

**NDSU**

UPPER GREAT PLAINS TRANSPORTATION INSTITUTE  
TRANSPORTATION LEARNING NETWORK

## **Self-Paced Learning Module Catalog**

June, 2017

<http://translearning.org>

<http://tln.learnflex.net>

**Transportation**  
**Learning Network**

A partnership with  
MDT, NDDOT, SDDOT, WYDOT and the  
Mountain-Plains Consortium Universities

## **ATSSA: Safe Installation and Removal of Temporary Traffic Control Devices**

Learning Hours = 1

This course describes methods to safely install and remove Temporary Traffic Control (TTC) devices.

## **ATSSA: Work Zone Safety Performance Measures**

Learning Hours = 1

This training covers how to develop work zone performance measures, the rationale for using performance measures for work zone safety, and performance measurement technology.

## **Bridge Construction Inspection: Heavy Equipment**

Learning Hours = 1

The Bridge Construction Inspection Heavy Equipment training presents the various types of heavy equipment used on bridge construction sites. The purpose, major parts, and safety tips are described for the following equipment: bulldozers, scrapers, dump trucks, loaders, backhoe excavators, trackhoe excavators, motor graders, cranes, forklifts, cherry pickers and personnel lifts.

## **Bridge Site Safety Worker Orientation**

Learning Hours = 1

The Bridge Site Safety Worker Orientation discusses the safety responsibilities and potential hazards on bridge construction sites.

## **Handling and Storage of Reinforcing Steel**

Learning Hours = .5

This training module will give you a better understanding of how to identify, handle and store both treated and untreated reinforcing steel.

## **Introduction to NDDOT Construction Automated Records System (CARS)**

Learning Hours = 1.5

This software demonstration provides an introduction and overview to the North Dakota Department of Transportation's Construction Automated Records System (CARS). This training includes Rights and Login, Navigation, Project Diary, Pay Quantity, Progressive Estimate, Contract Adjustment and Change Order.

## **Materials Testing Series**

### Introduction to the Soil-Moisture Density Relationship

Learning Hours = .5

This short module introduces the learner to the modules on the soil moisture-density relationship and soil drying methods.

### Lightweight Pieces in Aggregate

Learning Hours = 1

This module covers the test method to determine the percentage of lightweight pieces in aggregate by means of a sink-float separation in a heavy liquid. It includes:

- Why you perform the Lightweight Pieces in Aggregate Test
- Equipment used
- Obtaining the sample
- Conducting the test
- Calculating the percentage of lightweight pieces in the aggregate
- Resources including an example aggregate form and links to useful websites

## Microwave and Oven Methods of Drying Soils

Learning Hours = .5

This module covers the process of determining the total moisture content of a soil using a microwave or an oven. Each section explains when you would normally use the method, the equipment you need for that particular method, and how to conduct the procedure. It also shows how to calculate and record the moisture content.

### Proctor Test

Learning Hours = 1

This module covers the process of determining the maximum dry density and optimum moisture content of soils using AASHTO T 180 Method A.

### Proctor Test Short Version

Learning Hours = 1

This module covers the process of determining the maximum dry density and optimum moisture content of soils using AASHTO T 180 Method A. It is a shorter version of the Proctor Test module.

### Reducing Aggregate Samples

Learning Hours = 1

This course covers mechanical splitting and quartering of aggregates, including information on sampling, particle and sieve sizes.

### Rubber-Balloon Test

Learning Hours = .5

This module will give the learner a basic understanding of the Rubber-Balloon test. The Rubber-Balloon test results and moisture content of the soil are used to verify the acceptability of the contractor's compactive effort, so it is recommended learners also complete the Speedy Moisture and Proctor modules.

## Sand Cone Test

Learning Hours = 1

This module covers the process used to measure the in-place density of compacted soil using the Sand Cone test.

## Sieve Analysis of Fine and Coarse Aggregates

Learning Hours = 1

This module covers the test method to determine the particle size distribution of fine and coarse aggregates by sieving. It includes:

- Why you perform the Sieve Analysis
- Equipment used
- Obtaining the sample
- Conducting the test
- Calculating the particle size distribution of fine and coarse aggregates by sieving
- Resources including an example aggregate form and links to useful websites

## Speedy Moisture Test

Learning Hours = .5

This module covers the process of measuring the moisture content of soils using the Speedy Moisture test. The module is based on a 26-gram test.

## Wash Test

Learning Hours = 1

This module covers the test method to determine the amount of material finer than the #200 sieve in aggregate by washing. It includes:

- Why you perform the Wash Test
- Equipment used
- Obtaining the sample
- Conducting the test
- Calculating the material passing the number 200 sieve
- Resources including an example form and links to useful websites

## **Personal Protective Equipment**

Learning Hours = 1

Employees are provided required standards for personal protective equipment. The presentation addresses U.S. DOT, OSHA and ANSI guidance and standards regarding types of protective equipment the appropriate or required situations for using the various type of protective equipment.

## **Road Safety 365: A Safety Course for Local Governments Series**

### Module 1: The Need for Road Safety

Learning Hours = 1

This module identifies the need for road safety and the importance of identifying the dangers on road safety to protect the driving public. The seven goals in North Dakota's 2010 Strategic Highway Safety Plan are outlined.

### Module 2: Making Roads Safer

Learning Hours = 1

This module describes how to make roads safer using a six-step process. Strategies to accomplish each step are outlined.

