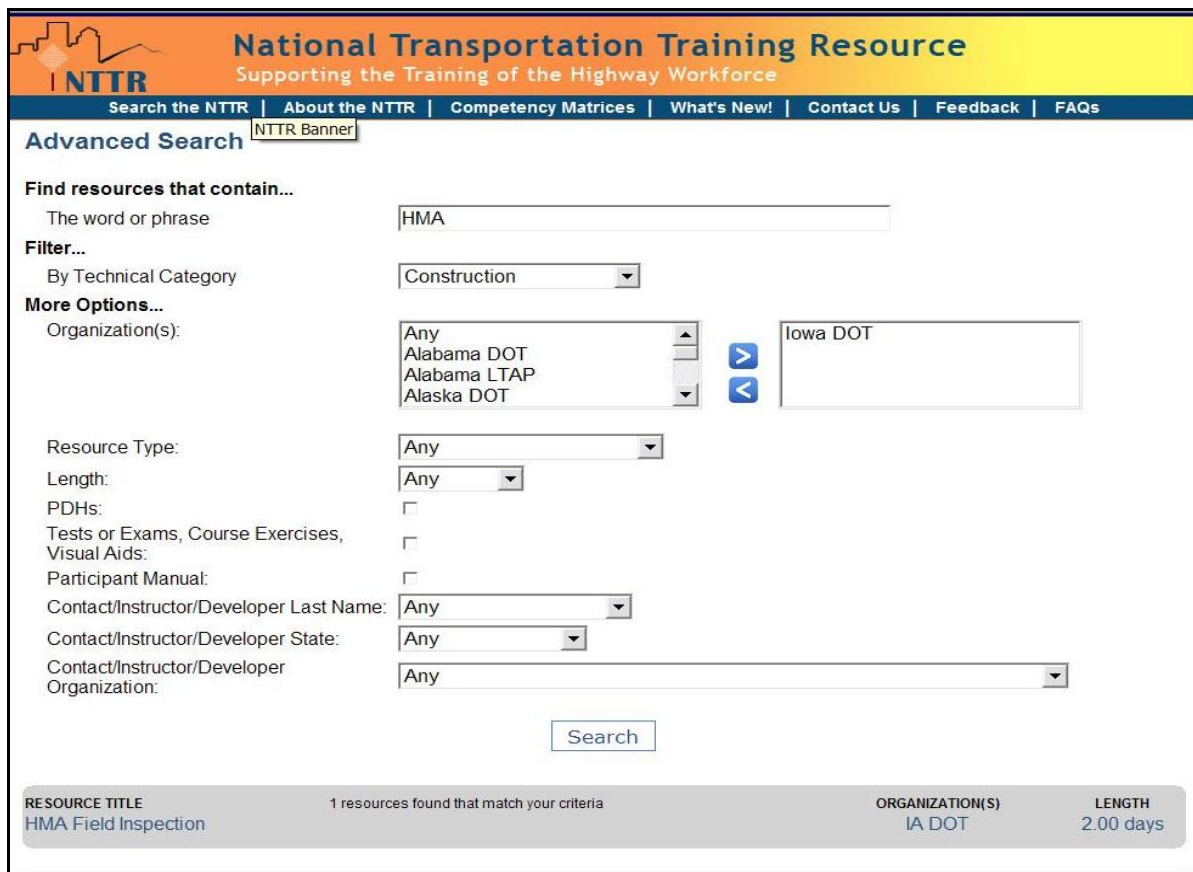
FHWA Home | Safety Home | US DOT Home | Privacy Policy | Feedback

FHWA
United States Department of Transportation - Federal Highway Administration

Figure 7. TCCC Competency Matrix.
Domain: HMA Pavement Field Inspection. Task: HMA Compaction

The NTTR database mirrors the structure of the TCCC competency matrices shown in Table 2. The resources can mapped to one or more Technical Categories. The application has the capability to map

resources as identified by the technical category, e.g. construction; the subject area, e.g. HMA field inspection; the discipline, e.g. compaction; down to the skill level, e.g. Level II as shown in Figure 7. The advanced search option for example, shown in Figure 8, was used to locate training resources available from Iowa DOT. It is anticipated that in the future the NTTR will be able to identify the resource gaps that will need to be filled for various competencies. The application was released in beta form in October 2008. The database is being loaded with contributed resources from the various partners. Currently, it has 469 resources entered for HMA contributed by 26 organizations. It is important to note that many of such resources will be available at no cost.



National Transportation Training Resource
Supporting the Training of the Highway Workforce

Search the NTTR | About the NTTR | Competency Matrices | What's New! | Contact Us | Feedback | FAQs

Advanced Search NTTR Banner

Find resources that contain...
The word or phrase:

Filter...
By Technical Category:

More Options...
Organization(s): (List: Any, Alabama DOT, Alabama LTAP, Alaska DOT)

Resource Type:

Length:

PDHs:

Tests or Exams, Course Exercises, Visual Aids:

Participant Manual:

Contact/Instructor/Developer Last Name:

Contact/Instructor/Developer State:

Contact/Instructor/Developer Organization:

RESOURCE TITLE	1 resources found that match your criteria	ORGANIZATION(S)	LENGTH
HMA Field Inspection		IA DOT	2.00 days

Figure 8. TCCC-NTTR Advanced Search Page.
Training Resources Search Results for HMA – Construction from Iowa DOT.

Training Course Development

In the area of training course development, the TCCC has made available, through its partnerships with NHI, AASHTO and others a series of well established classroom courses such as:

- Hot-Mix Asphalt (HMA) Construction
- Managing Construction Workmanship
- Bridge Construction Inspection
- Quality Assurance Technologies



- Pavement Preservation Online Guide and Training
- Mechanically Stabilized Earth Walls/Reinforced Soil Slopes
- Subsurface Investigation Qualification Course

TCCC Courses under development include:

- Inspection of Bridge Rehabilitation
- Maintenance Leadership Academy
- Environmental Factors in Highway Construction

TCCC future projects include the development of courses for:

- Embankment Inspection
- Basic Earthwork for Inspectors
- Placement and Testing of Self-Consolidating Concrete
- Inspection of Pipe Installation

In 2008, the TCCC embraced web-based technology for training course delivery. It pursued this new training delivery method by offering ten “no cost” web-based courses. The courses are:

- Pavement Preservation Treatment Construction
- Basic Materials for Highway and Structure Construction and Maintenance
- Ethics Awareness for the Transportation Industry
- Basic Construction and Maintenance Documentation – Improving the Daily Diary
- Math Module
- Hardened Concrete Properties – Durability
- GPS Technology
- Plan Reading
- Fundamentals of Materials Used for Concrete Pavements
- Incompatibility in Concrete Pavement Systems
- Mix Design Principles

According to its partner, the National Highway Institute (NHI), 1300 people have already taken the web-based courses. Additionally, two States have adopted some of the TCCC web based courses as “prerequisites” for existing State courses. Web based courses that are universal and readily available will greatly assist any transportation agency stretch its human resource dollars and eliminate wasteful course development redundancy. These are examples of courses that target a wide range of agency personnel including contractor project superintendents and foremen, State highway agency project engineers, and lead inspectors as well as county and municipal transportation workers.

The TCCC and its partners have worked closely to create an education and testing framework that is designed to focus on the core competencies of a workforce that is trained and certified to national standards and practices. The framework offers the flexibility for individual agencies to develop focused training and testing modules to cover special requirements or regional peculiarities and differences as a supplement to each program’s core competencies. Through this interaction, a workforce may be trained and certified to allow for the individual’s mobility to satisfy employment needs across state and agency lines. Employers gain a workforce that allows the companies to bid on contracts for adjoining states or regions with the flexibility of assigning staff where needed. The TCCC offers a wealth of knowledge that can be useful to any transportation agency.



The Asphalt Institute Airport Pavement Workshop

The Asphalt Institute offers the largest selection of nationally based training resources in the field of asphalt technology. Many of its publications are considered to be principle references for HMA design and construction. Through its Asphalt Academy it offers a range of training courses (Table A-2 Appendix A) that are administered either at its headquarters in Lexington, Kentucky or at various locations across the country. These include:

- Comprehensive Binder Technology
- Basic Binder Technician Training
- Advanced Binder Technician Course
- Mix Design Technology Certification (certification testing is optional)
- Construction of Quality Hot Mix Asphalt Pavements
- An Introduction to the Bailey Method
- Achieving Volumetrics and HMA Compactability Course
- Hot-Mix Asphalt (HMA) 101
- The Airport Pavement Workshop

The Asphalt Institute's Airport Pavement Workshop is essentially the most comprehensive nationally available training workshop that is specifically designed for HMA airport pavement design, construction and management. It includes a review of relevant specifications and Federal Aviation Administration (FAA) advisory circulars. The workshop topics include:

- FAA Thickness Design
 - Airport Pavement Thickness Design
 - Pavement Thickness Design Software
- Materials, Mix Design and Specifications
 - Asphalt Binder Selection
 - Aggregate Selection for Airport projects
 - Mix Design (Marshall and Superpave)
 - FAA P-401 Specifications Overview
- Evaluation and Construction
 - Pavement Structural Evaluation
 - P-401 (Superpave) for Airport Pavement Projects
 - Runway Roughness Criteria
 - HMA Paving Operations
 - HMA Compaction Operations
- Quality Control (QC) and Quality Assurance (QA)
 - FAA P-401 QC and QA Testing and Specifications Requirements
 - Panel Discussion: QC and QA Pavement Issues
- Management and Preservation
 - Pavement Management Concepts
 - Pavement Preservation for Airport Pavements
 - Crack Sealing and Patching
 - Fuel Resistant Overlays for Airport Aprons
- Rehabilitation
 - Rehabilitation of Asphalt Pavement with HMA
 - Rehabilitation of Concrete Pavement with HMA
- Research
 - Update: Airfield Asphalt Pavement Technology Program



- Update: FAA Advisory Circulars

The five organizations described offer models and resources for successful training and education programs that can be used to build and enhance the competencies of personnel involved in the design, construction and maintenance of HMA pavement for airports as well as for other transportation and infrastructure projects.



5. DEVELOP DETAILED LIST OF AIRPORT HMA TECHNICIAN FUNCTIONS AND RESPONSIBILITIES

The Job Task Analysis

A key part of this project is to identify the functions and responsibilities of the airport HMA technician. In the course of doing business NICET routinely gathers subject matter experts (SMEs) who represent a national cross-section of active practitioners in the specific field to create a “Job Task Analysis” (JTA) for developing or updating certification programs. The JTA is a NICET term for a list that defines and details the functions and responsibilities of the technician. It drives the development of a program, as it defines the levels of responsibility for the technician with respect to his/her career path from entry level to senior level. It also specifies the minimum time and/or experience required that would corroborate the knowledge, skills, and abilities for each level of responsibility.

<p>Attendees:</p> <ul style="list-style-type: none">- Robert Benko, Civil Engineer, FAA Safety/Standards, Des Plaines, IL- Youssef Elzein, PE, Senior Engineer II, Dayton International Airport, Vandalia, OH- Joseph Calautti, PE, Principal Engineer, The Port Authority of NY & NJ- Terry Sherman, Director, COE Transportation Systems Ctr., Omaha, NE- Farid Hamad, PE, District Manager, Lane Construction Co., Chantilly, VA- David Peshkin, PE, Vice President, Applied Pavement Technology, Downers Grove, IL- William Stamper, PE, Senior Engr. III, Aviation Services, PBS&J, Raleigh, NC- Dean Rue, PE,, Senior Aviation Engineer, CH2M Hill, Englewood, CO- David Hunley, PE, Transportation Vice-President, CONNICO, Hebron, KY- Christopher Decker, PE, Roy D. McQueen & Associates, Ltd, Dulles, VA- Mark Schiller, District Manager, Virginia Paving Company, Dulles, VA
<p>Meeting facilitated by:</p> <ul style="list-style-type: none">- Dr. Louise Wehrle assisted by Ahmed Farouki, Bud Darby & Ebony Clark.

Table 3. Subject Matter Expert Panel Members.

For this specific project NICET assembled a SME panel that met on May 7 and 8, 2007. The list of SME Panel members is provided in Table 3. They confirmed NICET’s preliminary research findings and the need for the development of a specific national certification program for “Airfield HMA Placement Operations and Field Testing Technicians.”

The panel then commenced its development of the JTA for the subject Airport HMA Technician. It first created an overview of education, work experience, responsibility, activities, typical job titles and progression called a profile. The result is presented in Table 4.

The panel then developed competencies for the “Airfield HMA Placement Operations Inspection and Field Testing Technician.” They first determined the domains or large areas of responsibility for the technician. The domains include:

- Inspection of Airfield Placement Operations.
- Field Testing of Airfield HMA Pavement.
- HMA Mixture Characteristics.
- Troubleshooting.
- Care and Maintenance of Testing and Inspection Equipment.
- Worksite Safety/Security.
- Management.
- Training.

Under each domain the SMEs identified the tasks that must be accomplished at each of the four levels, i.e. entry level through senior level. They also outlined the specific knowledge and skills that are required to accomplish each task by a competent technician. A summary is shown in Table 5 and the detailed list of competencies is provided in Appendix C page C-3.

Note that there are some domains at specific levels for which no tasks are identified. This does not mean that the technician does not perform these tasks; it may be that the task has already been tested at a lower level; e.g. for Inspection of Airfield HMA Placement Operations, there are no additional tasks at Level IV that have not already been tested. The task may be outside those included in strict definition of the technician at that level. For example, Level I has no management and training tasks, but Level IV does.

With each task, the SMEs identified knowledge and skills associated with the tasks. For instance, under HMA Mixture Characteristics, a Level I technician will demonstrate awareness of good mix properties through knowledge of uniform coating, lack of segregation and uniform temperature, and ability to visually monitor the mixture and monitor the temperature. At Level II, the technician must, in addition to the Level I requirements, demonstrate awareness of basic HMA mix design procedures through knowledge of Marshall and Superpave mix designs and must understand approved mix design properties and be able to explain mix design specification requirements. The Level III technician must explain the relationship between mix properties and mix design requirements and know the relationships between mix segregating and pavement density, between non-uniform temperature and mix compaction, between mix air voids, pavement air voids, and compaction, and must be able to visually inspect the mixture(s), and recognize cold spots, segregation, and non-uniform mix movement under the roller. At Level IV, in addition to the knowledge and skills for Levels I through III, the technician must recognize the need for HMA mix design adjustments and must know the mix properties represented by QC and field tests and must be able to review mix QC tests and field tests, inspect reports and note anomalies, and confirm field inspection and field test results with the mix lab test results.

The JTA domains and respective competencies demonstrates the progression in the typical profile of an airfield HMA placement and field testing technician and the shift and growth of his duties and responsibilities from entry level through senior level in his career track. The validated JTA is the foundation for the creation of the examination, the question database, and also the certification requirements for each of the specified certification levels.

Domain	Level I	Level II	Level III	Level IV
Education	No formal education requirement.	No formal education requirement. Program content at Level II and above assumes knowledge and skills based on work and/or educational experiences (college, self-study, correspondence courses, workshops, or field assignments, for example) that develop knowledge equivalent to courses in construction or civil engineering technology or a closely related Associate Degree program coupled with internships.		
Minimum Work Experience	6 months minimum work experience in asphalt field testing and inspection	Minimum of 24 months, of which at least 12 months must involve asphalt field testing and inspection activities. The balance may be in related pavement activities or other related QA/QC construction activities.	Sixty months of experience. At least 36 (3 years) of these months must involve asphalt construction, testing, and/or inspection as the primary activity, to include 18 months of airfield (FAA, DOD) experience. The balance may be in related state DOT QA/QC activities or other related specialties, such as construction inspection.	Level III work experience plus 60 additional months of asphalt airfield QA/QC experience involving a broad range of complexity and diversity.
Level of Responsibility and Typical Activities	Performs simple, repetitive, specific tasks, measurements, and computations. Documents findings.	Performs common field acceptance tests. Monitors asphalt construction procedures. Prepares test reports. Reads specifications and drawings.	Conducts common and specialized tests. Monitors common and unique airfield asphalt construction procedures. Interprets specifications and drawings. Reads and evaluates lab tests. Verifies locations and quantities. Maintains records. Offers recommendations.	Manages airfield pavement projects, oversee specialized airfield asphalt tests and complex construction procedures. Interacts with project engineer/manager. Recommends corrective actions. Evaluates constructability issues.
Typical Job Titles	Field Technician I Inspector I Engineering Aide I Assistant Inspector	Field Technician II QA/QC Technician Engineering Aide II Associate Inspector	Field Technician III Senior Technician/Inspector III Senior QA/QC Technician Inspector	Chief Technician Lab/Field Inspector IV Senior Inspector
*Includes FAA's P-401 specifications				

Table 4. Airfield HMA placement operations inspection and field testing technician profile.

Table 5. Competencies summary for airfield HMA placement operations inspection and field testing technician.

Domain	Level I	Level II	Level III	Level IV
Inspection of Airfield HMA Placement Operations	Measure Temperature of HMA	* Inspect the Haul Vehicle Operation	*Evaluate Plant, Transportation, Placement, and Compaction Operations	No task
	* Measure Thickness of Loose or Compacted HMA	* Inspect Tack Coat Application	*Determine Relationship of Rolling Operation to Mat Compaction	No task
	No task	*Inspect Surface Preparation	*Perform Aggregate Stockpile Management (3)	No task
	No task	*Inspect the Paver Operation	*Verify Plant Operation	No task
	No task	* Monitor Compactor Operation and Roller Pattern	No task	No task
Field Testing of Airfield HMA Pavement	*Perform Sampling and Handling of Loose HMA	*Measure and Collect Random Samples and Perform Tests	*Determine Segregation Profile	No task
	*Perform Smoothness Testing Using Straight Edge	* Inspect Longitudinal and Transverse Joint Construction	* Manage and Analyze Data Collected on Smoothness to Establish Corrective Measures	No task
	*Perform Nuclear Density Testing	*Determine Correlation Based on Nuclear Gauge and Core Densities	No task	No task
	*Perform Sampling and Handling of Compacted HMA Samples	No additional tasks for this level	No task	No task
	No task	* Measure Smoothness Using Profilograph	* Measure Smoothness by Profilograph	No task
HMA Mixture Characteristics	*Demonstrate Awareness of Good Mix Properties	*Demonstrate Awareness of Basic HMA Mix Design Procedures	*Explain Relationship Between Mix Properties and Mix Design Requirements	*Recognize Need for HMA Mix Design Adjustments

Table 5. Competencies summary for airfield HMA placement operations inspection and field testing technician (continued).

Domain	Level I	Level II	Level III	Level IV
Troubleshooting	* Demonstrate Awareness of Existence of Basic Anomalies	*Report Anomalies and Non-Conformance to Specification on Level I and Level II Tasks	* Verify, Accept or Reject Level I, II and III HMA Field Test Results and Inspection Reports	*Establish Troubleshooting Protocol and Documentation Procedures
Care & Maintenance of Testing & Inspection Equipment.	*Properly Use and Maintain Sampling and Testing Equipment	* Inspect and Maintain Sampling and Testing Equipment	* Verify Calibration and Proper Working Conditions of All Equipment Used in Airport HMA Field Testing and Inspection	* Manage Testing and Inspection Equipment Inventory
Worksite Safety\Security	*Follow Safe Practices/Safety and Security Plan and Report Unsafe Practices on The Job Site	*Identify and Address Basic Safety and Security Concerns	*Recognize Safety and Security Violations and Recommend Safety Actions	* Determine, Coordinate, and Implement the Training, Communication, Facility, and Monitoring Elements Required as Parts of an Adequate Safety Program
Management	No task	No task	* Assist With the Management of Multiple or Complex Projects	* Maintain the Quality of Processes and Personnel in Order to Maintain Field Competence
	No task	No task	*Coordinate Field Testing Operations	* Establish Field Testing Program and Schedule
	No task	No task	No task	*Monitor Changes in Standards and Specifications to Assure That Asphalt Field Testing and Inspection Procedures are in Conformance
	No task	No task	No task	*Project Management for Field Testing Operations
	No task	No task	No task	*Develop and Manage a Plan for Test/Trial Section Approval Process and JMF Adjustments
Training	No task	*Provide On-the-Job Training for Level I Technicians in Testing, Inspection, Safety, and Job Responsibilities	* Provide Formal and on-the-Job Training on Asphalt Field Testing, Inspection and Safety to Level I and II Technicians	*Establish and Manage a Training Program for Airport HMA Field Technicians

*Knowledge will include The Best Practices Manual for HMA airport construction, currently under development by FAA



Validation Survey

The program validation process involves sending the Job Task Analysis (JTA) to a group of practitioners who can confirm the need for the program and help determine whether the meaning is clear, the structure is reasonable, and the general content, i.e. candidate profile, levels of certification, work domains, the tasks for each domain and the knowledge and skills for each task are appropriate. The surveys are normally administered so that a wide section of practitioners at all levels may provide input. Results of the JTA survey are compiled and an examination blueprint or examination specification is developed and published. The validation survey results provide statistical evidence to support the validity of the practice analysis thus increasing the reliability and relevance of examination content.

The validation survey for this project was designed and administered electronically using the software tools provided by “Survey Monkey”. It was administered to a population of NICET certified technicians in the field of Construction Materials Testing - Asphalt, the field of Transportation Engineering Technology - Highway Construction Inspection and attendees of the 2006 FAA Great Lakes Region Airport Conference. In general, where a data base of specific incumbents does not exist or is difficult to acquire, a random sample of individuals who are familiar with the practice and career track of the potential certificate can be used. Over one thousand [1081] individuals were invited to participate.

The survey was administered in four consecutive sections. A separate survey section was administered for each level of the certification identified in the practice analysis, i.e. Levels I through IV (see Appendix C page C-19). Links to the surveys were also made available on the NICET website for others interested in participating.

Introductory questions were posed to collect information relevant to the respondent background and general feedback about the project such as:

- How long have you been working in the area of hot-mix asphalt materials?
- Have you earned any certifications?
- Is there a difference between owner and contractor airfield HMA placement operations inspection and field testing personnel qualifications?
- Do you think there is a need for a national certification program for “Airfield HMA Placement Operations Inspection and Field Testing Technicians”?

The following survey questions were posed to gather information and data relative to the proposed practice of an Airfield HMA Placement Operations Inspection and Field Testing Technician:

- Is the identified task appropriate for the certification level?
- If not at the proposed level, at which level should it be?
- How important is the task (using a Likert-type rating scale)? Answers:
 - 1- *I don't know*: responder is unfamiliar with this particular task therefore cannot evaluate its importance
 - 2- *Much less than average*: performance of activities in this task is not essential to the job performance
 - 3- *Somewhat less than average*: performance of activities in this task is minimally essential to the job performance
 - 4- *Average*: performance of activities in this task is moderately essential to the job performance

- 5- *Somewhat more than average*: performance of activities in this task is clearly essential to the job performance
 - 6- *Much more than average*: performance of activities in this task is absolutely essential to the job performance
- How frequently is this task being performed (using a Likert-type rating scale)? Answers:
- 1- *Never*
 - 2- *Daily*
 - 3- *Once a week*
 - 4- *Once a month*
 - 5- *Quarterly*
 - 6- *Once a year*

The survey also requested that the participants identify the percentage of exam questions that need to be devoted to each work domain and to each task within that domain.

Validation Results

A little over two hundred [207] individuals (a 19.1 % return rate) responded in total. A range of 15 to 25% for such surveys is considered to be an acceptable rate of return. A 30% rate of return is considered to be exceptional, however, it is usually difficult to attain. The detailed survey results are presented in Appendix C page C-91.

The respondents confirmed the need for the program particularly through level III. However, they were generally split in their answers concerning differences between owner and contractor airfield HMA placement operations inspection and field testing personnel qualifications. Since such personnel may switch back and forth during their careers between both sides the researchers and the panel members believe that all personnel need to be trained and evaluated to the same standards of competency in the subject specialty. The objective is improving the quality of the workforce as a whole and the reduction of conflict between project personnel.

The following examples show the relationship or effect of the results of the administered surveys on the proposed exam design or blueprint:

Example 1

Level I

Task: *Measure thickness of loose or compacted HMA.*

Knowledge:

- *ASTM D3549*
- *HMA Paving Handbook 2000 (Chapter 15)*
- *Standard agency specifications.*

Skills:

- *Safely measure thickness of HMA with probes.*

Seventy-nine percent of responders agreed that the above task should be within the responsibilities of a Level I technician. Thirty-eight percent of responders rated this task's importance as somewhat more than average. Eighty-eight percent of responders said a Level I technician performs this task daily. This confirms, according to actual practitioners, that this task should be within the scope of the proposed Level I certification examination and it should be somewhat heavily weighted within its domain.



Example 2

Level I

Task: *Inspect Surface Preparation.*

Knowledge:

- *HMA Paving Handbook 2000 (Chapter 14)*
- *AI MS-17, MS-22*
- *Project specifications*

Skills:

- *Verify grade.*
- *Verify cleanliness of sub-surface.*
- *Make sure surface is dry.*
- *Verify sub-grade is dry and not frozen.*
- *Comply with temperature requirement.*

Ninety-two percent of responders agreed the above task should be within the responsibilities of a Level I technician. Fifty percent of responders rated this task's importance as much more than average. One hundred percent of responders said a Level I technician performs this task daily. This confirms, according to actual practitioners, that this task should be within the scope of the proposed Level I certification examination and it should be heavily weighted within its domain.

Example 3

Level I

Task: *Perform sampling and handling of loose HMA.*

Knowledge:

- *ASTM D979*
- *Standard agency specifications*

Skills:

- *Handle loose HMA.*
- *Sample HMA.*

Fifty-six percent of responders said this task should not within the responsibilities of a Level I technician. Of that 56%, eighty-nine percent said this task should be within the responsibilities of a Level II technician. The importance rating was somewhat positive (45% said much more than average, 40% said somewhat more than average). This data indicates a need for the development committee to re-examine the task and consider moving it from Level I to Level II.

Example 4

Level IV

Task: *Establish troubleshooting protocol and documentation procedures.*

Knowledge:

- *Ramifications of issues*
- *Project specifications*
- *Basic statistical acceptance plans*
- *Cost benefit*
- *General knowledge of airport project structure and airport operations*

Skills:

- *Establish SOPs.*
- *Master level I, II & III functions.*
- *Initiate/implement acceptance/rejection process.*



- *Make final recommendations to final authority.*

All responders said this task should be within the responsibilities of a Level IV technician. Fifty percent rated this task's importance as much more than average. With 55% of responders stating this task is performed daily, it will be heavily weighted within its domain in the proposed Level IV examination.

The outcome of the job analysis is the examination blueprint. The blueprint will determine the composition of the examination, i.e. the percentage of the exam dedicated to each domain, as shown in Table 6, and the percentage of the exam to cover each task within the domain.

Airfield Hot Mix Asphalt (HMA) Placement Operations Inspection and Field Testing Percentage of Exam by Domain for Each Level				
DOMAIN	LEVEL I	LEVEL II	LEVEL III	LEVEL IV
* Inspection of HMA Airfield Placement Operations	26	24	15	0
* Field Testing of Airfield HMA Pavement	22	19	16	0
* HMA Mixture Characteristics	15	14	15	18
* Troubleshooting	11	12	15	17
* Care and Maintenance of Testing & Inspection Equipment	10	10	10	13
* Worksite Safety and Security	16	12	10	16
* Management	0	0	11	20
* Training	0	9	8	16
TOTAL	100 %	100 %	100 %	100 %

Table 6. Exam Blueprint by Work Domain.

The results of the validation survey and blueprint are then reviewed and finalized by the program's development committee before the actual exam development, question writing process, editing and beta testing is to start.

The development and validation of the practice analysis is perhaps the single most important component of developing a successful certification examination.



6. PROPOSED NATIONAL HMA CERTIFICATION/ACCREDITATION PROGRAM OPERATIONAL REQUIREMENTS

The development and administration of an accredited National Certification Program for airfield HMA placement and field testing technicians involves multiple stages of effort which begin from the inception of the concept and continue throughout its history of implementation until it is discontinued or replaced. The process relies heavily on the active participation of the industry sponsoring the program as represented by various groups of SMEs. The involvement of such groups begins by validating the need for the program and continues through its design, validation, and administration and maintenance stages. The active input and support of the industry throughout the life of a certification program is one of the most important and crucial factors that determine its success or failure in meeting its goals. This chapter outlines the operational requirements for a certification/accreditation program for airfield HMA placement and field testing technicians.

Certification/Accreditation Terminology

Before describing the operational requirements for the program, the researchers found it necessary to delineate important industry terminology. In this section, terms which are central to the understanding of certification/accreditation programs are defined.

Credentialing is an overarching term that includes certificates, licenses, certification, and accreditation. The psychometric industry relies heavily on the concepts of fairness, reliability, and validity, which are associated with testing, licensure, certification, and training. A defensible exam must be fair, reliable and valid. Fairness, reliability, and validity are concepts that are rooted in testing, have been included in legislation and are used to assess legal liability. They are the foundation upon which a well-designed examination is developed and administered, and are further defined below.

- **Fairness** means that neither the individual items or questions, nor the examination in its entirety, discriminates against a candidate on the basis of race, creed, or any other characteristic that does not prohibit a qualified candidate from practice. All applicants and candidates will be treated in an equitable manner throughout the entire certification process.
- **Reliability** means that the examination is expected to perform the same when administered to a group of candidates who share similar or like qualifications.
- **Validity** means that the exam tests that which it purports to test: the qualification of a particular group of people. It is the degree to which accumulated evidence supports specific interpretations of all components of a certification program.

It is important to note that it is possible to have a reliable exam that is not valid, but it is not possible to have a valid exam that is not reliable. This concept can be illustrated at the rifle range; if a rifle, aimed at the bull's eye, consistently shoots low and to the left, it is reliable in that it is expected to shoot low and to the left. It is however not valid, as the idea is to hit the bull's eye in the center every time.

Licensure is a legal credential conferred by federal, state, or local government authorities. It is based on law, regulation, or requirement of a profession and is a prerequisite to practice. It may or may not involve an examination. It may be as simple as filling out an application and submitting it along with payment to the governmental authority requiring the license or as rigorous as obtaining a Professional Engineer's (PE) License. On the other hand, it may require an examination, just as obtaining a driver's license requires an examination. However, the questions on the exam may or may not be rigorously developed, psychometrically



sound, and legally defensible. There may be no claim made that you are competent to practice, just that you have passed one entity's barrier to practice. Continuance of the license may require periodic proof of continued professional development, repayment, or retesting of the same or similar content. Licensure programs may also use certification programs, such as NICET's, as one of the requirements for licensure.

Certification is a voluntary credential conferred by private organizations. A professional certification program is based on the body of knowledge for the profession under examination. The examination program is administered independently of profession: i.e., the examinations do not deal specifically with any one entity's products, procedures, or policies, but address the generally accepted practice for the entire industry.

A further indication of independence is that there are no specific training programs that address the content of the examinations. Other training providers exist and their courses may provide some or all of the information necessary to pass the examinations; however, they do not know the questions on the exam and thus cannot "teach to the exam." They cannot present only that segment of information that will be tested, but will need to present the wider segment that leads to understanding of the practice area.

Accreditation is the formal recognition that a certification organization and its program(s) conform to a set of requirements established by a nationally recognized accreditation body. It is the acknowledgment by an independent, third party that a certification program has been created and is being administered in an acceptable manner. National regulatory organizations include:

- National Commission for Certifying Agencies (NCCA).
- Council of Engineering and Scientific Specialty Boards (CESB).
- Council on Licensure, Enforcement and Regulation (CLEAR).
- International Standards Organization (ISO).
- American National Standards Institute (ANSI).
- American Society for Testing & Materials (ASTM).

In accordance with ASTM D 5506, "Organizations Engaged in the Certification of Personnel Testing and Inspecting Bituminous Paving Materials," a **certification organization** is defined as an independent body engaged in the evaluation and credentialing of the knowledge, skills, and abilities of individuals who perform specified tasks. A typical certification organization must:

- Be a non-governmental, third-party national certification organization which is administratively independent in order to avoid any possibility of a conflict of interest.
- Be the sole entity making decisions relating to certification matters.
- Have an independent governing body which includes representation from consumers, the public, employers and regulators.
- Have the financial resources to conduct the certification activities in accordance with established industry standards.
- Have qualified knowledgeable and skilled staff necessary to conduct the certification activities and/or make use of qualified consultants or specialist to do so.
- Have a periodic recertification program.
- Design and implement examination and certification processes and programs using industry accepted psychometric standards.



- Keep testing and certification activities in tune with related training programs but ensure their application as completely independent and separate processes thus protecting their integrity and purpose.

To achieve accreditation status the certification body must meet the above criteria and have a quality management system that governs its day-to-day process. The management system must include detailed and comprehensive documentation and have a system of tracking all of its Standard Operating Policies and Procedures, including all updates and changes. The information must be available for examination by a team of qualified auditors representing the accreditation organization. This means all the files on program(s) design, development, and administration; all the candidates testing and certification histories; all customer interaction records; all general administrative activities, including financial matter, must be well documented and in order as required. If they are not in order, there must be rules in place to govern acceptable reasons for the disorder. Deficiencies must be rectified prior to the accreditation of the certification body and the respective program(s) under consideration. It is important to note that one or more of a certification organization's program may qualify and attain accreditation as they meet all the requisite requirements, but others may not qualify for accreditation as they are deficient in one aspect or another.

NICET is currently creating programs such that they will become accredited by the ANSI to an international standard, ISO/IEC 17024: *General Requirements for Bodies Operating Certification of Persons*. This standard is analogous to the ISO 9000 series for corporations. It indicates that a superior standard of diligence and care has gone into the creation of the certification program and its administration. Just like NICET's candidate population has to attain certification after they demonstrate a particular level of competence in their practice area, so does NICET have to attain a particular level of competence in certification design, administration, and management.

A **certificate or diploma** is conferred by an educational institution or a training entity with or without an assessment or an exit examination. Generally speaking, a certificate program awards the certificate after completion of a focused training program. The training program might be limited to a one hour seminar or it could be several days of a conference or training event. It could also be a series of courses such as you would find in a technical school, university, or college. The certificate indicates that you have paid attention and passed an exam based on the knowledge presented, if required. Usually the certificate is like a university or college degree; it requires no further upgrading of the knowledge base you gained in academia to maintain the certificate.

Current Industry Trends

ANSI has worked on personnel certification programs and established an accreditation protocol. ANSI has an accreditation program for the ISO/IEC standard 17024 that has been accepted by ASTM as the American National Standard. The agency will begin facilitating a process to do this with certificate programs as well, with ASTM developing the standard. ASTM already has a sub-committee, E 36-20, *Laboratory & Inspection Agency Accreditation: Certification/Registration Bodies*, dealing with the terminology of personnel certification/certificate/licensure programs. They have also created a draft document, "Standard Terminology Relating Conformity Assessment, Programs Certifying People."

Industry-accepted practices in the development of certification programs can be found on the following sites, among others mentioned above.



- ANSI (American National Standards Institute):
http://www.ansi.org/conformity_assessment/personnel_certification/overview.aspx?menuid=4
- NCCA (National Commission for Certifying Agencies):
<http://www.noca.org/NCCAAccreditation/NCCAMissionandVision/tabid/90/Default.aspx>
- Department of Defense: GI Bill Reimbursement:
- <http://www.gibill.va.gov/>
- Department of Defense Directive 8570.1 “Information Assurance Training, Certification, and Workforce Management”:
- <http://www.dtic.mil/whs/directives/corres/pdf/857001m.pdf>

Furthermore, ANSI is facilitating the process for reviewing certificate programs. According to a 7/25/07 conversation with Dr. Roy A. Swift, Program Director, Personnel Certifier Accreditation, ANSI and ASTM-International have agreed to work on developing a standard for certificate programs. Industry educational authorities are also very much interested in assisting the development of a standard for certificate programs. Currently there are no standards; nor are there uniform best practices that are being followed by a majority of certificate providers.

Certification Program Design and Development

Certification programs are centered on differentiating the qualified practitioner from the unqualified, or not-yet-qualified. To do this, examinations are administered to the candidate, and these examinations must have specific qualities; that is, they must be fair, valid, and reliable as defined above. The programs must be created according to the accepted standards of the certification industry. Groups of SMEs representing a national cross section of the practitioners from the specific industry are involved throughout the development process, and they also define the criteria for certification. This means that the examinations created must be based on a job/task analysis of the industry represented and must be corroborated by actual practitioners at all levels through multiple validation surveys. Results of the job/task analysis surveys are compiled and an examination blueprint or examination specification is developed and published.

From this examination blueprint, the number of questions for each area is decided. Questions are written to question writing standards (see Appendix D) by the committees of subject matter experts and are reviewed and edited prior to insertion into a test. Once there are a sufficient number of questions generated, a beta test is created. This is a test of the test; here the candidates may take a test and their results are examined to see if each question is performing in the way it is intended; that is, to distinguish between those with the knowledge to practice and those who do not have this knowledge.

Following the administration of the beta test, the committee of SMEs convenes to examine the test results and set the passing score. Based on one of several different methodologies (e.g. Angoff, Modified Angoff, Bookmarking, or Contrasting Groups), the committee decides the cut score, or passing grade for the examination. At this time, all beta test candidates who scored at or higher than the passing grade are considered to have passed the exam. Those who scored less are considered unsuccessful on this attempt.

During the service life of the program the SMEs are also consulted periodically to ensure that the exam and the associated certification program are still testing in a fair, reliable and valid manner. The examination must be continually monitored for changes. Changes in question statistics may indicate a need for a change to the examination. Similarly, changes in the practice area and associated standards may also require a change to the examination. The number of candidates testing and the repeated exposure of the exam questions is another factor to consider for updating the examination, i.e. the exam exposure is much greater



when a population of 5,000 examinees take the test than its exposure when only 100 examinees take it during the same period. Depending on all such performance factors, an SME Advisory Group may decide to upgrade its exams once every 2 years; another may decide to revise its examination once every 4 years. When used to test very large populations, it is not uncommon in the testing industry to retire the exam after only one exposure.

Checklist for Certification Program Development—Inspection of HMA Airfield Construction Operations Technician

Figure 9 presents a typical checklist and timeline of the certification program development process. Development of a certification program is clearly a rigorous, time consuming, expensive process, but at the same time is one that is valuable to any industry that wants to qualify its employees. Depending on its size and scope, it takes anywhere between 18 to 36 months for the development and implementation of a complete certification program.

[]	<p>Select and convene advisory panel Subject Matter Experts (SMEs) (Arrange and host 2-day meeting)</p>
[]	<p>Select and convene panel of practitioner SMEs for Job Task Analysis (Arrange and host at least two 2-day meetings & arrange and host teleconferences as needed)</p> <p>[] a. Develop domains</p> <p>[] b. Develop task statements</p> <p>[] c. Develop knowledge and skills for each task statement</p> <p>[] d. Assign tasks to levels of experience</p> <p>[] e. Develop validation instrument from above</p> <p>[] f. Administer to another group of SMEs</p> <p>[] g. Administer to field using ([Insert Name] software)</p>
[]	<p>Use survey data to develop exam content outline, i.e. exam blueprint (Arrange teleconferences or meeting with SMEs to confirm results) (Arrange psychometric assistance to reduce data finalize blueprint)</p>
[]	<p>Publish exam content outline on web site (Also send to education providers)</p>
[]	<p>Committee decides the number of questions on the exam assigned to each content area (Arrange and host meeting, or may be done electronically)</p>
[]	<p>Conduct item writing panels to write/review questions (Arrange and host at least four 2-day meetings & follow up with teleconferences to check/ensure proper editing) Exam maybe prepared for Computer-Based testing (CBT), Pencil and Paper testing (P & P), or both.</p>
[]	<p>Publish questions in examination format with selected examination vendor (This may take several months)</p>
[]	<p>Administer Beta test with selected vendor (Administer exam to qualified candidates at cost to encourage participation)</p>
[]	<p>Resolve beta administration</p> <p>[] a. Set passing score (use industry accepted method) (Arrange and host meeting & procure psychometric assistance to reduce beta test data)</p> <p>[] b. Notify examinees of status (P/F)</p> <p>[] c. Develop equivalent forms of exam for post-beta administration (Use psychometric and testing vendor)</p>
[]	<p>Continue to monitor exam</p> <p>[] a. Add questions for pre-testing purposes (Arrange and host periodic item writing workshops)</p> <p>[] b. Replace poorly performing questions</p> <p>[] c. Update questions according to new standards/industry developments (Arrange and host periodic SME item writing workshops)</p>
[]	<p>Conduct concurrent marketing plan, using:</p> <p>[] a. Web site, print materials, emails</p> <p>[] b. Address/involve advisory group and other committee contacts</p> <p>[] c. Address/involve employers, candidates/certificants listed in data base</p> <p>[] d. Attend industry conferences</p> <p>[] e. Develop partnerships and use them as conduit to their contacts</p>

Figure 9. Checklist and timeline of certification program development process.



Important Elements of Program Design and Development to Consider

The following is a discussion of several important elements of certification program design and implementation which need to be considered by program designers, administrators, and SMEs.

Multiple Choice Examination Questions

Multiple choice examination questions are a powerful tool used commonly used by examination designers to assess knowledge and skills as related to specific tasks. However, some may wonder whether a multiple-choice exam can adequately test and evaluate the Airfield HMA Placement Operations and Field Testing Technicians' higher-level analysis and synthesis skills? The answer is yes, it is possible. The questions will be more interpretative and may require a candidate to know the characteristics of several different processes in order to select the correct process. It is also possible to develop a scenario and ask questions designed to solicit specific interpretation and management of the scenario content. The hierarchy of testing may be seen as identified in the Job Task Competency Matrix for the Airfield HMA Placement and Field Testing Technician (Appendix C) and in Bloom's Taxonomy; which ranges from simple recall, understanding, application, analysis, and synthesis, to evaluation as indicated below.

Bloom's Taxonomy Verb List

The list of verbs in Table 7 is tied to each level of Bloom's taxonomy: recall, understanding, application, analysis, synthesis, and evaluation, where recall is the lowest level and evaluation is the highest level of knowledge. (For example, recall is the level at which the game show Jeopardy is aimed: however, simple recall of facts does not indicate that those facts can be synthesized to produce a favorable or desirable result. For more information, see <http://www.teachervision.fen.com/teaching-methods/curriculum-planning/2171.html>.)

Exam Structure and the Number and Distribution of Examination Questions

The exam blue print and the number and distribution of test questions that will be sufficient to demonstrate capability and competency for a specific task, or as a whole for a specific level of certification, are determined by the SMEs following the review and validation of the various components of the practice analysis. There are likely to be some questions that are essential and others that are important but not as essential. All essential issues must be addressed; the other issues are only addressed if they are found to be important to practice. A Domain (see Appendix C) such as "Inspection of Airfield Placement Operations" may be more important and require more questions to assess than the Domain for "Care and Maintenance of Testing and Inspection Equipment." Domains may also be equally important. In addition, in examining the profile for an "Airfield HMA Placement Operations and Field Testing Technician" (Table 4), it is likely that an entry level technician, i.e. a Level I, will have less content to be tested on than a senior or chief technician, i.e. Level IV. A senior or chief technician or inspector will be expected to have already inculcated the lower levels of knowledge and skills, having already been tested and passed such levels.

As a purely practical matter, for a test being taken on a computer there are costs associated with longer tests: if these costs outweigh the benefits, a shorter test will be delivered. For paper and pencil exams, one must take note of candidate fatigue; test sessions of more than 3 hours may lead to diminishing returns in that candidates will become fatigued and answer fewer questions correctly. It is unfair to base the future of a candidate who may not be familiar with, or comfortable with, testing on overly lengthy exams. Taking these considerations together, SMEs will decide upon adequate test length.

Knowledge: Recall the basic facts. The simple level of thinking	Tell, list, show, find, label, say, recite, check, locate, choose, select, name, identify, read, write, match, cite, count, define, draw, indicate, name, point, quote, recognize, record, relate, repeat, state, tabulate, and trace.
Comprehension: Understanding the idea is the key	Translate, retell, define, interpret, outline, expand, reward, qualify, alter, change, spell-out, account for, associate, classify compare, compute, contrast, describe, differentiate, discuss, distinguish, explain, estimate, express, locate, interpolate, predict, report, and restate.
Application: Using facts to find solutions to problems.	Solve, adopt, use, try, relate, illustrate, diagram, construct, employ, report, interview, record, apply, calculate, complete, demonstrate, dramatize, employ, examine, illustrate, interpret, locate, interpolate, operate, order, predict, practice, relate, report, restate, review, schedule, sketch, solve, translate and utilize.
Analysis: Examining parts in relationship to the whole	Break down, uncover, look in to, dissect, examine, take apart, classify, simplify, inspect, categorize compare, contrast, analyze, appraise, contract, criticize, debate, detect, diagram, differentiate, distinguish, experiment, infer, inspect, inventory, question, separate and summarize.
Synthesis: Creating new or original ideas for products	Invent, compose, combine, reorganize, develop, blend, form, originate, reorder, produce, design, predict, arrange, assemble, collect, construct, create, generalize, integrate, manage, organize, plan, prepare, prescribe, propose and specify.
Evaluation: Judging the value of ideas or products	Translate, debate, evaluate, grade, select, reject, determine, judge, criticize, recommend, rank, editorialize, appraise, assess, choose, critique, estimate, measure, rate, revise, score, and test

Table 7. Bloom’s Taxonomy Verb List.

Practical and Hands-On Performance Examinations

While a practical hands-on test may be of value for an “Airfield HMA Placement Operations and Field Testing Technician” it is difficult and usually quite costly to administer, as the same level of rigor needs to be applied to a practical or hands-on tests as a written test (that is, it must be fair, valid, and reliable). An important point to keep in mind is that practical tests are not objectively scored. With objectively scored examinations, such as multiple choice examinations, the focus of the effort is on the development of the examination itself. However, with practical examinations in many cases the process of developing the examination is obvious as the focus shifts to the development of a standardized method of scoring the examination. The development of the examination is usually a straightforward process if the knowledge and skills of the tasks to be evaluated are based on a specific industry standard; i.e. ASTM, AASHTO, or other. The process becomes much more difficult if the basis for such tasks is associated with a general industry practice. According to the Council on Licensure, Enforcement and Regulation (CLEAR), there are several important questions which need to be asked before a decision is made to use practical examinations:

- Is the behavior being measured something that could not be evaluated by the use of a multiple choice or objectively scored examination?
- Are the evaluators thoroughly trained prior to the exam administration?
- Are the evaluators free of conflicts of interest concerning the candidates?
- Are there detailed criteria for evaluating and scoring?

- How will a successful performance be defined?
- Does each evaluator make an independent rating?
- Are at least two independent evaluations made for each candidate?
- Is the evaluation free of potentially biasing information about the candidate that is not related to the examination performance?
- Has the examination session been documented (proctored, audio or video taped)?

If administered at labs, all labs should be similarly equipped. The evaluators must also be similarly qualified and trained and must administer tests according to the same criteria. Inter-rater reliability is an issue: that is, do Evaluator A and Evaluator B score similarly for like tests? Evaluators must also be disinterested in that the success or failure of the candidate under review should not have any impact on them. Then, there is the issue of liability: if a candidate breaks valuable equipment, or is injured or injures someone; where does the liability rest? Many labs are unwilling to test people who are not their own employees for this very reason. Evaluator fatigue and language barriers are other factors that need to be considered. Removing as much subjectivity as possible is vital to maintaining the reliability of the examination process. Needless to say, an organization needs to consider the option of using a practical or hands-on test very carefully, as a well-designed, multiple choice examination maybe sufficient to produce the intended results. Multiple choice exams that are computer based offer several design forms that include a wide range of interactive assessment methods and tools, i.e. computer adaptive testing, drag and drop type questions (Figure 10), point and click type questions, and so on.



To perform the Nuclear Density Compaction Test in accordance with ASTM and/or AASHTO, which pieces of equipment should the technician use?

Drag and Drop the proper equipment into the area below.



Figure 10. Drag & Drop Example



The computer gaming industry has developed sophisticated tools that are being used to simulate situations for certification testing purposes. While these simulations may lack the verisimilitude of a hands-on field test, they do serve as excellent proxies. Computer-generated simulations avoid the issues associated with maintaining a static test bench, with evaluators and inter-rater reliability, legal liability, and many other test administration logistical issues. Advantages of CBT simulation examinations include:

- Testing tools that go beyond the multiple choice question and checklist type exams by simulating actual testing and or inspection conditions and scenarios.
- Testing one or more of the related tasks at the same time
- Replaces both the written and hands-on performance exams
- Eliminates issues related to bias and examiner involvement
- Offers objective rather than subjective scoring
- Testing convenience and flexibility in high security nationally available test centers
- Immediate grading and results
- Reasonable cost and efficient administration
- No liability issues
- Reliable data collection on candidate and exam performance

In an unrelated study, NICET asked industry SMEs in the Construction Materials Testing field if they felt a hands-on or performance test was necessary for that field. According to the task being cited, positive responses ranged from 49 to 82 percent. Thus, NICET is investigating the use of computer simulation to create a performance test that will be used to demonstrate the effectiveness of this method of testing and to qualify the candidates to a standard methodology. It is hoped that this will alleviate both the liability issues and the reliability issues, while allowing candidates to test when they are ready and not when the lab is free so they can use the test equipment.

Certification Program Administration

A fair, reliable, and valid certification program that is defensible must offer the same examination and certification experience to all candidates to the greatest extent possible. Such experience begins from the moment the candidate is applying to take the test and continues through the acceptance of the application, the assignment of the testing date and location, testing, scoring, the feedback of test results, the certification process, and finally the issuance and mailing of the credential.

The Program Detail Manual

The “Program Detail Manual” is the candidate’s handbook; it includes and explains all the aspects of the examination and certification processes and requirements for that specific program. The manual typically includes:

- A description of the program, its goals, and target pool of candidates.
- Application forms and the application procedure.
- A fee schedule; i.e. testing fees, recertification renewal fees, refund policies, and associated general services fees).
- An overview of the development process, including the “Job Task Analysis and Technician Profile.”
- Recognition of the industry supporting the program and its pool of SMEs.
- The specific requirements for certification.



- An ample description of the exam content.
- Sample questions.
- Subject matter references and training resources.
- Scoring and reporting procedures.
- Test scheduling, test center locations and general test center requirements, i.e. what is allowed and not allowed in a test center such as reference materials, type of calculators, break periods, etc.
- Hints on what to expect and how to prepare for testing.
- Process timelines including registration deadlines.
- Requirements for recertification.
- The organization's "General Administrative Policies."
- The candidate's and certificant's required "Code of Ethics."
- The organization's "Due Process" system and typical consequences for violating the code of ethics; i.e. certification suspension, certification revocation, and so on.

The manual is a living document which needs to remain up to date for each program the organization offers. The manuals are typically free and may be published in a hardcopy format or be available for downloading from an electronic format through the organizations website. Many organizations currently offer complete electronic/computer-based application and test registration and payment processes. A draft "Program Detail Manual for Airfield HMA Placement Operations Inspection and Field Testing Technician" is presented in Appendix E.

Exam Delivery Methods

Examinations can be delivered using one or a combination of several mechanisms. Such mechanisms include P & P testing, CBT, or internet-based testing (IBT). There are advantages and disadvantages to each type of delivery method.

Paper and pencil delivery has been the traditional method of exam delivery for years and has the advantage of being a familiar mechanism to all candidates. However, the disadvantage lies with its being time and labor intensive; exams must be printed, coupled with answer sheets, secured with any extra materials in a candidate focused test package, delivered on time, and returned on time to be checked in. Answer sheets must be checked and exam results scanned, scored, and reported back to the correct candidate in a timely manner. Such handling processes can take 2 to 3 weeks to accomplish.

Computer-based testing is becoming a much more popular process as more and more dedicated exam administration centers are established across the country. It has the advantage of more flexible scheduling, secure proctored sites, and immediate results. The disadvantages include the fact that such centers may not be as close as paper and pencil test administration sites since they are usually located in and around more populated urban areas. There are also costs associated with computer-based delivery that may outweigh their advantages.

Internet-based testing is a new process. It has the advantage of being administered at the candidate's chosen site. The disadvantages lie mainly in security: how do you ensure that the person taking the exam is actually the candidate and that they have not received help from anyone else in the room? A similar proctor arrangement is needed such as that for paper and pencil testing; while multiple sites might be convenient, how is the testing agency to arrange for multiple, disinterested proctors? An additional disadvantage lies in the possibility of item exposure through unscrupulous behavior. That is, either the candidate or the proctor may



be able to extract items for personal use or for the use of others, and gain an unfair and untrue advantage in testing.

Exam Schedule

Exam administration cycles are determined by several external events: does the candidate pool have natural examination times, i.e. does a majority finish a course of study or a practice interval at the same time? Are there times when the candidate pool might not be working, i.e. seasonal employment? How many qualified candidates are needed in the industry? What is the growth expected in the industry? Are candidates accustomed to testing and thus can be self-directed, or will testing windows help to persuade candidates to prepare and test? Are there industry sponsored study cohorts, i.e., is there an association that conducts education/training with the end result being testing and then certification? For example, the NICET exams are administered on a quarterly schedule at more than one exam site in most of the US States and territories. At least one exam site is available each month in each of the subject States or territories. Furthermore, special arrangement test centers are established when needed.

Exam Location

Exams must be administered in secure proctored sites. If exams are administered via computer, the computer systems must have comparable or like capability. If practical hands-on testing is administered, labs must be similarly equipped. Exam sites should be quiet and comfortable. Appropriate sites may be at local universities or colleges, at test vendor sites, and at appropriately configured sites of industry partners. Contracts must be negotiated for these sites, and contacts for test delivery, test administration, and test return must be appointed. All personnel involved, including the test administration proctors, must assure that each step is being followed to ensure exam security and the security and protection of the candidate's privacy of information and his or her exam results. NICET, for example, has a network of over 300 regular and special testing sites across the United States. Most permanent sites are located at colleges, universities, and various learning institutions. Its special test sites are set up when needed as a result of requests of large groups of candidates which need to test in locations where a regular test site is too far or unavailable. All test sites and their respective proctors must meet NICET's criteria and guidelines for exam administration (see Appendix D).

Candidate Certification and Re-certification Requirements

Candidates are certified after all the requisite program certification requirements are met. Such requirements are established by the relevant group of SMEs and validated by the respective industry representation as previously discussed. Certification requirements generally include the following:

- Passing the written examination for the specific level of certification.
- Meeting the minimum relevant work experience requirements for that specific level (Table 4) for "The Airfield HMA Placement Operations Inspection and Field Testing Technician Profile."
- Verification of competency, which is normally provided by the examinee's immediate supervisor as identified by the examinee in the employment history section of the test application form or by another individual, in situations where the supervisor is a non-technical person, who does have technical expertise in the specialty area and has first-hand knowledge of the examinee's specific job skills. Verification of competency is the acknowledgement that the verifier has personally observed the examinee repeatedly and correctly perform the task or utilize the particular relevant knowledge required. The verifier must also complete and sign the statement of understanding to



that effect and is part of the candidate's test application form (see Program Detail Manual Appendix E).

- A Professional Recommendation can also be required as a general character reference, particularly for the upper levels of the certification track, i.e. Levels III and IV). The recommender is a qualified person who has good knowledge of the candidate other than his verifier.
- A hands-on performance testing maybe a fifth requirement for certification, as determined by the program's design.

Certified candidates are issued three official documents indicating their certification field, certification subfield, the level of certification, certification identification number and the dates of issue and expiration. Such documents include: a certificate, a letter, and a wallet card.

Properly administered certification programs mandate continued competence. They do this by requiring that the certified person obtain specific continued education that the program believes will continue to advance the knowledge of the certified person.

Certification bodies use certification periods which vary between 3 to 5 years. NICET does this through its insistence on continued professional development and practice that is demonstrated prior to the renewal of the certification through a required recertification process once every 3 years. Thus, renewal of the certification is not automatic. Certificants must meet specific recertification criteria before their certifications can be reissued and they maintain their "Active" status. The recertification requirements are detailed under NICET Policy 30. The essence of the process requires certificants to pay the required fees and accumulate ninety (90) Continued Development Points (CPDs) in the 3-year period, i.e.30 CPD points per year. Seventy-two (72) points are accumulated as "Active Practitioner Points" resulting from the candidate's full time employment activity in the certification specialty area. The remaining eighteen (18) points can be accumulated as a result of related training and professional development activity, testing and certification activity, program development and SME work, and so on. A recertification exam is also an option for specific cases. Certificants who fail to renew their certification on time fall into a delinquent status and are subject to penalties before their certification is reissued. Failing to renew will lead to an "Expired" status of the certification. In such cases the candidates are required to completely start over, i.e. a candidate certified at Level 3 in an expired status must go back and start testing starting with Level 1 if he or she wants the certification back. Certificants may also request and qualify for a "Retired" or "Inactive" status if they meet specific conditions.

Code of Ethics

Engineering technicians must recognize that the services they render have a significant impact on the quality of life for everyone. As they perform their duties and responsibilities on behalf of the public, employers, and clients, they shall demonstrate personal integrity and competence. Accordingly, candidates and certificants shall:

- Have due regard for the physical environment and for public safety, health, and well being. If their judgment is overruled under circumstances where the safety, health, property, or welfare of the public may be endangered, they shall notify their employer, client, and such other authority as may be appropriate. An employee shall initially express those concerns to the employer.



- Undertake only those assignments for which they are competent by way of their education, training, and experience.
- Perform their duties in an efficient and competent manner with fidelity and honesty.
- Admit and accept their own errors when proven wrong and never distort nor alter the facts in an attempt to justify their decisions.
- Avoid conflicts of interest whenever possible. When unavoidable, they shall disclose to their employer or client, in writing, any action that might create the appearance of a conflict of interest.
- Avoid receiving and granting bribery in all its forms.
- Strive to maintain their proficiency by updating their technical knowledge and skills in engineering technology.
- Not misrepresent or permit misrepresentation of their own or their associate's academic or professional qualifications, nor exaggerate their degree of responsibility for any work.
- Not reveal facts, data, or information obtained in connection with services rendered without prior consent of the client or employer except as authorized by law.

Violation of the “Code of Ethics” must be thoroughly investigated through a well established “Due Process” system. Enforcement of the “Code” is critical to the integrity and success of certification programs and credibility of the certification body. Policy must empower the organization to have the ability to apply a hierarchy of suitable penalties, such as suspension of testing activity, the suspension or revocation of certification, and so on in case of proven violation. A certification body operating as an independent third party organization has the freedom and is better situated to effectively enforce the “Code of Ethics,” follow the established “Due Process,” and apply the required penalties.

All of the previously cited items must be decided upon to create and to ensure the administration of a fair, reliable, valid, and therefore defensible, certification program.



7. RECOMMENDATIONS FOR A PROCESS TO IMPROVE AIRPORT HMA TECHNICIAN SKILLS AND KNOWLEDGE

Regardless of the means of assessment (i.e., certificate or certification), the practitioners of any field need an underlying educational foundation. Practitioners need to be educated and trained to a national industry standard. They also need to have the means of learning new standards, procedures and practices, particularly those associated with local or specific project conditions or requirements. Likewise, industry leaders need to have a mechanism to impart new ideas, procedures, and practices to the industry workforce. An educational or training program that allows both the industry to inform the workforce and the workforce to learn what they need is essential.

One of the most important factors for the success of a certification program is the presence of a well designed and accessible training component. Such resources are particularly important for entry level candidates who may be starting their careers or transitioning from other industries. While the idea is to examine the candidate on the profession as a whole, there is a need to have educational programs, if for no other reason than candidate comfort. No one likes to feel unprepared for an exam and most people do feel happier if they have a means of preparation. However, certification programs should not be directly engaged in providing education. It is very difficult to prevent instructors who are knowledgeable of the content of the exam from unconsciously stressing those content areas in their educational activities. This provides a completely unfair advantage to the candidate who is lucky enough to access this instruction and/or this instructor. Training must be administered as a parallel but separate activity to protect the value and integrity of the assessment and credentialing process.

The job/task analysis provides detailed information on which to base an educational program. The results of this analysis, when published, will show what areas of practice are considered to be most important. From this, educational and training companies can develop a curriculum with a national focus; the companies can also inject local nuances that may be particular to that area or region. Gaps indicating training development needs could also be easily identified. Thus a workforce will be well served in learning both regional and national information. This will serve the leaders of the industry as well. They will be confident that their workforce is aware of and familiar with national practices. This will also make it easier for industry to solicit work in adjoining states or regions.

The federal government regulates against discrimination in the workforce through enactment of 29CFR, Title 9, Part 1607, *Uniform Guidelines on Employee Selection Procedures*. This law notes that employment decisions may be defined as adversely discriminatory unless the procedure has been validated in accordance with federal guidelines stipulating that for the mechanism of discrimination, e.g., certification, the content must be determined empirically and cannot be used as a tool for employee screening or promotion if supported only by anecdotal evidence. Furthermore, the law mandates that “any validity study should be based upon a review of information about the job for which the selection procedure is to be used.”

Properly administered certification programs mandate continued competence. They do this by requiring that the certified person obtain specific continued education that the program believes will continue to advance the knowledge of the certified person. As discussed previously, with the TCCC and its NTTR there already exists a national educational and training organizational model that has an education/training program with multiple industry resources in place. The TCCC is open to membership from both state and federal departments of transportation and develops curricula and assessments that are specifically focused on transportation workforce issues. The TCCC, NICET and the other industry members have jointly worked together to develop a framework in which training institutions and entities provide the education and training

and its credentialing partners provide the testing and certification services. Both entities are striving toward the common goal of an educated and knowledgeable workforce that is cognizant of the full spectrum of transportation issues; from substrate to maintenance.

Need For a National Certification Program

As part of the job/task analysis survey, participants were asked if there was a need for national certification of HMA airfield inspection personnel. For this survey question, the results showed that from 74 percent (at Level I) to 60 percent (at Level III) responded that there is such a need. At Level IV, the response was roughly half and half: half said the program was needed and half said it was not as shown in Figure 11. This last result is not entirely surprising, since a Level IV practitioner is presumed to have risen through the ranks and earned at least 10 years or more of experience in airport and other areas of construction inspection, e.g. highway, bridge and public works. At that senior level he is considered to be more or less a transportation construction generalist. By that time, they are involved in mostly managerial tasks and should know what is technically necessary to practice. Still, most of the respondents felt there was a need for a national certification program at Levels I through III, from entry to less than 10 years experience. The full survey results are shown in Appendix C.

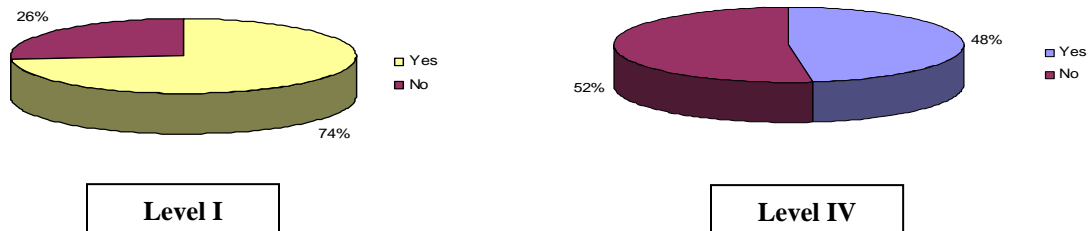


Figure 11. Survey results for the question: Do you think there is a need for a national certification program for "Airfield HMA Placement Operations Inspection and Field Testing Technicians"?

Based on these findings, the investigators recommend that an educational program with an assessment component be developed for HMA Airfield inspection personnel. However, the researchers cannot be sure that the respondents in particular and industry in general are completely aware of the differences between a certification and a certificate program as previously defined. Whether that assessment tool be a certificate program or a certification program is, of course, not the investigators decision to make. To help the decision makers, the advantages and disadvantages of each type of program follow.

Comparison of Certificate and Certification Programs

The advantages of a certificate program are summarized as follows:

- Can be easily created by only one or a few persons.
- Is portable and configurable for delivery in one, two, or more units of time.
- Can have an assessment tool to measure the amount of short term information retained. It may also be administered without an exit exam.



- May be fiscally prudent when costs are set to attract clientele, and to cover expenses of program creation, instructor time/effort/travel/housing, and other associated costs.
- May or may not involve continuing education to maintain certificate.
- May or may not be rescinded for cause.

The advantages of a certification program are summarized as follows:

- Is created by subject matter experts that develop criteria that meets industry standards and needs.
- Corroborated by validation surveys to industry practitioners to refine the contents, importance and frequency of tasks performed.
- Is national in scope, with industry-wide involvement.
- Assessments for all practitioners to one industry-accepted standard.
- Fiscally prudent, as costs may be set to allow beginning career entrants to access the examination without undue hardship.
- Inclusive of continuing professional involvement and education to maintain the same or higher, level of knowledge through a recertification.
- Rescinded for cause; most likely for violation of code of ethics.

The disadvantages of a certificate program are as follows:

- Can be created absent of any development standard with limited input and validation.
- Assessment is optional, usually with a passing score that is arbitrarily set and can be “adjusted” to maintain a high level of student achievement.
- May represent a limited view of industry.
- Can be quite costly for the average candidate without employer support.

The disadvantages of a certification program are as follows:

- Takes time and expense to produce when done according to industry standards.
- Requires participation by a significant number of industry subject matter expert volunteers.
- Is not immediate, i.e. requires time for testing, approval of credentials and certification.
- Requires solid stakeholder and rule-maker support and buy in.
- Requires frequent performance tracking, follow-up, maintenance and updating.
- Has a passing score set by psychometrically accepted methodologies involving participation of subject matter experts and is not immediate or easily adjustable.

