

TxDOT's Precertification Process

ATTACHMENT "B" Precertification Requirements by Category

The Texas Department of Transportation precertifies providers and sub-providers in the following technical work categories in accordance with the listed certification requirements. A firm may only use an individual who is employed by that firm at the time of submittal for precertification. The experience used to meet requirements may be either prior to or after licensure unless otherwise stated in a specific category. Such licenses or registrations shall be those issued by the appropriate professional licensing board.

Group 1 - Transportation Systems Planning

Work Category	Category Description	Certification Requirements
1.1.1	<u>Policy Planning</u> - This category includes the investigation and development of transportation planning and strategies to meet current or future needs at the state or local level.	The firm must employ: <ul style="list-style-type: none"> one professional engineer with training and experience in areas directly related to policy planning; or one planner with training and experience in areas directly related to policy planning.
1.2.1	<u>Systems Planning</u> - This category includes development of state or local transportation plans to create complete integrated systems to support movement of people and goods.	The firm must employ: <ul style="list-style-type: none"> one professional engineer with training and experience in areas directly related to systems planning; or one planner with training and experience in areas directly related to systems planning.
1.3.1	<u>Subarea/Corridor Planning</u> - This category includes the study of the feasibility of all modes of transportation corridors at the state or local level to determine the cost effectiveness of the various alternatives to meet specific goals and may include actual route location as a final product.	The firm must employ: <ul style="list-style-type: none"> one professional engineer with training and experience in areas directly related to subarea/corridor planning; or one planner with training and experience in areas directly related to subarea/corridor planning.
1.4.1	<u>Land Planning/Engineering</u> - This category includes planning and engineering in support of assessing the impacts that proposed transportation improvements may have on public and private property.	The firm must employ: <ul style="list-style-type: none"> one professional engineer with training and experience in comprehensive planning or areas directly related to assessing impacts to private property; or one planner with training and experience in comprehensive planning or areas directly related to assessing impacts to private property.
1.5.1	<u>Feasibility Studies</u> - This category includes investigation of programs or specific projects to determine if they are cost effective and meet the department's desired goals.	The firm must employ one professional engineer who has: <ul style="list-style-type: none"> proficiency in civil engineering; and

		<ul style="list-style-type: none"> completed a minimum of two feasibility studies.
1.6.1	<u>Major Investment Studies</u> - This category includes the investigation of modal and financing alternatives for major transportation projects at the state or local level.	<p>The firm must employ:</p> <ul style="list-style-type: none"> one professional engineer with proficiency in civil engineering and experience or education in urban planning and economic, or environmental impact assessment; and one person with a bachelor's degree in physical or a natural science with related experience.

Group 2 - Environmental Studies

Work Category	Category Description	Certification Requirements
2.1.1	<u>Traffic Noise Analysis</u> -This category includes the performance of a traffic noise analysis for a roadway project.	<p>The firm must employ one person with:</p> <ul style="list-style-type: none"> a bachelor's degree or equivalent experience in environmental studies, urban planning, civil or environmental engineering, or a related field; and demonstrated experience in use/application of Traffic Noise Guidelines, traffic noise modeling software, and appropriate sound measuring equipment through the accurate completion of a traffic noise analysis for a minimum of two highway projects at the FONSI level or above.
2.2.1	<u>Air Quality Analysis</u> - This category includes the performance of an air quality analysis for a roadway project.	<p>The firm must employ one person with:</p> <ul style="list-style-type: none"> a bachelor's degree or equivalent experience in environmental studies, urban planning, civil or environmental engineering, or a related field; and demonstrated experience in use/application of air quality guidelines and air quality modeling software through the accurate completion of an air quality analysis for a minimum of two highway projects at the FONSI level or above.
2.3.1	<u>Wetland Delineation</u> – This category includes the performance of a wetland delineation according to the United States Army Corps of Engineers requirements.	<p>The firm must employ one person with:</p> <ul style="list-style-type: none"> a minimum of one year of field experience in wetland delineation; and completion of a Wetland Training Institute or an equivalent one week wetland delineation class.
2.4	United States Army Corps of Engineers Permits - This category includes the following permits:	
2.4.1	<u>Nationwide Permit</u>	The firm must employ one person with working knowledge of the nationwide permit process and a minimum of one year of experience in nationwide permit determination.