### Module 3: Planning for Safety

Learning Hours = .5

This module explains how to plan for safety within each stage of road development as well as routine maintenance activities. Funding sources are identified to help public works supervisors, elected officials, and local safety committees improve road safety.

## **Seal Coat Series**

This series on Seal Coat was presented by Tom Wood in a video conference in January 2013. The modules provided attendees with an overview of current best practices for seal coat operations, including how to design and inspect a seal coat operation.

## Module 1: Pavement Preservation, Handbook, Design & Pay Items

Learning Hours = 1

## Module 2: Aggregate Requirements & Binders

Learning Hours = 1

## Module 3: Construction Details, Pavement Markings, Fog Sealing, & What's New

Learning Hours = 1

## **TC3 3D Engineered Models for Construction Series**

### Module 1: Introduction to 3D Engineered Models for Highway Transportation

Learning Hours = 2

This module introduces 3D engineered modeling and explains how advanced 3D engineered modeling offers improvements over traditional 2D methods to deliver projects within schedule and budget with better quality from concept to completion.

### Module 2: Surveying and 3D Engineered Models

Learning Hours = 2

Explains how 3D engineered modeling utilizes improved survey technologies for efficient design and construction.

### Module 3: 3D Engineered Models in Highway Design

Learning Hours = 2

Explains how advanced 3D engineered modeling enables intelligent design analysis, improves quality, and expedites downstream deliverables.

## Module 4: Applications of 3D Engineered Models in Highway Construction and Quality Assurance

Learning Hours = 2

Explains how 3D engineered modeling expedites concept to completion, reduces rework, increases safety, and decreases risk.

### **TC3 AASHTO T 308: Determining the Asphalt Binder Content of Hot Mix Asphalt (HMA) by the Ignition Method**

Learning Hours = 2

Explains the importance of asphalt content. It also describes the equipment needed to perform the test procedure, shows how to perform the ignition furnace test procedure (both Method A - internal balance and Method B - external balance), and instructs how to calculate and apply the correction factors.

### **TC3 Advanced Self-Consolidating Concrete**

Learning Hours = 1.5

This training will cover the basic characteristics of self-consolidating concrete as well as advantages of using SCC as compared to conventional concrete. In addition, it will discuss SCC's composition and proportioning as well as fresh and hardened properties. Finally, we will review specific examples where SCC has been used as well as the details of SCC use in slipform paving.

### **TC3 Aggregate Sampling Basics**

Learning Hours = 1

The Aggregate Sampling Basics course will cover the importance of proper sampling, why we need to sample aggregate, and why we need special procedures to do so. You will learn how to obtain a proper sample that will accurately represent the materials by utilizing sampling principles and preferred methods.

### **TC3 Basic Construction Surveying**

Learning Hours = 3

This training serves as a review of the basics of construction surveying. The important surveying tasks involved in this work and the surveying procedures to be followed are described in this course. This training is divided into three modules: Basic Surveying Concepts; Measurement and Construction Surveying; and Survey Mathematics.

### **TC3 Basic Materials for Highway Structure Construction**

Learning Hours = 3

Although there are a number of materials used in the construction and maintenance process for both highways and structures, this course is focused on the three basic materials. They are aggregate, Portland cement concrete (PCC), and hot mix asphalt (HMA). The course modules will address the procedures used in the production and sampling of aggregates.

### **TC3 Bloodborne Pathogens**

Learning Hours = 1

This course covers the basics of bloodborne pathogen safety and the techniques you can use to prevent any contamination, disease, or injury from occurring. In addition to covering safe work practices, this course will provide steps to take in case of bloodborne pathogen exposure.

### **TC3 Bolted Connections**

Learning Hours = 4

Bolting is a common method of making connections and care should be exercised in their design, installation, and maintenance. This course is divided into two modules: installation and inspection. For both modules, it is suggested that participants have a basic familiarity with construction and mechanical principles.

### **TC3 Bridge Construction Inspection Safety**

Learning Hours = 1

This course covers three topics: safety responsibility, personal protective equipment (PPE), and potential hazards. The course references OSHA and ANSI safety standards. Two important areas covered include communication and inspector authority.

### **TC3 CDL Series**

#### Air Brakes

Learning Hours = 1.5

This training has been designed for those interested in commercial driver's license (CDL) air brake systems. This training discusses the parts of an air brake system, dual air brake systems, how to inspect your air brake system, and how to effectively use your air brake system.

#### General Knowledge

Learning Hours = 3

This training was designed for those interested in general commercial driver's license (CDL) knowledge. This training contains the general knowledge and safe driving information that all commercial drivers should know.

#### Pre-Trip Inspection

Learning Hours = 2

This is a basic course in the area of commercial driver's license (CDL) pre-trip inspection. This training covers the different parts of a vehicle that you would check before a trip. We'll approach the different parts of the vehicle in the order that we would in a standard pre-trip inspection.

## **TC3 Change Orders, Claims, and Dispute Resolutions**

Learning Hours = 1

Highway construction contracts often require modification due to scope changes, differing site conditions, and a number of other reasons. Administration of changes and/or claims can result in a dispute. Some contracts have a dispute resolution process specified to facilitate timely administration of the issue.

