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Background

"Rebuilding the highway construction task force is an industry priority as agencies across the country face a serious shortage of trained and experienced personnel resulting from attrition and an aging workforce. At the same time cutting-edge construction and system preservation technologies demand new skills and knowledgeable construction personnel. Consequently, efforts to train and certify highway construction personnel have intensified in recent years. The Federal Highway Administration (FHWA) has taken a pro-active role in this effort. In order to streamline the process and avoid duplication of efforts, the Transportation Curriculum Coordination Council (TCCC) was formed in September of 2000.

The TCCC is a partnership between the FHWA, State Departments of Transportation (DOTs), and the highway transportation industry to support the training of the highway construction personnel. The TCCC's mission is to provide leadership at a national level, develop and maintain a national curriculum for various transportation disciplines, identify training and certification requirements, and coordinate/facilitate training efforts."[1]

A key effort to the mission of the TCCC is the Core Curriculum Matrix Development Initiative.

Core Curriculum Matrix Development Initiative

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 (e.g., State and local Department of Transportation [DOT] personnel, contractors, material suppliers and consultants) and the training opportunities that support the development of these competencies.

The resulting Core Curriculum is designed to help State and local DOTs establish a basis for their overall technician training and ongoing professional development programs. The curriculum is designed as a tool that helps to reach that goal. It is intended to help transportation agencies in their efforts to develop a skilled workforce by assisting the training developers in establishing comprehensive curriculum tracks and identifying existing training that can be used in their program (or adapted to fit). The curriculum can be tailored to fit the specific needs of each agency. Additionally, employees and managers can use the competencies and courses to further their professional development

[1] Taken from the Transportation Curriculum Coordination Council's (TCCC) website (www.nhi.fhwa.dot.gov/tccc/about.htm)

Development Process

The TCCC identified five technical categories for this initiative:

- Construction,
- Employee Development,
- Maintenance,
- Materials and
- Safety & Work Zones.

In each of these areas, technical working groups were established (See Appendix A for the list of each work group's members.)

Two types of matrices were developed in each of the five technical categories. One matrix defines subject areas and the respective disciplines and skill competencies required to execute the work; the other matrix identifies training which maps to the development of the defined skill competencies.

Competency Matrices

Each competency matrix is developed as a three-tiered structure (Figure 1).

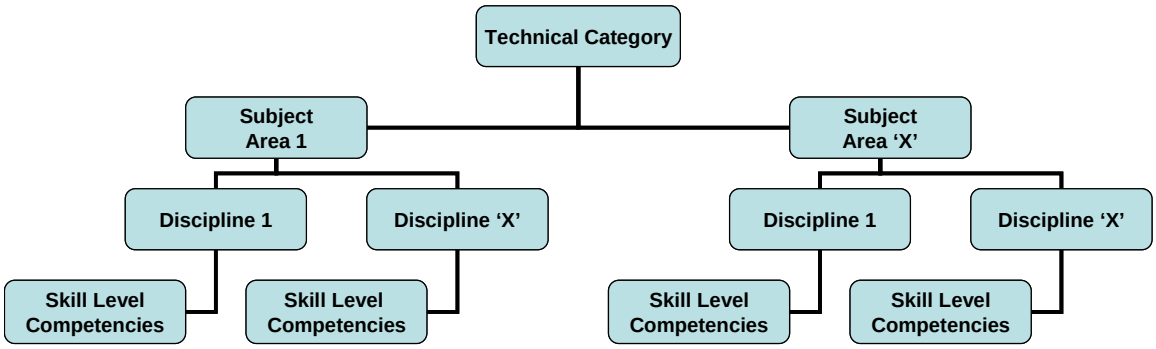

Figure 1 – Generic Schemata of a Competency Matrix

The first tier identifies the subject areas of the technical category - the primary areas of work required of the technical category. The second tier consists of the specific disciplines that make up each subject area - the discrete areas of activity to be performed. Appendix B of this document contains the complete set of subject areas and disciplines defined for each of the five technical categories.

The most discrete tier, the third tier, defines the relevant core skill competencies required to successfully execute each of the disciplines. Each competency is stated as an observable, measurable action to be performed. None of the competencies include qualifiers (i.e., level of proficiency required for accomplishment/acquisition). Rather, this has been left open so that the competency models can be more readily adapted to each state's programs and requirements.

Importantly, the third tier is stratified into four skill levels (i.e., areas of workmanship/roles) in order to define a career progression. These skill levels begin at the entry level (Level I) and progress through the management and administrative level (Level IV). Table 1 identifies each of the four skill levels and provides a definition of each level.

Skill Level	An individual at this level….
Level I - Entry	Is a new employee/trainee with little to no previous experience in the subject area and performs his activities under direct supervision.
Level II - Intermediate	Understands and demonstrates skills (is competent) in one or more areas of the entry level and performs specific tasks under general supervision.
Level III - Advanced	Understands and demonstrates specialized skills in a variety of tasks of the intermediate level and performs specialized tasks in limited areas or broad-based tasks with little to no daily supervision.
Level IV - Project Management (Administrator, Superintendent)	Prepares and reviews plans and schedules for specific activities; oversees or manages day-to-day activities in one or more specific tasks on one or more projects covering a range of complexity and technical functions as well as geographic areas. Individuals at this level are accountable for resource management and are responsible for making routine and complex decisions. It is recommended that this role of personnel have mastery of skills defined for all of the preceding levels.

Table 1 – Skill Levels and Definitions

A portion of a competency matrix is illustrated in Figure 2.

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Rights of Way (ROW) Management	Identifies stakes and easement limits		Obtains construction easements and work permits	
Contractor Payments	Computes quantity measurements	Develops contractor payment estimates	Verifies contractor payment estimates	Recommends contractor payment estimates
	Documents for application to contractor payments			Approve contractor payment estimates
Project Closeout		Explains the principles underlying the construction contractor performance evaluation process	Prepares project closeout documents	Completes project closeout procedures
			Prepares objective construction contractor performance evaluation	Recommends project acceptance

Figure 2 – Sample Portion of a Competency Matrix

As illustrated, some disciplines have defined competencies across the four skill levels. In this example, the *Contractor Payments* discipline explicitly defines the progression and increasing complexity of competencies as an inspector advances from the entry level (Level I) to the management level (Level IV).

This example also illustrates that skill levels may share a competency. Notice that for the *Rights of Way (ROW) Management* discipline Levels I and II appear to have the same competency as do Levels III and IV. The work group determined that the competency for Level I was applicable to Level II with the difference being the degree of supervision. For Level I, the inspector must identify stakes and easements *under direct supervision* whereas for Level II, the inspector would perform this with *little to no supervision*. Similar logic applies to the Level III and IV competency. Conversely, for the *Project Closeout* discipline, the work group determined that no competency was appropriate at Level I. An inspector at an entry skill level would not be involved in performing any activities tied to project closeout. As such, this block on the matrix is darkened.

For the Construction, Materials and Maintenance technical categories, the competencies defined in these matrices are those competencies relevant to the execution of the specific work to be performed under that specific technical category. It should be noted that some of these technical categories have common subject areas and disciplines. For example, both the Construction and Materials technical categories have *Quality Assurance (QA)* identified as a *subject area* consisting of the disciplines– Quality Control, Quality Acceptance and Independent Assurance Audits. The responsibility for implementing construction QA is shared within an Agency by both Construction personnel and Materials personnel; most of the fundamental concepts and related competencies for QA will apply to both Construction and Materials personnel, irrespective of specific duties, such as sampling, testing, or inspection. The competencies for these disciplines, however, are different since the actual work performed is different for construction inspection versus materials testing.

The competencies of the Employee Development and Safety matrices are not specific to a particular group of highway transportation workers. Rather, these matrices define competencies that are applicable across the entire highway transportation workforce. As such, if one looks at the full complement of competencies applicable to highway construction inspectors, one would refer to the Construction, Employee Development and Safety matrices to define the entire universe of relevant skill competencies.

Training Course Matrices

Once the competencies were identified, a search of available training courses was conducted. Each subject area identified for the technical category has a corresponding matrix that lists courses by discipline across the four skill levels.

The search encompassed not only websites of Federal agencies and organizations, but included websites of other public sector organizations and agencies, relevant associations, certification organizations, academic institutions and private, for-profit companies. The focus was on identifying a wide array of courses and vendors.

The courses listed on each matrix do not, by any means, represent the entire population of available courses. Additionally, the courses listed were selected based on information provided via the offering organization's website. In most instances, this information consisted of a course description, objectives, target audience and, for some courses, content outlines.

NOTE:

A very small minority (less than 5%) of courses listed on the matrices have been thoroughly reviewed and updated by the TCCC to reflect current standards and work practices. The majority of courses listed on the matrices have not undergone a thorough review of instructional materials nor have they been selected based on student critiques. Importantly, the listing of a course on a matrix does not represent an endorsement of the course and/or vendor by the Federal Highway Administration, AASHTO and other contributing members of the TCCC. It merely represents a possible training option, one that should be more fully vetted by the each State department of transportation.

Using the Matrices

The primary audiences of the matrices are training coordinators of State and local Departments of Transportation. It is recommended that each matrix be thoroughly reviewed and compared and contrasted to the state's current competency models and training and professional development programs. Importantly, the matrices are NOT intended to replace, but rather to be additive to these models and programs.

Each matrix should be viewed as a dynamic, living document, one that should be modified, as appropriate, to reflect each state's labor category structure and requirements.

Reading the Matrices

Figure 3 illustrates the structure of the competency matrices. As shown, the name of the subject area displays at the top of the matrix; it is divided into five columns. The number of rows varies based on the number of disciplines and competencies. The leftmost column identifies each of the disciplines associated with the subject area. In the remaining four columns are listed the competencies associated with the discipline for each of the four skill levels.

SUBJECT AREA TITLE				
DISCIPLINES	**COMPETENCIES BY SKILL LEVELS**			
	Level I	**Level II**	**Level III**	**Level IV**
Discipline name	Skill Competency	Skill Competency	Skill Competency	Skill Competency

Figure 3 – Structure of the Competency Matrix

As indicated earlier, not all of the skill levels may necessarily contain its own competencies for the discipline. As shown in Figure 4, if a competency for the preceding level applies to the subsequent level with the difference being the degree of autonomy, then the competency extends across all of the relevant levels. In the figure, Levels I and II share a competency as do Levels III and IV.

DISCIPLINES	**COMPETENCIES BY SKILL LEVELS**			
	Level I	**Level II**	**Level III**	**Level IV**
Rights of Way (ROW) Management	Identifies stakes and easement limits		Obtains construction easements and work permits	

Figure 4 – Example of Skill Levels Sharing a Competency

Figure 5 illustrates another example of levels sharing a competency. In this instance, Levels II and III share the competency for the *Partnering* discipline.

DISCIPLINES	**COMPETENCIES BY SKILL LEVELS**			
	Level I	**Level II**	**Level III**	**Level IV**
Partnering	Applies principles of partnering with contractors and other involved parties	Participates in partnering with contractors and other involved parties		Fosters partnering with contractors and other involved parties

Figure 5 – Second Example of Skill Levels Sharing a Competency

If, however, no competency is applicable at the skill level, then the cell of the matrix is darkened. In the examples shown in Figure 6, the *Project Closeout* discipline has no applicable competency at Level I and the *Value Engineering* discipline has no applicable competency for either Level I or Level II.

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Project Closeout		Explains the principles underlying the construction contractor performance evaluation process	Prepares project closeout documents Prepares objective construction contractor performance evaluation	Completes project closeout procedures Recommends project acceptance
Value Engineering			Recommends VECP actions Evaluates VECP	Approves VECP actions

Figure 6 – Competency Cell Greyed Out

The training course matrices have a structure similar to that of the competency matrices. Each matrix is labeled by subject area. The leftmost column lists the disciplines of the subject area and the remaining four columns are tied to each of the four skill areas, I through IV. Courses that support the development of the competencies identified for each skill level are listed. These courses are listed in alphabetical order.

Figure 7 shows a sample of a training course matrix.

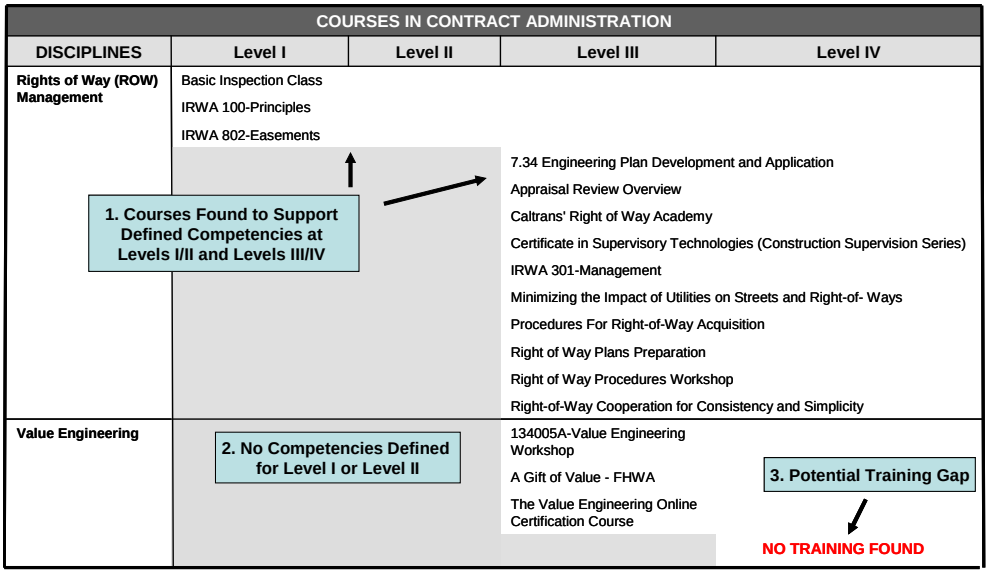

Figure 7 – Sample of a Training Course Matrix

As shown in the figure, one of three conditions will apply:

1. A course is listed that has been found to be supportive of the competency defined for the discipline.
2. No course is listed at the skill level for the discipline because the work group determined that no competency is applicable at that skill level (i.e., corresponds to the darkened cells on the competency matrix).
3. NO TRAINING FOUND is listed at the skill level for the discipline even though a competency is defined because no course supporting the competency could be found. In terms of each of the technical categories, the total number of competencies for which no training courses were identified include:
    - Construction – 31 competencies
    - Employee Development – 2 competencies
    - Maintenance – 4 competencies
    - Materials – 55 competencies
    - Safety & Workzone – See footnote[2]

    See Appendix C of this document for the complete list of competencies for which no training courses were found.

[2] Due to scheduling issues, a companion training vendor/courses matrix could not be developed for the Safety & Workzone competency matrices. This will be added at some point in the future.