Recommendations

Based on the information collected during this project, there is broad support for a program of national certification of airport HMA technicians and inspectors. Although not specifically considered in this project, it is believed that not only is such a program desired, but it would also contribute to improved quality and performance for HMA airfield paving projects. Essential criteria for the success of this certification program:

- Proper design and administration in accordance with industry standards
- Focus on national core competencies with the flexibility to accommodate regional needs
- Stakeholder support during development, administration and maintenance



- Institution of requirements and hierarchy of needed certification levels in contracts, codes and specifications
- Establishment of an appropriate marketing program
- A reward system for certificants, e.g. promotions, bonuses, reimbursement of training/testing/certification fees, etc.
- The availability of appropriate, accessible and reasonably priced training programs
- Continued maintenance and updating to accommodate industry needs

While existing programs could be used or adapted to meet this need, e.g. as the Corps of Engineers' program for FAA projects or others described previously, such an approach has the drawbacks of the "certificate" versus "certification" issues as indicated.

As such, from the results of this study the project team recommends the best course of action is to create a well designed training /education and credentialing system in accordance with the following:

- Use the Job Task Analysis (Profile and Competency Matrix) developed and the supporting materials already created by NICET including the validation results, reference guides and program detail manual to complete the development of a certification program. Using its expertise in developing programs, NICET could continue the work with industry SMEs to create a useful and valuable certification program with testing for different levels of expertise. It can also be designed to accommodate specific add-ons, i.e. specialty certifications, generated by special needs. This program would be developed according to the industry standards to meet ANSI accreditation requirements.
- Work in coordination and collaboration with the TCCC, NCAT, The Asphalt Institute, The Corps of Engineers and others industry partners to provide well designed parallel educational programs that focus on building and enhancing the competencies of HMA technicians and inspectors as identified in the Job Task Analysis. The partnership must fulfill the national needs as well as the needs of regional and local entities.

Such a coordinated education and certification program would efficiently provide the Federal Aviation Administration (FAA), the AAPTP and the industry with the greatest flexibility, the most mobility, and the greatest reliability in terms of educating and assessing the airfield HMA construction inspector workforce, while having the greatest probability of improving the quality of airfield HMA construction projects.

APPENDIX A

HMA Training/Certification Program Identification Matrix

APPENDIX A

HMA Training/Certification Program Identification Matrix

Introduction

A search of listed programs was performed in order to identify existing hot-mix asphalt certification and accreditation program activities. Table A-1 covers the findings at the state level, and it is presented in two parts. The first part summarizes the findings regarding the state programs, including information about the program source, whether it addresses HMA for highway or airfield training, and whether certification is a part of the program. In the second part of Table A-1 there is additional detail regarding the programs with certification, including how they address experience requirements, the examination requirements, and the cost of the program.

In table A-2, the results of the findings of national-level or multi-agency hot-mix asphalt certification and accreditation program activities are summarized, again in two parts. The first part of table A-2 identifies the program, briefly summarizes the scope and content, and again identifies whether the program addresses HMA for highway or airfield training and whether certification is a part of the program. As with the second part of table A-1, in the second part of table A-2 there is additional detail regarding the programs with certification, including how they address experience requirements, the examination requirements, and the cost of the program.

Table A-1. HMA Training/Certification Program Identification Matrix - State Listings.

#	State	Program Owner/Creator	Web site address	Notes	Highway	Airfield	Training	Certificate	Certification	Education Requirements
1	AL	Alabama Asphalt Pavement Association.	http://www.alasphalt.com/ http://www.alasphalt.com/training		X		X	X		
	AL DOT	Part of South East Region Alliance "SETFTTQ"	http://www.dot.state.al.us		X		X			
2	AK	Part of Asphalt Pavement Alliance	http://www.asphaltalliance.com	Lobby group	X					
	AK DOT	Part of The Western Region Alliance "WAQTC" see below.	http://www.dot.state.ak.us http://www.waqtc.org/		X		X			
3	AR	Part of Asphalt Pavement Alliance	http://www.asphaltalliance.com	Lobby group	X					
		Arkansas Asphalt Pavement Association	http://www.arasphalt.com		X					
	AR DOT	Part of the Multi Regional Alliance "M-TRAC"	http://www.ahtd.state.ar.us		X		X			
4	AZ	Part of Asphalt Pavement Alliance	http://www.asphaltalliance.com	Lobby group	X					
	ADOT	Arizona Technical Institute "ATI"	http://www.dot.state.az.us	ADOT test methods	X		X		X	
5	CA	Asphalt Pavement Association.	http://www.apaca.org		X					
	CA	"Northern" California Asphalt Pavement Association.	http://www.norcalasphalt.org/		X		X	X		
	CALTRANS		http://www.dot.ca.gov		X		X			
6	CO	Colorado Asphalt Pavement Association : administered through the Rocky Mountain Asphalt Education Center	http://www.co-asphalt.com/		X		X		X	
	CO DOT	Part of The Western Region Alliance "WAQTC" see below.	http://www.dot.state.co.us		X		X			
7	CT	Part of Asphalt Pavement Alliance	http://www.asphaltalliance.com	Lobby group	X					
	CT DOT	Part of The North East Region Alliance "NETTCP"	http://www.ct.gov/dot http://www.nettcp.com		X		X	X	X	High School Diploma
8	DC	Part of the Mid Atlantic Alliance "MARTCP"	http://www.ddot.dc.gov/ddot/site/default.asp		X	For non-commercial airfields only	X			
9	DE	Part of Asphalt Pavement Alliance	http://www.asphaltalliance.com	Lobby group	X					
	DE DOT	Part of the Mid Atlantic Alliance "MARTCP"	http://www.state.de.us/deldot		X		X			
10	FL	Asphalt Contractors Association of Florida	http://www.acaf.org/ http://ctt.ce.ufl.edu/default.aspx	Annual Asphalt Conference	X					
	FL DOT	Part of South East Region Alliance "SETFTTQ"	http://www.dot.state.fl.us		X		X			

Table A-1. HMA Training/Certification Program Identification Matrix - State Listings (continued).

#	State	Program Owner/Creator	Web site address	Notes	Highway	Airfield	Training	Certificate	Certification	Education Requirements
11	GA	Part of Asphalt Pavement Alliance	http://www.asphaltalliance.com	Lobby group	X					
	GA DOT	Part of South East Alliance "SETFTTQ"	http://www.dot.state.ga.us/dot/construction/materials-research/techniciancert.shtm	Certification in materials testing	X		X		X	
12	HI	Hawaii Asphalt Paving Industry	http://www.hawaiiasphalt.com/		X					HMA Seminar Series: http://www.hawaiiasphalt.com/news_info/info.htm
	HI DOT	Part of Western Region Alliance "WAQTC" (see below)	http://www.state.hi.us/dot		X		X			
13	ID	Idaho Asphalt Conference	http://www.webs1.uidaho.edu/bayomy/IAC/	Annual Asphalt Conference	X					
	ID DOT	Part of Western Region Alliance "WAQTC" (see below)	ID DOT: http://itd.idaho.gov/		X		X			
14	IL	Illinois Asphalt Pavement Association	http://www.il-asphalt.org/		X					
	IDOT		http://www.dotd.state.il.us		X		X			
15	IN	Asphalt Pavement Association of Indiana:	http://www.ind-asphalt.com		X					
	IN DOT	Part of the Multi-Regional Alliance "M-TRAC"	http://www.ind-asphalt.com		X		X			
16	IA	Asphalt Paving Association of Iowa	http://www.apai.net/	Co-op programs with AI, NAPA and FHWA	X		X		X	Airport Pavement Workshop: Asphalt Pavement Design, Construction and Maintenance, April 3-5/07, KS City, MO
	IA DOT	Part of Multi Regional Alliance "M-TRAC"	http://www.dot.state.ia.us/materials/Training/reference_documents/Registration%20Book2.pdf	Extensive program for training and certification	X		X		X	not specific; equivalent of high school
17	KS	Part Of Asphalt Pavement Alliance	http://www.asphaltalliance.com	Lobby group	X					
	KS DOT	Part of Multi Regional Alliance "M-TRAC"	http://www.ksdot.org		X		X			
18	KY	PlantMix Asphalt Industry of Kentucky	http://www.paiky.org/		X		X	X	X	Winter Training Calendar; http://www.paiky.org/whats_new/2007DraftSchedule.pdf
	KY DOT	Part of South East Region Alliance "SETFTTQ"	http://www.kytc.state.ky.us		X		X			
19	LA	Louisiana Asphalt Pavement Association	http://www.lahotmix.org/		X					
	LA DOT	Part of South East Alliance "SETFTTQ"	http://www.dotd.state.la.us		X		X			
20	ME	Part of Asphalt Pavement Alliance	http://www.asphaltalliance.com	Lobby group	X					
	ME DOT	Part of North East Region Alliance "NETTCP"	www.nettcp.com http://www.maine.gov		X		X			

A-4

Table A-1. HMA Training/Certification Program Identification Matrix - State Listings (continued).

#	State	Program Owner/Creator	Web site address	Notes	Highway	Airfield	Training	Certicate	Certification	Education Requirements
21	MD	Maryland Asphalt Association	http://www.mdasphalt.org/	MDSHA --offering 3 HMA courses	X		X			
	MD SHA	Part of Mid Atlantic Region Alliance "MARTCP"	http://www.sha.state.md.us/businesswithsha/Evaluations/omt/testlab.asp	uses MARTCP courses for HMA	X		X		X	not specific; equivalent of high school
22	MA	Part of Asphalt Pavement Alliance	http://www.asphaltalliance.com	Lobby group	X					
	MA DOT	Part of North East Region Alliance "NETTCP"	http://www.magnet.state.ma.us/mhdwww.nettcp.com		X		X			
23	MI	Asphalt Pavement Assn of Michigan	http://www.apa-mi.org/		X					
	MI DOT	Part of Multi Regional Alliance "M-TRAC"	www.mdot.state.mi.us www.michigan.gov/mdot/		X		X			
24	MN	Minnesota Asphalt Pavement Association	http://www.asphaltisbest.com/		X					
	MN DOT	Part of Multi Regional Alliance "M-TRAC"	http://www.dot.state.mn.us		X		X			
25	MS	Mississippi Asphalt Pavement Association	http://www.superpave.com/		X		X		X	CAT Level I-III; http://www.superpave.com/education.cfm
	MS DOT	Part of South East Region Alliance "SETFTTQ"	http://www.mdot.state.ms.us		X		X			not specified
26	MO	Missouri Asphalt Pavement Association	http://www.moasphalt.org/		X					
	MO DOT	Part of Multi Regional Alliance "M-TRAC"	http://www.modot.state.mo.us		X		X			
27	MT	Part of Asphalt Pavement Alliance	http://www.asphaltalliance.com www.mdt.mt.gov/	Lobby group	X					
	MT DOT	Part of Western Region Alliance "WAQTC" see below.	http://www.mdt.state.mt.us		X		X			
28	NC	Carolina Asphalt Pavement Association	http://www.carolinaasphalt.org/		X					
	NC DOT	Part of South East Region Alliance "SETFTTQ"	http://www.ncdot.org		X		X			
29	ND	Dakota Asphalt Pavement Association (ND & SD)	www.dakota-asphalt.org		X		X			Bituminous Technology Classes: www.dakota-asphalt.org
	ND DOT		http://www.dot.nd.gov		X		X			
30	NE	Nebraska Concrete & Aggregates Association	http://www.nebroncagg.com		X		X			Training; http://www.nebroncagg.com/training/index.htm
	NE DOT		http://www.dor.state.ne.us		X		X			
31	NV	Part of Western Research Institute			X					
	NV DOT	Part of Western Region Alliance "WAQTC" (see below)	http://www.nevadadot.com		X		X			
32	NH	Certification program through NETTCP	http://www.nettcp.com/		X		X			
	NH DOT	Part of North East Region Alliance "NETTCP"	http://www.webster.state.nh.us/dot www.nh.gov/dot		X		X			
33	NJ	New Jersey Asphalt Pavement Association	http://www.njapa.com/		X					Lists several events: http://www.njapa.com/njapa-events.html
	NJ DOT	Part of Mid Atlantic Region Alliance "MARTCP"	http://www.state.nj.us/transportation		X		X			
34	NM	New Mexico Ready Mix Concrete and Aggregates Association	http://www.concrete-nm.org		X					Seminars & Lunch n Learn training prog.; http://www.concrete-nm.org/events.html
	NM DOT	TTCP & part of the Western Alliance "WAQTC" (see below)	http://www.nmshtd.state.nm.us		X		X		X	
35	NY	New York Construction Materials Association	http://www.nymaterials.com/	Annual paving conference	X					
	NY DOT		http://www.dot.state.ny.us		X		X			
36	OH	Flexible Pavements of Ohio	http://www.flexiblepavements.org/		X		X	X	X	Techn Cert Classes: http://www.flexiblepavements.org/tech_cert.cfm
	OH DOT	Part of Multi Regional Alliance "M-TRAC"	http://www.dot.state.oh.us		X		X			

Table A-1. HMA Training/Certification Program Identification Matrix - State Listings (continued).

#	State	Program Owner/Creator	Web site address	Notes	Highway	Airfield	Training	Certificate	Certification	Education Requirements
37	OK	Part of Asphalt Pavement Alliance	http://www.asphaltalliance.com	Lobby group	X					
	OK DOT		http://www.okladot.state.ok.us		X		X			
38	OR	Asphalt Pavement Association of Oregon	http://www.apao.org/		X		X		X	Cert /Ed courses throughout year; http://www.apao.org/overviewed.shtml
	OR DOT	Part of Western Region Alliance "WAQTC" see below.	http://www.oregon.gov/ODOT/HWY/TECHSERV/training.shtml		X		X			not specified
39	PA	Pennsylvania Asphalt Pavement Association	http://www.pahotmix.org/		X		X	X		PennDOT courses; http://www.pahotmix.org/Education.asp
	PA DOT	NECEPT and part of Mid Atlantic Region Alliance "MARTCP"	http://www.dot.state.pa.us		X		X		X	
40	PR	Part of Asphalt Pavement Alliance	http://www.asphaltalliance.com	Lobby group	X					
	PR DOT	Part of South East Region Alliance "SETFTTQ"	http://www.dtop.gov.pr		X		X			
41	RI		www.dot.state.ri.us		X					
	RI DOT	Part of North East Region Alliance "NETTCP"	http://www.dot.state.ri.us http://www.nettcp.com/		X		X		X	
42	SC	Part of Asphalt Pavement Alliance	http://www.asphaltalliance.com		X					
	SC DOT	Part of South East Region Alliance "SETFTTQ"	http://www.dot.state.sc.us		X		X			
43	SD	Dakota Asphalt Pavement Association (North Dakota and South Dakota)	www.dakota-asphalt.org		X		X			
	SD DOT		http://www.sddot.com		X		X			
44	TN	Tennessee Road Builders Association	http://www.trba.org/		X		X			Lists several events: http://www.trba.org/members/seminars.asp
	TN DOT	Part of South East Region Alliance "SETFTTQ"	www.tdot.state.tn.us		X		X			
45	TX	Texas Asphalt Pavement Association	http://www.bxhotmix.org/		X		X		X	not specified
	TX DOT	Part of Western Region Alliance "WAQTC" see below.	http://www.dot.state.tx.us		X		X			
46	UT	UTAH LTAP Conference	http://www.utah2.usu.edu/Services/Workshops/asphalt/asphalt.html		X		X			
	UT DOT	Part of Western Alliance "WAQTC" see below.	http://www.dot.state.ut.us		X		X			
47	VA	Virginia Asphalt Association	http://www.vaasphalt.org/		X					VDOT Materials Cert; http://www.virginiadot.org/business/matschools.asp
	VA DOT	Part of North East Region Alliance "NETTCP"	http://virginiadot.org		X		X			
48	VT		http://www.nettcp.com/		X		X			
	VT DOT	Part of North East Region Alliance "NETTCP"	http://www.aot.state.vt.us		X		X			
49	WA	Washington Asphalt Pavement Association	http://www.asphaltwa.com/		X					
	WA DOT	Part of Western Region Alliance "WAQTC" see below.	http://www.wsdot.wa.gov		X		X			
50	WV DOT	Part of North East Region Alliance "NETTCP"	http://www.wvdot.com	Co-op program with Fairmont State College	X		X		X	

Table A-1. HMA Training/Certification Program Identification Matrix - State Listings (continued).

#	State	Program Owner/Creator	Web site address	Notes	Highway	Airfield	Training	Certificate	Certification	Education Requirements
51	WI	Wisconsin Asphalt Pavement Association	http://www.wispave.org/		X		X			
	WI DOT	Part of Multi Regional Alliance "M-TRAC"	http://www.dot.state.wi.us		X		X			
52	WY	Petersen Asphalt Conference	http://www.petersenasphaltconference.org/index.php		X					
	WY DOT		http://wydotweb.state.wy.us		X		X			
		WAQTC = Western Alliance for Quality Transportation Construction	http://www.waqtc.org/							
		M-TRAC = Multi-Regional Training and Certification	http://rebar.ecn.purdue.edu/Superpave/M-TRAC/index.htm							
		NETTCP = Northeast Transportation Training and Certification Program	http://www.nettcp.com/							
		SETFTTQ = Southeast Task Force on Technician Training and Qualification								
		MARTCP = Mid-Atlantic Region Technician Certification Program	http://www.martcp.org/index.asp							
		NECEPT = Northeast Center of Excellence for Pavement Technology	http://www.superpave.psu.edu/							

Table A-1. HMA Training/Certification Program Identification Matrix - State Listings (continued).

#	State	Program Owner/Creator	Experience Requirements	Examination Requirements	Re-Certification Requirements	Cost of Program	Cost of Recertification	Other/Description
1	AL	Alabama Asphalt Pavement Association.						
	AL DOT	Part of South East Region Alliance "SETFITQ"						
2	AK	Part of Asphalt Pavement Alliance						
	AK DOT	Part of The Western Region Alliance "WAQTC" see below.						
3	AR	Part of Asphalt Pavement Alliance						
		Arkansas Asphalt Pavement Association						
	AR DOT	Part of the Multi Regional Alliance "M-TRAC"						
4	AZ	Part of Asphalt Pavement Alliance						
	ADOT	Arizona Technical Institute "ATI"						
5	CA	Asphalt Pavement Association.						
	CA	"Northern" California Asphalt Pavement Association.						
	CALTRANS							
6	CO	Colorado Asphalt Pavement Association administered through the Rocky Mountain Asphalt Education Center	Certification Prerequisites: Work Experience Statement Levels ABCE: Submit a statement verifying a minimum of 30 days experience in testing of Hot Mix Asphalt and/or related materials. This is waived if the technician was LabCAT certified. Experience statement Level S: statement verifying a minimum of 30 days experience in the operation, set-up and profiling roadways using the HSP. (2) Verification for all Levels by a LabCAT supervisor certified in the levels the technician or operator is testing for. (3) A liability release form.			Asphalt Technician Certification Fees: Levels ABC: CAPA member or CDOT \$650, Non Member \$1200; Level AB: CAPA Member \$500, Non Member \$910; Level A: \$200, Non Member \$420; Level B: CAPA Member or CDOT \$300, Non Member \$510; Level CAPA Member or CDOT \$250, Non Member \$490 http://www.co-asphalt.com/documents/Certification-Program-Schedule.pdf		
	CO DOT	Part of The Western Region Alliance "WAQTC" see below.						
7	CT	Part of Asphalt Pavement Alliance						
	CT DOT	Part of The North East Region Alliance "NETTCP"	Six months experience in hot mix asphalt paving inspection under the supervision of an NETTCP certified HMA Inspector. Or, a minimum of two years experience in hot mix asphalt laydown operations as described in the NETTCP Policy Manual.	a.) Closed book examination; b.) Written Examination must be completed within ninety minutes.	2 days Written classroom course	HMA Paving Inspector Certification; Member cost \$495, Non-member cost \$685	Hot Mix Asphalt Paving Inspector Re-certification course: Member cost \$295, Non-Member cost \$400	
8	DC	Part of the Mid Atlantic Alliance "MARTCP"						
9	DE	Part of Asphalt Pavement Alliance						
	DE DOT	Part of the Mid Atlantic Alliance "MARTCP"						
10	FL	Asphalt Contractors Association of Florida						Scholarship Program
	FL DOT	Part of South East Region Alliance "SETFITQ"						

Table A-1. HMA Training/Certification Program Identification Matrix - State Listings (continued).

#	State	Program Owner/Creator	Experience Requirements	Examination Requirements	Re-Certification Requirements	Cost of Program	Cost of Recertification	Other/Description
11	GA	Part of Asphalt Pavement Alliance						
	GA DOT	Part of South East Alliance "SETFTTQ"	Must have been previously certified as a level 1 QCT, must have demonstrated field competencies to District TMOS (see website for details).		At least 12 hours of the required training hours must be received by attending the QCT Level 2 specific training classes. The remaining 6 hours of training may be obtained by attending one of the following: The annual joint contractor/dot bituminous construction workshop, QCT Level 1 training class, or the annual quality asphalt construction workshop.			
12	HI	Hawaii Asphalt Paving Industry						
	HI DOT	Part of Western Region Alliance "WAQTC" (see below)						
13	ID	Idaho Asphalt Conference						
	ID DOT	Part of Western Region Alliance "WAQTC" (see below)						
14	IL	Illinois Asphalt Pavement Association						
	IDOT							
15	IN	Asphalt Pavement Association of Indiana:						
	IN DOT	Part of the Multi-Regional Alliance "M-TRAC"						
16	IA	Asphalt Paving Association of Iowa						Scholarship Programs and Funding
	IA DOT	Part of Multi Regional Alliance "M-TRAC"	recommended, period unspecified		yes	\$500 to \$650	\$75.00 to \$100.00	
17	KS	Part Of Asphalt Pavement Alliance						
	KS DOT	Part of Multi Regional Alliance "M-TRAC"						
18	KY	PlantMix Asphalt Industry of Kentucky				\$50-\$85: http://www.kyt2.com/Info%20you%20need%20to%20know.htm		
	KY DOT	Part of South East Region Alliance "SETFTTQ"						Scholarship programs and funding
19	LA	Louisiana Asphalt Pavement Association						
	LA DOT	Part of South East Alliance "SETFTTQ"						
20	ME	Part of Asphalt Pavement Alliance						
	ME DOT	Part of North East Region Alliance "NETTCP"						

Table A-1. HMA Training/Certification Program Identification Matrix - State Listings (continued).

#	State	Program Owner/Creator	Experience Requirements	Examination Requirements	Re-Certification Requirements	Cost of Program	Cost of Recertification	Other/Description
21	MD	Maryland Asphalt Association				MAA members-\$425; Non Members \$600		
	MD SHA	Part of Mid Atlantic Region Alliance "MARTCP"	recommended, period unspecified	yes	Retake course or pass exam	\$200 Level I, \$770 Level II Call MAA contact	\$50.00	
22	MA	Part of Asphalt Pavement Alliance						
	MA DOT	Part of North East Region Alliance "NETTCP"						
23	MI	Asphalt Pavement Assn of Michigan						
	MI DOT	Part of Multi Regional Alliance "M-TRAC"						
24	MN	Minnesota Asphalt Pavement Association						
	MN DOT	Part of Multi Regional Alliance "M-TRAC"						
25	MS	Mississippi Asphalt Pavement Association						
	MS DOT	Part of South East Region Alliance "SETFTTQ"	varies - 3 months to 2 years	yes	course and exam			
26	MO	Missouri Asphalt Pavement Association						
	MO DOT	Part of Multi Regional Alliance "M-TRAC"						
27	MT	Part of Asphalt Pavement Alliance						
	MT DOT	Part of Western Region Alliance "WAQTC" see below.						
28	NC	Carolina Asphalt Pavement Association						
	NC DOT	Part of South East Region Alliance "SETFTTQ"						
29	ND	Dakota Asphalt Pavement Association (ND & SD)						
	ND DOT							
	NE	Nebraska Concrete & Aggregates Association						
	NE DOT							
31	NV	Part of Western Research Institute						
	NV DOT	Part of Western Region Alliance "WAQTC" (see below)						
32	NH	Certification program through NETTCP						
	NH DOT	Part of North East Region Alliance "NETTCP"						
33	NJ	New Jersey Asphalt Pavement Association						
	NJ DOT	Part of Mid Atlantic Region Alliance "MARTCP"						
34	NM	New Mexico Ready Mix Concrete and Aggregates Association						
	NM DOT	TTCP & part of the Western Alliance "WAQTC" (see below)		Each Technician will be required to pass both written and performance examinations.				
35	NY	New York Construction Materials Association						
	NY DOT							
36	OH	Flexible Pavements of Ohio			7 additional contact hours of instruction each year in relevant subjects approved by OCAPE			Scholarship Programs
	OH DOT	Part of Multi Regional Alliance "M-TRAC"						

Table A-1. HMA Training/Certification Program Identification Matrix - State Listings (continued).

#	State	Program Owner/Creator	Experience Requirements	Examination Requirements	Re-Certification Requirements	Cost of Program	Cost of Recertification	Other/ Description
37	OK	Part of Asphalt Pavement Alliance						
	OK DOT							
38	OR	Asphalt Pavement Association of Oregon	Prerequisite range from CAT-I - CAT II		Certifications are good for 3 years, To recertify you must retake the training class or retake the exam	Training Program:\$222.00		Education Foundation Scholarship Programs
	OR DOT	Part of Western Region Alliance "WAQTC" see below.	required, period unspecified			\$100		
39	PA	Pennsylvania Asphalt Pavement Association	One full hot-mix asphalt construction season (6 months) of experience and recommendation by a Certified Bituminous Field Technician or Superintendent and a District Assistant Construction Engineer.			\$25-\$480	\$25	
	PA DOT	NECEPT and part of Mid Atlantic Region Alliance "MARTCP"						
40	PR	Part of Asphalt Pavement Alliance						
	PR DOT	Part of South East Region Alliance "SETFTTQ"						
41	RI							
	RI DOT	Part of North East Region Alliance "NETTCP"						
42	SC	Part of Asphalt Pavement Alliance						
	SC DOT	Part of South East Region Alliance "SETFTTQ"						
43	SD	Dakota Asphalt Pavement Association (North Dakota and South Dakota)						
	SD DOT							
44	TN	Tennessee Road Builders Association						
	TN DOT	Part of South East Region Alliance "SETFTTQ"						
45	TX	Texas Asphalt Pavement Association	required, period unspecified	yes	course/exam	\$1,000	\$700	
	TX DOT	Part of Western Region Alliance "WAQTC" see below.						
46	UT	UTAH LTAP Conference						
	UT DOT	Part of Western Alliance "WAQTC" see below.						
47	VA	Virginia Asphalt Association						
	VA DOT	Part of North East Region Alliance "NETTCP"						
48	VT							
	VT DOT	Part of North East Region Alliance "NETTCP"						
49	WA	Washington Asphalt Pavement Association						Scholarship Programs
	WA DOT	Part of Western Region Alliance "WAQTC" see below.						
50	WV DOT	Part of North East Region Alliance "NETTCP"						

Table A-1. HMA Training/Certification Program Identification Matrix - State Listings (continued).

#	State	Program Owner/Creator	Experience Requirements	Examination Requirements	Re-Certification Requirements	Cost of Program	Cost of Recertification	Other/Description
51	WI	Wisconsin Asphalt Pavement Association						
	WI DOT	Part of Multi Regional Alliance "M-TRAC"						
52	WY	Petersen Asphalt Conference						
	WY DOT							
		WAQTC = Western Alliance for Quality Transportation Construction						
		M-TRAC = Multi-Regional Training and Certification						
		NETTCP = Northeast Transportation Training and Certification Program						
		SETFTTQ = Southeast Task Force on Technician Training and Qualification						
		MARTCP = Mid-Atlantic Region Technician Certification Program						
		NECEPT = Northeast Center of Excellence for Pavement Technology						

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings.

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Scope	Content	Highway	Airfield	Training	Certificate	Certification	
1	ACC	The Airport Consultants Council (ACC) is the international trade association that represents the unique interests of consultant firms and related businesses that provide airport development and operations expertise.	www.acconline.org	The ACC Institute: Techniques for Airfield Pavement Maintenance, Repair & Rehabilitation	This course is aimed at airport maintenance staff, facility managers, and engineering and other technical staff responsible for the specification, design, construction, or inspection of airfield pavement maintenance, repair and rehabilitation treatments.			X	X (lectures & hands-on workshop)			
2	ATTI	The Arizona Technical Testing Institute (ATTI) is a coalition of the Arizona Department of Transportation (ADOT), highway contractors, materials suppliers, materials testing laboratories, Arizona Rock Products Association (ARPA), and Associated General Contractors (AGC).	www.attiaz.org	See programs below: (State specific)								
				Asphalt Technician	Laboratory testing of HMA mixtures	ARIZ 104, AASHTO T40, ARIZ 247, ARIZ 406, ARIZ 410, ARIZ 415, AASHTO T166, ARIZ 416, ARIZ 417, ARIZ 421, ARIZ 424, ARIZ 42, AASHTO T312	X		X		X	
				Field Technician	Sampling & compaction testing of HMA, Soils & Aggregate	ARIZ 104, ARIZ 105, ARIZ 225, ARIZ 227, ARIZ 229, ARIZ 230, ARIZ 232, ARIZ 235, ARIZ 246, ARIZ 412, AASHTO T40, AASHTO T217	X		X		X	
3	The Asphalt Institute	A leading organization in the field of HMA that serves a national and international customer base directly and indirectly.	www.asphaltinstitute.org	See programs below:								
				Asphalt Mix Design Technology Certification		Superpave, Marshall, SMA, OGFC and RAP in HMA	X		X		X	
				National Binder Technician Certification Program	The program is designed to address a national need for expanded training in PG testing. This program will provide a consistent means of ensuring that asphalt binder technicians are fully qualified to produce valid data.	MS-25 Asphalt Binder Testing Manual / AASHTO M320	X		X		X	
				Construction of Quality Hot Mix Asphalt Pavements	This one-day course familiarizes participants with basic principles of HMA pavement construction and the inspector's responsibilities in the construction process.	Hot Mix Materials HMA Production HMA Placement Compaction Operations	X		X		X	
				Airport Pavement Workshop (content directly related to FAA construction specifications, circulars and requirements)	Workshop provides up-to-date information for the design, construction and management of asphalt airport pavements. It includes a review of specifications, advisory circulars, materials, pavement design, construction, and preservation.	FAA Thickness design Pavement evaluation Maintenance & rehabilitation methods Materials & construction Quality control & assurance P-401 and Superpave specifications			X		X	X
				Asphalt Binder Technology	Covers all aspects of the Superpave Performance-Graded asphalt binder specs. The 3-day course includes hands-on and classroom sessions.		X		X		X	
				Achieving Volumetrics and HMA Compactability			X		X		X	
				HMA Mix Design Technologies Course			X		X	X		

A-13

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Scope	Content	Highway	Airfield	Training	Certificate	Certification
3	The Asphalt Institute	A leading organization in the field of HMA that serves a national and international customer base directly and indirectly.	www.asphaltinstitute.org	Hot Mix Asphalt Pavement Evaluation and Rehabilitation (in partnership with NHI)	Course presents state of the art practice and techniques to identify the causes and patterns of HMA pavement distresses and techniques for rehabilitation selection, design, and construction	Typical behavior and performance of HMA pavements HMA Pavement distress types Rehabilitation methods Selection of rehab alternatives	X		X	X	
				Asphalt Pavement Recycling Technologies (in partnership with NHI)	Joint effort between FHWA, ARRA & NCAT. The ARRA "Basic Asphalt Recycling Manual" is used as reference.	Hot & cold recycling methods Recycling as a viable alternative Selection of appropriate recycling method Materials, mix design and QC/QA	X		X	X	
4	Asphalt Pavement Alliance	Asphalt Institute, National Asphalt Pavement Association (NAPA) & State Asphalt Pavement Associations.	www.asphaltalliance.com	Offers multiple articles, papers and fact sheets on asphalt and HMA for airfields.			X	X	X		
5	Asphalt Pavement Association of Oregon	A nonprofit trade association representing the interests of the asphalt paving industry in Oregon.	www.apao.org	See programs below: (design specific to WAQTC and ODOT requirements)							
				Hot Mix Asphalt production workshops		Principles of Drum Mix Production. Operating Practices, Baghouse and RAP, Scheduled and Predictive Maintenance	X		X	X	
				Hot Mix Asphalt construction workshops	The purpose of this course is to put agency officials, paving contractors and consultants "on the same page" when planning and executing an HMA project.	HMA laydown HMA compaction operations Paving operations checklist	X		X	X	
				Design and specifications of asphalt pavements	This course covers the use of the AI's Asphalt Pavement Design Guide	Urban Streets, Rural Roads, and Driveways Commercial and Industrial Facilities Specialty Pavements Intersection Design	X		X	X	
				Certified Asphalt Technician I (CAT-I)	CAT-I performs sampling and testing for HMAC and EAC mixtures including AC content, max. specific gravity, sieve analysis, void measurements using a currently approved compaction device.		X		X		X
				Certified Asphalt Technician II (CAT-II)	CAT-II is responsible for managing the volumetric properties of asphalt mixes by controlling plant operations, for troubleshooting HMAC sampling and testing processes, and for making appropriate adjustments to HMAC production and laydown procedures		X		X		X

A-14

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Scope	Content	Highway	Airfield	Training	Certificate	Certification
5	Asphalt Pavement Association of Oregon	A nonprofit trade association representing the interests of the asphalt paving industry in Oregon.	www.apao.org	Certified Mix Design Technician (CMDT)	A CMDT is responsible for preparing HMAC Mix Designs, including all material testing and data analysis necessary to properly complete a design. A CMDT prepares designs for both dense and open graded HMAC mixtures		X		X		X
				Certified Aggregate Technician (CAgT)	CAgT performs tests on soils and aggregates including sieve analysis, fracture, sand equivalency and other tests and performs other duties as required by current specifications for soils and aggregate materials.		X		X		X
				Certified Embankment & Base Technician (CEBT)	CEBT performs testing of soils and aggregates for establishing maximum density and optimum moisture for compaction of subgrade soil and aggregate bases		X		X		X
				Certified Density Technician (CDT)	CDT performs in-place density testing of soils, aggregates, and asphalt mixtures using the nuclear density gauge		X		X		X
6	Colorado Asphalt Pavement Association	Rocky Mountain Asphalt Education Center LabCAT is a partnership between CAPA-CDOT-FHWA. CAPA is also active with the FAA and the AAPT in regards to airport construction requirements.	www.co-asphalt.com	See programs below: (design specific to CDOT requirements)							
				HMA Construction Inspection			X		X	X	
				Introduction to HMA QC/QA Testing	Training in field and laboratory testing required for QC/QA of hot mix asphalt projects	Laydown Plant Materials Control Volumetrics & Stability, Aggregates	X		X	X	
				Introduction to HMA Mixture Design			X		X	X	
				Level A - Laydown Operations	Technicians working at HMA laydown operation and responsible for sampling and conducting compaction tests	ASTM D 3685 / CP- 75 AASHTO T188 / CP - 41 AASHTO T2 / CP -30 AASHTO T248 / CP- 55 CP-81 CP=CDOT method	X		X		X
				Level B - Asphalt Plant Materials Control	Technicians responsible for materials process control at the asphalt hot mix plant	AASHTO T248 / CP 32 AASHTO T11/T27 / CP-31 A31 B AASHTO T287 / CP- 85 AASHTO T308 / CP-L 5120 AASHTO T166 / CP- 44 AASHTO T209 / CP -51 & Control Charts CP=CDOT method	X		X		X

A-15

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

A-16

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Scope	Content	Highway	Airfield	Training	Certificate	Certification
6	Colorado Asphalt Pavement Association	Rocky Mountain Asphalt Education Center LabCAT is a partnership between CAPA-CDOT-FHWA. CAPA is also active with the FAA and the AAPT in regards to airport construction requirements.	www.co-asphalt.com	Level C - Mixture Volumetric's and Stability	Technicians responsible for determining mixture volumetric's and strength characteristics for HMA produced at the hot mix plant	AASHTO T248 / CP-32 AASHTO T287 / CP-85 AASHTO T168 / CP-44 AASHTO T209 / CP-51 AASHTO TP4 / CP-L 5115 AASHTO T246 / CP-L 5106 AASHTO T283 / CP-L 5109 AASHTO PP19 CP=CDOT method	X		X		X
				Level S - Smoothness	Technicians responsible for determining smoothness using High Speed Profiling equipment		X		X		X
				Level E - Aggregates	Technicians responsible for determining the characteristics of the aggregates to be used in HMA mixture design	AASHTO T2 AASHTO T84 AASHTO T85 AASHTO T176 AASHTO T304 CDOT method CP-45 CDOT method CP-L 4211	X		X		X
				Level I - Asphalt Inspector		Prepaving Conference Plans and specifications Asphalt plant Equipment Approved mix designs Subgrade preparation Traffic control Paving Operations Placement, compaction, joints, smoothness & density	X		X		X
7	Lake Land College	Illinois DOT HMA training program for both industry and IDOT employees administered by Lake Land College.	http://www.lakeland.cc.il.us/dotqcqa/	See programs below: (design specific to ILDOT requirements)							
				CET 020 Mixture Aggregate Technician (3 Days)	Aggregates handling and testing in addition to sampling and testing for aggregate producers participating in the Aggregate Gradation Control System		X		X	X	
				CET 021 Aggregate Technician (5 Days)	Persons completing this course will be able to administer and do the testing required for an aggregate producer participating in the Aggregate Gradation Control System.		X		X	X	
				CET 027 Mixture Aggregate Technician Upgrade (2 Days)	Perons completing this course and the Mixture Aggregate Technician Course will be able to administer and do the testing required for an aggregate producer participating in the Aggregate Gradation Control System.		X		X	X	
				CET 032 AGCS Technician (2 days)	Persons completing this course will acquire knowledge on the origin, handling and testing of aggregates, which will enable them to pull aggregate samples and run the AGCS program for an aggregate producer		X		X	X	
				CET 029 Hot Mix Asphalt Level I (5 days)	Laboratory testing of HMA using Superpave technology and information on the production of HMA		X		X	X	

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Scope	Content	Highway	Airfield	Training	Certificate	Certification
7	Lake Land College	Illinois DOT HMA training program for both industry and IDOT employees administered by Lake Land College.	http://www.lakeland.cc.il.us/dotqcqa/	CET 023 Hot Mix Asphalt Level II (5 days)	An advanced course covering proportioning, troubleshooting and laydown of HMA.		X		X	X	
				CET 031 Hot Mix Asphalt Level III (5 days)	Persons completing this course will be able to do Superpave mix designs for Hot Mix Asphalt.		X		X	X	
				CET 026 Nuclear Density (1 day)	This course covers the use of the Nuclear Density gauge and paperwork involved.		X		X	X	
8	MARTCP	Mid-Atlantic Regional Technician Certification Program "MARTCP" A partnership between MD, VA, DE, PA, WV, NJ and DC Departments of Transportation & FHWA - TCCC.	www.martop.org	See programs below: (design specific to coalition regional requirements - some programs are offered jointly with the Maryland Asphalt Association - MAA)							
				Aggregate Technician (Plant / Field)	A self taught course from available manual		X		X		X
				HMA Field Technician	Instruction covers best practices for placement, compaction and delivery of HMA		X		X		X
				HMA Plant Technician - Level I	Instruction covers plant operations that influence mix quality, including sampling and testing.		X		X		X
				HMA Plant Technician - Level II	Instruction covers HMA Superpave mix design analysis, materials selection and process control		X		X		X
				Inertial Profiler Operator Technician	The course is designed for technicians involved in the use of inertial profilers and the application of data generated from such profilers		X		X		X
				HMA (behind the paver) Sampling - (certification issued by Maryland Asphalt Association - MAA)	Course covers proper HMA sampling methods prior to compaction, specifications, importance of random sampling and effect on test results and final payment		X		X		X

A-17

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Scope	Content	Highway	Airfield	Training	Certificate	Certification
9	M-TRAC	Multi-Regional Training and Certification "M-TRAC" partnership between IL, IN, IA, KS, LA, MI, MN, MO, NE, NM, ND, OH, SD, WI Departments of Transportation and FHWA - TCCC	http://rebar.ecn.purdue.edu/Superpave/M-TRAC/index.htm	See sample of generic programs below: (design for some programs is generic and for others is specific to individual state requirements - the coalition is an excellent resource for training materials, e.g. IA, WI & MO DOTs)							
				Aggregate Sampling and Testing	The test methods covered represent inclusion of aggregate tests necessary for general aggregate use requirements and also testing for use in asphaltic concrete and portland cement concrete.	AASHTO T2, T248, T255, T27, T11, T96, T112, T176, T84, T85, T19, T113, T104, T304 ASTM D3665, C535, D5821, D4791	X		X		X
				Hot Mix Asphalt	The content is designed to cover the Superpave systems; only those tests and specifications applicable to the Superpave systems are included.	AASHTO T 40, T 168, R30, T 312, T 166, T 209, T 283, T 308	X		X		X
10	NAPA	The National Asphalt Pavement Association is the only trade association that exclusively represents the interests of the Hot Mix Asphalt producer and paving contractor on the national level.	www.hotmix.org	HMA comprehensive training resources (hardcopy, CD-ROM, Video, On-line publications and training materials)			X	X	X		
				HMA Personnel Skill Sets in the areas of: - HMA production, - QC/QA, - HMA placement, - Management	The skill sets provide a method to identify needed training and provide a method to evaluate the competency for a person performing a given task		X	X	X		
11	NCAT	The National Center for Asphalt Technology was created in 1986 through an agreement between the National Asphalt Pavement Association (NAPA) Research and Education Foundation and Auburn University	www.eng.auburn.edu/center/ncat/	See programs below:							
				Superpave Binder Course	The course provides information on the development of binder grading systems and test procedures, and presents step-by-step descriptions of test methods used in the Superpave binder system.	Overview of binder grading systems. Superpave PG system & LTPP Bind software. Rotational Viscosity, DSR, BBR, and PAV aging, Softening point, Flash Point & Mass loss. Specs and evaluation of binder data. Steady Shear Flow and Critical Cracking Temperature	X	X	X	X	X (optional)
				Asphalt Technology ()	The course provides a basic understanding of all phases of HMA technology. Upon completion participants will be able to make knowledgeable decisions related to HMA pavements and communicate effectively with asphalt specialists.	Asphalt Binders refining, physical properties, Superpave binder testing and specifications, modified asphalt binders, Aggregates, HMA mix types and properties and Superpave design, HMA Construction, HMA Design and Rehabilitation	X	X	X	X	

A-18

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Scope	Content	Highway	Airfield	Training	Certificate	Certification
11	NCAT	The National Center for Asphalt Technology was created in 1986 through an agreement between the National Asphalt Pavement Association (NAPA) Research and Education Foundation and Auburn University	www.eng.auburn.edu/center/ncat/	Superpave Mix Design	The course is designed to give hot mix asphalt industry and various agency personnel a better understanding of the materials specifications, test procedures, and general mix design requirements for a Superpave volumetric mix design.	Lecture: Overview of Superpave. Superpave binder testing and specification. Superpave aggregate testing and requirements. HMA volumetric analysis. Superpave mix design. Moisture susceptibility testing. Impact of mix design on HMA performance and construction. Laboratory: Binder testing procedures. Superpave Aggregate tests. Volumetric mix design using the gyratory compactor. Moisture susceptibility testing	X	X	X	X	X (optional - for GA DOT personnel)
				SMA/OGFC Mix Design and Construction	The purpose of the workshop is to provide a basic understanding of SMA and New Generation OGFC mixtures. Included is the state-of-the-practice for materials, mix design, construction, and specifications needed for a successful project.	Mix Design, Materials Selection, Gradation, Design Process Production, Equipment for batch and drum plants, QC/QA Construction, Placement, Compaction Specifications and other Issues	X		X	X	
				Professor Training on HMA Technology	A comprehensive training program for college and university civil engineering faculty that will allow them to offer undergraduate and graduate courses in Asphalt Technology	Asphalt Cement, Aggregates, Hot Mix Asphalt, Construction, Design and Rehabilitation	X	X	X	X	

A-19

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Scope	Content	Highway	Airfield	Training	Certificate	Certification
12	NECEPT	Northeast Center of Excellence for Paving Technology (NECEPT) is located at the Pennsylvania Transportation Institute (PTI) at the Pennsylvania State University. The Center is funded by the Pennsylvania Department of Transportation (PennDOT) and FHWA. Added support is received from industry and the Pennsylvania Asphalt Paving Association (PAPA).	www.superpave.psu.edu	See programs below: (some modules are PennDOT Specific)							
				PENNDOT Bituminous Field Technician	The course is for technicians directly involved with bituminous pavement construction, testing and inspection. It is based primarily on the National Highway Institute course, "Hot Mix Asphalt Construction"	Introduction/Specs and PTM's Surface Preparation HMA Delivery HMA Placement Joint Construction Compaction Segregation Summary / Trouble Shooting	X		X		X
				PENNDOT Bituminous Level 1 Plant Technician	The course is for technicians directly involved with bituminous pavement mixture design, HMA production, process control and/or quality assurance testing	PENNDOT Specs and Test Methods PENNDOT Bulletin 27 Superpave Mixture Design and Analysis Aggregate Tests Aggregate Blending Specific Gravity and Absorption Density and Voids Analysis QC/Process Control Hot Mix Asphalt Plants Paving Operations Segregation (Thermal and Particle Size)	X		X		X
				PENNDOT Level 2 Plant Technician			X		X		X
				Superpave Volumetric Mix Design Workshop	Classroom segments familiarize participants with the Superpave system, along with hands on laboratory testing to evaluate a proposed Superpave mixture design	Introduction to Superpave, Mix Design Binder and Aggregate Selection. Design Using Gyratory Compactor. Volumetric Requirements. Superpave Mix Design. Gyratory compaction. Aggregate testing. AASHTO T283, Indirect Tensile Tests. Rotational Viscometer, Superpave Shear Tester	X		X		X
				PA Aggregate Technician	Course conducted for PennDOT by the Harrisburg Area Community College (HACC)		X		X		X

A-20

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Scope	Content	Highway	Airfield	Training	Certificate	Certification
13	NETTCP	North East Regional Alliance: CT, MA, ME, NH, RI, VT Departments of Transportation, FHWA, FAA and Industry	www.nettcp.com	See programs below: (AASHTO and ASTM test methods)							
				HMA Paving Inspector	Course is designed for individuals responsible for inspecting, sampling and testing HMA in the field.	Materials and HMA Mixtures. Production Facilities. Surface Preparation. Mix Delivery and Placement. Joint Construction. Compaction. AASHTO T168, T166, T209, T269. ASTM D3665, D 2950	X		X		X
				PG Asphalt Binder Laboratory Technician	Course is designed for individuals responsible for sampling & testing PG Asphalt Binders	AASHTO T228, T40, T240, R28, T316, T315, T313, M320, T48, R29, T314. ASTM D 3665. Asphalt Binder Temperature Measurement.	X		X		X
				HMA Plant Technician	Course is designed for individuals responsible for sampling & testing HMA at the production facility.	AASHTO T2, T248, Hot and Cold Bin Sampling, T27, T11, T168, T164 or T308, T30, T312, T245, T40, T304, T176, T84, T85, T166, PP19, T255, T209, ASTM D5321, D4719, D3549, D 3665, HMA & Binder Temperature	X		X		X
				QA Technologist (QA background, concepts and application)	Course is designed for individuals responsible for interpreting and applying QA Specifications in transportation construction	QA in Transportation Construction. Evolution of QA Specs. Elements of a QA Program. Contractor and Agency Roles. Measuring Quality. Mathematical Tools and Rules. QC Application. Acceptance and Payment. QA Implementation.	X		X		X
14	NICET	The National Institute for Certification in Engineering Technologies / A division of The National Society of Professional Engineers.	www.nicet.org	See programs below: (Career track four-level certification programs based on national practices, AASHTO and ASTM test methods)							
				Construction Materials Testing / Asphalt	The career track program is designed for field and laboratory technicians engaged specifically in the testing and inspection of construction materials - asphalt.	See "Program Detail Manual for Construction Materials Testing" for specific details concerning testing content & certification requirements (www.nicet.org)	X				X
				Highway Materials	The program is for highway technicians involved in lab and field testing of highway materials. The program addresses knowledge of techniques and equipment; recordkeeping, reporting procedures pertaining to materials and quality control; and supervisory techniques.	See "Program Detail Manual for Highway Materials" for specific details concerning testing content & certification requirements (www.nicet.org)	X				X
				Highway Construction Inspection	The program is for technicians involved in the inspection (monitoring) of highway construction projects. Areas covered are interpretation of contract plans and specifications; project record keeping, reporting; construction surveying, field inspection and testing procedures, techniques, and equipment; and supervisory techniques.	See "Program Detail Manual for Highway Construction" for specific details concerning testing content and certification requirements (www.nicet.org)	X				X

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Scope	Content	Highway	Airfield	Training	Certificate	Certification
15	RedVector	Leading provider for online education programs.	www.redvector.com	Online training courses include:							
				Airport Pavements - Asphalt	Course provides the basics of asphalt pavement design for airports based on design guidance from the FAA.			X	X (One hour interactive online)		
				Asphalt 1: Introduction to Superpave and Materials Selection	Course discusses characteristics of HMA, including aggregate and binder mixtures, and asphalt mixture design procedures.		X	X	X (Two hour interactive online)		
				Asphalt 2: Superpave Mixture Volumetrics	Course describes volumetric analysis of HMA		X	X	X (Three hour interactive online)		
				Asphalt Design - SuperPave: Aggregates & Mixtures	Course provides a detailed look at aggregates and mixtures for Superpave, based on information from the FHWA.		X	X	X (One hour interactive online)		
				Asphalt Design - SuperPave: Binders	Course provides a detailed look at testing, specifying, and selecting asphalt binders for Superpave, based on information from the FHWA.		X	X	X (Two hour interactive online)		
16	SETFTTQ	South East Regional Alliance AL, AR, FL, GA, KY, LA, MS, NC, PR, SC, TN, VA, WV Departments of Transportation, FHWA and AASHTO Subcommittee on Materials.	www.dot.state.fl.us/statematerialsoffice/setaskforce/	See programs below: (most of the participating DOTs have state-specific HMA training and certification or qualification programs. Examples are shown below)							
				Florida: Asphalt Plant Level I	Technicians performing all testing used in the acceptance decision at the asphalt plant	AASHTO T 30, T 40, T 166, T 168, T 209, TP 4, Florida Method FM 5-544, FM 5-545, FM 5-563		X	X (training materials developed by NCAT)		X
				Florida: Asphalt Plant Level II	Technicians responsible for oversight of testing and production activities at asphalt plant		X	X (training materials developed by NCAT)		X	
				Florida: Asphalt Paving Level I	Technicians performing all testing used in the acceptance decision at the roadway	ASTM D3665, AASHTO T 238	X	X (training materials developed by NCAT)		X	
				Florida: Asphalt Paving Level II	Technicians responsible for oversight of testing and paving activities at roadway.		X	X (training materials developed by NCAT)		X	
				Florida: Asphalt Mix Designer	Technicians responsible for designing asphalt mixes	ASTM D 5821, AASHTO T 304, D 4791, T176, TP 4, T 84, T 85, T 209, T 283, Florida Method FM 5-565	X	X (training materials developed by NCAT)		X	
				Florida: Asphalt QC Manager	Personnel responsible for the overall Quality Control activities for a Company/District		X	X (training materials developed by Univ. of Florida)		X	

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

A-23

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Scope	Content	Highway	Airfield	Training	Certificate	Certification
16	SETFTTQ	South East Regional Alliance AL, AR, FL, GA, KY, LA, MS, NC, PR, SC, TN, VA, WV Departments of Transportation, FHWA and AASHTO Subcommittee on Materials.	www.dot.state.fl.us/statematerialsoffice/settaskforce/	Kentucky: Superpave Plant Technologist	Personnel performing daily inspection and process-control, acceptance, or verification testing at the HMA plant.	Kentucky Method KM 401, 404, 405, 407, 421, 425, 426, 433, 434, 435, 436, 437, 438, 439, 442; and AASHTO T 308, T 166, T 209, and T 312. KM: Kentucky Method	X		X (Kentucky Methods & Specs manuals, inhouse-developed training manual)		X
				Kentucky: Superpave Mix Design Technologist	Individuals who perform, submit, adjust, or approve mix designs.	All tests above plus following: KM 411, KM443, AASHTO T 312, R 35; and ASTM D 4867. KM: Kentucky Method	X		X (Kentucky Methods & Specs manuals, AI SP-2 & inhouse-developed training manual)		X
				South Carolina: Level 1	HMA QC Technician - QC-Contractor personnel and QA-State personnel	AASHTO T2, T11, T27, T166, T209, T245, T248, T283 (SC-T-70), T308 (SC-T-75), SC-T-72 SC: South Carolina Method	X		X		X
				South Carolina: Level 2S - HMA Mix Design Technician	Technicians performing Marshall and Superpave Mix Designs	AASHTO T2, T11, T27, T166, T176, T209, T245, T248, T283, T312, TP4, ASTM D4791 (SC-T-77) SC: South Carolina Method	X		X		X
				South Carolina: Level 3 - HMA Quality Control Manager	Technicians responsible for oversight and troubleshooting of HMA mix design, production, and placement		X		X		X
				South Carolina: Asphalt Roadway Technician (ART)	Technicians responsible for performing QC testing and inspection on the roadway on HMA paving projects	SC-T-84, SC-T-85, SC-T-86, SC-T-100, SC-T-101 SC: South Carolina Method	X		X		X

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

A-24

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Scope	Content	Highway	Airfield	Training	Certificate	Certification
17	Texas Asphalt Pavement Association	Texas Asphalt Pavement Association is a full-service association for the hot mix asphalt industry.	http://www.txhotmix.org	See programs below: (TxDOT specific)							
				HMA Plant Production Specialist (Level 1-A)	Course Includes: Sampling aggregates, HMA mixes, bituminous materials, Superpave and Gyratory compaction, specific gravity, moisture and asphalt content, ignition method, aggregate gradations, control charts	Tex-221-F, Tex-222-F, Tex-225-F, Tex-500-C, Tex-206-F, Tex-205-F, Tex-241-F, Tex-207-F, (Parts I and VI), Tex-227-F, Tex-212-F (Part II), Tex-236-F, Tex-200-F, Tex-530-C, Tex-233-F Tex: Texas Method	X		X		X
				HMA Roadway Specialist (Level 1-B)	Course Includes: Pre-paving HMA Laydown Segregation HMA Compaction Joint Construction ride Quality	Texas Test Methods: Tex-207-F, Tex-222-F, Tex-239-F, Tex-243-F, Tex-244-F, Tex-246-F, Tex-1001-S Specifications: Control of the Work, Control of Materials, Equipment, Dense-Graded HMA (Method), Dense-Graded Hot Mix Asphalt (QC/QA), Permeable Friction Course (PFC), Performance-Designed Mixes, Stone-Matrix Asphalt, Ride Quality for Pavement Surfaces	X		X		X
				HMA Mix Design Specialist (Level 2)	Course Includes: Aggregate Quality Testing Mix Design and Verification and Bituminous Mixture Testing including Indirect Tensile Strength Test, Asphalt Content by the Ignition Method, Superpave Gyratory Compaction, Hamburg Wheel Tracking Test	Texas Test Methods: Tex-107-E, Tex-217-F (I & II), Tex-460-A, Tex-203-F, Tex-280-F, Tex-461-A, Tex-408-A, Tex-204-F, Tex-205-F, Tex-206-F, Tex-207-F, Tex-227-F, Tex-226-F, Tex-236-F, Tex-241-F, Tex-242-F, Tex-530-C.	X		X		X
18	USACE	USACE Transportation Systems Center -TSC	https://transportation.erdc.usace.army.mil/tsmcox/training.html	Airfield Paving Workshop	HQUSACE policy requires TSC to conduct on-site Airfield Paving Workshops for all Corps-constructed airfield projects over \$5M, or when specifically requested by the Corps District or customer	Introduction Mix Design Plants Surface Preparation Laydown Compaction QC/QA Performance Problems Specification UFGS 02749 Review	X	X	X (program offered with NCAT)	X	
		USAC Learning Center	http://ulc.usace.army.mil	Construction and Rehabilitation of Flexible Pavements	This course covers Corps requirements for quality construction of flexible pavements including subgrade, subbase, and base courses; primes, tacks, and seal coats; surface treatment and slurry seals; plant-mixed bituminous paving mixtures. It also covers modern techniques for practical and effective maintenance and repair of flexible pavements.		X	X	X	X	

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Scope	Content	Highway	Airfield	Training	Certificate	Certification
19	WAQTC	Western Regional Alliance: AK, CO, HI, ID, MT, NE, NM, OR, TX, UT, WA, Western and Central Federal Lands Highway Divisions (WFLHD and CFLHD) of the FHWA in cooperation with industry associations	http://www.waqtc.org/	See programs below: Shown is the groups' generic type program and also the program offered by NMDOT							
				Transportation Technician Qualification Program -TTQP /Asphalt Testing Technician - AsTT		AASHTO T 168, WAQTC TM 5, Reducing Samples of Hot Mix Asphalt to Testing Size (07), AASHTO T 329, T 308, T 30, T 209, T 166, T 275, T 40, WAQTC TM 8, In-Place Density of Bituminous Mixes Using the Nuclear Moisture-Density Gauge (07).	X		X		X
20		The New Mexico Department of Transportation (NMDOT) and Associated Contractors of New Mexico (ACNM).	http://www.nmshtd.state.nm.us/main.asp?secid=11319	NMDOT: TTCP- Hot Mix Asphalt (AASHTO Test Methods)		AASHTO T-30, T-40, T-166, T-168, T-209, T-218, T-269, T-304, T-308, T-312	X		X		X
	NOTES:	None of the programs are accredited									

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Pre-requisites or Education Requirements	Experience Requirements	Examination Requirements	Re-Certification	Cost of Program	Cost of Recertification	No. Credentialed	Availability/ Recognition		
1	ACC	The Airport Consultants Council (ACC) is the international trade association that represents the unique interests of consultant firms and related businesses that provide airport development and operations expertise.	www.acconline.org	The ACC Institute: Techniques for Airfield Pavement Maintenance, Repair & Rehabilitation					\$ 590 member \$ 695 non-member			National		
2	ATTI	The Arizona Technical Testing Institute (ATTI) is a coalition of the Arizona Department of Transportation (ADOT), highway contractors, materials suppliers, materials testing laboratories, Arizona Rock Products Association (ARPA), and Associated General Contractors (AGC).	www.attiaz.org	See programs below: (State specific)										
				Asphalt Technician			Written plus performance exam	every 5 yrs w/written plus performance exam	\$450			State		
				Field Technician			Written plus performance exam	every 5 yrs w/written plus performance exam	\$300			State		
3	The Asphalt Institute	A leading organization in the field of HMA that serves a national and international customer base directly and indirectly.	www.asphaltinstitute.org	See programs below:										
				Asphalt Mix Design Technology Certification						call AI			National	
				National Binder Technician Certification Program		minimum six months of asphalt binder testing experience					varies depending on site			National
				Construction of Quality Hot Mix Asphalt Pavements							\$195			National
				Airport Pavement Workshop (content directly related to FAA construction specifications, circulars and requirements)			No exam requirement	None			\$545 for FAA employees \$895 for others			National
				Asphalt Binder Technology							call AI			National
				Achieving Volumetrics and HMA Compactability							call AI			National
HMA Mix Design Technologies Course							call AI			National				

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Pre-requisites or Education Requirements	Experience Requirements	Examination Requirements	Re-Certification	Cost of Program	Cost of Recertification	No. Credentialed	Availability/ Recognition	
3	The Asphalt Institute	A leading organization in the field of HMA that serves a national and international customer base directly and indirectly.	www.asphaltinstitute.org	Hot Mix Asphalt Pavement Evaluation and Rehabilitation (in partnership with NHI)					\$335			National	
				Asphalt Pavement Recycling Technologies (in partnership with NHI)					\$270			National	
4	Asphalt Pavement Alliance	Asphalt Institute, National Asphalt Pavement Association (NAPA) & State Asphalt Pavement Associations.	www.asphaltalliance.com	Offers multiple articles, papers and fact sheets on asphalt and HMA for airfields.								National	
5	Asphalt Pavement Association of Oregon	A nonprofit trade association representing the interests of the asphalt paving industry in Oregon.	www.apao.org	See programs below: (design specific to WAQTC and ODOT requirements)									
				Hot Mix Asphalt production workshops					\$ 200 (call APAO)			Regional	
				Hot Mix Asphalt construction workshops					\$150			Regional	
				Design and specifications of asphalt pavements					call APAO			Regional	
				Certified Asphalt Technician I (CAT-I)	Certified Aggregate Technician -CAgT recommended				retesting	\$ 1250 ODOT \$ 1340 Affiliate \$ 1475 Non-member			Regional
				Certified Asphalt Technician II (CAT-II)	Certified Asphalt Technician - CAT - I				retesting	\$ 625 ODOT \$ 670 Affiliate \$ 740 Non-member			Regional

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Pre-requisites or Education Requirements	Experience Requirements	Examination Requirements	Re-Certification	Cost of Program	Cost of Recertification	No. Credentialed	Availability/ Recognition		
5	Asphalt Pavement Association of Oregon	A nonprofit trade association representing the interests of the asphalt paving industry in Oregon.	www.apao.org	Certified Mix Design Technician (CMDT)	CAGT plus CAT - I strongly recommended			retesting	\$ 1750 ODOT \$ 1875 Affiliate \$ 2065 Non-member			Regional		
				Certified Aggregate Technician (CAGT)	Basic math and prior lab experience			retesting	\$ 1000 ODOT \$ 1070 Affiliate \$ 1180 Non-member			Regional		
				Certified Embankment & Base Technician (CEBT)	Basic math and prior lab experience			retesting	\$ 1000 ODOT \$ 1070 Affiliate \$ 1180 Non-member			Regional		
				Certified Density Technician (CDT)	Radiation Safety certification plus badge			retesting	\$ 1000 ODOT \$ 1070 Affiliate \$ 1180 Non-member			Regional		
6	Colorado Asphalt Pavement Association	Rocky Mountain Asphalt Education Center LabCAT is a partnership between CAPA-CDOT-FHWA. CAPA is also active with the FAA and the AAPTP in regards to airport construction requirements.	www.co-asphalt.com	See programs below: (design specific to CDOT requirements)										
				HMA Construction Inspection									State	
				Introduction to HMA QC/QA Testing						\$ 400 member 500 non-member				State
				Introduction to HMA Mixture Design										State
				Level A - Laydown Operations	basic reading and math, plus nuclear certification	one paving season field or lab	written plus hands on testing	retesting every 3 years	\$ 200 member 420 non-member				State	
Level B - Asphalt Plant Materials Control	basic reading and math, plus nuclear certification	one paving season field or lab	written plus hands-on testing	retesting every 3 years	\$ 300 member 510 non-member				State					

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Pre-requisites or Education Requirements	Experience Requirements	Examination Requirements	Re-Certification	Cost of Program	Cost of Recertification	No. Credentialed	Availability/ Recognition
6	Colorado Asphalt Pavement Association	Rocky Mountain Asphalt Education Center LabCAT is a partnership between CAPA-CDOT-FHWA. CAPA is also active with the FAA and the AAPT in regards to airport construction requirements.	www.co-asphalt.com	Level C - Mixture Volumetric's and Stability	Certification in Levels A and B, basic reading and math plus nuclear certification	one paving season field or lab	written plus hands-on testing	retesting every 3 years	\$ 250 member \$ 490 non-member			State
				Level S - Smoothness	basic reading and math, plus nuclear certification	one paving season field or lab	written exam	retesting every 3 years	\$ 300 member \$ 550 non-member		State	
				Level E - Aggregates	basic reading and math, plus nuclear certification	one paving season field or lab	written plus hands-on testing	retesting every 3 years	\$ 280 member \$ 535 non-member		State	
				Level I - Asphalt Inspector		6 month laydown operations and minimum 60 days of inspection (other alternatives available)		\$ 250 member \$ 400 non-member		State		
7	Lake Land College	Illinois DOT HMA training program for both industry and IDOT employees administered by Lake Land College.	http://www.lakeland.cc.il.us/idotcqca/	See programs below: (design specific to ILDOT requirements)								
				CET 020 Mixture Aggregate Technician (3 Days)					\$490			State
				CET 021 Aggregate Technician (5 Days)					\$715			State
				CET 027 Mixture Aggregate Technician Upgrade (2 Days)	CET 020				\$225			State
				CET 032 AGCS Technician (2 days)					\$385			State
				CET 029 Hot Mix Asphalt Level I (5 days)	CET 020 or CET 021				\$815			State