## **TC3 Chip Seal Best Practices**

Learning Hours = 3

The Chip Seal Best Practices course assists in the development and implementation of pavement preservation programs by identifying the benefits of using chip seal as part of a preventive maintenance program.

This course has six modules: Introduction into Chip Seals, Designing Chip Seal Mixes, Selecting the Proper Materials for the Chip Seal Mix, Use of Equipment, Proper Construction Practices and Performance Measures of Chip Seals

## **TC3 Concrete Series**

### Basics of Cement Hydration

Learning Hours = 1

This module covers how a concrete mixture changes from a plastic state to become a solid concrete slab in a relatively short period of time. Central to this transformation is a complex process called hydration, an irreversible series of chemical reactions between water and cement.

### Construction of Concrete Pavements

Learning Hours = 1

This module covers construction operations and establishes important ties to design and materials.

### Design of Pavement

Learning Hours = 1

This module introduces pavement design and subgrade concepts as they relate to materials and construction. It does not provide sufficient detail to actually design or evaluate a design and should be presented in that manner.

### Early Age Cracking

Learning Hours = 1

Cracks are not a problem as long as they are controlled through jointing; ideally the concrete will crack below the saw joint to relieve the stress. Uncontrolled random cracks are not aesthetically acceptable and can reduce ride quality, durability, and particularly load transfer. Early cracking in this module is defined as those cracks that occur before the concrete is open to public traffic. In this module, we will be talking about early age cracking. Primarily, why does it occur and how can it be eliminated or at least controlled?

### Fresh Concrete Properties

Learning Hours = 1

This module covers the properties of fresh concrete needed to produce high-quality, long lasting pavements and how to monitor these properties.

### Fundamentals of Materials Used for Concrete Pavements

Learning Hours = 2

The materials used in Portland cement concrete play an extremely valuable role in the performance of the concrete. This training covers both the non-reactive and reactive materials used in Portland cement concrete. This would include the aggregates, curing compound, reinforcement, and the materials that are chemically reactive.

### Hardened Concrete Properties - Durability

Learning Hours = 1

Durability as a property of hardened concrete is essential for long-lasting pavements. This workshop discusses factors that contribute to durable concrete and covers permeability, frost resistance, sulfate resistance, alkali silica attack, and a brief look at abrasion resistance.

### Incompatibility in Concrete Pavement Systems

Learning Hours = 1

The materials used in Portland cement concrete play an extremely valuable role in the performance of the concrete. This training covers the incompatibilities of materials used in Portland cement concrete. Although certain materials may be perfectly acceptable on their own, when they are combined they are not compatible with each other. This can cause early stiffening, retardation, cracking, and the lack of a quality of air void system.

### Mix Design Principles

Learning Hours = 1

This module discusses mix design and mix proportioning. Mix design is the process of choosing the characteristics we are looking for in the concrete mixture. Mix proportioning, on the other hand, involves taking the information provided by the mix design process and using that information to determine the actual proportions of ingredients in the mixture. This course discusses theoretical, laboratory, and field testing to determine the Portland cement concrete mix that will achieve the best possible durability, strength, constructability, economy, and uniformity.

### QCQA for Concrete Pavements

Learning Hours = 1

This module covers an overview of quality control/quality assurance (QC/QA) concepts and definitions. It does not provide sufficient detail to actually develop a comprehensive QC/QA plan.

## Troubleshooting for Concrete Pavements

Learning Hours = 1

This module covers using the information available in the Integrated Materials and Construction Practices for Concrete Pavement (IMCP) Manual to identify and diagnose problems related to concrete pavement pre- and post-construction and to develop a plan to address the problems.

## **TC3 Construction of Mechanically Stabilized Earth (MSE) Walls**

Learning Hours = 5

The Construction of Mechanically Stabilized Earth (MSE) Walls course contains 10 modules, and begins with an overview of what MSE walls are, how they work, and how they are constructed. The need for inspection is emphasized throughout this course. This course will also help participants understand what is considered in a design and what information is contained in a geotechnical report. Roles of the inspector/engineer and contractor are discussed along with relevant safety procedures. This course also familiarizes participants with typical project drawings and typical specifications. Finally, inspection requirements and methods are presented.

## **TC3 Construction of PCC Pavement Series**

### Paving Process

Learning Hours = 2.5

This training covers line/grade and pavement foundations, slipform paving, including reinforcement, PCC placement, texturing, and troubleshooting, and fixed form paving, including placing operations and form removal.

## Curing, Sawing, and Joint Sealing

Learning Hours = 1

This training covers crack prevention, sawing, and sealant types, including installation.

### Production

Learning Hours = 2.5

This training covers quality in construction and provides an overview of the production process, including the materials used, the production team, and plant and batch operations.

## **TC3 Construction Stormwater Field Guide Training**

Learning Hours = 5

The information presented in this guide is based on techniques and control measures considered generally effective in many areas of the country. This guide is not meant to be a design manual or pollution prevention plan, nor is it meant to supersede, substitute, or make more stringent well-defined practices or regulatory standards. The information discussed in this guide provides information on installing and maintaining best management practices so that they are effective.