Appendix A – Technical Category Work Group Members

Technical Working Group:	Team Members:
Construction	**Allan Samuels** – Arizona Department of Transportation (Team Lead) **Teresa Kabana** - Arizona Department of Transportation **Linda Hughes** – Washington Department of Transportation **William Beuter** – Virginia Department of Transportation **Lee Onstott** – New Mexico State Highway Transportation Department **Paula McGee** – New Mexico State Highway Transportation Department **Leo Stevens** – New England Transportation Technician Certification Program (NETTCP) **Bud Darby** – National Institute for Certification in Engineering Technologies (NICET) **Douglas Townes** – Federal Highway Administration (FHWA) Resource Center **Rob Elliott** – FHWA Resource Center **Ben Rivers** - FHWA **Rich Barrows** – FHWA
Employee Development	**Chris Anderson** – Iowa Department of Transportation (Team Lead) **Paula McGee** – New Mexico State Highway Transportation Department **Barbara Martin** – Montana Department of Transportation **Ewa Flom** - FHWA
Maintenance	**Robert Peda** – Pennsylvania Department of Transportation (Team Lead) **Bud Darby** – NICET
Materials	**Woody Hood** - Maryland SHA (Team Lead) **Tom Malerk** – Florida Department of Transportation **Garth Newman** – Idaho Department of Transportation/Western Alliance for Quality Transportation Construction (WAQTC) **Linda Hughes** – Washington Department of Transportation **Leo Stevens** – NETTCP
Safety/Work Zone	**Ben Gribbon** – FHWA (Team Lead) **Jack Cowsert** – North Caroline Department of Transportation **Todd Wilson** – New Mexico Department of Transportation **Bud Darby** – NICET **Donna Clark** – American Traffic Safety Services Association (ATSSA) **Ed Stellfox** – Maryland T2 Center **Scott Battles** – FHWA **William Bremer** – FHWA **Victoria Brinkly** – FHWA **Kenneth Opiela** - FHWA

Appendix B – Subject Areas and Disciplines

Technical Category: Construction

Subject Area	Discipline
Contract Administration	Rights of Way (ROW) Management Contractor Payments Supplemental Agreements (change orders) Force accounts Cost Estimating Claims Management Preconstruction (field design/ redesign) Project Closeout Specifications Office Procedures Scheduling Partnering Value Engineering Consultant Construction Engineering & Inspection (CCEI)
Quality Assurance	Quality Control Quality Acceptance Independent Assurance (IA)
Environment	General Disposal Areas Environmental Permits, Certificates and Licenses (Streams & Wetlands Cultural Resources Hazardous Materials Erosion and Sediment Control Debris Burning Water & Sanitary Sewer Facilities
Surveying & Staking	Surveying Verification
Utilities	Permits/Agreements Location/Mapping/ Surveying Utility Construction Railroads Subsurface Utility Engineering (SUE)
Grading	Excavation Controlled Blasting Contour Grading Site Preparation Embankment Borrow Compaction Documentation

Subject Area	Discipline
Drainage	General Surface and Subsurface Drainage Systems Convential Drainage Systems Construction Inspection Large and Special Drainage Systems Construction Inspection
Aggregate Inspection	Surface Preparation Stockpiling and Hauling Laydown Compaction Surface Tolerances/ Smoothness Documentation
Geotechnical Construction	General Geotechnical Construction Inspection Subsurface Exploration Geosynthetic Materials Installation Inspection Shallow Foundation Inspection Driven Foundation Inspection Drilled Shaft Inspection Ground Anchor Inspection Soil Nail Wall Inspection Mechanically Stabilized Earth Wall Inspection Reinforced Soil Slopes (RSS) Inspection Ground Improvement Inspection Sheet Pile Installation Documentation
New Structure Construction	Footings Retaining Walls (General) Forming & Falsework Concrete Girders Steel girders & connectors Reinforcing Steel - Layout Concrete Placement & Consolidation Joints Finishing & Curing Concrete Deck Smoothness Precast Structures Post Tensioning Documentation
PCC Pavement Filed Inspection	Surface Preparation Concrete Delivery Paving Machine Laydown (placement)/ Consolidation Steel Placement Smoothness Dowels/Joints Documentation
HMA Field Inspection	Surface Preparation Hauling Laydown

Subject Area	Discipline
	Compaction Smoothness Documentation
Asphalt Recycling	Inspection Documentation
Landscaping	Horticultural Practices Seeding Irrigation Systems Landscape Incidentals

Technical Category: Employee Development

Subject Area	Discipline
Basic Skills	Reading Writing Mathematics Communication Technical Credibility Training
Thinking & Learning	Problem Solving Creativity and Innovation Decision Making Continual Learning External Awareness Strategic Thinking
Personal Qualities	Work Habits/Image Interpersonal Skills Time Management Stress Management Ethics Flexibility Service Motivation Vision Accountability Entrepreneurship Financial Management Technology Management Political Savvy Project Management
Working with Others	Human Resources Management Harassment Discrimination Diversity Teamwork Partnering/Customer Service Leadership Influencing/ Negotiating Public Relations
Computer Technology	Office Automation Applications Internet Job-Related Technologies

Technical Category: Maintenance

Subject Area	Discipline
Maintenance Administration	Planning Scheduling Quality Control Customer Focus Program Presentation Asset Management Contract Management Performance Improvement
Roadway & Shoulder	Shaping Stabilization Distress Analysis Patching Crack Sealing Joint Sealing Widening Surface Treatment Base/Subbase Repair
Drainage	Drainage Systems Pipe/Culvert Replacement Grade Control Environmental Protection Soils Hydraulics Drainage Inspection Drainage Intercept Systems Subsurface Drainage
Winter Operations	Winter Traffic Services
Roadside Maintenance	Vegetation Management
Bridge Maintenance	Cleaning Repair
Fleet Management	Motorized Equipment
Work Zone Traffic Control	Short Term Traffic Control Long Term Traffic Control Flagging
Traffic Services & Safety	Pavement Marking Signs Guiderail and Median Barrier Incident Services

Technical Category: Materials

Subject Area	Discipline
Soils Testing	Bulk Disturbed Sampling Moisture-Density Relationship for Fine Soils Moisture-Density Relationship for Coarse Soils Geotechnical Exploration, Sampling & In-Situ Testing Documentation
Aggregates	Sampling Field Testing Lab Testing Documentation
Treated & Untreated Bases Untreated Bases are bases in which only the addition of water has been made to the original material. Treated bases can have the addition of cement, lime, calcium chloride, etc. to control moisture, aid in compaction, etc.	Sampling/Testing Field Testing Lab Testing Mix Design Documentation
HMA Field Testing (Virgin Mix &/or RAP)	Sampling/Testing Asphalt Binder Testing Documentation
Recycling: Field In-Place (Hot or Cold)	Sampling/Testing
HMA Production & QA Labs (including Mix Design)	Sampling/Testing HMA Mix Design Asphalt Binder Testing Mix Verification Documentation
Cementitious Material (Low Density Fill, Shotcrete & Other Cementitious Materials)	Sampling/Testing Documentation
PCC Pavement Field Testing	Concrete Delivery Sampling/Testing Smoothness Documentation
PCC Bridges & Minor Structures	Concrete Delivery Sampling/Testing Smoothness (Bridge Decks) Documentation
PCC Production & QA Labs	Sampling/Testing PCC Mix Design Mix Verification Documentation

Subject Area	Discipline
Miscellaneous Paint, Prestress/Precast Products, Reinforcing Steel, Steel, High Strength Bolting, Guardrail, Pavement Marking, Drainage Structures, Welding, Geotextiles, Joint Materials, Signing, Bridge Bearing, Landscape Materials & All Others	Sampling/Testing
Quality Assurance	Quality Control Quality Acceptance Independent Assurance Audits PCC Production (Offsite &/or Jobsite Plant Inspection/Approvals)
Geotechnical Testing	General Geotechnical Laboratory Soil Sample Preparation Classification & Index Testing of Soils Performance Testing of Soils Geosynthetics Verification Testing

Technical Category: Safety

Subject Area	Discipline
Personal Safety	Emergencies First Aid Bloodborne Pathogens Fitness for Duty Good Health & Injury Prevention Risk Management
Workplace Safety	Confined Space (General and Construction) Electrical Safety Emergency Procedures Hazardous Materials (HazMat) Personal Protective Equipment Worksite Safety Awareness Security
Construction Safety	Steel Fabrication & Erection Trenching & Shoring Safety Fall Protection Hand & Power Tools Moving Vehicles
Vehicles & Equipment	Operation Commercial Vehicles Defensive Driving Motorized Equipment Special Equipment
Workzone Operations	Flagging Operations Lane Closure Types Lane Closure & Separation Inspection Traffic Control Plan Construction Traffic (On-Site) Nighttime TTC Complex Applications Work Zone Traffic Control Other
Work Zone Devices	Advanced Warning Signs Installation, Placement & Removal Temporary Traffic Control Devices Temporary Pavement Markings & Delineators Variable Message Signs Raised Pavement Markers Attenuators Other

Subject Area	Discipline
Work Zone Mobility	Traffic Management Plan Performance Monitoring Public Relations Other
Traffic Control Devices (TCD)	TCD Fundamentals Visibility & Retroreflectivity
Signing	Sign Basic Principles Sign Panel Fabrication Roadside Sign Installation Overhead Sign Installation Object Markers Sign Maintenance Sign Visibility Sign Management
Markings	Basic Principles of Pavement Markings Traffic Control Plans (Permanent) Marking Materials Markings Equipment Markings Installation Pavement Markers Marking Maintenance & Inspection Marking Visibility & Retroreflectivity Marking Management
Signals	Signal Basics Signal Components Signal Controllers & Cabinet (Wire-up) Signal Equipment Signal Design Signal Timing & Optimization Signal Systems Other Signals & Beacons
Traffic Systems	Electronic TCD's Illuminated Signs Lighting Maintenance of Electronic Devices Electrical Power Traffic Operations Traffic Detection Traffic Incident Management Intelligent Transportation Systems
Roadway Safety Appurtenances	Barriers, End Treatments Barriers Longitudinal Barriers Bicycle Facilities

Subject Area	Discipline
	Intersection Controls Pavement Edge Pavement Safety Pedestrian Facilities Railroad Crossings Roadway Delineation Rumble Strips Speed Control
Safety Strategies	Bicycle Traffic & Safety Human Factors Intersections Pavement Pedestrians Railroad Crossings Road Safety Audits Roadway Departure Speed Management
Other	Traffic Engineering Safety Training & Education Other Highway Safety Disciplines Other Highway Safety Competencies

Appendix C – Competencies for Which No Training Courses Were Identified

Technical Category: Construction

Subject Area	Discipline	Competency	Skill Level
Contract Administration	Partnering	Fosters partnering with contractors and other involved parties	IV
	Value Engineering	Approves VECP actions	IV
	Consultant Construction Engineering & Inspection (CCEI)	Monitors and documents CCEI services	II
		Selects and negotiates CCEI contracts Approves modifications to CCEI contracts Processes error and omission claims	IV
Environment	Disposal Areas	Explains the procedures that a contractor must follow in securing the approval of a disposal site Explains the contents of a contractor's site plan for a disposal area Explains the responsibilities of both the contractor and the DOT as they pertain to disposal areas	II & III
	Debris Burning	Verifies that the contractor's burning has been approved and is in compliance with all applicable laws, rules, and ordinances	II & III
	Water & Sanitary Sewer Facilities	Verifies that cisterns, septic tanks, and other structures have been demolished and backfilled properly Verifies that all wells have been properly closed Verifies that water supplies are protected from contamination by sewage Verifies that water mains and accessories have been disinfected prior to tie-ins in accordance with prescribed procedures	II & III

Subject Area	Discipline	Competency	Skill Level
Drainage	Convential Drainage System Construction Inspection	Conducts conventional drainage system performance tests Recognizes improper conventional drainage system installation and recommends corrective actions	III
	Large & Special Drainage System Construction Inspection	Describes the basic elements of large and special drainage systems such as multi-plate culverts Performs basic inspection of manufactured elements of large and special drainage systems	I
Aggregate Inspection	Stockpiling & Hauling	Recommends acceptance or corrective action based on inspection results Documents and follows up on corrective actions	III
Geotechnical Construction	Geosynthetic Materials Installation Inspection	Performs simple geosynthetic materials installation observations, measurements and computations	I
	Shallow Foundation Inspection	Recognizes foundation excavation requirements	II
	Documentation	Describes the basics of project documentation	I

Subject Area	Discipline	Competency	Skill Level
New Structure Construction	Precast Structures	Identifies precast items on construction plan Recognizes precast products and materials acceptance stamps/certifications	I
		Recognizes implications of improper installation Recommends corrective actions Recommends changes to the location of precast units to accommodate conflicts in the field Recommends acceptance or rejection of precast units	III
		Determines contract decisions related to changes or corrective actions regarding precast units	IV
	Post Tensioning	Recommends corrective action or rejection of product	IV

Technical Category: Employee Development

Subject Area	Discipline	Competency	Skill Level
Personal Qualities	Flexibility	Demonstrates flexibility and adjusts to new situations	I
Working with Others	Public Relations	Understand the components of public communications and outreach programs	III

Technical Category: Maintenance

Subject Area	Discipline	Competency	Skill Level

Subject Area	Discipline	Competency	Skill Level
Maintenance Administration	Customer Focus	Insures that customer inquiries and requests are responded to in a courteous and professional manner	III
Drainage	Drainage Inspection	Implements drainage system inspection, preventive maintenance and repair procedures	III
		Establishes drainage system inspection, preventive maintenance and repair procedures	IV
	Subsurface Drainage	Establishes underdrain system installation procedures	III & IV

Technical Category: Materials

Subject Area	Discipline	Competency	Skill Level
Soils Testing	Moisture-Density Relationship for Fine Soils	Makes recommendations to project personnel to adjust jobsite processes based on varying moisture conditions	III
	Moisture-Density Relationship for Coarse Soils	Makes recommendations to project personnel to adjust jobsite processes based on varying moisture conditions	III
	Documentation	Interprets completed documentation Documents corrective action based on an individual test result Checks documentation for accuracy Enters data into a statistical program	III

Subject Area	Discipline	Competency	Skill Level
HMA Production & QA Labs (Including Mix Design)	Sampling/Testing	Performs sampling and testing of PCC samples in accordance with AASHTO/ASTM standards Calibrates/inspects equipment Applies proper lab testing techniques Performs basic mathematical calculations Reports out test results	II
	Documentation	Completes sample forms and test reports Collects preliminary sample data as required by test method Performs mathematical calculations Submits test results for review	II
Cementitious Materials	Documentation	Completes sample forms and test reports Collects preliminary sample data as required by test method Performs mathematical calculations Submits test results for review	II
PCC Pavement Filed Testing	Concrete Delivery	Rejects loads not meeting specification requirements	II

Subject Area	Discipline	Competency	Skill Level
PCC Production & QA Lab	Documentation	Completes sample forms and test reports Collects preliminary sample data as required by test method Performs mathematical calculations Submits test results for review	II
		Interprets completed documentation Documents corrective action based on an individual test result Checks documentation for accuracy Enters data into a statistical program	III
Miscellaneous Areas	Sampling/Testing	Assists in performing sampling and testing Describes proper sampling techniques Uses proper equipment to procure representative field samples Identifies products from Qualified Products List (QPL)	I
		Determines corrective action based on an individual test results	III
Quality Assurance	PCC Production (Offsite and/or Jobsite Plant Inspections/ Approvals)	Assists in inspecting and approving offsite and jobsite batch plants, stockpiles, material shipments	I
		Inspects and approves offsite jobsite batch plants and stockpiling of materials Verifies correct and approved materials when received on project	II
		Approves QC plan for PCC production Recommends corrective action	III
		Determines corrective actions at a program level	IV
Geotechnical Testing	General Geotechnical	Assist in the performance of standard geotechnical laboratory tests	I
		Conducts standard geotechnical materials laboratory tests	II

Subject Area	Discipline	Competency	Skill Level
	Laboratory	Administers specialized geotechnical materials laboratory tests	III
		Oversees all geotechnical materials laboratory tests Recommends geotechnical materials acceptance and payment	IV
	Soil Sample Preparation	Assists in preparing samples for classification and Index Testing	I
		Prepares samples for classification and Index Testing according to AASHTO/ASTM Standard test procedures	II
		Extrudes undisturbed samples, evaluates sample quality, and prepares specimens for performance testing	III
		Oversees proper sample preparation and enforces quality assurance procedures	IV
	Classification & Index Testing of Soils	Conducts standard geotechnical classification and index tests (i.e. Sieve analysis, #200 Wash, hydrometer, specific gravity, liquid limit, plastic limit, and moisture content determinations) according to AASHTO/ASTM standard test procedures	II
		Conducts unit weight determinations on undisturbed specimens	III
		Oversees geotechnical laboratory testing and enforces quality assurance procedures	IV

Subject Area	Discipline	Competency	Skill Level
	Performance Testing of Soils	Conducts common geotechnical performance tests (i.e. Unconfined compression, triaxial shear (UU, CU, CD), direct shear, permeability (falling head, constant head), 1-D consolidation, and shrink/swell potential) after communicating with geotechnical design engineer on testing requirements	III
		Oversees geotechnical laboratory testing and enforces quality assurance procedures	IV
	Geosynthetics Verification Testing	Verifies material strengths and engineering properties	III
		Oversees material testing and verifies product specifications with respect to design requirements	IV

Construction Competency Matrices

***NOTE*: The Construction Competency matrices are designed to be used in combination with the Safety and Employee Development matrices.**

Subject Areas:

Contract Administration

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Rights of Way (ROW) Management	Identifies stakes and easement limits		Obtains construction easements and work permits	
Contractor Payments	Computes quantity measurements Documents for application to contractor payments	Develops contractor payment estimates	Verifies contractor payment estimates	Recommends contractor payment estimates Approve contractor payment estimates
Supplemental Agreements (change orders)	Explains general change order procedures Documents quantities Corrects quantities	Provides information to write change orders	Prepares change orders	Approves change orders Recommends change orders Applies negotiation skills within contract limits.
Force accounts	Explains general force account procedures Documents quantities Corrects quantities	Prepares force accounts	Directs labor, equipment and materials	Prepares plan and guide estimates
Cost Estimating	Computes quantities	Applies basic principles of cost estimating	Utilizes historical bid prices to obtain prices for new or negotiated items	Develops estimate using labor, equipment, materials and historical item prices

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Claims Management	Recognizes work falling outside the scope of the contract	Maintains proper project records	Implements claims management and contract claims specifications processes and procedures	Manages project to minimize claims
	Prepares construction diaries	Summarizes project records		Applies claims management process and procedures
				Negotiates claims
Preconstruction (field design/ redesign)	Identifies basic elements of a construction plan	Visualizes complete components of the plan	Modifies basic design (field) using available design tools	Approves design changes that can be made in the field
	Locates worksite features included on the construction plan	Identifies design conflicts or omissions		Escalates design issues that must be escalated to the designer of record
	Distinguishes among the plan, profile and cross section			
Project Closeout		Explains the principles underlying the construction contractor performance evaluation process	Prepares project closeout documents	Completes project closeout procedures
			Prepares objective construction contractor performance evaluation	Recommends project acceptance
Specifications	Relates specifications to project requirements	Identifies order of precedence of specifications	Interprets specifications for change orders	Writes specifications for change orders
		Applies specifications in enforcing contract requirements		