2.4.2	<u>§404 (Title 33, United States Code §1344) Individual Permits</u> (including mitigation and monitoring).	The firm must employ one person with working knowledge of the individual §404 Permit process, with one year of experience, and who has applied for and received one individual permit.
2.4.3	<u>U. S. Coast Guard and U.S. Army Corps of Engineers §10 (Title 33, United States Code §403) Permits</u>	The firm must employ one person with one year of experience and working knowledge of the Rivers and Harbors Act, §10 who has applied for and received one navigation-related permit.
2.5.1	<u>Water Pollution Abatement Plan</u> - This category includes geologic field assessment and the preparation of pollution abatement plans as they relate to the Edwards Aquifer Rules.	The firm must employ one person with: <ul style="list-style-type: none"> • a background in geology, environmental studies, civil or environmental engineering, or a related field; and • working knowledge of the Edwards Aquifer rules.
2.6	Protected Species Coordination - This category includes the following types of biological issues and coordination.	
2.6.1	<u>Protected Species Determination (Habitat)</u> -This category involves the determination of the potential presence or absence of a protected species or important habitat.	The firm must employ one person: <ul style="list-style-type: none"> • with knowledge of currently protected species and/or habitats, and a demonstrated ability to perform basic inventory work sufficient to comply with FHWA National Environmental Protection Act (NEPA) requirements.
2.6.2	<u>Impact Evaluation Assessments.</u> - This category requires demonstrated ability to use habitat and species determination and biological survey data to analyze impacts to biological resources.	The firm must employ one person: <ul style="list-style-type: none"> • with demonstrated ability to prepare a biological impact analysis for NEPA documentation or to support the Federal Endangered Species Act (ESA) Section 7 consultations, including the preparation of a biological assessment, or ESA Section 10.a permit applications.
2.6.3	<u>Biological Surveys</u> -This category requires demonstration of ability to conduct biological resource field studies.	The firm must employ one person: <ul style="list-style-type: none"> • with demonstrated ability to survey the project site and classify the vegetation community, list animal species associated with that community and identify special habitat features within the community; who has required state and federal permits; and with experience in appropriate survey protocols for specific protected species
2.7.1	<u>§4(f) (Title 23, United States Code of Federal Regulations §771.135) and/or §6(f) (Title 49, United States Code §303) Evaluations</u> – This category includes §4(f) evaluations, identified in the Department of Transportation Act of 1966, which are conducted when right of way is acquired from publicly owned parks, recreation areas, wildlife or waterfowl refuges, or historic sites, and §6(f)	The firm must employ one person: <ul style="list-style-type: none"> • with a minimum of one year of experience in applying §4(f) and/or §6(f) requirements; • who has completed a minimum of one successful evaluation; and • who has received FHWA or other federal agency approval.

	evaluations which apply (applies) when federal land and water conservation funds are used for improvements to the site.	
2.8.1	<p><u>Surveys, Research and Documentation of Historic Buildings, Structures, and Objects</u></p> <p>– This category includes surveys, research, and documentation efforts carried out in accordance with the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (Volume 48 of the Federal Register, 44716) to comply with §106 (Title 16, United States Code §470f) of the national Historic Preservation Act of 1966, as amended, and other state and federal historic preservation related laws and regulations. Associated activities include: delineation of the area of potential effects for projects with the potential to affect historic properties; field surveys and photographic and written documentation on historic properties located within a project's area of potential effects; development of historic contexts that provide an organizational and thematic format for evaluating historic properties; determination of National Register eligibility for identified historic properties; preparation of historic documentation on affected properties in accordance with the documentation requirements of the Historic American Buildings Survey and the Historic American Engineering Record; evaluation of the effect of projects on significant properties; and the development of management and preservation plans for historic properties.</p>	<p>The firm must employ one person with experience working with the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (Volume 48 of the Federal Register, 44716), 36 CFR Part 800, and documentation requirements of the Historic American Buildings Survey and Historic American Engineering Record and:</p> <ul style="list-style-type: none"> • a master's degree in architectural history, historic preservation or a closely related field, with course work in American architectural history and a minimum of one year of direct experience performing surveys, research or documentation of historic buildings, structures, and objects; • a bachelor's degree in architectural history, historic preservation or a closely related field, with course work in American architectural history and a minimum of two years of direct experience performing surveys, research or documentation of historic buildings, structures, and objects; or • a minimum of ten years of direct experience performing surveys, research, or documentation of historic buildings, structures, and objects, including scholarly publications and presentations at professional meetings.
2.9.1	<p><u>Historic Architecture</u> - This category includes architectural work to ensure compliance with Secretary of the Interior's Standards for Historic Preservation projects (Volume 48 of the Federal Register, 44716). Associated activities include detailed investigations of historic structures, preparation of historic structure research reports, preparation of plans and specifications for historic preservations projects,</p>	<p>The firm must employ a registered architect:</p> <ul style="list-style-type: none"> • with a minimum of two years of full-time experience managing historic preservation projects; or • with a minimum of one year of full-time experience managing historic preservation projects and completion of a minimum of one year of graduate study in preservation architecture.