## **TC3 Drilled Shaft Inspector Tutorial**

Learning Hours = 4

The Drilled Shaft Inspector Tutorial provides training on the fundamental concepts of construction for those involved in the inspection of drilled shafts. This 4-hour WBT includes the following topics related to drilled shafts: Foundations; Drilled shaft types; Methods of construction; Construction equipment; and Tools. This course details the work of the inspector prior, during, and after completion of the drilled shaft construction process. Areas of focus include the inspector's roles, functions, responsibilities, and levels of involvement at different phases of construction. Theoretical and actual drilled shaft concrete volumes calculation, post installation, load, and integrity tests, as well as other types of tests are also addressed in this course.

## **TC3 Earthwork Series**

### Earth Materials as Engineering Materials

Learning Hours = 1.5

The Earth Materials as Engineering Materials is part of the Earthwork Series. This training is an overview of the basic properties of earth materials or soil and their engineering properties as they relate to construction. Soil is the product of mechanical and chemical weathering of rocks. Most naturally occurring soils consist of a mixture of assorted grains of different sizes and shapes.

### Excavation

Learning Hours = 3

Excavation is the fourth part of the five-part Earthwork Series. Excavations of soil and rock are an integral part of highway construction due to the associated costs, safety concerns, engineering considerations, and short- and long-term performance expectations.

### Fill Placement

Learning Hours = 4

Fill Placement is the fifth part of the five-part Earthwork Series. Embankment construction, structural and utility bedding and backfilling, and the construction of drainage and filter systems are fundamental examples of highway earthwork—where the control of the material and how it is placed significantly influences engineering performance. This course provides an overview of the basic applications where fill materials are to be used, and some common problems and safety considerations that you will need to know.

## Grades and Grading

Learning Hours = 3

Grades and Grading is the third part of the five-part Earthwork Series. It is designed to prepare technical frontline workers for what they can expect to see during actual project inspection. Topics covered include an overview of the plans that pertain to earthwork and earthwork quantities, grade stakes that will be encountered and their meanings, how Global Positioning System (GPS) works and its functions in the field, and verifying and documenting grade information

## Site Preparation

Learning Hours = 1.5

Site Preparation is one of the modules included in the Earthwork Series. This module is designed to help inspectors understand the responsibilities of preparing the site for the start of the construction process. This includes clearing and grubbing, utility relocation, and inspector responsibilities

## **TC3 Erosion and Control Center**

Learning Hours = 3.5

This course focuses on erosion and sediment control measures that are designed to prevent environmental damage caused by pollution prevention related to construction materials, equipment-operations, maintenance, and soil erosion and sedimentation from land development. The course also covers construction site stormwater runoff, which is regulated on the local level and at the state level, as well planning, design, and inspection of erosion and sediment control practices.

## **TC3 Ethics in the Transportation Industry**

Learning Hours = 1

Not all State agencies' codes of conduct are the same but they all demand similar ethical behavior of their employees. This training contains good practices from various agencies. The topics of discussion include conflict of interest, safety, fraud, falsification of documentation, reporting ethical concerns, gifts and favors, fairness, personal use of agency property, and consequences.

## **TC3 Flagger Training**

Learning Hours = 1

Being a flagger is the most important job on the work site. Careless use of the sign or distraction from duty could cause serious injury to workers or the motoring public. Performing flagger duties diligently can prevent traffic incidents in the work area.

## **TC3 Flexible Pavement Preservation Treatment Series**

### Chip Seals

Learning Hours = 1.5

Topics covered in this course include project selection, pavement and weather condition requirements, storage, traffic control, construction sequence, aggregate spreading distance, brooming, chip spreading process, distributor preparation, and troubleshooting.

### Fog Seals

Learning Hours = 1

Topics covered in this course include uses of fog seals, suitable pavement surfaces, storage and handling of materials, application process, and problems and causation.

## Introduction to Pavement Preservation

Learning Hours = 1

Topics discussed include pavement structure, distresses, and differentiating pavement preservation from preventive maintenance.

## Materials

Learning Hours = 2

Topics covered in this course include materials comprising maintenance treatments, emulsions, and aggregates.

## Selecting the Right Treatment

Learning Hours = .5

Discusses the appropriate pavement preservation treatment(s) depending on given pavement and traffic conditions.

## Slurry Seals

Learning Hours = 1.25

Topics covered in this course include reasons to use slurry seals, gradations of slurry seal aggregate, preparation and application process, and problems and solutions.

## Thin Functional HMA Overlay

Learning Hours = 2

Topics covered in this course include proper usage, suitable pavement conditions, construction, and troubleshooting.

## Ultra-Thin HMA Bonded Wearing Course

Learning Hours = 1

Topics covered in this course include usage, distresses, application considerations, construction, and troubleshooting.

### **TC3 Full Depth Reclamation (FDR)**

Learning Hours = 4.5

Full depth reclamation (FDR) is a rehabilitation technique in which the full thickness of the asphalt pavement and a predetermined portion of the underlying materials (the base, subbase, and/or subgrade) is uniformly pulverized and blended to provide an upgraded, homogeneous material. This course will start with the basics of FDR and then move through pre-production and reclaiming to post-production activities. This course contains four modules: Introduction, Pre-production activities, Reclaiming the pavement and Post production.

### **TC3 Fundamentals of Geosynthetic Materials**

Learning Hours = 4

This course provides an introduction to geosynthetic materials, including geosynthetic applications for transportation facilities, construction, and maintenance. It will also cover the types of functions geosynthetics perform, general construction procedures and inspection items for geosynthetic installations, appropriate material property and design parameter test methods for specific geosynthetic applications, and the need for site-specific monitoring or special inspection.