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Office Procedures	Follows office filing procedures for project		Prepares project-relevant reports and correspondence	
Scheduling	Follows project schedule in the execution of assigned work activities	Interprets project schedule	Monitors project schedule Uses scheduling tools	Reviews contractor schedule modifications
Partnering	Applies principles of partnering with contractors and other involved parties	Participates in partnering with contractors and other involved parties		Fosters partnering with contractors and other involved parties
Value Engineering			Recommends VECP actions Evaluates VECP	Approves VECP actions

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Consultant Construction Engineering & Inspection (CCEI)		Monitors and documents CCEI services	Selects and contracts for professional services	Selects and negotiates CCEI contracts
		Supervises small project teams	Establishes project staffing levels and qualifications	Approves modifications to CCEI contracts
			Evaluates CCEI Services	Processes error and omission claims
			Recommends CCEI contract modifications	

Quality Assurance

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Quality Control	Measures dimensions	Describes operations of quality control systems	Analyzes control and acceptance data	Assesses results and takes action to correct processes to meet applicable requirements
	Examines/classifies attributes	Monitors quality control systems data	Takes action at project level based on compared data	Recommends action to QC program administrator
	Documents results			
Quality Acceptance	Measures dimensions	Describes operations of quality control and acceptance systems	Analyzes control, acceptance and IA data	Assesses results and takes action to correct processes to meet applicable requirements
	Examines/classifies attributes	Monitors quality control and acceptance systems data	Takes action at project level based on compared data	Recommends action to QA program administrator
	Documents results	Documents results		
Independent Assurance (IA)		Measures dimensions	Performs independent evaluations of the work process and technicians used for quality control or acceptance	Analyzes systems data and makes program-level decisions based on systems competence.
		Examines/classifies attributes	Recommends actions based on analysis results	Develops draft system/program improvements
		Documents results		

Environment

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
General		Explains the environmental stipulations regarding erosion and siltation, pollution (water, air, & noise), forests and archeological, paleontological, and rare mineralogical findings		
Disposal Areas		Explains the procedures that a contractor must follow in securing the approval of a disposal site	Conducts claims reviews	
		Explains the contents of a contractor's site plan for a disposal area	Negotiates and resolves issues	
		Explains the responsibilities of both the contractor and the DOT as they pertain to disposal areas	Approves work orders	
Environmental Permits, Certificates and Licenses (Streams & Wetlands	Describes Environmental Permits, Certificates and Licenses	Verifies that all appropriate permits have been obtained	Conducts claims reviews	
	Reviews Environmental Permits, Certificates and Licenses for project-applicable commitments	Verifies that the contractor adheres to the provisions of all environmental permits	Negotiates and resolves issues	
	Verifies that all permits and special provisions are maintained on-site and the dates are still applicable (expiration dates are current)	Verifies that the contractor has not caused the rutting, compaction and pollution or other harm to the wetland mitigation planting area	Approves work orders	

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
	Verifies that all new pipes and/or culverts for road crossings on perennial streams are being countersunk a minimum of 6 inches for the establishment of natural habitat and that prescribed low-flow provisions are followed	Verifies that all "no impact" jurisdictional areas are marked off and protected prior to construction		
	Verifies that the contractor is using mats in wetland areas to support construction equipment	Verifies that all temporary structures in jurisdictional permitted areas are properly maintained		
	Verifies that the contractor has submitted for approval the design and method of temporarily relocating streams to facilitate construction	Verifies that the contractor has prevented stream constriction which would reduce flows below the prescribed minimum (normally 50%)		
		Verifies that all disturbed jurisdictional stream and wetland areas are returned to natural contours		

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Cultural Resources	Verifies that all cultural resources (archaeological sites, historic buildings, etc.) that have been delineated on construction plans for avoidance are being protected from impact from construction		Conducts claims reviews Negotiates and resolves issues Approves work orders	
Hazardous Materials		Verifies that the site-specific Environmental Plan for the removal and application of protective coatings of metals in structures has been sent to the contractor	Conducts claims reviews	
		Verifies that during the startup and removal portions of the coating removal process the contractor's certified Industrial Hygienist, Licensed Lead Supervisor or Steel Structure Painting Council Supervisor (as identified in the Environmental Plan) is on site	Negotiates and resolves issues	
		Verifies that the contractor has collected air samples during the application and removal of protective coatings and has submitted the analysis results as specified	Approves work orders	

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
		Verifies that the contractor has a Spill Prevention Control and Countermeasure Plan on-site and adequate secondary containment for petroleum storage if more than a total of 1320 gallons of petroleum product is stored (55-gallon containers and greater) on the project		
		Verifies that fuels and lubricants are stored outside of flood plains and that impoundments are in place to contain accidental spills and prevent such spills from entering waterways		
Erosion and Sediment Control	Verifies that the contractor is inspecting and immediately responding to install and correct or maintain erosion and siltation measures so they function properly or when conditions dictate	Verifies that the contractor has installed temporary and permanent devices to control erosion and minimize siltation of waterways and adjacent properties	Conducts claims reviews	
		Verifies that the contractor has a fully certified erosion and sediment control employee on the project during any land disturbing operations	Negotiates and resolves issues	
		Verifies that the contractor has uniformly graded disturbed areas to natural contours to facilitate drainage and prevent impoundment of water	Approves work orders	
		Verifies that all discharge water is being filtered to remove deleterious materials prior to discharge into state waters		

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
		Verifies that all excavated materials are being disposed of in an approved area above the mean high water elevation in a manner that will prevent their return into state waters		
		Verifies that the contractor is preventing erosion of soil and the pollution and siltation of rivers, streams, and impoundments during the construction of new bridges and culverts and removal of existing bridges and culverts		
Debris Burning	Explains the Specification pertaining to burning debris from construction operations	Verifies that the contractor's burning has been approved and is in compliance with all applicable laws, rules, and ordinances	Conducts claims reviews	
			Negotiates and resolves issues	
			Approves work orders	
Water & Sanitary Sewer Facilities		Verifies that cisterns, septic tanks, and other structures have been demolished and backfilled properly	Conducts claims reviews	
		Verifies that all wells have been properly closed	Negotiates and resolves issues	
		Verifies that water supplies are protected from contamination by sewage	Approves work orders	
		Verifies that water mains and accessories have been disinfected prior to tie-ins in accordance with prescribed procedures		

Construction Surveying & Staking

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Surveying Verification	Identifies principles of surveying and landscape preservation	Checks grades	Verifies dimensions and volumes by trigonometric and quantity methods	Coordinates with surveyors to identify necessary changes
	Reads survey and slope stakes	Checks location from reference and slope stakes	Conducts cross sections and calculations to prepare earthwork volumes (cuts & embankments)	Adjusts contract to reflect survey changes and errors
	Interprets map contours	Confirms staking information		
	Uses hand level and cloth tape for measurement purposes	Uses and calibrates survey tools and instruments		

Utilities

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Permits/Agreements	Identifies basic elements of permits and agreement forms Follows basic permit and agreement form procedures	Ensures documentation (permits/agreements) compliance	Adjusts schedule to accommodate dates of utility relocation work to avoid delay highway contractor	Coordinates with organizations to arrange for appropriate permits/agreements Communicates and works toward resolution of discrepancies or issues
Location/Mapping/ Surveying	Identifies utility locations/mapping	Relates utility locations/mapping to construction activities (e.g., depths)	Identifies need for additional mapping/location and relationship with project schedules and delays	Ensures appropriate action for additional mapping/location and relationship with project schedules and delays
Utility Construction	Recognizes plans, specifications and safety issues related to utility construction	Identifies construction techniques, specifications and safety issues related to utility construction	Adjusts schedule to accommodate dates of utility relocation work to avoid delay highway contractor	Makes appropriate changes and adjustments based on applicable code and pipeline regulations
Railroads	Recognizes need for appropriate permits and staff	Complies with applicable permits and railroad requirements		Coordinates with railroad organizations for permits/changes

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Subsurface Utility Engineering (SUE)	Locates (plan view) and designates (plan and profile views) utilities on the project	Assesses utility condition	Ensures utility operations	Mitigates conflicts and minimizes utility relocation
		Verifies survey and utility mapping outputs	Identifies utility conflicts	Develops relocation cost estimates
			Recognizes SUE quality levels	Resolves accommodation conflicts
			Implements accommodation policies	

Grading

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Excavation	Explains the basic principles of excavation	Interprets grading stakes	Recognizes implication of improper application (including effects on and of other structures)	Determines contract decisions related to excavation, clearing and grubbing, unsuitable material and acceptance of shoring plans
	Assists in measuring areas for payment	Explains the basics of haul diagrams in the Contract Plans	Interprets haul diagram and identifies changes in the field	Recommends changes in balance points to equalize distribution of excavated material on the jobsite
	Describes safety issues related to shoring in areas of excavation (OSHA Trenching Safety Requirements)	Identifies areas requiring shoring and reviews plans	Recommends acceptance or rejection of shoring plans	
			Distinguishes between materials that can be excavated by conventional equipment (blades, loaders, hoes, rippers, etc.) or by rock excavation techniques (hydraulic & pneumatic equipment, blasting, swelling agents, etc.)	

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
			Evaluates subgrades (proofrolling, soundings, testpits, etc.) to identify wet or unsuitable subgrade materials and recognizes solution alternatives	
Controlled Blasting		Explains the basic principles of Controlled Blasting	Recognizes implication of improper application	Determines contract decisions related to controlled blasting
		Identifies safety concerns related to traveling public	Reviews Contractor's controlled blasting plan	
			Verifies vibration monitoring requirements and results	
			Recommends contract decisions related to controlled blasting	
Contour Grading		Explains the basic principles of contour grading	Recognizes implication of improper application	Determines contract decisions related to contour grading
		Enforces specifications	Recommends contract decisions related to contour grading	
		Interprets staking		
		Identifies improper information		

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Site Preparation	Explains the difference between clearing and grubbing	Identifies limits of clearing and grubbing for payment	Recommends acceptance or rejection of limits of clearing and grubbing for payment	
		Recognizes proper soil surface preparations (I.e. benching, surface drainage, scarifying, sealing, etc.)	Evaluates foundation soils (proofrolling, soundings, testpits, etc.) to identify wet or unsuitable foundation materials and recognizes solution alternatives	
			Identifies limits of wet or unsuitable material and makes recommendations for shallow repair/improvement of area, or notifies geotechnical engineer if other ground improvement methods are warranted	
Embankment	Explains the basic principles of embankment construction	Interprets grading stakes	Recognizes implication of improper construction of embankment	Determines contract decisions related to embankment
		Recognizes unsuitable embankment material	Recommends acceptance or rejection of embankment material	Recommends corrective actions to be taken in relationship to improperly constructed embankments
		Recognizes problems associated with density tests and notifies supervisor	Interprets results of density tests for acceptance or rejection of compacted materials	

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
		Recognizes improper slope and embankment construction	Verifies requirements and results for ground improvement methods used for embankment construction (I.e. vertical drains, reinforced slopes, light weight fill, column supported embankments, etc.)	
Borrow	Describes the basic requirements of borrow material	Identifies limits of borrow site	Recognizes implication of improper application	Determines contract decisions related to borrow
	Collects weigh tickets and identifies area of placement of material	Observes and documents the reclamation of the borrow site	Recommends acceptance of rejection of borrow site reclamation plan	
		Identifies representative samples for laboratory testing	Recommends acceptance or rejection of borrow source	
		Interprets material test result for suitability of material		
Compaction	Describes principles of compaction	Interprets material test result for acceptance or rejection of compactive effort and/or soil moisture	Recognizes implication of improper application	Determines contract decisions related to compaction

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
		Distinguishes soil types and recognizes moisture-density relationships for all approved soil types and compactive efforts	Recommends contract decisions related to compaction	
		Reviews results of compaction tests, moisture contents, and field proctor tests as required		
		Recognizes problems associated with density tests and notifies supervisor		
Documentation	Measures quantities of material hauled	Calculates quantities for payment	Checks calculations and approves payment	Authorizes payment for all items related to a contract
		Calculates densities and moisture contents	Compiles documentation to support contract changes	Prepares changes to the contract documents
		Recognizes proper material documentation		
		Writes project diaries		

Drainage

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
General Surface and Subsurface Drainage Systems	Describes the basic purposes of surface and subsurface drainage systems	Recognizes proper surface and subsurface drainage system installation procedures	Recognizes improper surface and subsurface drainage system location staking and recommends corrective actions	Determines contract decisions related to changed conditions or corrective actions pertaining to surface and subsurface drainage systems
	Identifies surface and subsurface drainage items on contract plans	Interprets surface and subsurface drainage system stakes and identifies location problems in the field	Recommends changes to the location of drainage items to accommodate conflicts in the field (after communicating with engineer)	
	Recognizes special identification, test compliance stamps and certificates on drainage system materials	Documents acceptance of drainage items and records measurement for payment	Documents rejection of drainage system work and corrective action taken	
Convential Drainage Systems Construction Inspection	Describes the elements and engineering properties of conventional drainage systems	Inspects drainage pipe unloading, storage and installation procedures	Conducts conventional drainage system performance tests	Determines contract decisions related to changed conditions or corrective actions pertaining to conventional drainage system installations
	Performs basic inspection of standard manufactured pipe, conduit, fittings and precast elements	Inspects drainage pipe bedding and backfilling materials and procedures	Recognizes improper conventional drainage system installation and recommends corrective actions	

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Large and Special Drainage Systems Construction Inspection	Describes the basic elements of large and special drainage systems such as multi-plate culverts	Inspects large and special drainage pipe unloading, storage and installation procedures	Conducts large and special drainage system performance tests	Determines contract decisions related to changed conditions or corrective actions pertaining to large and special system installations
	Performs basic inspection of manufactured elements of large and special drainage systems	Inspects large and special drainage pipe bedding and backfilling materials and procedures	Recognizes improper large and special drainage system installation and recommends corrective actions	

Aggregate Bases & Subbases Inspection

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Surface Preparation	Assists in performing inspections of the surface upon which the aggregate materials are to be placed	Inspects subgrade or previously placed aggregate layers surface for required density and cross section 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
Stockpiling and Hauling	Assists in inspecting contractor's aggregate stockpiling methods	Inspects contractors stockpiling methods	Recommends acceptance or corrective action based on inspection results	Determines contract decisions related to stockpiling and hauling vehicle acceptance and payment
	Assists in performing inspections of hauling vehicles	Inspects trucks for proper loading and protection of aggregate materials	Documents and follows up on corrective actions	Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
		Checks weigh tickets for compliance with load restrictions		
Laydown	Assists in performing inspections related to laydown of aggregate materials	Inspects laydown and processing of aggregate materials for compliance with uniformity cross section requirements	Recommends acceptance or corrective action based on visual inspection and results of jobsite test	Determines contract decisions related to HMA laydown acceptance and payment

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
			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	Identifies types of compaction equipment	Recommends acceptance or corrective action based on visual inspection and results of jobsite compaction tests	Determines contract decisions related to laydown and compaction acceptance and payment
		Explains how the types of compaction equipment are used	Documents and follows up on corrective actions	Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
Surface Tolerances/ Smoothness	Recognizes the factors that control surface smoothness and how equipment is used to measure smoothness	Interprets results of job surface tolerance and smoothness checks	Recommends acceptance or corrective action based on visual inspection and results of surface tolerance and smoothness checks	Determines contract decisions related to surface tolerance and smoothness acceptance and payment
	Assists in laying out roadway sections for surface tolerance checks	Calculates pay factors for incentive/disincentive where appropriate	Documents and follows up on corrective actions	Recommends disciplinary action when corrective measures are not taken in a reasonable time frame

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Documentation	Selects correct inspection forms to be used for different aggregate layers	Completes inspection forms	Documents acceptance or corrective action based on a review of inspection reports, measurements and test results	Enters data into summary reports or statistical programs
		Performs basic mathematical calculations		Interprets data
		Reports out inspection results		Recommends corrective action on a program basis to managers

Geotechnical Construction

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
General Geotechnical Construction Inspection	Performs basic geotechnical construction inspection observations, measurements and computations	Conducts common geotechnical installation acceptance tests and inspects standard installations	Administers specialized geotechnical installation acceptance tests and unique installation inspections	Oversees common and specialized geotechnical installation acceptance tests and installation procedures
		Verifies locations and quantities		Decides on geotechnical installation acceptance and payment
Subsurface Exploration		Assists in performing basic subsurface exploration crew soil boring, coring, sampling tasks	Reads plans and locates borings	Supervises standard subsurface exploration boring, coring, sampling, visual description and logging crew operations
		Determines water levels in borings	Operates drilling equipment without supervision	Performs specialized geotechnical field and insitu testing
		Operates drilling equipment under direct supervision	Performs standard subsurface exploration boring, coring, disturbed and undisturbed sampling, SPT, visual description and logging tasks, and proper sample storage/transport	Installs specialized instrumentation