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Pre-requisites or Education Requirements	Experience Requirements	Examination Requirements	Re-Certification	Cost of Program	Cost of Recertification	No. Credentialed	Availability/ Recognition
7	Lake Land College	Illinois DOT HMA training program for both industry and IDOT employees administered by Lake Land College.	http://www.lakeland.cc.il.us/idoqcqa/	CET 023 Hot Mix Asphalt Level II (5 days)	CET 029				\$735			State
				CET 031 Hot Mix Asphalt Level III (5 days)	CET 023 and CET 029				\$985			State
				CET 026 Nuclear Density (1 day)					\$150			State
8	MARTCP	Mid-Atlantic Regional Technician Certification Program "MARTCP" A partnership between MD, VA, DE, PA, WV, NJ and DC Departments of Transportation & FHWA - TCCC.	www.martcp.org	See programs below: (design specific to coalition regional requirements - some programs are offered jointly with the Maryland Asphalt Association - MAA)								
				Aggregate Technician (Plant / Field)			written test plus QA audit	Every 5 years - pass random audits	\$200			Regional
				HMA Field Technician			written test plus performance	Every 5 years - pass random audits or retake course and/or pass written exam	call MAA			Regional
				HMA Plant Technician - Level I			written test plus performance	Every 5 years - pass random audits or retake course and/or pass written and performance exam	\$200			Regional
				HMA Plant Technician - Level II	HMA Plant Technician - I		written test plus hands-on practical	Every 5 years - pass random audits or retake course and/or pass written and performance exam	\$770			Regional
				Inertial Profiler Operator Technician			written test plus performance	Every 5 years - pass random audits or retake course and/or pass written and performance exam	\$235			Regional
				HMA (behind the paver) Sampling - (certification issued by Maryland Asphalt Association - MAA)						call MAA		

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Pre-requisites or Education Requirements	Experience Requirements	Examination Requirements	Re-Certification	Cost of Program	Cost of Recertification	No. Credentialed	Availability/ Recognition
9	M-TRAC	Multi-Regional Training and Certification "M-TRAC" partnership between IL, IN, IA, KS, LA, MI, MN, MO, NE, NM, ND, OH, SD, WI Departments of Transportation and FHWA- TCCC	http://rebar.ecn.purdue.edu/Superpave/M-TRAC/index.htm	See sample of generic programs below: (design for some programs is generic and for others is specific to individual state requirements - the coalition is an excellent resource for training materials, e.g. IA, WI & MO DOTs)								
				Aggregate Sampling and Testing	see website for individual state requirements		written and performance					Regional
				Hot Mix Asphalt	see website for individual state requirements		written and performance				Regional	
10	NAPA	The National Asphalt Pavement Association is the only trade association that exclusively represents the interests of the Hot Mix Asphalt producer and paving contractor on the national level.	www.hotmix.org	HMA comprehensive training resources (hardcopy, CD-ROM, Video, On-line publications and training materials)								National
				HMA Personnel Skill Sets in the areas of: - HMA production, - QC/QA, - HMA placement, - Management							National	
11	NCAT	The National Center for Asphalt Technology was created in 1986 through an agreement between the National Asphalt Pavement Association (NAPA) Research and Education Foundation and Auburn University	www.eng.auburn.edu/center/ncat/	See programs below:								
				Superpave Binder Course		background in asphalt testing is helpful	certification exam is optional		\$800			National
				Asphalt Technology ()		undergraduate degree or at least 3 years experience in HMA technology			\$850			National

A-31

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Pre-requisites or Education Requirements	Experience Requirements	Examination Requirements	Re-Certification	Cost of Program	Cost of Recertification	No. Credentialed	Availability/ Recognition
11	NCAT	The National Center for Asphalt Technology was created in 1986 through an agreement between the National Asphalt Pavement Association (NAPA) Research and Education Foundation and Auburn University	www.eng.auburn.edu/center/ncat/	Superpave Mix Design		some experience with Marshall or Hveem mix design procedures	certification exam is optional for GA DOT personnel.		\$ 800 \$100 for GA DOT employees			National
				SMA/OGFC Mix Design and Construction					call NCAT		National	
				Professor Training on HMA Technology				No Fees Funding provided by NAPA Young Leaders & NAPA Research & Education Foundation		National		

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Pre-requisites or Education Requirements	Experience Requirements	Examination Requirements	Re-Certification	Cost of Program	Cost of Recertification	No. Credentialed	Availability/ Recognition
12	NECEPT	Northeast Center of Excellence for Paving Technology (NECEPT) is located at the Pennsylvania Transportation Institute (PTI) at the Pennsylvania State University. The Center is funded by the Pennsylvania Department of Transportation (PennDOT) and FHWA. Added support is received from industry and the Pennsylvania Asphalt Paving Association (PAPA).	www.superpave.psu.edu	See programs below; (some modules are PennDOT Specific)								
				PENNDOT Bituminous Field Technician	6 months or one season of HMA construction		written	after 5 yrs repeat course and exam or professional development activity	\$498			State
				PENNDOT Bituminous Level 1 Plant Technician	one year experience with HMA plants		written	after 5 yrs repeat course and exam or professional development activity	\$498			State
				PENNDOT Level 2 Plant Technician	Level 1 Plant Certification		written	after 5 yrs repeat course and exam or professional development activity				State
				Superpave Volumetric Mix Design Workshop	Level 1 Plant Certification		written plus performance		\$770			State
				PA Aggregate Technician					\$595			State

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Pre-requisites or Education Requirements	Experience Requirements	Examination Requirements	Re-Certification	Cost of Program	Cost of Recertification	No. Credentialed	Availability/ Recognition
13	NETTCP	North East Regional Alliance: CT, MA, ME, NH, RI, VT Departments of Transportation, FHWA, FAA and Industry	www.nettcp.com	See programs below: (AASHTO and ASTM test methods)								
				HMA Paving Inspector	Highschool or GED	Min 6 mos. HMA experience plus nuclear density certification	written exam	review course plus written exam	\$495 members \$685 non-members	\$295 members \$400 non-members		Regional
				PG Asphalt Binder Laboratory Technician	Highschool or GED	Min. 60 days in asphalt binder testing or 2 yrs verifiable relevant experience	written plus performance exam	review course plus written and performance exam	\$1,475	\$975		Regional
				HMA Plant Technician	Highschool or GED	Min 30 days in Hot plant inspection or 2 yrs verifiable relevant experience	written plus performance exam	review course plus written and performance exam	\$965 members \$1,275 non-members	\$450 members \$600 non-members		Regional
				QA Technologist (QA background, concepts and application)	Highschool or GED	QA training, 3 yrs experience plus technician or inspector's certification or 5 yrs of verifiable transportation construction experience	written exam		\$625 members \$875 non-members			Regional
14	NICET	The National Institute for Certification in Engineering Technologies / A division of The National Society of Professional Engineers.	www.nicet.org	See programs below: (Career track four-level certification programs based on national practices, AASHTO and ASTM test methods)								
				Construction Materials Testing / Asphalt	Knowledge equal to Highschool or GED	Level I: 3-6 mos Level II: 2 years Level III: 5 Years Level IV 10 years	written exam	continuing professional development or re-testing	\$205 per exam	\$125 for the first certification subfield plus \$30 for each additional subfield	Construction Materials Testing / Asphalt: 2321	National
				Highway Materials	Knowledge equal to Highschool or GED	Level I: 3-6 mos Level II: 2 years Level III: 5 Years Level IV 10 years	written exam	continuing professional development or re-testing	\$205 per exam	\$125 for the first certification subfield plus \$30 for each additional subfield	Highway Materials: 501	National
				Highway Construction Inspection	Knowledge equal to Highschool or GED	Level I: 3-6 mos Level II: 2 years Level III: 5 Years Level IV 10 years	written exam	continuing professional development or re-testing	\$205 per exam	\$125 for the first certification subfield plus \$30 for each additional subfield	Highway Construction Inspection: 4160	National

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Pre-requisites or Education Requirements	Experience Requirements	Examination Requirements	Re-Certification	Cost of Program	Cost of Recertification	No. Credentialed	Availability/ Recognition	
15	RedVector	Leading provider for online education programs.	www.redvector.com	Online training courses include:									
				Airport Pavements - Asphalt					\$38.95				National
				Asphalt 1: Introduction to Superpave and Materials Selection					\$77.90				National
				Asphalt 2: Superpave Mixture Volumetrics				\$149.85					National
				Asphalt Design - SuperPave: Aggregates & Mixtures			\$49.95						National
				Asphalt Design - SuperPave: Binders			\$99.90						National
16	SETFTTQ	South East Regional Alliance - AL, AR, FL, GA, KY, LA, MS, NC, PR, SC, TN, VA, WV Departments of Transportation, FHWA and AASHTO Subcommittee on Materials.	www.dot.state.fl.us/statematerialsoffice/setaskforce/	See programs below: (most of the participating DOTs have state-specific HMA training and certification or qualification programs. Examples are shown below)								Regional	
				Florida: Asphalt Plant Level I	Asphalt Testing Self - Study		Written plus Proficiency	every 5 years					State
				Florida: Asphalt Plant Level II	Passed written exam for Plant Level I, Asphalt Plant, Self-Study	90 days asphalt related work experience	Written	every 5 years					State
				Florida: Asphalt Paving Level I			Written plus Proficiency	every 5 years					State
				Florida: Asphalt Paving Level II	Asphalt Paving Self- Study	90 days asphalt related work experience	Written	every 5 years					State
				Florida: Asphalt Mix Designer	Passed written exam for Plant Level I	90 days asphalt related work experience	Written	every 5 years					State
				Florida: Asphalt QC Manager	Passed written exams for Asphalt Mix Designer, Plant Level II, Paving Level II, and General Quality Control.	12 months experience in asphalt.	Written	every 5 years					State

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Pre-requisites or Education Requirements	Experience Requirements	Examination Requirements	Re-Certification	Cost of Program	Cost of Recertification	No. Credentialed	Availability/ Recognition
16	SETFTTQ	South East Regional Alliance AL, AR, FL, GA, KY, LA, MS, NC, PR, SC, TN, VA, WV Departments of Transportation, FHWA and AASHTO Subcommittee on Materials.	www.dot.state.fl.us/statematerialsoffice/setaskforce/	Kentucky: Superpave Plant Technologist			Written plus Proficiency	every 5 years - Written plus Proficiency				State
				Kentucky: Superpave Mix Design Technologist	Superpave Plant Technologist		Written plus Proficiency	every 5 years - Written plus Proficiency				State
				South Carolina: Level 1		6 mos related experience required.	Written plus Proficiency	every 5 years - Written plus Proficiency				State
				South Carolina: Level 2S - HMA Mix Design Technician	Completion of HMA QC Technician certification	2 yrs field experience and 6 mos required mix design exp.	Written plus Proficiency (Min. one-time participation in AMRL, proficiency sample program (Marshall and Superpave)	every 5 years - Written (Maintain satisfactory participation in AMRL prof. Sample program to submit mix designs)				State
				South Carolina: Level 3 - HMA Quality Control Manager	Level I, Level 2S and ART Certification	2 yrs managerial experience	Written	Written (Passing Level 3 Recertification exam provides recertification in all other levels at same time				State
				South Carolina: Asphalt Roadway Technician (ART)	Must be certified by nuclear gauge manufacturer	6 months	Written	every 5 years - Written				State

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Pre-requisites or Education Requirements	Experience Requirements	Examination Requirements	Re-Certification	Cost of Program	Cost of Recertification	No. Credentialed	Availability/ Recognition
17	Texas Asphalt Pavement Association	Texas Asphalt Pavement Association is a full-service association for the hot mix asphalt industry.	http://www.txhotmix.org	See programs below: (TxDOT specific)								
				HMA Plant Production Specialist (Level 1-A)			Written plus performance	every 3 years - recertification course				
				HMA Roadway Specialist (Level 1-B)			Written plus performance	every 3 years - recertification course				
				HMA Mix Design Specialist (Level 2)			Written plus performance	every 3 years - recertification course				
18	USACE	USACE Transportation Systems Center -TSC	https://transportation.erd.c.usace.army.mil/tsmcx/training.html	Airfield Paving Workshop:					About \$8,000 for a single workshop and about \$5,000 when combined with a 2-day PCC Airfield Paving workshop			National
		USAC Learning Center	http://ulc.usace.army.mil	Construction and Rehabilitation of Flexible Pavements								National

Table A-2. HMA Training/Certification Program Identification Matrix - National & Regional Listings (continued).

#	National Organization / Regional Alliances	Program Owner/Creator	Web site address	Program	Pre-requisites or Education Requirements	Experience Requirements	Examination Requirements	Re-Certification	Cost of Program	Cost of Recertification	No. Credentialed	Availability/ Recognition
19	WAQTC	Western Regional Alliance: AK, CO, HI, ID, MT, NE, NM, OR, TX, UT, WA, Western and Central Federal Lands Highway Divisions (WFLHD and CFLHD) of the FHWA in cooperation with industry associations	http://www.waqtc.org/	See programs below: Shown is the groups' generic type program and also the program offered by NMDOT								
				Transportation Technician Qualification Program -TTQP /Asphalt Testing Technician - AsTT	Basic math & reading comprehension skills plus Radiation Safety certification for Asphalt module		written plus performance	written plus performance every 3 to 5 years per qualifying agency requirements	cost determined by each State	cost determined by each State	Regional	
20		The New Mexico Department of Transportation (NMDOT) and Associated Contractors of New Mexico (ACNM).	http://www.nmshtd.state.nm.us/main.asp?seid=11319	NMDOT: TTCP- Hot Mix Asphalt (AASHTO Test Methods)	Aggregate certification	160 hours of HMA related on-the-job training (OJT)	written plus performance	3 to 5 years w/valid aggregate certification				State (reciprocity review will be performed by the TTCP Administrator on a case-by-case basis)
	NOTES:	None of the programs are accredited										

APPENDIX B

Certification Benefits Survey

APPENDIX B

Certification Benefits Survey

Introduction

In October 2007, NICET conducted a survey of Senior Certified Technicians in Asphalt and in Highway Construction. The purpose of this survey was to collect information regarding the impact and benefits on the workforce and industry of earning and maintaining a professional certification. Over four hundred (428) individuals were invited to participate, including NICET Senior Certified Technicians in Asphalt and in Highway Construction: 403 people responded to the survey. Appendix B includes a copy of the survey that was distributed, as well as a summary of the results.

Certification Benefits

1. Do you or your employer require certification?

Yes No I don't know

2. Do you or your employer recognize certification?

Yes No I don't know

3. Do you or your employer reimburse or pay the costs of certification exams?

Yes No I don't know

4. Is certification required for your job?

Yes No I don't know

5. Does certification impact positively on your salary?

Yes No I don't know

6. If you answered Yes to previous question, how does certification impact your salary? Please select all that apply.

Raise in pay Bonus Company sponsored employee award Reimbursement for testing fee

7. Does certification impact positively on your promotion possibilities?

Yes No I don't know

8. Please add any other benefits of certification.

9. Does a certified workforce enhance a company's bottom line?

Yes
 No
 I don't know

10. Is certification required to bid for some contracts?

Yes
 No
 I don't know

11. Does a certified workforce help a company win contracts?

- Yes
- No
- I don't know

12. How does certification benefit your company? (Check all that apply.)

- Decreases employee turnover
- Decreases need for redoing jobs
- Increases likelihood of job being done correctly first time
- Decreases time/money spent on repairs
- Increases reputation for competence

13. Add any additional benefits of certification that you have observed.

14. Are these benefits measurable?

- Yes
- No
- I don't know

15. Do you or your employer measure the cost/benefit of certification?

- Yes
- No
- I don't know

16. If you answered Yes to the previous question, how are these benefits measured?

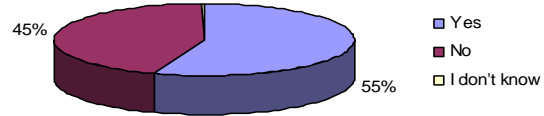
Thank You!

Thank you! NICET appreciates your input and wishes you the best in your career.

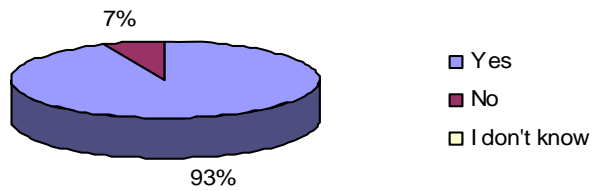
You will now be directed to NICET's website www.nicet.org. Please visit regularly for updates on how we are striving to better serve our customers.

Certification Benefits Survey Results

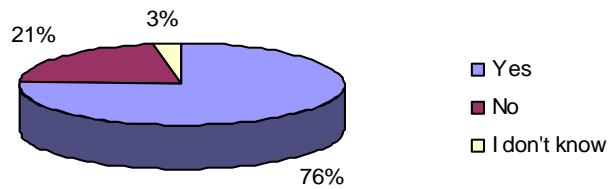
Do you or your employer require certification?



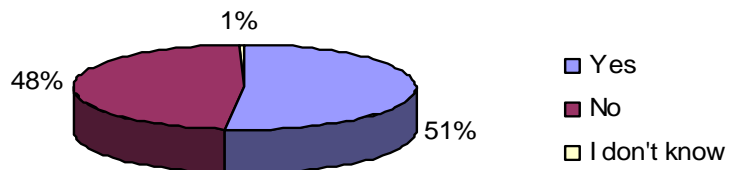
Do you or your employer recognize certification?



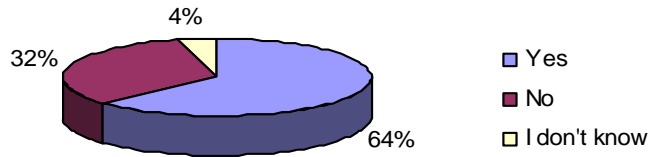
Do you or your employer reimburse or pay the costs of certification exams?



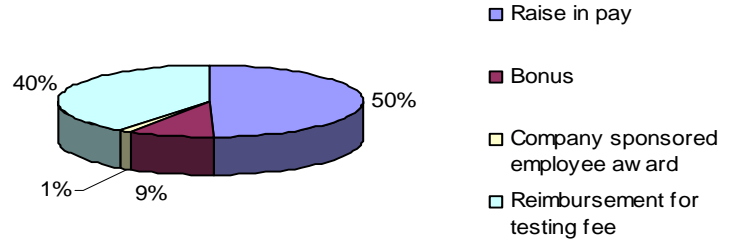
Is certification required for your job?



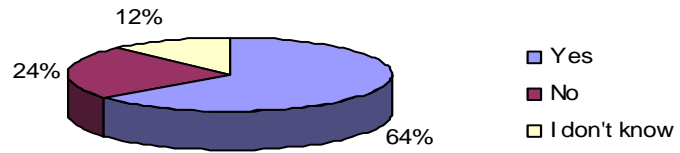
Does certification impact positively on your salary?



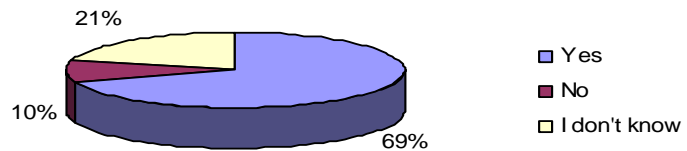
If you answered "Yes" to the previous question, how does certification impact your salary? Please select all that apply.



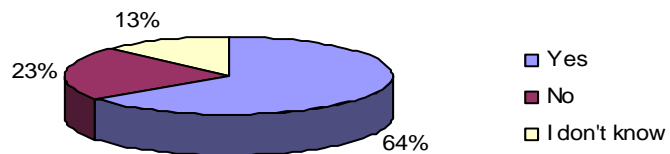
Does certification impact positively on your promotion possibilities?



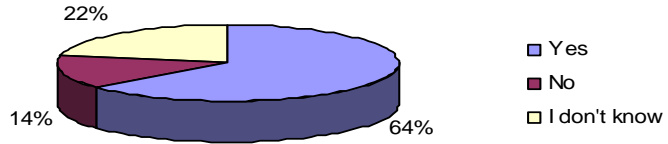
Does a certified workforce enhance a company's bottom line?



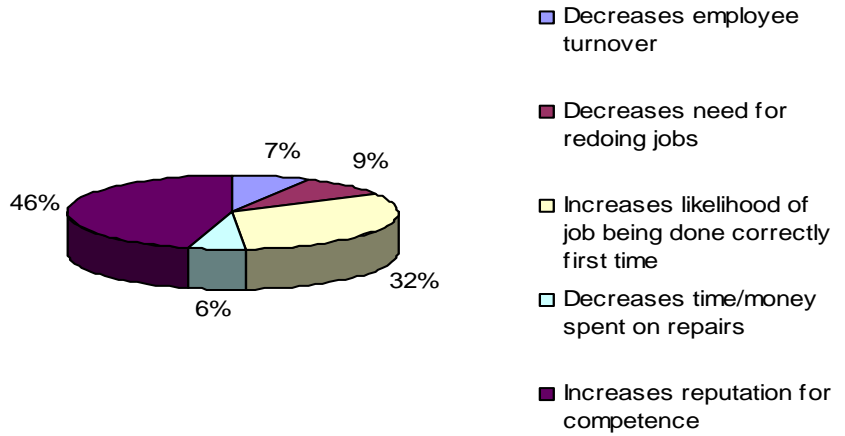
Is certification required to bid for some contracts?



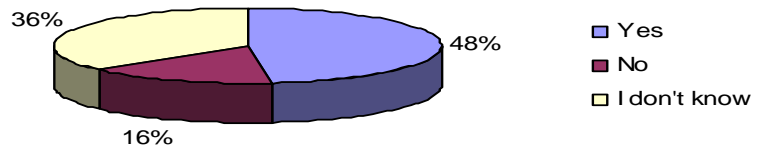
Does a certified workforce help a company win contracts?



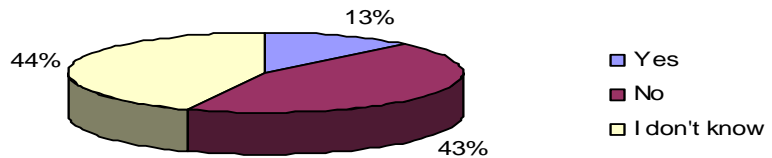
**How does certification benefit your company?
(Check all that apply)**



Are these benefits measurable?



Do you or your employer measure the cost/benefit of certification?



How are these benefits measured? (Open-ended responses)

- Individuals with NICET certification have a proven work history and knowledge of construction practices.
- We are able to bid on certain jobs due to certifications and the jobs are typically awarded at a higher rate of pay.
- Without the certification the company could not bid work for the [PennDOT]. As a state requirement, employees certified means future work with the department.
- As a consultant, our customers pay higher rates for NICET certified inspectors.
- By the job we do.
- We measure the hard costs of certification and accreditation but not the soft costs.
- These benefits help me being competent on all jobs and give me opportunity for promotion.
- Quality and Integrity of employees.
- By amount and volume of contracts with those who require it.
- It negates outside expense by doing the test within our laboratory.
- My pay raise more than covered the cost of the exam.
- Employer does not [measure benefit of certification,] but the certification assures credibility, confidence and knowledge of the job.
- Simply more projects awarded to us.
- There is a direct relationship between the capacity for certification attainment and field/laboratory capacities. In addition many projects must be staffed with certified technicians as stated above.
- With a certified and trained inspection staff, my employer is able to gain contracts to grow.
- We are able to market [to] municipalities in our area, and receive more work because of our certifications.
- Certification verifies a level of knowledge in their field.
- The company keeps close track of the profit to overhead ratio.
- Benefits are measured by performance at job and relationship between co-workers and contractors.
- Also by timely and satisfactory completion of contract.

Additional Comments on how earning professional certification has benefited you or benefits you have observed. (Open-ended responses):

- Shows where employees need improvement.
- Less overhead of supervisory personnel being involved in a daily basis.
- While I haven't observed it, I would assume that it would look good on my resume if I were to go to another state and they would see that I am NICET certified, and that they would recognize that this only comes with experience and knowledge.

Appendix B. Certification Benefits Survey Results

- Increases overall company image.
- We use certification as a marketing tool.
- The firm benefits on obtaining contracts because some clients require only NICET inspectors.
- Being NICET Certified makes the employee feel more confident in his/her capabilities.
- Pennsylvania dept. of trans. required inspectors to be certified for contracts bid. My certification along with others insures the company contract work.
- Once when I was working in Florida, I was laid off from my job. Within a month I received a call from our corporate office in Washington D.C. and they said that they needed a NICET level III on a NYDOT highway project. I took the job for 9 months and kept my benefits. Luckily I had a Level III. Actually I have five certifications and have been doing the work since.
- Our company is recognized as an industry leader due to the number of well-certified testing professionals we have on staff.
- Certified personnel generally are more responsible and care about making sure the job is done to the best of their ability.
- Certified personnel tend to take more pride in doing the job correctly.
- Certification [with NICET specifically] is a standard by which we measure potential contract employees for hire on our contracts. The benefits to our agency are that we have a measure to assure competency at a high level.
- Clients have a greater respect for technicians that are furthering their education in their respected fields of work.
- I suppose that when you say certification, you really mean NICET certification. Many of the states implement their own certification programs which seem to weigh more than the NICET. For example certifications from Florida and Illinois are recognized more than NICET. Most here in the Midwest don't know what NICET is. That seems to be an East coast and southern Midwest thing.
- NICET is required on most NJ highway and bridge projects.
- Certified Technicians always add to the credibility and reputation for employers.
- Provides a potential career path as well as a higher compensation path.
- Increased job commitment and treating the job as a profession/career.
- 40 Hrs OSHA Training certificate.
- Inspection details, plans, and specifications are understood clearly and the monitoring of contractor performance is more comprehensive. Also, individuals take more pride in their own performance. I know when I assign people to a project that are certified that they can do the job with little supervision and I do not feel I am running a day care center for inspectors.
- Prevents “puffed up” resumes, especially at level IV for supervisory positions.
- Construction Inspection has little or no overhead costs for a company since most costs are billable to the owner. If the owner requires NICET Certification for consultant staffing, that's a small price to pay.
- Certification for an individual is a good measure of an employee's dedication and commitment to the industry. It provides the employer and client with a level of interest and competence that the employee has in their field of expertise.

Appendix B. Certification Benefits Survey Results

- The certification program adds to qualifications, but having a AS or BS in Engineering Tech. or Science adds to overall credibility. NICET should mandate continued education to maintain certification, thus the cert. would be of greater value.
- My company won a consulting/inspection contract and the salary ranges were increased to the higher limit due to our staff all being certified. Within the first six months the state allowed our increases to begin (copies of certifications were provided to the state), unlike the general smaller increments I've experienced while working with a firm with non-certified inspectors.
- Certification is a pre-qualification for some Projects.
- Increased credibility in expert testimony situations. This may include litigation, arbitration, or mediation. Certification augments experience in a particular field and helps demonstrate that the technician is operating according to accepted standards, e.g., ACI certification for sampling and field-testing of concrete.
- Satisfaction that certification is a professional certification obtained by field participation and a lot of study.
- The study required to pass the test is like college, only it is to the point and not a lot of non-specific info, this is equivalent to 4 to 1 ratio of collage training. A person training to be a mechanic spending 3 years in history study.
- The Fed. Gov't. recognizes a Certification as an advantage during interviews and candidate selection for a position.
- Enlarges one's employment horizon, allows a certain (variable) degree of pride in one's work, promotes the need for correct procedures and workmanlike practices.
- During the selection process of “picking” the firm, clients weigh the certifications as a basis of having knowledgeable individuals on the project.
- I work for PennDOT in maintenance. Certification is not required and in reality probably attained by very few of us. Construction is different in that most if not all inspectors are certified.
- Makes me a more competent, valuable employee. I work for the MD state highway administration and after I retire I can work as a consultant construction inspector and thus I am already where the others have to climb up to.
- Respect from co-workers.
- I work for a public agency and NICET certification is not required. However, when we need to inspect a FAA construction project, NICET certification is required. That is why I went and got certified, so my employer would not have to hire outside our work force. I did not receive additional compensation nor was I reimbursed for all the tests I had to take to get to NICET Level III.
- We save money on contracts because we can perform contractor QC programs in-house instead of subbing them out to third party labs.
- NICET-certified employees indicate the employee has the knowledge, experience, and background to perform critical on-site inspections of roadway construction and maintenance activities. My agency has already indicated that NICET certification will be given preference on any new employee hiring for our Inspector classification.
- Insures that workforce is qualified.
- The company can be confident that the quality of work will be prioritized.
- Offsets and balances the fact that work element experience exceeds that of formal education without experience.

Appendix B. Certification Benefits Survey Results

- Penn DOT utilizes NICET certifications for reviewing consultant inspection agreements with engineering companies. The certifications are required as a way to verify experience for higher-level inspection positions.
- Assures educated people for monitoring the work.
- Having my NICET certification has kept me gainfully employed for over 18 years. As a female and single parent I am better respected as a professional. Although I do not have a college degree I have trained many college graduates how to be great inspectors and office engineers. I love NICET—thanks.
- People know that you belong to a professional organization.
- Positive reinforcement, gauge of employee capacities/areas where improvement training is needed, enhances employee self esteem.
- First, I would like to say that I am proud to be NICET certified Level IV. Over the past 15 years or so I have gained the respect of my supervisors and have been asked to attend other certification programs, such as ACI, CWI, Hazwopper, SAT, and TCC. I have become a truly valued employee able to achieve nearly any task, from training other inspectors to perform inspections and advancing them to higher levels to assuring that contractors do not miss details that would create additional work or future delays. Through certifications, I have gained the respect of the clients, and with a trained and certified inspection staff my employer is able to gain contracts.
- Recognized by The Pennsylvania Department of Transportation.
- When you tell someone you are a level 4 in your field they automatically know you have passed a testing system that you can not guess at and achieve the success of completion.
- In Nevada we certify all materials technicians per Nevada Alliance of Quality Testing in Construction (NAQTC). I see NICET occasionally referenced in FAA bid documents, but AASHTO accredited laboratories and NAQTC certified technicians also meets the requirement for certified testing. Certifying my technicians under NICET's programs would be redundant and the cost is not justified.
- MoDOT no longer recognizes or cares if we are certified. I am keeping my certification because I might seek employment somewhere else after retirement.
- Increase competence.
- The NICET certification helps justify 25 years of highway design and inspection work.
- Level of cert shows expertise in that field.
- Respect by my peers.
- It provides a level of trust by the client which might otherwise not be there.
- Able to acquire city work.
- Acknowledged by DOT.
- Although NICET is not required for employment it is strongly/positively considered for promotional possibilities.
- Assists in obtaining clients/work projects.
- Assures knowledgeable employees.
- Benefits the company.

Appendix B. Certification Benefits Survey Results

- Better assignments.
- Better status in construction industry.
- Can be used in other states.
- CAN NOT BE PROMOTED WITHOUT CERTIFICATION.
- Capability of Immediate Recognition to Perform Work.
- Certification is required by some DOTs; therefore it becomes critical for continued employment.
- Consulting work after retirement.
- Credibility amongst peers, employers, and engineering community.
- Enables bidding on larger projects that require certifications.
- For employment in the private sector.
- Free lane opportunities.
- Future employment opportunity.
- Helps with laboratory accreditations.
- I am currently employed by the Transportation Division for the State of Pennsylvania. While certification is not required, most construction inspectors have it and maintain it specifically for the purpose of working for a consultant engineer post PennDOT.
- I can show that I know what I'm talking about and have undergone inspections testing when dealing with contractors and trades.
- I could get a job easily because nowadays companies do require certifications.
- I have more knowledge of specific construction operations.
- Impressive on Resume.
- In finding employment.
- Increase in professionalism.
- Increases client confidence, provides an option for a non-engineer to demonstrate competence similar to the CSI certification programs (CDT, CCS, etc.)
- Increases likelihood of procuring job contracts.
- Industry standard cert.
- It gives the one certified the sense of accomplishment that I feel is needed to compete in the job markets of today's society.
- It is required of consultant inspectors working for the state of PA.
- It recognizes that one knows his responsibilities and knowledge.

Appendix B. Certification Benefits Survey Results

- Job security.
- Keeps an individual up to date on procedures.
- Less field work more office work.
- Maintain certification to allow an inside track to interview for various positions that require NICET certification.
- MoDOT no longer requires NICET for employees but continues to reimburse for re-certification.
- More and more projects are requiring certified technicians to perform testing and inspection services.
- More responsibility.
- More state work.
- My certification makes a fine talking point in any hiring or promotional interview.
- My company actively uses my resume with NICET cert as a selling point on proposals!
- National recognition in terms of engineering knowledge and experience.
- Needed for consultant work.
- Obtaining FAA Work; will cross over for other required State certifications.
- Offers opportunity for a position of higher responsibility which equates to higher pay.
- On jobsite, if you are certified, people are less likely to question your results or opinions.
- Opportunity to work for any Engineering firm that does CI passing NICET Levels assures needed field experience for work assignments.
- Personal achievement and satisfaction.
- Positively market yourself.
- Prestige.
- Promotes professional standing among peers and Engineers.
- Raises professional bar. helps assure quality. forces learning on both employee and employer.
- Recognition and respect for non college graduates.
- Recognition and respect for performance.
- Recognition by clients.
- Recognition within the industry as a qualified technician.
- Required to work NYSDOT Projects.
- Required by many regulatory agencies.
- Respectability.

Appendix B. Certification Benefits Survey Results

- Satisfaction to myself to know I have achieved this certification and at one time it was required by MoDOT to be promoted.
- Shows dedication to profession, competence.
- Status within the company.
- The Fed. Gov't. only recognizes NICET as another advantage to your resume.
- The only time I need a NICET certification is when I am inspecting a FAA construction project. FAA requires NICET certified inspectors.

APPENDIX C

**Airfield HMA Placement Operations Inspection and
Field Testing Technician Certification Competencies
Final Matrix and Validation Surveys**

APPENDIX C

Airfield HMA Placement Operations Inspection and Field Testing Technician Certification Competencies Final Matrix and Validation Surveys

Introduction

On May 7 and 8, 2007, NICET assembled a panel of subject matter experts (SMEs) to perform a “Job Task Analysis” or JTA for the inspection and testing of airfield HMA placement. Job Task Analysis is a term that NICET uses to describe a process in which the functions and responsibilities of a technician are defined and described task by task, and a facilitated process using SMEs is a well accepted approach to developing a matrix of required competencies at different levels.

The development of this competency matrix was followed by the distribution of a detailed validation survey, in which additional field practitioners/SMEs were asked to rate the importance of each task.

Table C-1 presents the final matrix of competencies as developed by the SMEs, while figure C-1 is the validation survey for Levels I through IV. In October 2007, NICET distributed the surveys in order to validate the content of a likely certification program for Airfield HMA Placement Operations Inspection and Field Testing Technicians. Over one thousand (1081) individuals were invited to participate, including NICET certified technicians in Asphalt Highway Construction and attendees of the 2006 FAA Great Lakes Region Airport Conference. Links to the surveys were also available on NICET’s website for others interested in participating. A separate survey was administered for each level of certification (Levels I through IV). Eighty-five people responded to the Level I survey, 40 people responded to the Level II survey, 25 people responded to the Level III survey, and 57 people responded to the Level IV survey. The results are presented in figure C-2 through C-5.

Airfield HMA Placement Operations Inspection and Field Testing Technician Competencies – Final Matrix

Domain	Level I	Level II	Level III	Level IV
Inspection of Airfield HMA Placement Operations	<p>*Measure Temperature of HMA</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Thermometer • Infrared gun <p>Skills:</p> <ul style="list-style-type: none"> • Read thermometer • Record measurement 	<p>*Inspect the Haul Vehicle Operation</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • HMA Paving Handbook 2000 (Chapter 13) • AI MS-22 <p>Skills:</p> <ul style="list-style-type: none"> • Cover load for transport • Make sure bed is clean/cleaned • Properly load truck 	<p>*Evaluate Plant, Transportation, Placement, and Compaction Operations</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • FHWA NHI Course 131032 • Equipment performance • Types of plants, equipment • NAPA applicable requirements • Best practice manuals for HMA airport construction (under development via AAPTTP) <p>Skills:</p> <ul style="list-style-type: none"> • Understand relationship of equipment to placement operation (e.g. based on work time frames) • Evaluate appropriate size and number of equipment • Evaluate specific site environment conditions w/ respect to time available for compaction 	No additional tasks for this level
	<p>*Measure Thickness of Loose or Compacted HMA</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • ASTM D3549 • HMA Paving Handbook 2000 (Chapter 15) • Standard agency specifications <p>Skills:</p> <ul style="list-style-type: none"> • Safely measure thickness of HMA with probes 	<p>*Inspect Tack Coat Application</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • HMA Paving Handbook 2000 (Chapter 14) • ASTM D2995, D140 • AI MS-22 • FAA P603 <p>Skills:</p> <ul style="list-style-type: none"> • Quantify application rate (e.g. gallons to surface area). • Verify cleanliness of sub-surface • Apply tack coat uniformly • Comply with temperature requirement of tack material 	<p>*Relationship of Rolling Operation to Mat Compaction</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • HMA Paving Handbook 2000 (Chapter 18) • Basic understanding of different roller types • AI MS-22 <p>Skills:</p> <ul style="list-style-type: none"> • Evaluate mix reaction in accordance with the compacted effort based on temp • Recommend corrective action • Follow up on recommended corrective action • Document recommendations and follow-up 	No additional tasks for this level

C-3

Airfield HMA Placement Operations Inspection and Field Testing Technician Competencies – Final Matrix (cont.)

Domain	Level I	Level II	Level III	Level IV
Inspection of Airfield HMA Placement Operations (cont.)	No additional tasks for this level	<p>*Inspect Surface Preparation</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • HMA Paving Handbook 2000 (Chapter 14) • AI MS-17, MS-22 • Project specifications <p>Skills:</p> <ul style="list-style-type: none"> • Verify grade • Verify cleanliness of sub-surface • Make sure surface is dry • Verify sub-grade is dry and not frozen • Comply with temperature requirement 	<p>*Aggregate Stockpile Management (3)</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • HMA Pavement Handbook 2000 (chapter 6) • National Stone, Sand and Gravel Association <p>Skills:</p> <ul style="list-style-type: none"> • Inspect and evaluate stockpile construction according to best practices • Identify aggregate contamination. 	No additional tasks for this level
	No additional tasks for this level	<p>*Inspect the Paver Operation</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • HMA Paving Handbook 2000 (Chapters 15 and 16) • FHWA / NHI course 131032 (Tab 12) • AI MS-22 <p>Skills:</p> <ul style="list-style-type: none"> • Observe truck /paver interaction • Synchronize truck delivery with paver operations • Screed width 	<p>*Verify Plant Operation</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Types of plants, storage facilities and manufacturing process, weigh master certification • HMA Pavement Handbook 2000 (chapters 8, 9, 10, 11) <p>Skills:</p> <ul style="list-style-type: none"> • Verify load-out HMA ticket information • Inspect plant certifications (e.g. weigh master, weigh scales) • Verify plant types and storage facilities 	No additional tasks for this level

Airfield HMA Placement Operations Inspection and Field Testing Technician Competencies – Final Matrix (cont.)

Domain	Level I	Level II	Level III	Level IV
<p>Inspection of Airfield HMA Placement Operations (cont.)</p>	<p>No additional tasks for this level</p>	<p>*Monitor Compactor Operation and Roller Pattern</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • HMA Paving Handbook 2000 (Chapter 18) • Basic understanding of different roller types • AI MS-22 <p>Skills:</p> <ul style="list-style-type: none"> • Understand relationship between rolling and density as applied to paving operations • Know effect of temperature of the mat on roller pattern • Understand difference between static and vibratory rolling 	<p>No additional tasks for this level</p>	<p>No additional tasks for this level</p>
<p>Field Testing of Airfield HMA Pavement</p>	<p>*Perform Sampling and Handling of Loose HMA</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • ASTM D979 • Standard agency specifications <p>Skills:</p> <ul style="list-style-type: none"> • Handle loose HMA • Sample HMA 	<p>*Measure and Collect Random Samples and Perform Tests</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • ASTM D3665 • Sampling frequency • Standard agency specifications <p>Skills:</p> <ul style="list-style-type: none"> • Read plans to determine location • Find locations • Read survey stake • Measure offsets • Apply Lot definitions to paving • Verify testing frequency 	<p>*Determine Segregation Profile</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • General knowledge of techniques for determining segregation (thermal imaging, gradation, density, texture, visual) • ASTM E965 <p>Skills:</p> <ul style="list-style-type: none"> • Visually identify areas of segregation • Determine sampling location 	<p>No additional tasks for this level</p>

Airfield HMA Placement Operations Inspection and Field Testing Technician Competencies – Final Matrix (cont.)

Domain	Level I	Level II	Level III	Level IV
Field Testing of Airfield HMA Pavement (cont.)	<p>*Perform Smoothness Testing Using Straight Edge</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • P401 • ASTM E127 <p>Skills:</p> <ul style="list-style-type: none"> • Manually move straight edge across pavement • Read and record measurements 	<p>*Inspect Longitudinal and Transverse Joint Construction</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • HMA Paving Handbook 2000 (Chapters 17) • AI MS-22 NHI course 131032 on HMA construction <p>Skills:</p> <ul style="list-style-type: none"> • Cut back joint using cutting wheel where specified • Compact joint using proper compaction • Verify with straight edge • Verify tacking • Offset multiple lift joints 	<p>*Manage and Analyze Data Collected on Smoothness to Establish Corrective Measures</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Lot sampling • P401 <p>Skills:</p> <ul style="list-style-type: none"> • Identify problem areas • Establish corrective actions • Verify results of corrective actions • Convey corrective actions to contractor 	No additional tasks for this level
	<p>*Perform Nuclear Density Testing</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • ASTM D2950 • Nuclear safety certification • Manufacturer’s recommendations <p>Skills:</p> <ul style="list-style-type: none"> • Perform test procedure • Calibrate equipment • Calculate density 	<p>*Determine Correlation Based on Nuclear Gauge and Core Densities</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • ASTM D2950 <p>Skills:</p> <ul style="list-style-type: none"> • Evaluate lab densities and apply correction factor to mix types 	<p>* Measure Smoothness by Profilograph</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • ASTM E950 <p>Skills:</p> <ul style="list-style-type: none"> • Identify problem areas • Establish corrective actions • Verify results of corrective actions • Convey corrective actions to contractor 	No additional tasks for this level

Airfield HMA Placement Operations Inspection and Field Testing Technician Competencies – Final Matrix (cont.)

Domain	Level I	Level II	Level III	Level IV
Field Testing of Airfield HMA Pavement (cont.)	<p>*Perform Sampling and Handling of Compacted HMA Samples</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • ASTM D979 • ASTM D5361 <p>Skills:</p> <ul style="list-style-type: none"> • Use coring machine • Transport and handle core • Properly extract cores • Fill core holes 	<p>*Measure Smoothness Using Profilograph</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Manufacturers operations manual • ASTM E1274 <p>Skills:</p> <ul style="list-style-type: none"> • Understand measurements (blanking band) • Calculate smoothness • Read charts • Synchronize longitudinal measurements • Operate profilograph (assemble and disassemble) • Calibrate profilograph 	No additional tasks for this level	No additional tasks for this level
HMA Mixture Characteristics	<p>*Demonstrate Awareness of Good Mix Properties</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Uniform coating • Lack of segregation • Uniform temperature <p>Skills:</p> <ul style="list-style-type: none"> • Visually monitor mixture • Monitor temperature 	<p>*Demonstrate Awareness of Basic HMA Mix Design Procedures</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Marshall Mix Design • Superpave Mix Design <p>Skills:</p> <ul style="list-style-type: none"> • Understand approved mix design properties • Explain mix design specification requirements 	<p>*Explain Relationship Between Mix Properties and Mix Design Requirements</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Relationships between mix segregation and pavement density • Relationship between non-uniform temperature and mix compaction • Relationship between mix air voids, pavement air voids, and compaction <p>Skills:</p> <ul style="list-style-type: none"> • Visually inspect mixture • Recognize cold spots, segregation, non-uniform mix, movement under the roller 	<p>*Recognize Need for HMA Mix Design Adjustments</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Mix properties represented by QC and field tests <p>Skills:</p> <ul style="list-style-type: none"> • Review mix QC tests and field tests • Inspect reports and note anomalies • Confirm field inspection and field test results with mix lab test results

Airfield HMA Placement Operations Inspection and Field Testing Technician Competencies – Final Matrix (cont.)

Domain	Level I	Level II	Level III	Level IV
Troubleshooting	<p>*Demonstrate Awareness of Existence of Basic Anomalies</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • HMA Pavement Handbook • Agency-specific specs <p>Skills:</p> <ul style="list-style-type: none"> • Understand pass/ fail criteria of testing methods • Report results to supervisor 	<p>*Report Anomalies and Non-Conformance to Specification on Level I and Level II Tasks</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • HMA Pavement Handbook • Agency-specific specs <p>Skills:</p> <ul style="list-style-type: none"> • Differentiate between pass and fail results • Recognize non-compliance • Verify results or re-tests • Recommend corrective action to supervisor 	<p>*Verify, Accept or Reject Level I, II and III HMA Field Test Results and Inspection Reports</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Ramifications of issues • Project specifications • Basic statistical acceptance plans • Cost-benefit <p>Skills:</p> <ul style="list-style-type: none"> • Master Level I and II functions • Accept/reject results • Assess impacts (cost, scheduling, safety, operations) • Report/document recommended decision to supervisor 	<p>*Establish Troubleshooting Protocol and Documentation Procedures</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Ramifications of issues • Project specifications • Basic statistical acceptance plans • Cost-benefit • General knowledge of airport project structure and airport operations <p>Skills:</p> <ul style="list-style-type: none"> • Establish SOPs • Master Level I, II and III functions • Initiate/implement acceptance/rejection process • Make final recommendations to final authority
Care and Maintenance of Testing and Inspection Equipment	<p>*Properly Use and Maintain Sampling and Testing Equipment</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Manufacturer's recommendations <p>Skills:</p> <ul style="list-style-type: none"> • Operate and maintain equipment in accordance with manufacturer's recommendations 	<p>*Inspect and Maintain Sampling and Testing Equipment</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Manufacturer's recommendations <p>Skills:</p> <ul style="list-style-type: none"> • Operate and maintain equipment in accordance with manufacturer's recommendations • Verify proper equipment storage 	<p>*Verify Calibration and Proper Working Conditions of All Equipment Used in Airport HMA Field Testing and Inspection</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Agency requirements (e.g. NRC requirements for nuclear gauge) <p>Skills:</p> <ul style="list-style-type: none"> • Maintain/document equipment per agency requirements • Recognize defective equipment and recommend replacement 	<p>*Manage Testing and Inspection Equipment Inventory</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Project equipment necessary • Required SOPs <p>Skills:</p> <ul style="list-style-type: none"> • Acquire necessary equipment • Schedule maintenance • Develop SOPs for equipment maintenance

Airfield HMA Placement Operations Inspection and Field Testing Technician Competencies – Final Matrix (cont.)

Domain	Level I	Level II	Level III	Level IV
<p align="center">Worksite Safety and Security</p>	<p>*Follow Safe Practices/Safety and Security Plan and Report Unsafe Practices on The Job Site</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Airport safety regulations • Basic individual safety practices • Company safety regulations • Basic first aid <p>Skills:</p> <ul style="list-style-type: none"> • Follow company safety procedures • Follow safe practices • Practice personal safety • Recognize individual safety violation • Administer first aid 	<p>*Identify and Address Basic Safety and Security Concerns</p> <p>Knowledge</p> <ul style="list-style-type: none"> • OSHA, Federal, state and regional requirements (OSHA 10-hour training program or equivalent knowledge) • Environmental concerns • Security requirements • Safety plan • Incident management system <p>Skills:</p> <ul style="list-style-type: none"> • Recognize and report individual safety violation • Follow appropriate regulations • Oversee personal safety and the safety of lower level employees • Report safety violations for self and lower level employees to proper authority 	<p>*Recognize Safety and Security Violations and Recommend Safety Actions</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • OSHA, Federal, state and regional requirements. (OSHA 30-hour training program or equivalent knowledge) <p>Skills:</p> <ul style="list-style-type: none"> • Recognize worksite safety violations • Implement worksite safety plan • Document all worksite safety violations 	<p>*Determine, Coordinate, and Implement the Training, Communication, Facility, and Monitoring Elements Required as Parts of an Adequate Safety Program</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • OSHA, Federal, state and regional requirements. (OSHA 40-hour training program or equivalent knowledge) • Appropriate and required documentation processes and forms • Project safety management system <p>Skills:</p> <ul style="list-style-type: none"> • Ability to develop safety plan • Administer safety plan • Document and report safety and security violations

Airfield HMA Placement Operations Inspection and Field Testing Technician Competencies – Final Matrix (cont.)

Domain	Level I	Level II	Level III	Level IV
Management	No additional tasks for this level	No additional tasks for this level	<p>*Assist With the Management of Multiple or Complex Projects</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Project specifications and contract requirements • Personnel supervision and management • Personnel safety standards, procedures, and equipment • Equipment use, storage, and transportation procedures • Procedures, standards, and equipment needed for all Level I and II tasks • Basic principles of general record keeping and record-keeping for payroll and contract administration purposes 	<p>*Maintain the Quality of Processes and Personnel in Order to Maintain Field Competence</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Accreditation Programs and the appropriate technician training and certification program(s) • ISO Guide 17025 • Equipment calibration, maintenance, personnel qualification requirements, training requirements, equipment inventory, dispute resolution, record keeping, proficiency sample testing and reporting requirements of AASHTO R18

Airfield HMA Placement Operations Inspection and Field Testing Technician Competencies – Final Matrix (cont.)

Domain	Level I	Level II	Level III	Level IV
<p>Management (cont.)</p>			<p>Skills:</p> <ul style="list-style-type: none"> • Determine and communicate project requirements • Determine personnel capabilities and qualifications, matching them with the needs of project tasks • Develop work schedules– for efficient use of staff, equipment, and resources to complete work in a timely and cost-effective manner • Coordinate inspection and testing activities with other project operations • Verify and enforce safety compliance by technicians • Determine internal QC requirements and check for compliance • Review tech’s payroll (time card) • - Define and communicate employee expectations • Maintain records of performance evaluation • Communicate directions and evaluate results • Mentor subordinates • Resolve conflict 	<p>Skills:</p> <ul style="list-style-type: none"> • Evaluate field inspection and testing processes and personnel qualifications for compliance with accreditation standards • Analyze and recommend possible changes to bring testing and inspection processes and personnel into compliance

Airfield HMA Placement Operations Inspection and Field Testing Technician Competencies – Final Matrix (cont.)

Domain	Level I	Level II	Level III	Level IV
<p>Management (cont.)</p>	<p>No additional tasks for this level</p>	<p>No additional tasks for this level</p>	<p>*Coordinate Field Inspection and Testing Operations</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Typical owner/customer concerns • Technician capabilities • Inspection, testing and reporting time • Interrelationships among equipment maintenance, inspection, calibration, and use and potential conflicts • Owner/customer expectations <p>Skills:</p> <ul style="list-style-type: none"> • Determine owner/customer expectations • Schedule equipment maintenance, inspection, calibration, and use to minimize conflict • Schedule employee work to meet customer/contract execution schedule • Identify inspection and test anomalies and make adjustments in reporting to meet customer needs • Identify appropriate inspection and test methods to meet project requirements 	<p>*Establish Field Inspection and Testing Program and Schedule</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Appropriate field inspection task and tests to characterize HMA placement processes and materials • Time, equipment, and technician needs to conduct Level I, Level II and Level III inspection and testing tasks • What inspection tasks and tests can be conducted independently and which ones need to be sequenced • Know the reason and purpose for conducting inspection tasks and tests <p>Skills:</p> <ul style="list-style-type: none"> • Schedule field inspection and testing staff • Determine the sequence of inspection and testing tasks necessary for efficient field operations

Airfield HMA Placement Operations Inspection and Field Testing Technician Competencies – Final Matrix (cont.)

Domain	Level I	Level II	Level III	Level IV
<p>Management (cont.)</p>	<p>No additional tasks for this level</p>	<p>No additional tasks for this level</p>	<p>No additional tasks for this level</p>	<p>Monitor Changes in Standards and Specifications to Assure That HMA Field Testing and Inspection Procedures are in Conformance</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • AASHTO, ASTM, FAA, federal, state, and local government procedures for issuing and updating testing standards • Current ASTM / AASHTO / FAA / State DOT / FHWA standards and specifications updates <p>Skills:</p> <ul style="list-style-type: none"> • Read, interpret, and identify changes in updated standards and specifications • Determine the most recent date and content of standard • Identify differences between old and new standards • Ensure the appropriate standard is applied to project

Airfield HMA Placement Operations Inspection and Field Testing Technician Competencies – Final Matrix (cont.)

Domain	Level I	Level II	Level III	Level IV
<p>Management (cont.)</p>	<p>No additional tasks for this level</p>	<p>No additional tasks for this level</p>	<p>No additional tasks for this level</p>	<p>*Project Management for Field Inspection and Testing Operations</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Cost of inspection and testing operations, including equipment, personnel, reporting and overhead • Principles of budget planning, management and billing • Understand contract and scope of services • Principles of supervision, and employee mentoring and training Labor Laws OSHA regulations • Cost estimating for prospective projects • Meeting project needs within budget and on time • Loss prevention techniques • Personnel management • Customer service • Sources of information about project objectives, limitations, procedures, resources, personnel, budgets, and schedules • Purposes and language of contracts and the nature of contractual relationships (scope of services)

Airfield HMA Placement Operations Inspection and Field Testing Technician Competencies – Final Matrix (cont.)

Domain	Level I	Level II	Level III	Level IV
<p>Management (cont.)</p>				<p>Skills:</p> <ul style="list-style-type: none"> • Communicate effectively internally and externally • Provide customer service and client interaction • Coordinate work of field technicians and others to define and meet common field inspection and testing goals • Manage multiple projects simultaneously • Avoid and manage conflicts • Perform dispute resolution as needed • Understand and use different Scheduling tools • Determine project specifications and QC requirements • Provide field management for a project Q/C program to assure that objectives are being met on time and within budget

Airfield HMA Placement Operations Inspection and Field Testing Technician Competencies – Final Matrix (cont.)

Domain	Level I	Level II	Level III	Level IV
<p style="text-align: center;">Management (cont.)</p>	<p>No additional tasks for this level</p>	<p>No additional tasks for this level</p>	<p>No additional tasks for this level</p>	<p>*Develop and Manage a Plan for Test/Trial Section Approval Process and HMA JMF Adjustments</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Proportioning methods for asphalt concrete mixes • AI SP-2 • AI MS-22 • Asphalt Lab level 1, 2, 3 tests <p>Skills:</p> <ul style="list-style-type: none"> • Determine sample requirements, test methods, and reporting requirements • Interpret results

Airfield HMA Placement Operations Inspection and Field Testing Technician Competencies – Final Matrix (cont.)

Domain	Level I	Level II	Level III	Level IV
Training	No additional tasks for this level	<p>*Provide On-the-Job Training for Level I Technicians in Inspection, Testing, Safety, and Job Responsibilities</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Inspection and testing procedures • Test equipment • Reporting requirements • Training methods • Safety requirements <p>Skills:</p> <ul style="list-style-type: none"> • Communicate verbally clearly • Document attended training by Level 1 	<p>*Provide Formal and On-The-Job Training on HMA Field Inspection and Testing and Safety to Level I and II Technicians</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Fundamentals of the subject matter • Understand all pertinent inspection and test procedures and application of results • Understand all pertinent inspection and test equipment maintenance and use • Safety standards, procedures, and equipment • AASHTO R18/ISO Guide 17025 • Appropriate styles of training (lecture, written material, demonstration, hands-on) for various types of knowledge or skills <p>Skills:</p> <ul style="list-style-type: none"> • Practice effective communication and delivery of information and technology transfer • Provide proper observation and assessment • Demonstrate proficiency in the performance of applicable test and inspection procedures • Determine training needs of each technician • Organize and present information clearly • Demonstrate and/or explain testing and safety procedures • Observe and check learner’s proficiency 	<p>*Establish and Manage a Training Program for Airport HMA Field Inspection and Testing Technicians</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Inspection and testing methods • Capabilities and limitations of inspection and testing equipment • Equipment calibration requirements • Written report content and requirements <p>Skills:</p> <ul style="list-style-type: none"> • Communication and delivery skills • Recognize and mentor technicians with management potential • Provide performance evaluations to technicians

Airfield HMA Placement Operations Inspection and Field Testing Technician Competencies – Final Matrix (cont.)

NOTES:

1. Knowledge will include The Best Practices Manual for HMA Airport Construction, currently under development by FAA.
2. For clarity, the Domain “Inspection and Testing” was separated into two Domains, i.e. one for “Inspection” and another for “Testing.”
3. A Domain for “HMA Mixture Characteristics” was added to cover the tasks as indicated per the discussions which took place at the committee’s meeting on May 7th and 8th, 2007.
4. The Domains for “Data Analysis” and “Documentation and Reporting” and “Interpretation of Plans and Specifications” were deleted and their respective tasks were combined as necessary with the other Domains.
5. The tasks and corresponding knowledge and skills for the “Management” and “Training” Domains were completed by the NICET staff based on the Job Task Analysis “JTA” competency matrix developed for the “Testing and Inspection of HMA Placement Operation Technician” for highway work.

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

Introduction

Thank you in advance for your time and thoughtful input.

This survey will be used to validate the developed job task analysis for a NICET Airfield Hot-Mix Asphalt (HMA) Placement Operations Inspection and Field Testing Technician Level I.

This survey is divided into three parts.

- **Part 1: Task Ratings and Job Performance** - Rate the tasks and their importance to the job performance of the technician and the frequency each is performed.
- **Part 2: Initial Section Weights** - Give your opinion on what percentage of the exam should be delegated to each section of tasks.
- **Part 3: Exam Questions per Task** - Choose the percentage of questions each task should cover during the exam.

Note that questions with an asterisk (*) require an answer prior to moving on to the next. If you would like to change your answer or view a previously answered question, use the navigation buttons, "NEXT" or "PREV", to do so.

Before you begin the survey, please tell us a little about yourself.

About You

How long have you been working in the area of hot-mix asphalt materials testing and inspection?

- Less than 1 year 1-2 years 2-5 years 5-10 years More than 10 years

*** In which area(s) of HMA materials testing and inspection do you have experience? (Check all that apply.)**

- HMA Field Testing HMA Lab Testing HMA Placement Operations and Inspection

*** Do you have experience in other areas of materials testing? (Check all that apply.)**

- Aggregates Concrete Soils

Have you earned any certifications?

- Yes No

If you answered Yes to the previous question, which certification(s) do you have?

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

What is your job title?

*** Is there a difference between owner and contractor airfield HMA placement operations inspection and field testing personnel qualifications?**

Yes
 No

Comments

*** Do you think there is a need for a national certification program for "Airfield HMA Placement Operations Inspection and Field Testing Technicians"?**

Yes
 No

Comments

Technician Profile/Explanation of Domains

Please read the following technician profile of the NICET Airfield Hot-Mix Asphalt (HMA) Placement Operations Inspection and Field Testing Technician very carefully because you will need this information as you proceed through the survey.

Characteristics of a candidate who is borderline-qualified to pass the examination (one who has just met the minimum requirements for certification, but no more) include:

- **Education/Knowledge:** Formal education not required but educational experiences at least equivalent to a high school diploma are expected.
- **Minimum Work Experience:** Six months minimum work experience in asphalt field testing and inspection.
- **Typical Activities Performed:** Simple, repetitive, specific tasks, measurements and computations. Document findings.
- **Typical Job Titles:** Field Technician I, Inspector I, Engineering Aide I, Assistant Inspector

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

There are four levels of certification, ranging from the entry-level trainee (Level I) to the senior level technician (Level IV). **This is a survey for the content for the Level I certification.**

Each level of certification is represented by a section of tasks. The tasks are grouped into **domains**, or major areas of responsibility. In the next section of the survey, each section of tasks is stated and followed by the knowledge and skills considered necessary to properly complete each task.

The domains or major areas of responsibility are:

- Inspection of Airfield HMA Placement Operations
- Field Testing of Airfield HMA Pavement
- HMA Mixture Characteristics
- Troubleshooting
- Care & Maintenance of Testing & Inspection Equipment
- Worksite Safety and Security
- Management
- Training

Part 1: Task Ratings and Job Performance

Following are the proposed tasks, knowledge and skills necessary for the Level I NICET Airfield HMA Placement Operations Inspection and Field Testing Technician.

Please rate the JOB IMPORTANCE and FREQUENCY of the following tasks for a borderline-qualified candidate by selecting the appropriate point on the rating scale next to each task.

Inspection of Airfield HMA Placement Operations

Empty box for task ratings and job performance.

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Measure temperature of hot mix asphalt.**

Knowledge:

- Thermometer
- Infrared gun

Skills:

- Read thermometer.
- Record measurement.

Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level I, which Level is this task appropriate? (Type *Level II*, *Level III*, *Level IV* or *not at all*.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 2. Measure thickness of loose or compacted hot mix asphalt.**

Knowledge:

- **ASTM D3549**
- **HMA Paving Handbook 2000 (Chapter 15)**
- **Standard agency specifications**

Skills:

- **Safely measure thickness of hot mix asphalt with probes.**

Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level I, which Level is this task appropriate? (Type *Level II, Level III, Level IV* or *not at all*.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Field Testing of Airfield HMA Pavement

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Perform sampling and handling of loose hot mix asphalt.**

Knowledge:

- ASTM D979
- Standard agency specifications

Skills:

- Handle loose hot mix asphalt.
- Sample hot mix asphalt.

Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level I, which Level is this task appropriate? (Type *Level II, Level III, Level IV* or *not at all*.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 2. Perform smoothness testing using straight edge.**

Knowledge:

- P401
- ASTM E127

Skills:

- Manually move straight edge across pavement.
- Read and record measurements.

Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level I, which Level is this task appropriate? (Type *Level II, Level III, Level IV* or *not at all*.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NICET/ APTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 3. Perform nuclear density testing.**

Knowledge:

- **ASTM D2950**
- **Nuclear safety certification**
- **Manufacturer's recommendations**

Skills:

- **Perform test procedure.**
- **Calibrate equipment.**
- **Calculate density.**

Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level I, which Level is this task appropriate? (Type Level II, Level III, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NICET/ AAPTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 4. Perform sampling and handling of compacted hot mix asphalt samples.**

Knowledge:

- ASTM D979
- ASTM D5361

Skills:

- Use coring machine.
- Transport and handle core.
- Properly extract cores.
- Fill core holes.

Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level I, which Level is this task appropriate? (Type Level II, Level III, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

HMA Mixture Characteristics

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Demonstrate awareness of good mix properties.**

Knowledge:

- **Uniform coating**
- **Lack of segregation**
- **Uniform temperature**

Skills:

- **Visually monitor mixture.**
- **Monitor temperature.**

Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level I, which Level is this task appropriate? (Type *Level II, Level III, Level IV* or *not at all*.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Troubleshooting

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Demonstrate awareness of existence of basic anomalies.**

Knowledge:

- **HMA Pavement Handbook**
- **Agency specific specifications**

Skills:

- **Understand pass/fail criteria of testing methods.**
- **Report results to supervisor.**

Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level I, which Level is this task appropriate? (Type Level II, Level III, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Care & Maintenance of Testing & Inspection Equipment

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Properly use and maintain sampling and testing equipment.**

Knowledge:

- **Manufacturer's recommendations**

Skills:

- **Operate and maintain equipment in accordance with manufacturer's recommendations.**

Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level I, which Level is this task appropriate? (Type *Level II, Level III, Level IV* or *not at all.*)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Worksite Safety & Security

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Follow safe practices/ safety and security plan and report unsafe practices on the job site.**

Knowledge:

- Airport safety regulations
- Basic individual safety practices
- Company safety regulations
- Basic first aid

Skills:

- Follow company safety procedures.
- Follow safe practices.
- Practice personal safety.
- Recognize individual safety violation.
- Administer first aid.

Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level I, which Level is this task appropriate? (Type Level II, Level III, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Management

There are no tasks at this level.

Training

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

There are no tasks at this level.

Part 2: Initial Section Weights

Please type the percentage of the questions you think should be devoted to each of these sections.

NOTE: Your total should add up to 100%.

*** What percentage of the certification exam do you think should be devoted to each section of tasks?**

Inspection of Airfield HMA Placement Operations	<input type="text"/>
Field Testing of Airfield HMA Pavement	<input type="text"/>
HMA Mixture Characteristics	<input type="text"/>
Troubleshooting	<input type="text"/>
Care & Maintenance of Testing & Inspection Equipment	<input type="text"/>
Worksite Safety & Security	<input type="text"/>

Part 3: Items per Task

Exam questions will be multiple-choice in format. Each question will be linked to a task.

Please indicate what percentage of the items within a section should be devoted to each task on the examination.

NOTE: Your total per section of tasks should add up to 100%.

*** "Inspection of Airfield HMA Placement Operations" Tasks**

Task 1. Measure temperature of HMA.	<input type="text"/>
Task 2. Measure thickness of loose or compacted HMA.	<input type="text"/>

*** "Field Testing of Airfield HMA Pavement" Tasks**

Task 1. Perform sampling and handling of loose hot mix asphalt.	<input type="text"/>
Task 2. Perform smoothness testing using straight edge.	<input type="text"/>
Task 3. Perform nuclear density testing.	<input type="text"/>
Task 4. Perform sampling and handling of compacted hot mix asphalt samples.	<input type="text"/>

"HMA Characteristics" Tasks

Task 1. Demonstrate awareness of good mix properties. (100%)	
--	--

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

"Troubleshooting" Tasks

Task 1. Demonstrate awareness of existence of basic anomalies. (100%)

"Care & Maintenance of Testing & Inspection Equipment" Tasks

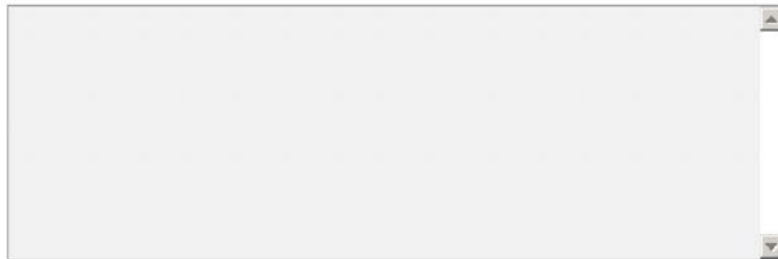
Taks 1. Properly use and maintain sampling and testing equipment. (100%)

"Worksite Safety & Security" Tasks

Task 1. Follow safe practices/ safety and security plan and report unsafe practices on the job site. (100%)

Comments

Please enter any additional comments here.