### **TC3 GPS Technology**

Learning Hours = 1

GPS technology is becoming a commonly used tool for construction and maintenance. This course will provide the participant with a general understanding of GPS and the accuracy that can be obtained with this new technology. GPS is used for surveying, rough and fine grading, utility locations, excavation and grading, paving, and a number of other uses. In this course, the participant will learn what advantages are gained using this technology and how these advantages are transferred to government agencies and the end user. The understanding of GPS is essential to technicians when performing inspection and maintenance job functions.

### **TC3 Guardrail Series**

#### **TC3 Guardrail Series: Guardrail Basics**

This course provides an introduction to guardrails, including their purpose, components, and considerations (for example, clear zones).

#### **TC3 Guardrail Series: Installation and Inspection of New Guardrails**

This course is divided into two modules: Module 1: Guardrail Installation Systems and Placement covers 27- and 31-in. guardrail heights. The sections of a guardrail are discussed, as well as considerations for guardrail placement, including depth, soil support, deflection, etc. The considerations for median barriers are also explained. Module 2: New Guardrail Installation Inspection describes guardrail inspection and explains what should be documented along the way. Scenarios are presented for various guardrail installation situations.

#### **TC3 Guardrail Series: Maintenance and Repair**

This course provides information on the correct procedures for the maintenance and repair of guardrails.

#### **TC3 High Visibility Garments**

Learning Hours = 1

The need to be seen is critical for worker safety, especially for workers who perform tasks on or near moving vehicles or equipment. By wearing high-visibility garments, workers can draw attention to themselves to prevent injuries and fatalities from struck-by hazards in complex work environments, when the ability to be seen at all times is necessary.

### **TC3 HMA Paving Field Inspection**

Learning Hours = 4.5

This training provides guidance and instruction to inspectors involved in the construction of hot mix asphalt (HMA) pavements. The important tasks involved in this work are explained and proper procedures are described. This training is arranged in a fashion to help the inspector first learn the various aspects of what is involved in a HMA paving operation and then become familiar with the duties that are a part of the HMA pavement grade inspection responsibilities. It also explains how to recognize the mix properties of a HMA mixture.

### **TC3 Hot In-Place Recycling (HIR)**

Learning Hours = 2.5

Hot in-place recycling (HIR) is a pavement preservation and corrective maintenance technique that consists of heating and softening the existing asphalt pavement. When combined with an asphalt overlay, HIR can be classified as structural rehabilitation. The HIR techniques described in this training provide owner agencies with cost-effective and sustainable methods to repair their aging pavements. HIR processes have been used on all functional classes of roadways. When properly designed, specified, and constructed, HIR methods can result in significant cost savings as compared to conventional maintenance operations, while reducing carbon dioxide emissions.

### **TC3 Improving the Daily Diary**

Learning Hours = 1

This training is intended to assist you with proper documentation on a construction or maintenance project. It is important that the information in the daily diary kept for projects are accurate, correct, and factual to ensure proper payment and to avoid lawsuits. Please note that the terminology may differ slightly from DOT to DOT; for example, the document may also be referred to as a daily work report. Each state agency/company has their own requirements, which the viewer needs to review and follow.



### **TC3 Inspector Training for Cold In-Place Recycling (CIR)**

Learning Hours = 4

Cold in-place Recycling (CIR) is a method of reconstructing any flexible pavement where the need arises from structural failures. These failures include transverse cracking, wheel rutting, potholes, surface irregularities, or a combination of these. The proper selection of a CIR process, in conjunction with good specifications and quality construction, are all important in the long-term performance of the pavement rehabilitation. This series on CIR will introduce each method and provide a background on when, how, and why that method is selected/used.

### **TC3 Introduction to e-Construction**

Learning Hours = 2

Introduction to e-Construction provides an overview of what e-construction is, including information on the construction processes using e-construction, the benefits of e-construction, potential obstacles and solutions, and how to get started.

### **TC3 Job Hazard Analysis**

Learning Hours = 2

This course reviews what a job hazard analysis is and why it should be performed. More specifically, this course identifies the information that should be documented during a job hazard analysis and provides example jobs and potential hazards that may be encountered.

### **TC3 Maintenance of Drainage Features for Safety**

Learning Hours = 1

This course highlights common roadway drainage problems that can cause an unsafe condition and suggests inspection methods and corrective action. Maintaining roadway drainage is important for safety and for ensuring the long life of the roadway as it prevents erosion of the roadway, saturation of the subbase, and damage to roadway structures.

### **TC3 Maintenance of Traffic for Supervisors**

Learning Hours = 5

The Maintenance of Traffic for Supervisors training presents information about the placement of, field maintenance required for, and inspection of traffic control devices. In addition, drafting work zone traffic control plans and flagging are discussed. This training focuses on the design of a traffic control plan, and how and why it's needed in the work zone.

### **TC3 Maintenance of Traffic for Technicians**

Learning Hours = 5

The Maintenance of Traffic for Technicians training presents information about the placement of, field maintenance required for, and inspection of traffic control devices. In addition, drafting work zone traffic control plans and flagger operations are discussed.

### **TC3 Maintenance Stormwater Field Guide Training**

Learning Hours = 3

This course is based on the Maintenance Stormwater Field Guide. It covers topics related to best management practice inspection, common operational practices, good housekeeping, and other pollution source control measures. Using the tips in this course and the related guide will help in complying with Federal and State regulations for stormwater quality. It will also help achieve a greater level of environmental stewardship.