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
			Installs common instrumentation	
Geosynthetic Materials Installation Inspection	Performs simple geosynthetic materials installation observations, measurements and computations	Conducts standard geosynthetic materials acceptance and inspects standard installations Verifies locations and quantities	Administers geosynthetic materials specialized acceptance tests and unique installation inspections	Oversees common and specialized acceptance and installation procedures Decides on geosynthetic materials installation acceptance and payment
Shallow Foundation Inspection		Recognizes foundation excavation requirements	Verifies bearing material Recognizes effects of open excavation with respect to time on bearing capacity and performance (I.e. rainwater infiltration, groundwater, soil relaxation, etc.)	Recommends corrective actions on foundation bearing after communicating with engineer
Driven Foundation Inspection	Identifies pile foundation types Recognizes elements of an approved driven pile installation plan	Performs standard driven pile foundation inspections Verifies compliance with the approved installation plan Recognizes basic driving control methods	Correlates estimated and actual driven pile tip elevations to boring logs Supervises standard driven pile inspection operations	Authorizes payment for all driven foundation items within contract Assures compliance with contract specifications and approved installation plans

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
		Performs basic load testing		
Drilled Shaft Inspection	Describes the basics of drilled shaft dry, casing and wet construction methods	Performs standard drilled shaft installation inspections and	Supervises standard drilled shaft inspection crew operations	Authorizes payment for all drilled shaft items within contract
	Recognizes elements of an approved drilled shaft installation plan	Verifies compliance with the approved installation plan	Verifies and documents subsurface soil/rock and groundwater conditions	Assure compliance with the contract specifications and approved installation plans
		Recognizes construction and installation equipment components		
Ground Anchor Inspection			Recognizes proper and improper installation	Communicates with engineer on documented results, and trouble-shooting as required
			Verifies and documents installation requirements and results (drilling, encountered soil/rock, hole depth, drill-hole integrity, anchors, corrosion protection, proper torque (if applicable), grouting (bonded and unbonded), seating platform and plate/nut assembly, pretensioning, lock-off, and project details)	
			Verifies and documents load test requirements and results	

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Soil Nail Wall Inspection			Recognizes proper and improper installation	Communicates with engineer on documented results, and trouble-shooting as required
			Verifies and documents installation requirements and results (excavation, benching, nail spacing, drilling, encountered soil/rock, hole depth, drill-hole integrity, nails, corrosion protection, grouting, seating platform and plate/nut assembly, drain installation, mesh/reinforcement placement, shotcreting, and project details)	
			Verifies and documents load test requirements and results	
Mechanically Stabilized Earth Wall Inspection		Recognizes proper MSE wall construction	Recognizes improper MSE wall construction and conditions effecting wall performance and stability	Recommends corrective actions to MSE wall construction after communicating with engineer
		Verifies compaction and reinforcement placement requirements and	Oversees wall construction	

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
		documents results	Verifies structural and drainage detail requirements, structural connection requirements, and delivered materials, material requirements, corrosion testing results	
Reinforced Soil Slopes (RSS) Inspection		Recognizes proper reinforced soil slope construction	Recognizes improper reinforced soil slope construction and conditions effecting slope performance and stability	Recommends corrective actions to RSS construction after communicating with engineer
		Verifies compaction and reinforcement placement requirements and documents results	Oversees RSS construction	
			Verifies structural and drainage detail requirements, reinforcement splices, delivered materials, material requirements	
Ground Improvement Inspection			Recognizes proper and improper installation of various ground improvement methods	Communicates with engineer on documented results, and trouble-shooting as required

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
			Verifies and documents requirements and results for ground improvement methods, including vertical drains, lightweight fill, vibrocompaction, dynamic compaction, stone columns, vibroconcrete columns, grouting (permeation, compaction, jet, soil fracture, rock fissure, and general pressure grouting), reinforced earth, deep soil mixing, and column supported embankments	
			Verifies and documents results of performance testing, as required	

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Documentation	Describes the basics of project documentation	Calculates quantities for geotechnical installations and geosynthetic materials	Checks calculations	Authorizes payment for all geotechnical and geosynthetic items related to a contract
		Writes project diaries	Approves payment for geotechnical installations and geosynthetic material	Prepares changes to the contract documents
			Compiles documentation to support contract changes	

New Structure Construction

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Footings	Describes types of footings	Determines specification and geotechnical requirements compliance or corrective action required	Recommends contract decisions related to foundations acceptance and payment	Determines contract decisions related to foundations
	Assists in checking staking for location	Checks staking for location in relation to plans	Verifies footing bearing elevation and location	
		Verifies concrete requirements and placement	Verifies steel reinforcement requirements & placement	
Retaining Walls (General)	Describes types of retaining wall systems	Recognizes wall construction requirements (including concrete, concrete steel reinforcement, backfill, backfill reinforcement, drainage, and plan detail requirements)	Recognizes improper wall construction and conditions effecting wall performance and stability	Determines contract decisions related to walls
	Assists in checking line and grade	Checks staking for location in relation to plans	Oversees wall construction	Recommends corrective actions on foundation and wall bearing after communicating with engineer
		Verifies concrete requirements & placement	Verifies foundation and wall bearing subgrade conditions	

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
		Verifies backfill requirements & placement (See Grading: Compaction)	Verifies structural and drainage detail requirements, structural connection requirements, and delivered materials, material requirements, material testing results	
Forming & Falsework	Explains basic formwork and falsework specifications	Compares field layout to forming and falsework drawings	Reviews Contractor's submittals	Approves formwork and falsework submittals
		Determines specification compliance or corrective action required	Recommends contract decisions relating to forming and falsework	Determines contract decisions related to forming and falsework acceptance and payment
Concrete Girders	Explains the basic types of a concrete girder	Determines specification compliance or corrective action required	Recommends contract decisions related to concrete girders acceptance and payment	Determines contract decisions related to concrete girders acceptance and payment
	Assists in checking girder deflection	Checks for proper deflection of girders		
		Observes placement of girder		
		Observes handling and storage of concrete girders		

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Steel girders & connectors	Explains the basic properties of a steel girder	Determines specification compliance or corrective action required	Recommends contract decisions related to steel girders acceptance and payment	Determines contract decisions related to steel girders acceptance and payment
	Describes procedure for checking bolts	Verifies proper bolted connections		
		Verifies for proper sandblasting of steel		
		Inspects painting of girder in field		
		Inspects handling and storage of girder		
Reinforcing Steel - Layout	Explains basic reinforcing steel layout specifications	Identifies proper spacing, tieing and support of reinforcing steel	Recommends contract decisions related to reinforcing steel layout acceptance and payment	Determines contract decisions related to reinforcing steel layout acceptance and payment
	Describes the various types of reinforcing steel	Observes handling and storage of reinforcing steel		
	Describes handling and storage of different types of reinforcing steel	Inspects reinforcing steel for damage (rust, damaged epoxy coating) and enforces corrective action		
	Assists in checking reinforcing bar spacing and support	Compares field layout to contract plans		

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Concrete Placement & Consolidation	Describes the principles of concrete placement	Determines specification compliance or corrective action required	Recommends contract decisions related to concrete placement acceptance and payment	Determines contract decisions related to placement acceptance and payment
	Describes proper vibration techniques	Determines if the concrete is being properly vibrated		
		Determines if the proper pour rate is being maintained		
Joints	Describes types of Joints	Determines specification compliance or corrective action required	Recommends contract decisions related to steel girders acceptance and payment	Determines contract decisions related to then acceptance of joints and payment
		Compares layout of joints to plans and determines if proper material is used to construct joint		
Finishing & Curing Concrete	Describes methods of finishing and curing concrete	Determines specification compliance or corrective action required	Recommends contract decisions related to finishing and curing concrete and payment	Determines contract decisions related to finishing concrete
	Assists in checking rails for deck finishing machine	Observes setup of deck finishing machine and checks for proper deck thickness	Documents and follows up on corrective actions	Approves removal of curing system
	Assists in checking the application of curing compound	Inspects the application of curing compound and checks to make sure the curing system is maintained	Recommends approval of removal of curing system	

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Deck Smoothness	Describes the requirements for smoothness	Determines specification compliance or corrective action required	Recommends contract decisions related to smoothness acceptance and payment	Determines contract decisions related to smoothness
	Demonstrates the proper technique for using a straightedge	Checks smoothness		
Precast Structures	Identifies precast items on construction plan	Recognizes proper precast structure installation procedures	Recognizes implications of improper installation	Determines contract decisions related to changes or corrective actions regarding precast units
	Recognizes precast products and materials acceptance stamps/certifications	Identifies location problems in the field	Recommends corrective actions	
		Identifies product defects prior to installation	Recommends changes to the location of precast units to accommodate conflicts in the field	
			Recommends acceptance or rejection of precast units	

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Post Tensioning		Checks strand condition, certification of post-tensioning equipment (jack)	Monitors load and measures elongation	Recommends corrective action or rejection of product
		Inspects pre-tensioning preparations	Documents and calculates elongation for acceptance	
		Verifies post tensioning layout	Recognizes implications of improper installation of grout	
		Assists in monitoring tensioning sequence		
		Inspects grouting operations		
Documentation	Describes the basics of project documentation	Calculates quantities for payment	Checks calculations and approves payment	Authorizes payment for all items related to a contract
		Writes project diaries	Compiles documentation to support contract changes	Prepares changes to the contract documents and recommend approval
		Documents acceptance of precast units		
		Records measurements for payments		

PCC Pavement Field Inspection

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Surface Preparation	Assists in performing surface inspections	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
Concrete Delivery	Assists in inspections of delivery vehicles to make sure they are in good working condition	Inspects trucks to assure that all gauges, meters, etc. are in working order	Recommends acceptance or corrective action based on inspection results	Determines contract decisions related to concrete delivery acceptance and payment
		Checks for worn parts that could affect mix quality	Documents and follows up on corrective actions	Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
		Collects load tickets		
		Verifies correct mix was shipped		
Paving Machine	Assists in inspecting paving machine to determine that it is in good working condition	Inspects paving machine to make sure it is in good working condition	Recommends acceptance or corrective action based on inspection results	Determines contract decisions related to paving machine acceptance and payment.
		Checks to ensure that the machine is set up correctly to place concrete at the specified thickness, profile and finish.	Documents and follows up on corrective actions	Recommends disciplinary action when corrective measures are not taken in a reasonable time frame

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Laydown (placement)/ Consolidation	Assists in performing inspections of laydown/consolidation of materials in accordance with job specific requirements	Inspects laydown/consolidation of materials to meet job specific requirements	Recommends acceptance or corrective action based on visual inspection and results of jobsite measurements	Determines contract decisions related to placement and consolidation acceptance and payment
			Documents and follows up on corrective actions	
Steel Placement	Assists in performing inspections of steel and placement	Inspects placement of steel to meet job specific requirements	Recommends acceptance or corrective action based on visual and jobsite inspection of steel placement	Determines contract decisions related to steel placement acceptance and payment
			Documents and follows up on corrective actions	Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
Smoothness	Recognizes the factors that control smoothness and how equipment is used to measure smoothness	Interprets printouts of smoothness readings	Recommends corrective action based on visual inspection and results of smoothness tests actions	Determines contract decisions relating to smoothness acceptance and payment.
	Assists in laying out roadway sections to be measured for smoothness	Calculates pay factors for incentive/disincentive where appropriate	Documents and follows up on corrective actions	Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
Dowels/Joints	Assists in performing inspections of dowel placement and joints to meet	Performs inspection of dowel placement and joints to meet job specific requirements	Recommends acceptance or corrective action based on visual inspection	Determines contract decisions related to dowel placement and joints acceptance and payment.

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
	job specific requirements		Documents and follows up on corrective actions	Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
Documentation	Selects correct forms to be used in documenting inspections	Completes inspection reports	Documents acceptance or corrective action based on a review of test results, inspection reports and visual observations	Interprets data
		Conducts field tests		Recommends corrective action on a program basis to managers
		Documents equipment inspection		Enters data into summary or statistical program
		Performs basic mathematical calculations and report out results		

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.

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
	Identifies types of compaction equipment Explains how the types of compaction equipment are used		Documents and follows up on corrective actions	Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
Smoothness	Recognizes the factors that control smoothness and how equipment is used to measure smoothness Assists in laying out roadway sections to be measured for smoothness	Interprets printouts of smoothness readings Calculates pay factors for incentive/disincentive where appropriate	Recommends acceptance or corrective action based on visual inspection and results of smoothness tests	Determines contract decisions related to smoothness acceptance and payment Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
Documentation	Selects correct inspection forms to be used for different layers and types of HMA	Performs basic mathematical calculations Reports out inspection results	Documents acceptance or corrective action based on a review of inspection reports, measurements and test results	Enters data into summary reports or statistical programs. Interprets data Recommends corrective action on a program basis to managers

Asphalt Recycling

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Inspection		Examines and verifies representative processes during production operations	Determines specification compliance or corrective action required based on individual and cumulative inspections and measurements	Enters data into summary or statistical program
		Performs field inspections and measurements of equipment as required	Monitors corrective action taken and results	Interprets results
		Identifies equipment and specification references used to inspect and verify field processes		Recommends corrective action on a program basis to managers
		Explains proper field processes (surface prep, mixing, laydown, compaction and smoothness), inspection and verification techniques		
		Reports out inspection results		

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Documentation		Completes and submits inspection reports	Documents specification compliance or corrective action required	Enters data into summary or statistical program
		Performs basic mathematical calculations	Documents corrective action taken and results	Interprets data
				Recommends corrective action on a program basis to managers

Landscaping

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Horticultural Practices	Explains plant growth and planting methods	Inspects, and records plant types, topsoil characteristics, soil amendments, pruning, staking and guying procedures	Reviews inspection records and results	Approves or rejects results of the inspection and review of plant types, topsoil, amendments, pruning, staking and guying procedures, nursery landscaping inspection, plant diseases and pests and landscaping establishment
	Reads planting plans	Inspects and determines plant diseases and pests	Recommends acceptance or rejection of plant types, topsoil, amendments, pruning, staking and guying procedures, nursery plant inspections, landscaping diseases and pests, and landscaping establishment	Distinguishes plant diseases and pests
	Describes pruning, staking and guying procedures	Inspects and records landscaping establishment	Applies native plant laws and xeriscape principles	
	Describes pruning, staking and guying procedures	Defines and applies highway planting methods	Conducts nursery plant inspection	
	Explains landscaping establishment			

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Seeding	Explains soil preparation, tillage, mulch, tackifiers and crimping	Calculates application rates	Reviews inspection records and recommends acceptance or rejection of application rates, seeds, soil preparation, tillage, mulch, tackifiers and crimping methods	Accepts or rejects application rates, seeds, soil preparation, tillage, mulch, tackifiers and crimping methods
	Describes hydro-seeding, broadcast and drilling methods	Recognizes types of seeds		
	Describes the 3 classes of seeding	Differentiates characteristics of pure live seed		
		Inspects and documents seeds/pure live seeds		
		Summarizes batch mixing		
		Inspects and documents soil preparation, tillage, mulch, tackifiers and crimping methods		
Irrigation Systems	Identifies controllers, pipe, filters, flow monitor, pressure regulator, emitters, sprinklers, valves, backflow preventer	Inspects controllers, pipe, filters, flow monitor, pressure regulator, emitters, sprinklers, valves and backflow preventers	Recommends acceptance or rejection of water sources, layout, backflow prevention and equipment including controllers, filters emitters, sprinklers, flow monitors, pressure regulators, and valves (master, remote control, pressure release, isolation, check and blow off valve) testing	Accepts or rejects water sources, layout, backflow prevention and equipment including controllers, filters emitters, sprinklers, flow monitors, pressure regulators, and valves
	Describes the function of each component	Documents the function, condition, type of pipe and correct pipe joint methods		
	Identifies the water source	Inspects and documents the water source		

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
		Observes and documents irrigation testing		
Landscape Incidentals	Explains landscape plans and layouts	Inspects and documents the application of herbicides and pesticides	Reviews and accepts or rejects documentation of the application of herbicides and pesticides and landscape design principles	Accepts or rejects the application of herbicides and pesticides, plating and graphics and landscape design principles
	Identifies the application of herbicides and pesticides	Confirms and records the layout of graphics and inert materials as well as grade preparation, sampling, color acceptance, landscape graphics and measurement		
	Explains grade preparation, sampling, landscape graphics, color acceptance and measurement			

Employee Development Competency Matrices

***NOTE*: The Employee Development Competency matrices are designed to be used in combination with the Construction, Materials, Maintenance and Safety & Work Zone matrices.**

Subject Areas:

Basic Skills

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Reading	Reads at an 8th grade level	Reads at a 12th grade level	Reads at a sophomore college level	Reads at a senior college level
Writing	Writes at an 8th grade level	Writes at a 12th grade level	Uses proper writing techniques in business writing	
Mathematics	Performs basic math computations at an 8th grade level	Performs advanced math calculations and algebra equations	Performs trigonometric calculations and has an understanding of statistics	Performs statistical quality control
Communication	Listens to and interprets verbal messages Seeks feedback from others	Presents materials to diverse audiences	Develops and delivers audience-centered presentations	Responds appropriately to questions and requests from the media
Technical Credibility	Applies procedures related to specialized expertise	Leads work team when Supervisor not present	Manages projects and teams of technicians Determines resource requirements Hires personnel	
Training	Recognizes equipment and situations requiring training	Recommends training	Identifies training and development needs	Ensures compliance with QA/QC/OSHA/TCCC and other training standards Conducts training

Thinking & Learning

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Problem Solving	Uses basic problem solving techniques	Uses the appropriate problem solving tool for a given problem situation	Recognizes problems and implements solutions	Uses process improvement techniques to resolve problems
Creativity and Innovation	Applies knowledge and skills in a variety of situations	Implements new concepts and ideas	Creates a climate for creative thinking	Initiates new concepts and ideas
Decision Making	Makes appropriate decisions based on the requirements of the task	Specifies goals and constraints and chooses best alternative	Facilitates decision making through the use of appropriate tools and processes	Makes enterprise level decisions Serves as accountable authority for all decision making
Continual Learning	Grasps new information, masters new knowledge Seeks feedback from others	Seeks new sources of information to expand knowledge, skills and abilities	Integrates knowledge, skills and abilities to work processes	
External Awareness	Recognizes the organizational structure and general policies and procedures for working within the organization	Explains the organization's cultural climate to others	Applies federal and other external policies and standard to internal operations	Develops near-term and long-range plans to accommodate external trends
Strategic Thinking	Applies basic strategic thinking skills to daily work activities	Applies complex strategic thinking skills to daily work activities	Develops strategic plans Examines policy issues and strategic planning with a long-term perspective	Generates plans in alignment with external drivers

Personal Qualities

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Work Habits/Image	Demonstrates a positive attitude toward themselves and others	Recognizes the importance of work habit and image on the team	Demonstrates professionalism, both in dealing with the public and coworkers	
	Demonstrates willingness to learn		Models, encourages and rewards professional behavior in others	
	Accepts responsibility			
	Demonstrates good grooming and personal hygiene practices			
Interpersonal Skills	Responds to needs and feelings in an empathic way			
	Responds, receives and gives information in a positive manner			
Time Management	Completes assigned activities in the time allotted	Completes short and long term projects on time	Manages meetings with proper preparation	
		Prioritizes work		
Stress Management	Balances competing demands by taking healthy steps to manage demands		Encourages and supports the healthy management of stress	
Ethics	Adheres to high standards of integrity			
	Practices ethical behaviors and expects it of others			
Flexibility	Demonstrates flexibility and adjusts to new	Adjusts daily plans and reorganizes projects as required		
		Adjusts resources to the new plan		

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
	situations	Modifies project plans to accommodate project changes		
Service Motivation	Demonstrates the organization's customer service policies and practices	Expects high quality of customer service from team	Models effective customer service and encourages others to a high quality of service	
Vision	Recognizes the organization's vision	Reinforces organization's vision through work practices	Influences others to translate vision into action	
Accountability	Follows rules Performs job responsibilities	Holds self and team accountable for work	Accountable for work, resources, budget of team Responsible that projects are completed in a timely manner and within budget	
Entrepreneurship	Considers work as own business	Takes risks to achieve a recognized benefit or advantage	Uses effective business practices to produce results Creates an atmosphere that encourages team to try new methods	
Financial Management		Manages resources to stay within the budget	Administers budget for program Manages contracting	Acquires budgets
Technology Management	Performs basic technological skills appropriate for the job	Uses skills to improve job performance	Integrates technology into the workplace	
Political Savvy	Recognizes basic organizational politics	Navigates the organizational system to get resources and work done	Identifies the internal and external politics of the organization	

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Project Management	Describes role on the project	Describes role of team in the project	Manages project team	Manages complex projects and programs
		Manages resources	Develops WBS and project timelines/schedules	Tracks and manages milestones
				Adjusts project and program schedules

Working with Others

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Human Resources Management			Assesses current and future staffing needs Conducts interviews of potential candidates Hires personnel Performs preventive disciplinary functions according to contract provisions Resolves disagreements	
Harassment	Recognizes what constitutes harassment Describes rights as an employee and the legal consequences of harassing	Follows process for reporting and handling harassment complaints	Understands supervisory responsibilities in dealing with harassment	
Discrimination	Recognizes discriminatory communications and behaviors in the workplace	Describes employment related laws affecting discriminatory communications and behaviors in the workplace	Ensures that hiring process and work environment adhere to non-discriminatory practices	
Diversity	Recognizes the value of cultural, ethnic, gender, and other individual differences		Addresses the special needs of employees in the workplace Communicates implications of EEO/AA, ADA and civil rights to the workplace	

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
			Ensures that honor of diversity and accommodation is practiced in the workplace and inherent in the hiring process	
Teamwork	Recognizes the role of a team and being a team member		Facilitates the open exchange of ideas among teams	Leads work teams
	Works cooperatively with other team members		Mentors others	
Partnering/Customer Service	Describes principles of Partnering and Customer service			
	Practices Partnering and Customer Service			
	Builds partnerships with customers			
Leadership Influencing/ Negotiating			Performs role of supervisor	
			Persuades others and gains cooperation to obtain information and accomplish goals	
Public Relations	Provides information to the public in polite and articulate manner	Explains more complex situations in polite and articulate manner	Understand the components of public communications and outreach programs	Conducts analyses and provides supporting material to PR executives for projects

Computer Technology

<table>
<tr><th>DISCIPLINES</th><th colspan="4">COMPETENCIES BY SKILL LEVELS</th></tr>
<tr><th></th><th>Level I</th><th>Level II</th><th>Level III</th><th>Level IV</th></tr>
<tr><td rowspan="3">Office Automation Applications</td><td>Performs basic word processing functions</td><td>Uses word processor in performance of work activities</td><td colspan="2" rowspan="3">Uses office automation applications (word processor, spreadsheet, email, presentation, scheduling) in the performance of daily work activities</td></tr>
<tr><td rowspan="2">Sends and receives email</td><td>Performs basic spreadsheet functions</td></tr>
<tr><td>Sends and receives attachments to email messages</td></tr>
<tr><td>Internet</td><td colspan="2">Locate web pages that have information pertaining to their employment (e.g. MSDS)</td><td colspan="2">Researches information on construction topics, local government websites, Federal government web sites, etc.</td></tr>
<tr><td>Job-Related Technologies</td><td colspan="4">Uses job-related technologies required in the execution of daily work activities</td></tr>
</table>

Maintenance Competency Matrices

***NOTE*: The Maintenance Competency matrices are designed to be used in combination with the Safety and Employee Development matrices.**

Subject Areas:

Maintenance Administration

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Planning	Identifies the categories of equipment and materials to be scheduled	Relates project plans and specifications to labor, equipment and materials requirements Develops project-specific resource requirements (labor, materials and equipment) based on project plan	Develops project-specific resource requirements (labor, materials and equipment) based on project plans	Uses GPS, GIS and other planning tools to develop long and short range plans to respond to budget, resources and organization requirements
Scheduling	Relates specific weekly schedules to meeting project milestones	Applies resource balanced project-specific weekly plans and contingent plans	Develops resource balanced project-specific weekly plans and contingent plans	Applies CPM techniques to develop resource-balanced period and annual work plans
Quality Control	Relates the basic elements of the quality assurance process to day to day operations	Applies quality assurance parameters to day to day operations	Integrates quality assurance parameters in the weekly planning process and day to day scheduling	Conducts quality assurance reviews Analyzes quality assurance review outputs to determine areas of quality improvement. Identifies and implement quality improvements
Customer Focus	Responds courteously to general external customer	Identifies the level of customer inquiries and	Insures that customer inquiries and requests are	Identifies and segment customer base

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
	inquiries at the field operations level	responds courteously	responded to in a courteous and professional manner	Develops and implement customer satisfaction surveys Analyzes results of customer surveys
Program Presentation		Responds to individual verbal requests and inquiries	Provides verbal and written response to individual and small group inquiries and questions	Develops and delivers oral and written presentations to small and medium size audiences on planning (short & long range) and budgetary requirements
Asset Management		Collects and maintains records inventory of highway features Inspects and documents contract maintenance work as assigned	Develops operational budgets and resource allocation requirements for highway and bridge features.	Identifies life cycle cost and optimum treatment types and frequencies associated with highway features
Contract Management	Collects and files contractor quality and workmanship assessment reports	Summarizes and distributes contractor quality and workmanship assessment reports	Directs and guides inspectors on the proper reporting, documentation & maintenance of contractor performance assessment reports	Develops policies and procedures for maintaining files, records and documentation of contracts

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Performance Improvement		Monitors work activity performance measures for quality workmanship	Summarizes work activity performance measures for quality workmanship	Develops and monitors performance measures with focus on quality and work results
				Develops benchmarks to identify best practices

Roadway & Shoulder

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Shaping		Performs roadway and shoulder shaping and cutting procedures	Supervises roadway and shoulder shaping and cutting procedures	
Stabilization		Describes restabilization procedures, related materials and application techniques	Implements restabilization procedures and application techniques	
Distress Analysis	Identifies surface distresses and basic repair methods	Identifies surface distress remedies and repairs	Analyzes surface distresses and related remedies and repair	Implement procedures for identification and analysis of surface distresses and related remedies and repair
Patching	Performs manual patching procedures using related materials	Monitors manual patching procedures	Implements manual and mechanized patching procedures	Establishes manual and mechanized patching procedures and candidate selection guidelines
Crack Sealing	Describes crack sealing procedures using related materials and equipment Describes safe material handling procedures	Monitors crack sealing procedures using related materials and equipment Applies candidate selection guidelines Demonstrates safe material handling procedures	Implements crack sealing procedures	Establishes crack sealing procedures and candidate selection guidelines

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Joint Sealing	Describes joint sealing procedures using related materials and equipment	Monitors joint sealing procedures using related materials and equipment Applies candidate selection guidelines	Implements joint sealing procedures	Establishes joint sealing procedures and candidate selection guidelines
Widening			Implements widening techniques using related equipment and materials Applies candidate selection criteria.	Establishes widening techniques and candidate selection criteria
Surface Treatment	Identifies the characteristics and uses of liquid bituminous and plant mixed bituminous materials	Inspects liquid bituminous and plant mixed bituminous materials based on their characteristics and specifications	Inspects plant mixed bituminous material leveling and paving procedures treatment procedures Inspects liquid seal coat and surface treatment procedures and equipment calibration	Implements liquid seal coat and surface treatment procedures and equipment calibration Implements plant mixed bituminous material leveling and paving procedures Utilizes surface treatment candidate selection guidelines
Base/Subbase Repair	Explains typical base and subbase failure identification and repair techniques	Applies base and subbase failure identification and repair techniques	Establishes base and subbase failure identification and repair techniques	

Drainage

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Drainage Systems	Identifies drainage system types and their function	Installs drainage systems according to their function and specifications	Supervises the installation of drainage systems according to the specifications	
Pipe/Culvert Replacement	Repairs and replaces cross and parallel drainage systems including inlets, endwalls, underdrains and related materials	Supervises the repair and replacement of cross and parallel drainage systems including inlets, endwalls, underdrains and related materials	Establishes procedures for the repair and replacement of cross and parallel drainage systems including inlets, endwalls, underdrains and related materials	
Grade Control	Defines the different types and use of grade control instruments	Uses grade control instruments to determine and control line and grade of drainage systems	Uses grade control instruments to check the staking and final line and grade of drainage systems	
Environmental Protection	Identifies wetlands and explains erosion and sedimentation processes	Describes wetlands identification procedures and protection regulations	Monitors and maintain temporary and permanent erosion and sedimentation controls measures	Conducts functional assessments of wetland
		Defines and installs temporary erosion and sedimentation control measures	Monitors solid waste collection and disposal procedures	Practices environmentally-sensitive maintenance management
		Collects and disposes solid waste		

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Soils		Defines soil types and their characteristics	Identifies soil types and their characteristics	
Hydraulics				Performs drain field hydraulic studies, calculations and EPA regulations
Drainage Inspection	Describes the characteristics of functioning drainage systems	Inspects and identifies drainage system deficiencies Performs proper cleaning and repair techniques	Implements drainage system inspection, preventive maintenance and repair procedures	Establishes drainage system inspection, preventive maintenance and repair procedures
Drainage Intercept Systems	Describes the characteristics of functioning drainage intercept systems	Inspects and identifies drainage intercept system deficiencies Performs proper cleaning and repair techniques	Implements drainage intercept system inspection, preventive maintenance and repair procedures	
Subsurface Drainage	Describes underdrain systems and proper installation procedures	Installs underdrain systems using proper installation procedures	Establishes underdrain system installation procedures	

Winter Operations

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Winter Traffic Services	Performs basic snowplowing maneuvers including proper equipment use for specific snow/ice conditions	Demonstrates the proper equipment calibration and application of anti-icing and deicing materials	Implements Pre-season and Pre-storm event preparations including identification of priority routes and resource allocation	Manages storm and Post-storm event operations
	Defines the types of anti-icing and de-icing chemicals, spreading rates, equipment calibration and reporting requirements	Describes pre-season preparations and the relationship between weather forecasts and winter maintenance operations	Establishes and maintains materials location and inventory control system including stockpile management in accordance with environmental protection regulations	Reviews storm event records to plan and organize for future storm events

Roadside Maintenance

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Vegetation Management	Performs tree trimming and brush cutting using proper safety practices Performs roadside mowing using proper mowing techniques and cycles	Implements safe tree trimming, brush cutting and roadside mowing practices	Establishes safe herbicide chemicals application, tree trimming and removal and roadside mowing practices	Establishes roadside maintenance management programs

Bridge Maintenance

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Cleaning	Performs bridge drainage systems cleaning and flushing	Implements bridge drainage systems cleaning and flushing using proper techniques and equipment.	Establishes effective bridge drainage systems cleaning and flushing procedures using proper techniques and equipment	
Repair	Explains basic bridge types, components and basic maintenance inspection	Performs basic bridge types, components, basic maintenance inspection and basic repairs	Implements procedures for superstructure and substructure maintenance and repair techniques, materials and inspection	Establishes bridge inspection techniques and effective maintenance management techniques

Fleet Management

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Motorized Equipment	Conducts equipment operation, daily inspection, safety and preventative maintenance procedures	Directs and guides operators on the proper reporting, documentation and maintenance of assigned equipment	Establishes direction and guidance on the proper reporting, documentation and maintenance of assigned equipment	Implements fleet optimization and life cycle management

Work Zone Traffic Control

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Short Term Traffic Control	Installs the required traffic control components on an assigned field project	Selects short term work zone traffic control setups	Establishes procedures for selection and maintenance of short term work zone traffic control setups	Conducts work zone traffic control quality assurance reviews
	Maintains the required traffic control components on an assigned field project	Establishes short term work zone traffic control setups		
		Maintains short term work zone traffic control setups		
Long Term Traffic Control			Selects, erects and maintains long term traffic control setups	Conducts work zone traffic control quality assurance reviews
Flagging	Demonstrates techniques for proper flagging and use of two-way radios			
	Monitors flagging operations and two-way radio use			

Traffic Services & Safety

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Pavement Marking				Integrates & coordinates the pavement marking program with roadway maintenance activities
Signs		Performs basic sign condition evaluation, cleaning, maintenance and replacement	Describes sign types and placement criteria Identifies deficiencies Schedules repairs and maintenance	
Guiderail and Median Barrier	Performs basic guardrail and end treatment and crash cushion maintenance and repair	Identifies guiderail types and end treatments Monitors guiderail, end treatment and crash cushion maintenance condition	Implements maintenance condition, placement warrants and safety standards for guiderails, end treatments and crash cushions	
Incidental Services	Defines terrorism awareness and hazardous spill response	Identifies measures necessary to secure against terrorist activities	Responds to incident management and roadway emergencies	Develops multi-agency incident management plan

Materials Competency Matrices

***NOTE**: The Materials Competency matrices are designed to be used in combination with the Safety and Employee Development matrices.*

Subject Areas:

Soils Testing

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Bulk Disturbed Sampling	Assists in obtaining sample	Performs sampling techniques in accordance with AASHTO/ASTM standards		
	Assists in preparing samples	Reduces samples in accordance with AASHTO/ASTM standards		
Moisture-Density Relationship for Fine Soils	Prepares material for testing in accordance with AASHTO/ASTM test methods	Performs testing in accordance with AASHTO/ASTM test methods	Makes recommendations to project personnel to adjust jobsite processes based on varying moisture conditions	Performs as QC/QA program manager responsible for jobsite quality of work
		Conducts QC or QA testing		Authorizes corrective action when required on a jobsite specific basis
Moisture-Density Relationship for Coarse Soils	Prepares material for testing in accordance with AASHTO/ASTM test methods	Performs testing in accordance with AASHTO/ASTM test methods	Makes recommendations to project personnel to adjust jobsite processes based on varying moisture conditions	Performs as QC/QA program manager responsible for jobsite quality of work
		Conducts QC or QA testing		Authorizes corrective action when required on a jobsite specific basis
Geotechnical Exploration, Sampling & In-		Determines water levels in borings	Operates drilling equipment without supervision	Authorizes corrective action when required on a jobsite specific basis

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Situ Testing		Operates drilling equipment under direct supervision	Reads plans	Supervises standard subsurface exploration boring, coring, sampling, visual description and logging crew operations
		Assists in performing basic subsurface exploration crew soil boring, coring, sampling tasks	Locates borings	Performs specialized geotechnical field and insitu testing
			Performs standard subsurface exploration boring, coring, disturbed and undisturbed sampling, SPT, visual description/field classification and logging tasks and proper sample storage/transport	Installs specialized instrumentation (e.g. vibrating wire piezometers, pressure transducer piezometers, tiltmeters, etc.)
			Installs common (e.g. stand pipe piezometers, screened wells, inclinometers) instrumentation	

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Documentation	Selects correct sample forms and test reports for type of material to be tested	Completes sample forms and test reports	Interprets completed documentation	Conducts trends analyses of all test results on a program basis
	Assists in completing documentation	Collects preliminary sample data as required by test method	Documents corrective action based on an individual test result	Documents corrective actions at a program level
		Performs mathematical calculations	Checks documentation for accuracy	
		Submits test results for review	Enters data into a statistical program	

Aggregates

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Sampling	Determines aggregate size	Performs Proper Sampling Techniques in accordance with AASHTO/ASTM standards	Conducts visual inspections of stockpiles for contamination	Makes recommendations for corrective action
	Identifies the different methods for building stockpiles	Reduces samples in accordance with AASHTO/ASTM standards	Ensures proper stockpiling practices	Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
	Explains what is meant by a “designated stockpile”			
Field Testing	Identifies the different types of field sampling equipment and how it is used	Performs testing in accordance with AASHTO/ASTM Test Methods	Interprets test methods and test results	Interprets data
	Procures test samples in accordance with AASHTO/ASTM standards		Determines corrective action based on an individual test result	Makes recommendations for corrective action
Lab Testing	Recognizes the AASHTO/ASTM Standards relevant to laboratory testing	Performs testing in accordance with AASHTO/ASTM Test Methods	Interprets test methods and test results	Interprets data

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
	Recognizes the different types of laboratory testing equipment and how it is used		Determines correct steps to take based on the test results and as required by test method to address problems	Makes recommendations for corrective action
Documentation	Selects correct sample forms and test reports for type of material to be tested	Completes sample forms and test reports	Interprets completed documentation	Conducts trends analyses of all test results on a program basis
	Assists in completing documentation	Collects preliminary sample data as required by test method	Documents corrective action based on an individual test result	Documents corrective actions at a program level
		Performs mathematical calculations	Checks documentation for accuracy	
		Submits test results for review	Enters data into a statistical program	

Treated & Untreated Bases

Untreated Bases are bases in which only the addition of water has been made to the original material. Treated bases can have the addition of cement, lime, calcium chloride, etc. to control moisture, aid in compaction, etc.

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Sampling/ Testing	Determines aggregate size	Performs Proper Sampling Techniques in accordance with AASHTO/ASTM standards	Conducts visual inspections of stockpiles for contamination	Makes recommendations for corrective action
	Identifies the different methods for building stockpiles	Reduces samples in accordance with AASHTO/ASTM standards	Ensures proper stockpiling practices	Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
	Explains what is meant by a “designated stockpile”			
Field Testing	Identifies the different types of field sampling equipment and how it is used	Performs testing in accordance with AASHTO/ASTM Test Methods	Interprets test methods and test results	Interprets data
	Procures test samples in accordance with AASHTO/ASTM standards		Determines corrective action based on an individual test result	Makes recommendations for corrective action
Lab Testing	Recognizes the AASHTO/ASTM Standards relevant to laboratory testing	Performs testing in accordance with AASHTO/ASTM Test Methods	Interprets test methods and test results	Interprets data

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
	Recognizes the different types of laboratory testing equipment and how it is used		Determines correct steps to take based on the test results) and as required by test method to address problems	Makes recommendations for corrective action
Mix Design	Recognizes basic mix design development	Explains how varying the percentage of components in a mix design affects the overall performance of that mix design	Designs and approves basic mix designs	Reviews, adjusts and approves changes to a mix design
		Performs preliminary mix design testing in accordance with AASHTO/ASTM standards		
Documentation	Selects correct sample forms and test reports for type of material to be tested	Completes sample forms and test reports	Interprets completed documentation	Conducts trends analyses of all test results on a program basis
	Assists in completing documentation	Collects preliminary sample data as required by test method	Documents corrective action based on an individual test result	Documents corrective actions at a program level
		Performs mathematical calculations	Checks documentation for accuracy	
		Submits test results for review	Enters data into a statistical program	

HMA Field Testing (Virgin Mix &/or RAP)

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Sampling/ Testing	Explains proper sampling techniques	Procures representative samples from continuous production at the point of placement in accordance with AASHTO/ASTM standards	Determines corrective action based on an individual test results	Makes recommendations for corrective action
	Identifies equipment used to procure representative field samples	Performs field tests as required in accordance with AASHTO/ASTM standards		Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
	Assists in the conduct of sampling and testing activities			
Asphalt Binder Testing	Assists in sampling and testing	Performs binder sampling and testing procedures in accordance with AASHTO/ASTM standards	Performs equipment maintenance, calibration and setup	Takes action to suspend producer QC Plan for deficient materials
			Determines corrective action based on an individual test results	Makes recommendations for remediation of binder problems for project use
Documentation	Selects correct sample forms and test reports for type of material to be tested	Completes sample forms and test reports	Interprets completed documentation	Conducts trends analyses of all test results on a program basis

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
	Assists in completing documentation	Collects preliminary sample data as required by test method	Documents corrective action based on an individual test result	Documents corrective actions at a program level
		Performs mathematical calculations	Checks documentation for accuracy	
		Submits test results for review	Enters data into a statistical program	

Recycling: Field In-Place (Hot or Cold)

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Sampling/Testing	Explains proper sampling techniques	Procures representative samples from continuous production at the point of placement in accordance with AASHTO/ASTM standards	Determines corrective action based on an individual test results	Makes recommendations for corrective action
	Identifies equipment used to procure representative field samples	Performs field tests as required in accordance with AASHTO/ASTM standards		Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
	Assists in performing sampling and testing of In-Place Recycling of HMA			
Documentation	Selects correct sample forms and test reports for type of material to be tested	Completes sample forms and test reports	Interprets completed documentation	Conducts trends analyses of all test results on a program basis
	Assists in completing documentation	Collects preliminary sample data as required by test method	Documents corrective action based on an individual test result	Documents corrective actions at a program level
		Performs mathematical calculations	Checks documentation for accuracy	
		Submits test results for review	Enters data into a statistical program	

HMA Production & QA Labs (Including Mix Design)

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Sampling/Testing	Assists in performing QC/QA tests in the laboratory and on the project	Performs sampling and testing of PCC samples in accordance with AASHTO/ASTM standards	Determines correct steps to take based on the test result(s) and as required by test method to address problems	Makes recommendations for corrective action
	Identifies the different types of lab equipment and how each is used	Calibrates/inspects equipment	Compares QA results against Producer's QC results	Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
	Recognizes if the appropriate sampling and testing techniques are used	Applies proper lab testing techniques	Makes recommendations to correct Project or Production Facility problems	
		Performs basic mathematical calculations	Interprets test methods and test results	
		Reports out test results		
HMA Mix Design	Recognizes basic mix design development	Performs preliminary mix design testing	Designs and approves basic mix designs	Reviews, adjusts and approves mix designs
		Explains basic mix design development and how varying the percentage of components in a mix affects the overall performance of that mix design		

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Asphalt Binder Testing	Assists in sample preparation for testing	Performs binder test procedures in accordance with AASHTO/ASTM standards	Performs equipment calibration, set-up and maintenance	Takes action to suspend producer QC plan for deficient materials
			Reviews test results for acceptance or corrective action	Makes recommendations for remediation of binder problems for project use
Mix Verification	Recognizes basic mix design development	Performs checks of a production facility's mix designs by running laboratory or field mixes to verify mix properties	Designs and approves mix designs	Reviews, adjusts and approves mix designs
	Recognizes basic components of PCC Mix Designs	Checks submitted mixes for accuracy	Compares QA results against producer's QC results	
			Assesses results and takes action to correct processes to meet applicable standards	
			Determines correct steps to take based on verification tests to address problem	
			Makes recommendations to correct those problems on a project or production facility basis	

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Documentation	Selects correct sample forms and test reports for type of material to be tested	Completes sample forms and test reports	Interprets completed documentation	Conducts trends analyses of all test results on a program basis
	Assists in completing documentation	Collects preliminary sample data as required by test method	Documents corrective action based on an individual test result	Documents corrective actions at a program level
		Performs mathematical calculations	Checks documentation for accuracy	
		Submits test results for review	Enters data into a statistical program	

Cementitious Material (Low Density Fill, Shotcrete and Other Cementitious Materials)

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Sampling/Testing	Identifies proper sampling techniques and equipment used to procure representative field samples related to low density fill and shotcrete	Procures representative samples at job site in accordance with AASHTO/ASTM standards	Determines corrective action based on an individual test results	Makes recommendations for corrective action
	Assists in performing sampling and testing	Performs field tests in accordance with AASHTO/ASTM standards		Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
	Identifies products from Qualified Products List (QPL)	Determines need to perform additional testing to verify tests not meeting specifications		
Documentation	Selects correct sample forms and test reports for type of material to be tested	Completes sample forms and test reports	Interprets completed documentation	Conducts trends analyses of all test results on a program basis
	Assists in completing documentation	Collects preliminary sample data as required by test method	Documents corrective action based on an individual test result	Documents corrective actions at a program level
		Performs mathematical calculations	Checks documentation for accuracy	
		Submits test results for review	Enters data into a statistical program	

PCC Pavement Field Testing

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Concrete Delivery	Checks delivery tickets for correct concrete mix and assists in inspecting delivery vehicle that all gauges are in working condition e.g., water, revolution counter	Rejects loads not meeting specification requirements	Recommends corrective action based on individual test results	Determines corrective actions at a program level Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
Sampling/Testing	Explains proper sampling and testing techniques relevant to components of PCC	Procures representative samples from continuous production at the point of placement in accordance with AASHTO/ASTM standards	Determines corrective action based on an individual test results	Documents and follows-up on corrective actions
	Assists in the conduct of sampling and testing activities	Conducts field tests		Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
		Inspects equipment		

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Smoothness	Assists in laying out roadway sections to be measured for smoothness	Monitors work	Recommends corrective action based on visual inspection and results of smoothness tests	Elevates smoothness problems to the attention of Engineer, QC Manager or IA Team
			Interprets printouts of smoothness readings	Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
			Calculates pay factors for incentive/disincentive where appropriate	
Documentation	Selects correct sample forms and test reports for type of material to be tested	Completes sample forms and test reports	Interprets completed documentation	Conducts trends analyses of all test results on a program basis
	Assists in completing documentation	Collects preliminary sample data as required by test method	Documents corrective action based on an individual test result	Documents corrective actions at a program level
		Performs mathematical calculations	Checks documentation for accuracy	
		Submits test results for review	Enters data into a statistical program	

PCC Bridges & Minor Structures

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Concrete Delivery	Checks delivery tickets for correct concrete mix and assists in inspecting delivery vehicle that all gauges are in working condition e.g., water, revolution counter	Rejects loads not meeting specification requirements	Recommends corrective action based on individual test results	Determines corrective actions at a program level Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
Sampling/Testing	Explains sampling & testing techniques relevant to components of PCC Mix Designs as specified by appropriate test methods	Collects samples of mix components in accordance with AASHTO/ASTM standards	Interprets results of tests on components of mix design	Determines corrective actions at a program level
	Identifies proper sampling techniques and equipment used to procure representative field samples related to PCC for field structures	Tests samples of mix components in accordance with AASHTO/ASTM standards	Determines corrective action based on an individual test results	Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
	Assists in performing QC or QA tests for delivered concrete	Procures representative samples from continuous production at the point of placement in accordance with AASHTO/ASTM standards	Performs QC or QA tests in accordance with specifications	

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
		Performs field tests for quality assurance program using AASHTO/ASTM standards		
Smoothness (Bridge Decks)	Assists in laying out deck sections to be measured for smoothness	Observes or performs smoothness testing	Recommends corrective action based on visual inspection and results of smoothness tests	Determines corrective actions at a program level
			Interprets printouts of smoothness readings	Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
			Calculates pay factors for incentive/disincentive where appropriate	
Documentation	Selects correct sample forms and test reports for type of material to be tested	Completes sample forms and test reports	Interprets completed documentation	Conducts trends analyses of all test results on a program basis
	Assists in completing documentation	Collects preliminary sample data as required by test method	Documents corrective action based on an individual test result	Documents corrective actions at a program level
		Performs mathematical calculations	Checks documentation for accuracy	
		Submits test results for review	Enters data into a statistical program	

PCC Production & QA Labs

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Sampling/Testing	Assists in performing QC/QA tests in the laboratory and on the project	Performs sampling and testing of PCC samples in accordance with AASHTO/ASTM standards	Determines correct steps to take based on the test result(s) and as required by test method to address problems	Makes recommendations for corrective action
	Identifies the different types of lab equipment and how each is used	Calibrates/inspects equipment Applies proper lab testing techniques	Compares QA results against Producer's QC results	Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
	Recognizes if the appropriate sampling and testing techniques are used	Performs basic mathematical calculations	Makes recommendations to correct Project or Production Facility problems	
		Reports out test results	Interprets test methods and test results	
PCC Mix Design	Recognizes basic mix design development	Performs preliminary mix design testing	Designs and approves basic mix designs	Reviews, adjusts and approves mix designs
		Explains basic mix design development and how varying the percentage of components in a mix affects the overall performance of that mix design		

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Mix Verification	Recognizes basic mix design development	Performs checks of a production facility's mix designs by running laboratory or field mixes to verify mix properties	Designs and approves mix designs	Reviews, adjusts and approves mix designs
	Recognizes basic components of PCC Mix Designs	Checks submitted mixes for accuracy	Compares QA results against producer's QC results	
			Assesses results and takes action to correct processes to meet applicable standards	
			Determines correct steps to take based on verification tests to address problem	
			Makes recommendations to correct those problems on a project or production facility basis	

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Documentation	Selects correct sample forms and test reports for type of material to be tested	Completes sample forms and test reports	Interprets completed documentation	Conducts trends analyses of all test results on a program basis
	Assists in completing documentation	Collects preliminary sample data as required by test method	Documents corrective action based on an individual test result	Documents corrective actions at a program level
		Performs mathematical calculations	Checks documentation for accuracy	
		Submits test results for review	Enters data into a statistical program	

Miscellaneous

Paint, Prestress/Precast Products, Reinforcing Steel, Steel, High Strength Bolting, Guardrail, Pavement Marking, Drainage Structures, Welding, Geotextiles, Joint Materials, Signing, Bridge Bearing, Landscape Materials & All Others

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Sampling/Testing	Assists in performing sampling and testing	Conducts sampling and testing in accordance with AASHTO/ASTM standards	Determines corrective action based on an individual test results	Makes recommendations for corrective action
	Describes proper sampling techniques	Determines need to perform additional testing to verify tests not meeting specifications		Recommends disciplinary action when corrective measures are not taken in a reasonable time frame
	Uses proper equipment to procure representative field samples	Describes process for placing material on the Qualified Products List (QPL)		
	Identifies products from Qualified Products List (QPL)			

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Documentation	Selects correct sample forms and test reports for type of material to be tested	Completes sample forms and test reports	Interprets completed documentation	Conducts trends analyses of all test results on a program basis
	Assists in completing documentation	Collects preliminary sample data as required by test method	Documents corrective action based on an individual test result	Documents corrective actions at a program level
		Performs mathematical calculations	Checks documentation for accuracy	
		Submits test results for review	Enters data into a statistical program	

Quality Assurance

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I^	Level II^^	Level III	Level IV
Quality Control		Explains the roles and responsibilities of the QC versus the QA Technician	Reviews Quality Control Plans for compliance as it relates to owner/agency specification requirements	Interprets data
		Explains the difference between a Quality Control Plan and a Quality Assurance Program	Performs basic QC statistical calculations	Performs analysis of quality control results
		Performs data entry	Recommends action based on QC data	Makes recommendations for corrective action on a program basis to managers
			Recommends approval/rejection of Quality Control Plans	
Quality Acceptance		Explains the roles and responsibilities of the QC versus the QA Technician	Analyzes quality control and acceptance results	Interprets data
		Explains the difference between a Quality Control Plan and a Quality Assurance Program	Performs basic QA statistical calculations	Writes acceptance specifications for HMA, Concrete and other materials

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I^	Level II^^	Level III	Level IV
		Performs data entry	Reviews acceptance specifications for HMA, Concrete and other materials	Makes recommendations for corrective action on a program basis to managers
			Identifies the different types of quality acceptance programs (e.g., performance based and method specifications)	Applies pay factors for incentive/disincentive where appropriate
			Calculates pay factors for incentive/disincentive where appropriate	
			Determines actions based on comparison data	
Independent Assurance Audits			Performs follow-up assessments of technicians failing an IA audit	Develops yearly IA report for FHWA
			Checks equipment for calibration	Proposes program changes based on deficiencies noted in the yearly IA Report
			Determines that equipment is in good working condition	
			Performs comparison tests on material based on quantity	
			Enters IA data	

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I^	Level II^^	Level III	Level IV
			Assesses technician's proficiency in performing hands-on tests	
PCC Production (Offsite and/or Jobsite Plant Inspections/ Approvals)	Assists in inspecting and approving offsite and jobsite batch plants, stockpiles, material shipments	Inspects and approves offsite jobsite batch plants and stockpiling of materials	Approves QC plan for PCC production	Determines corrective actions at a program level
		Verifies correct and approved materials when received on project	Recommends corrective action	

Level I^

Quality Control

The QC Technician would have been trained, performed hands-on testing and obtained certification in the material discipline for which they were performing QC prior to becoming a QC Technician. There would not be an entry level as we know it and as shown for that material discipline

Quality Acceptance

The QA Technician would have been trained, performed hands-on testing and obtained certification in the material discipline for which they were performing QA prior to becoming a QA Technician. There would not be an entry level as we know it and as shown for that material discipline

Independent Assurance Audits

The IA Technician would have been trained, performed hands-on testing and obtained certification in the various material disciplines prior to becoming an IA Technician. There would not be an entry level as we know it and as shown for the various material areas for this IA function.