Thank You

NICET thanks you for participating in this survey. It is because of professionals like yourself that NICET is able to offer valid and useful certification programs.

The results of this survey will serve as the backbone for developing program competencies and examination questions for a Airfield HMA Placement Operations Inspection and Field Testing Technician Level I certification. Your continued dedication to your industry is greatly appreciated.

You will now be directed to NICET's website, www.nicet.org. Please be sure to visit frequently for news on certification programs and to see how NICET is continually striving to better serve our customers.

NICET/ AAPT Airfield HMA Placement Operations Inspection & Field Testing Technician

Introduction

Thank you in advance for your time and thoughtful input.

This survey will be used to validate the developed job task analysis for a NICET Airfield Hot-Mix Asphalt (HMA) Placement Operations Inspection and Field Testing Technician Level II.

This survey is divided into three parts.

- **Part 1: Task Ratings and Job Performance** - Rate the tasks and their importance to the job performance of the technician and the frequency each is performed.
- **Part 2: Initial Section Weights** - Give your opinion on what percentage of the exam should be delegated to each section of tasks.
- **Part 3: Exam Questions per Task** - Choose the percentage of questions each task should cover during the exam.

Note that questions with an asterisk (*) require an answer prior to moving on to the next. If you would like to change your answer or view a previously answered question, use the navigation buttons, "NEXT" or "PREV", to do so.

Before you begin the survey, please tell us a little about yourself.

About You

How long have you been working in the area of hot-mix asphalt materials testing and inspection?

Less than 1 year 1-2 years 2-5 years 5-10 years More than 10 years

*** In which area(s) of HMA material testing and inspection do you work or have experience? (Check all that apply.)**

HMA Field Testing HMA Lab Testing HMA Placement Operations Inspection

*** Do you have experience in any other areas of materials testing? (Check all that apply.)**

Aggregates Concrete Soils

Have you earned any certifications?

Yes No

If you answered Yes to the previous question, which certification(s) do you have?

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

What is your job title?

*** Is there a difference between owner and contractor airfield HMA placement operations inspection and field testing personnel qualifications?**

 Yes No

Comments

*** Do you think there is a need for a national certification program for "Airfield HMA Placement Operations Inspection and Field Testing Technicians"?**

 Yes No

Comment

Technician Profile/Explanation of Domains

Please read the following technician profile of the NICET Airfield Hot-Mix Asphalt (HMA) Placement Operations Inspection and Field Testing Technician very carefully because you will need this information as you proceed through the survey.

Characteristics of a candidate who is borderline-qualified to pass the certification examination (one who has just met the minimum requirements for certification, but no more) include:

- **Education/Knowledge:** Formal education not required but work/and or educational experiences equivalent to college, self-study, correspondence courses, workshops, or field assignments, etc.) are expected.
- **Minimum Work Experience:** Twenty-four months minimum work experience, of which at least twelve months must involve asphalt field testing and inspection activities.
- **Typical Activities Performed:** Performs common field acceptance tests. Monitor asphalt construction procedures. Prepare test reports. Read specs and drawings.
- **Typical Job Titles:** Field Technician II, QA/QC Technician, Engineering Aide II, Associate Inspector

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

There are four levels of certification, ranging from the entry-level trainee (Level I) to the senior level technician (Level IV). **This is a survey for the content for the Level II certification.**

Each level of certification is represented by a section of tasks. The tasks are grouped into **domains**, or major areas of responsibility. In the next section of the survey, each section of tasks is stated and followed by the knowledge and skills considered necessary to properly complete each task.

The domains or major areas of responsibility are:

- Inspection of Airfield HMA Placement Operations
- Field Testing of Airfield HMA Pavement
- HMA Mixture Characteristics
- Troubleshooting
- Care & Maintenance of Testing & Inspection Equipment
- Worksite Safety and Security
- Management
- Training

Part 1: Task Ratings and Job Performance

Following are the proposed tasks, knowledge and skills necessary for the NICET Airfield HMA Placement Operations Inspection and Field Testing Technician Level II.

Please rate the JOB IMPORTANCE and FREQUENCY of the following tasks for a borderline-qualified candidate by selecting the appropriate point on the rating scale next to each task.

Inspection of Airfield HMA Placement Operations

Empty box for task ratings and job performance.

NICET/ APTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Inspect the haul vehicle operation.**

Knowledge:

- **HMA Paving Handbook 2000 (Chapter 13)**
- **AI MS-22**

Skills:

- **Cover load for transport.**
- **Make sure bed is clean/ cleaned.**
- **Properly load truck.**

Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level II, which Level is this task appropriate? (Type *Level I, Level III, Level IV* or *not at all*.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NICET/ AAPTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 2. Inspect tack coat application.**

Knowledge:

- **HMA Paving Handbook 2000 (Chapter 14)**
- **ASTM D2995, D140**
- **AI MS-22**
- **FAA P603**

Skills:

- **Quantify application rate (e.g. gallons to surface area).**
- **Verify cleanliness of subsurface.**
- **Apply tack coat uniformly.**
- **Comply with temperature requirement of tack material.**

Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level II, which Level is this task appropriate? (Type Level I, Level III, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 3. Inspect surface preparation.**

Knowledge:

- **HMA Paving Handbook 2000 (Chapter 14)**
- **AI MS-17, MS-22**
- **Project specifications**

Skills:

- **Verify grade.**
- **Verify cleanliness of sub-surface.**
- **Make sure surface is dry.**
- **Verify sub-grade is dry and not frozen.**
- **Comply with temperature requirement.**

Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level II, which Level is this task appropriate? (Type Level I, Level III, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NICET/ APTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 4. Inspect the paver operation.**

Knowledge:

- **HMA Paving Handbook 2000 (Chapters 15 and 16)**
- **FHWA/ NHI course 131032 (Tab 12)**
- **AI MS-22**

Skills:

- **Observe truck/ paver interaction.**
- **Synchronize truck delivery with paver operations.**
- **Screed width.**

Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level II, which Level is this task appropriate? (Type Level I, Level III, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 5. Monitor compactor operation and roller pattern.**

Knowledge:

- **HMA Paving Handbook 2000 (Chapter 18)**
- **Basic understanding of different roller types**
- **AI MS-22**

Skills:

- **Understand relationship between rolling and density as applied to paving operations.**
- **Know effect of temperature of the mat on roller pattern.**
- **Understand difference between static and vibratory rolling.**

Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?

Yes
 No

If not at Level II, which Level is this task appropriate? (Type Level I, Level III, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Field Testing of Airfield HMA Pavement

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Measure and collect random samples and perform tests.**

Knowledge:

- **ASTM D3665**
- **Sampling frequency**
- **Standard agency specifications**

Knowledge:

- **Read plans to determine location.**
- **Find locations.**
- **Read survey stake.**
- **Measure offsets.**
- **Apply lot definitions to paving.**
- **Verify testing frequency.**

Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level II, which Level is this task appropriate? (Type Level I, Level III, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 2. Inspect longitudinal and transverse joint construction.**

Knowledge:

- **HMA Paving Handbook 2000 (Chapter 17)**
- **AI MS-22**
- **NHI course 131032 on HMA construction**

Skills:

- **Cut back joint using cutting wheel where specified.**
- **Compact joint using proper compaction.**
- **Verify with straight edge.**
- **Verify tacking.**
- **Offset multiple lift joints.**

Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level II, which Level is this task appropriate? (Type Level I, Level III, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NICET/ APTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 3. Determine correlation based on nuclear gauge and core densities.**

Knowledge:

- **ASTM D2950**

Skills:

- **Evaluate lab densities and apply correction factor to mix types.**

Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level II, which Level is this task appropriate? (Type *Level I, Level III, Level IV* or *not at all*.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NICET/ AAPTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 4. Measure smoothness using profilograph.**

Knowledge:

- **Manufacturer's operations manual**
- **ASTM E1274**

Skills:

- **Understand measurements (blanking band).**
- **Calculate smoothness.**
- **Read charts.**
- **Synchronize longitudinal measurements.**
- **Operate profilograph (assemble and disassemble).**
- **Calibrate profilograph.**

Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?

Yes
 No

If not at Level II, which Level is this task appropriate? (Type Level I, Level III, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

HMA Mixture Characteristics

NICET/ AAPTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Demonstrate awareness of basic hot mix properties and mix design procedures.**

Knowledge:

- Marshall Mix Design
- Superpave Mix Design

Skills:

- Understand approved mix design properties.
- Explain mix design specification requirements.

Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level II, which Level is this task appropriate? (Type Level I, Level III, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Troubleshooting

NICET/ APTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Report anomalies and non-conformance to specifications on Level I and Level II tasks.**

Knowledge:

- **HMA Pavement Handbook**
- **Agency specific specifications**

Skills:

- **Differentiate between pass and fail results.**
- **Recognize non-compliance.**
- **Verify results or re-tests.**
- **Recommend corrective action to supervisor.**

Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?

Yes
 No

If not at Level II, which Level is this task appropriate? (Type Level I, Level III, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Care & Maintenance of Testing & Inspection Equipment

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Inspect and maintain sampling and testing equipment.**

Knowledge:

- **Manufacturer's recommendations**

Skills:

- **Operate and maintain equipment in accordance with manufacturer's recommendations.**
- **Verify proper equipment storage.**

Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level II, which Level is this task appropriate? (Type Level I, Level III, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Worksite Safety & Security

NICET/ APTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Identify and address basic safety and security concerns.**

Knowledge:

- **OSHA, Federal, state and regional requirements (OSHA 10-hour training program or equivalent knowledge)**
- **Environmental concerns**
- **Security requirements**
- **Safety plan**
- **Incident management system**

Skills:

- **Recognize and report individual safety violation.**
- **Follow appropriate regulations.**
- **Oversee personal safety and the safety of lower level employees.**
- **Report safety violations for self and lower level employees to proper authority.**

Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?

Yes
 No

If not at Level II, which Level is this task appropriate? (Type Level I, Level III, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Management

There are no tasks at this level.

NICET/ AAPT Airfield HMA Placement Operations Inspection & Field Testing Technician

Training

*** 1. Provide on-the-job training for Level I Technicians in inspection, testing, safety and job responsibilities.**

Knowledge:

- Inspection and testing procedures
- Test equipment
- Reporting requirements
- Training methods
- Safety requirements

Skills:

- Communicate verbally clearly.
- Document attended training by Level I Technicians.

Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level II, which Level is this task appropriate? (Type Level I, Level III, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Part 2: Initial Section Weights

Please type the percentage of the questions you think should be devoted to each of these sections.

NOTE: Your total should add up to 100%.

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** What percentage of the exam do you think should be devoted to each section of tasks?**

Inspection of Airfield HMA Placement Operations	<input type="text"/>
Field Testing of Airfield HMA Pavement	<input type="text"/>
HMA Mixture Characteristics	<input type="text"/>
Troubleshooting	<input type="text"/>
Care & Maintenance of Testing & Inspection Equipment	<input type="text"/>
Worksite Safety & Security	<input type="text"/>
Training	<input type="text"/>

Part 3: Items per Task

Exam questions will be multiple-choice in format. Each question will be linked to a task.

Please indicate what percentage of the items within a section should be devoted to each task on the examination.

NOTE: Your total per section of tasks should add up to 100%.

*** "Inspection of Airfield HMA Placement Operations" Tasks**

Task 1. Inspect the haul vehicle operation.	<input type="text"/>
Task 2. Inspect tack coat application.	<input type="text"/>
Task 3. Inspect surface preparation.	<input type="text"/>
Task 4. Inspect the paver operation.	<input type="text"/>
Task 5. Monitor compactor operation and roller pattern.	<input type="text"/>

*** "Field Testing of Airfield HMA Pavement" Tasks**

Task 1. Measure and collect random samples and perform tests.	<input type="text"/>
Task 2. Inspect longitudinal and transverse joint construction.	<input type="text"/>
Task 3. Determine correlation based on nuclear gauge and core densities.	<input type="text"/>
Task 4. Measure smoothness using profilograph.	<input type="text"/>

"HMA Characteristics" Tasks

Task 1. Demonstrate awareness of basic hot mix asphalt mix design procedures. (100%)

NICET/ AAPTP Airfield HMA Placement Operations Inspection & Field Testing Technician
<p>"Troubleshooting" Tasks</p> <p>Task 1. Report anomalies and non-conformance to specification on Level I and Level II tasks. (100%)</p> <p>"Care & Maintenance of Testing and Inspection Equipment" Tasks</p> <p>Task 1. Inspect and maintain sampling and testing equipment. (100%)</p> <p>"Worksite Safety and Security" Tasks</p> <p>Task 1. Identify and address basic safety and security concerns. (100%)</p> <p>"Training" Tasks</p> <p>Task 1. Provide on-the-job training for Level I Technicians in inspection, testing, safety and job responsibilities. (100%)</p>
<p>Comments</p> <p>Please enter any additional comments here.</p> <div style="border: 1px solid gray; height: 100px; width: 100%;"></div>
<p>Thank You</p> <p>NICET thanks you for participating in this survey. It is because of professionals like yourself that NICET is able to offer valid and useful certification programs.</p> <p>The results of this survey will serve as the backbone for developing program competencies and examination questions for a Airfield HMA Placement Operations Inspection and Field Testing Technician Level II certification. Your continued dedication to your industry is greatly appreciated.</p> <p>You will now be directed to NICET's website, www.nicet.org. Please be sure to visit frequently for news on certification programs and to see how NICET is continually striving to better serve our customers.</p>

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

Introduction

Thank you in advance for your time and thoughtful input.

This survey will be used to validate the developed job task analysis for a NICET Airfield Hot-Mix Asphalt (HMA) Placement Operations Inspection and Field Testing Technician Level III.

This survey is divided into three parts.

- **Part 1: Task Ratings and Job Performance** - Rate the tasks and their importance to the job performance of the technician and the frequency each is performed.
- **Part 2: Initial Section Weights** - Give your opinion on what percentage of the exam should be delegated to each section of tasks.
- **Part 3: Exam Questions per Task** - Choose the percentage of questions each task should cover during the exam.

Note that questions with an asterisk (*) require an answer prior to moving on to the next. If you would like to change your answer or view a previously answered question, use the navigation buttons, "NEXT" or "PREV", to do so.

Before you begin the survey, please tell us a little about yourself.

About You

How long have you been working in the area of hot-mix asphalt materials testing and inspection?

- Less than 1 year 1-2 years 2-5 years 5-10 years More than 10 years

*** In which area(s) of HMA testing and inspection do you have experience? (Check all that apply.)**

- HMA Field Testing HMA Lab Testing HMA Placement Operations

*** Do you have experience in any other areas of materials testing? (Check all that apply.)**

- Aggregates Concrete Soils

Have you earned any certifications?

- Yes No

If you answered Yes to the previous question, which certification(s) do you have?

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

What is your job title?

*** Is there a difference between owner and contractor airfield HMA placement operations inspection and field testing personnel qualifications?**

 Yes No

Comment

*** Do you think there is a need for a national certification program for "Airfield HMA Placement Operations Inspection and Field Testing Technicians"?**

 Yes No

Comments

Technician Profile/Explanation of Domains

Please read the following technician profile of the NICET Airfield Hot-Mix Asphalt (HMA) Placement Operations Inspection and Field Testing Technician very carefully because you will need this information as you proceed through the survey.

Characteristics of a candidate who is borderline-qualified to pass the examination (one who has just met the minimum requirements for certification, but no more) include:

- **Education/Knowledge:** Formal education not required but work/and or educational experiences equivalent to college, self-study, correspondence courses, workshops, or field assignments, etc.) are expected.
- **Minimum Work Experience:** Five years experience. At least 36 (3 years) of these months must involve asphalt construction, testing and/or inspection as the primary activity, to include 18 months of airfield (FAA, DOD) experience.
- **Typical Activities Performed:** Conduct common and specialized tests. Monitor common and unique airfield asphalt construction procedures. Interpret specifications and drawings. Read and evaluate lab tests. Verify locations and quantities. Maintain records. Offer recommendations.

NICET/ APTP Airfield HMA Placement Operations Inspection & Field Testing Technician

- **Typical Job Titles:** Field Technician III, Senior Technician/Inspector III, Senior QA/QC Technician, Inspector

There are four levels of certification, ranging from the entry-level trainee (Level I) to the senior level technician (Level IV). **This is a survey for the content for the Level III certification.**

Each level of certification is represented by a section of tasks. The tasks are grouped into **domains**, or major areas of responsibility. In the next section of the survey, each section of tasks is stated and followed by the knowledge and skills considered necessary to properly complete each task.

The domains or major areas of responsibility are:

- Inspection of Airfield HMA Placement Operations
- Field Testing of Airfield HMA Pavement
- HMA Mixture Characteristics
- Troubleshooting
- Care & Maintenance of Testing & Inspection Equipment
- Worksite Safety and Security
- Management
- Training

Part 1: Task Ratings and Job Performance

Following are the proposed tasks, knowledge and skills necessary for the NICET Airfield HMA Placement Operations Inspection and Field Testing Technician Level III.

Please rate the JOB IMPORTANCE and FREQUENCY of the following tasks for a borderline-qualified candidate by selecting the appropriate point on the rating scale next to each task.

Inspection of Airfield HMA Placement Operations

[Empty area for task ratings and job performance]

NICET/ APTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Evaluate plant, transportation, placement and compaction operations.**

Knowledge:

- **FHWA NHI Course 131032**
- **Equipment performance**
- **Types of plants, equipment**
- **NAPA applicable requirements**
- **Best practice manuals for HMA airport construction (*under development via APTP*)**

Skills:

- **Understand relationship of equipment to placement operation (e.g. based on work time frames).**
- **Evaluate appropriate size and number of equipment.**
- **Evaluate specific site environment conditions with respect to time available for compaction.**

Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level III, which Level is this task appropriate? (Type *Level I, Level II, Level IV* or *not at all*.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NICET/ AAPTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 2. Recognize relationship of rolling operation to mat compaction.**

Knowledge:

- **HMA Paving Handbook 2000 (Chapter 18)**
- **Basic understanding of different roller types**
- **AI MS-22**

Skills:

- **Evaluate mix reaction in accordance with the compacted effort based on temperature.**
- **Recommend corrective actions.**
- **Follow up on recommended corrective action.**
- **Document recommendations and follow-up.**

Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level III, which Level is this task appropriate? (Type *Level I, Level II, Level IV* or *not at all*.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NICET/ APTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 3. Manage aggregate stockpile.**

Knowledge:

- **HMA Paving Handbook 2000 (Chapter 6)**
- **National Stone, Sand & Gravel Association**

Skills:

- **Inspect and evaluate stockpile construction according to best practices.**
- **Identify aggregate contamination.**

Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level III, which Level is this task appropriate? (Type *Level I, Level II, Level IV* or *not at all*.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 4. Verify plant operation.**

Knowledge:

- **Types of plants, storage facilities and manufacturing process, weigh master certification**
- **HMA Paving Handbook 2000 (Chapters 8, 9, 10, 11)**

Skills:

- **Verify load-out hot mix asphalt ticket information.**
- **Inspect plant certifications (e.g. weigh master, weigh scales).**
- **Verify plant types and storage facilities.**

Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level III, which Level is this task appropriate? (Type Level I, Level II, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Field Testing of Airfield HMA Pavement

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Determine segregation profile.**

Knowledge:

- General knowledge of techniques for determining segregation (thermal imaging, gradation, density, texture, visual)
- ASTM E965

Skills:

- Visually identify areas of segregation.
- Determine sampling location.

Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level III, which Level is this task appropriate? (Type Level I, Level II, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 2. Manage and analyze data collected on smoothness to establish corrective measures.**

Knowledge:

- Lot sampling
- P401

Skills:

- Identify problem areas.
- Establish corrective actions.
- Verify results of corrective actions.
- Convey corrective actions to contractor.

Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level III, which Level is this task appropriate? (Type Level I, Level II, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 3. Measure smoothness by profilograph.**

Knowledge:

- **ASTM E950**

Skills:

- **Identify problem areas.**
- **Establish corrective actions.**
- **Verify results of corrective actions.**
- **Convey corrective actions to contractor.**

Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?

Yes
 No

If not at Level III, which Level is this task appropriate? (Type *Level I, Level II, Level IV* or *not at all*.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

HMA Mixture Characteristics

NICET/ AAPTTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Explain relationship between mix properties and mix design requirements.**

Knowledge:

- Relationships between mix segregation and pavement density
- Relationship between non-uniform temperature and mix compaction
- Relationship between mix air voids, pavements air voids and compaction

Skills:

- Visually inspect mixture.
- Recognize cold spots, segregation, non-uniform mix, and movement under the roller.

Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level III, which Level is this task appropriate? (Type Level I, Level II, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Troubleshooting

NICET/ APTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Verify, accept or reject Level I, II and III HMA field test results and inspection reports.**

Knowledge:

- Ramifications of issues
- Project specifications
- Basic statistical acceptance plans
- Cost benefit

Skills:

- Master Level I and II functions.
- Accept and/or reject results.
- Assess impacts (cost, scheduling, safety, operations).
- Report and document recommended decision to supervisor.

Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level III, which Level is this task appropriate? (Type Level I, Level II, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Care & Maintenance of Testing & Inspection Equipment

NICET/ APTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Verify calibration and proper working conditions of all equipment used in airport hot mix asphalt field testing and inspection.**

Knowledge:

- Agency requirements (e.g. NRC requirements for nuclear gauge)

Skills:

- Maintain/ document equipment per agency requirements.
- Recognize defective equipment and recommend replacement.

Should this table be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level III, which Level is this task appropriate? (Type *Level I, Level II, Level IV* or *not at all*.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Worksite Safety & Security

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Recognize safety and security violations and recommend safety actions.**

Knowledge:

- **OSHA, Federal, state and regional requirements (OSHA 30-hour training program or equivalent knowledge)**

Skills:

- **Recognize worksite safety violations.**
- **Implement worksite safety plan.**
- **Document all worksite safety violations.**

Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level III, which Level is this task appropriate? (Type Level I, Level II, Level IV or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Management

NICET/ AAPTTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Assist with the management of multiple or complex projects.**

Knowledge:

- **Project specifications and contract requirements**
- **Personnel supervision and management**
- **Personnel safety standards, procedures, and equipment**
- **Equipment use, storage, and transportation procedures**
- **Procedures, standards, and equipment needed for all Level I and II tasks**
- **Basic principles of general record keeping and record-keeping for payroll and contract administration purposes**

Skills:

- **Determine and communicate project requirements.**
- **Determine personnel capabilities and qualifications, matching them with the needs of project tasks.**
- **Develop work schedules for efficient use of staff, equipment, and resources to complete work in a timely and cost-effective manner.**
- **Coordinate inspection and testing activities with other project operations.**
- **Verify and enforce safety compliance by technicians.**
- **Determine internal QC requirements and check for compliance.**
- **Review technicians' payroll (time card).**
- **Define and communicate employee expectations.**
- **Maintain records of performance evaluation.**
- **Communicate directions and evaluate results.**
- **Mentor subordinates.**
- **Resolve conflict.**

Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level III, which Level is this task appropriate? (Type *Level I*, *Level II*, *Level IV* or *not at all*.)

NICET/ AAPTTP Airfield HMA Placement Operations Inspection & Field Testing Technician

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*** 2. Coordinate field inspection and testing operations.**

Knowledge:

- Typical owner/customer concerns
- Technician capabilities
- Inspection, testing and reporting time
- Interrelationships among equipment maintenance, inspection, calibration, and use, and potential conflicts
- Owner/customer expectations

Skills:

- Determine owner/customer expectations.
- Schedule equipment maintenance, inspection, calibration, and use to minimize conflict.
- Schedule employee work to meet customer/contract execution schedule.
- Identify inspection and test anomalies and make adjustments in reporting to meet customer needs.
- Identify appropriate inspection and test methods to meet project requirements.

Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?

Yes
 No

If not at Level III, which Level is this task appropriate? (Type Level I, Level II, Level IV or not at all.)

NICET/ APTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
*	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Training

*** 1. Provide formal and on-the-job training on HMA Field Inspection & Testing and safety to Level I and II technicians.**

Knowledge:

- **Fundamentals of the subject matter**
- **Understand all pertinent inspection & test procedures and application of results**
- **Understand all pertinent inspection & test equipment maintenance and use**
- **Safety standards, procedures, and equipment**
- **AASHTO R18/ISO Guide 17025**
- **Appropriate styles of training (lecture, written material, demonstration, hands-on) for various types of knowledge or skills**

Skills:

- **Practice effective communication and delivery of information and technology transfer.**
- **Provide proper observation and assessment.**
- **Demonstrate proficiency in the performance of applicable test and inspection procedures.**
- **Determine training needs of each technician.**
- **Organize and present information clearly.**
- **Demonstrate and/or explain testing and safety procedures.**
- **Observe and check learner's proficiency.**

Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?

NICET/ AATPT Airfield HMA Placement Operations Inspection & Field Testing Technician

- Yes
- No

If not at Level III, which Level is this task appropriate? (Type *Level I, Level II, Level IV* or *not at all*.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Part 2: Initial Section Weights

Please type the percentage of the questions you think should be devoted to each of these sections.

NOTE: Your total should add up to 100%.

*** What percentage of the exam do you think should be devoted to each section of tasks?**

Inspection of Airfield HMA Placement Operations	<input type="text"/>
Field Testing of Airfield HMA Pavement	<input type="text"/>
HMA Mixture Characteristics	<input type="text"/>
Troubleshooting	<input type="text"/>
Care and Maintenance of Testing and Inspection Equipment	<input type="text"/>
Worksite Safety and Security	<input type="text"/>
Management	<input type="text"/>
Training	<input type="text"/>

Part 3: Items per Task

Exam questions will be multiple-choice in format. Each question will be linked to a task.

Please indicate what percentage of the items within a section should be devoted to each task on the examination.

NOTE: Your total per section of tasks should add up to 100%.

NICET/ AAPTPT Airfield HMA Placement Operations Inspection & Field Testing Technician

*** "Inspection of Airfield HMA Placement Operations" Tasks**

- Task 1. Evaluate plant, transportation, placement and compaction operations.
- Task 2. Recognize relationship of rolling operation to mat compaction.
- Task 3. Manage aggregate stockpile.
- Task 4. Verify plant operation.

*** "Field Testing of Airfield HMA Pavement" Tasks**

- Task 1. Determine segregation profile.
- Task 2. Manage and analyze data collected on smoothness to establish corrective measures.
- Task 3. Measure smoothness by profilograph.

"HMA Characteristics" Tasks

- Task 1. Explain relationship between mix properties and mix design requirements. (100%)

"Troubleshooting" Tasks

- Task 1. Verify, accept or reject Level I, II and III HMA Field test results and inspection reports. (100%)

"Care and Maintenance of Testing and Inspection Equipment" Tasks

- Task 1. Verify calibration and proper working conditions of all equipment used in Airport HMA Field Testing and Inspection. (100%)

"Worksite Safety and Security" Tasks

- Task 1. Recognize safety and security violations and recommend safety actions. (100%)

*** "Management" Tasks**

- Task 1. Assist with the management of multiple or complex projects.
- Task 2. Coordinate field inspection and testing operations.

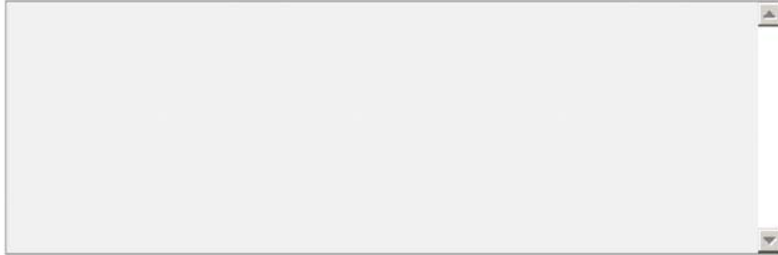
"Training" Tasks

- Task 1. Provide formal and on-the-job training on HMA field inspection and testing and safety to Level I and II Technicians. (100%)

Comments

NICET/ APTP Airfield HMA Placement Operations Inspection & Field Testing Technician

Please enter any additional comments here.



Thank You

NICET thanks you for participating in this survey. It is because of professionals like yourself that NICET is able to offer valid and useful certification programs.

The results of this survey will serve as the backbone for developing program competencies and examination questions for a Airfield HMA Placement Operations Inspection and Field Testing Technician Level III certification. Your continued dedication to your industry is greatly appreciated.

You will now be directed to NICET's website, www.nicet.org. Please be sure to visit frequently for news on certification programs and to see how NICET is continually striving to better serve our customers.

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

Introduction

Thank you in advance for your time and thoughtful input.

This survey will be used to validate the developed job task analysis for a NICET Airfield Hot-Mix Asphalt (HMA) Placement Operations Inspection and Field Testing Technician Level IV.

This survey is divided into three parts.

- **Part 1: Task Ratings and Job Performance** - Rate the tasks and their importance to the job performance of the technician and the frequency each is performed.
- **Part 2: Initial Section Weights** - Give your opinion on what percentage of the exam should be delegated to each section of tasks.
- **Part 3: Exam Questions per Task** - Choose the percentage of questions each task should cover during the exam.

Note that questions with an asterisk (*) require an answer prior to moving on to the next. If you would like to change your answer or view a previously answered question, use the navigation buttons, "NEXT" or "PREV", to do so.

Before you begin the survey, please tell us a little about yourself.

About You

How long have you been working in the area of hot-mix asphalt materials testing and inspection?

- Less than 1 year 1-2 years 2-5 years 5-10 years More than 10 years

*** In which area(s) of HMA testing and inspection do you have experience? (Check all that apply.)**

- HMA Field Testing HMA Lab Testing HMA Placement Operations Inspection

*** Do you have experience in any other areas of materials testing? (Check all that apply.)**

- Aggregates Concrete Soils

Have you earned any certifications?

- Yes No

If you answered Yes to the previous question, which certification(s) do you have?

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

What is your job title?

*** Is there a difference between owner and contractor airfield HMA placement operations inspection and field testing personnel qualifications?**

 Yes No

Comments

*** Do you think there is a need for a national certification program for "Airfield HMA Placement Operations Inspection and Field Testing technicians"?**

 Yes No

Comments

Technician Profile/Explanation of Domains

Please read the following technician profile of the NICET Airfield Hot-Mix Asphalt (HMA) Placement Operations Inspection and Field Testing Technician very carefully because you will need this information as you proceed through the survey.

Characteristics of a candidate who is borderline-qualified to pass the examination (one who has just met the minimum requirements for certification, but no more) include:

- **Education/Knowledge:** Formal education not required but work/and or educational experiences equivalent to college, self-study, correspondence courses, workshops, or field assignments, etc.) are expected.
- **Minimum Work Experience:** Level III work experience plus 60 additional months of asphalt airfield QA/QC experience involving a broad range of complexity and diversity.
- **Typical Activities Performed:** Manage airfield pavement projects, oversee specialized airfield asphalt tests and complex construction procedures. Interact with project engineer/manager. Recommend corrective actions. Evaluate constructability issues.

NICET/ AAPTP Airfield HMA Placement Operations Inspection & Field Testing Technician

- **Typical Job Titles:** Chief Technician, Lab/Field Inspector IV, Senior Inspector

There are four levels of certification, ranging from the entry-level trainee (Level I) to the senior level technician (Level IV). **This is a survey for the content for the Level IV certification.**

Each level of certification is represented by a section of tasks. The tasks are grouped into **domains**, or major areas of responsibility. In the next section of the survey, each section of tasks is stated and followed by the tasks and the knowledge and skills considered necessary to properly complete the task.

The domains or major areas of responsibility are:

- Inspection of Airfield HMA Placement Operations
- Field Testing of Airfield HMA Pavement
- HMA Mixture Characteristics
- Troubleshooting
- Care and Maintenance of Testing and Inspection Equipment
- Worksite Safety and Security
- Management
- Training

Part 1: Task Ratings and Job Performance

Following are the proposed tasks, knowledge and skills necessary for the NICET Airfield HMA Placement Operations Inspection and Field Testing Technician Level IV.

Please rate the JOB IMPORTANCE and FREQUENCY of the following tasks for a borderline-qualified candidate by selecting the appropriate point on the rating scale next to each task.

Inspection of Airfield HMA Placement Operations

There are no tasks at this level.

Field Testing of Airfield HMA Pavement

There are no tasks at this level.

HMA Mixture Characteristics

NICET/ APTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Recognize need for hot mix asphalt mix design adjustments.**

Knowledge:

- **Mix properties represented by QC and field tests**

Skills:

- **Review mix QC tests and field tests.**
- **Inspect reports and note anomalies.**
- **Confirm field inspection and field test results with mix lab test results.**

Should this task be within the responsibilities of a Level IV certified Airfield HMA Placement Operations Inspection and Field Testing technician?

Yes
 No

If not at Level IV, which Level is this task appropriate? (Type Level I, Level II, Level III or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Troubleshooting

NICET/ APTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Establish troubleshooting protocol and documentation procedures.**

Knowledge:

- Ramifications of issues
- Project specifications
- Basic statistical acceptance plans
- Cost-benefit
- General knowledge of airport project structure and airport operations

Skills:

- Establish standard operating procedures.
- Master Level I, II and III functions.
- Initiate / implement acceptance/ rejection process.
- Make final recommendations to final authority.

Should this task be within the responsibilities of a Level IV certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
- No

If not at Level IV, which Level is this task appropriate? (Type Level I, Level II, Level III or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Care & Maintenance of Testing & Inspection Equipment

NICET/ AAPTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Manage testing and inspection equipment inventory.**

Skills:

- **Project equipment necessary**
- **Required standard operating procedures (SOPs)**

Skills:

- **Acquire necessary equipment.**
- **Schedule maintenance.**
- **Develop SOPs for equipment maintenance.**

Should this task be within the responsibilities of a Level IV certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level IV, which Level is this task appropriate? (Type *Level I, Level II, Level III* or *not at all*.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Worksite Safety & Security

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Determine, coordinate and implement the training, communication, facility and monitoring elements required as parts of an adequate safety program.**

Knowledge:

- **OSHA, Federal, state and regional requirements (OSHA 40-hour training program or equivalent knowledge)**
- **Appropriate and required documentation processes and forms**
- **Project safety management system**

Skills:

- **Develop safety plan.**
- **Administer safety plan.**
- **Document and report safety and security violations.**

Should this task be within the responsibilities of a Level IV certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level IV, which Level is this task appropriate? (Type Level I, Level II, Level III or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Management

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 1. Maintain the quality of processes and personnel in order to maintain field competence.**

Knowledge:

- **Accreditation Programs and the appropriate technician training and certification program(s)**
- **ISO Guide 17025**
- **Equipment calibration, maintenance, personnel qualification requirements, training requirements, equipment inventory, dispute resolution, record keeping, proficiency sample testing and reporting requirements of AASHTO R18**

Skills:

- **Evaluate field inspection and testing processes and personnel qualifications for compliance with accreditation standards.**
- **Analyze and recommend possible changes to bring testing and inspection processes and personnel into compliance.**

Should this task be within the responsibilities of a Level IV certified Airfield HMA Placement Operations Inspection and Field Testing technician?

Yes
 No

If not at Level IV, which Level is this task appropriate? (Type Level I, Level II, Level III or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NICET/ APTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 2. Establish field inspection and testing program and schedule.**

Knowledge:

- **Appropriate field inspection task and tests to characterize HMA placement processes and materials**
- **Time, equipment, and technician needs to conduct Level I, Level II and Level III inspection and testing tasks**
- **What inspection tasks and tests can be conducted independently and which ones need to be sequenced**
- **Know the reason and purpose for conducting inspection tasks and tests**

Skills:

- **Schedule field inspection and testing staff.**
- **Determine the sequence of inspection and testing tasks necessary for efficient field operations.**

Should this task be within the responsibilities of a Level IV certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level IV, which Level is this task appropriate? (Type Level I, Level II, Level III or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 3. Monitor changes in standards and specifications to assure HMA Field Testing and Inspection procedures are in conformance.**

Knowledge:

- **AASHTO, ASTM, FAA, federal, state, and local government procedures for issuing and updating testing standards**
- **Current ASTM / AASHTO / FAA / State DOT / FHWA standards and specifications updates**

Skills:

- **Read, interpret, and identify changes in updated standards and specifications.**
- **Determine the most recent date and content of standard.**
- **Identify differences between old and new standards.**
- **Ensure the appropriate standard is applied to project.**

Should this task be within the responsibilities of a Level IV certified Airfield HMA Placement Operations Inspection and Field Testing technician?

- Yes
 No

If not at Level IV, which Level is this task appropriate? (Type Level I, Level II, Level III or not at all.)

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NICET/ APTP Airfield HMA Placement Operations Inspection & Field Testing Technician

*** 4. Manage field testing and inspection operations projects.**

Knowledge:

- **Cost of inspection and testing operations, including equipment, personnel, reporting and overhead**
- **Principles of budget planning, management and billing**
- **Understand contract and scope of services**
- **Principles of supervision, and employee mentoring and training**
- **Labor Laws**
- **OSHA regulations**
- **Cost estimating for prospective projects**
- **Meeting project needs within budget and on time**
- **Loss prevention techniques**
- **Personnel management**
- **Customer service**
- **Sources of information about project objectives, limitations, procedures, resources, personnel, budgets, and schedules**
- **Purposes and language of contracts and the nature of contractual relationships (scope of services)**

Skills:

- **Communicate effectively internally and externally.**
- **Provide customer service and client interaction.**
- **Coordinate work of field technicians and others to define and meet common field inspection and testing goals.**
- **Manage multiple projects simultaneously.**
- **Avoid and manage conflicts.**
- **Perform dispute resolution as needed.**
- **Understand and use different scheduling tools.**
- **Determine project specifications and Q/C requirements.**
- **Provide field management for a project Q/C program to assure that objectives are being met on time and within budget.**

Should this task be within the responsibilities of a Level IV certified Airfield HMA Placement Operations Inspection and Field Testing technician?

Yes No

NICET/ AAPT Airfield HMA Placement Operations Inspection & Field Testing Technician

If not at Level IV, which Level is this task appropriate? (Type *Level I, Level II, Level III* or *not at all*.)

*

Much more than average Somewhat more than average Average Somewhat less than average Much less than average I don't know

How important is this task?

*

Once a year Quarterly Once a month Once a week Daily Never

How often is this task performed?

*** 5. Develop and manage a plan for test/trial section approval process and HMA JMF adjustments.**

Knowledge:

- Proportioning methods for asphalt concrete mixes
- AI SP-2
- AI MS-22
- Asphalt Lab level 1, 2, 3 tests

Skills:

- Determine sample requirements, test methods, and reporting requirements.
- Interpret results.

Should this task be within the responsibilities of a Level IV certified Airfield HMA Placement Operations Inspection and Field Testing technician?

Yes
 No

If not at Level IV, which Level is this task appropriate? (Type *Level I, Level II, Level III* or *not at all*.)

NICET/ AATP Airfield HMA Placement Operations Inspection & Field Testing Technician

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Training

*** 1. Establish and manage a training program for Airport HMA Field Testing and Inspection technicians.**

Knowledge:

- Inspection and testing methods
- Capabilities and limitations of inspection and testing equipment
- Equipment calibration requirements
- Written report content and requirements

Skills:

- Communicate training needs effectively.
- Use proper delivery tools and techniques to ensure proper delivery of training program.
- Recognize and mentor technicians with management potential.
- Provide performance evaluations to technicians.

Should this task be within the responsibilities of a Level IV certified Airfield HMA Placement Operations Inspection and Field Testing technician?

Yes
 No

If not at Level IV, which Level is this task appropriate? (Type Level I, Level II, Level III or not at all.)

NICET/ AATPT Airfield HMA Placement Operations Inspection & Field Testing Technician

	Much more than average	Somewhat more than average	Average	Somewhat less than average	Much less than average	I don't know
How important is this task?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Once a year	Quarterly	Once a month	Once a week	Daily	Never
How often is this task performed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Part 2: Initial Section Weights

Please type the percentage of the questions you think should be devoted to each of these sections.

NOTE: Your total should add up to 100%.

*** What percentage of the exam do you think should be devoted to each section of tasks?**

HMA Mixture Characteristics	<input type="text"/>
Troubleshooting	<input type="text"/>
Care and Maintenance of Testing and Inspection Equipment	<input type="text"/>
Worksite Safety and Security	<input type="text"/>
Management	<input type="text"/>
Training	<input type="text"/>

Part 3: Items per Task

Exam questions will be multiple-choice in format. Each question will be linked to a task.

Please indicate what percentage of the items within a section should be devoted to each task on the examination.

NOTE: Your total per section of tasks should add up to 100%.

"HMA Characteristics" Tasks

Task 1. Recognize need for HMA mix design adjustments. (100%).

"Troubleshooting" Tasks

Task 1. Establish troubleshooting protocol and documentation procedures. (100%)

NICET/ APTP Airfield HMA Placement Operations Inspection & Field Testing Technician

"Care and Maintenance of Testing and Inspection Equipment" Tasks

Task 1. Manage testing and inspection equipment inventory. (100%)

"Worksite Safety and Security" Tasks

Task 1. Determine, coordinate, and implement the training, communication, facility and monitoring elements required as parts of an adequate safety program. (100%)

*** "Management" Tasks**

Task 1. Maintain the quality of processes and personnel in order to maintain field competence.

Task 2. Establish field testing and inspection program and schedule.

Task 3. Monitor changes in standards and specifications to assure HMA Field Testing and Inspection procedures are in conformance.

Task 4. Manage field testing and inspection operations projects.

Task 5. Develop and manage a plan for test/trial section approval process and HMA JMF adjustments.

"Training" Tasks

Task 1. Establish and manage a training program for Airport HMA field inspection and testing technicians. (100%)

Comments

Please enter any additional comments here.

Thank You

NICET thanks you for participating in this survey. It is because of professionals like yourself that NICET is able to offer valid and useful certification programs.

The results of this survey will serve as the backbone for developing program competencies and examination questions for a Airfield HMA Placement Operations Inspection and Field Testing Technician Level IV certification. Your continued dedication to your industry is greatly appreciated.

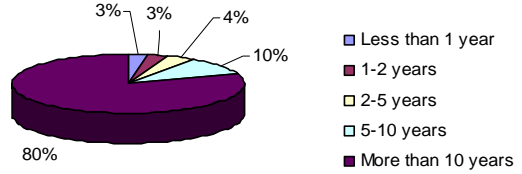
NICET/ APTP Airfield HMA Placement Operations Inspection & Field Testing Technician

You will now be directed to NICET's website, www.nicet.org. Please be sure to visit frequently for news on certification programs and to see how NICET is continually striving to better serve our customers.

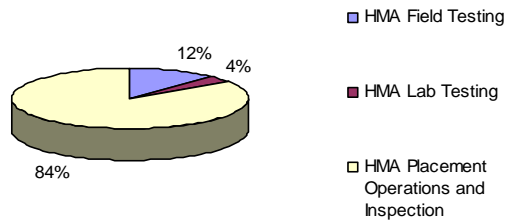
Airfield HMA Placement Operations Inspection and Field Testing Technician Validation Survey Results—Level I

Background/About You:

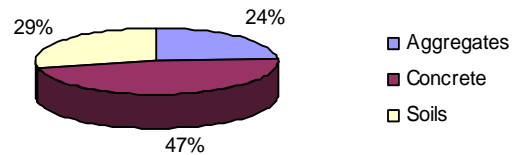
How long have you been working in the area of hot-mix asphalt materials testing and inspection?



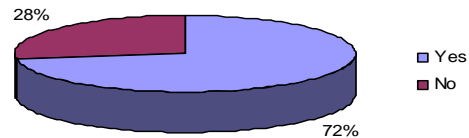
In which area(s) of HMA materials testing and inspection do you have experience? (Check all that apply.)



Do you have experience in other areas of materials testing? (Check all that apply.)



Have you earned any certifications?



If you answered Yes to the previous question, which certification(s) do you have? Responses:

ACI	MoDOT
CWI (Certified Welding Inspector)	NBIS
DDC (Department of Design and Construction) NYC	NECEPT Bituminous
Concrete Testing	NICET Highway Materials
FAA ERPLM	NICET Highway Construction
Illinois DOT HMA	NICET Soils
Illinois DOT PCC (Portland Cement Concrete)	NJSAT (New Jersey Society of Technologists)
MDOT	PennDOT Concrete

What is your job title? Top 20 responses:

Airport Construction Manager	Project Engineer
Airport Design Technician	Resident Engineer
Civil Engineer	Senior Certified Engineer Technician
Chief Inspector	Senior Construction Inspector
Construction Inspector	Senior Construction Manager
Construction Manager	Senior Engineer
Construction Project Manager	Senior Highway Maintenance Manager
Consultant Inspector	Senior Inspector
Inspection Supervisor	Senior Project Manager
Office Engineer	Transportation Construction Manager

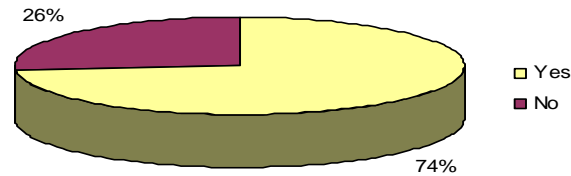
Is there a difference between owner and contractor airfield HMA placement operations inspection and field-testing personnel qualifications?



Please explain your response to the previous question. Responses:

- I was Quality Assurance manager supporting the Construction Manager for the Midway Airport Terminal Development Program 2001-2003. Walsh had K5 subcontracted to placed apron transition HMA (temporary), and taxi lane HMA shoulders. We never paved asphalt in areas intended for permanent runway/taxiway aircraft loading. The P-401 specifications called for our independent check of contractor submitted HMA test data. The contractor's lab was certified, and that equipment was made available for our independent Marshall tests on our samples.
- Typically, owner placed HMA is not tested in the field and is placed as part of a maintenance effort, with owner financing.
- Airport HMA requires Federal Specs.
- The contractor is trying to get the job complete as soon as possible and overlooks some specs that are time consuming.
- Either must comply with stringent FAA specifications.
- The Owner's Representative does not necessarily have to be certified. The Owner's Representative must be accepted by the Owner and FAA based on experience. The Contractor's Representative must be certified by either the State DOT in which the work is being performed or NICET.
- Our projects require the contractor to conduct quality control testing and the engineer to conduct acceptance testing.
- They both should have a minimum level of experience and training.

Do you think there is a need for a national certification program for "Airfield HMA Placement Operations Inspection and Field Testing Technicians"?



Please explain your response to the previous question. Responses:

- We hired two IDOT trained HMA inspectors at Midway Airport for the QA efforts, and checked the certifications of contractor QC lab and field inspectors.
- A national certification program could provide for an excellent resource for professional education for individuals and companies in the industry. Some thoughts with that in mind:
 1. Our current HMA personnel are certified through State DOT programs and update as required by the certification. It would seem to be more efficient if the FWHA and FAA could mold a single certification package rather than separate, eliminating the duplication of effort for individuals in the industry.
 2. Uniformity of certification by State would be beneficial as well, rather than individual requirements by State. We continuously see contractors trying to achieve density and failing every time. And every time we try and converse with the contractors prior to placement of HMA they make statements like "we know what we are doing" and "we pave IDOT mixes all the time." What I would love to see is a certification program set up for contractors to test their ability and pre-check their qualifications as to the performance of the placement of HMA on airport projects.
- A national certification program should ensure consistency in operations and could make inspectors aware of conditions unique to an area.
- HMA placement is not done differently on airfields as opposed to roadways. The requirements such as thickness, stability, or testing frequency may differ, but these things would be covered in the job specifications. I can't imagine an inspector spending an entire career paving only airfields. I would think the bulk of inspection work for paving would be on roadways/highways. This is where the certification should be required. The knowledge gained from this work can then be used in airfield paving.
- No, just know the specs and you will be ok. I did an airport and the testing is the same way with the 50-60-70- and 80 series. Just that you have to get 98% and they won't budge on that.
- The FAA has strict spec's, compared to roadway.
- If not an official certification, some training or seminar should be required.
- There needs to be a National Program for Airport and Highway. In today's construction market, technicians and inspector's frequently cross state lines. There is a tremendous expense and inconvenience in trying to certify state to state.
- Yes - FAA specification differ from NYSDOT specifications.
- Installation of the HMA at an airport pretty much parallels a highway. The difference is in the strict requirements on tolerances and the testing done to meet FAA and other agencies requirements.

- As long as a national standard/specification existed, I believe it would work. As “best practice” could be performed no matter the location of the HMA testing/paving operations. And a standardized specification applied uniformly to both owner and contractors would eliminate confusion.
- The owner sets forth the specifications, and has his QA inspectors, as for the contractor, has a QC inspector that his main concern is compaction.
- Field testing technicians ensure the PTD on roads while inspectors check the delivery tickets, take samples and layer depths, and record placement stations. I do not think a runway is going to be any different to a major highway and therefore can not see the need for separate certification.
- I have projects in New York and New Jersey and find that the sub-consultants we hire to conduct acceptance testing for FAA P-401 Bituminous surface courses are not consistent. In some cases I have found that rather than conducting the acceptance testing some firms have simply watched the contractor conduct their quality control testing and submitted that for acceptance testing.
- Highway construction and airport construction are a little different. I believe airport specs are a little more strict.
- This will ensure that the life of the asphalt will be as close as possible to the life of the mix design.

Task Ratings and Importance

The following questions were asked about each task and the associated skills and knowledge identified to successfully complete the task:

- Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?
- If not at Level I, which Level of certification is this task appropriate for?
- How important is this task?
- How often is this task performed?

Inspection of Airfield HMA Placement Operations Tasks

Measure Temperature of HMA Paving Mixtures.

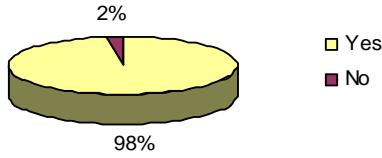
Knowledge:

- Thermometer.
- Infrared gun.

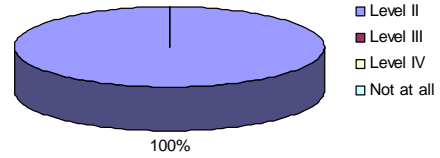
Skills:

- Read thermometer.
- Record measurement.

Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?

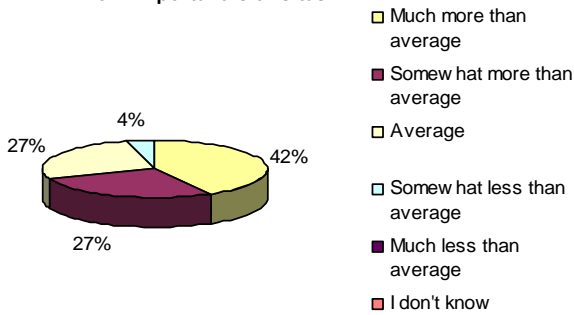


If not at Level I, which Level is this task appropriate?

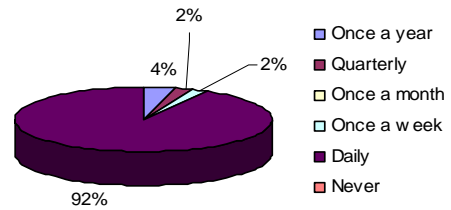


* Only one respondent said this task was not appropriate at Level I.

How important is this task?



How often is the task performed?



Measure thickness of loose or compacted HMA.

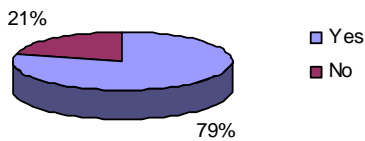
Knowledge:

- ASTM D3549.
- HMA Paving Handbook 2000 (Chapter 15).
- Standard agency specifications.

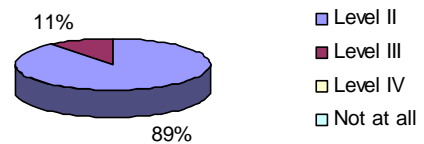
Skills:

- Safely measure thickness of HMA with probes.

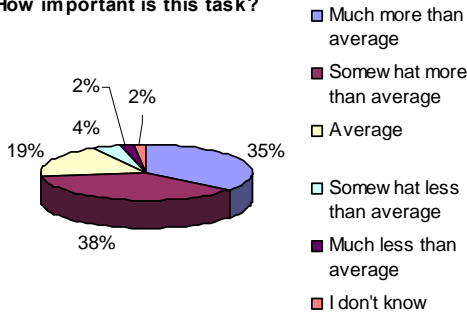
Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?



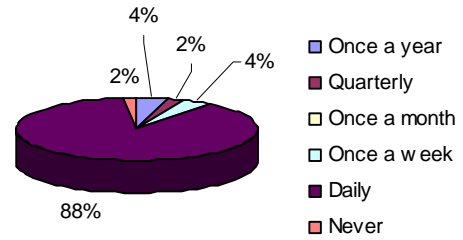
If not at Level I, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Field Testing of Airfield HMA Pavement Tasks

Perform sampling and handling of loose HMA.

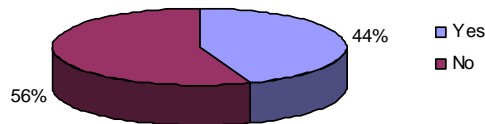
Knowledge:

- ASTM D979.
- Standard agency specifications.

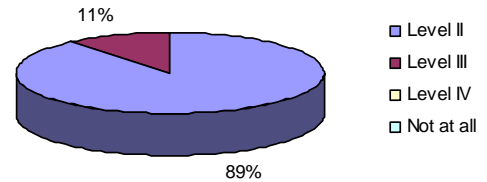
Skills:

- Handle loose HMA.
- Sample HMA.

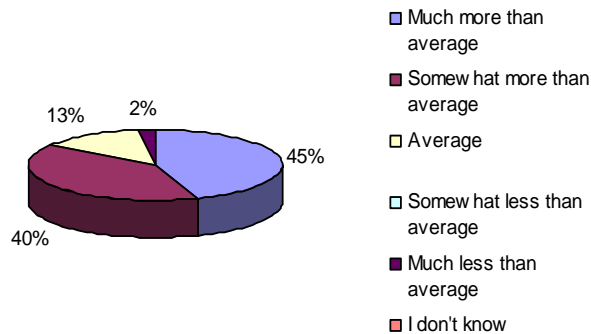
Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?



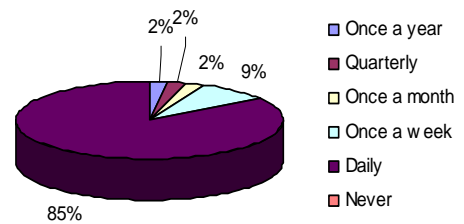
If not at Level I, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Perform smoothness testing using straight edge.

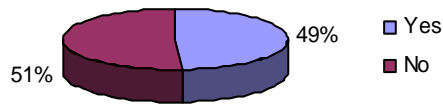
Knowledge:

- FAA P401.
- ASTM E127.

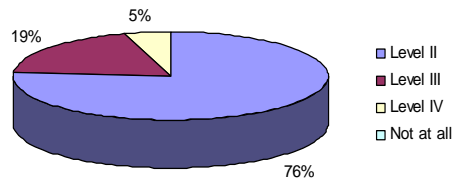
Skills:

- Manually move straight edge across pavement.
- Read and record measurements.

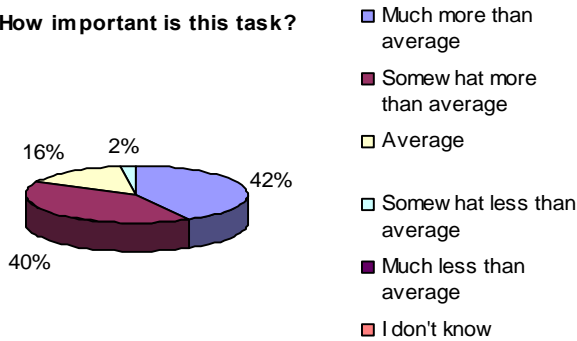
Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?



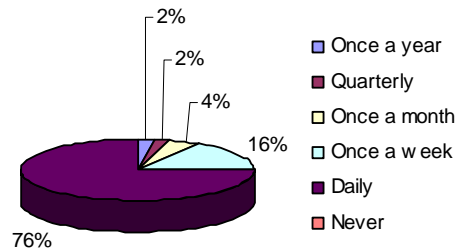
If not at Level I, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Perform nuclear density testing.

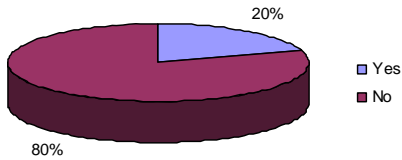
Knowledge:

- ASTM D2950.
- Nuclear safety certification.
- Manufacturer's recommendations.

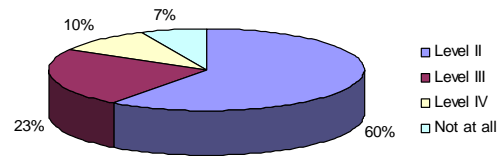
Skills:

- Perform test procedure.
- Calibrate equipment.
- Calculate density.

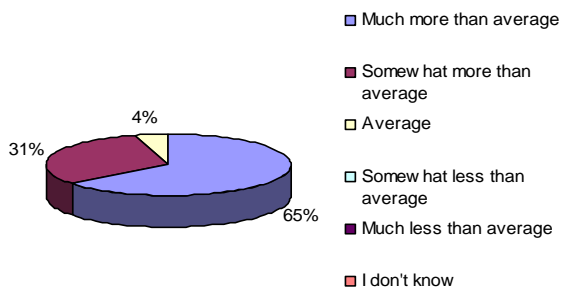
Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?



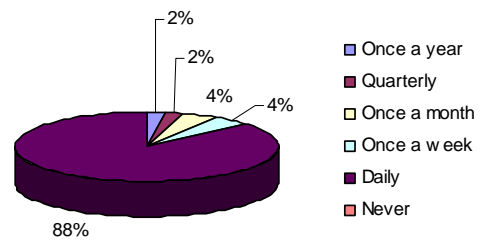
If not at Level I, which Level is this task appropriate?



How important is the task?



How often is this task performed?



Perform sampling and handling of compacted HMA samples.

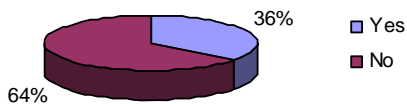
Knowledge:

- ASTM D979.
- ASTM D5361.

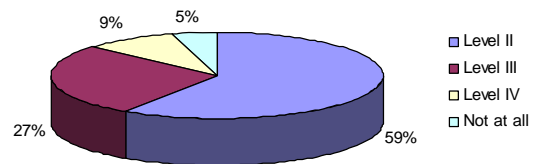
Skills:

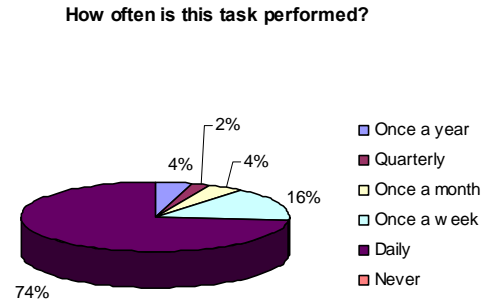
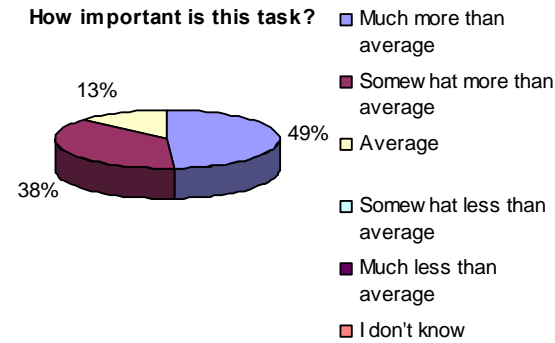
- Use coring machine.
- Transport and handle core.
- Properly extract cores.
- Fill core holes.

Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?



If not at Level I, which Level is this task appropriate?





HMA Mixture Characteristics Tasks

Demonstrate awareness of good mix properties.

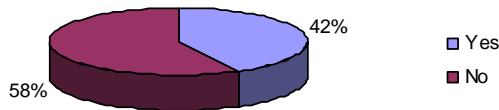
Knowledge:

- Uniform coating.
- Lack of segregation.
- Uniform temperature.

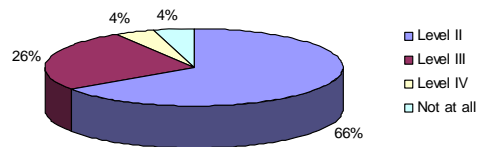
Skills:

- Visually monitor mixture.
- Monitor temperature.

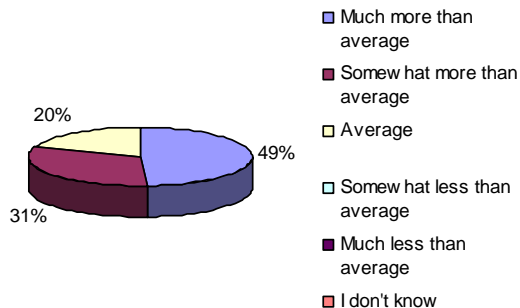
Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?



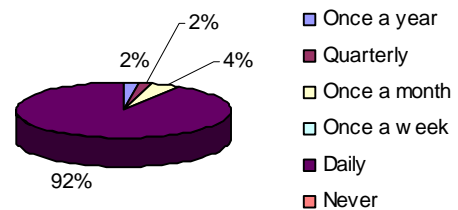
If not at Level I, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Troubleshooting Tasks

Demonstrate awareness of existence of basic anomalies.

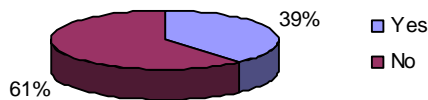
Knowledge:

- HMA Pavement Handbook.
- Agency specific specs.

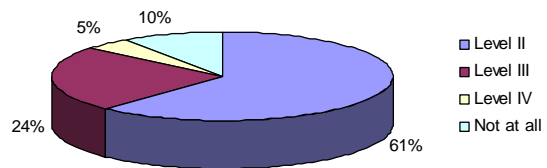
Skills:

- Understand pass/ fail criteria of testing methods.
- Report results to supervisor.

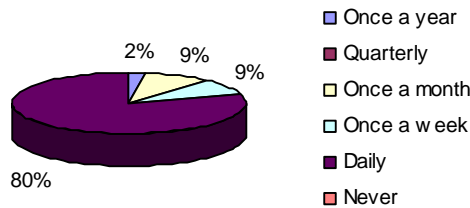
Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?



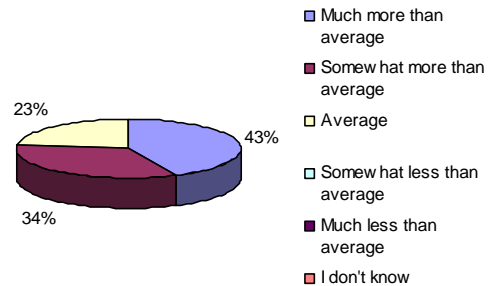
If not at Level I, which Level is this task appropriate?



How often is this task performed?



How important is this task?



Care and Maintenance of Testing and Inspection Equipment Tasks

Properly use and maintain sampling and testing equipment.

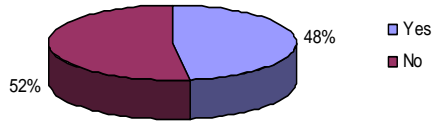
Knowledge:

- Manufacturer's recommendations.

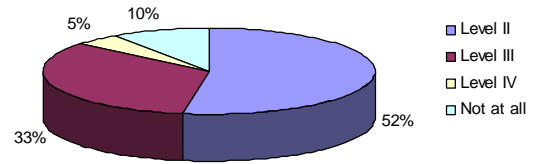
Skills:

- Operate and maintain equipment in accordance with manufacturer's recommendations.

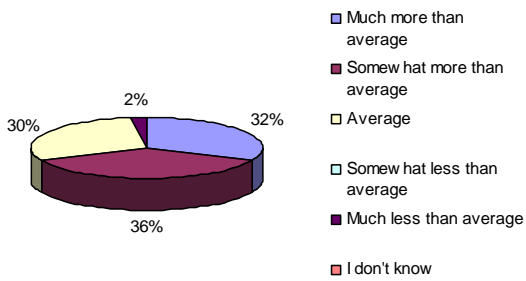
Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?



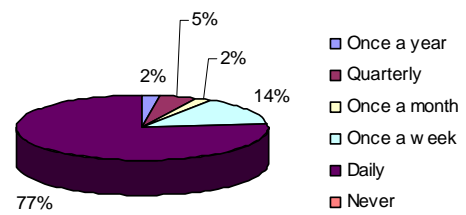
If not at Level I, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Worksite Safety and Security Tasks

Follow safe practices/safety and security plan and report unsafe practices on the job site.

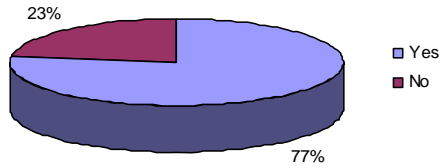
Knowledge:

- Airport safety regulations.
- Basic individual safety practices.
- Company safety regulations.
- Basic first aid.