### **TC3 Maintenance Training Series**

#### **Base and Subbase Stabilization and Repair**

Learning Hours = 1

Reviews the failures and distresses that indicate structural deterioration exists in a roadway. The course also covers project selection and trade-off considerations through example roadway projects that give participants the opportunity to evaluate a roadway and determine if it is a candidate for reconstruction or repair.

Participants can use this information, as well as guidance on design and construction, to make sound project planning decisions.

### **Basics of Work Zone Traffic Control**

Learning Hours = 1

Meeting the national requirements for work zone traffic control is a critically important responsibility of maintenance personnel. The national requirements, found in Part 6 of the Manual on Uniform Traffic Control Devices (MUTCD), promote driver and worker safety during roadway maintenance projects. This training provides an introduction to the requirements outlined in Part 6 of the 2009 MUTCD. The course also offers an overview of the manual's structure and requirements regarding traffic control devices and their applications, flagging operations and procedures, and pedestrian and worker safety.

### **Cultural and Historic Preservation**

Learning Hours = 1

Cultural and historic sites are often located within an area where maintenance activities are scheduled to be completed. This training teaches participants about regulations and concerns related to safeguarding cultural and historic sites from the potential impacts of highway maintenance activities. Examples of maintenance activities that can impact such sites include slope stabilization, shoulder or pavement widening, and vegetation control. Additional examples are presented during the course.

### **Outdoor Advertising**

Learning Hours = 1

Participants of this course will learn about the rules and regulations for maintaining and controlling outdoor advertising, guidance on administering an outdoor advertising program, the steps involved in the permitting process, and appropriate actions for non-compliance by sign owners. Additionally, participants are encouraged to compare the standards outlined in the HBA to their State's rules and regulations, which may include stricter provisions than those in the HBA.

## Pavement Preservation Program

Learning Hours = 1

Pavement preservation represents a major paradigm shift in the way many transportation agencies view and operate their highway networks. The Pavement Preservation Program course provides basic information on what comprises a pavement preservation program and how it is implemented. It places particular emphasis on changes in practice and the assignment of dedicated funding.

Additionally, this course covers the benefits and challenges of a preservation program, as well as approaches to communicating its advantages to stakeholders.

## Roadside Vegetation Management

Learning Hours = 1

Vegetation management is much more than routine mowing of grass and trimming of bushes and trees. The Roadside Vegetation Management course explains the need for, and purpose of, good vegetation management. The course also underscores why vegetation management is a critical part of a roadway maintenance program.

Participants of this course will learn about equipment and herbicides used for vegetation management, including an overview of mechanical vegetation control and the environmental controls and precautions needed when using herbicides as part of a noxious weed control program.

## Roadway Drainage

Learning Hours = 1

This course reviews the components of shoulders and ditches, the purpose of a roadway drainage inventory, and the permits used in roadway drainage maintenance. Examples of existing drainage inventories are provided. In addition, the benefits of proper water removal are discussed through examples of drainage system issues, such as ponding and washouts, in order to emphasize the connection between good drainage and roadway safety.

## Shaping and Shoulders

Learning Hours = 1.5

Shoulders play an important role in both pavement performance and roadway safety. Maintaining shoulders in a proper and timely manner is a primary goal of transportation agencies. In an effort to assist agencies in meeting this goal, the Shaping and Shoulders course provides information on the maintenance of both paved and unpaved shoulders, including specific details on the maintenance of gravel shoulders.

## Thin HMA Overlays and Leveling

Learning Hours = 1

Thin hot-mix asphalt (HMA) overlays and leveling are common pavement treatments and can be a central part of a maintenance crew's activities. During the Thin HMA Overlays and Leveling course, participants will be introduced to the characteristics and purposes of thin HMA overlays as well as the placement of leveling courses. Each of these techniques is capable of improving the functionality of an otherwise structurally sound pavement.

## Underground Storage Tanks

Learning Hours = 1

The nation's underground storage tank (UST) systems consist of underground tanks and piping that store petroleum and other hazardous materials. This course addresses the procedures to install, operate, and remove USTs.

Developed specifically for maintenance personnel, this course provides participants with an understanding of the Federal laws and regulations that govern UST systems. During the course, participants acquire the knowledge needed to successfully oversee UST installations and closures. Specifically, the course explores the requirements of industry installation and closure codes, leakage detection, spill and overflow prevention, corrosion protection, and ensuring a "clean" closure.

## Weather-related Operations

Learning Hours = 1

Participants of this course will learn about the planning requirements for an effective storm response, including scheduling and training personnel, identifying equipment needs, executing dry runs, and the additional requirements posed by a multi-day storm event. This training assists participants with planning and responding effectively to all weather-related operations.

## **TC3 Materials Testing: Reducing Aggregate Sampling**

Learning Hours = 1

The Materials Testing and Reducing Aggregate Samples course will cover the two methods for splitting a sample: using a mechanical splitter and quartering. The purpose of these procedures is to reduce large samples of aggregate to the appropriate size for testing. The end product should be a sample that is representative of the source.