Level II^^

Independent Assurance Audits

The Level II IA Technician would have been trained, performed hands-on testing and obtained certification in the various material disciplines prior to becoming an IA Technician. There would not be a Level II as we know it and as shown for the various material areas for this IA function. IA Tech should be at least comparable to a Level III.

Geotechnical Testing

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
General Geotechnical Laboratory	Assist in the performance of standard geotechnical laboratory tests	Conducts standard geotechnical materials laboratory tests	Administers specialized geotechnical materials laboratory tests	Oversees all geotechnical materials laboratory tests Recommends geotechnical materials acceptance and payment
Soil Sample Preparation	Assists in preparing samples for classification and Index Testing	Prepares samples for classification and Index Testing according to AASHTO/ASTM Standard test procedures	Extrudes undisturbed samples, evaluates sample quality, and prepares specimens for performance testing	Oversees proper sample preparation and enforces quality assurance procedures
Classification & Index Testing of Soils		Conducts standard geotechnical classification and index tests (i.e. Sieve analysis, #200 Wash, hydrometer, specific gravity, liquid limit, plastic limit, and moisture content determinations) according to AASHTO/ASTM standard test procedures	Conducts unit weight determinations on undisturbed specimens	Oversees geotechnical laboratory testing and enforces quality assurance procedures

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Performance Testing of Soils			Conducts common geotechnical performance tests (i.e. Unconfined compression, triaxial shear (UU, CU, CD), direct shear, permeability (falling head, constant head), 1-D consolidation, and shrink/swell potential) after communicating with geotechnical design engineer on testing requirements	Oversees geotechnical laboratory testing and enforces quality assurance procedures
Geosynthetics Verification Testing			Verifies material strengths and engineering properties	Oversees material testing and verifies product specifications with respect to design requirements

Safety & Work Zone Competency Matrices

***NOTE**: The Safety & Work Zone Competency matrices are designed to be used in combination with the Construction, Materials, Maintenance and Employee Development matrices.*

Subject Areas:

Personal Safety

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Emergencies	Handles emergency situations following the organization's protocols			
First Aid	Describes the basic rules and procedures of First Aid, Medical Services and CPR	Demonstrates the basic rules and procedures of first aid	Identifies missing supplies and training needs	Optional certification in CPR
	Identifies use of supplies	Uses proper supplies and procedures		
	Describes initial procedures			
Bloodborne Pathogens	Avoids and protects self against bloodborne pathogens	Executes program procedure when exposure occurs	Shares information on BP procedures	Ensures compliance with BP program
	Follows the organization's required protocol for bloodborne pathogens (BP) when an exposure occurs	Understands the organization's BP program and policies		
Fitness for Duty	Describes the basic fitness for duty rules including fatigue, attire, preparation, drugs and alcohol	Explains the value of individual and group wellness	Evaluates or supervises the fitness for duty of others	Ensures compliance with Fitness for Duty requirements
Good Health & Injury Prevention	Describes the basic work safe procedures for lifting, climbing and walking	Practices basic work safe procedures	Defines Ergonomics as it relates to the workplace	Supervises health and injury prevention programs and activities

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
	Lives and maintains a healthy lifestyle			
Risk Management	Recognizes situations, materials, and equipment requiring special training, handling, or safety procedures	Performs and documents safety inspections	Investigates and collects data and evidence from accidents, crashes and incidents	Prepares safety plans and accident prevention training programs
	Alert to work environment, movement and potential hazards		Conducts safety audits	
	Asks questions related to personal safety		Performs operations reviews and risk analyses	
			Conducts safety meetings Reminds and motivates others	

Workplace Safety – General Industry

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Confined Space (General and Construction)	Applies the OSHA confined space safety regulations for the entrant level	Applies the OSHA confined space safety regulations for the entrant and attendant levels	Applies the OSHA confined space safety regulations for the entrant, attendant and supervisory levels	Documents conformity with the OSHA Confined Space Regulation 29 CFR 1910146 Permit and Compliance Requirements
Electrical Safety	Recognizes basic electrical hazards associated with surface, buried and overhead lines and connections	Performs electrical hazard inspections	Prepares electrical hazard inspection checklists Reviews or supervises inspections	Recommends improvements in electrical procedures, equipment or safety
Emergency Procedures	Describes emergency response rules including location of kill switches, first aid and wash stations	Demonstrates emergency response notification rules including ,fire, egress and public protection	Performs accident and incident investigations	Prepares and applies incident management program
Hazardous Materials (HazMat)	Recognizes Hazmats and chemicals Is familiar with Hazmats	Properly handles chemicals and Hazmats (functionally specific)	Applies OSHA safety regulations for hazardous materials	Ensures compliance with OSHA Hazmat regulations, including 49 CFR Subpart H
Personal Protection Equipment (PPE)	Identifies required/assigned PPE Describes and assess the proper function of PPE	Troubleshoots PPE	Applies applicable OSHA PPE Regulations, including 29 CFR 1910132 and 1926101-103, 23 CFR 635108, and MUTCD 6D03 & 6E02	Ensures compliance with PPE regulations

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Work Site Safety Awareness	Recognizes potential security risks and safety conflicts with surrounding equipment, traffic and other workers within assigned work site	Demonstrates assigned work site safe work habits and communicates warnings to fellow workers	Provides safe work site verbal and written instructions and advice to assigned workers	Standardizes safe work site safety instructions into SOP's and provides adequate training and equipment
	Recognizes tasks requiring specific safety training	Follows the organization's reporting processes for accidents	Reports all accidents within the specified time period	Reviews incidents and recommends improvements
	Demonstrates responsibility for maintaining a safe work environment	Familiar with applicable rules and regulations	Assists in assessing accidents	
	Practices safe work habits; follows all safety rules and regulations		Maintains a safe working environment for employees	
			Identifies and eliminates hazards	
			Encourages ideas to improve workplace safety	
Security	Recognizes and reports security concerns	Follows proper procedures and reports security concerns	Ensures communication and resolution of security concerns	Ensures personnel have proper training and awareness to address security concerns
		Corrects security concerns within the limits of training and responsibility		

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
General Industry Training Requirements (OSHA)	Additional skills and training required OSHA as applicable: Powered Platforms, Man Lifts and Vehicle-Mounted Work Platforms; Occupational Health & Environmental Control; General Environmental Controls; Medical Services and First Aid; Fire Protection; Materials Handling & Storage; Machinery & machine Guarding; Welding, Cutting, and Brazing; Guarding Manholes; Tree trimming See by 29 CFR Part 1910			

Construction Safety

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Steel Fabrication & Erection	Recognizes hazardous operations associated with steel fabrication and erection	Demonstrates safe steel fabrication and erection welding, cutting and brazing procedures	Performs safety inspections to ensure safe steel fabrication and erection operations	
Trenching & Shoring Safety	Recognizes equipment and stability situations affecting trench safety	Describes OSHA Shoring Regulations	Applies OSHA Shoring Regulations	Ensures compliance with OSHA trenching and shoring regulations
Fall Protection	Recognizes people or equipment at risk	Applies the basic fall protection procedures	Applies the OSHA Regulations for fall protection	Manages improvements to general procedures and equipment to minimize risk
Hand & Power Tools	Describes basic safe equipment operation procedures for hand tools (e.g., chain saws, electric drills)	Demonstrates safe use of hand tools and larger equipment	Supervises or trains in proper use and safety	Supervises or manages tools safety
Moving Vehicles	Recognizes and alert to risks near moving vehicles, equipment, traffic and other workers within and adjacent to assigned work site	Demonstrates safe work habits, alertness, and movements	Provides safe movement verbal and written instructions and advice to assigned workers	Standardizes safe work site movement instructions into SOP's
	Maintains personal visibility, alertness, and communication	Communicates warnings to fellow workers		Provides adequate training and equipment

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
	Looks and sounds appropriate warnings prior to moving vehicles or equipment			
Construction Industry Training Requirements	Additional skills and training required, as applicable, in *Signs, Signals & Barricades;* Welding & Cutting; Electrical; Scaffolding; Cranes, Derricks, Hoists, Elevators, and Conveyors; Motor Vehicles, *Mechanized Equipment* & Marine Operations; Excavations; Concrete & Masonry; Underground Construction etc; Demolition; Blasting & Explosives; Power Transmission & Distribution; Stairways & Ladders; and Toxic & Hazardous Substances. *See 29 CFR Parts 1910 and 1926.*			

Vehicles & Heavy Equipment

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Operation	Safely executes mandatory maneuvers and basic uses	Proficient and consistently safe with equipment Identifies limitations and hazards of equipment	Long term use of equipment with positive productivity and exemplarity safety record	Assists or leads training of others
Commercial Vehicles	Meets minimum requirements and licensing to operate assigned equipment Holds proper license and endorsements for driving duties required Identifies traffic regulations specific to vehicle operation (driving)		Ensures others meet minimum requirements to operate equipment	
Defensive Driving	Uses proper driving skills Obeys all applicable traffic regulations	Lists fundamental defensive driving principles (e.g. Smith System, SIPDE)	Recognizes and identifies improper defensive driving procedures	Ensures proper driving operation by others through supervision and evaluation
Motorized Equipment	Conducts equipment operation, daily inspection, safety and preventive maintenance procedures	Directs and guides operators on the proper reporting, documentation and maintenance of assigned equipment	Establishes direction and guidance on the proper reporting, documentation and maintenance of assigned equipment	Implements fleet optimization and life cycle management
Specific Equipment	*These skills are required for each vehicle and heavy equipment operated*			

Workzone Operations

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Flagging Operations	Performs flagging and Pilot Car operation, including proper location of flagging station, communications with second flagger, and providing minimal public information	Supervises flagging/ Pilot Car operation	Audits flagging/ Pilot Car operation	Instructs flagging/ Pilot Car operation
	Safely stops, holds, and releases traffic			
	Holds flagging certification, if required			
Lane Closure Types	Explains implementation of different closure types (stationary, mobile, moving types) and separation types (positive, guidance)	Knowledge of concepts behind different closure types	Explains advantages/ disadvantages and safety considerations of each type of closure	Audits lane closures
	Defines short term, rural, 2 lane/ 2 way lane closures	Defines long term, rural, multilane closures	Explains urban lane closures (with intersections)	Audits lane closures
Lane Closure & Separation	Describes devices and uses	Installs tapers, lateral clearance, transition taper	Calculates and specifies tapers, lateral clearance, transition taper	Analyzes costs and benefits of positive lane closure
	Identifies Positive separating devices (Barrier Rail/ Guard Rail)	Selects devices (concrete barrier, 230 vs. 350, movable barrier, water filled barrier, guardrail)	Designs positive lane closure	
Inspection	Installs and maintains TTC	Troubleshoots TTC to pass	Inspects TTC	Monitors inspections and

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
	so as to pass inspection	rigorous inspections	Documents compliance and potential problems, offers suggestions upon request or as directed	compliance
Traffic Control Plan (TCP)	Interprets basic TC plans	Interprets more complex TC plans	Explains TC design concepts	Explains clear zone concepts
	Recognizes symbols	Describes installation procedures for complex devices	Explains legal liability	References basics of geometric design
	Interprets distances and orientation		Suggests changes and minor adjustments	Recognize potential hazards
	Describes installation procedures for basic devices		Interprets contract documents and resolve conflicts	Implements solutions
			Audits work zones	
Construction Traffic (On-Site)	Safely parks and merges personal and construction vehicles	Implements and troubleshoots on-site traffic controls	Plans and designs on-site traffic flow and controls	Ensures adequate on-site traffic control and safety
	Alert to pedestrians			
Nighttime TTC	Selects proper attire	Inspects and maintains retroreflectivity of signs and markings	Identifies important differences and considerations between day and night operations	Explains trade-offs and estimates costs and benefits associated with night operations
	Installs lighting equipment			
Complex Applications	Basic awareness safety issues related to rail grade crossing, and complex intersections	Awareness of safety and right of way issues	Awareness of safety, right of way and liability issues	Recognizes and designs TTC for atypical and complex applications
Work Zone Traffic Control	*See Maintenance Disciplines: Short Term Traffic Control, Long Term Traffic Control, Flagging Operations*			

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Other	Additional skills as required if not addressed above, in: WZ Fundamentals, Traffic Control Zones, Typical Applications, Mobile Operations, Special Situations, ITS and Supplemental Devices, Impact Attenuators, Work Zone Worker Safety, Inspection, and other skills as may be required by: 23 CFR Part 6301010(d), and 635108			

Workzone Devices

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Advance Warning Signs	Color usage/ covering signs/ sign relocation	Changeable message signs, maintenance	Describes usage of sheeting materials Explains breakaway and other mounting concepts Inspects and maintains signs	Specifies proper advanced warning signs and placement
Installation, Placement & Removal	Installs devices and tools in proper location, as directed Identifies devices and tools Safely removes and stores devices and tools in proper sequence	Directs proper installation of safety devices as planned	Plans use of appropriate safety devices	Analyzes risk and benefits of alternative approved devices in specific applications
Temporary Traffic Control Devices	Recognizes, erects and maintains signs, arrow displays, channelizing devices (cones, tubes, drums), supports and warning lights	Recognizes and corrects displaced, damaged, malfunctioning or incorrectly installed devices	Specifies appropriate devices as needed to implement or adjust the traffic control plan	Recommends improved devices and manages quality, inventory and maintenance
Temporary Pavement Markings & Delineators	Identifies and selects specified materials and required equipment Installs pavement markers, markings and delineators	Troubleshoots pavement marking application	Interprets TCP to identify quantity and placement of temporary markings	Troubleshoots TCP for markings
Variable Message Signs	Correctly places and activates portable	Cleans, inspects, and maintains PCMS matrices	Designs acceptable messages for 1-3 phase PCMS	Selects use of PCMS and supervises proper programming

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
	changeable message signs (PCMS)		Identifies unacceptable abbreviations and untimely messages	Specifies proper placement
Raised Pavement Markers	Installs raised pavement markers (RPM's)	Maintains RPM's	Troubleshoots RPM's	Specifies, manages RPM's
Impact Attenuators	Installs attenuators	Maintains attenuators	Troubleshoots attenuators	Specifies, manages attenuators
Other	*See following Safety Subjects: Traffic Control Devices, Markings, Signs, and Signals*			