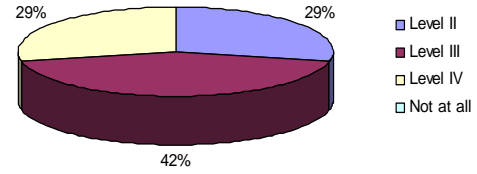
Skills:

- Follow company safety procedures.
- Follow safe practices.
- Practice personal safety.
- Recognize individual safety violation.
- Administer first aid.

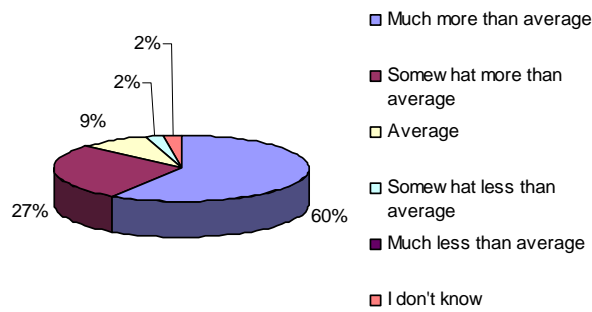
Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?



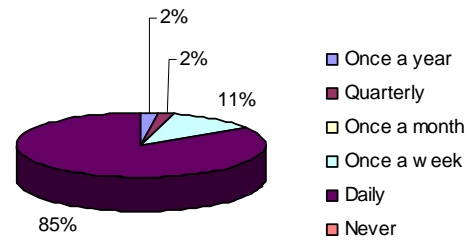
If not at Level I, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Management Tasks

There are no tasks at this level.

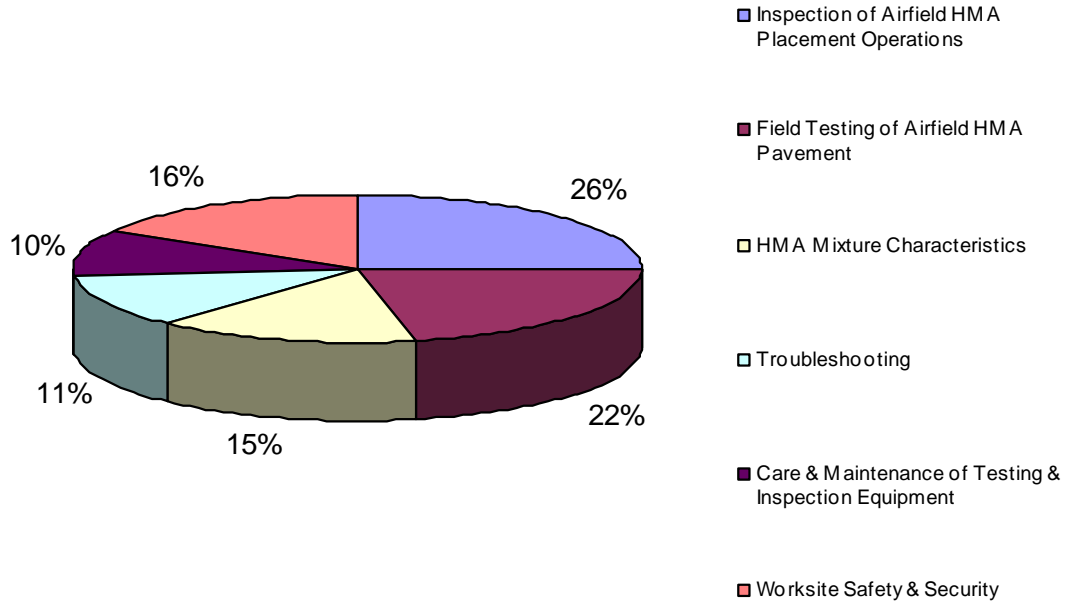
Training Tasks

There are no tasks at this level.

Initial Section Weights

What percentage of the Level I certification exam do you think should be devoted to each section of tasks, i.e. each Domain?

What percentage of the exam should be devoted to each section of tasks?

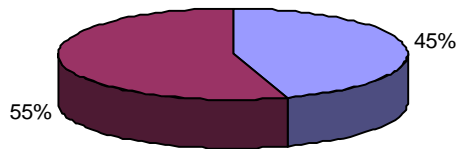


Items per Task

The following question was asked for each section of tasks:

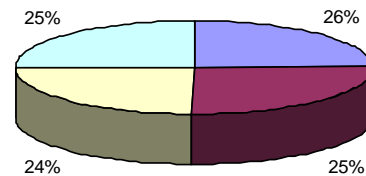
- What percentage of the items/questions within each section/domain should be devoted to each task?

Inspection of Airfield HMA Placement Operations



- Task 1. Measure temperature of HMA.
- Task 2. Measure thickness of loose or compacted HMA.

Field Testing of Airfield HMA Pavement



- Task 1. Perform sampling and handling of loose hot mix asphalt.
- Task 2. Perform smoothness testing using straight edge.
- Task 3. Perform nuclear density testing.
- Task 4. Perform sampling and handling of compacted hot mix asphalt samples.

HMA Characteristics

Task 1: Demonstrate awareness of good mix properties. (100%)

Troubleshooting

Task 1: Demonstrate awareness of existence of basic anomalies. (100%)

Care and Maintenance of Testing and Inspection Equipment

Task 1: Properly use and maintain sampling and testing equipment. (100%)

Worksite Safety and Security

Task 1: Follow safe practices/ safety and security plan and report unsafe practices on the job site. (100%)

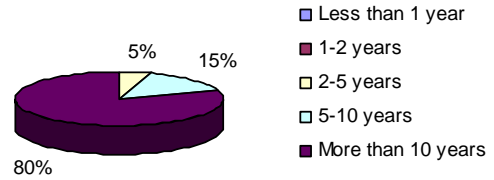
Additional General Comments By Respondents

- The certification is a valuable tool.
- Placement Operations and field testing technician should be two separate fields. Cross-training should be given to provide either technician the fundamental knowledge of what the other technician should be doing. Concentrate the training so that each tech has a strong knowledge of his field.
- I work on highway and roadway construction. At entry-level there is not much responsibility. Testing of materials using tools and techniques as per a standard are straightforward. Any judgment calls regarding placement operations and level are for a more experienced inspector, Level III. During a paving operation every truck is tested for temp, temp is monitored throughout the rolling process; this is an important task that is done frequently.
- Assuming the material sampled is verified in a lab to be within specifications. The finish is everything. Which leaves you somewhat at the mercy of the roller operator. It is most important to have good experienced operators on the pavers and rollers. It is something that is not usually under our control, but the specifications can have limits of deviation; which can be checked with a straight edge, profilograph, laser or transit and rod.
- Level I should be supervised by Level II or higher at all times while on Airport Property.
- I feel that inspection and testing should be separate. In NYS we have sub-consultants perform all testing.
- Some of the proposed areas are performed by the contractor with the inspector witnessing, so there is no question in regard to if the inspector knows or has the required knowledge required to perform the task, e.g. using core-drilling machine.
- Just watching an experienced HMA inspector, and asking questions as to why do you do this or that, and not being afraid to ask what might seem to be a stupid question, would be the best learning curve for a new person.
- Nuclear testing is a specialty item and you have to be individually trained to handle nuclear equipment.
- Field inspector should be trained; bituminous tech. prior to NICET certification.

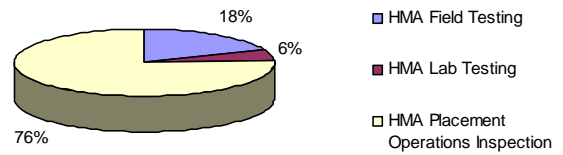
Airfield HMA Placement Operations Inspection and Field Testing Technician Validation Survey Results—Level II

Background/About You

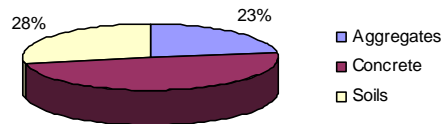
How long have you been working in the area of hot-mix asphalt materials testing and inspection?



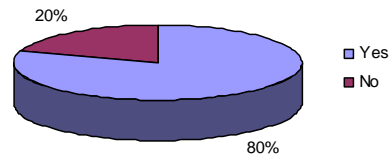
In which area(s) of HMA material testing and inspection do you work or have experience? (Check all that apply.)



Do you have experience in other areas of materials testing? (Check all that apply.)



Have you earned any certifications?



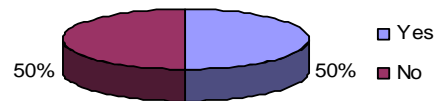
If you answered Yes to the previous question, which certification(s) do you have? Responses:

ACI	NECEPT
CT	NETTCP
CTQP (Florida DOT)	NICET Concrete
CWI	NICET Highway Construction
DDC NYC Concrete Testing	NICET Highway Materials
FHWA	NJSAT
HMAPI	PCC
Illinois DOT QA/QC	PennDOT
MAPA	SAI
MoDOT	Troxler

What is your job title? Top 20 Responses:

Airport Construction Manager	Inspection Supervisor
Assistant Construction Manager	Office Engineer
Chief Construction Inspector	Resident Engineer
Chief Inspector	Senior Certified Engineering Technician
Civil Engineer	Senior Construction Inspector
Construction Project Manager	Senior Engineer
Consultant	Senior Field Rep
Contract Manager	Senior Highway Maintenance Manager
Design Engineer	Senior Inspector
Director of Inspection Services	Transportation Construction Manager

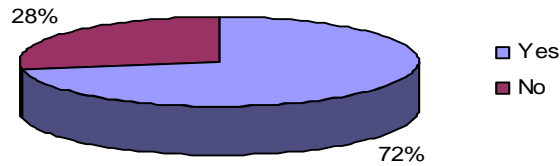
Is there a difference between owner and contractor airfield HMA placement operations inspection and field-testing personnel qualifications?



If you answered Yes, to the previous question, please explain. Responses:

- There should not be a difference in terms of the purchaser. The purchaser should be made aware of the different types of mix for the load that will be placing on the HMA. The client should then make a choice between the mix because it varies in prices.
- Both must comply with stringent FAA Specifications.
- I answered no only because I feel there is a need for the same set of guidelines for both. However, I only deal with State Projects.
- Comments below assume that the Contractor has a viable QC process, and the owner is doing QA on the site.
 1. Contractor QC should be at a knowledge level sufficient to ensure proper compliance with the contract testing and reporting requirements.
 2. The owner’s level of knowledge and skill should be at a higher level, which allows for in depth understanding of the design and contract requirements, as well as the testing procedures and results analysis.
- The owner’s on site representative must be able to observe and accept testing of materials and methods. If the owner’s representative is not required to approve or reject workmanship and materials, then there is no reason to pay for a person to fulfill those duties. In such a case, perhaps a certification of compliance is acceptable. In my opinion, HMA operations at airports would require a high level of Contractor Quality Control, and a corresponding level of Quality Assurance by the owner.

Do you think there is a need for a national certification program for “Airfield HMA Placement Operations Inspection and Field Testing Technicians”?



If you answered Yes, to the previous question, please explain. Responses:

- I believe there is a need for Asphalt certification as well as electrician and grouting under one institution. I believe this gives the certification more value.
- If not certification, some training or seminar should be required.
- As long as the standard and specification is country-wide I believe it would work.
- There will be differences in specifications, not necessarily in materials [rock, oil, etc], but in typical section, mix design, compaction, placement, surface tolerances, etc.

Task Ratings and Importance

The following questions were asked about each task and the associated skills and knowledge identified to successfully complete the task:

- Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?
- If not at Level I, which Level of certification is this task appropriate?
- How important is this task?
- How often is this task performed?

Inspection of Airfield HMA Placement Operations Tasks

Inspect the Haul Vehicle Operation.

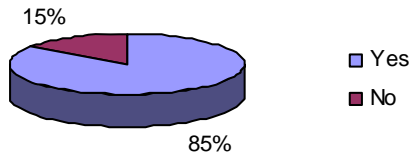
Knowledge:

- HMA Paving Handbook 2000 (Chapter 13).
- Asphalt Institute MS-22.

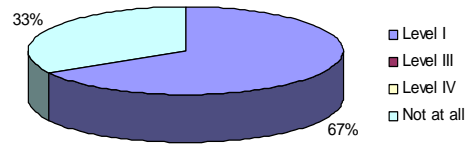
Skills:

- Cover load for transport.
- Make sure bed is clean/cleaned.
- Properly load truck.

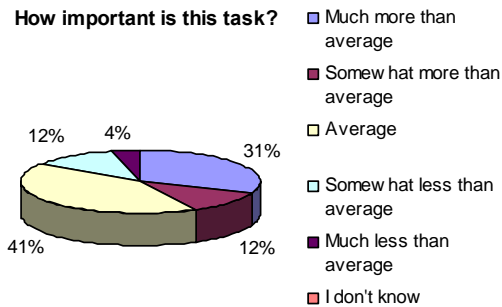
Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?



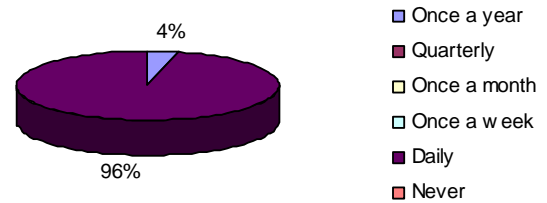
If not at Level II, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Inspect Tack Coat Application.

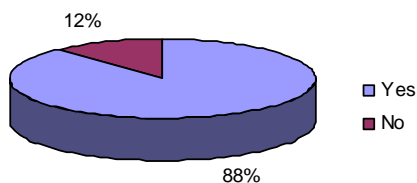
Knowledge:

- HMA Paving Handbook 2000 (Chapter 14).
- ASTM D2995, ASTM D140.
- Asphalt Institute MS-22.
- FAA P603.

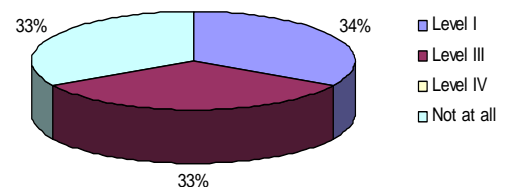
Skills:

- Quantify application rate (e.g. gallons to surface area).
- Verify cleanliness of sub-surface.
- Apply tack coat uniformly.
- Comply with temperature requirement of tack material.

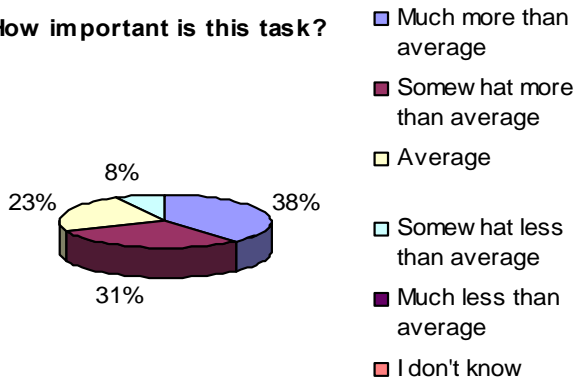
Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?



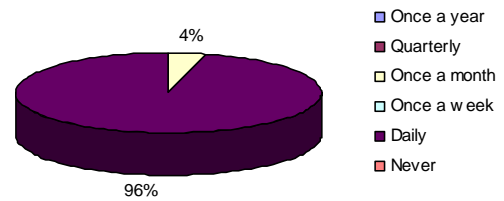
If not at Level II, which Level is this task appropriate?



How important is this task?



How often do you perform this task?



Inspect Surface Preparation.

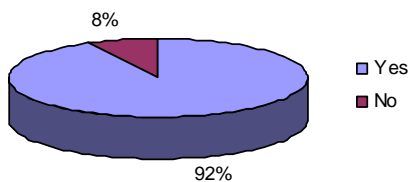
Knowledge:

- HMA Paving Handbook 2000 (Chapter 14).
- Asphalt Institute MS-17, MS-22.
- Project specifications.

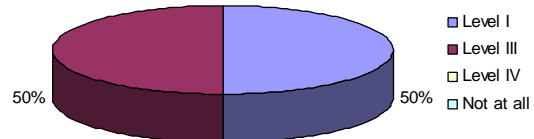
Skills:

- Verify grade.
- Verify cleanliness of sub-surface.
- Make sure surface is dry.
- Verify sub-grade is dry and not frozen.
- Comply with temperature requirement.

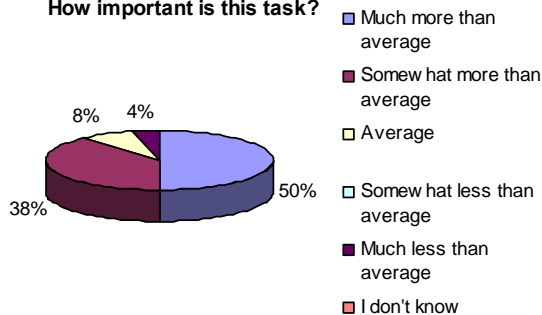
Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?



If not at Level II, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Inspect the Paver Operation.

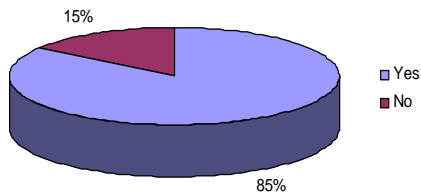
Knowledge:

- HMA Paving Handbook 2000 (Chapters 15 and 16).
- FHWA / NHI course 131032 (Tab 12).
- Asphalt Institute MS-22.

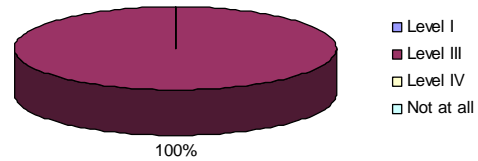
Skills:

- Observe truck /paver interaction.
- Synchronize truck delivery with paver operations.
- Screed width.

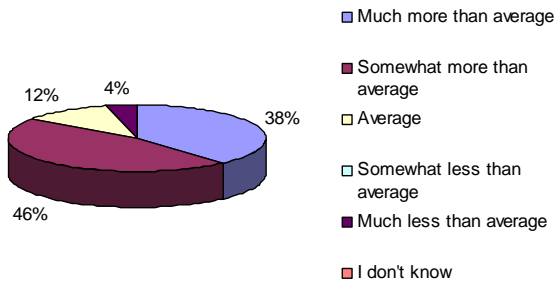
Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?



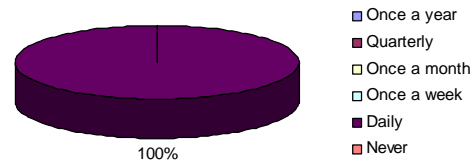
If not at Level II, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Monitor Compactor Operation and Roller Pattern.

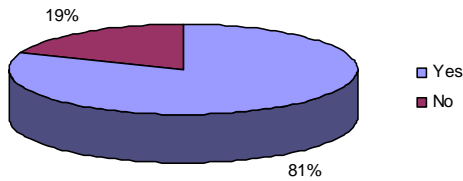
Knowledge:

- HMA Paving Handbook 2000 (Chapter 18).
- Basic understanding of different roller types.
- Asphalt Institute MS-22.

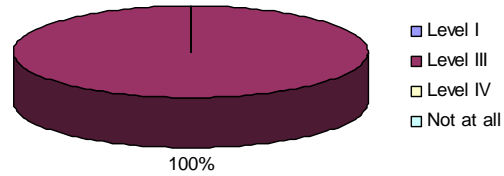
Skills:

- Understand relationship between rolling and density as applied to paving operations.
- Know effect of temperature of the mat on roller pattern.
- Understand difference between static and vibratory rolling.

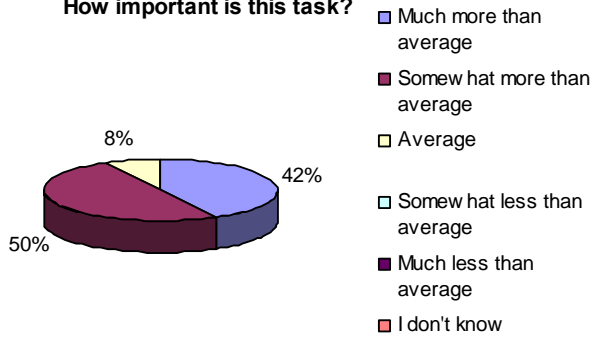
Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?



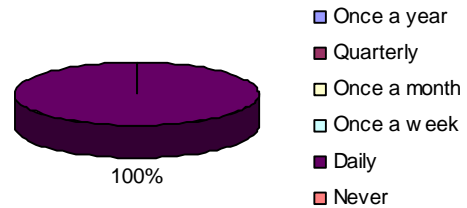
If not at Level II, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Field Testing of Airfield HMA Pavement Tasks

Measure and Collect Random Samples and Perform Tests.

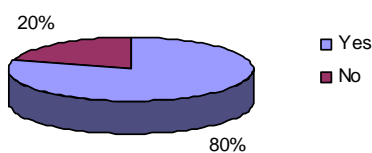
Knowledge:

- ASTM D3665.
- Sampling frequency.
- Standard agency specifications.

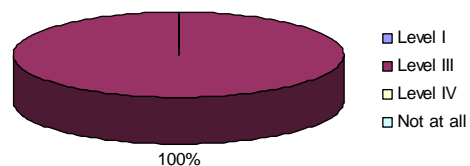
Skills:

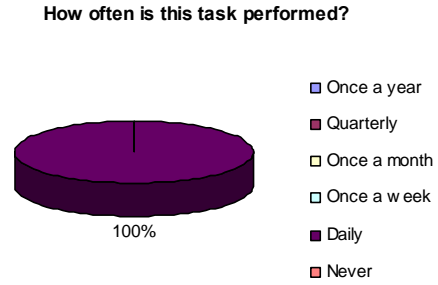
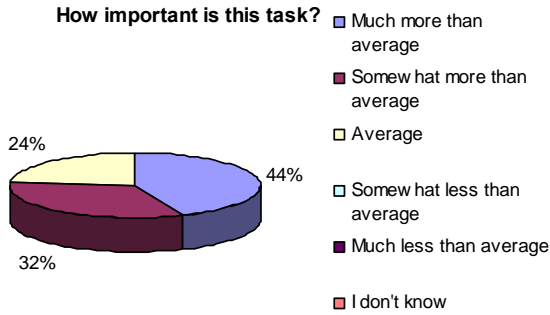
- Read plans to determine location.
- Find locations.
- Read survey stake.
- Measure offsets.
- Apply Lot definitions to paving.
- Verify testing frequency.

Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?



If not at Level II, which Level is this task appropriate?





Inspect Longitudinal and Transverse Joint Construction.

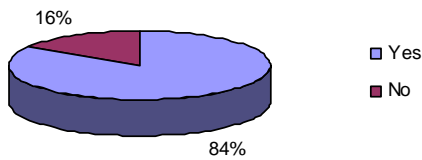
Knowledge:

- HMA Paving Handbook 2000 (Chapter 17).
- Asphalt Institute MS-22.
- NHI course 131032 on HMA construction.

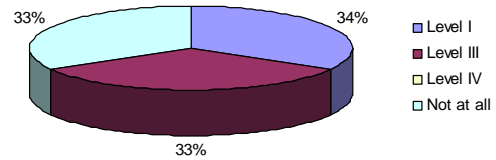
Skills:

- Cut back joint using cutting wheel where specified.
- Compact joint using proper compaction.
- Verify with straight edge.
- Verify tacking.
- Offset multiple lift joints.

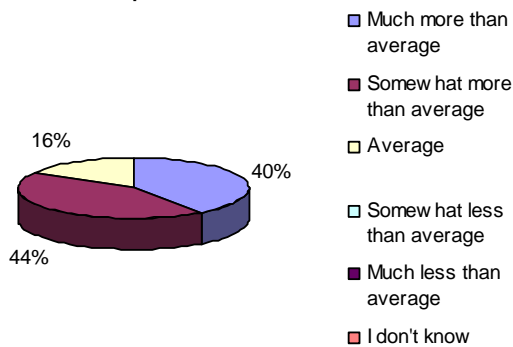
Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?



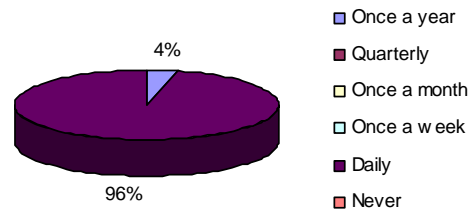
If not at Level II, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Determine Correlation Based on Nuclear Gauge and Core Densities.

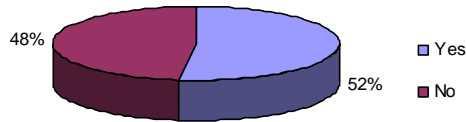
Knowledge:

- ASTM D2950.

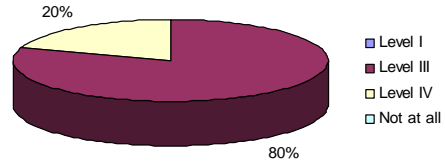
Skills:

- Evaluate lab densities and apply correction factor to mix types.

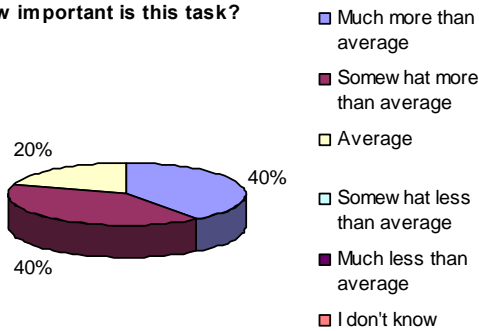
Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?



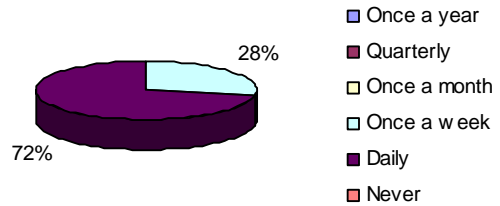
If not at Level II, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Measure Smoothness Using Profilograph.

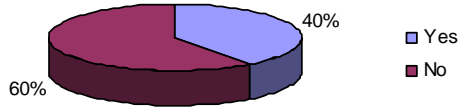
Knowledge:

- Manufacturer's operations manual.
- ASTM E1274.

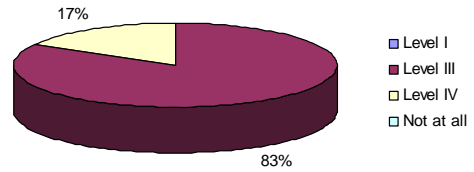
Skills:

- Understand measurements (blanking band).
- Calculate smoothness.
- Read charts.
- Synchronize longitudinal measurements.
- Operate profilograph (assemble and disassemble).
- Calibrate profilograph.

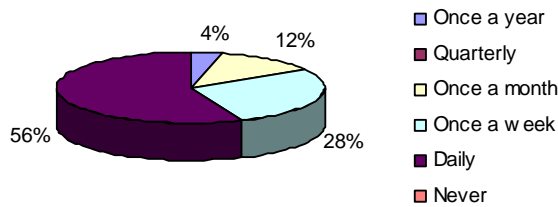
Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?



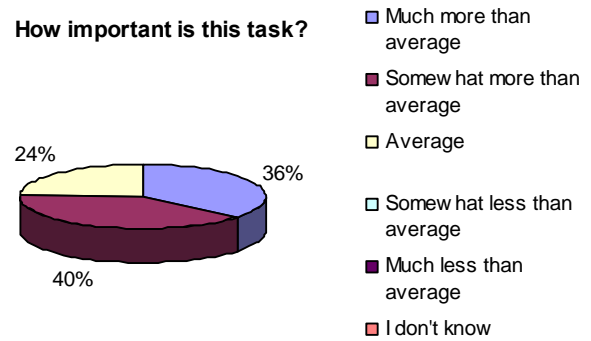
If not at Level II, which Level is this task appropriate?



How often is this task performed?



How important is this task?



HMA Mixture Characteristics Tasks

Demonstrate Awareness of Basic HMA Mix Design Procedures.

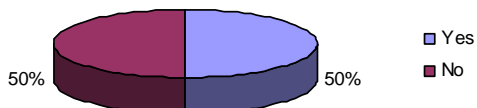
Knowledge:

- Marshall Mix Design.
- Superpave Mix Design.

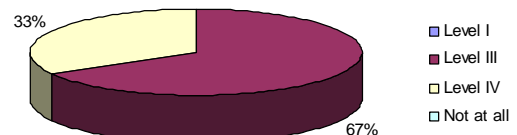
Skills:

- Understand approved mix design properties.
- Explain mix design specification requirements.

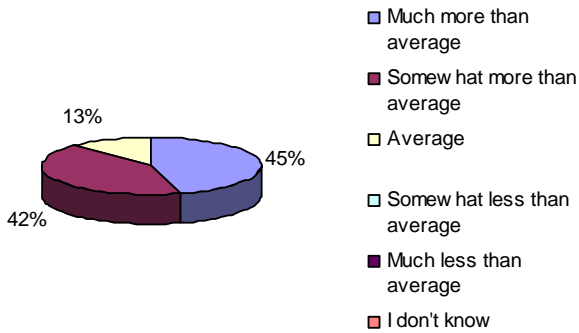
Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?



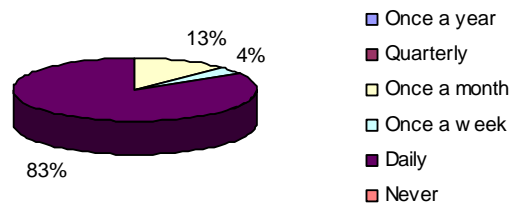
If not at Level II, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Troubleshooting Tasks

Report Anomalies and Non-Conformance to Specification on Level I and Level II Tasks.

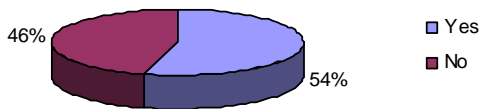
Knowledge:

- HMA Pavement Handbook.
- Agency specific specs.

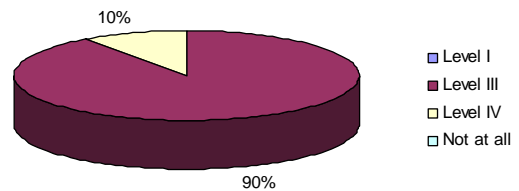
Skills:

- Differentiate between pass and fail results.
- Recognize non-compliance.
- Verify results or re-tests.
- Recommend corrective action to supervisor.

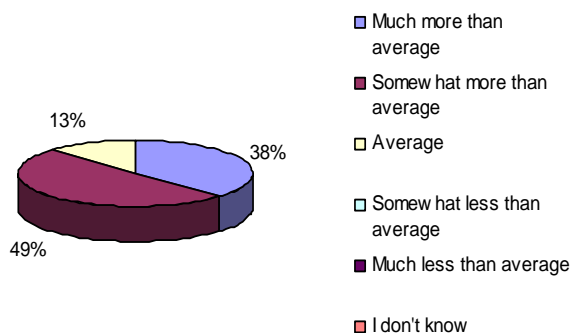
Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?



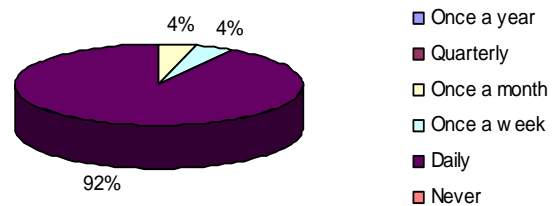
If not at Level II, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Care and Maintenance of Testing and Inspection Equipment

Inspect and Maintain Sampling and Testing Equipment.

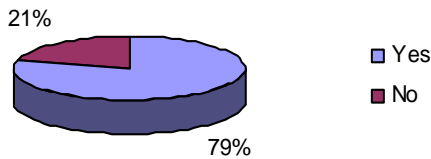
Knowledge:

- Manufacturer’s recommendations.

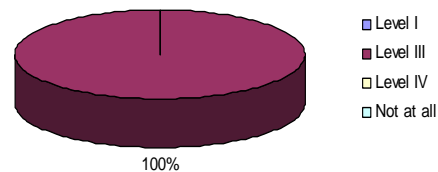
Skills:

- Operate and maintain equipment in accordance with manufacturer’s recommendations.
- Verify proper equipment storage.

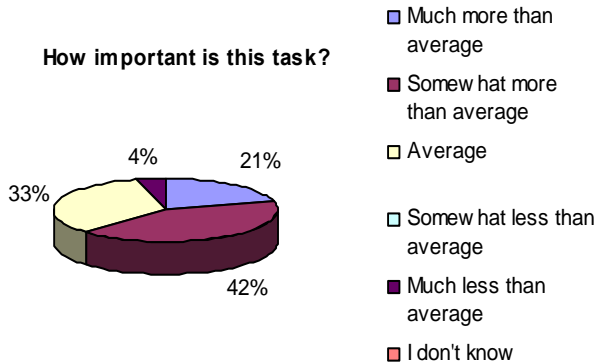
Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?



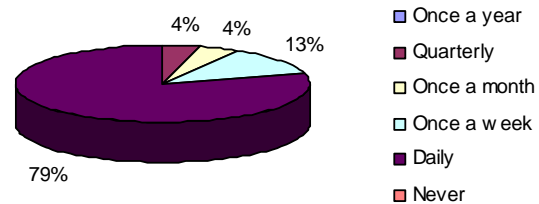
If not at Level II, which level is this task appropriate?



How important is this task?



How often is this task performed?



Worksite Safety and Security

Identify and Address Basic Safety and Security Concerns.

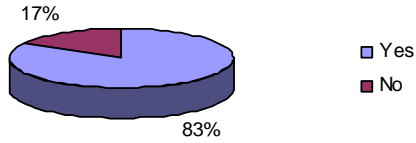
Knowledge

- OSHA, Federal, state and regional requirements (OSHA 10 hour training program or equivalent knowledge).
- Environmental concerns.
- Security requirements.
- Safety plan.
- Incident management system.

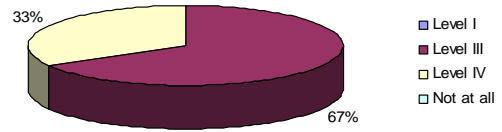
Skills:

- Recognize and report individual safety violation.
- Follow appropriate regulations.
- Oversee personal safety and the safety of lower level employees.
- Report safety violations for self and lower level employees to proper authority.

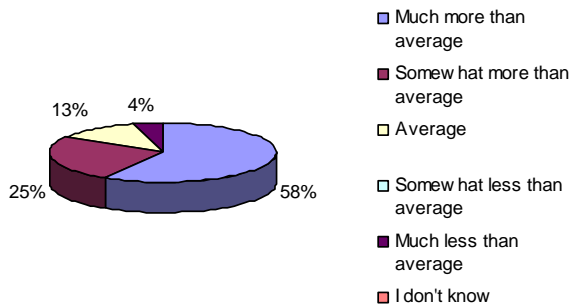
Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?



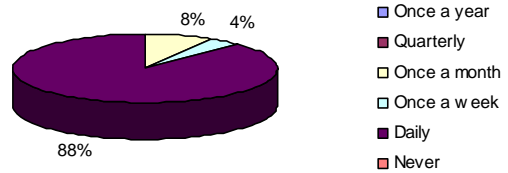
If not at Level II, which level is this task appropriate?



How important is this task?



How often is this task performed?



Management Tasks

There are no tasks at this level.

Training

Provide On-the-Job Training for Level I Technicians in Inspection, Testing, Safety, and Job Responsibilities.

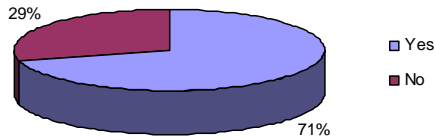
Knowledge:

- Inspection and testing procedures.
- Test equipment.
- Reporting requirements.
- Training methods.
- Safety requirements.

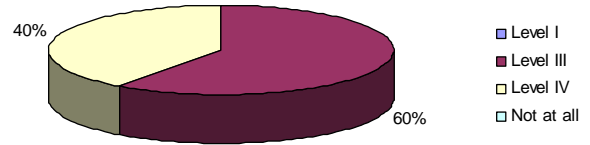
Skill:

- Communicate verbally clearly.
- Document attended training by level 1.

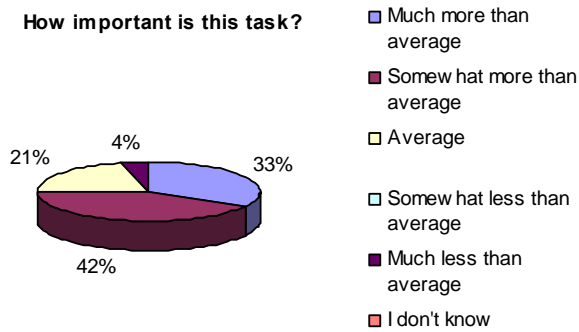
Should this task be within the responsibilities of a Level II certified Airfield HMA Placement Operations Inspection and Field Testing technician?



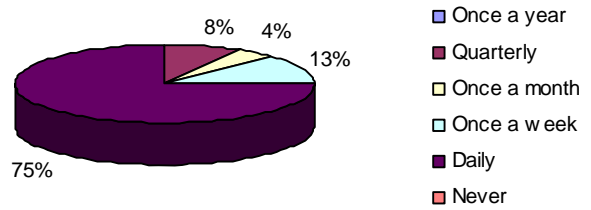
If not at Level II, which Level is this task appropriate?



How important is this task?

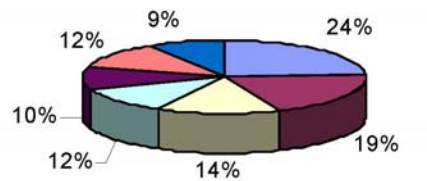


How often is this task performed?



Initial Section Weights

What percentage of the Level II certification exam do you think should be devoted to each section/domain of tasks?



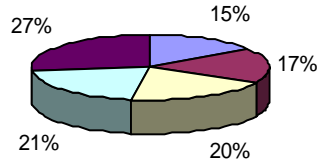
- Inspection of Airfield HMA Placement Operations
- Field Testing of Airfield HMA Pavement
- HMA Mixture Characteristics
- Troubleshooting
- Care and Maintenance of Testing and Inspection Equipment
- Worksite Safety and Security
- Training

Items Per Task

The following question was asked for each section of tasks:

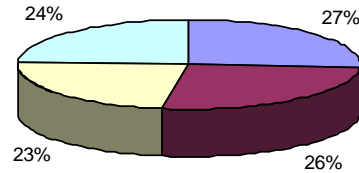
- What percentage of the items/questions within each section/domain should be devoted to each task?

Inspection of Airfield HMA Placement Operations



- Task 1. Inspect the haul vehicle operation.
- Task 2. Inspect tack coat application.
- Task 3. Inspect surface preparation.
- Task 4. Inspect the paver operation.
- Task 5. Monitor compactor operation and roller pattern.

Field Testing of Airfield HMA Pavement



- Task 1. Measure and collect random samples and perform tests.
- Task 2. Inspect longitudinal and transverse joint construction.
- Task 3. Determine correlation based on nuclear gauge and core densities.
- Task 4. Measure smoothness using profilograph.

HMA Mixture Characteristics

Task 1: Demonstrate awareness of basic hot mix asphalt mix design procedures. (100%)

Troubleshooting

Task 1: Report anomalies and non-conformance to specification on Level I and Level II tasks. (100%)

Care and Maintenance of Testing and Inspection Equipment

Task 1: Inspect and maintain sampling and testing equipment. (100%)

Worksite Safety and Security

Task 1: Identify and address basic safety and security concerns. (100%)

Training

Task 1: Provide on-the-job training for Level I Technicians in inspection, testing, safety and job responsibilities. (100%)

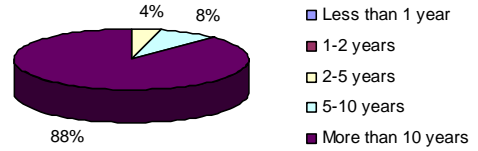
Additional General Comments

- I work on highway paving jobs. Placement and compaction are generally the responsibility of Level III and Level IV. Little or no responsibilities are for the Level I or Level II other than monitoring temp, thickness and density
- A field inspector should know and understand the procedures on a given assignment. He is there for quality assurance. Without the appropriate knowledge how would it be possible to execute such responsibilities?
- Again, some of the tasks should be performed by a higher level tech such as nuke gauge, rolling pattern.

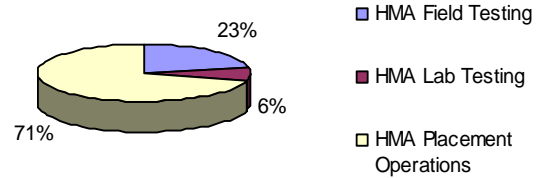
Airfield HMA Placement Operations Inspection and Field Testing Technician Validation Survey Results—Level III

Background/About You

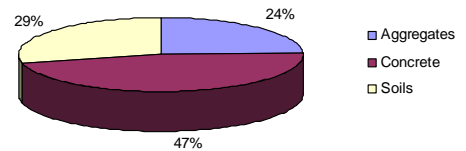
How long have you been working in the area of hot-mix asphalt materials testing and inspection?



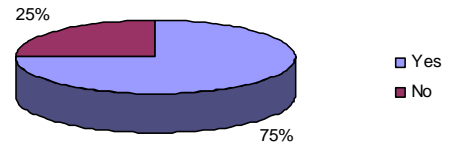
In which area(s) of HMA material testing and inspection do you work or have experience? (Check all that apply.)



Do you have experience in other areas of materials testing? (Check all that apply.)



Have you earned any certifications?



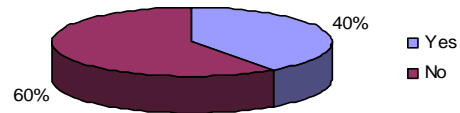
If you answered Yes to the previous question, which certification(s) do you have?

ACI	NECEPT Bituminous
CT	NICET Highway Construction
DDC NYC Concrete Testing	NJSAT
Florida DOT	PCC
HMAPI	PennDOT Concrete
Illinois DOT QA/QC	SAI
NBIS	

What is your job title?

Assistant Construction Manager	Senior Certified Engineering Technician
Chief Inspector	Senior Construction Inspector
Consultant	Senior Engineer
Contract Manager	Senior Field Rep.
Director of Inspection Services	Senior Highway Maintenance Manager
Inspection Supervisor	Senior Inspector
Office Engineer	Transportation Construction Manager 1
Resident Engineer	Transportation Construction Manager 2

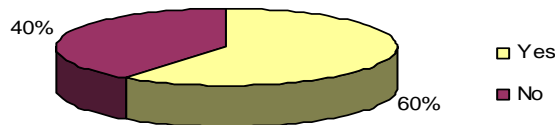
Is there a difference between owner and contractor airfield HMA placement operations inspection and field testing personnel qualifications?



Please explain your response to the previous question. Responses:

- Both must comply to stringent FAA specs.
- I answered no above because I feel both should follow the same guidelines and also I am only involved in State projects.

Do you think there is a need for a national certification program for "Airfield HMA Placement Operations Inspection and Field Testing Technicians"?



Please explain your response to the previous question: Responses:

- If not certification, some training or seminar should be required.
- Conformity to a country-wide spec and standard for both contractors and owners is very important in my opinion.

Task Ratings and Importance

The following questions were asked about each task and the associated skills and knowledge identified to successfully complete the task:

- Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?
- If not at Level I, which Level of certification is this task appropriate?
- How important is this task?
- How often is this task performed?

Inspection of Airfield HMA Placement Operations Tasks

Evaluate Plant, Transportation, Placement, and Compaction Operations.

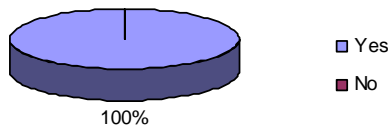
Knowledge:

- FHWA NHI Course 131032.
- Equipment performance.
- Types of plants, equipment.
- NAPA applicable requirements.
- Best practice manuals for HMA airport construction (under development via APTP).

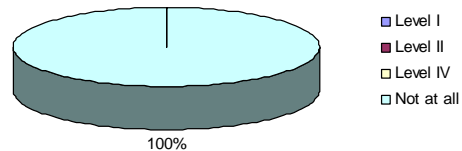
Skills:

- Understand relationship of equipment to placement operation (e.g. based on work time frames).
- Evaluate appropriate size and number of equipment.
- Evaluate specific site environment conditions w/ respect to time available for compaction.

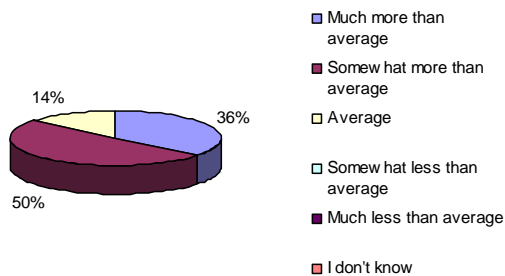
Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?



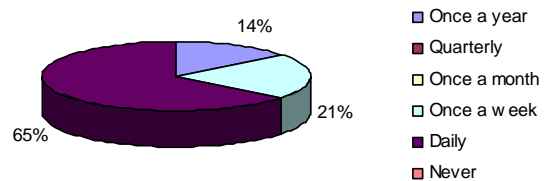
If not at Level III, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Relationship of Rolling Operation to Mat Compaction.

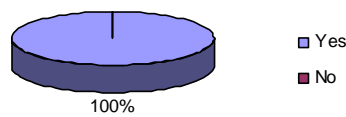
Knowledge:

- HMA Paving Handbook 2000 (Chapter 18).
- Basic understanding of different roller types.
- Asphalt Institute MS-22.

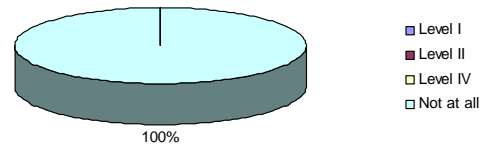
Skills:

- Evaluate mix reaction in accordance with the compacted effort based on temperature.
- Recommend corrective action.
- Follow up on recommended corrective action.
- Document recommendations and follow-up.

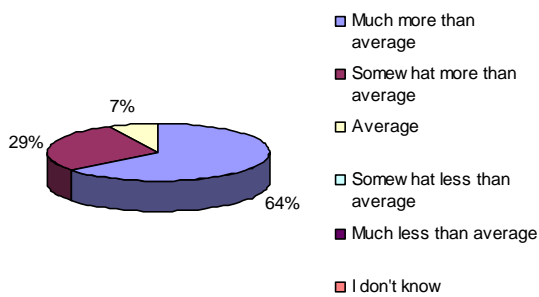
Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?



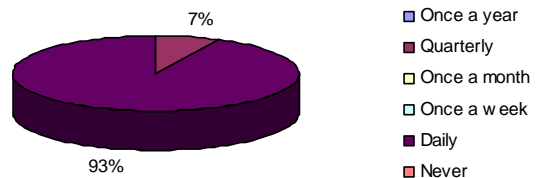
If not at Level III, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Manage aggregate stockpile.

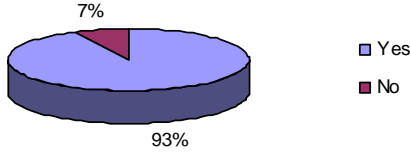
Knowledge:

- HMA Paving Handbook 2000 (Chapter 6).
- National Stone, Sand and Gravel Association.

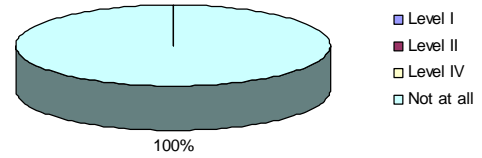
Skills:

- Inspect and evaluate stockpile construction according to best practices.
- Identify aggregate contamination.

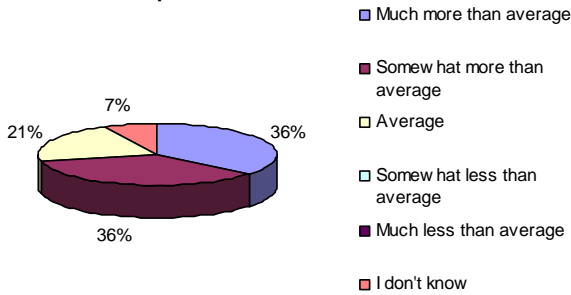
Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?



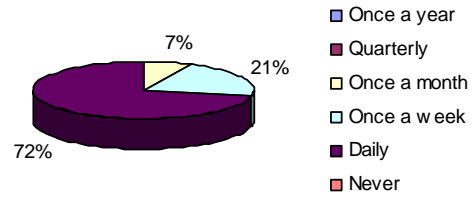
If not at Level III, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Verify plant operation.

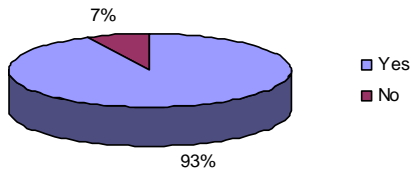
Knowledge:

- Types of plants, storage facilities and manufacturing process, weigh master certification.
- HMA Pavement Handbook 2000 (chapters 8, 9, 10, 11).

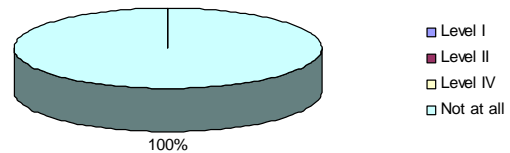
Skills:

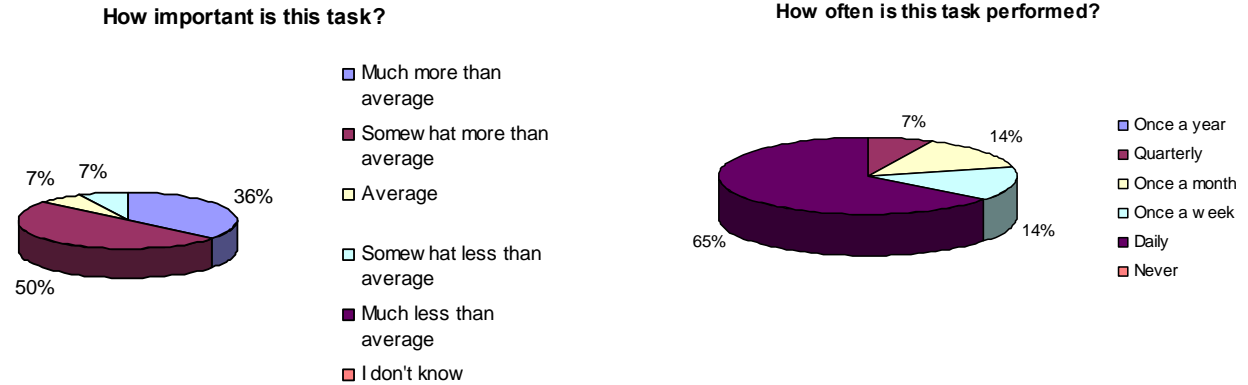
- Verify load-out HMA ticket information.
- Inspect plant certifications (e.g. weigh master, weigh scales).
- Verify plant types and storage facilities.

Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?



If not at Level III, which Level is this task appropriate?





Field Testing of Airfield HMA Pavement Tasks

Determine Segregation Profile.

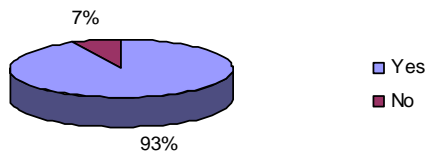
Knowledge:

- General knowledge of techniques for determining segregation (thermal imaging, gradation, density, texture, visual).
- ASTM E965.

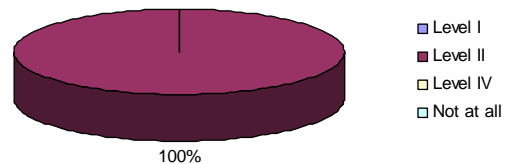
Skills:

- Visually identify areas of segregation.
- Determine sampling location.

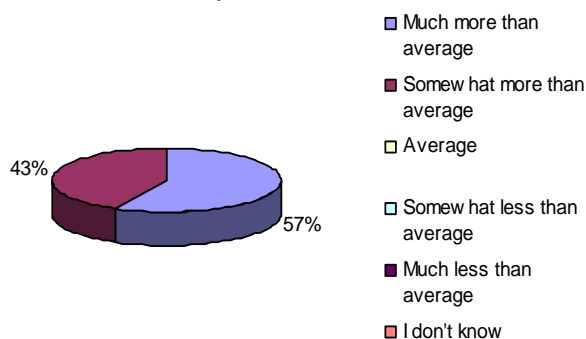
Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?



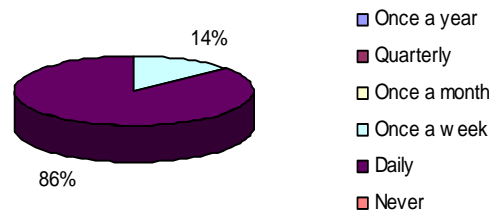
If not at Level III, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Manage and Analyze Data Collected on Smoothness to Establish Corrective Measures.

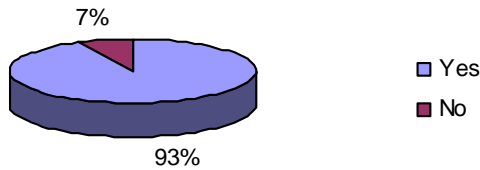
Knowledge:

- Lot sampling.
- FAA P401.

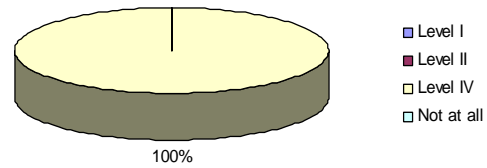
Skills:

- Identify problem areas.
- Establish corrective actions.
- Verify results of corrective actions.
- Convey corrective actions to contractor.

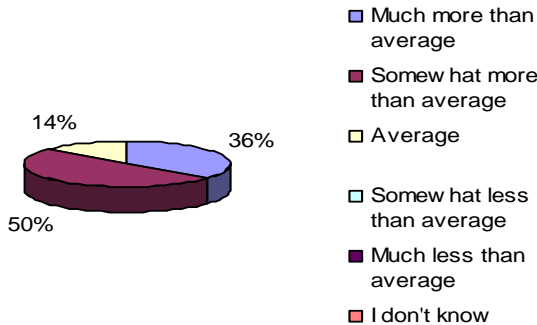
Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?



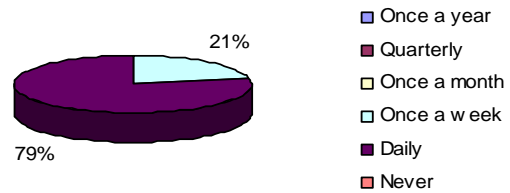
If not at Level III, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Measure Smoothness by Profilograph.

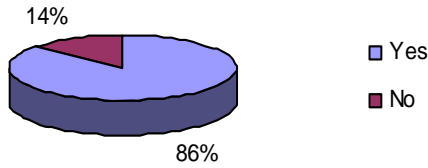
Knowledge:

- ASTM E950.

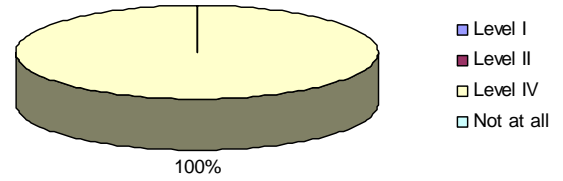
Skills:

- Identify problem areas.
- Establish corrective actions.
- Verify results of corrective actions.
- Convey corrective actions to contractor.

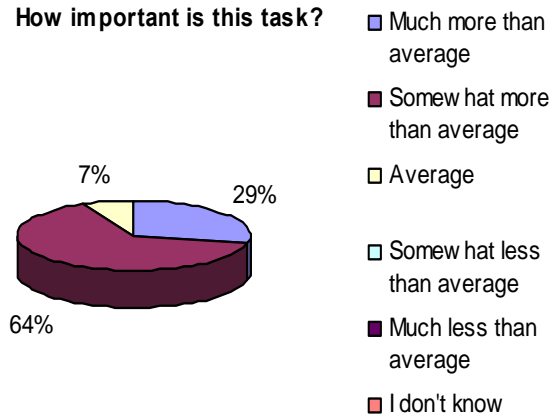
Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?



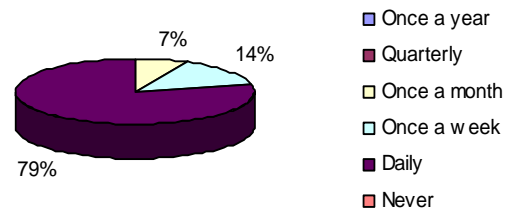
If not at Level III, which Level is this task appropriate?



How important is this task?



How often is this task performed?



HMA Mixture Characteristics Tasks

Explain Relationship Between Mix Properties and Mix Design Requirements.

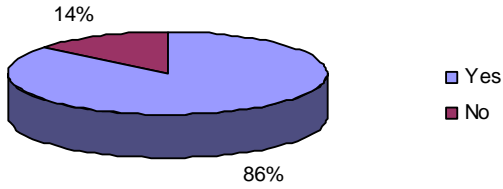
Knowledge:

- Relationships between mix segregation and pavement density.
- Relationship between non-uniform temperature and mix compaction.
- Relationship between mix air voids, pavement air voids and compaction.

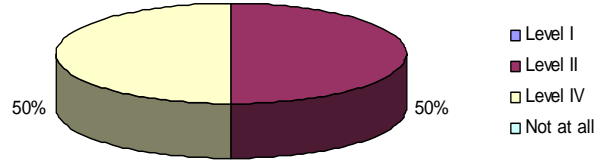
Skills:

- Visually inspect mixture.
- Recognize cold spots, segregation, non-uniform mix, and movement under the roller.

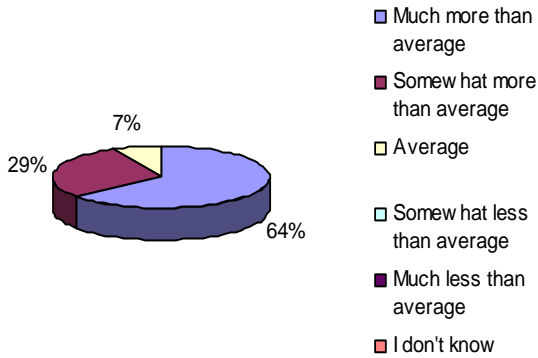
Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?



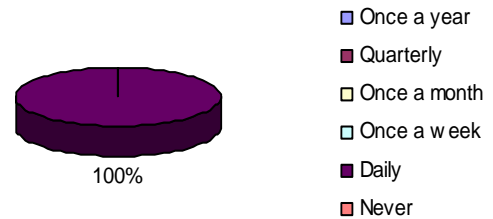
If not at Level III, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Troubleshooting Tasks

Verify, Accept or Reject Level I, II and III HMA Field Test Results and Inspection Reports.

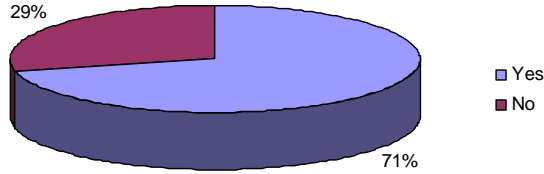
Knowledge:

- Ramifications of issues.
- Project specifications.
- Basic statistical acceptance plans.
- Cost benefit.

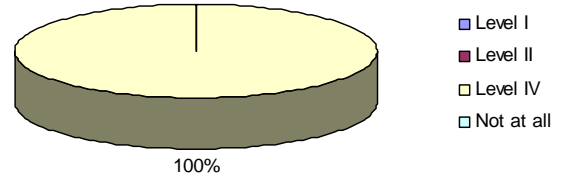
Skills:

- Master Level I and II functions.
- Accept and/or reject results.
- Assess impacts (cost, scheduling, safety, operations).
- Report/document recommended decision to supervisor.

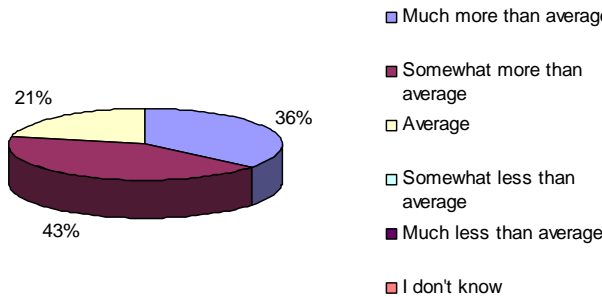
Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?



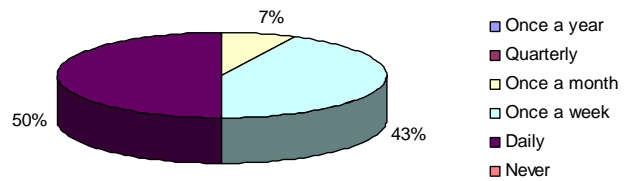
If not at Level III, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Care and Maintenance of Testing and Inspection Equipment Tasks

Verify Calibration and Proper Working Conditions of All Equipment Used in Airport HMA Field Testing and Inspection.

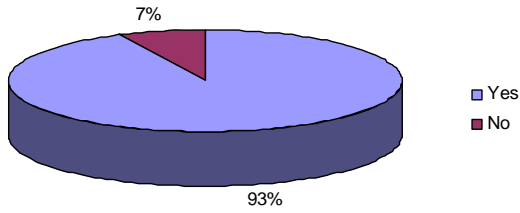
Knowledge:

- Agency requirements (e.g. NRC requirements for nuclear gauge).

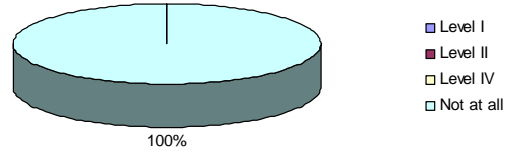
Skills:

- Maintain/document equipment per agency requirements.
- Recognize defective equipment and recommend replacement.

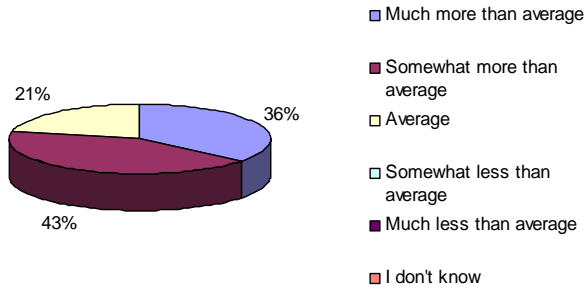
Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?



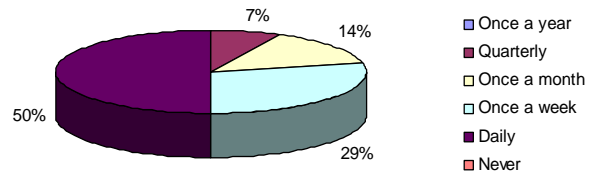
If not at Level III, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Worksite Safety and Security Tasks

Recognize Safety and Security Violations and Recommend Safety Actions.

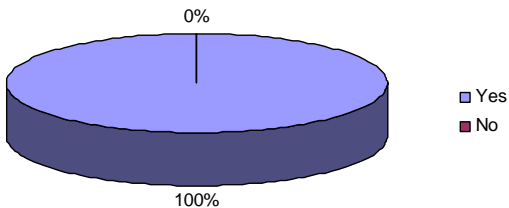
Knowledge:

- OSHA, Federal, state and regional requirements. (OSHA 30-hour training program or equivalent knowledge).

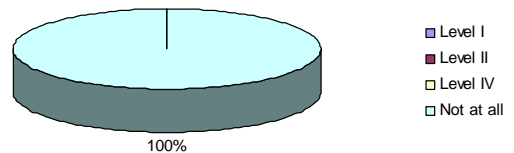
Skills:

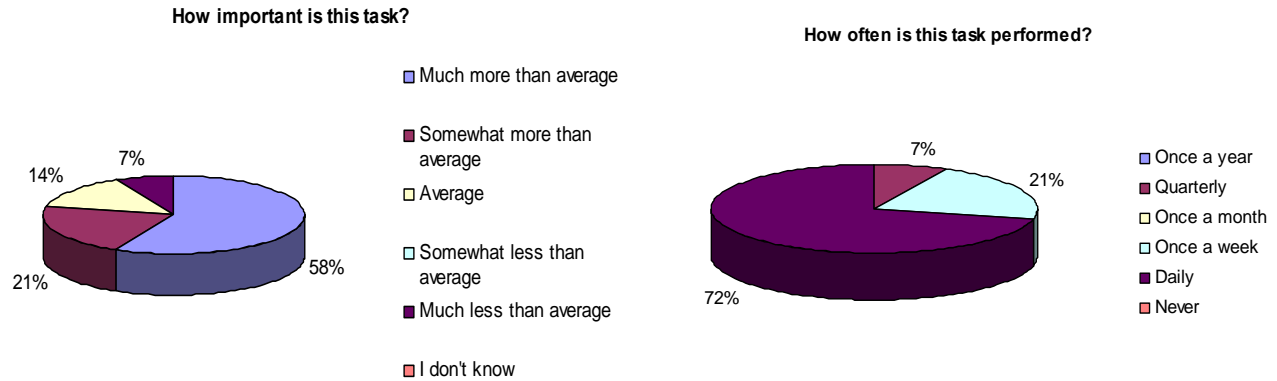
- Recognize worksite safety violations.
- Implement worksite safety plan.
- Document all worksite safety violations.

Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?



If not at Level III, which Level is this task appropriate?