## **TC3 Math Module**

Learning Hours = 6

The Math Module reviews basics such as math functions, algebra, and geometry. This course includes instruction that would be applicable to variety of end users. The basic math functions would be appropriate to the entry level technician or as a review. The more complex areas of algebra and geometry would be appropriate for the more advanced technician.

## **TC3 PCC Pavement Preservation Series**

### Concrete Overlays

Learning Hours = 2

This module discusses how preventative maintenance impacts pavement preservation, good candidates for preservation, and the benefits to pavement preservation.

### Concrete Pavement Evaluation

Learning Hours = 2

This module also describes the common procedures associated with conducting thorough pavement evaluations.

### Diamond Grinding and Grooving

Learning Hours = 1

This module describes recommended procedures for surface restoration of Portland cement concrete (PCC) pavements, specifically diamond grinding and diamond grooving operations.

### Full Depth Repairs

Learning Hours = 2

This module covers the procedures for cast-in-place Portland cement concrete (PCC) full-depth repair (FDR) of jointed concrete pavements (JCP), including jointed plain concrete pavements (JPCP) and jointed reinforced concrete pavements (JRCP). FDR techniques for continuously reinforced concrete pavements (CRCP) are discussed separately toward the end of the presentation.

### Joint Resealing and Crack Sealing

Learning Hours = 1

This module covers joint resealing and crack sealing for concrete pavements. Joint resealing and crack sealing is defined as placement of an approved sealant material in an existing joint or crack to reduce moisture infiltration and prevent intrusion of incompressibles.

### Load Transfer Restoration

Learning Hours = 1

This module presents design and construction information on load transfer restoration (LTR), sometimes referred to as retrofitted load transfer. This course explains the difference between load transfer restoration (a generic term) and dowel bar retrofitting (DBR), which is a specific means of achieving LTR. There are other methods available, but DBR is the most proven.

### Partial-Depth Repairs

Learning Hours = 1

This module covers the procedures for partial-depth repairs (PDR) on Portland cement concrete (PCC) pavements. PDR is the removal and replacement of small, shallow areas of deteriorated PCC at spalled or distressed joints.

### Preventive Maintenance and Pavement Preservation Concepts

Learning Hours = 1

This module discusses how preventative maintenance impacts pavement preservation, good candidates for preservation, and the benefits to pavement preservation.

### Retrofitted Edge Drains

Learning Hours = 1

This module presents design and construction information on retrofitted edge drains. This treatment is not as widely used as it once was, largely because it has limited applicability. Specifically, it must be targeted to those pavements that are 1) in good structural condition and 2) have bases with some degree of permeability that would allow water to be drained from beneath the pavement and to the edge drain.

### Slab Stabilization and Slab Jacking

Learning Hours = 1

This module covers the use of slab stabilization (also known as undersealing) and slab jacking of concrete pavements. Slab stabilization restores support beneath slabs where voids have been detected, and slab jacking is used to raise depressed or settled slabs.

### Strategy Selection

Learning Hours = 1

This module provides guidance on the selection of concrete pavement preservation strategies. Based on a collective review of a number of recent published documents, this module covers the seven-step process that can be used to determine the most appropriate treatment (or combination of treatments) for a Portland cement concrete (PCC) pavement.

### **TC3 Personal Protective Equipment**

Learning Hours = 1

The Personal Protective Equipment (PPE) course provides students with the knowledge and skills necessary for proper care and use of PPE.

### **TC3 Pile Driving Inspector Tutorial**

Learning Hours = 4

This course is designed to help participants prepare for the Pile Driving Inspector's Qualification Test. It was developed by the Florida Department of Transportation (FDOT) and adapted for general use by TC3. Inside you will find information on various topics that are necessary for a pile inspector to know. From the pile driving system to the inspector's role and responsibilities, there is a wealth of information presented in this tutorial that will provide you with the knowledge and tools to complete the qualification process.

## **TC3 Pipe Installation, Inspection, and Quality**

Learning Hours = 7

This training provides an in-depth view of the basic materials used in pipe construction. The course modules will address the different types of pipe as well as the foundation work, bedding selection, placement, joint sealants, backfilling and documentation for concrete, metal and plastic pipe. The information in this training will help transportation professionals involved in the installation, inspection, and quality of pipe on highway construction projects improve their understanding of the factors that contribute to high-quality installations.

## **TC3 Plan Reading Series**

### Bridge Plans

Learning Hours = 1.5

The ability to read plans is essential for anyone involved in highway and/or bridge construction. This training reviews the information found in a bridge plan.

### County Plans

Learning Hours = 1

The ability to read plans is essential for anyone involved in highway and/or bridge construction. This training reviews the information found in a county plan for a highway project.

### Culvert Plans

Learning Hours = 1.5

The ability to read plans is essential for anyone involved in highway and/or bridge construction. This training reviews the information found in a culvert plan.

### Erosion and Sediment Control Plans

Learning Hours = .5

The ability to read plans is essential for anyone involved in highway and/or bridge construction. This training reviews the information found in the Erosion and Sediment Control Plans (sheets that begin with "D") section of a highway plan.

### Grading Plans

Learning Hours = 1.5

The ability to read plans is essential for anyone involved in highway and/or bridge construction. This training reviews the information found in the Grading Plans (sheets that begin with "B") section of a highway plan.

### Highway Plan Reading Basics

Learning Hours = 1

The ability to read plans is essential for anyone involved in highway and/or bridge construction. This training describes the foundational information needed to begin reading and understanding highway plans. This includes an overview of the title page and its components, station numbers, townships, and quantity estimates.