Workzone Mobility

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Transportation Management Plan	Aware of Transportation Management Plan	Refers others to TMP	Implements TMP, including detours, and traveler information signs	Provides Input to TMP, including feasibility and monitoring
		Lists or describes general purpose of TMP		
Performance Monitoring	Installs data collectors	Performs real time data collection on traffic volume and speed	Analyzes real time data and assesses performance	Performs mobility audit of work zone
	Maintains and troubleshoots data collectors	Summarizes traffic data and impacts	Coordinates with traffic mgmt personnel	Makes adjustments to improve performance
		Observes/ reports anecdotal traffic volume and speed information	Makes WZTC adjustments as needed	Recommends contingency plans tied to specific impacts and thresholds
			Implements contingency plans	
Public Relations	Provides minimal information to public in polite and articulate manner	Explains more complex situations in polite and articulate manner	Understand the components of public communications and outreach programs	Conducts analyses and provides supporting material to PR executives for projects
Other	As skills as required in: Community Impacts, Costs, WZ Objectives, Enforcement Role, Incident management, Accommodating pedestrians and bicycles, Environmental Safety, Decision Support Tools, WZ Administration, Legal Considerations, Other Safety Considerations, Best Practices, Human factors, WZ Crashes, Evaluation of TCP/TMP, Design & Operations, Commercial Vehicles, and other skills as may be required by 23 CFR Part 630 Subpart J, and MUTCD Part VI			

Traffic Control Devices

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
TCD Fundamentals	Describes TCD fundamentals, including purpose and basic principles	Applies basic principles of TCDs: principles, types, colors, standardization, classification, functions, legal authority, liability	Applies TCD fundamentals to specific problems	Troubleshoots unique situations using fundamental and specific signing principles
		References MUTCD		
Visibility & Retroreflectivity	Explains the basic principles of visibility and retroreflectivity	Inspects TCD's for visibility and retroreflectivity	Interprets standards	Establishes visibility policies
	Performs maintenance as needed to maintain visibility of TCD's	Identifies and reports problem TCD's and PPE	Implements inspection and replacement policies	Develops visibility programs
	Applies to subject areas: Work Zone Devices, Signs, Signals, Pavement Markings			

Signing

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Sign Basic Principles	Explains basic principles of signs, types, colors, standardization, classification, functions, legal authority, liability	Describes sign fundamentals	Applies sign fundamentals to specific problems	Troubleshoots unique situations using fundamental and specific signing principles
Sign Panel Fabrication	Assembles signs (wood, aluminum, polycarbonate, sheeting, storage, rehabilitation, design templates, software, shapes, colors, dimensions, symbols, word messages, lettering, borders)	Fabricates signs	Designs signs with use of standards, templates, and software; references "Standard Highway Signs"	Designs unique signs without templates based on guidelines, standards, and principles
		Cuts and assembles materials	Specifies materials	
			Recognizes signs that require rehabilitation	
Roadside Sign Installation	Properly identifies, transports, and handles: signs, supports, mounting tools; and hardware for ground mounted posts	Installs appropriate breakaway supports	Location, placement, lateral clearance, height, support type	Manages installation program
		Familiar with installation and use of signs for TTC and related TTC skills	Schedules installations, selects supports and structures	
		Familiar with use of utility poles		
Overhead Sign Structures	Identifies, transports, and sub-assembles overhead tubes, structures, panels, supports, hardware and	Performs overhead installation	Specifies materials and schedules installations	Analyzes or estimates costs and benefits of overhead signs

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
	tools, with supervision or provides assistance	Describes appropriate safety precautions		Specifies effective structures and placement
		Familiar with weights, size, wind loads, and strengths		
Object Markers	Identifies hardware and tools	Recognizes appropriate type and placement of markers	Specifies number, type, and placement of object markers required	Recognizes relative costs and benefits associated with markers
	Installs object markers, small warning signs, mileposts, raised pavement markers and reflectors	Identifies worn or missing markers	Identifies candidate locations for improved markings	
Sign Maintenance	Corrects worn, missing, vandalized, or obscured signs with repairs, cleaning, and vegetation control	Recognizes and reports worn, missing, obscured, and non-standard signs	Recognizes situations requiring change in signing	Manages maintenance program
		Plans corrections	Recommends and supervises maintenance	
Sign Visibility	Removes or trims vegetation from signs maintain visibility	Inspects signs for visibility and retroreflectivity	Interprets standards	Establishes visibility policies
	Removes graffiti	Identifies and reports problem signs	Implements sign inspection and replacement policies	Develops sign visibility and retroreflectivity programs
Sign Management	Identifies components, conditions, and location	Ensures sign inventory information is complete	Supervises sign inventory management systems	Develops and implements sign inventory management systems

Markings

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Basic Principles of Pavement Markings	Identifies basic principles of markings, markers, types, colors, standardization, widths, patterns, longitudinal and transverse markings, and curb markings based on MUTCD	Explains marking fundamentals	Applies marking fundamentals to specific problems; references MUTCD	Troubleshoots unique situations using fundamental and specific marking principles
Traffic Control Plans (Permanent)	Interprets basic TC plans Identifies equipment and materials indicated by plans	Interprets more complex TC plans	Performs basic design of TC Plans	Performs advanced design of TC Plans
Marking Materials	Identifies PM materials (paint, thermoplastic, epoxy, polyurethane, tape, markers) Handles PM materials	Describes differences and properties of PM materials	Selects, orders, and specifies materials and volumes per agency guidelines	Analyzes costs and safety benefits of alternative materials
Marking Equipment	Safely selects, inspects, starts and preventively maintains equipment	Safely and proficiently operates PM installation equipment	Troubleshoots and repairs PM equipment Recommends equipment needs	Selects and purchases cost-effective installation equipment

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Markings Installation	Identifies specified materials, tools, and equipment Installs materials Maintains existing markings	Places materials according to plan, weather and temperature	Troubleshoots difficult installations	Recommends corrective action
Pavement Markers	Identifies and installs raised pavement markers (RPM), in-roadway lighting	Maintains and troubleshoots in-road markers	Specifies materials, location and placement of in-road markers	Describes costs and benefits of in road markers
Marking Maintenance & Inspection	Recognizes worn, dull, or missing markings	Maintains, repairs and replaces markings	Specifies and schedules maintenance	Manages marking maintenance program
Marking Visibility & Retroreflectivity	Describes importance of nighttime visibility Recognizes worn and poorly reflective markings	Conducts nighttime inspection of markings and assesses visibility by agency standards	Supervises nighttime inspections and helps interpret standards	Specifies visibility policy and thresholds, interprets and applies standards
Marking Management	Recognizes worn, dull, or missing markings	Collects field data upon request Recommends markings in need of replacement or maintenance	Describes use of field data and markings management system, if applicable	Implements or manages pavement

Signals

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Signal Basics	Recognizes purpose, warrants, phases, options, MUTCD, components	Explains fundamentals	Applies fundamentals to specific problems	Applies fundamental and specific knowledge to unique situations
Signal Components	Identifies components and options: house, faces, lenses, detectors, cabinet	Maintains and recommends basic components	Specifies components	Approves use of new components
Signal Controllers & Cabinet (Wire-up)	Recognizes electromechanical parts, solid-state components, switches, microprocessors, wire types and diagrams, conduit, coatings and box Performs preventive maintenance of controller	Installs and maintains controllers	Troubleshoots, repairs, and supervises installation of controllers	Designs controllers and recommends changes
Signal Equipment	Maintains and repairs existing equipment Selects appropriate tools and components for existing signal	Installs cabinet, controller, masts, spans and signal heads	Supervises and troubleshoots equipment installation	Specifies signal equipment
Signal Design	Identifies types, mounting, locations	Suggests type, mounting and location	Specifies type and location	

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Signal Timing & Optimization	Recognizes malfunctions	Recognizes timing / cycle failure	Implements timing studies	Calculates signal timing based on signal system, specific data and standards
	Resets controller to default timing	Recommends timing evaluation	Suggests signal phases and timing	
		Sets timing as directed	Corrects timing as set	
Signal Systems	Detectors, preventive maintenance, systems, signal preemption	Restores interaction and coordination of signal systems when interrupted	Operates signals system; suggests changes to system	Oversees traffic signal systems
Other Signals & Beacons	Identifies differences among hazards, intersections, signal pre-emption, ramp meters, railroad crossings	Describes and repairs other signals and beacons	Recommends use and changes to other signals and beacons	Specifies use of signals and beacons
	Installs components and wiring			
Other Signals Skills	Other skills as needed or to be incorporated above: Warrants, priority control, pedestrian signals, intervals, lenses, faces, display and design, mounting, controller installation, location, software, signal interconnectics			

Traffic Systems

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Electronic TCD's	Installs beacons, changeable message signs and illuminated signs	Maintains electronic TCDs	Troubleshoots electronic TCDs	Specifies use and components of electronic TCDs
Illuminated Signs	Lists fundamentals and installs illuminated signs	Supervision installation, maintenance and repair of illuminated signs	Troubleshoots and suggests appropriate locations and components	Conducts cost-benefit analyses and recommends use
Lighting	Identifies and assembles hardware: footing, poles, brackets, luminaries, high mast equipment, pull-box	Supervises installation and repairs Describes purpose, use, location, power, voltage, fixtures, luminance, hardware and effect of/on environment Placement, location, troubleshooting	Manages installation & maintenance program References Highway Lighting Handbook	Designs lighting systems Conducts C/B analyses Recommends changes in equipment

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Maintenance of Electronic Devices	Maintains and troubleshoots electronic devices directed	Inspects devices and recognizes worn, damaged, obscured, faded, misplaced and malfunctioning devices	Supervises device maintenance personnel	Manages maintenance program for electronic TCDs and other devices
		Familiar with local and national Electronic Safety Codes	Implements proactive preventive maintenance programs	
Electrical Power	Recognizes power requirements of electronic devices	Maintains power and backup equipment	*Refer to qualifications for Electricians*	
		Familiar with local and National Electrical Safety Codes		
Traffic Operations	Describes agency role in traffic operations	Recognizes need for agency intervention in traffic operations	Deploys operations adjustments	Recommends traffic operations and management strategies
Traffic Detection	Installs traffic detection equipment, including speed, signal actuators, approaching traffic and weigh in motion devices	Inspects and troubleshoots detection equipment	Describes and recommends equipment	Analyzes costs and benefits of detection and recommends detectors
Traffic Incident Management	Understands Roles & Responsibilities, Principles of TTC	Correctly selects and places TTC devices and personnel for Emergencies	Assists with traffic management center operations	Coordinates IM with other agency personnel
	Places vehicle	Articulates differences from planned work zones		

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
	safely when near incidents (crashes, special events, unscheduled work areas)	Certified flagger		
Intelligent Transportation Systems	*Refer to ITS Architecture and Professional Capacity Building Program*			

Roadway Safety Appurtenances

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Barriers, End Treatments	Installs and maintains end treatments	Recognizes outdated end treatments Supervises installation and replacement	Selects appropriate end treatments	Estimates effects of end treatments on crashes
Barriers	Installs barriers, including crash cushions	Monitors and maintains barriers with little or no supervision	Identifies and recommends objects requiring barriers or crash cushion, or attenuators	
Longitudinal Barriers	Installs and maintains longitudinal barriers, including guardrail, concrete barriers and medians	Supervises installation Recognizes improperly installed devices	Describes characteristics of different barriers Lists factors affecting barrier selection and effectiveness	Selects longitudinal barriers based on specific locations and characteristics Identifies flawed installations
Bicycle Facilities	Installs markings for bike lanes and multi-use paths	Recognizes hazards to bicyclists	Specifies markings and signage for bike lanes and multi-use paths	
Intersection Controls	Installs traffic control signs, transverse stop bars, yield markings, stop ahead signs, crosswalk lines, signal ahead signs, lane	Maintains worn or missing signs and markings at intersections	Corrects signal timing	Recommends intersection safety countermeasures

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
	control signs and markings and directional signs	Installs red-light running detection equipment	Identifies intersection deficiencies	
Pavement Edge	Installs beveled edge on new pavements and existing pavements with significant edge drops	Recognizes significant edge drops	Recommends pavement edge improvements	Manages pavement edge strategies
Pavement Safety	Properly installs paving materials	Recognizes pavement that may have poor friction characteristics	Describes friction characteristics of paving materials Recommends paving materials considering friction and safety	Tests pavement friction and estimates effects on safety
Pedestrian Facilities	Applies signs and markings for paths and crosswalks Installs pedestrian signals	Maintains pedestrian signals	Times and troubleshoots pedestrians signals	Develops pedestrian signals plans Recommends improved pedestrian safety equipment
Railroad Crossings	Installs and maintains active and passive TCDs and crossing surfaces	Inspects grade crossing traffic, devices, and surfaces	Inspects advanced grade crossing technology	Recommends roadway or equipment improvements for specific crossings
Roadway Delineation	Properly installs roadway safety appurtenances and delineators Recognizes the severity of lane and roadway departure crashes	Recognizes poorly delineated segments	Recommends improved delineation for specific road segments	Manages roadway delineation program

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Rumble Strips	Installs and maintains rumbles strips/stripes	Supervises installation	Determines specifications Prioritizes segments for treatment	Develops budget and policy for rumble stripping
Speed Control	Installs regulatory and advisory signs Installs and activates Your Speed signs		Recognizes benefits of comprehensive speed management approach	

Safety Strategies

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Bicycle Traffic & Safety	Identifies road, traffic and maintenance conditions that affect bicyclists	Lists needs of bicyclists as roadway users Describes characteristics and roads and paths designed for bicyclists	Recognizes opportunities to accommodate bikes during all project phases	Articulates the benefits of transportation systems accommodating bikes Develops and implements pedestrian & bike safety programs
Human Factors	Recognizes that human factors and limitations has a role in highway design, operations, and safety decisions	Identifies human factors information that is needed for using roadways	Describes human factors information that is included in guidelines and standards	Applies human factors principles to resolve issues related to highway design, operations, and safety
Intersections	Describes need to balance needs of many users at intersections Recognizes intersection terms and issues	Explains general effects of geometric design and traffic control devices on unsignalized intersections	Identifies countermeasures for signalized and unsignalized intersections	Identifies and diagnoses intersections with poor crash experience or high potential Recommends appropriate countermeasures
Pavement		Recognizes pavement that may have poor friction characteristics	Describes friction characteristics of paving materials Recommends paving materials considering friction and safety Familiar with RSRAP	Tests pavement friction and estimates effects on safety
Pedestrians	Lists characteristics of pedestrians and traffic affecting pedestrians	Recognizes pedestrian and traffic conflicts	Identifies sites for improvement	Develops and implements pedestrian & bike safety program

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Railroad Crossings	Recognizes risk at uncontrolled crossings	Inspects grade crossing traffic, devices and surfaces	Describes alternatives and identifies associated hazards	Identifies hazards and relative costs Optional: teaches or manages a grade crossing safety program
Road Safety Audits	Describes role of RSA	Identifies minimum requirements for RSA	Leads or participates in RSAs	Implements or supervises RSA program
Roadway Departure	Recognizes the severity of lane and roadway departure crashes	Identifies factors influencing road departure crashes	Identifies countermeasures for road departure crashes	Identifies road segments with high road departure crashes or potential
		Selects proper materials	Selects NCHRP-350 approved devices	Evaluates and recommends appropriate countermeasures
		Recognizes improperly installed devices		
Speed Management	Describes general role of speed in highway safety and crashes	Identifies multiple factors influencing driver speed	Recognizes a variety of approaches to speed management	Describes or leads process for setting and maintaining appropriate speed limits
		Describes decision sight distance and stopping sight distance	Describes limitations of individual approaches	

Other Safety Competencies

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	**Level II**	**Level III**	**Level IV**
Traffic Engineering	Other traffic skills as needed including operational analysis, level-of-service, capacity, traffic studies, assessment of alternatives, geometric design, countermeasures evaluation, etc or assists with these efforts as needed			Prepares for PTOE
Safety Training & Education	Identifies training and competency sources	Coordinates training needs and activities	Identifies training needs Works with partners to develop new training Articulates instructions systems design features Specifies assessment and credit issues	Manages training programs
Other Highway Safety Disciplines	Addition skills and training as needed in: aggressive driving, breakaway supports, context sensitive design, crash data statistics, highway safety fundamentals, crash worthiness, highway safety plans, Section 402 Program, Funding and Incentive Programs, MUTCD, NCHRP Reports 350 and 500, Older Drivers and Pedestrians, Red Light Running, Roadside Safety Design, Safety Management, Safety Conscious Planning, Traffic Calming, Utility Safety, Rural ITS, Software (Safety Analyst, PBCAT, RSRAP, Quick Zone, US Limits), Strategic Highway Safety Plan, Roundabouts, National Model, IHSDM, Rural Application of Left Turn Lanes, and Variables Speed Limits			

DISCIPLINES	COMPETENCIES BY SKILL LEVELS			
	Level I	Level II	Level III	Level IV
Other Highway Safety Competencies	For additional safety competencies, safety professionals, and FHWA personnel, refer to the competency sets below: These competency sets are not yet coordinated with the TCCC Safety competencies			
	1 FHWA Field Safety Competencies			
	2 FHWA Headquarters Safety Competencies			
	3 FHWA Safety Professional Development Program (Safety PDP)			
	4 FHWA Technical Career Track (TCT) Competencies			
	5 NHTSA Safety Competencies			
	6 USDOT Draft Combined Safety Competencies			
	7 TRB Core Safety Competencies (Subcommittee on Highway Safety Workforce)			
	8 CDC Injury & Violence Prevention Core Competencies			