Management Tasks

Assist with the management of multiple or complex projects.

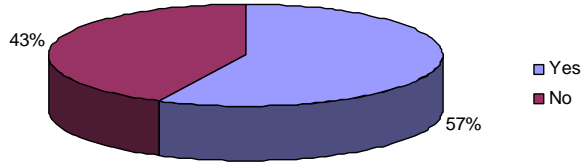
Knowledge:

- Project specifications and contract requirements.
- Personnel supervision and management.
- Personnel safety standards, procedures, and equipment.
- Equipment use, storage, and transportation procedures.
- Procedures, standards, and equipment needed for all Level I and II tasks.
- Basic principles of general record keeping and record-keeping for payroll and contract administration purposes.

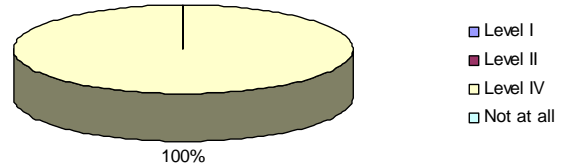
Skills:

- Determine and communicate project requirements.
- Determine personnel capabilities and qualifications matching them with the needs of project tasks.
- Develop work schedules– for efficient use of staff, equipment, and resources to complete work in a timely and cost-effective manner.
- Coordinate inspection and testing activities with other project operations.
- Verify and enforce safety compliance by technicians.
- Determine internal QC requirements and check for compliance.
- Review tech’s payroll (time card).
- Define and communicate employee expectations.
- Maintain records of performance evaluation.
- Communicate directions and evaluate results.
- Mentor subordinates.
- Resolve conflict.

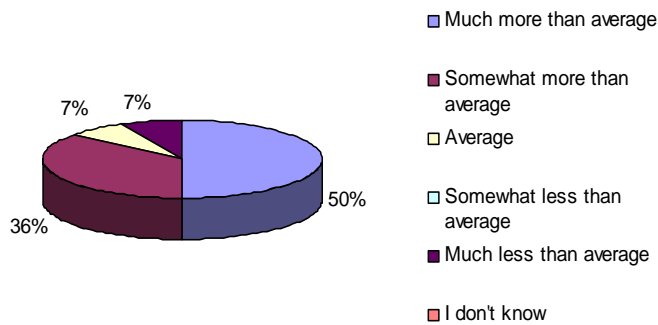
Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?



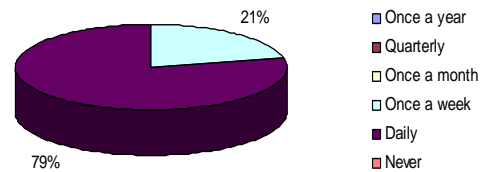
If not at Level III, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Coordinate field inspection and testing operations.

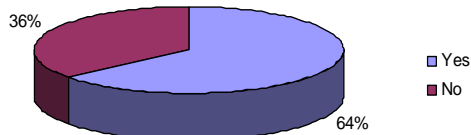
Knowledge:

- Typical owner/customer concerns.
- Technician capabilities.
- Inspection, testing and reporting time.
- Interrelationships among equipment maintenance, inspection, calibration, and use and potential conflicts.
- Owner/customer expectations.

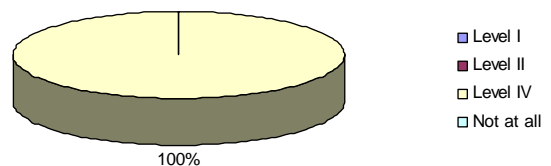
Skills:

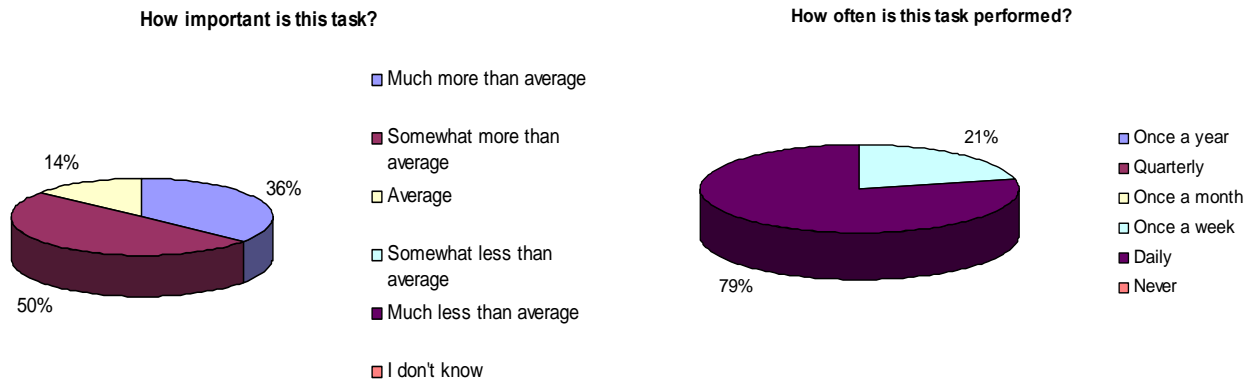
- Determine owner/customer expectations.
- Schedule equipment maintenance, inspection, calibration, and use to minimize conflict.
- Schedule employee work to meet customer/contract execution schedule.
- Identify inspection and test anomalies and make adjustments in reporting to meet customer needs.
- Identify appropriate inspection and test methods to meet project requirements.

Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?



If not at Level III, which Level is this task appropriate?





Training Tasks

Provide Formal and On-The-Job Training on HMA Field Inspection and Testing and Safety to Level I and II Technicians.

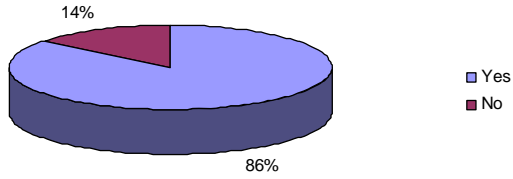
Knowledge:

- Fundamentals of the subject matter.
- Understand all pertinent inspection and test procedures and application of results.
- Understand all pertinent inspection and test equipment maintenance and use.
- Safety standards, procedures, and equipment.
- AASHTO R18/ISO Guide 17025.
- Appropriate styles of training (lecture, written material, demonstration, hands-on) for various types of knowledge or skills.

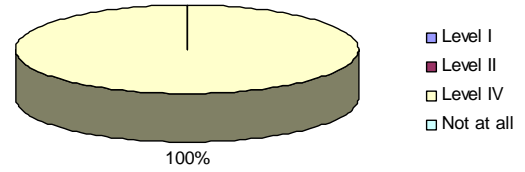
Skills:

- Practice effective communication and delivery of information and technology transfer.
- Provide proper observation and assessment.
- Demonstrate proficiency in the performance of applicable test and inspection procedures.
- Determine training needs of each technician.
- Organize and present information clearly.
- Demonstrate and/or explain testing and safety procedures.
- Observe and check learner's proficiency.

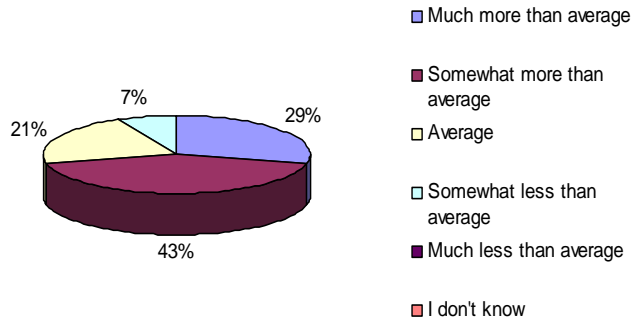
Should this task be within the responsibilities of a Level III certified Airfield HMA Placement Operations Inspection and Field Testing technician?



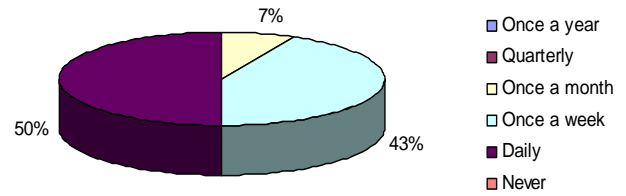
If not at Level III, which Level is this task appropriate?



How important is this task?

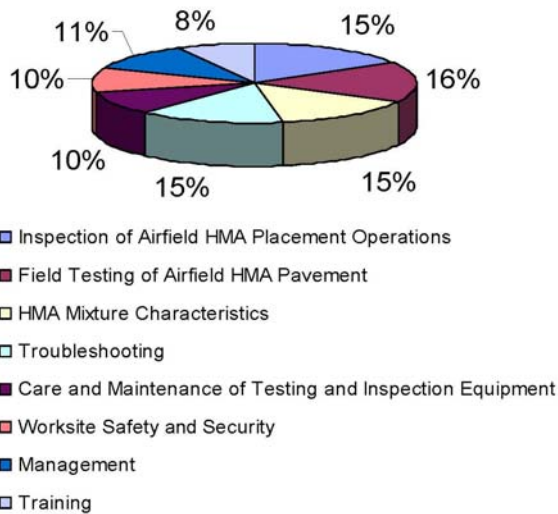


How often is this task performed?



Initial Section Weights

What percentage of the Level III certification exam do you think should be devoted to each section/domain of tasks?

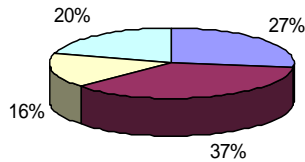


Items per Task

The following question was asked for each section of tasks:

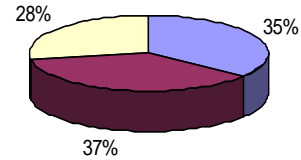
- What percentage of the items within each section/domain should be devoted to each task?

Inspection of Airfield HMA Placement Operations



- Task 1. Evaluate plant, transportation, placement and compaction operations.
- Task 2. Recognize relationship of rolling operation to mat compaction.
- Task 3. Manage aggregate stockpile.
- Task 4. Verify plant operation.

Field Testing of Airfield HMA Pavement



- Task 1. Determine segregation profile.
- Task 2. Manage and analyze data collected on smoothness to establish corrective measures.
- Task 3. Measure smoothness by profilograph.

HMA Characteristics

Task 1: Explain relationship between mix properties and mix design requirements. (100%)

Troubleshooting

Task 1: Verify, accept or reject Level I, II and III HMA Field test results and inspection reports. (100%)

Care and Maintenance of Testing and Inspection Equipment

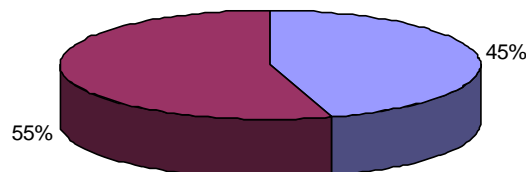
Task 1: Verify calibration and proper working conditions of all equipment used in Airport HMA Field Testing and Inspection. (100%)

Worksite Safety and Security

Task 1: Recognize safety and security violations and recommend safety actions. (100%)

Management

Management



- Task 1. Assist with the management of multiple or complex projects.
- Task 2. Coordinate field inspection and testing operations.

Training

Task 1: Provide formal and on-the-job training on HMA field inspection and testing and safety to Level I and II Technicians. (100%)

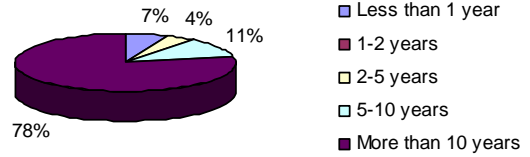
Additional General Comments

- Some tasks required at plants are done by those certified in materials. Normally a highway construction inspector does not do stockpile acceptance. Materials acceptance should be documented on each delivery ticket.
- Again some of the tasks I believe should be handled by a high level tech.

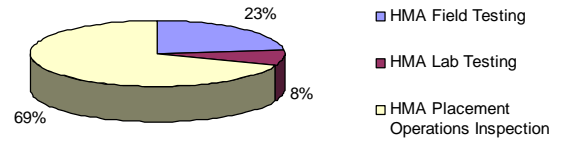
Airfield HMA Placement Operations Inspection and Field Testing Technician Validation Survey Results—Level IV

Background/About You

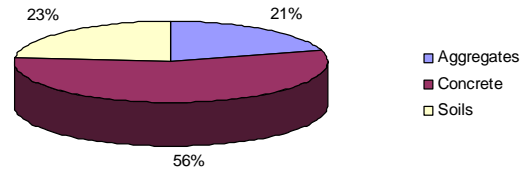
How long have you been working in the area of hot-mix asphalt materials testing and inspection?



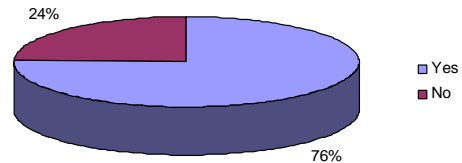
In which area(s) of HMA testing and inspection do you have experience? (Check all that apply.)



Do you have experience in any other areas of materials testing? (Check all that apply.)



Have you earned any certifications?



Which certifications have you earned?

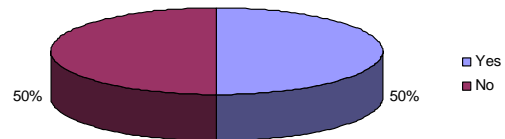
ACI
 CWI
 DSFADF
 Florida DOT
 HMAPI
 Illinois DOT QA/QC
 MAPA
 NECEPT

NICET Asphalt
 NICET Highway Construction
 NICET Highway Materials
 NICET Soils
 NJSAT
 PCC
 PennDOT
 Troxler

What is your job title?

- | | |
|---------------------------------|---|
| Airport Engineer | Project Engineer |
| Area Engineer | Project Manager |
| Assistant Construction Manager | Resident Engineer |
| Assistant Resident Engineer | Resident Engineer/ Chief Inspector |
| Chief Inspector | Senior Certified Engineering Technician |
| Construction Engineer | Senior Construction Inspector |
| Construction Manager | Senior Highway Maintenance Manager |
| Director of Inspection Services | Senior Inspector |
| Inspection Supervisor | Transportation Construction Manager 1 |
| Office Engineer | Transportation Construction Manager 2 |

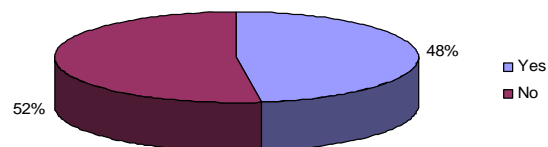
Is there a difference between owner and contractor airfield HMA placement operations inspection and field testing personnel qualifications?



Please explain your response to the previous question. Responses:

- Owner inspection geared more for overall inspection for ride, air voids finish, etc; contractor’s inspection seems to be only concerned for air voids and ride.
- Both must comply with stringent FAA specs.
- Contractor is usually required to perform more testing.
- Owners usually require certification, while contractors usually rely on supplier's QA/QC staff.
- I answered no because I believe they should be one and the same and also I deal only with State projects.
- Contractor testing includes taking the core samples and submitting them to the lab.

Do you think there is a need for a national certification program for "Airfield HMA Placement Operations Inspection and Field Testing technicians"?



Please explain your response to the previous question. Responses:

- If not certification, some training or seminar should be required.
- FAA already has a program in place.
- Not in my experience, the agencies have programs set up for the consultant (CM) inspectors to mark out the locations for sampling and lab inspectors to verify the mix, but none require the inspection staff to provide any further testing. The field cores and lab tests are provided and paid for by the contractor as per contract.

Task Ratings and Importance

The following questions were asked about each task and the associated skills and knowledge identified to successfully complete the task:

- Should this task be within the responsibilities of a Level I certified Airfield HMA Placement Operations Inspection and Field Testing technician?
- If not at Level I, which Level of certification is this task appropriate?
- How important is this task?
- How often is this task performed?

Inspection of Airfield HMA Placement Operations Tasks

There are no tasks at this level.

Field Testing of Airfield HMA Pavement Tasks

There are no tasks at this level.

HMA Mixture Characteristics Tasks

Recognize Need for HMA Mix Design Adjustments.

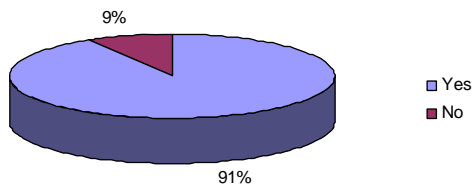
Knowledge:

- Mix properties represented by QC and field tests.

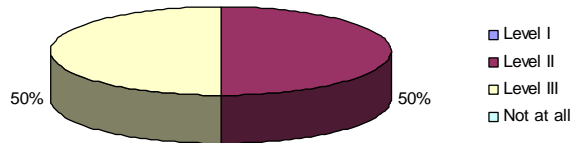
Skills:

- Review mix QC tests and field tests.
- Inspect reports and note anomalies.
- Confirm field inspection and field test results with mix lab test results.

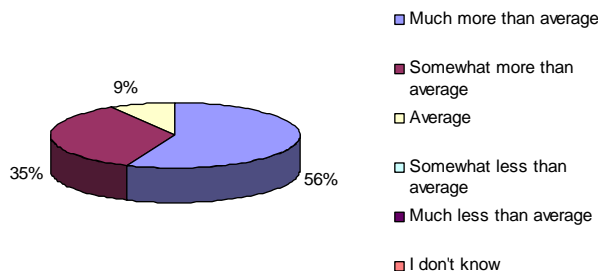
Should this task be within the responsibilities of a Level IV certified Airfield HMA Placement Operations Inspection and Field Testing technician?



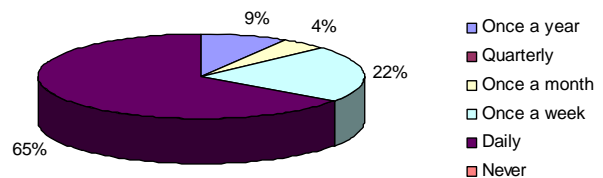
If not at Level IV, which level is this task appropriate?



How important is this task?



How often is this task performed?



Troubleshooting Tasks

Establish troubleshooting protocol and documentation procedures.

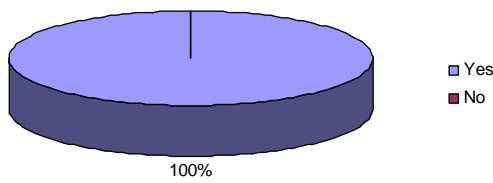
Knowledge:

- Ramifications of issues.
- Project specifications.
- Basic statistical acceptance plans.
- Cost benefit.
- General knowledge of airport project structure and airport operations.

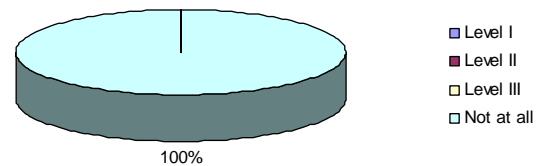
Skills:

- Establish SOPs.
- Master Level I, II and III functions.
- Initiate/implement acceptance/rejection process.
- Make final recommendations to final authority.

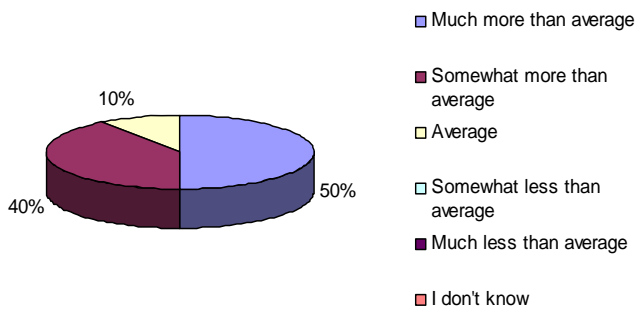
Should this task be within the responsibilities of a Level IV certified Airfield HMA Placement Operations Inspection and Field Testing technician?



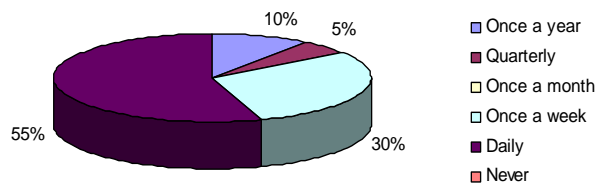
If not at Level IV, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Care and Maintenance of Testing and Inspection Equipment Tasks

Manage Testing and Inspection Equipment Inventory.

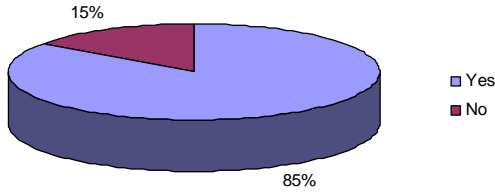
Knowledge:

- Project equipment necessary.
- Required SOPs.

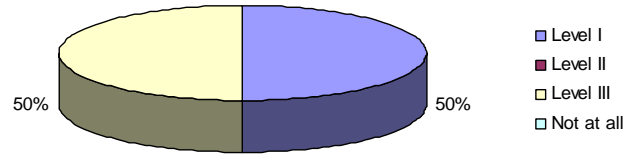
Skills:

- Acquire necessary equipment.
- Schedule maintenance.
- Develop SOPs for equipment maintenance.

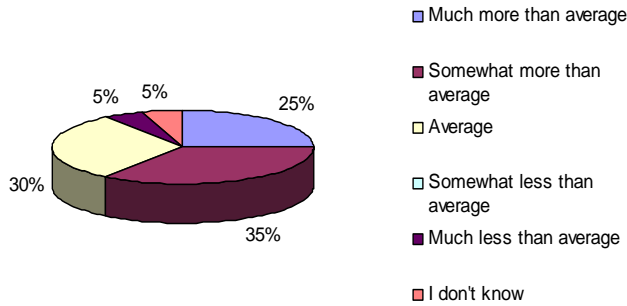
Should this task be within the responsibilities of a Level IV certified Airfield HMA Placement Operations Inspection and Field Testing technician?



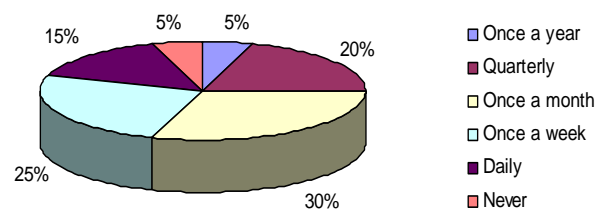
If not at Level IV, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Worksite Safety and Security Tasks

Determine, Coordinate, and Implement the Training, Communication, Facility, and Monitoring Elements Required as Parts of an Adequate Safety Program.

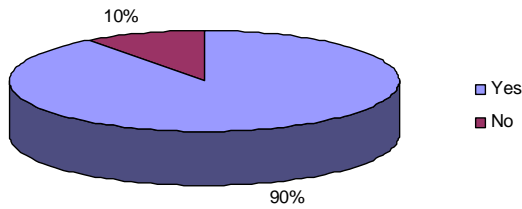
Knowledge:

- OSHA, Federal, state and regional requirements (OSHA 40-hour training program or equivalent knowledge).
- Appropriate and required documentation processes and forms.
- Project safety management system.

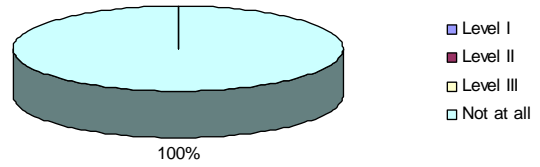
Skills:

- Develop safety plan.
- Administer safety plan.
- Document and report safety and security violations.

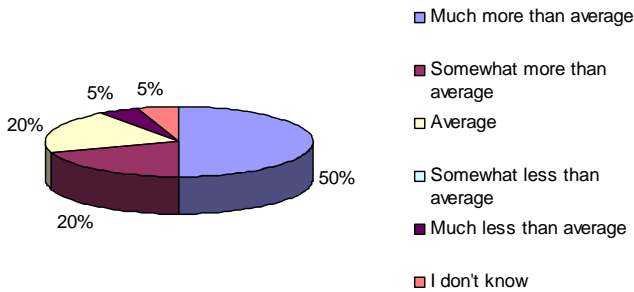
Should this task be within the responsibilities of a Level IV certified Airfield HMA Placement Operations Inspection and Field Testing technician?



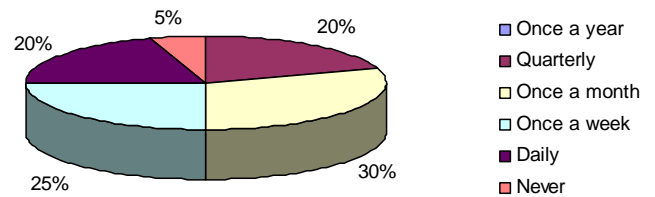
If not at Level IV, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Management Tasks

Maintain the quality of processes and personnel in order to maintain field competence.

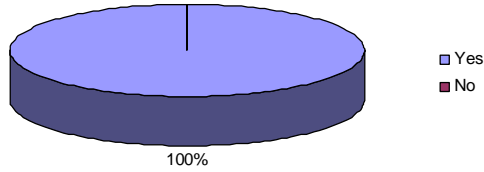
Knowledge:

- Accreditation Programs and the appropriate technician training and certification program(s).
- ISO Guide 17025.
- Equipment calibration, maintenance, personnel qualification requirements, training requirements, equipment inventory, dispute resolution, record keeping, proficiency sample testing and reporting requirements of AASHTO R18.

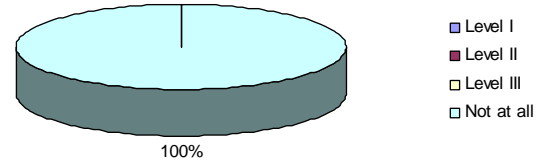
Skills:

- Evaluate field inspection and testing processes and personnel qualifications for compliance with accreditation standards.
- Analyze and recommend possible changes to bring testing and inspection processes and personnel into compliance.

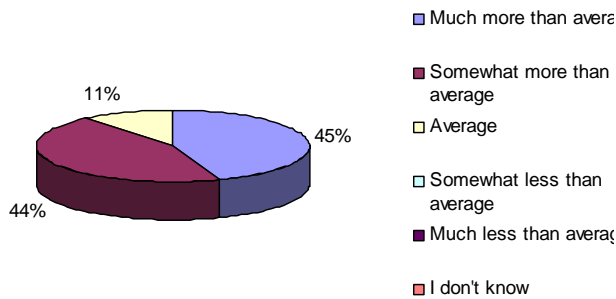
Should this task be within the responsibilities of a Level IV certified Airfield HMA Placement Operations Inspection and Field Testing technician?



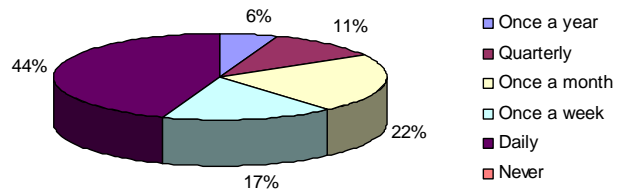
If not at Level IV, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Establish Field Inspection and Testing Program and Schedule.

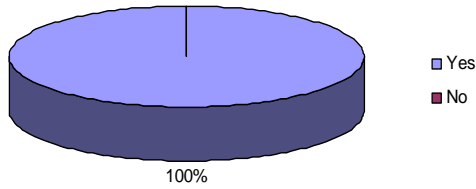
Knowledge:

- Appropriate field inspection task and tests to characterize HMA placement processes and materials.
- Time, equipment, and technician needs to conduct Level I, Level II and Level III inspection and testing tasks.
- What inspection tasks and tests can be conducted independently and which ones need to be sequenced.
- Know the reason and purpose for conducting inspection tasks and tests.

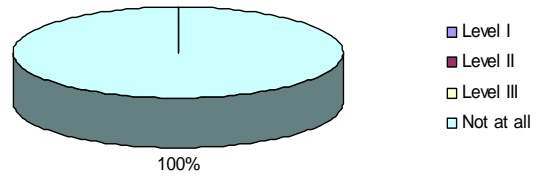
Skills:

- Schedule field inspection and testing staff.
- Determine the sequence of inspection and testing tasks necessary for efficient field operations.

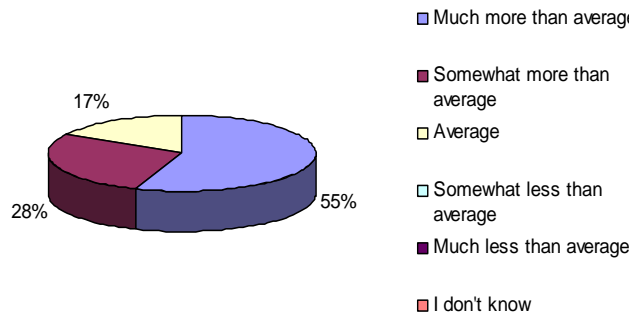
Should this task be within the responsibilities of a Level IV certified Airfield HMA Placement Operations Inspection and Field Testing technician?



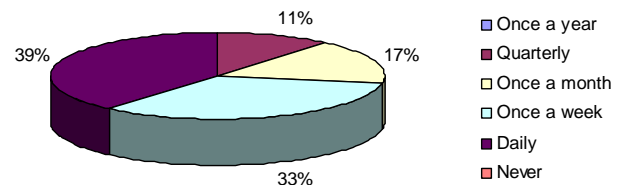
If not at Level IV, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Monitor changes in standards and specifications to assure that HMA Field Testing and inspection procedures are in conformance.

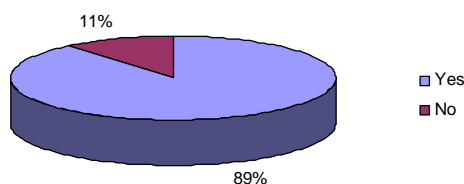
Knowledge:

- AASHTO, ASTM, FAA, federal, state, and local government procedures for issuing and updating testing standards.
- Current ASTM / AASHTO / FAA / State DOT / FHWA standards and specifications updates.

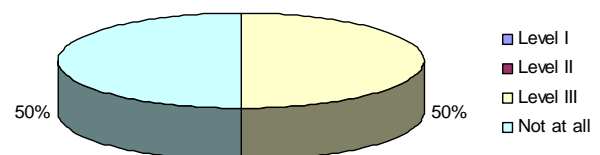
Skills:

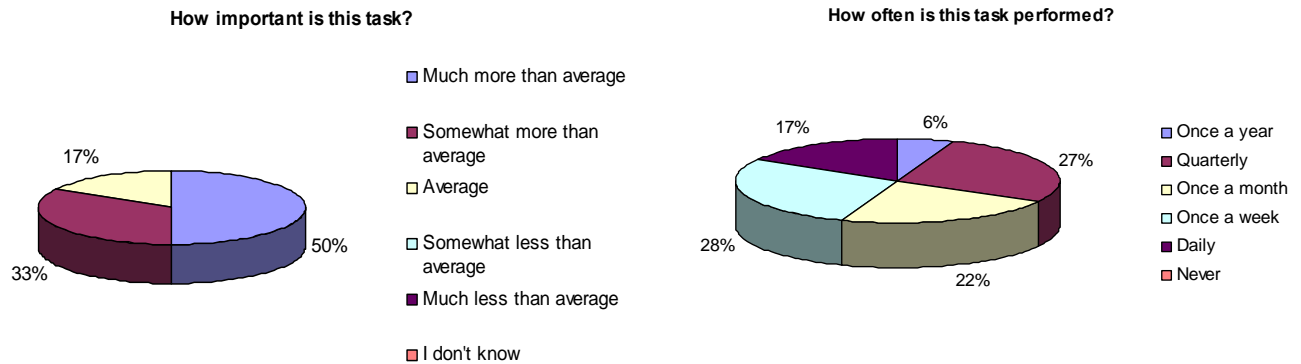
- Read, interpret, and identify changes in updated standards and specifications.
- Determine the most recent date and content of standard.
- Identify differences between old and new standards.
- Ensure the appropriate standard is applied to project.

Should this task be within the responsibilities of a Level IV certified Airfield HMA Placement Operations Inspection and Field Testing technician?



If not at Level IV, which Level is this task appropriate?





Manage field-testing and inspection operations projects.

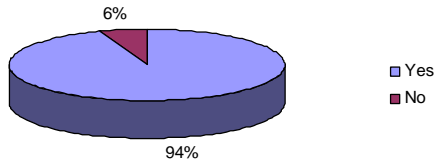
Knowledge:

- Cost of inspection and testing operations, including equipment, personnel, reporting and overhead.
- Principles of budget planning, management and billing .
- Understand contract and scope of services.
- Principles of supervision, and employee mentoring and training.
- Labor Laws.
- OSHA regulations.
- Cost estimating for prospective projects.
- Meeting project needs within budget and on time.
- Loss prevention techniques.
- Personnel management.
- Customer service.
- Sources of information about project objectives, limitations, procedures, resources, personnel, budgets, and schedules.
- Purposes and language of contracts and the nature of contractual relationships (scope of services).

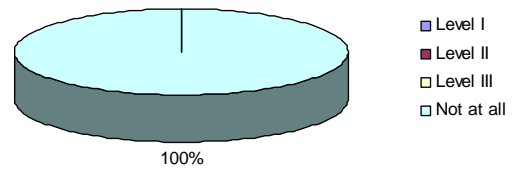
Skills:

- Communicate effectively internally and externally.
- Provide customer service and client interaction.
- Coordinate work of field technicians and others to define and meet common field inspection and testing goals.
- Manage multiple projects simultaneously.
- Avoid and manage conflicts.
- Perform dispute resolution as needed.
- Understand and use different scheduling tools.
- Determine project specifications and Q/C requirements.
- Provide field management for a project Q/C program to assure that objectives are being met on time and within budget.

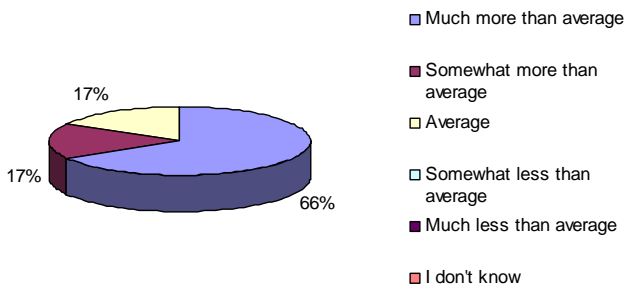
Should this task be within the responsibilities of a Level IV certified Airfield HMA Placement Operations Inspection and Field Testing technician?



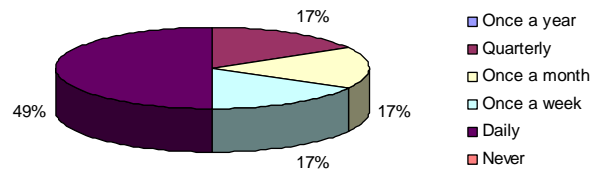
If not at Level IV, which Level is this task appropriate?



How important is this task?



How often is this task performed?



Develop and manage a plan for test/trial section approval process and HMA JMF adjustments.

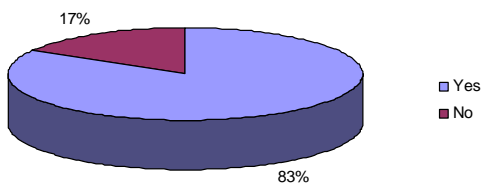
Knowledge:

- Proportioning methods for asphalt concrete mixes.
- Asphalt Institute SP-2.
- Asphalt Institute MS-22.
- Asphalt Level 1, 2, 3 tests.

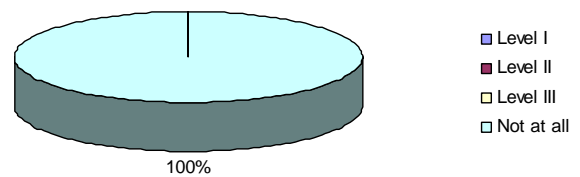
Skills:

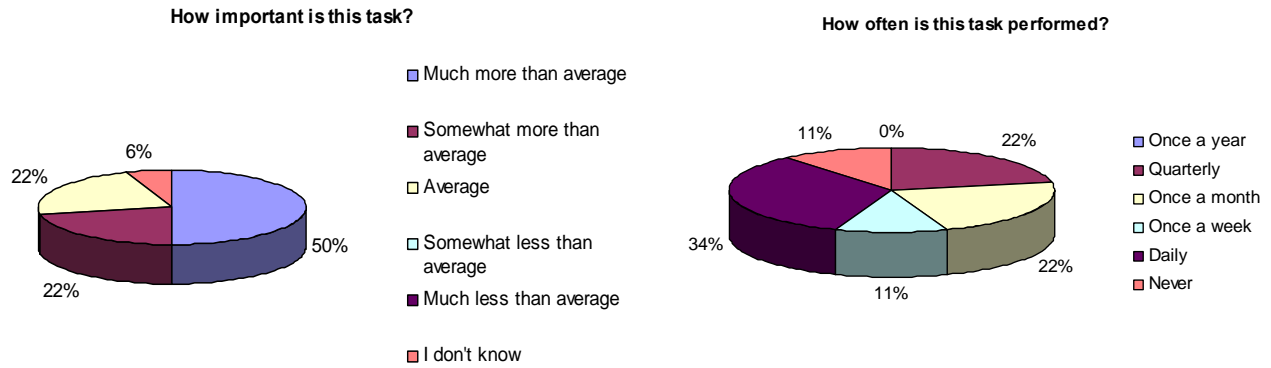
- Determine sample requirements, test methods, and reporting requirements.
- Interpret results.

Should this task be within the responsibilities of a Level IV certified Airfield HMA Placement Operations Inspection and Field Testing technician?



If not Level IV, which Level is this task appropriate?





Training Tasks

Establish and manage a training program for airport HMA field inspection and testing technicians.

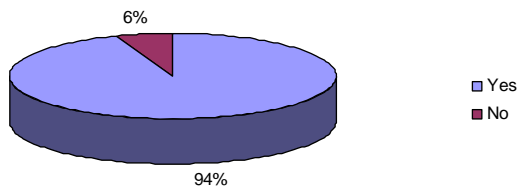
Knowledge:

- Inspection and testing methods.
- Capabilities and limitations of inspection and testing equipment.
- Equipment calibration requirements.
- Written report content and requirements.

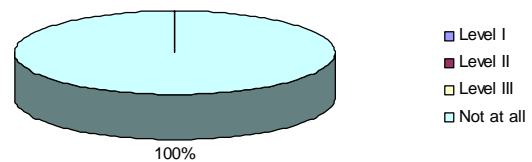
Skills:

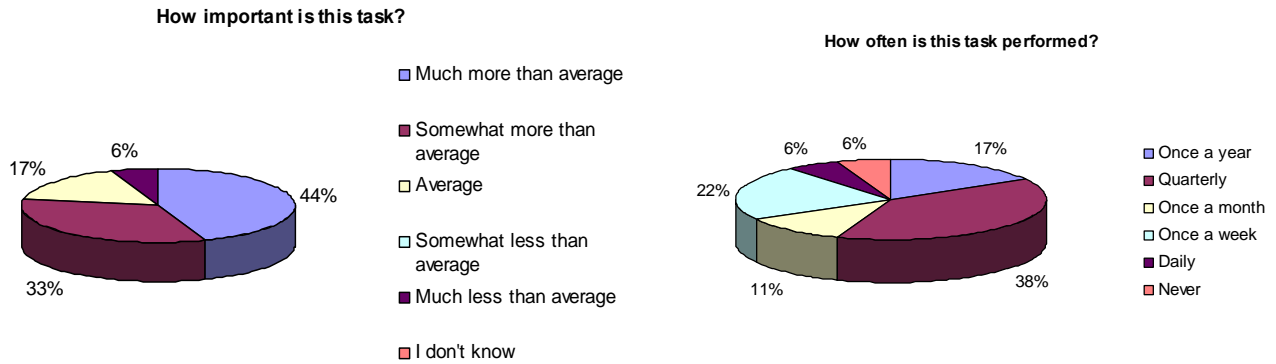
- Communicate training needs effectively.
- Use proper delivery tools and techniques to ensure proper delivery of training program.
- Recognize and mentor technicians with management potential.
- Provide performance evaluations to technicians.

Should this task be within the responsibilities of a Level IV certified Airfield HMA Placement Operations Inspection and Field Testing technician?



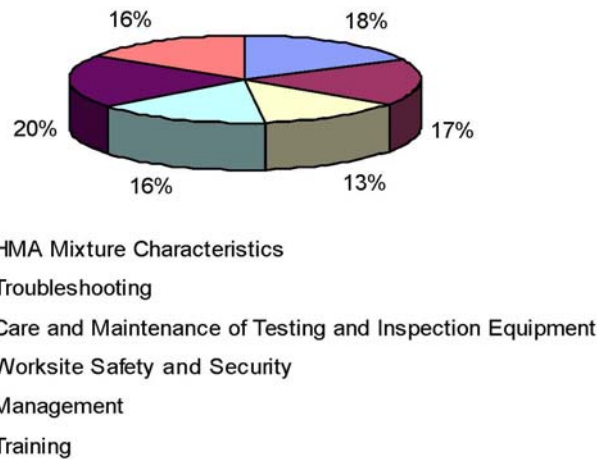
If not Level IV, which Level is this task appropriate?





Initial Section Weights

What percentage of the Level IV certification exam do you think should be devoted to each section/domain of tasks?



Items per Task

The following question was asked for each section of tasks:

- What percentage of the items within each section/domain should be devoted to each task?

HMA Mixture Characteristics

Task 1: Recognize need for HMA mix design adjustments. (100%)

Troubleshooting

Task 1: Establish troubleshooting protocol and documentation procedures. (100%)

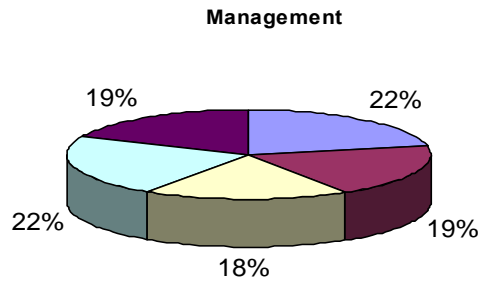
Care and Maintenance of Testing and Inspection Equipment

Task 1: Manage testing and inspection equipment inventory. (100%)

Worksite Safety and Security

Task 1: Determine, coordinate, and implement the training, communication, facility and monitoring elements required as parts of an adequate safety program. (100%)

Management



- Task 1. Maintain the quality of processes and personnel in order to maintain field competence.
- Task 2. Establish field testing and inspection program and schedule.
- Task 3. Monitor changes in standards and specifications to assure HMA Field Testing and Inspection procedures are in conformance.
- Task 4. Manage field testing and inspection operations projects.
- Task 5. Develop and manage a plan for test/trial section approval process and HMA JMF adjustments.

Training

Task 1: Establish and manage a training program for Airport HMA field inspection and testing technicians. (100%)

Additional General Comments

- Management and coordination of the inspection team are very important to control the quality and progress of any project.
- Some HMA mix design approval responsibilities lie with those certified in materials. A Level IV construction inspector must decipher approval documentation.
- Of all the Levels I believe the proposed tasks for Level IV are the most complete without any need to change.

APPENDIX D

D-1. Multiple-Choice Test Question Development Manual

**D-2. Proctor Guidelines for Administering the NICET
Examinations**

APPENDIX D

D-1. Multiple-Choice Test Question Development Manual

D-2. Proctor Guidelines for Administering the NICET Examinations

Introduction

While a determination of the exam structure used to evaluate mastery of various tasks at different levels is ultimately undertaken subsequent to the design and development of the certification program, Appendix D-1 is a copy of NICET's manual for developing multiple-choice test questions. The application of guidelines such as these are essential to the development of a fair, valid, and reliable assessment tool.

The document in Appendix D-2 is NICET's proctoring guidelines for administering their exams. These guidelines are essential to ensuring that NICET programs are uniformly and equitably applied wherever they are administered.

Appendix D-1

**MULTIPLE-CHOICE TEST QUESTION
DEVELOPMENT MANUAL (REV.)**



NICET
1420 King Street
Alexandria, VA 22314
(888) 476-4238



NATIONAL INSTITUTE FOR CERTIFICATION IN ENGINEERING TECHNOLOGIES

**MULTIPLE-CHOICE TEST QUESTION
DEVELOPMENT MANUAL**

www.nicet.org
888-476-4238

Table of Contents

INTRODUCTION	3
CERTIFICATION PROGRAM STRUCTURE	3
QUESTION TOPICS.....	4
QUALITY QUESTIONS: A SUMMARY	4
WRITING MULTIPLE-CHOICE QUESTIONS	5
A-Z OF TEST ITEM CONSTRUCTION.....	5
APPENDIX A: BLOOM'S TAXONOMY VERB LIST	
APPENDIX B Mystery Solved: Where Do Good Questions Come From?	



INTRODUCTION

Every test question (commonly referred to as a test item) is a measurement instrument. The question should be carefully crafted to accurately gauge the competence of engineering technicians in an important area. It is essential that the questions be of high quality. This booklet provides question writers with guidance that, in combination with their own technical skill and communications ability, will give them more information on and help them develop more skills in this important part of the examination process.

NICET usually maintains three active versions of any examination. Each version of an exam is represented by one “bank” of test questions. Test question preparation includes the writing of multiple-choice questions for each bank of the examination according to the test blueprint. Some existing questions from the NICET question database may be related to the program under development. In this case, these questions will be reviewed for relevance and, if appropriate, assigned to an item bank.

Each newly written question will be edited by a NICET staff member who will return the edited question to its author for corroboration of any changes and to ensure that the sense of the question has not been altered. Each question will then be reviewed by another Subject Matter Expert for technical accuracy and returned to the author if any change is advised. Following this iterative process, NICET will arrive at a sound question that can be used to determine the competency of an individual test taker.

Finally, each question will be field tested according to standard practice for certification test development. This testing venue is commonly referred to as a Beta test. This is where an initial slate of candidates take the examination during its first presentation. Those candidates will not learn their results until a sufficient number of candidates have taken the examination such that statistical computations on the question characteristics can be compiled. For instance, a question to which all candidates respond correctly is not useful in discriminating between those who have sufficient knowledge to practice from those who do not. Conversely, a question that everyone answers incorrectly is also not a good question and is unable to discriminate, as it should. Revisions to marginally poorly performing questions will be made as necessary, and the questions will be readied for use in certification testing.

The material in this manual is designed to help question writers produce high quality test questions that can accurately assess the skills and knowledge needed for competent performance of the program’s tasks.

The most important sections of this book are “Quality Questions: A Summary,” and “Writing Multiple Choice Questions,” which delineates what is meant by “high quality test questions.” The remaining sections provide summaries, examples, and further considerations.

CERTIFICATION PROGRAM STRUCTURE

NICET offers certification to engineering technicians in a variety of fields and subfields. Candidates possess differing levels of work experience for different areas of certification. To gain certification, an individual candidate must fulfill the examination requirement, and must provide NICET with a record of work experience, a verification of performance and a personal recommendation.

The content of the certification exams associated with particular certification programs is based upon a job/task analysis (also called a practice analysis or role delineation study). The analysis is carried out as the first phase of development of a new program. A team of subject matter experts (SMEs) is convened to decide what tasks are appropriate to the area under discussion. This list of tasks is then compiled into a survey, with some demographic data also being requested, and distributed to the practitioners. They will respond with how often a task



is performed, how important the task is and what percentage of their time is devoted to performing the task. From this, the SMEs will decide on the content of the examination. Thus, the analysis produces a set of examination specifications, or an examination blueprint, for which a specified number of questions is written according to the data revealed by the job/task analysis.

QUESTION TOPICS

Each examination is divided into domains, or areas of practice, which delineate the topics on which examination questions are to be written. Three purposes are served by domain descriptions;

1. Firstly, they assure that the questions in each domain bank will cover the range of activities described in that topic area.
2. The process of writing descriptive knowledge, skills and abilities for each domain involves close scrutiny of the practical meaning of the area itself, which may lead to improvements in the descriptive copy.
3. Domains, by specifying areas for questioning, expedite and simplify the process of item writing.

Each domain will have descriptive copy that includes the tasks for that particular area, as well as the knowledge, skills and abilities a candidate must possess in order to perform tasks in a competent manner. Thus the content of questions is guided by the results of the job/task analysis.

The importance of each domain will also be assessed by the job/task analysis. For instance, if a particular task is considered to be very important but only performed rarely, it will have questions written reflecting this importance. Contrast this with a task that is of low importance, but often performed. Such an area will not have many questions assigned to it, reflecting its lack of relevance to the overall level of competency. An example of this is found in the job of the police. It is very important that he or she is capable of using firearms; yet it is devoutly to be wished that little firearms use is encountered. Instead, police are more often to be found writing tickets or documenting events; neither of which activity may be life threatening.

QUALITY QUESTIONS: A SUMMARY

A well-written question ...

- directly addresses the domain or practice area,
- requires, for solution, a thought process or knowledge appropriate to the nature and level of the work,
- is clearly written with unambiguous language
- can be readily understood and answered by the competent technician,
- is unlikely to be correctly answered by the technician who lacks competence at the job/task level specified,
- addresses important concepts or competencies and does not test trivia,
- is practical rather than theoretical,
- has only one correct answer, or key,
- has three incorrect answers, or distractors, which are plausible to technicians with borderline competency, yet which are clearly incorrect to competent technicians,



- has answers that are not distinguished from distractors by anything other than correctness
- avoids using “none of the above” or “all of the above” as possible answers,
- uses appropriately clear figures where needed,
- is not negatively phrased
- is grammatically correct
- is based on information readily available to all practitioners,
- avoids humor or attempts at humor
- does not use fake or made-up words as options, and
- is not offensive to any person or group due to religious, racial, or sexual content.

WRITING MULTIPLE-CHOICE QUESTIONS

The multiple-choice question, or item, has a particular structure. The question portion is called the stem; the stem presents the problem or asks the question. The answers are called options, with the correct answer being the key and the incorrect answers being the distractors. The form of the stem may vary; for instance, it may ask a question to which the options form the answers, or it may be an incomplete statement that is completed by the option selected.

In the examples given below, the correct response is the first one given; i.e., option 1 is the key. If this is not the case, the correct option or key is given. As a convention, when submitting test questions for approval, the correct answer, or key, is always presented first. This reduces ambiguity and then the NICET editor(s) will ensure that the correct responses are randomly distributed prior to the administration to the candidate pool.

Each item must be entire in and of itself. No item can depend directly upon another for its answer. Questions should be independent because they are testing the knowledge of a candidate; if one question cues another or several other questions, the extent of a candidate's knowledge may not be adequately tested. For instance, if a candidate answers one question and then uses that question as a cue to answer several others, has he or she demonstrated knowledge of one item or of several? If a candidate does not correctly respond to a question, can that candidate then respond correctly to the other linked questions? However, if candidates are given a comprehensive scenario, the scenario can be used as the sole basis for several different questions, as long as each question can still be answered independently.

Each question must have a recognized source. That is to say, questions based on proprietary practice, or questions based on memoranda or works that are not widely distributed should not be used. The object is to assess the competency of all practitioners with respect to a common core of knowledge and to allow their employer to introduce them to proprietary practices.

A-Z OF TEST ITEM CONSTRUCTION

The principles of test item construction follow; together with come illustrative poor examples and some better examples of questions.

- A. Each item should address only one concept and should be clearly and unambiguously phrased. Examinations for engineering technicians should test technical knowledge, vs. reading comprehension.

POOR EXAMPLE

Testing can contribute to an instructional program in many important ways. However, the main function of testing in teaching is to



1. measure outcomes.
2. sample content.
3. diagnose learning difficulties.
4. reward hard work.

BETTER EXAMPLE (without extraneous verbiage)

The main function of testing in teaching is to

1. measure outcomes.
2. sample content.
3. diagnose learning difficulties.
4. reward hard work.

- B. State the question positively and avoid negative wording if at all possible. When exceptions or negations are sought, the negative word(s) should be in all capital letters and boldface type so as to avoid confusing the candidate. NEVER use a double negative, i.e., a negative term in the stem allied with a negative term in the key.

POOR EXAMPLE

Which of the following is not a desirable practice when preparing multiple-choice questions?

1. Placing a blank near the beginning of the stem.
2. Stating the stem in positive form.
3. Using a stem that could function as a short-answer question.
4. Shortening the alternatives by lengthening the stem.

BETTER EXAMPLE (note the placement and font of negative word)

All of the following are desirable practices when preparing multiple-choice questions EXCEPT

1. Placing a blank near the beginning of the stem.
2. Stating the stem in positive form.
3. Using a stem that could function as a short-answer question.
4. Shortening the alternatives by lengthening the stem.

- C. Instead of placing a blank in the stem, use the sentence completion technique.

POOR EXAMPLE

A _____ system is defined as a sprinkler system with piping containing air that may or may not be under pressure.

1. dry-pipe
2. wet-pipe
3. pre-action
4. deluge



BETTER EXAMPLE

The sprinkler system with piping containing air that may or may not be under pressure is a

1. dry-pipe system.
2. wet-pipe system.
3. pre-action system.
4. deluge system.

- D. Ensure that all options are grammatically correct and logically consistent with the stem.
(Incidentally, use the spell checker to catch any mis-spelled words that might alter the meaning of a stem or option or might even lead to more than one correct answer).

POOR EXAMPLE

The recall of factual information can best be measured with a

1. short-answer question.
2. matching question.
3. essay question.
4. multiple-choice question.

BETTER EXAMPLE (note that option 3 now cannot be ruled out because it is not grammatically correct)

The recall of factual information can best be measured with a/an

1. short-answer question.
2. matching question.
3. essay question.
4. multiple-choice question.

- E. Put as much of the wording as possible in the stem, e.g., if all the options begin with the same word or words, these should be in the stem.

POOR EXAMPLE

A dashed line on a drawing represents

1. an edge that is hidden from view.
2. an edge that is of special character.
3. an edge that is removable.
4. an edge that will be removed later.

BETTER EXAMPLE

A dashed line on a drawing represents an edge that

1. is hidden from view.
2. is of special character.
3. is removable.
4. will be removed later.



- F. Avoid verbal cues that might enable candidates to either select the correct answer or eliminate incorrect alternatives.

POOR EXAMPLE

Which of the following would you consult first to locate research articles on achievement testing?

1. Review of Educational Research
2. Journal of Educational Psychology
3. Journal of Consulting Psychology
4. Journal of Educational Measurement

BETTER EXAMPLE

Which would you consult first to find articles on achievement testing?

1. Review of Educational Research
2. Journal of Educational Psychology
3. Journal of Consulting Psychology
4. Journal of Educational Methodology

- G. Avoid stating the correct option in lengthy, textbook language or stereotypical phraseology.

POOR EXAMPLE

According to OSHA, what is the responsibility of the employer as far as medical services and first-aid are concerned?

1. The employer shall insure availability of medical personnel and shall provide proper first-aid equipment and training in its use.
2. These are the employee's responsibility.
3. The employer must have a doctor on duty.
4. The employer must have a nurse on duty.

BETTER EXAMPLE

According to OSHA, what is the responsibility of the employer as far as medical services and first-aid are concerned?

1. The employer shall train personnel to use first-aid equipment.
2. These are solely the employee's responsibility.
3. The employer must have a medical doctor on duty.
4. The employer must have a nurse practitioner on duty.

- H. Avoid the use of overlapping options, or one incorrect option that may also include other options. By the same token, avoid using 'All of the above' as an option, since that is essentially an overlapping choice. A candidate may recognize that two of the options are correct, respond correctly with 'All of the above' without knowing why these two options are correct or recognizing that the third is also correct.



POOR EXAMPLE

In which of the following places is one LEAST likely to encounter a rattlesnake?

1. New Hampshire
2. The Gulf Coast states
3. Florida
4. Louisiana

BETTER EXAMPLE (eliminating option 2 which includes both options 3 and 4)

In which of the following places is one LEAST likely to encounter a rattlesnake?

1. New Hampshire
2. Florida
3. Louisiana
4. Alabama

- I. Avoid using “None of the above” as a response. In the example given below, a candidate might choose option 4, “None of the above”, because he or she knows that Richmond is the capital of Virginia, or because he or she knows in what states Kansas City, Annapolis and Rochester are located. In the latter case, he or she may not know the correct answer, or the city that is the capital of Virginia.

POOR EXAMPLE

What is the capital of Virginia?

1. Kansas City
2. Annapolis
3. Rochester
4. None of the above.

BETTER EXAMPLE

What is the capital of Virginia?

1. Richmond
2. Kansas City
3. Annapolis
4. Rochester

- J. Avoid needless complexity; as a matter of fact, avoid the following construction altogether. This construction takes up testing time by requiring the candidate to repeatedly refer to the question and the options in selecting the correct combination of responses.

POOR EXAMPLE

Which of the following is/are vegetable(s)?

1. Carrot



2. Peach
3. Lion
4. Mica

1. A
2. A, B, C
3. B, C, D
4. C, D, A

BETTER EXAMPLE

Which of the following is a vegetable?

1. Carrot
2. Peach
3. Lion
4. Mica

- K. Include enough information in the stem so that a knowledgeable candidate can answer the question before reading the options.

POOR EXAMPLE

Penicillin is

1. an antibiotic
2. a ramification
3. a fungus
4. a mold

BETTER EXAMPLE

Penicillin, one of the first agents discovered that battle bacterial infections, is commonly known as *a/an*

1. antibiotic
2. ramification
3. fungus
4. mold

- L. Avoid using the first person in questions. When asking what 'you' would do or should do, the candidate may well respond with a real life example of what he or she did in a similar situation, which may or may not have been the correct practice. It is however, the correct answer to "what did you do?"

POOR EXAMPLE

When performing a slump test, what should you do when a portion of the concrete shears off as you remove the cone?

1. Discard the sample and rerun the test.



2. Measure the side that did not shear.
3. Measure to the midpoint of the shear.
4. Measure to the highest point of the shear.

BETTER EXAMPLE

When performing a slump test, if a portion of the concrete shears off as the cone is removed, what should be done?

1. Discard the sample and rerun the test.
2. Measure the side that did not shear.
3. Measure to the midpoint of the shear.
4. Measure to the highest point of the shear.

- M. List numerical options in order, from the smallest to the largest. Try to use numbers that are of similar character and of quality. In the below poor example, the numbers are in no order, bear no relationship to the number of degrees in a right angle, and two have extraneous and different decimal characterization.

POOR EXAMPLE (key is option 4)

How many degrees are in a right angle?

1. 20
2. 30.5
3. 10.45
4. 90

BETTER EXAMPLE (key is option 3)

How many degrees are in a right angle?

1. 30
2. 60
3. 90
4. 180

- N. Ask only one question at a time. In the below Poor Example, there are two questions; one involving knowledge of conversion factors and one answering the question posed in the stem, without unit conversion. In the Better Example, the questions have been separated.

POOR EXAMPLE

What is the length of a twelve-foot long sidewall on a plan that is drawn to a quarter scale? Express the answer in inches.

1. 36 inches
2. 12 inches
3. 24 inches
4. 6 inches



BETTER EXAMPLE

What is the length of a twelve-foot long sidewall on a plan that is drawn to a quarter scale?

1. 3 feet
2. 6 feet
3. 12 feet
4. 18 feet

How many inches are in a quarter of a foot?

1. 3
2. 4
3. 6
4. 1

- O. Avoid questions with a differing number of options. Use the same number of options throughout. This will prevent a candidate from deciding that the correct option has not been used because there was a mistake in the test printing/presentation.
- P. Do not make up words to use as options; this may confuse an otherwise knowledgeable candidate who does not recognize the word and therefore is unable to determine that it is not the correct option.
- Q. Avoid humor at all costs. It may be funny to the question creator if he or she uses "(A) Jeremiah" as an option for a question on profit (prophet) ratio, but it degrades the level of professionalism of the certifying agency and belittles the candidate's level of knowledge.
- R. Avoid using absolute terms such as 'always', 'never', 'none' as these will trigger the test wise candidate's knowledge that the options are incorrect; likewise, the use of 'some', 'usually' or 'may' can trigger an incorrect response in an otherwise knowledgeable candidate.
- S. When using figures or drawings, ensure that they are clear and uncluttered and that the part of the drawing that is referenced in the question is clearly labeled as such.
- T. Avoid at all costs testing trivial information; if the concept isn't important to the practice, it should not be on the examination.

POOR EXAMPLE

What does OSHA stand for?

1. Occupational Safety and Health Administration
2. Organization of Southern Handicapped Athletes
3. Occupational Safety and Healthy Association
4. Organization of Sea Hardy Anemones.

BETTER EXAMPLE



According to OSHA, what is the responsibility of the employer as far as medical services and first-aid are concerned?

1. The employer shall train personnel to use first-aid equipment.
2. These are solely the employee's responsibility.
3. The employer must have a medical doctor on duty.
4. The employer must have a nurse practitioner on duty.

U. Make options parallel in meaning/situation/structure to avoid introducing a measure of ambiguity to the candidate.

POOR EXAMPLE

The television show "Seinfeld" was based in

1. New York
2. San Francisco
3. Milwaukee
4. the 1990's

BETTER EXAMPLE

The television show "Seinfeld" was based in

1. New York
2. San Francisco
3. Milwaukee
4. Chicago

V. Eschew obfuscation; in other words, don't use big words where you can just as easily use smaller, more familiar words. For example, "Tintinnabulation of vacillating pendulums in inverted, metallic, resonant cups" can (and should) be rephrased as "Jingle Bells". (also, see X, below)

W. Ensure questions are neutral and not biased toward any race and/or gender.

X. Ensure that the examination questions are written for the appropriate reading level; many certification exams are written to the high-school level (6-8th grade). This is to ensure that what the question is asking is clearly understood by all candidates, even those to whom English may not be a native language. (see V, above)

Y. Ensure that the content of all questions is readily available to the candidate base. Do not write questions based on individual company practice or on specific internal memoranda that can be known only to a very limited few. The answer to all questions should be easily found either in books, in industry newsletters, on web sites, in standards, codes or governmental regulations or other readily available sources.

Z. Test basic underlying constructs by including them in the content of the examination. For instance, don't ask straight mathematical questions; put them in context of the work that the typical candidate for certification may do.



POOR EXAMPLE:

One quart of floor paint will cover 250 square feet. How many quarts are required to paint the floor of a room measuring 25 feet x 50 feet?

1. 5
2. 10
3. 15
4. 20

BETTER EXAMPLE:

One fire alarm will provide detection for 250 square feet. How many fire alarms are required to provide coverage of a room measuring 25 feet x 50 feet?

1. 5
2. 10
3. 15
4. 20

APPENDIX A: BLOOM'S TAXONOMY VERB LIST

Following is a list of verbs tied to each level of Bloom's taxonomy: recall, understanding, application, analysis, synthesis and evaluation, where recall is the lowest level and evaluation is the highest level of knowledge. Recall is the level at which the game show Jeopardy is aimed: simple recall of facts does not indicate that those facts can be synthesized to produce a favorable or desirable result (for more information, see <http://www.teachervision.fen.com/teaching-methods/curriculum-planning/2171.html>)

<p>Knowledge - Recall the basic facts. The simple level of thinking</p>	<p>Tell, list, show, find, label, say, recite, check, locate, choose, select, name, identify, read, write, match, cite, count, define, draw, indicate, name, point, quote, recognize, record, relate, repeat, state, tabulate, and trace</p>
<p>Comprehension - Understanding the idea is the key</p>	<p>Translate, retell, define, interpret, outline, expand, reward, qualify, alter, change, spell-out, account for, associate, classify compare, compute, contrast, describe, differentiate, discuss, distinguish, explain, estimate, express, locate, interpolate, predict, report, and restate</p>
<p>Application - Using facts to find solutions to problems</p>	<p>Solve, adopt, use, try, relate, illustrate, diagram, construct, employ, report, interview, record, apply, calculate, complete, demonstrate, dramatize, employ, examine, illustrate, interpret, locate, interpolate, operate, order, predict, practice, relate, report, restate, review, schedule, sketch, solve, translate and utilize</p>
<p>Analysis - Examining parts in relationship to the whole</p>	<p>Break down, uncover, look in to, dissect, examine, take apart, classify, simplify, inspect, categorize compare, contrast, analyze, appraise, contract, criticize, debate, detect, diagram, differentiate, distinguish, experiment, infer, inspect, inventory, question, separate and summarize</p>
<p>Synthesis - Creating new or original ideas for products</p>	<p>Invent, compose, combine, reorganize, develop, blend, form, originate, reorder, produce, design, predict, arrange, assemble, collect, construct, create, generalize, integrate, manage, organize, plan, prepare, prescribe, propose and specify</p>
<p>Evaluation - Judging the value of ideas or products</p>	<p>Translate, debate, evaluate, grade, select, reject, determine, judge, criticize, recommend, rank, editorialize, appraise, assess, choose, critique, estimate, measure, rate, revise, score, and test</p>

APPENDIX B: Mystery Solved: Where Do Good Questions Come From?

Mystery Solved: Where Do Good Questions Come From?

By: David Foster, Ph.D. (April 2003)

Think of a test question as a product, like a disposable razor, but a lot more expensive and with more long-term impact on your life. The razor, made of plastic and metal, was molded, cut, sharpened, assembled, inspected, packaged, distributed and, finally, bought. You probably never thought much about the process that brought that razor to you, but that's because it's not all that important.

But a test question, that's different. It's important to you, at least at the moment you are trying to answer it correctly. And you probably try to understand it and evaluate it from the moment you see it until you move on to the next one.

Does a test question go through a development process similar to that of a razor, from raw material to useful product? How was the question originally written? Or better yet, why was it written? What reviews and changes did it go through? How many people like you actually read it and agreed that it should be on the test? These are great questions (no pun intended) and deserve to be answered.

First of all, a question can't be written until a job skill has been identified. For example, a job skill might be: The test-taker must be able to install a router. (Job skills are usually identified by interviewing experts through a process known as a job task analysis.) Once the skill is identified, one or more questions can be written with the goal of measuring the skill as well as possible.