### Right-of-Way Plans

Learning Hours = 1

The ability to read plans is essential for anyone involved in highway and/or bridge construction. This training reviews the information found in right-of-way plans for a highway project.

### Traffic Control Plans

Learning Hours = .5

The ability to read plans is essential for anyone involved in highway and/or bridge construction. This training reviews the information found in the Traffic Control Plans (sheets that begin with "C") section of a highway plan.

## **TC3 Portland Cement Concrete Paving Inspection**

Learning Hours = 5

This course has been prepared to provide guidance and instruction to inspectors involved in the construction of Portland cement concrete (PCC) pavements. The important tasks involved in this work are explained and proper procedures are described.

## **TC3 Recognizing Roadside Weeds**

Learning Hours = 1

The first step in determining an appropriate weed control strategy is to identify the weed plant. There are numerous plants growing along many roadsides that can be considered weeds. This is a basic course in the area of weed identification. Most weeds are territorial to different climates and regions, therefore, it is difficult to nationally identify weeds that are dealt with by different State DOTs.

## **TC3 Rockfall Stabilization**

Learning Hours = 4

This course will introduce the key concepts in rockfall stabilization, including tools and methods used in stabilization and reinforcement. The purpose of this course is to familiarize the construction inspector with current techniques utilized in stabilizing rock slopes with respect to rockfall.

## **TC3 Roller Compacted Concrete Pavement**

Learning Hours = 6

The Roller Compacted Concrete (RCC) Pavements course provides detailed overviews of RCC properties and materials, mixture proportioning, structural design issues, and production and construction considerations, plus troubleshooting guidelines and an extensive reference list for more comprehensive information. This course contains six modules

## **TC3 Safe Use of Basic Carpentry Tools**

Learning Hours = 3

Carpentry tools are a common part of our day-to-day lives and are present in nearly every industry. These tools help us to easily perform tasks that otherwise would be difficult or impossible. On the other hand, these simple tools can be hazardous and have the potential for causing severe injuries when used or maintained improperly. Special attention toward carpentry tool safety is necessary in order to reduce or eliminate these hazards.

### **TC3 Safe Use of Hand and Power Operated Tools**

Learning Hours = 1

Hand and power tools are a common part of our day-to-day lives and are present in nearly every industry. These tools help us to easily perform tasks that otherwise would be difficult or impossible. On the other hand, these simple tools can be hazardous and have the potential for causing severe injuries when used or maintained improperly. Special attention toward hand and power tool safety is necessary in order to reduce or eliminate these hazards.

### **TC3 Safety Orientation**

Learning Hours = 2

This training provides a general safety awareness orientation. Remember the motto: "Do it safely, or don't do it!" Prevention of injury and safeguarding health is the responsibility of everyone—both management and employees. The safety and health of employees is the overriding concern in all phases of operations.

### **TC3 Superpave for Construction**

Learning Hours = 3.5

The Superpave for Construction course contains information for field construction personnel on the Superpave mix design system and the control of field-produced hot mix asphalt (HMA). The first module introduces Superpave HMA design testing and analysis. It covers design testing procedures, design analysis methods, and includes calculations to analyze the volumetrics of paving samples. Module 2 covers relevant volumetric examples, including the use of phase diagrams to calculate volumetric properties.

### **TC3 Superpave Mix Design Process and Analysis**

Learning Hours = 2

This training will give hot mix asphalt (HMA) materials engineers and/or materials technicians a better understanding of Superpave mix design process and analysis. The training will also give a better understanding of volumetrics for those who perform mix designs (typically technicians) and those who analyze the data (typically engineers). Module 1: Mix Design. This module will describe the design of asphalt concrete mix and how Superpave mix design is analyzed. Module 2: Volumetrics. This module will cover asphalt mixture volumetrics and volumetric properties using phase diagrams.

### **TC3 Test Self-Consolidating Concrete**

Learning Hours = 1

This training includes an overview of the fresh properties of self-consolidating concrete (SCC), including terminology, target guidelines, and quality control. In addition, the American Society for Testing and Materials (ASTM) test methods for slump flow and flow rate, passing ability using the j-ring, column segregation, static segregation and making SCC test cylinders are reviewed.

### **TC3 Transportation Asset Management Overview**

Learning Hours = 2

This training explains the basics of asset management and why it is important. This training will provide new terms and new ways of thinking about what you're already doing. More importantly, you'll understand why it's so important to be strategic and systematic when you're responsible for managing huge numbers of assets.

### **TC3 Trenchless Technology**

Learning Hours = 5.5

This course is ideal for individuals with new positions or needing a refresher in using and working with trenchless technology. This course also serves as an introduction for engineers that are not familiar with trenchless technology. Project members that are responsible for writing and submitting permits for trenchless technology on projects may also benefit from this course.

### **TC3 Understanding Materials Testing for Inspectors**

Learning Hours = 5

This course provides an introduction to materials testing for inspectors and entry-level quality assurance (QA) personnel. It provides basic information about testing including roles, types of test procedures, and who should test. It also discusses the type/purpose of tests related to soils, aggregates, asphalt, concrete, and other non-field tests, and what different test results tell us. Lastly, this training provides information on potential problems that may be encountered in the field, and how to address those issues.