An expert in the subject matter (SME) who also has some experience writing test questions is the first person to actually produce the first draft of the question, which may include graphics as well. Often the SME will get help from colleagues to make sure the question is accurate. All questions, but especially multiple-choice questions, require that the SME follow specific format rules for such questions.

After the initial authoring, the question, along with all the others produced, is sent to an editor. The editor is not an SME, but does understand the rules of language, style and the formatting of questions. The editor will fix the language and design problems with the sole goal of reducing ambiguity. For example, if the editor notices that, because of wording, two choices of a multiple-choice question are correct (when only one should be), he will rework one of them or alert the original SME to the problem. The result is a better question.

The question is returned to a group of SMEs who review each one for technical accuracy, representation and relevance. Does the question really measure the test objective? Is it an important question, measuring an important skill? Does the test "need" the question to be balanced across the content domain? Is the question accurate, including a correct answer? The question is usually changed (and may even be deleted) at this stage.

The question is returned to the editor again because changes produced during the technical review have added or changed text. The editor will fix any obvious errors introduced by the technical review.

When all questions have been refined in this way, they are subjected to an actual "field test" of their quality. In what is called a beta test, questions are answered by actual certification candidates in circumstances that mimic the motivation and environment of a real certification test. The beta test provides test results that are subjected to statistical analysis. The analysis will catch those questions that aren't performing properly. They are then removed from further consideration. Obviously, the question you see on the certification test survived the beta process.

Finally, the final set of questions is published as the actual certification exam. Before the test is released to any candidate, it goes through a series of quality assurance steps. While these steps are focused on the actual functioning of the test, the questions are reviewed once more.

APPENDIX B: Mystery Solved: Where Do Good Questions Come From?

These several steps make sure that each test question, while not perfect, is as good as it can be at measuring the identified job skill. With enough of these great questions, it is possible to produce a reliable and valuable test score that indicates whether a person should be certified or not.

David Foster, Ph.D., is a member of the International Test Commission and sits on several measurement industry boards.

Partial Bibliography:

American Board of Neuroscience Nursing. Test Item Writing Workbook. November 2001. Glenview, IL

Bloom's Taxonomy; from Teacher Vision website <http://www.teachervision.fen.com/teaching-methods/curriculum-planning/2171.html>

Burdette, Bruce. Guide for Technical Examination Committees. n.d. Southern Building Code Congress International, Birmingham, AL

Foster, David. Mystery Solved: Where do good questions come from? April 2003. Cert Mag, www.certmag.com

Cheung, Derek and Robert Bucat. How Can We Construct Good Multiple-Choice Items? Paper presented at the Science and Technology Education Conference, June 20-21, 2002. Hong Kong

Foster, David. Mystery Solved: Where do good questions come from? April 2003. Cert Mag, www.certmag.com

Gross, Leon J. Item Writers Manual; Preparing Examination Items. National Board of Examiners in Optometry, 1980.

Haladyna, Thomas. Writing Multiple-Choice Items, 2001. CAT*ASI, Evanston, IL.

Lauret, David T., ed. Item Writing Rules, Excerpted from Chapter 4 of Developing Certification Test Items, Fourth Edition, 2000. Galton Technologies, Inc., Orem, UT

National Board of Medical Examiners. Constructing Written Test Questions for the Basic and Clinical Sciences, 3rd edition, 2001. Philadelphia, PA

NICET. Multiple-Choice Work Element Examinations; Question Development Manual. 1995. Alexandria, VA

Appendix D-2

**PROCTOR GUIDELINES FOR ADMINISTERING
THE NICET EXAMINATIONS**



The purpose of this document is to set out for the Proctor general information regarding NICET testing.

Please read each section carefully.

Proctors are encouraged to read each section carefully, especially the sections on what the examinees need to be told in preparation for starting their examinations and what must be conveyed to them while they are taking their examinations.

NICET
1420 King Street
Alexandria, VA 22314
(888) 476-4238



NATIONAL INSTITUTE FOR CERTIFICATION IN ENGINEERING TECHNOLOGIES

**PROCTOR GUIDELINES FOR ADMINISTERING
THE NICET EXAMINATIONS**

www.nicet.org
888-476-4238

Table of Contents

I. INTRODUCTION	3
II. DUTIES AND QUALIFICATIONS OF STAFF	3
III. TEST SECURITY	4
IV. TEST CHARACTERISTICS	5
V. TEST ROOM REQUIREMENTS AND SEATING ARRANGEMENTS:	5
VI. EXAMINATION PACKAGE HANDLING:	6
VII. CANDIDATE ROSTERS:	6
VIII. CANDIDATE SIGN-IN:	7
IX. CANDIDATE LATE ARRIVALS:	8
X. EXAMINATION CHALLENGES:	8
XI. TEST DAY INSTRUCTIONS:	8
XII. RETURNING TEST MATERIALS:	10



I. INTRODUCTION

Examinations administered by NICET will fall into three categories as follows:

- 1) Work Element exams that support over 30 specialty certification programs for engineering technicians. The time required to complete these examinations varies from 30 minutes to 7 hours because the content of each exam is specified by the examinee. Thus, it is unlikely that there will be two exams in the test room that are identical. These exams are all open book.
- 2) Part A/B exams that are fixed time (3 hours), fixed content examinations supporting 8 broad based engineering technician certification programs. Normally an examinee sits for both parts on the same day (Part A in the morning and Part B in the afternoon), but some will sit for only one part (either Part A or B) in the morning. Each part is handled as a stand-alone test, thus the examinee is given an Examinee Envelope for the morning test and a second Examinee Envelope for the afternoon test. These exams are also open book.
- 3) Examinations for individuals seeking certifications offered by other certification agencies without a testing volume that warrants a multi-opportunity testing schedule like NICET's. Rules pertaining to how those exams must be administered will be included in a separate sheet bundled with each group's examinations..

II. DUTIES AND QUALIFICATIONS OF PROCTOR STAFF

Exam administration personnel must be individuals who will be viewed by others as unbiased (i.e., unlikely to provide an advantage for one or more examinees) and who are not currently participating or planning to participate as an examinee in a NICET certification process. Each person who is administering NICET examinations must have a signed Proctor Agreement on file with NICET prior to the test date. Exam administration personnel are not permitted to answer (directly or indirectly) questions from examinees that pertain to the subject matter being tested, but they can answer procedural questions about the testing facility and the examination process.

- 1) Test Site Supervisor's Responsibilities
 - a) Establish test dates.
 - b) Make arrangements/reservations for testing room(s) and setup. Ensure proper testing conditions in the rooms being used, i.e. at least 3 to 4 ft table space per examinee.
 - c) Seek NICET authorization prior to test date for additional proctors as needed; normally NICET authorizes 1 test proctor for every 25 examinees. Each test site supervisor is responsible for signing all honorarium forms.
 - d) Reschedule the date of test administration is necessary for extraordinary reasons (i.e. inclement weather) and contact all examinees telling them NICET will contact them with an alternate date.
 - e) Receive and secure test materials.
 - f) Deliver exam packages to test location and give to lead proctor for administration.
 - g) Collect testing materials from lead proctor after testing is completed.
 - h) Return ALL used and unused testing material to NICET. Make sure exam envelopes are in alphabetical order for return shipment to NICET.
 - i) Notify NICET 30 days in advance of any changes to testing location or conditions that may adversely affect candidate testing.
 - j) Notify NICET 90 days in advance of cancellation of this contract.
- 2) Test Site Lead Proctor and Assistant Proctor Responsibilities:



NATIONAL INSTITUTE FOR CERTIFICATION IN ENGINEERING TECHNOLOGIES

**PROCTOR GUIDELINES FOR ADMINISTERING
THE NICET EXAMINATIONS**

www.nicet.org
888-476-4238

- a) Establish a seating plan for the room(s) to be used for administration of the examinations.
- b) Receive and secure test materials from the Test Site Supervisor.
- c) Notify NICET immediately upon receipt of the Examination Package by calling 1-888-476-4238, ext 111 leaving a message with the staff member or the voice mailbox or email NICET at Test@nicet.org.
- d) Arrive punctually for all start, break and ending times as stated for administration of examinations.
- e) Ensure that each examinee signs in before distributing tests. Verify identity of applicants by photo identification and signature comparison.
- f) Administer tests on time and monitor candidates to prevent cheating, sharing of materials, talking, or other forms of collusion. Cell phones and pagers are not allowed inside the testing area, nor are palm pilots, computers, laptops and other alpha keypad devices. Calculators are authorized only if they have a self-contained power source and no alphanumeric keypad.
- g) Collect exams; making sure entire exam along with all instruction pages has been returned as well as answer sheet. Secure them. Do not allow any examinee to leave the room until you have checked their packet. Failure to not collect examinations could result in dismissal as a NICET Proctor and/or responsibility for development of a new examination.
- h) Return examinations to test site supervisor.
- i) If unable to administer the test as agreed, proctor must find a suitable replacement and must notify NICET of such change prior to the test date.
- j) Proctor is not permitted to answer policy questions during the examination process. Proctor may refer the testing candidates back to NICET for answers to any questions they might have.
- k) Advise NICET of a test room change and/or a need to change no later than 14 days before the scheduled test date. If this is not possible, contact each examinee using the time roster to advise them of the location change. Post notification outside the original location to redirect examinees.
- l) Select and orient any assisting proctors and familiarize them with NICET policies and procedures. There must be at least one proctor for each testing room or for every 25 examinees. Each assisting proctor must supply information requested on Assistant Proctor Agreement Form. No honorarium will be issued until this information is received. Administration responsibilities (a-k above and m below) applicable to the lead proctor are applicable to any Test Site Assistant Proctor.
- m) Advise NICET 90 days in advance of cancellation of this contract.

III. TEST SECURITY

Any proctor has the authority to dismiss any examinee from the testing room and confiscate all examination materials (including materials brought into the testing room by the examinee) due to improprieties such as impersonating the examinee of record, creating a disturbance, aiding another examinee, receiving help from another examinee, looking at another examinee's answer sheet, attempting to remove exam materials, or making notes about the test content. If any examinee becomes belligerent or threatening in any way, report these instances to NICET immediately by submitting a written explanation of the occurrence. Proctors may submit explanation either by email to test@nicet.org or by faxing to 703-682-2756 Attn: Mae Scott, Manager, Examination Services.

Divulging exam content to any other person in any manner is prohibited. Actions by NICET may include, but are not limited to, certification revocation, being barred from further testing and legal prosecution.

If there is reason to believe that the integrity of any NICET certification examination has been compromised, NICET may, at its discretion, require those involved to prove their innocence and then take a replacement examination before examination results are considered official.

Page 4 of 11

NICET © 2007 No Derivative Works. ☹ May be reproduced but do not alter, transform, or build upon this work.



IV. TEST CHARACTERISTICS

All NICET paper and pencil examinations are open book. Technical manuals, standards, and regulations are permitted, as are English grammar books, dictionaries and other generic reference materials. Technical papers and personal memoranda of a technical nature are also permitted, but must be bound in some manner. Calculators must have a self-contained power source and must be without an alphanumeric keyboard. Computers (laptops, palmtops, etc.) and other electronic devices that allow storage of alphanumeric data are **not** allowed. Each examinee must bring complete individual resources; **sharing is not permitted**. Answer sheets must be marked with a #2 pencil.

V. TEST ROOM REQUIREMENTS AND SEATING ARRANGEMENTS:

The following are recommendations for creating a comfortable and positive testing environment.

- 1) Several days before the administration, check with the custodial staff to ensure that the rooms will be heated or cooled properly, that the lights are all working, and that the general conditions are satisfactory.
- 2) Testing rooms should be away from noisy areas or activities such as athletic events, band practice, commencement exercises, construction work, heavy traffic, etc.
- 3) Testing rooms should be appropriately heated or cooled and adequately ventilated.
- 4) Lighting should enable all examinees to read the test questions and mark their answer sheets in comfort.

Proctors should take into account that these open-book examinations call for substantially more testing space and surface than does a standard closed-book examination. The surface area per examinee should be at least 3 ft by 4 ft wide and must also accommodate a calculator, answer sheets, and an examination booklet.

Seating arrangements may be complicated by the different examinee completion times. Completion time for each examinee (NICET and special contract groups) will be furnished by NICET on one of the provided rosters. It is recommended that seating arrangements be such that those finishing earliest be seated closest to the proctor's station, with that station located adjacent to the test room exit. Remaining examinees should then be seated away from the proctor's station in ascending order of exam time length. This will allow examinees to leave with the least distraction for those still working. Additionally, examinees must be sufficiently separated from each other so that their actions will not disturb adjacent examinees and will discourage "roving eyes".

Considerations when seating examinees are:

- 1) To limit disruption caused by late arrivals, reserve the row nearest the room entrance for their seating.
- 2) Disperse examinees who are taking the same exams.
- 3) Disperse, as much as possible, examinees who work together.
- 4) Reserve a remote location for an examinee whose disability requires special accommodations. If more than one test room must be used, the completion time seating order may still be appropriate with the "early" finishers in one room and "late" finishers in another room.



VI. EXAMINATION PACKAGE HANDLING:

Approximately 5 to 7 business days prior to the test date, the Test Site Supervisor should receive the Examination Package (envelope, box or several boxes). **It should be opened immediately and checked for the following contents to allow NICET to ship replacements for missing or damaged items:**

- 1) **Proctor's Envelope:** This envelope will be unsealed and will contain the following:
 - a) These Guidelines.
 - b) Proctor Expense Form
 - c) Return Fed-Ex Bill
 - d) Proctor Inventory Form
 - e) Returning Test Materials instruction, explaining how to arrange for shipment of the test materials back to NICET.
 - f) Two different NICET examinee rosters – one in name order and one in completion time order; the Examinee Sign In Roster and Examinee Finish Time Sequence (Seating) List, respectively. For further information, see Section VII.
 - g) A supply of NICET answer sheets – each examinee is to be given one sheet at time of sign-in. Examinees who have more than 240 test questions will need a 2nd answer sheet.
 - h) Extra NICET scratch paper and challenge forms for emergency use.
 - i) Chip Boards – to be used in binding the completed answer sheets to ensure they are returned to NICET in good condition for subsequent machine scoring.
 - j) A special contract examinee roster if applicable for each special contract organization exam.

Proctor Envelope: DO NOT destroy; use it to return the completed answer sheets, rosters and all extra material to NICET. Place these materials between the two chipboards provided. Seal the envelope and enclose in the package used to return all exam materials to NICET.

- 2) **Examinee Envelopes:** These remain sealed until opened by the examinee. The Lead Proctor should check against each Sign-In Roster to ensure that there is an examination envelope for each rostered examinee. When packing the boxes for shipment back to NICET make sure all exam envelopes are in alphabetical order.

Notify NICET immediately upon receipt of the Examination Package by calling 1-888-476-4238, ext 111, leaving a message with the staff member or in their voice mailbox or email NICET at Test@nicet.org. Verify that the package was received and complete. If there are missing items, leave a message, including name, phone number, testing location and identify any items missing from the list above. NICET will ship replacements within 1 business day via overnight shipment.

VII. CANDIDATE ROSTERS:

The Proctor's Envelope (see Section VI) will contain at least two rosters for NICET examinees and a roster for any non-NICET examinees. One roster lists the names of the examinees in alphabetical order and is designed for use as the Sign-in Roster. The second roster lists the names of the examinees in ascending order of examination length and thus, their exam completion time. The latter is designed to facilitate development of the seating plan and provides a checklist of completion times for ease of exam administration. Proctors must check each type of roster to examination packets for each individual listed have been received.

The completion times shown on the second roster reflect specified start and end times and are calculated from the **Start Time** carried in the NICET computer. If a later start time must be used, adjustments to the completion times shown on the roster must be made. A one-hour lunch break beginning 3 hours after the **Start Time** is also reflected in the shown completion times. Each examinee is notified of their completion time, which is listed on the first page of their examination. If there are



NATIONAL INSTITUTE FOR CERTIFICATION IN ENGINEERING TECHNOLOGIES

**PROCTOR GUIDELINES FOR ADMINISTERING
THE NICET EXAMINATIONS**

www.nicet.org
888-476-4238

any differences between the completion times shown on your roster and those shown on the examinee's test booklet, the one shown on the booklet will be considered as the "official" completion time.

Please note: Maximum exam completion time is 420 minutes - unless other arrangements have been made by NICET.

If the roster shows a completion time of 5 hours or less after the **Start Time**, the Chief Proctor has the option of not breaking for lunch if all the affected examinees desire to do so. If it is unanimously decided (no subtle coercion allowed) that there will not be a lunch break, then each affected completion time should be decreased by one hour. A lunch break must be provided as scheduled by NICET when one or more completion times exceed 5 hours after the **Start Time**.

VIII. CANDIDATE SIGN-IN:

All examinees must sign in.

Examinees have been instructed to report to the test site one-half hour in advance of the exam Start Time. Each examinee must sign the roster and must present some form of photo identification if he or she is not known to you, preferably a driver's license or employer badge and the confirmation notice received from NICET. **If examinee does not have proper photo identification - he or she should not be allowed to test.** If the applicant does not have the confirmation notice, he or she should not be excluded from testing if they have a photo I.D.

Proctors must check all materials each examinee brings into the test room (see Allowed and Disallowed Materials lists below) – since the examinations are open book (the exceptions are the non NICET examinations). After testing has started, no additional material may be brought into the room.

Allowed Materials:

- 1) Technical books and manuals, standards, and other publications are permitted, as are dictionaries and English grammar books, general math and science reference books.
- 2) Technical papers and personal memoranda of a technical nature are permitted only if contained in a binder of some sort, such as a 3-ring binder.
- 3) Calculators of all types with a self-contained power source and no alpha/numeric keypad are permitted.

Disallowed Materials:

- 1) Loose papers are NOT permitted because they are difficult to control, are prone to move about and retrieving them from odd locations disturbs other examinees.
- 2) Computers such as palmtops, notebooks, laptops, portable and desktops are NOT permitted since all calculations can be handled manually or with a calculator.
- 3) Pagers and cell phones are NOT permitted during the exam and should not be brought into the testing room. Proctors are asked to pay particular attention to camera phones as they can be used to copy exam material.

When the examinee meets the admittance requirements, allow him/her to take their **sealed Examinee Envelope** plus one answer sheet and proceed to their assigned seat. All other Non NICET exams are pre-packaged with their own answer sheets. **Examinee Envelopes must remain sealed until opening instructions are given.**

Allow sufficient time for all examinees to enter the required preliminary information on their answer sheets (name, social security number and exam number). Warn examinees that failure to fully blacken in the circles could result in misscoring and a lengthy delay in receiving correct score results. Advise examinees on the challenge process (Section X). Instruct examinee's to remove the Special Instructions from their exam packet and read thoroughly.



IX. CANDIDATE LATE ARRIVALS:

Admission of slightly late arrivals is authorized, but NO examinee (regardless of length of exam or “special” circumstances) is to be allowed to test if their time of arrival at the test room exceeds 60 minutes after the Start time given in the person’s confirmation notice.

Explain to the late arrival that admittance is with the understanding that he/she must cease work at the scheduled completion time for his/her exam. If the examinee accepts the time constraint and the possible negative consequences, he/she must state such in writing on the sign-in roster along with his/her signature. The time compression, although important, may not prevent a successful end result because the NICET time allowance tends to be generous, and judicious selection of questions to answer can influence the scoring in a positive manner. (Examinees who have tested previously will probably feel comfortable with determining these risks.)

If a late arrival person wishes to proceed, quietly discuss all of the test instructions with him/her and then direct the examinee to begin testing upon taking the assigned seat.

X. EXAMINATION CHALLENGES:

Examination questions that an examinee cannot answer due to a missing figure, unreadable text, questions using standards that are not listed on NICET’s document titled “Standard Editions Referenced in Fire Protection Exams”, etc. - SHOULD BE CHALLENGED. A successful challenge may result in a correct answer credit for the question or the deletion of the question from scoring, thus it is poor test management to avoid filling out a challenge form. Time spent on writing a challenge is more likely to be productive than time spent on a question for which identifying the correct answer is not possible. Challenging a question, simply because the examinee cannot identify the correct answer or because they disagree with all of the answer options, and/or there is a new industry standard in place does not make the testing question obsolete or incorrect.

All challenges should be placed on the challenge sheets (starting on page 4 of the special instructions for testing). Each challenge sheet has a space available for the examinee to fill in name and exam number. Failure to do so may result in a challenge not being reviewed. Proctors may provide additional pages from the proctor’s packet.

XI. TEST DAY INSTRUCTIONS:

About fifteen (15) minutes before the scheduled Start Time, instruct the examinees to open their Examinee Envelope and:

- 1) Remove their Special Instructions from the envelope. Each examinee should read these instructions before removing the exam packet. They should have at least two booklets, one the exam itself and an instruction booklet. After thoroughly reading their instructions, they then should remove their exam packet and sign and date the front page.
- 2) Ask examinees to verify the presence of all the test materials listed on the special instruction sheet. Have examinees write their name and exam number on the appropriate pages within the instruction booklet – ESPECIALLY if they are submitting challenges. Failure to do so may result in a challenge not being reviewed.
- 3) If a NICET examination exceeds 240 questions, the examinee will need to request a second answer sheet. If missing items can be supplied from the “extras” provided in the Proctor Envelope, do so now. Otherwise proctor should inform the examinees that he or she will return after testing is underway to solve the problem.
- 4) Have examinees carefully read the special instructions that are in their Examinee Envelope.
- 5) Read aloud the following rules which will apply while testing is in process:
 - a) Pagers, beepers and cell phones OF ALL TYPES are not permitted in the testing room!



NATIONAL INSTITUTE FOR CERTIFICATION IN ENGINEERING TECHNOLOGIES

**PROCTOR GUIDELINES FOR ADMINISTERING
THE NICET EXAMINATIONS**

www.nicet.org
888-476-4238

- b) Computers, such as palmtop, notebook, laptop, portable and desktop are NOT permitted in the testing room.
 - c) Calculators are permitted, however they must have their own power source and MAY NOT contain an alphanumeric keypad.
 - d) Permission to use the restrooms will be limited to one person at a time.
 - e) Permission for a short smoking break or to get a drink from the water fountain will be limited to one person at a time and must be coordinated with restroom use.
 - f) Examination materials, specifically test questions, are NOT to be copied in any manner or removed from testing room.
 - g) If a question cannot be answered as you wish to answer it because you are certain that the question itself contains a factual error, the correct answer is not an available answer option, additional information is needed, etc.; please complete a “challenge” for that test question. The challenge must state your rationale for the challenge and provide all relevant information to prove that an error is present. A challenge should also be made if the applicant believes he did not receive all testing items as requested. When the exams are returned to NICET, those without challenges are destroyed.
 - h) Answer sheets must be carefully and completely filled out to receive credit. Automated optical scanning is used and improper markings will cause misreading which will result in recording errors that may include posting test scores to the test history of another examinee. Thoroughly blacken the cell representing the answer chosen and correctly recognize the question number pattern on the answer sheet. The NICET answer sheet has a pattern that uses half-page zones and within each zone, the question numbers increase from top to bottom in columns that move from left to right.
 - i) When returning your test materials, leave the instructions, answer sheet and exam outside of your envelope for proctor verification.
- 6) At 8:30 am or the otherwise designated Start Time, upon determining that the examinees are ready to start taking their exams, announce the start of the morning 3-hour session.

If any examinee present has a hearing disability, please make sure the examinee has a copy of these instructions and is given extra time to read through all instructions prior to the start of testing. You will be notified by NICET prior to the examination date if anyone meets these criteria.

While Testing Is In Progress (Morning)

Throughout the morning, periodically display the clock time and the elapsed time from the actual Start Time on a chalkboard or a flip chart. Thirty-minute intervals should suffice. Properly store extra and completed examination packet and supplemental materials during the exam session, especially examination packages for no shows. Random checks of examinees reference materials are strongly suggested to ensure that examinees have not removed any of their test material and/or they have not copied examination questions themselves.

If the actual Start Time is other than the start time NICET used to calculate the completion times on the time roster, announce the new completion times for each person and correct the computer printed completion times on the printed roster.

Lunch Break

About five (5) minutes before the lunch break, advise examinees that you will be instructing them to cease work at the 3-hour elapsed time mark. After you issue the cease work announcement, inform the examinees that:

- 1) They must leave all test materials at their testing position with their exam face down on top of their answer sheet.



NATIONAL INSTITUTE FOR CERTIFICATION IN ENGINEERING TECHNOLOGIES

**PROCTOR GUIDELINES FOR ADMINISTERING
THE NICET EXAMINATIONS**

www.nicet.org
888-476-4238

- 2) They are not to discuss test questions or solution details of their exam with other examinees.
- 3) They are to return to the testing room in fifty (50) minutes.
- 4) The testing room will be off-limits during the lunch break.
- 5) At five (5) minutes before the scheduled Resume Time, you will open the test room and they can return to the positions they were at prior to the lunch break. (No position changes are allowed except for compelling reasons).
- 6) Those taking a timed 3-hour exam (NICET Part A or B, special contract exam, etc.) must turn in their test materials now.

Prior to Start Announcement (Afternoon)

Remind Examinees that the afternoon rules and procedures are unchanged from those of the morning session.

If any examinees are scheduled for the NICET Part B exam, distribute those Examinee Envelopes at this time and provide each examinee with a new (second) NICET answer sheet.

While Testing is in Progress (Afternoon)

Throughout the afternoon continue with displaying the clock time and the elapsed time from the actual Start Time.

When the 420-minute (7 hours) elapsed time is reached, require all remaining examinees to cease work.

At End of Testing

Whenever an examinee completes his/her testing, collect from that person all the items that were originally in the Examinee Envelope. All scratch paper that was provided in the exam packet and any provided by the examinee is included in this requirement. The only exception is NICET answer sheets, which are to be presented outside of the Examinee Envelope. They will be packaged separately for the return to NICET.

(THIS DOES NOT INCLUDE SPECIAL CONTRACT TESTING GROUPS). Verify that the examinee has bubbled in the areas for their name, social security number and examination number. Place all answer sheets in alphabetical order between the chipboards provided. Double check that the examinee has signed and dated the front page of the examination. Verify that there is an examinee envelope for each person on the roster (no shows included) and verify that all answer sheets are accounted for. Insure that all challenge forms are noted and each examinee submitting a challenge has written their name and exam number on the appropriate pages. Write the word challenge on the outside of each examinee envelope. Before closing boxes for shipment make sure all envelopes are in alphabetical order. Seal shipping box and call for FedEx pickup (see Section XII).

XII. RETURNING TEST MATERIALS:

Upon completion of the exam a pickup must be scheduled with Federal Express for the next business day.

Package the materials as follows:

- 1) All answer sheets should be in alpha order. Ensure that each examinee has bubbled in the spaces for their name, social security number and exam numbers. Then place answer sheets between the chipboards that are provided and place packet in the Proctor's Envelope.



NATIONAL INSTITUTE FOR CERTIFICATION IN ENGINEERING TECHNOLOGIES

**PROCTOR GUIDELINES FOR ADMINISTERING
THE NICET EXAMINATIONS**

www.nicet.org
888-476-4238

- 2) Proctor Honorarium, Proctor Inventory forms and exam roster should be placed on top of chipboards containing examinee answer sheets and placed in the proctor's envelope.
- 3) All extra challenge forms and scratch paper should be placed back into the proctor's envelope.
- 4) Completed challenges should be left in their examination package and not bundled with the answer sheets.
- 5) Exams should be placed back into their individual envelopes - after checking that there are two documents for each examinee, the instructions and the exam itself. Examination envelopes should be placed in alphabetical order in the container provided for shipment. Answer sheets should be placed in the chipboards provided.
- 6) All materials should be placed back into the container that they were shipped in, and sealed. Packages should be marked "return to sender 3-day express saver" and returned to NICET.

PLEASE NOTE: Failure to return the test materials as listed above may result in penalties.

NICET thanks you for Proctoring!

APPENDIX E

**Airfield HMA Placement Operations Inspection and Field
Testing—Technician Certification
Draft Program Detail Manual**

APPENDIX E
Airfield HMA Placement Operations Inspection
and Field Testing—Technician Certification
Draft Program Detail Manual

Introduction

A Program Detail Manual serves as a handbook to the certification candidate. It includes and explains all of the aspects of the examination and certification processes, as well as the requirements for a specific program. This Draft Program Detail Manual was developed as part of Task 6 of this project to provide an indication of the content and format of the manual. It references the “National Institute for Certification in Hot Mix Asphalt (NICHMA) and the National Society for Airport Engineering, which are both fictitious organizations.

**NATIONAL INSTITUTE FOR CERTIFICATION IN HOT MIX ASPHALT®
(NICHMA)**

sponsored by

The National Society for Airport Engineering
(NSAE)



DRAFT

PROGRAM DETAIL MANUAL

**Airfield HMA Placement Operations Inspection
and
Field Testing Technician**

Please check the Institute's web site (www.nichma.org) to make sure you have the most recent edition of this document. Effective upon issuing a new edition, all previous editions become obsolete. This manual may be freely copied in its entirety.

First Edition
April 2008

Airfield Hot Mix Asphalt (HMA) Placement Operations Inspection and Field Testing

Table of Contents

General Information and Program Description	1
Program Development.....	1
Technician Profile.....	2
The Practice Analysis.....	3
Level I	4
Level II	6
Level III.....	9
Level IV	13
Certification Requirements (Summary Outline).....	16
The Exam	17
The Exam Blue Print	17
The Exam Questions	18
Training	19
Program References.....	19
Sample Score Reports	21
Work Experience Requirements	22
Performance Verification Requirements.....	22
Personal Recommendation (Levels III and IV only).....	22
Major Project Write-up Requirements and Guidelines (Level IV only)	23
Application Procedures and Timeline.....	24
Test Date and Location	
Candidate Evaluation and Certification	
Conditional Decision Status	
Recertification.....	25
Certification Cycle	
Application Process	
Accumulating the Continued Professional Development (CPD) Points	
Display of Certification Status / Representation of Qualifications.....	26
Use of the NICHMA Certification Mark	
Complaints Against Applicants and Certificants	
Certification Process Irregularities	
Schedule of Fees Related to Certification	27
Application Forms	
Code of Ethics/Condition of Application	28
General Application Package	30
Program Application Package.....	36

General Information

This Program Detail Manual contains the certification criteria for Airfield Hot Mix Asphalt (HMA) Placement Operations Inspection and Field Testing Technicians.

Policies, procedures, rules and forms referenced in this manual can be found on the Institute's web site (www.nichma.org).

**National Institute for Certification in Hot Mix Asphalt
(NICHMA)
100 Main Street, Alexandria VA 22314**

Program Description

The purpose of this program is to recognize the professionalism of qualified technicians and provide a way for others to distinguish those technicians who have demonstrated job knowledge and work experience. The program is also a valuable tool for training program design and technician competency evaluation.

This testing and certification program is designed for technicians engaged specifically in field testing and inspection of hot mix asphalt materials used in airfield construction. Knowledge of engineering properties of construction materials used in asphalt runway, taxiway, roads, and related civil engineering projects and knowledge of related testing, inspection, construction specifications, standards, processes, methods, equipment and materials is required.

This certification does not entitle the certificant to practice engineering. The practice of engineering is defined and regulated by state engineering licensing boards; unlawful practice of engineering is a violation of state laws. When not exempted by state law, the performance of work by the engineering technician or technologist which constitutes the practice of engineering must be under the direct supervision and control of a licensed professional engineer.

Program Development

Through a practice analysis, a national panel of subject matter experts identified the typical job tasks of an Airfield Hot Mix Asphalt (HMA) Placement Operations Inspection and Field Testing Technician. The NICHMA then surveyed practitioners nationwide to validate the practice analysis and determine how much coverage each task should receive on the written exam. With the feedback, the development committee created a test blueprint, and additional committees of subject matter experts were assembled to write and review the program's test questions. The test questions were then beta tested and then psychometrically analyzed to ensure a fair, accurate exam that is targeted to the appropriate level of competency.

Technician Profile

The technician profile on the following page is a brief description of the work and career path of the Airfield Hot Mix Asphalt (HMA) Placement Operations Inspection and Field Testing Technician. It identifies minimum education requirements, work experience requirements, levels of responsibility, typical activities and typical job titles for the subject technicians through their progression in a career path from entry level through senior level.

Technician Profile

Airfield Hot Mix Asphalt (HMA) Placement Operations Inspection and Field Testing

	Level I	Level II	Level III	Level IV
Education	No formal education requirement. Program content at Level II and above assumes knowledge and skills based on work and/or educational experiences (college, self-study, correspondence courses, workshops, or field assignments, etc.) that develop knowledge equivalent to courses in construction or civil engineering technology or a closely related Associate Degree program coupled with internships.			
Minimum Work Experience	Six months minimum work experience in asphalt field testing and inspection.	Minimum of 24 months, of which at least 12 months must involve asphalt field testing and inspection activities. The balance may be in related pavement activities or other related QA/QC construction activities.	Five years experience. At least 36 (3 years) of these months must involve asphalt construction, testing and/or inspection as the primary activity, to include 18 months of airfield (FAA, DOD) experience. The balance may be in related state DOT QA/QC activities or other related specialties such as construction inspection.	Level III work experience plus 60 additional months of asphalt airfield QA/QC experience involving a broad range of complexity and diversity.
Level of Responsibility and Typical Activities	Performs simple, repetitive, specific tasks, measurements and computations. Document findings.	Performs common field acceptance tests. Monitor asphalt construction procedures. Prepare test reports. Read specs and drawings.	Conduct common and specialized tests. Monitor common and unique airfield asphalt construction procedures. Interpret specifications and drawings. Read and evaluate lab tests. Verify locations and quantities. Maintain records. Offer recommendations.	Manage airfield pavement project(s), oversee specialized airfield asphalt tests and complex construction procedures. Interact with project engineer/manager. Recommend corrective actions. Evaluate constructability issues.
Typical Job Titles	Field Technician I Inspector I Engineering Aide I Assistant Inspector	Field Technician II QA/QC Technician Engineering Aide II Associate Inspector	Field Technician III Senior Technician/Inspector III Senior QA/QC Technician Inspector	Chief Technician Lab/Field Inspector IV Senior Inspector

The Practice Analysis:

The practice analysis, as identified by the program's development committee and validated by a national group of practitioners in the subject field, serves as an outline of exam content. Job tasks and their required knowledge and skills are assigned to domains (larger areas of responsibility).

The domains for the Airfield Hot Mix Asphalt (HMA) Placement Operations Inspection and Field Testing Technician certification program are:

- **Inspection of Airfield HMA Placement Operations**
- **Field Testing of Airfield HMA Pavement**
- **HMA Mixture Characteristics**
- **Troubleshooting**
- **Care and Maintenance of Testing and Inspection Equipment**
- **Worksite Safety/Security**
- **Management**
- **Training**

The following pages contain the practice analysis for each of the four levels of certification.

Practice Analysis
Airfield Hot Mix Asphalt (HMA) Placement Operations Inspection and Field Testing
Level I

Inspection of Airfield HMA Placement Operations

Measure Temperature of HMA

Knowledge:

- Types of thermometers required
- Infrared gun operation

Skills:

- Place thermometer as required and determine temperature of HMA
- Operate infrared gun to determine temperature of HMA
- Record and report temperature measurements as required

Measure Thickness of Loose or Compacted HMA

Knowledge:

- ASTM D3549
- HMA Paving Handbook 2000 (Chapter 15)
- Standard agency specifications

Skills:

- Safely measure thickness of HMA with probes
- Record and report thickness measurement as required

Field Testing of Airfield HMA Pavement

Perform Sampling and Handling of Loose HMA

Knowledge:

- ASTM D979
- Standard agency specifications
- Sampling equipment and tools

Skills:

- Properly handle loose HMA mixtures
- Use proper tools to acquire a representative sample of HMA as required
- Complete sample identification information

Perform Smoothness Testing Using Straight Edge

Knowledge:

- FAA P401
- Standard agency specifications

Skills:

- Identify required equipment and tools
- Manually move straight edge across pavement
- Read, record and report measurements

***Perform Nuclear Density Testing**

Knowledge:

- ASTM D2950
- Nuclear safety certification
- Manufacturer's recommendations

Skills:

- Calibrate equipment
- Operate machine to perform test procedure as required
- Calculate, record and report HMA layer density and percent compaction

***Perform Sampling and Handling of Compacted HMA Samples**

Knowledge:

- ASTM D979
- ASTM D5361

(Level I, continued)

Skills:

- Use coring machine
- Transport and handle core.
- Properly extract cores
- Fill core holes

HMA Mixture Characteristics

Demonstrate Awareness of Good Mix Properties

Knowledge:

- Required specifications
- Mixture coating characteristics
- Aggregate grading and segregation problems
- Mixture production, paving and compaction temperature requirements

Skills:

- Visually monitor mixture uniformity and consistency
- Identify segregation problems
- Monitor temperature uniformity and compliance.
- Record and report findings

Troubleshooting

***Demonstrate Awareness of Existence of Basic Anomalies**

Knowledge:

- HMA Pavement Handbook
- Agency-specific specifications

Skills:

- Understand pass/ fail criteria of testing methods
- Report results to supervisor

Care and Maintenance of Testing and Inspection Equipment

***Properly Use and Maintain Sampling and Testing Equipment**

Knowledge:

- Sampling and testing equipment and tools as identified for Level I
- Manufacturer's handling and maintenance recommendations

Skills:

- Handle, operate, store and maintain equipment in accordance with manufacturer's recommendations
- Report equipment and tool malfunctions as required

Worksite Safety\Security

***Follow Safe Practices/Safety and Security Plan and Report Unsafe Practices on the Job Site**

Knowledge:

- Airport safety and security regulations
- Basic individual safety practices
- Company safety regulations
- Basic first aid

Skills:

- Follow company safety and security procedures
- Follow site safety practices
- Practice personal safety
- Recognize and report individual safety violation
- Administer basic first aid

*NOTE: Knowledge will include "The Best Practices Manual for HMA airport construction," currently under development for the FAA.

Practice Analysis
Airfield Hot Mix Asphalt (HMA) Placement Operations Inspection and Field Testing
Level II

Inspection of Airfield HMA Placement Operations

***Inspect the Haul Vehicle Operation**

Knowledge:

- HMA Paving Handbook 2000 (Chapter 13)
- Asphalt Institute MS-22

Skills:

- Inspect vehicle to assure proper cover of load for transport
- Make sure the truck bed is clean/cleaned and free from detrimental materials
- Assure proper truck loading operation

***Inspect Tack Coat Application**

Knowledge:

- HMA Paving Handbook 2000 (Chapter 14)
- ASTM D2995
- ASTM D140
- Asphalt Institute MS-22
- FAA P603

Skills:

- Determine tack coat application rate (e.g. gallons to surface area).
- Verify cleanliness of sub-surface
- Examine tack coat application to assure uniformity and consistency
- Determine compliance of tack coat material with temperature requirements

Inspect Surface Preparation

Knowledge:

- HMA Paving Handbook 2000 (Chapter 14)
- Asphalt Institute MS-17, MS-22
- Project specifications

Skills:

- Verify grade and compaction requirements and compliance
- Verify cleanliness of sub-surface
- Make sure surface is dry
- Verify sub-grade is dry and not frozen
- Assure compliance with temperature requirements

***Inspect the Paver Operation**

Knowledge:

- HMA Paving Handbook 2000 (Chapters 15 and 16)
- FHWA / NHI course 131032 (Tab 12)
- Asphalt Institute MS-22

Skills:

- Observe and monitor truck and paver interaction
- Synchronize truck delivery with paver and paving train operations
- Inspect screed width to determine compliance with paving plan

***Monitor Compactor Operation and Roller Pattern**

Knowledge:

- HMA Paving Handbook 2000 (Chapter 18)
- Basic understanding of different roller types and functions
- Asphalt Institute MS-22

Skills:

- Determine the relationship between rolling and density/compaction in paving operations
- Assess the effect of temperature of the mat on roller pattern and sequence
- Identify the difference between static and vibratory rolling

(Level II, continued)

Field Testing of Airfield HMA Pavement

***Measure and Collect Random Samples and Perform Tests**

Knowledge:

- ASTM D3665
- Sampling frequency
- Standard agency specifications

Skills:

- Read plans to determine sampling and/or testing location
- Find locations on project site
- Read survey stake
- Measure offsets
- Apply Lot definitions to paving.
- Verify testing frequency

***Inspect Longitudinal and Transverse Joint Construction**

Knowledge:

- HMA Paving Handbook 2000 (Chapters 17)
- Asphalt Institute MS-22
- NHI course I31032 on HMA construction

Skills:

- Inspect joint cut back and preparation using cutting wheel where specified
- Verify proper tacking
- Assess proper joint compaction and finishing
- Verify surface compliance with straight edge
- Assure compliance of joint offsets for multiple lifts

***Determine Correlation Based on Nuclear Gauge and Core Densities**

Knowledge:

- ASTM D2950

Skills:

- Evaluate mixture lab densities
- Determine and apply correction factor to compaction results for paving mix types
- Calculate corrected mat compaction and determine compliance with specifications

***Measure Smoothness Using Profilograph**

Knowledge:

- Manufacturer's operations manual
- ASTM E1274

Skills:

- Assemble (and disassemble) and operate equipment as required
- Calibrate profilograph
- Understand required measurements (blanking band)
- Calculate smoothness
- Read charts
- Synchronize longitudinal measurements
- Record and report results

HMA Mixture Characteristics

Demonstrate Awareness of Basic HMA Mix Design Procedures

Knowledge:

- Marshall Mix Design
- Superpave Mix Design
- FAA P401

Skills:

- Understand approved mix design properties
- Explain mix design specification requirements

(Level II, continued)

Troubleshooting

***Report Anomalies and Non-Conformance to Specification on Level I and Level II Tasks**

Knowledge:

- HMA Pavement Handbook
- Agency-specific specs

Skills:

- Differentiate between pass and fail test results
- Recognize noncompliance to construction specification requirements
- Verify results and/or the need for re-testing
- Recommend corrective action to supervisor

Care and Maintenance of Testing and Inspection Equipment

***Inspect and Maintain Sampling and Testing Equipment**

Knowledge:

- Types of equipment, instruments and tools
- Manufacturer's recommendations
- Operation and maintenance processes

Skills:

- Operate and maintain equipment in accordance with manufacturer's recommendations
- Verify proper equipment storage
- Document and report malfunction

Worksite Safety\Security

Identify and Address Basic Safety and Security Concerns

Knowledge

- OSHA, Federal, state and regional requirements (OSHA 10-hour training program or equivalent knowledge)
- Environmental concerns
- Security requirements
- Safety plan
- Incident management system

Skills:

- Recognize and report individual safety violation
- Follow appropriate safety and security regulations
- Oversee personal safety and the safety of lower level employees
- Report safety violations for self and lower level employees to proper authority

Training

***Provide On-the-Job Training for Level I Technicians in Testing, Inspection, Safety and Job Responsibilities**

Knowledge:

- Inspection and testing procedures
- Test equipment, instruments and tools
- Reporting requirements
- Training methods
- Safety requirements

Skills:

- Practice clear verbal communication
- Mentor trainees as required
- Document Level I training activities

*NOTE: Knowledge will include "The Best Practices Manual for HMA airport construction", currently under development for the FAA.

Practice Analysis
Airfield Hot Mix Asphalt (HMA) Placement Operations Inspection and Field Testing
Level III

Inspection of Airfield HMA Placement Operations

Evaluate Plant, Transportation, Placement, and Compaction Operations

Knowledge:

- FHWA NHI Course 131032
- Equipment performance
- Types of plants, equipment
- NAPA applicable requirements
- Best practice manuals for HMA airport construction (under development through AATPT)

Skills:

- Understand relationship of equipment to placement operation (e.g. based on work time frames)
- Evaluate appropriate size and number of equipment
- Evaluate specific site environmental conditions with respect to time available for compaction

Relationship of Rolling Operation to Mat Compaction

Knowledge:

- HMA Paving Handbook 2000 (Chapter 18)
- Basic understanding of different roller types
- Asphalt Institute MS-22

Skills:

- Evaluate mix reaction to applied compaction effort in relationship to temperature.
- Recommend corrective action
- Follow up on recommended corrective action
- Document recommendations and follow-up

***Aggregate Stockpile Management (3)**

Knowledge:

- HMA Pavement Handbook 2000 (chapter 6)
- National Stone, Sand and Gravel Association (NSSGA)

Skills:

- Inspect and evaluate stockpile construction according to best practices
- Examine aggregate loading practices
- Identify aggregate contamination and required remedial action
- Document and report findings

Verify Plant Operation

Knowledge:

- Types of plants, manufacturing process and weigh master certification
- Plant production and storage capacity
- HMA Pavement Handbook 2000 (chapters 8, 9, 10, 11)

Skills:

- Determine proper plant operation and compliance
- Assess compliance of produced mix with specification requirements
- Verify load-out HMA ticket information
- Inspect plant certifications (e.g. weigh master, weigh scales)
- Verify plant type and storage facilities and capacity
- Record and report findings

(Level III, continued)

Field Testing of Airfield HMA Pavement

***Determine Segregation Profile**

Knowledge:

- General knowledge of techniques for determining segregation (thermal imaging, gradation, density, texture, visual)
- ASTM E965

Skills:

- Visually identify areas of segregation
- Determine sampling location
- Record and report findings

***Manage and Analyze Data Collected on Smoothness to Establish Corrective Measures**

Knowledge:

- Lot sampling
- FAA P401

Skills:

- Identify problem areas
- Establish corrective actions
- Verify results of corrective actions
- Record and report corrective actions to contractor

***Measure Smoothness by Profilograph**

Knowledge:

- ASTM E950

Skills:

- Identify problem areas
- Establish corrective actions
- Verify results of corrective actions
- Record and report corrective actions to contractor
- HMA Mixture Characteristics

HMA Mixture Characteristics

***Explain Relationship between Mix Properties and Mix Design Requirements**

Knowledge:

- Relationships between mix segregation and pavement density
- Relationship between non-uniform temperature and mix compaction
- Relationship between mix air voids, pavement air voids and compaction

Skills:

- Visually inspect mixture
- Recognize cold spots, segregation, non-uniform mix, movement under the roller
- Identify the reasons for noncompliance

Troubleshooting

***Verify, Accept or Reject Level I, II and III HMA Field Test Results and Inspection Reports**

Knowledge:

- Ramifications of issues
- Project specifications
- Basic statistical acceptance plans
- Cost-benefit

Skills:

- Master Level I and II functions
- Accept/reject results
- Assess impacts (cost, scheduling, safety, operations)
- Report/document recommended decision to supervisor

(Level III, continued)

Care and Maintenance of Testing and Inspection Equipment

***Verify Calibration and Proper Working Conditions of All Equipment Used in Airport HMA Field Testing and Inspection**

Knowledge:

- Equipment, instruments and tools
- Manufacturer's operation and maintenance requirements
- Agency requirements (e.g. NRC requirements for nuclear gauge)

Skills:

- Operate equipment, instruments and tools as specified
- Maintain/document equipment per agency requirements
- Recognize defective equipment and recommend replacement

Worksite Safety\Security

***Recognize Safety and Security Violations and Recommend Safety Actions**

Knowledge:

- OSHA, Federal, state and regional requirements. (OSHA 30-hour training program or equivalent knowledge)

Skills:

- Recognize worksite safety and security violations
- Implement worksite safety plan
- Document and report all worksite safety violations

Management

***Assist with the Management of Multiple or Complex Projects**

Knowledge:

- Project specifications and contract requirements
- Personnel supervision and management
- Personnel safety standards, procedures, and equipment
- Equipment use, storage, and transportation procedures
- Procedures, standards, and equipment needed for all Level I and II tasks
- Basic principles of general record keeping and record-keeping for payroll and contract administration purposes

Skills:

- Determine and communicate project requirements
- Determine personnel capabilities and qualifications matching them with the needs of project tasks
- Develop work schedules– for efficient use of staff, equipment, and resources to complete work in a timely and cost-effective manner
- Coordinate inspection and testing activities with other project operations
- Verify and enforce safety compliance by technicians
- Determine internal QC requirements and check for compliance
- Review tech's payroll (time card)
- Define and communicate employee expectations
- Maintain records of performance evaluation
- Communicate directions and evaluate results
- Mentor subordinates
- Resolve conflict

(Level III continued)

***Coordinate Field Inspection and Testing Operations**

Knowledge:

- Typical owner/customer concerns
- Technician capabilities
- Inspection, testing and reporting time
- Interrelationships among equipment maintenance, inspection, calibration, and use and potential conflicts
- Owner/customer expectations

Skills:

- Determine owner/customer expectations
- Schedule equipment maintenance, inspection, calibration, and use to minimize conflict
- Schedule employee work to meet customer/contract execution schedule
- Identify inspection and test anomalies and make adjustments in reporting to meet customer needs
- Identify appropriate inspection and test methods to meet project requirements

Training

***Provide Formal and On-The-Job Training on HMA Field Inspection and Testing and Safety to Level I and II Technicians**

Knowledge:

- Fundamentals of the subject matter
- Understand all pertinent inspection and test procedures and application of results
- Understand all pertinent inspection and test equipment maintenance and use
- Safety standards, procedures, and equipment
- AASHTO R18/ISO Guide 17025
- Appropriate styles of training (lecture, written material, demonstration, hands-on) for various types of knowledge or skills.

Skills:

- Practice effective communication and delivery of information and technology transfer
- Provide proper observation and assessment
- Demonstrate proficiency in the performance of applicable test and inspection procedures
- Determine training needs of each technician
- Organize and present information clearly
- Demonstrate and/or explain testing and safety procedures
- Observe and check learner's proficiency.

*NOTE: Knowledge will include "The Best Practices Manual for HMA airport construction", currently under development for the FAA.

Practice Analysis
Airfield Hot Mix Asphalt (HMA) Placement Operations Inspection and Field Testing
Level IV

HMA Mixture Characteristics

***Recognize Need for HMA Mix Design Adjustments**

Knowledge:

- Mix properties represented by Quality Control (QC) activities and field tests

Skills:

- Review mix QC tests and field tests
- Inspect reports and note anomalies
- Confirm field inspection and field test results with mix lab test results

Troubleshooting

***Establish Troubleshooting Protocol and Documentation Procedures**

Knowledge:

- Ramifications of issues
- Project specifications
- Basic statistical acceptance plans
- Cost-benefit
- General knowledge of airport project structure and airport operations

Skills:

- Establish SOPs
- Master Level I, II and III functions
- Initiate/implement acceptance/rejection process
- Make final recommendations to final authority

Care and Maintenance of Testing and Inspection Equipment

***Manage Testing and Inspection Equipment Inventory**

Knowledge:

- Project equipment necessary
- Required SOPs

Skills:

- Acquire necessary equipment
- Schedule maintenance
- Develop SOPs for equipment maintenance

Worksite Safety/Security

***Determine, Coordinate, and Implement the Training, Communication, Facility, and Monitoring Elements Required as Parts of an Adequate Safety Program**

Knowledge:

- OSHA, Federal, state and regional requirements. (OSHA 40-hour training program or equivalent knowledge)
- Appropriate and required documentation processes and forms
- Project safety management system

Skills:

- Ability to develop safety plan
- Administer safety plan
- Document and report safety and security violations

(Level IV, continued)

Management

***Maintain the Quality of Processes and Personnel in Order to Maintain Field Competence**

Knowledge:

- Accreditation Programs and the appropriate technician training and certification program(s)
- ISO Guide 17025
- Equipment calibration, maintenance, personnel qualification requirements, training requirements, equipment inventory, dispute resolution, record keeping, proficiency sample testing and reporting requirements of AASHTO R18

Skills:

- Evaluate field inspection and testing processes and personnel qualifications for compliance with accreditation standards
- Analyze and recommend possible changes to bring testing and inspection processes and personnel into compliance

***Establish Field Testing Program and Schedule**

Knowledge:

- Appropriate field inspection task and tests to characterize HMA placement processes and materials
- Time, equipment, and technician needs to conduct Level I, Level II and Level III inspection and testing tasks
- What inspection tasks and tests can be conducted independently and which ones need to be sequenced
- Know the reason and purpose for conducting inspection tasks and tests

Skills:

- Schedule field inspection and testing staff
- Determine the sequence of inspection and testing tasks necessary for efficient field operations

*** Monitor Changes in Standards and Specifications to Assure That Asphalt Field Testing and Inspection Procedures are in Conformance**

Knowledge:

- AASHTO, ASTM, FAA, federal, state, and local government procedures for issuing and updating testing standards
- Current ASTM / AASHTO / FAA / State DOT / FHWA standards and specifications updates

Skills:

- Read, interpret, and identify changes in updated standards and specifications
- Determine the most recent date and content of standard
- Identify differences between old and new standards
- Ensure the appropriate standard is applied to project

(Level IV continued)

***Project Management for Field Testing Operations**

Knowledge:

- Cost of inspection and testing operations, including equipment, personnel, reporting and overhead
- Principles of budget planning, management and billing
- Understand contract and scope of services
- Principles of supervision, and employee mentoring and training
- Labor Laws
- OSHA regulations
- Cost estimating for prospective projects
- Meeting project needs within budget and on time
- Loss prevention techniques
- Personnel management
- Customer service
- Sources of information about project objectives, limitations, procedures, resources, personnel, budgets, and schedules
- Purposes and language of contracts and the nature of contractual relationships (scope of services)

Skills:

- Communicate effectively internally and externally
- Provide customer service and client interaction
- Coordinate work of field technicians and others to define and meet common field inspection and testing goals
- Manage multiple projects simultaneously
- Avoid and manage conflicts
- Perform dispute resolution as needed
- Understand and use different Scheduling tools
- Determine project specifications and QC requirements
- Provide field management for a project Q/C program to assure that objectives are being met on time and within budget

***Develop and Manage a Plan for Test/Trial Section Approval Process and JMF Adjustments**

Knowledge:

- Proportioning methods for asphalt concrete mixes
- Asphalt Institute SP-2
- Asphalt Institute MS-22
- Level 1, 2, 3 tests

Skills:

- Determine sample requirements, test methods, and reporting requirements
- Interpret results
- Document and report findings

Training

***Establish and Manage a Training Program for Airport HMA Field Technicians**

Knowledge:

- Inspection and testing methods
- Capabilities and limitations of inspection and testing equipment
- Equipment calibration requirements
- Written report content and requirements

Skills:

- Communication and delivery skills
- Recognize and mentor technicians with management potential
- Provide performance evaluations to technicians

*NOTE: Knowledge will include "The Best Practices Manual for HMA airport construction", currently under development for the FAA.

Certification Requirements

To achieve certification, the applicant must meet all the criteria for the desired Level as specified:

Level I
Written Examination Passing score on Level I exam
Work Experience Six months minimum work experience in asphalt field testing and inspection (see profile).
Performance Verification All Level I Performance Measures

Level II
Written Examination Pass Levels I and II exams
Work Experience Two years experience, including 12 months must involve asphalt field testing and inspection activities (see profile).
Performance Verification All Level II Performance Measures

Level III
Written Examination Passing score on Levels I, II, and III exams
Work Experience Five years experience. At least 36 of these months must involve asphalt construction, testing and/or inspection as the primary activity, to include 18 months of airfield (FAA, DOD) experience (see profile).
Performance Verification All Level III Performance Measures
Personal Recommendation Current recommendation from a valid recommender

Level IV
Written Examination Passing score on Levels I, II, III, and IV exams
Work Experience Level III work experience plus 60 additional months of asphalt airfield QA/QC experience involving a broad range of complexity and diversity (see profile).
Performance Verification All Level IV Performance Measures
Personal Recommendation Current recommendation from a valid recommender
Major Project Write-up of applicant's role in a major project

The Exam:

At each Level of the program, a passing score on the examination is required. The test questions are based on typical job tasks as detailed in the Practice Analysis; therefore, preparation for this exam should be minimal. Certification at a lower level is not required as a condition for certification at an upper level. However, passing the exam requirement at the lower level is required as a condition for certification at an upper level, i.e. certification at Level III requires meeting all the certification requirements for Level III in addition to passing the exam requirements for both Levels I and II.

The exam will be administered in a Computer Based Test (CBT) format at a national network of proctored test sites. The exam will be closed-book. Examinees are expected to be familiar with the references included in the Practice Analysis. The Selected General References (on page 18) include a few additional resources that could help in preparing for the exam.

The Exam Blue Print:

The exam “Blue Print” is a direct result of the national validation survey of the Practice Analysis for the certification program. It shows the exam question distribution relative to each “Domain” for each program level. More critical and important “Domains” are usually allotted a higher number of questions than less important ones. If the “Domains” are equally important then they are usually given an equal weighting in the exam. Additional details for the “Task” weight distribution within each “Domain” are available at www.nichma.org.

Exam Blue Print				
Airfield Hot Mix Asphalt (HMA) Placement Operations Inspection and Field Testing				
Percentage of Exam by Domain for each Level				
DOMAIN	LEVEL I	LEVEL II	LEVEL III	LEVEL IV
* Inspection of HMA Airfield Placement Operations	26	24	15	0
* Field Testing of Airfield HMA Pavement	22	19	16	0
* HMA Mixture Characteristics	15	14	15	18
* Troubleshooting	11	12	15	17
* Care and Maintenance of Testing and Inspection Equipment	10	10	10	13
* Worksite Safety and Security	16	12	10	16
* Management	0	0	11	20
* Training	0	9	8	16
TOTAL	100 %	100 %	100 %	100 %

The Exam Questions:

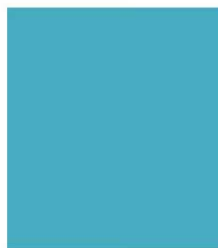
The test questions are a combination of multiple choice and performance based drag and drop, hot spot, scenario, media (image, audio and/or video) or interactive stimuli. Responses may be fixed, written, drawn and/or created. Some questions may refer to a graphic that the examinee must analyze in order to answer the question correctly. Other times, the examinee may be asked to answer a question by clicking with the mouse on a specific part of a picture. The basic rule used by the question writers and developers is “if one performed the task competently as required he or she will be able to answer the question correctly.”

Example #1:



To perform the Nuclear Density Compaction Test in accordance with ASTM and/or AASHTO, which pieces of equipment should the technician use?

Drag and Drop the proper equipment into the area below.



Example # 2:

When measuring the smoothness of the finished surface of a bituminous pavement in accordance with FAA P-401 construction specifications, what size straight edge is required?

1. 4.0 ft.
2. 8.0 ft
3. 12.0 ft.
4. 16.0 ft.
5. 18.0 ft.

Training:

NICHMA does not endorse, certify, or accredit training programs. The Institute does, however, provide information on the certification procedures and objectives so that training courses can be designed and developed specifically to help persons planning to take a NICHMA certification exam. The Institute has partnered with some educational providers to ensure that candidates have a means of refreshing their knowledge and ensuring a higher degree of competency and comfort when taking the examination. Such activity is totally separate from certification program design, validation, items/questions authoring and exam structure and content development processes. This serves to ensure that the competency evaluation and resulting certification received by the candidate is fair, reliable, unbiased and truly national in scope and geared toward the established industry standards and practices. The following is a list of the selected references that the program development committee identified for the various tasks in the Job Task Analysis. The list can serve as an important resource for the candidate to refresh his knowledge in preparing for the exam.

Program References:

- * The following are resources that may help candidates prepare for the exam and/or expand their industry knowledge:
- * The Asphalt Handbook (MS-4, 7th edition). The Asphalt Institute. Lexington, KY.
- * Asphalt Overlays for Highway and Street Rehabilitation (MS-17), The Asphalt Institute. Lexington, KY.
- * Asphalt Pocketbook of Useful Information (MS-6). The Asphalt Institute. Lexington, KY.
- * Bituminous Tack Coat, Standards for Specifying Construction of Airports (P-603, AC No.: 150/5370-10C), Federal Aviation Administration, US Department of Transportation, 800 Independence Avenue, SW, Washington, DC 20591 (http://www.faa.gov/airports_airtraffic/airports/resources/advisory_circulars/; phone: 1-866- 835-5322)
- * Compaction and Paving Theory and Practice, Dynapac Publication no. HC 111-2, Malmo, Sweden.
- * Construction of Hot-Mix Asphalt Pavements (MS-22, 2nd edition). The Asphalt Institute. Lexington, KY.
- * Establishing and Implementing a Quality System for Construction Materials Testing Laboratories (AASHTO: R 18), Standard Specifications for Transportation Materials and Methods of Sampling and Testing (Part IB: Specifications). American Association of State Highway and Transportation Officials. Washington, D.C. (phone: 1-888-227-4860 fax: 202-624-5469)
- * First Aid and Personal Safety Reference Guides, American Red Cross National Headquarters, 2025 E Street, NW , Washington, DC 20006 (www.redcross.org; phone: (703-206-6000)
- * Flexible Surface Courses, Standards for Specifying Construction of Airports (P-401, AC No.: 150/5370-10C), Federal Aviation Administration, US Department of Transportation, 800 Independence Avenue, SW, Washington, DC 20591 (http://www.faa.gov/airports_airtraffic/airports/resources/advisory_circulars/; phone: 1-866- 835-5322).
- * General Requirements for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025). International Organization for Standards, 2005.
- * A Guide for Hot Mix Asphalt Pavement (CD-ROM). National Asphalt Pavement Association. Lanham, MD.
- * Hot Mix Asphalt Airport Construction Best Practice Manual (AATP Project 05-01), Airfield Asphalt Pavement Technology Program, Federal Aviation Administration and Auburn University (Completion expected by Dec 2008).
- * Hot-Mix Asphalt Materials, Mixture Design, and Construction. National Asphalt Pavement Association. Lanham, MD.
- * Hot-Mix Asphalt Paving Handbook 2000 (2nd edition). National Asphalt Pavement Association. Lanham, MD.
- * Introduction to Asphalt (MS-5). The Asphalt Institute. Lexington, KY.
- * Mix Design Methods (MS-2, 6th edition). The Asphalt Institute. Lexington, KY.

- * Safety and Health Regulation for Construction (29 CFR Part 1926). Occupational Safety and Health Administration (OSHA). US Department of Labor. Government Printing Office. Washington, D.C.
- * Standard Practice for Estimating Application Rate of Bituminous Distributors (ASTM D 2995-99), Annual Book of ASTM Standards. American Society for Testing and Materials. Philadelphia, PA.
- * Standard Practice for Random Sampling of Construction Materials (ASTM D 3665-06), Annual Book of ASTM Standards. American Society for Testing and Materials. Philadelphia, PA.
- * Standard Practice for Sampling Bituminous Materials (ASTM D 140-01), Annual Book of ASTM Standards. American Society for Testing and Materials. Philadelphia, PA.
- * Standard Practice for Sampling Bituminous Paving Mixtures (ASTM D 979-01), Annual Book of ASTM Standards. American Society for Testing and Materials. Philadelphia, PA.
- * Standard Practice for Sampling Compacted Bituminous Mixtures for Laboratory Testing (ASTM D 5361-06), Annual Book of ASTM Standards. American Society for Testing and Materials. Philadelphia, PA.
- * Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods (ASTM D 2950-05), Annual Book of ASTM Standards. American Society for Testing and Materials. Philadelphia, PA.
- * Standard Test Method for Measuring the Longitudinal Profile of Traveled Surfaces with an Accelerometer Established Inertial Profiling Reference (ASTM E 950-98), Annual Book of ASTM Standards. American Society for Testing and Materials. Philadelphia, PA.
- * Standard Test Method for Measuring Pavement Macrottexture Depth Using a Volumetric Technique (ASTM E 965-96), Annual Book of ASTM Standards. American Society for Testing and Materials. Philadelphia, PA.
- * Standard Test Method for Measuring Pavement Roughness Using a Profilograph (ASTM E 1274-03), Annual Book of ASTM Standards. American Society for Testing and Materials. Philadelphia, PA.
- * Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens (ASTM 3549-03), Annual Book of ASTM Standards. American Society for Testing and Materials. Philadelphia, PA.
- * Superpave Mix Design (SP-2, 3rd edition), The Asphalt Institute. Lexington, KY.
- * TCCC Hot-Mix Asphalt Construction (NHI Course No.: 131032), National Highway Institute, Federal Highway Administration, US Department of Transportation, 4600 North Fairfax Drive Suite 800, Arlington, Virginia 22203 (<http://www.nhi.fhwa.dot.gov/Home.aspx>; phone: 703-235-0500 and 1-877-558-6873; fax: 703-235-0593)
- * The Virtual Superpave Laboratory (CD-ROM). National Asphalt Pavement Association. Lanham, MD.

Sample Score Reports:

The exam will be scored on a pass/fail basis. Examinees will receive their score report at the test center.

Passing Score:

Airfield HMA Placement Operations Inspection And Field Testing Technician Level I Examination Score Report	
Name:	Test ID:
Address:	Test Center: 9999
	Test Date: January 2, 2009
<p>Congratulations. You have passed the Level I examination for NICHMA's Airfield HMA Placement Operations Inspection And Field Testing Technician Level I examination.</p> <p>To achieve certification: you must submit, and have approved by the Institute, the additional documentation as described on the NICHMA web site (www.nichma.org). If you have already submitted these materials, then you need do nothing more until you hear from NICHMA.</p>	

Failing Score:

Airfield HMA Placement Operations Inspection And Field Testing Technician Level I Examination Score Report																						
Name:	Test ID:																					
Address:	Test Center: 9999																					
	Test Date: January 2, 2009																					
<p>Score on NICHMA's Airfield HMA Placement Operations Inspection And Field Testing Technician Level I examination taken on January 2, 2009.</p> <p style="text-align: center;">Your test score: 58% Passing score: 61%</p> <p>You did not achieve a passing score on this examination. You may take this test again after a period of 120 days, provided that you do not test more than three times with any two-year period.</p> <p>Analysis of scoring by sections of the test:</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Percent Correct</th> <th></th> </tr> </thead> <tbody> <tr> <td>Inspection of Airfield HMA Placement Operations</td> <td>65%</td> <td>(This section constituted X% of the exam)</td> </tr> <tr> <td>Field Testing of Airfield HMA Pavement</td> <td>50%</td> <td>(This section constituted X% of the exam)</td> </tr> <tr> <td>HMA Mixture Characteristics</td> <td>48%</td> <td>(This section constituted X% of the exam)</td> </tr> <tr> <td>Troubleshooting</td> <td>55%</td> <td>(This section constituted X% of the exam)</td> </tr> <tr> <td>Care and Maintenance of Testing and Inspection Equipment</td> <td>70%</td> <td>(This section constituted X% of the exam)</td> </tr> <tr> <td>Worksite Safety/Security</td> <td>91%</td> <td>(This section constituted X% of the exam)</td> </tr> </tbody> </table> <p>This test has been developed for the purpose of making a pass/fail determination against a standard of the minimally qualified candidate for Level I certification. Use of numerical or percentage test scores for other purposes, such as ranking of candidates, is not appropriate.</p>		Category	Percent Correct		Inspection of Airfield HMA Placement Operations	65%	(This section constituted X% of the exam)	Field Testing of Airfield HMA Pavement	50%	(This section constituted X% of the exam)	HMA Mixture Characteristics	48%	(This section constituted X% of the exam)	Troubleshooting	55%	(This section constituted X% of the exam)	Care and Maintenance of Testing and Inspection Equipment	70%	(This section constituted X% of the exam)	Worksite Safety/Security	91%	(This section constituted X% of the exam)
Category	Percent Correct																					
Inspection of Airfield HMA Placement Operations	65%	(This section constituted X% of the exam)																				
Field Testing of Airfield HMA Pavement	50%	(This section constituted X% of the exam)																				
HMA Mixture Characteristics	48%	(This section constituted X% of the exam)																				
Troubleshooting	55%	(This section constituted X% of the exam)																				
Care and Maintenance of Testing and Inspection Equipment	70%	(This section constituted X% of the exam)																				
Worksite Safety/Security	91%	(This section constituted X% of the exam)																				

Work Experience:

As part of the certification application, the applicant must submit a work history in which he or she documents his or her complete work experience. The work history write-up must be detailed, specific and in chronological order. The documentation must include the title, duties and responsibilities, project and employer information including the supervisor's name for each position held. Before he or she will be awarded a certification, the applicant must have acquired the amount of relevant, technician-level work experience described in the Technician Profile for this program. A significant proportion of the work experience must be recent.

Education Credit: If an applicant has been awarded a two-year or four-year degree from an ABET-accredited engineering technology program directly related to the certification area, then he or she might receive up to 1.5 years' worth of credit towards the work experience requirement. The Education Credit Addendum form can be downloaded off the Institute's web site.

Performance Verification:

The application contains a listing of performance measures that are key to Airfield HMA Placement Operations Inspection And Field Testing technician work. Before the applicant will be awarded a certification, he or she must submit supervisor verification that he or she repeatedly and correctly performs the tasks of or applies the knowledge required by each performance measure.

Verification of these performance measures is typically provided by the examinee's immediate supervisor (the Verifier) as identified by the examinee in the employment history section of the application. If the examinee's immediate supervisor does NOT have technical expertise in the specialty area, or if the examinee has no supervisor, verification must be obtained from an individual who does have technical expertise in the specialty area AND has first-hand knowledge of the examinee's specific job skills. Each verifier must complete and sign the Verifier Information Form that is included in the application package.

Note: Lack of verification does not prevent the applicant from taking the exam. However, verification is a requirement for certification at all levels.

Personal Recommendation (Levels III and IV only):

This form is available on the Website. It must be completed by a person who is familiar with the examinee's character, technical capabilities, background and general performance.

A valid Technician Recommendation form **MUST** be on file to award certification at Levels III and IV. It is valid for one year from the date shown next to the Recommender's signature.

Note: The Recommender must be a qualified person other than any of the Verifier(s) of record for each candidate. Other requirements are detailed on the subject form.

Major Project Write-up (Level IV only)

Ten years or more of employment in the certification area, by itself, is **not** sufficient for the granting of Level IV. An absolute requirement for certification at Level IV is continued progression of duties and responsibilities and senior-level involvement in a major program which is **directly related to the subfield in which Level IV certification is sought**. In order to avoid lengthy delays in processing your Level IV certification, this documentation should be sent with the Level IV examination application.

Level IV Major Project Write-Up Guidelines Airfield HMA Placement Operations Inspection And Field Testing

- The project write-up is a separate document from the work history.
- It is a concise, detailed, two- to three-page written description of one or more major projects specific to the subfield of certification, i.e. a major Airfield HMA Placement project.
- The write-up must be prepared by the candidate. Official job descriptions, testimonials from others, company reports, etc. are not acceptable.
- The project must have taken place well into your career in the certification area and must be recent (have taken place within the past 3 to 4 years).
- The write-up must demonstrate independent, senior-level engineering technician work, including supervisory capacity and delegated responsibilities and duties in the majority of the activities associated with the program area and described domains.

The write-up must describe in detail the following:

The Project

- Type and size of project.
- Project location.
- Project owner, contractor and consulting firm.
- Type of construction, i.e. new, major reconstruction, rehabilitation, expansion, etc
- Project cost, i.e. approximate dollar value.
- Construction time period, i.e. project start and completion dates, and dates of candidate's involvement
- General scope of construction activities.

The Candidate's Involvement

- Supervisory duties and responsibilities, i.e. title, position, authority, daily duties and tasks, number and categories of people supervised and the various tasks they performed
- Type of service and range of experience as related to specific Airfield HMA Placement Operations Inspection And Field Testing activities, including program management, documentation, reporting, project closeout, etc.

NOTE: If a wide range of Airfield HMA Placement Operations Inspection and Field Testing activities cannot be documented for a single program, they may be accumulated via several more narrowly focused programs to demonstrate the scope and range of experience for the candidate.

Application Procedures and Timeline:

The Application

The certification process begins with submitting the exam application and the Examination Fee. Applicants can submit this application online and pay via credit card or mail the printed application form with a check. Forms can be found starting on page 28 of this manual. Copies can also be downloaded off the Institute's web site.

Applicants who submit the test application online will be prompted to download additional application forms that must be submitted to NICHMA for evaluation of work experience, verification, etc.)

NOTE: To speed up the certification process, applicants are encouraged to submit **ALL** application materials as required **PRIOR TO** taking the written exam.

Within three weeks of receiving the application, the Institute will e-mail the applicant instructions for scheduling the exam with the test vendor. The notification will also include information about the Institute's exam rescheduling policies.

Test Date and Location:

The applicant may call the test vendor to schedule, or the applicant can visit the vendor's website to select a test date and time slot. The test vendor offers test centers throughout the United States and Canada, and most test centers are open Monday through Friday.

The Institute's confirmation notice will list the items (including the type of identification) that the candidate must bring to the test center. The exams are closed-book. Cell phones of any type and calculators are not allowed inside the test center. The test is timed, and the clock will not stop for breaks. (An onscreen timer will count down the remaining time.)

The applicant will receive his or her score report at the test center as soon as the test is completed and scored. If the applicant fails the written exam, he or she must wait 120 days before retesting that exam. (An exam can be taken no more than three times in a two-year span.)

The Certification Evaluation

If the candidate passes the written exam, then NICHMA will evaluate the rest of the application materials to determine whether the candidate has met all the criteria for the particular certification level.

It can take up to 45 days after the test date for NICHMA to notify the candidate of his or her certification status. If the candidate has successfully met all the criteria for the certification, he or she will receive a certificate and an approval letter with a wallet card.

Conditional Decision

If the candidate failed to meet the criteria for the certification, then he or she will receive a Conditional Decision Letter with specific instructions for completing the requirements. The Conditional Decision Letter provides the candidate with a one-year grace period to satisfy the remaining certification criteria; during this time he or she will be immune to any changes to the program requirements. When the candidate replies to a Conditional Decision Letter, NICHMA will re-evaluate the candidate's application materials and act accordingly. The re-evaluation can take up to 45 days.

Recertification:

To protect the public's interests and promote engineering technicians' continued competency, progression and stature on the engineering team, the Institute encourages certificants' professional advancement by requiring recertification. Once a technician has been certified, he or she needs to track his/her Continuing Professional Development (CPD) activities according to a pre-established point scale. At the end of the three-year certification period, the certificant must demonstrate his/her professional growth by accumulating and documenting 90 CPD points for each certification held.

Certification Cycle

The certificate(s) awarded will have an expiration date of three years from the date of award. The certificate(s) will expire at the end of that three-year period unless renewed through recertification. A certificate that is not renewed at the end of the three-year period will expire. If the certificate is not renewed and thus, expires, all records will be deleted from the database and the candidate may have to retake the examination in order to become certified.

NOTE: Upgrading the certificate or adding a certificate in a different technical area will not alter the 3-year expiration date.

Application Process

The recertification application will be mailed to the certificant about **six months** before the certification expires. The application includes complete instructions and lists the recertification processing fee (a base fee plus a small incremental fee for each subfield) and any outstanding registry fees. For each certification title that the certificant wishes to continue, he or she will be asked to provide the CPD point total for the three-year period ending on the expiration date. Information about the sources of the CPD points must be documented on the application. The candidate may be required to submit more specific details and proof of activities claimed if the application is selected for an audit. Within three weeks of submitting the recertification application and payment, the applicant will receive either a new certificate and wallet card or an audit notification.

Accumulating the CPD Points

Throughout the three-year certification period, CPD Points may be accumulated by the following activities:

1. Continued employment in the field of certification - up to 72 points
2. Additional Technical Education - up to 45 points
3. Advance Profession (i.e. committee/professional society involvement) - up to 45 points
4. Certification testing and/or upgrade - up to 45 points
5. Special Recertification Exam - 60 points

NICHMA's recertification policy outlines detailed information about CPD activities and point values. For more information, please consult the policy on the NICHMA web site (www.nichma.org).

Display of Certification Status and Representation of Qualifications:

To call attention to their certification, certificants may write the designation **CET** ("Certified Engineering Technician" or "Certified Engineering Technologist") after their name. Or, they may write the appropriate technician certification level (**I, II, III, or IV**) after the name. This information is typically followed by an additional line that provides the NICHMA Certification Number (found on the certificate and wallet card).

Use of the NICHMA - Certified Mark:

The "NICHMA - Certified" mark may be used only by active-status NICHMA certificants. The mark is available for download on NICHMA's website, along with examples of how it may be reproduced. Also available for download is a Support Statement, which may be used by businesses that endorse NICHMA certification or employ NICHMA certificants.

When printed on a business card, the mark must be placed so that it is linked to the individual named on the business card who is currently certified by NICHMA. It is **NOT** acceptable to place the NICHMA - certified mark so that it suggests that the firm is certified by NICHMA. It is **NOT** acceptable to place the NICHMA - certified mark on company letterhead, stationery, marketing materials, websites, etc. **It is NOT acceptable to use the support statement, certified mark or anything custom - designed to stamp/seal drawings or other project documents.**

The Institute's name, initials/acronym, logo, certification mark, and affiliation mark are registered with the U.S. Patent and Trademark Office as trademarks. The logo may not be reproduced, published, or publicly displayed without the permission of NICHMA. The Certified Mark and Support Statement may be reproduced, published, and/or publicly displayed only in accordance with the guidelines set forth on the NICHMA web site. Unauthorized use of the trademarked logo and/or certification mark is strictly prohibited under U.S. Federal Law, and will be subject to legal prosecution.

Complaints Against Applicants and Certificants:

The Institute will investigate the following types of complaints:

- Complaints pertaining to an applicant's or certificant's qualifications for a particular certification.
- Complaints pertaining to violations of NICHMA's Code of Ethics.
- Complaints pertaining to a certificant's improper execution of the technical practices which are an integral part of the certification
- Complaints may be accepted pertaining to an individual's representation that he or she holds a valid NICHMA certification.

NOTE: The following actions may be taken against proven violators: reprimand, temporary suspension or permanent revocation.

Certification Process Irregularities:

False, incomplete, or misleading application information or improper verification or recommendation may result in the following actions: delay of the certification decision; temporary suspension of certification(s) held, permanent revocation of certification(s) held, or suspension of ability to sit for any NICHMA exam for a period of at least two years. Verifiers and Recommenders who falsify information are subject to the same actions.

Schedule of Fees Related to Certification (as of October 2007):

NOTE: Fees are subject to change. Please check the Fees Schedule on the Institute's website before you submit a payment.

Application Fees

Examination Fee (includes evaluation of application)	\$205
Examination Rescheduling Fee	\$100

Conditional Decision Letter Fees

(This fee applies only if a third Conditional Decision Letter must be issued to the applicant because he or she has failed to satisfy all the certification criteria in the initial evaluation and two subsequent Conditional Decision Letter response evaluations)

Application Review Fee	\$100
------------------------	-------

Certification Maintenance Fees

Recertification Processing Fee (every three years)

Base Recertification Fee	\$95
Incremental Fee (per certification area)	\$30

The cost of recertifying in a single certification is \$125. The cost is \$155 for two certifications, \$185 for three certifications, etc.

Retired Status Fee	\$45
Certification Reinstatement Fee	\$50

Personal Records

Copy of Score Report	\$20
Duplicate Certificate	\$30 (\$40 for two to four copies; \$50 for five or more)
Duplicate Approval Letter with Wallet Card	\$30
Copies of Application Forms:	\$20

Other Fees

Certificant Directories	\$20-70 depending on subfield
Bad Check Service Charge	\$30

Conditions of Application

1. NICHMA has established policies, procedures, and fees that govern certification decisions, the uses of certification, and interactions with applicants and certificants. These policies, procedures, and fees may be changed by NICHMA at any time without prior notification. These policies, procedures, and fees are freely available on NICHMA's website (www.NICHMA.org). Each person who signs any NICHMA application accepts and agrees to follow these policies and procedures in all dealings with NICHMA.
2. Each NICHMA certification may have multiple criteria that must be met by a candidate in order for the certification to be conferred. These criteria may be changed by NICHMA at any time without prior notification. Current criteria, along with general information about NICHMA and its certification programs, are available from NICHMA's website (www.NICHMA.org). Individuals who are not resident in, or working in, the United States or its territories may not be eligible for certification. These individuals must contact NICHMA before applying and may be required to follow additional procedures, with additional fees, to demonstrate that they meet the criteria.
3. All applicants, candidates, and certificants must comply with the NICHMA Code of Ethics (see below) and follow generally accepted ethical practices at all times. For example, acquiring and/or providing specific knowledge of test questions prior to testing, or acquiring or providing assistance during an examination; intentionally providing information to NICHMA that is incomplete, or inaccurate; or knowingly providing technical services in an unsafe, inaccurate, or unprofessional manner may subject the offender to any number of sanctions, including legal prosecution.
4. NICHMA reserves the right to deny, suspend, or revoke any certification (pending or awarded) should the Institute determine that an applicant, candidate, or certificant has misrepresented information, violated a NICHMA policy or procedure, or violated the NICHMA Code of Ethics.
5. Maintenance of current accurate contact information is the responsibility of the applicant. NICHMA requires accurate contact information to communicate to the applicant important information related to testing, certification, and recertification.
6. The NICHMA name, logo, and certification mark are the property of NICHMA and may not be used without the expressed written permission of the Institute.
7. NICHMA approval letters, wallet cards, and certificates are issued to certificants for their use but remain NICHMA property at all times and may be recalled by the Institute at any time without prior notification.
8. NICHMA test questions and examinations are the copyrighted property of NICHMA. Any copying, sharing, or distribution of the content of those test questions and/or examinations constitutes copyright infringement and is a violation of U. S. federal law. Violators will be subject to suspension or revocation of NICHMA status and/or prosecution to the full extent of the law.
9. Each person who signs a NICHMA application grants NICHMA the right to contact individuals named in application materials or other communications with NICHMA to confirm the accuracy of information provided by the applicant.
10. NICHMA certification must be used, represented, and displayed in accordance with NICHMA policies. NICHMA certification does not constitute a license to practice engineering.
11. Each person who signs a NICHMA application grants NICHMA the right to publish their name, address, and certification information in its certification directories and to provide that information to others in response to bonafide inquiries. Test scores will be given to the test-taker only, unless the test-taker submits a release form authorizing NICHMA to give the scores to another specified individual.
12. The applicant's Social Security number or government-issued ID number is required for identification purposes. It will be used for NICHMA internal use ONLY and will not be given to anyone else without legitimate legal reason.
13. An applicant's test records will be purged for an individual certification area after five years if no further testing is completed in that certification area and the individual is not certified in that area. If the applicant has active certifications or is actively testing in other certification areas, the records for those other certification areas will not be affected.
14. An applicant with a disability as defined in Title III of the Americans with Disabilities Act who may be placed at a disadvantage when taking a NICHMA certification examination must advise NICHMA, in writing, of their needs by including a letter or other appropriate documentation with their application. NICHMA will respond by telephone or other means to make appropriate accommodations.
15. All certifications expire three years after an individual's initial certification is awarded and every third year thereafter. Re-certification will be based on the certificant's activities during that three-year period. Requirements and fees may be found in NICHMA's Continuing Professional Development Policy (See www.NICHMA.org). Several months before expiration, a recertification application will be sent to the last postal or email address provided by the certificant. If the application with payment is not received by NICHMA prior to the expiration date, the certificate will expire. Reinstatement to Active Status will involve an additional fee. If reinstatement has not occurred three years after the expiration date, all certifications and all testing records will be purged. Payment of new testing and/or application fees does not substitute for payment of the full recertification fee when due. Additionally, obtaining a higher-level NICHMA certification does not alter or "reset" the originally established three-year certification period.

NICHMA Engineering Technician Certification General Application Package

Computer Based Testing Programs

Basic Instructions

Certification candidates must submit both the General Application Package, which applies to any NICHMA computer-based testing program, and the Program Application Package for the specific certification that you are pursuing. See the booklet “Applying for NICHMA Certification” (at www.NICHMA.org) for more details.

General

Part I: Test Application

1. Candidate Information
 - Candidate contact information and preferences
2. Test Selection and Payment Computation
 - Select the tests you are applying for
 - Compute total amount of testing fees and include check and/or vouchers for the total amount due

Part II: Work History

- A position is a job title at a company. You may have held different positions at the same company. Be sure to include each position you have held.

Part III: Personal Recommendation

- Required for some levels of certification. To be completed by a responsible government official, Professional Engineer, or customer representative who has not been your Verifier.

There is a unique Program Package for each certification program. Each is a separate download.

Program

Part I: Performance Verifier Information

Part II: Performance Verification

Part IV: Project Write-up

See www.NICHMA.org for specific requirements

Send application with payment to:

NICHMA
c/o Bank of America
Dept 0037
Washington, DC 20055

REMEMBER!

- **Make a copy of the entire application and keep it with your testing/certification records.**
- **Include name and identification number on every page of every part of the application.**

October 2007

National Institute for Certification in Hot-Mix Asphalt®

www.NICHMA.org

GEN-I

Page 1 of 2

NICHMA GENERAL APPLICATION

Part I: Test Application

Section 1 - Candidate Information (Please print clearly or type)

A - Home

B - Business

<input type="checkbox"/> Mr. <input type="checkbox"/> Ms. _____ <div style="display: flex; justify-content: space-between;"> Last Name First Name Middle Initial </div> Home Address: _____ <div style="display: flex; justify-content: space-between;"> Street Apt. </div> _____ <div style="display: flex; justify-content: space-between;"> City State Zip Code +4 </div> Social Security Number: _____	Present Employer: _____ <div style="display: flex; justify-content: space-between;"> Business Address: Company Name </div> _____ <div style="display: flex; justify-content: space-between;"> Street </div> _____ <div style="display: flex; justify-content: space-between;"> City State Zip Code +4 </div> Present Position Title: _____
---	--

C – Electronic Contact Information and Preferences

Phone Numbers: Business: _____ Home: _____
 Mobile/cell: _____ Fax: _____

Email Addresses: Business: _____
 Home: _____

When receiving items by mail, which address do you prefer? Business Home

May we contact you about NICHMA business by:

- Email? yes no If yes, preferred email address? Business Home
- Fax? yes no

D - Previous Applications

Check the box below that applies to you:

This is my first NICHMA application

I have applied before – Date of last application: _____

I am NICHMA certified – Certification number: _____

Note: if you are not certified and you do not test in 5 years, your test records will be deleted.

Name Change? If your name has changed since your last application, enter your previous name here: _____

Applicant's Statement

I certify that the information given on this page is accurate and current, that NICHMA may use the information as indicated to identify me and to send me information, and that it is my responsibility to notify NICHMA should any of the information provided on this page change.

 Signature

 Date

Candidate Name: _____ Social Security Number: _____

NICHMA GENERAL APPLICATION

Part II: Test Application

Section 2: Test Selection

GEN-I
Page 2 of 2

Indicate, by checking the appropriate box, the exam (or exams) that you are now applying for. Each exam applied for MUST be completed within a 90-day window of eligibility. It will be your responsibility to contact the computer-based testing center network to schedule your test. More information about eligibility and scheduling is available in "Applying for ICHMAA Certification" and at www.ICHMAA.org.

Select, by checking, the tests that you want to take and indicate when you want your 90-day testing eligibility to begin – either As Soon As Possible or on a date (between one month and six months from the postmark date on this application) of your choosing.

- Airfield HMA Inspection and Testing Level I Exam:** ASAP OR Begin eligibility on _____
Required for Certification at all Levels
- Airfield HMA Inspection and Testing Level II Exam:** ASAP OR Begin eligibility on _____
Required for Certification at Levels II, III, and IV
- Airfield HMA Inspection and Testing Level III Exam:** ASAP OR Begin eligibility on _____
Required for Certification at Levels III and IV
- Airfield HMA Inspection and Testing Level IV Exam:** ASAP OR Begin eligibility on _____
Required for Certification at Level IV

Enter the total number of exams selected here: _____

Multiply the number of exams selected by the current NICHMA exam fee. Enter the Total Amount Due in the box below.
For the current exam fee, go to <http://www.NICHMA.org/candidates/fees.cfm>.

_____ X _____ = _____

\$

Total Amount Due

(Number of Exams) X (Exam Fee) = Total Amount Due

Payment for the Total Amount Due, in the form of a check, money order, or an NICHMA test voucher (or a combination) must accompany this application form. Make payable to "NICHMA". Fees are listed on our Website at <http://www.NICHMA.org/candidates/fees.cfm>, or can be obtained by calling 888-555-1212.

Mail this form with fee payment to:
NICHMA
c/o Bank of America
Dept 0037
Washington, DC 20055

- DID YOU . . .**
- Keep a copy of this application for your records?
 - Mail all parts of this application together?
 - Enclose your payment?
 - Sign and Date the Applicant's Statement

NICHMA OFFICE USE ONLY

Employer ID	Postmark Date	Spec. Cont.	ADA	App #	Lockbox #1	Amt Paid

Candidate: _____ Social Security Number: _____

NICHMA GENERAL APPLICATION

Part II: Work History

GEN-II
Page 1 of 1

Complete one box for **each position** you have held. A "position" is one job title at one employer. Please print clearly and use additional pages as needed.

Company Name: _____		Co. Phone: _____	
		Area Code and Number	
Business Address: _____		City	State
		Street	Zip
Position Title: _____		Dates of employment: ____/____ - ____/____	
		mo. year mo. year	
Name of Supervisor: _____		Position was: <input type="checkbox"/> Full Time <input type="checkbox"/> Part time	
Describe Duties, Responsibilities and Tasks Performed (continue on back if necessary):			
Company Name: _____		Co. Phone: _____	
		Area Code and Number	
Business Address: _____		City	State
		Street	Zip
Position Title: _____		Dates of employment: ____/____ - ____/____	
		mo. year mo. year	
Name of Supervisor: _____		Position was: <input type="checkbox"/> Full Time <input type="checkbox"/> Part time	
Describe Duties, Responsibilities and Tasks Performed (continue on back if necessary):			

Applicant's Statement

I verify that the work descriptions above are an accurate representation of my work experience.

Signature

Date

Candidate: _____ Last 4 digits of Social Security Number: _____

NICHMA GENERAL APPLICATION

Part III: Personal Recommendation
(Please print legibly or type)

GEN-II
Page 1 of 1

Section 1 - Recommender's Personal Information

This form must be completed by a professional who is familiar with the technical capabilities and background of the applicant and can attest to the technical quality, responsibility, and ethics demonstrated in the applicant's work experience. NICHMA prefers recommendations from: licensed professional engineers, registered land surveyors, or NICHMA-certified engineering technologists and senior engineering technicians, but will also accept recommendations from other professionals such as graduate engineers, scientists, senior level technicians and technologists, fire marshals, code officials, or officials of other authorities having jurisdiction.

Name: _____ Phone Number: (____) ____ - _____

Position Title: _____

Company Name: _____

My highest degree is: _____ in: _____ from: _____
field school

I am (registered, certified, licensed) as: _____ by: _____

Registration/Certification/License Number: _____ Date granted: _____

Describe your technical background: _____

The person who completes this recommendation form cannot also provide Performance Measure Verifications for this candidate. NICHMA will not accept recommendation forms that are completed by relatives or subordinates of the applicant.

Section 2 – Recommender's Relationship with the Candidate

Familiarity with the candidate's character, abilities, and accomplishments:

- Unfamiliar – little relevant interaction
- Somewhat familiar – occasional interaction
- Reasonably familiar – regular interaction
- Very familiar – frequent interaction

Length of time that you have known the candidate: _____ years and _____ months

Nature of your relationship with the candidate:

- association within the company
- association through professional activities
- association through contracting activities
- other: _____

Describe your professional relationship with the applicant: _____

Candidate: _____ Last 4 digits of Social Security Number: _____

NICHMA GENERAL APPLICATION

Part III: Personal Recommendation

Section 3 - Recommender's Evaluation of the Candidate

GEN-III
Page 2 of 2

Role of the Engineering Technician:
Apply well-defined and proven procedures, methods, and practices, derived from established or real-time engineering guidance, to specific technical assignments, and do so in an ethical and responsible manner.

Regarding the role described in the box above:

I do not recommend this candidate for this role.

I recommend this candidate for this role because he/she has (check all that apply):

made substantial progress toward independent capability in this role.

fulfilled this role, demonstrating good, independent technical judgment and self-management.

fulfilled this role, demonstrating a capability to resolve complex technical issues and lead a team of technicians.

Please indicate by placing a mark in the one most appropriate box to the right of each statement, whether, and to what degree, the candidate demonstrates each of the following attributes.

	Never	Some-times	Mostly	Always	Don't know
The candidate consistently works hard to achieve the objectives of his/her job.					
The candidate is attentive to his/her own work and to the work of others that impacts his/her own responsibilities.					
The candidate shows initiative and equanimity in dealing with new jobs, changed circumstances, or problems, and accepts responsibility for outcomes.					
The candidate organizes and directs the activities of work teams to achieve their objectives in a timely and cost-effective manner.					
The candidate develops and maintains cordial and goal-oriented relationships with work team members and with clients.					
The candidate encourages, uses, and appreciates the ideas and initiative of others.					
The candidate communicates clearly and effectively with work team members and clients.					
The candidate's actions are ethical and his/her statements are truthful and do not conceal or hold back relevant information.					

Additional comments or observations on the candidate's capabilities, responsibility, and achievements:

Section 4 - Recommender's Statement

I attest that all information I have provided is, to the best of my knowledge, true. I understand that falsifying information on this form can affect my right to serve as a recommender or a verifier for other NICHMA certification candidates and can result in my own NICHMA certification(s) being revoked.

Name of Recommender (please print)

Signature of Recommender

Date

Incomplete recommendation forms will not be accepted by NICHMA.

This form expires one year after being signed by the recommender.

NICHMA Engineering Technician Application
Airfield HMA Placement Operations Inspection
and Field Testing Technician
CBT Program Application Package

Basic Instructions

Certification candidates must submit both the General Application Package, which applies to any NICHMA computer-based testing program, and the Program Application Package for the specific certification that you are pursuing. See the booklet “Applying for NICHMA Certification” (at www.ICHMAA.org) for more details.

Program

Part I: Verifier Information

- Each performance or project “Verifier” must complete a Verifier Information Form.
- Must submit with original signature – NOT photocopy or fax

Part II: Performance Verification

- Your supervisor or a person in a position to inspect or approve your work must verify all General and Specific Performance Measures listed for the certification level that you seek, and any lower levels.

Part III: Project Write-up. Please refer to the guidelines in this Program Detail Manual

The General Package is submitted for, and applies to, any ICHMAA certification. It is a separate download.

General

The General Application Package includes the following:

Part I: Test Application

Part II: Work History

Part III: Personal Recommendation

Send Program Application to:

NICHMA
1420 King Street
Alexandria, VA 22314

REMEMBER!

- **Make a copy of the entire application and keep it with your testing/certification records.**
- **Include name and identification number on every page of every part of the application.**

October 2007

Candidate: _____ Last 4 digits of Social Security Number: _____

NICHMA PROGRAM APPLICATION

Program Application Package - Part I: Verifier Information

PROG – I
Verifier
Page 1 of 1

(Please print legibly or type)

Each person who verifies the above-named candidate's performance or projects (the "Verifier") must complete this form:

Name: _____ Title: _____

Current employer: _____

Daytime phone: _____ Email: _____

Professional licenses/certifications: _____

My observation of the candidate occurred during my employment period at

- Current employer
- Previous employer: _____

My observation of the candidate occurred as a part of my role as:

- Candidate's direct supervisor
- Candidate's indirect supervisor/manager responsible for the candidate's work results/outcomes
- Engineer on one of the candidate's projects
- Governmental authority: _____
- Contract supervisor for: client, or general contractor
- Other (please explain relationship): _____

During what time period were you in the above-indicated relationship with the candidate?

From ____ / ____ to ____ / ____
Mo. Yr. Mo. Yr.

I have (Check all that apply):

- directly observed the candidate's work.
- directly observed the results of the candidate's work.
- received reliable reports from those who have directly observed the candidate's work.
- observed the candidate's ability to supervise others who are doing this work.

Verifier's Statement:

I certify that:

- I understand and have carefully considered each general and specific performance and/or project that I have verified or will verify.
- I have not verified, and will not verify, any performance measure or task that I have not either personally observed or received reliable and specific reports from one who has personally observed the performance.
- I have not signed, and will not sign, any verification statement on a form that does not have the candidate's name at the top.
- I have not asked nor will I ask anyone to sign my name in my stead.

Signature _____ Date _____

Candidate: _____

Candidate Id Number: _____

**NICHMA Program Application
Part II - Performance Verification (Levels I and II)**

Instructions to the Verifier: For each performance measure listed, please write your initials in the appropriate column to indicate whether you have witnessed the candidate demonstrate proper performance of the task.		Has the candidate demonstrated proper performance of the task?		
		yes	no	I cannot determine.
Level I				
1001	The candidate has demonstrated an ability to measure temperature of HMA.			
1002	The candidate has demonstrated an ability to measure the thickness of loose or compacted HMA			
1003	The candidate has demonstrated an ability to perform sampling and handling of loose HMA samples.			
1004	The candidate has demonstrated an ability to perform smoothness testing of HMA pavement using a straightedge.			
1005	The candidate has demonstrated an ability to perform nuclear density testing.			
1006	The candidate has demonstrated an ability to perform sampling and handling of compacted HMA samples.			
1007	The candidate has demonstrated awareness of identifying good HMA properties.			
1008	The candidate has demonstrated awareness of existence of basic anomalies.			
1009	The candidate has demonstrated the ability to properly use and maintain sampling and testing equipment.			
1010	The candidate has demonstrated the ability to follow safety and security practices and report unsafe practices on the job site.			

Level II				
2001	The candidate has demonstrated the ability to inspected haul vehicle operations as required.			
2002	The candidate has demonstrated the ability to properly inspect tack coat application.			
2003	The candidate has demonstrated the ability to inspect surface preparation prior to HMA paving operations.			
2004	The candidate has demonstrated the ability to inspect proper paver operation.			
2005	The candidate has demonstrated the ability to effectively monitor HMA compactor operation and roller pattern.			
2006	The candidate has demonstrated the ability to measure and collect random samples of Airfield HMA Pavement.			
2007	The candidate has demonstrated the ability to competently inspect longitudinal and transverse joint construction.			
2008	The candidate has demonstrated the ability to competently determine correlation based on nuclear gauge and core densities.			
2009	The candidate has demonstrated ability to competently measure smoothness using the profilograph.			
2010	The candidate has demonstrated awareness of basic HMA mix design procedures.			
2011	The candidate has demonstrated the ability to report anomalies and non-conformance to specifications for Level I and II tasks.			
2012	The candidate has demonstrated the ability to inspect and maintain sampling and testing equipment.			
2013	The candidate has demonstrated the ability to identify and address basic safety concerns.			
2014	The candidate has demonstrated the ability to provide on the job training for Level I technicians in inspection, testing, safety and other related duties and responsibilities.			

Verifier Name: _____

Verifier Signature: _____

Candidate: _____

Candidate Id Number: _____

**NICHMA Program Application
Part II - Performance Verification (Levels III and IV)**

Instructions to the Verifier: For each performance measure listed, please write your initials in the appropriate column to indicate whether you have witnessed the candidate demonstrate proper performance of the task.		Has the candidate demonstrated proper performance of the task?		
		yes	no	I cannot determine.
Level III				
3001	The candidate has demonstrated the ability to evaluate HMA plant, transportation, placement and compaction operations.			
3002	The candidate has demonstrated an understanding of the relationship of rolling operation to mat compaction.			
3003	The candidate has demonstrated the ability to inspect and evaluate stockpile management operations			
3004	The candidate has demonstrated the ability to verify plant operations.			
3005	The candidate has demonstrated the ability to determine segregation profile.			
3006	The candidate has demonstrated the ability to measure smoothness using the profilograph.			
3007	The candidate has analyzed data collected on smoothness to establish corrective measures.			
3008	The candidate has demonstrated the ability to explain relationships between HMA mix properties and mix design requirements.			
3009	The candidate has demonstrated the ability to evaluate, verify, accept and reject Level I, II and III field test results and inspection reports.			
3010	The candidate has demonstrated the ability to verify calibration and proper working condition of all equipment used in airport HMA field testing and inspection.			
3011	The candidate has demonstrated the ability to recognize safety and security violations and recommend safety action.			
3012	The candidate has demonstrated the ability to assist with the management of multiple or complex projects.			
3013	The candidate has demonstrated the ability to coordinate field inspection and testing operations.			
3014	The candidate has demonstrated the ability to provide formal and on the job training in HMA field inspection, testing and safety tasks to Level I, II technicians.			

Level IV				
4001	The candidate has demonstrated the ability to recognize the need for HMA mix design adjustments.			
4002	The candidate has demonstrated the ability to establish troubleshooting protocols and documentation procedures.			
4003	The candidate has demonstrated the ability to manage testing and inspection equipment inventory.			
4004	The candidate has repeatedly demonstrated a consistent ability to determine, coordinate, and implement the training, communication, facility, and monitoring elements required as parts of an adequate safety program.			
4005	The candidate has repeatedly demonstrated the ability to maintain the quality of processes and personnel in order to maintain field competence.			
4006	The candidate has demonstrated the ability to establish field testing programs and schedules.			
4007	The candidate has demonstrated the ability to monitor changes in standards and specifications to assure that asphalt field testing and inspection procedures are in conformance as required.			
4008	The candidate has demonstrated the ability to manage field inspection and testing operations projects.			
4009	The candidate has demonstrated the ability to develop /manage a plan for test/trial section approval process and JMF adjustments.			
4010	The candidate has demonstrated the ability to establish and manage a training program for HMA Airport field inspection and testing technicians			

Verifier Name: _____ Verifier Signature: _____

Airfield HMA Placement Operations Inspection and Field Testing Technician Training Competencies - Level I

Domain: Inspection of Airfield HMA Placement Operations	
Measure Temperature of HMA	<ul style="list-style-type: none"> • Proper procedures for using a dial-and-armored-stem thermometer. • Proper procedures for using a gun-type infrared thermal meter. • Performing calibration checks on gun-type infrared thermal meters. • Reference: Principles of Construction of Hot-Mix Asphalt Pavements: 146-7
Measure Thickness of Loose or Compacted HMA	<ul style="list-style-type: none"> • Proper use of apparatus (metal tape or rule, set of calipers, jig) to measure thickness • Recognizing acceptable samples (properly cored/sawed and free of foreign materials) • Proper measuring procedures according to ASTM D 3549 • Basic mathematical calculations (determining volume according to D-1 188 or D 2726, calculate average thickness) • Applicable measurement units/subdivisions according to ASTM D 3549 • Interpretation of agencies' specifications for HMA thickness • Reference: ASTM 3549: 328-9
Domain: Field Testing of Airfield HMA Pavement	
Perform Sampling and Handling of Loose HMA	<ul style="list-style-type: none"> • Proper procedures for obtaining samples of loose HMA in accordance with ASTM D 979 at various points in storage, transport, and construction (i.e. from a funnel device feeding a conveyor for mixture delivery to storage, from a conveyor belt, from a skip conveyor delivering mixture to bin storage, from bituminous cold mix stockpiles, from truck transports, from the roadway prior to compaction) • Determining the number of samples required and the recommended quantity of each sample • Interpretation of agency specifications • Reference ASTM D 979
Perform Smoothness Testing Using Straight Edge	<ul style="list-style-type: none"> • Proper technique for using a straightedge to measure pavement smoothness (in compliance with standards and/or agency specifications) • Identification of waves and irregularities on pavement • Interpret agency specification tolerances for smoothness irregularities
Perform Nuclear Density Testing	<ul style="list-style-type: none"> • Mathematic calculations (density) • Knowledge of radioactive materials safety hazards and proper radiation safety procedures • Proper nuclear gauge testing techniques (backscatter, direct transmission) in accordance w/ ASTM D 2950 • Calibration/standardization of nuclear density gauge • Interpretation of manufacturer instructions for equipment calibration • Reporting of information required in ASTM D2950 (Section 11) • Reference: ASTM D 2950
Perform Sampling and Handling of Compacted HMA Samples	<ul style="list-style-type: none"> • Proper procedures for obtaining samples in accordance with ASTM D 979 from roadway after compaction (Sec. 5.2.6) • Proper removal of core samples from compacted roadway in accordance with ASTM D 5361 • Proper operation of a core drill or power saw • Accepted practices for filling core holes • Reference ASTM D 979
Domain: HMA Mixture Characteristics	
Demonstrate Awareness of Good Mix Properties	<ul style="list-style-type: none"> • Familiarity with different types of hot mixes (dense graded, open graded, gap graded) and their characteristics • Familiarity with aggregate properties (i.e. shape, surface texture, maximum particle size, absorption, gradation, voids, VMA) and how they affect the final mix • Understanding of how penetration and temperature affect mix stiffness • Understanding of potential differences between mixes produced in the laboratory and mixes produced in a batch or drum mix plant • Reference: Hot-Mix Asphalt Paving Handbook: 10-23
Domain: Troubleshooting	
Demonstrate Awareness of Existence of Basic Anomalies	<ul style="list-style-type: none"> • Basic knowledge of test procedures and their ranges of acceptable results • Interpretation of standards and agency specifications • Documentation and reporting of test results
Domain: Care and Maintenance of Testing and Inspection Equipment	
Properly Use and Maintain Sampling and Testing Equipment	<ul style="list-style-type: none"> • Basic knowledge of test procedures and their associated equipment • Interpretation of manufacturer instructions for equipment operation and maintenance • Ability to follow verbal and written instructions for equipment care
Domain: Worksite Safety and Security	
Follow Safe Practices / Safety and Security Plan and Report Unsafe Practices on The Job Site	<ul style="list-style-type: none"> • Understanding of airport safety regulations • Understanding of basic individual safety practices • Ability to follow written and verbal instructions • Basic first aid • Ability to recognize and report safety violations

Airfield HMA Placement Operations Inspection and Field Testing Technician Training Competencies - Level II

Domain: Inspection of Airfield HMA Placement Operations	
Inspect the Haul Vehicle Operation	<ul style="list-style-type: none"> • Visual inspection of all surfaces that come in contact with asphalt mixture (to ensure they are clean, smooth, and free of cracks, holes, and dents) • Acceptable procedures and chemical solutions for coating truck beds • Acceptable cover and/or insulation types based on weather and holding time in truck • Ref: Hot-Mix Asphalt Paving Handbook: 118-119 and Asphalt Paving Manual: 49
Inspect Tack Coat Application	<ul style="list-style-type: none"> • Determining proper application rates (considering amount of water in asphalt emulsion and the amount of diluent material in cutback asphalt) • Basic mathematical calculations • Inspection of surface for cleanliness and evenness • Proper curing times • Traffic control • Reference: Hot Mix Asphalt Paving Handbook: 126-129
Inspect Surface Preparation	<ul style="list-style-type: none"> • Inspection of surface to verify adequate leveling of low spots and/or cold planing of high spots • Inspection of existing surface for failures • replacement and/or patching of failures • Sealing cracks in the existing asphalt pavement surface • Applying surface treatment to the entire roadway area • Cleaning of surface of dust, dirt, and other debris with mechanical broom, air flushing, and water flushing • Reference: Hot Mix Asphalt Paving Handbook 128-129
Inspect the Paver Operation	<ul style="list-style-type: none"> • Truck and screed components (including push rollers, paver hopper, material flow gates, twin slot conveyors, and augers) and their functions • Mix amount minimum and/or maximum requirements of the various paver components • Proper cleaning and removal of mix from components during operation • Reference: Hot Mix Asphalt Paving Handbook 130-151
Monitor Compactor Operation and Roller Pattern	<ul style="list-style-type: none"> • Appropriate uses and conditions for static (steel-tired, pneumatic-tired) and vibratory rollers • Maintenance and safety checks of roller components • Recommended ground contact pressures for pneumatic-tired rollers, and the role of tire size, ply rating, wheel load, and tire inflation pressures • Effects of vibratory roller frequency and amplitude on mix in various conditions. • Mathematical calculations related to vibratory rollers (centrifugal force, frequency, amplitude) • Reference: Asphalt Paving Manual 39-47
Domain: Field Testing of Airfield HMA Pavement	
Measure and Collect Random Samples and Perform Tests	<ul style="list-style-type: none"> • Procedures for selecting sampling locations or times as described in ASTM 3665 • Calibration/inspection of test equipment • Proper lab testing techniques • Basic mathematical calculations • Collection of preliminary sample data as required by test method • Reporting of test results • Sample forms and test reports completion • Submittal of test results for review
Inspect Longitudinal and Transverse Joint Construction	<ul style="list-style-type: none"> • Inspection of butt joints, tapered joints (paper, board, sawed), handmade joints • Proper construction techniques for various joint types • Measuring overlap length and height in longitudinal joints • Proper performance of longitudinal joint raking • Traffic control needs • Ref: Hot Mix Asphalt Paving Handbook 163-174
Determine Correlation Based on Nuclear Gauge and Core Densities	<ul style="list-style-type: none"> • Proper nuclear gauge testing techniques (backscatter method and direct transmission method) in accordance with ASTM D 2950 • Interpreting nuclear method test results and converting them to actual density by comparing them with the results of other test methods (i.e. ASTM D 1188 or ASTM D 2726)
Measure Smoothness Using Profilograph	<ul style="list-style-type: none"> • Proper procedure in accordance with ASTM E 1274 for using a profilograph to measure pavement smoothness • Knowledge of profilograph types (uniformly spaced wheels, non-uniformly spaced wheels) and their components (i.e. blanking band template, excessive height template) • Calibration of profilograph equipment • Basic mathematics (roughness calculations) • Analytical geometry (interpreting sine wave graph results) • Recording of test results (ASTM E 1274 Section 11)

(Level II Training Competencies, continued)

Domain: HMA Mixture Characteristics	
Demonstrate Awareness of Basic HMA Mix Design Procedures	<ul style="list-style-type: none"> • Mathematical calculations • Properties of typical mix design components • The effects of component properties, component proportions, and air void content on the mix's physical properties • Marshall Method test procedures (determination of the bulk specific gravity, measurement of Marshall stability of flow, and analysis of specimen density and voids content) • Calculating optimum asphalt cement content (Marshall Method) • Superpave mix design (aggregate selection, asphalt binder selection, sample preparation, performance tests, density and voids calculations, optimum asphalt binder content selection, moisture susceptibility evaluation) • Effects of climate and aging on the mix's performance over time (Superpave method) • Ref: Hot-Mix Asphalt Paving Handbook: 1-19 [Marshall] • Ref: WSDOT Pavement Guide: 5: Mix Design. [Superpave]
Domain: Troubleshooting	
Report Anomalies and Non-Conformance to Specification on Level I and Level II Tasks	<ul style="list-style-type: none"> • Knowledge of test procedures and their ranges of acceptable results • Interpretation of standards and agency specifications • Interpreting and analyzing test results and reporting findings • Maintenance of records of results • Knowledge of mat problems, their causes, and prevention/solution • Reference: Hot-Mix Asphalt Paving Handbook: 194-212
Domain: Care and Maintenance of Testing and Inspection Equipment	
Inspect and Maintain Sampling and Testing Equipment	<ul style="list-style-type: none"> • Interpreting manufacturer's literature • Test procedures and related equipment and technologies • Proper equipment operation, maintenance, and storage procedures • Recognizing equipment problems and their effect on test results
Domain: Worksite Safety and Security	
Identify and Address Basic Safety and Security Concerns	<ul style="list-style-type: none"> • OSHA worksite safety standards • Interpreting field plans and lab layout floor plans • Documenting incidents and injuries per OSHA regulations • Preventing OSHA safety violations
Domain: Training	
Provide On-the-Job Training for Level I Technicians in Inspection, Testing, Safety, and Job Responsibilities	<ul style="list-style-type: none"> • Effective written and verbal communication skills • Proper testing and inspection procedures • Proper use of testing and inspection equipment • Recording and reporting test results • Basic safety requirements

Airfield HMA Placement Operations Inspection and Field Testing Technician Training Competencies - Level III

Domain: Inspection of Airfield HMA Placement Operations	
Evaluate Plant, Transportation, Placement, and Compaction Operations	<ul style="list-style-type: none"> • Quality control • Troubleshooting • Knowledge of plants, placement methods, and equipment • Auditing skills
Relationship of Rolling Operation to Mat Compaction	<ul style="list-style-type: none"> • Basic mathematics (calculate density, air void content) • Lab tests procedures for determining theoretical maximum density • Knowledge of ASTM Test Method D2041 for determining Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures (Rice test) • Knowledge of different roller types (static steel wheel, pneumatic, vibratory) and the recommended procedures for using each • Adjustment of roller components and settings (i.e. roller position, tire pressure) to achieve desired results • Knowledge of how operator's methodology (i.e. speed, number of roller passes, rolling zone, rolling pattern, rolling direction) influences compaction • Knowledge of mat problems (i.e. short durability, mixture shoving and rutting) caused by poor mix compaction and how to solve/prevent these problems • Reference: Hot-Mix Asphalt Paving Handbook: 175, 180-193, 211-212
Aggregate Stockpile Management	<ul style="list-style-type: none"> • Knowledge of different plant types, their processes, and their equipment • Proper environment and methods for stockpiling aggregate • Determining and monitoring moisture content • Techniques for reducing moisture content and preventing segregation • Reference: Hot-Mix Asphalt Paving Handbook: 50-51
Verify Plant Operation	<ul style="list-style-type: none"> • Knowledge of different plant types (i.e. batch, parallel-flow drum-mix, counter-flow drum-mix), their components, and their accepted operation procedures • Knowledge of acceptable storage techniques and environments • Reference: Hot-Mix Asphalt Paving Handbook: 41-49
Domain: Field Testing of Airfield HMA Pavement	
Determine Segregation Profile	<ul style="list-style-type: none"> • Knowledge of techniques typically used to determine segregation (thermal imaging, gradation, density, texture, visual) • Basic mathematic calculations • Visual inspection of HMA to identify areas of segregation • Knowledge of how paver equipment and operation contributes to segregation • Interpretation of ASTM standards and agency specifications to determine test frequency requirements, sample locations, and distance intervals
Manage and Analyze Data Collected on Smoothness to Establish Corrective Measures	<ul style="list-style-type: none"> • Interpretation of standards and agency specifications to determine acceptable smoothness tolerances • Procedures for measuring smoothness (in compliance with standards and agency specifications) • Acceptable procedures for removing deficient areas and replacing with new material (in compliance with standards and agency specifications) • Reference: FAA P401
Measure Smoothness by Profilograph	<ul style="list-style-type: none"> • Proper procedure in accordance with ASTM E 950 for using a profilograph to measure pavement smoothness • Knowledge of the test vehicle operation and components (i.e. accelerometer, displacement transducer, distance transducer, driver speed display, systems outputs display, storage device, marking equipment to identify locations and events) • Proper calibration of equipment • Interpretation of profilograph results • Understanding of precision and bias • Reporting and submitting information
Domain: HMA Mixture Characteristics	
Explain Relationship Between Mix Properties and Mix Design Requirements	<ul style="list-style-type: none"> • Causes of segregation and its ability to increase air void content • How temperature variances in the plant or paver can contribute to nonuniform texture and nonuniform density • How a low VMA or uneven temperature within a layer of HMA mix can contribute to checking during compaction • General knowledge of mat problems and their causes and solutions • Visual inspection of mixture prior to and during compaction • Interpretation of HMA test results • Reference: Hot-Mix Asphalt Paving Handbook: 194-212

(Level III Training Competencies, continued)

Domain: Troubleshooting	
Verify, Accept or Reject Level I, II and III HMA Field Test Results and Inspection Reports	<ul style="list-style-type: none"> • Interpretation of testing standards and agency/project specifications • Analyzing test results; recognizing and troubleshooting problems • Understanding of how various mix problems affect compaction and the HMA's durability • Understanding of how plant and field operations affect job cost, scheduling, and safety • Communicating mix problems to materials testing technicians • Reporting recommendations to supervisor • Knowledge of mat problems, their causes, and prevention/solution • Reference: Hot-Mix Asphalt Paving Handbook: 194-212
Domain: Care and Maintenance of Testing and Inspection Equipment	
Verify Calibration and Proper Working Conditions of All Equipment Used in Airport HMA Field Testing and Inspection	<ul style="list-style-type: none"> • Knowledge of testing procedures and their associated equipment • Understanding of standards' recommendations and/or agency requirements for equipment calibration • Proper documentation of equipment calibration information • Ability to identify and resolve equipment problems
Domain: Worksite Safety and Security	
Recognize Safety and Security Violations and Recommend Safety Actions	<ul style="list-style-type: none"> • Understanding of federal and local safety requirements • Recognizing and properly documenting worksite safety violations • Providing safety instruction and training to Level I and Level II technicians
Domain: Management	
Assist With the Management of Multiple or Complex Projects	<ul style="list-style-type: none"> • Knowledge of all Level I and II test procedures and their related equipment and standards • Interpretation of project specifications and contract documents • Supervision of lower-level employees; mentoring subordinates; resolving conflicts • Obtaining and maintaining proper documentation of test results and other information • Verbal and written reporting to supervisors and other project parties • Creation of and interpretation of project schedules (use of project management software) • Scheduling equipment usage and ensuring proper equipment operation, calibration, and maintenance • Scheduling of employees for appropriate tasks based on their technical skills; providing training • Enforcement of safety procedures • Organization management tasks (i.e. payroll, supplies) • Quality control procedures • Reference: Hot-Mix Asphalt Paving Handbook 7-13
Coordinate Field Inspection and Testing Operations	<ul style="list-style-type: none"> • Knowledge of all Level I and II test procedures and their related equipment and standards • Ability to identify tests that are necessary for a project's goals • Scheduling equipment usage and ensuring proper equipment operation, calibration, and maintenance • Ability to interpret and adhere to project schedule, and make adjustments for contingencies • Effective written and verbal communication with owner/customer and other parties on the project • Customer relations / public image skills
Domain: Training	
Provide Formal and On-The-Job Training on HMA Field Inspection and Testing and Safety to Level I and II Technicians	<ul style="list-style-type: none"> • Providing effective written and verbal (lectures, demonstrations, hands-on) instructions and on-the-job training in the areas of safety, testing procedures, and equipment calibration and maintenance • Effective verbal and nonverbal communication skills; ability to provide feedback during training • Ability to determine employees' training needs and gauge their progress • Verifying that the employee has learned the training material • Preparing instructional materials (manuals, booklets)

Airfield HMA Placement Operations Inspection and Field Testing Technician Training Competencies - Level IV

Domain: HMA Mixture Characteristics	
Recognize Need for HMA Mix Design Adjustments	<ul style="list-style-type: none"> • Mathematical calculations • Mix design development • Typical mix design components and how percentage affects overall performance • Mix design testing in accordance with AASHTO/ASTM standards • Effects of climate and aging on mix's performance over time (Superpave method) • Superpave mix design (aggregate selection, asphalt binder selection, sample preparation, performance tests, density and voids calculations, optimum asphalt binder content selection, moisture susceptibility evaluation) • Ref: Principles of Construction of Hot-Mix Asphalt: 70-79 • Ref: WSDOT Pavement Guide: 5: Mix Design. [Superpave]
Domain: Troubleshooting	
Establish Troubleshooting Protocol and Documentation Procedures	<ul style="list-style-type: none"> • Quality control enforcement • Test and inspection procedures • Interpreting project specifications • Risk management principles • Identifying and managing costs related to testing and inspection operations • Costs and legal liabilities of improper operations • Testing and inspection documentation and reporting
Domain: Care and Maintenance of Testing and Inspection Equipment	
Manage Testing and Inspection Equipment Inventory	<ul style="list-style-type: none"> • Test procedures and related equipment and technologies • Schedule preparation and implementation • Quality control practices and implementation
Domain: Worksite Safety and Security	
Determine, Coordinate, and Implement the Training, Communication, Facility, and Monitoring Elements Required as Parts of an Adequate Safety Program	<ul style="list-style-type: none"> • Designing and administering safety training programs • Effective verbal and written communication of safety regulations • In-house posting/reporting of OSHA safety information • OSHA procedures for documenting and reporting injuries • Correcting OSHA safety violations

(Level IV continued on the next page)

(Level IV Training Competencies, continued)

Domain: Management	
Maintain the Quality of Processes and Personnel in Order to Maintain Field Competence	<ul style="list-style-type: none"> • Documentation and recordkeeping of accreditation activities • Quality control procedures enforcement • Relevant certification areas/levels and their role in measuring staff members' competency • Certification maintenance as recommended/required by standards, specifiers, jurisdictions, etc. • Continuing professional development of staff members
Establish Field Inspection and Testing Program and Schedule	<ul style="list-style-type: none"> • Various test methods and procedures and their time and setting requirements • Staff scheduling and project scheduling • Project management software • Creating and interpreting critical path method charts and Gantt charts to identify relationships between the work flow's tasks and resources
Monitor Changes in Standards and Specifications to Assure That HMA Field Testing and Inspection Procedures are in Conformance	<ul style="list-style-type: none"> • Interpreting and monitoring changes in relevant industry standards • Communicating standards changes to employees and providing relevant training • Producing and maintaining in-house literature (employee manuals / SOPs) to conform with changes in standards
Project Management for Field Inspection and Testing Operations	<ul style="list-style-type: none"> • Using Project Management software to create and monitor schedules • Effective verbal and written communication with employees, other contractors, customers, specifiers, and the public • Preparing and distributing progress reports to project stakeholders • Financial calculations • Budget preparation and monitoring • Preparation, maintenance, and storage of contract documents • Coordinating scheduling with other contractors • Supervising and motivating employees • Providing training and mentoring for employees • Reference: Hot-Mix Asphalt Paving Handbook 7-13
Develop and Manage a Plan for Test/Trial Section Approval Process and HMA JMF Adjustments	<ul style="list-style-type: none"> • Test procedures and methods • Standards relevant to testing • Documenting and reporting inspection and testing results
Domain: Training	
Establish and Manage a Training Program for Airport HMA Field Inspection and Testing Technicians	<ul style="list-style-type: none"> • Different learning styles and motivational techniques • Instructional methods that foster learning and retention • Preparation of instructional materials • Measuring trainees' learning and documenting their progress • Analyzing performance of training program • Encouraging employees' continuing professional development

Program References

The following are specific program references that may help candidates prepare for the exam:

- * The Asphalt Handbook (MS-4, 7th edition). The Asphalt Institute. Lexington, KY.
- * Asphalt Overlays for Highway and Street Rehabilitation (MS-17), The Asphalt Institute. Lexington, KY.
- * Asphalt Pocketbook of Useful Information (MS-6). The Asphalt Institute. Lexington, KY.
- * Bituminous Tack Coat, Standards for Specifying Construction of Airports (P-603, AC No.: 150/5370-10C), Federal Aviation Administration, US Department of Transportation, 800 Independence Avenue, SW, Washington, DC 20591 (http://www.faa.gov/airports_airtraffic/airports/resources/advisory_circulars/; phone: 1-866- 835-5322)
- * Compaction and Paving Theory and Practice, Dynapac Publication no. HC 111-2, Malmo, Sweden.
- * Construction of Hot-Mix Asphalt Pavements (MS-22, 2nd edition). The Asphalt Institute. Lexington, KY.
- * Establishing and Implementing a Quality System for Construction Materials Testing Laboratories (AASHTO: R 18), Standard Specifications for Transportation Materials and Methods of Sampling and Testing (Part IB: Specifications). American Association of State Highway and Transportation Officials. Washington, D.C. (phone: 1-888-227-4860 fax: 202-624-5469)
- * First Aid and Personal Safety Reference Guides, American Red Cross National Headquarters, 2025 E Street, NW , Washington, DC 20006 (www.redcross.org; phone: (703-206-6000)
- * Flexible Surface Courses, Standards for Specifying Construction of Airports (P-401, AC No.: 150/5370-10C), Federal Aviation Administration, US Department of Transportation, 800 Independence Avenue, SW, Washington, DC 20591 (http://www.faa.gov/airports_airtraffic/airports/resources/advisory_circulars/; phone: 1-866- 835-5322).
- * General Requirements for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025). International Organization for Standards, 2005.
- * A Guide for Hot Mix Asphalt Pavement (CD-ROM). National Asphalt Pavement Association. Lanham, MD.
- * Hot Mix Asphalt Airport Construction Best Practice Manual (AAPT Project 05-01), Airfield Asphalt Pavement Technology Program, [Federal Aviation Administration](#) and [Auburn University](#) (Completion expected by 7-1-2008).
- * Hot-Mix Asphalt Materials, Mixture Design, and Construction. National Asphalt Pavement Association. Lanham, MD.
- * Hot-Mix Asphalt Paving Handbook 2000 (2nd edition). National Asphalt Pavement Association. Lanham, MD.
- * Introduction to Asphalt (MS-5). The Asphalt Institute. Lexington, KY.

- * Mix Design Methods (MS-2, 6th edition). The Asphalt Institute. Lexington, KY.
- * Safety and Health Regulation for Construction (29 CFR Part 1926). Occupational Safety and Health Administration (OSHA). US Department of Labor. Government Printing Office. Washington, D.C.
- * Standard Practice for Estimating Application Rate of Bituminous Distributors (ASTM D 2995-99), Annual Book of ASTM Standards. American Society for Testing and Materials. Philadelphia, PA.
- * Standard Practice for Random Sampling of Construction Materials (ASTM D 3665-06), Annual Book of ASTM Standards. American Society for Testing and Materials. Philadelphia, PA.
- * Standard Practice for Sampling Bituminous Materials (ASTM D 140-01), Annual Book of ASTM Standards. American Society for Testing and Materials. Philadelphia, PA.
- * Standard Practice for Sampling Bituminous Paving Mixtures (ASTM D 979-01), Annual Book of ASTM Standards. American Society for Testing and Materials. Philadelphia, PA.
- * Standard Practice for Sampling Compacted Bituminous Mixtures for Laboratory Testing (ASTM D 5361-06), Annual Book of ASTM Standards. American Society for Testing and Materials. Philadelphia, PA.
- * Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods (ASTM D 2950-05), Annual Book of ASTM Standards. American Society for Testing and Materials. Philadelphia, PA.
- * Standard Test Method for Measuring the Longitudinal Profile of Traveled Surfaces with an Accelerometer Established Inertial Profiling Reference (ASTM E 950-98), Annual Book of ASTM Standards. American Society for Testing and Materials. Philadelphia, PA.
- * Standard Test Method for Measuring Pavement Macrotexture Depth Using a Volumetric Technique (ASTM E 965-96), Annual Book of ASTM Standards. American Society for Testing and Materials. Philadelphia, PA.
- * Standard Test Method for Measuring Pavement Roughness Using a Profilograph (ASTM E 1274-03), Annual Book of ASTM Standards. American Society for Testing and Materials. Philadelphia, PA.
- * Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens (ASTM 3549-03), Annual Book of ASTM Standards. American Society for Testing and Materials. Philadelphia, PA.
- * Superpave Mix Design (SP-2, 3rd edition), The Asphalt Institute. Lexington, KY.
- * TCCC Hot-Mix Asphalt Construction (NHI Course No.: 131032), National Highway Institute, Federal Highway Administration, US Department of Transportation, 4600 North Fairfax Drive Suite 800, Arlington, Virginia 22203
(<http://www.nhi.fhwa.dot.gov/Home.aspx>; phone: 703-235-0500 and 1-877-558-6873; fax: 703-235-0593)
- * The Virtual Superpave Laboratory (CD-ROM). National Asphalt Pavement Association. Lanham, MD.
- * WSDOT Pavement Guide: 5: Mix Design. Washington State Department of Transportation.
(http://training.ce.washington.edu/wsdot/Modules/05_mix_design/05-5_body.htm)

Training Resources

The following are general resources that may help candidates identify relevant classroom or web-based training programs or study material to prepare for the exam, expand their industry knowledge and/or enhance their professional development activity:

- * Advisory Circulars, Regulations and Guidelines, Federal Aviation Administration, US Department of Transportation, 800 Independence Avenue, SW, Washington, DC 20591 (http://www.faa.gov/airports_airtraffic/airports/resources/advisory_circulars/, phone: 1-866-TELL-FAA 835-5322)
- * The American Society of Civil Engineers. 1801 Alexander Bell Drive, Reston, Virginia 20191. (www.asce.org; phone: 800-548-2723; fax: 703-295-6222)
- * The Asphalt Institute. 2696 Research Park Drive, Lexington, Kentucky 40511 (www.asphaltinstitute.org; phone: 859-288-4960; fax: 859-288-4999)
- * Multi-Regional Training and Certification - MTRAC, (<http://rebar.ecn.purdue.edu/Superpave/M-TRAC/index.htm>).
- * National Asphalt Pavement Association. 5100 Forbes Blvd. Lanham, Maryland 20703 (www.hotmix.org; phone: 888-HOT-MIXX (468-6499); fax: 301-731-4621)
- * National Highway Institute (NHI), Federal Highway Administration, US Department of Transportation, 4600 North Fairfax Drive Suite 800, Arlington, Virginia 22203 (<http://www.nhi.fhwa.dot.gov/Home.aspx>; phone: 703-235-0500 and 1-877-558-6873; fax: 703-235-0593)
- * National Stone, Sand and Gravel Association (NSSGA), 1605 King Street, Alexandria, Virginia 22314 (www.nssga.org; phone: 703-525-8788).
- * New England Transportation Technician Certification Program – NETTCP (www.nettcp.com; phone: 781-837-2680, fax: 781-837-2683).
- * Northeast Center of Excellence for Pavement Technology - NECEPT, Pennsylvania Transportation Institute, 201 Transportation Research Building, University Park, PA 16802 (www.superpave.psu.edu; phone: 814-866-1320)
- * Resources and Training, National Local Technical Assistance Program / LTAP (<http://www.ltapt2.org/resources>).
- * Southeast Task Force for Technician Training and Qualification, Florida Department of Transportation, State Materials Office, 5007 N.E. 39th Avenue, Gainesville, FL 32609 (www.dot.state.fl.us/statematerialsoffice/setaskforce; phone: 352-955-6600)
- * Standard Specifications for Transportation Materials and Methods of Sampling and Testing (Parts IA and IB: Specifications and Parts IIA and IIB: Tests). American Association of State Highway and Transportation Officials. Washington, D.C. (<http://www.transportation.org>; phone: 1-888-227-4860, fax: 202-624-5469)

- * Transportation Curriculum Coordination Council (TCCC), Federal Highway Administration, US Department of Transportation, 1200 New Jersey Avenue, SE Washington, DC 20590 (<http://www.nhi.fhwa.dot.gov/tccc/>; phone: 202-366-2023)
- * US Army Corps of Engineers, 441 G Street NW, Washington DC 20314 (www.usace.army.mil; phone: 202 761 0008).
- * USACE Learning Center, P.O. Box 1600, Huntsville, Alabama 35708-4301 (<http://ulc.usace.army.mil>; phone: 256-895-7424; fax: 256-895-7425)
- * U.S. Nuclear Regulatory Commission (NRC), Washington, DC 20555-0001 (www.nrc.gov; phone: 1-800-368-5642, 301-415-7000).
- * Western Alliance for Quality Transportation Construction - WAQTC, (www.waqtc.org).