	development of management plans for individual properties, and preparation of measured drawings for affected historic properties.	
2.10.1	<p><u>Archeological Surveys, Documentation, Excavations, Testing Reports and Data Recovery Plans</u> – This category includes: reconnaissance or intensive archeological surveys performed in accordance with the criteria listed in the Secretary of the Interior’s Standards and Guidelines for Archeology and Historic Preservation (1982), Reports Relating to Archeological Permits in the Rules of Practice and Procedure for the Antiquities Code of Texas, and performance standards as outlined in the Council of Texas Archaeologists (CTA) Guidelines; documentation of operations that use archeological techniques to obtain and record evidence of human activity or behavior important in history or prehistory; testing and preparation of testing reports to describe the results of work following the investigation and evaluation of archeological sites and/or other historic properties; and data recovery plans that address appropriate strategies and methodologies for excavation and data recovery.</p>	<p>The firm must employ a principal investigator:</p> <ul style="list-style-type: none"> • with a master’s degree in archeology, anthropology, or closely related field, who has a minimum of one year of full-time professional experience or equivalent specialized training in archeological research or administration; • who has a minimum of one year of supervised field and analytic experience in archeology; • who is a professional archeologist who meets the standards of a principal or co-principal investigator, as defined by state standards, with a minimum of one year of full-time professional experience at a supervisory level in archeological resources; • who has served as principal or co-principal investigator on a minimum of five archeological projects, or equivalent scope that were successfully completed under the jurisdiction of the National Historical Preservation Act, the Antiquities Code of Texas, or an equivalent law in another state; and • who has the equipment and personnel necessary to perform the work.
2.11.1	<p><u>Historical and Archival Research</u> - This category includes historical and archival research on historic properties or historic archeological sites, the development of research designs to guide historical research efforts, and the development of historic contexts to provide an organizational and thematic format for further research and evaluation of historic properties and historic archeological sites.</p>	<p>The firm must employ one person with:</p> <ul style="list-style-type: none"> • a master’s degree in history or a closely related field with a minimum of one year of full-time experience in historical research, writing, teaching, or other demonstrated professional historical activity and archival research and documentation; or • a bachelor’s degree in history or a closely related field with a minimum of two years of full-time experience in research, writing, teaching, interpretation, or other demonstrated professional activity with an academic institution, historical organization or agency, museum, or other professional institution, and a minimum of one year of experience managing historical and archival research.
2.12.1	<p><u>Socio-Economic and Environmental Justice Analyses</u> - This category includes: analyzing U. S. Census data for the affected area; identifying changes in land use, land values, and the local tax</p>	<p>The firm must employ one person with:</p> <ul style="list-style-type: none"> • a bachelor’s degree in sociology, economics, urban planning, engineering, or a related field described in this category;

	<p>base; identifying impacts to the business environment to include relocations, construction period impacts, accessibility issues, and effects to employees and customers; estimating the number and type of residential relocations; identifying the availability of comparable replacement housing in accordance with the Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970; identifying impacts to community cohesion and the effects to public facilities and services; and identifying and addressing disproportionately high and adverse health and environmental impacts to minority populations and low-income populations in accordance with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations (February 11, 1994).</p>	<ul style="list-style-type: none"> • a minimum of one year of full-time experience performing socio-economic analysis for environmental documents; and • knowledge of applicable federal, state, and local regulations.
2.13.1	<p><u>Hazardous Materials Initial Site Assessment</u> - This category includes the performance of an initial site assessment to identify known or possible hazardous materials and determine the potential for encountering them during project development. The assessment shall be in general accordance with the American Society for Testing and Materials Environmental Site Assessment standard practices, ASTM 1528 and 1527, or satisfy due diligence and appropriate inquiry requirements under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The appropriate level of inquiry for assessing existing and previous land use, regulatory databases (list search) and files, site visit and/or field surveys, and interviews shall be made with consideration of project design and right of way requirements. This category also includes the determination of whether additional research or investigation is necessary during subsequent stages of project development.</p>	<p>The firm must employ one person with:</p> <ul style="list-style-type: none"> • a minimum of one year of experience performing Phase I environmental site assessments/hazardous material assessments; and • working knowledge of pertinent federal, state and local environmental laws and regulations, ASTM standard practices for environmental site assessments, and hazardous material assessments/investigations.
2.14.1	<p><u>Environmental Document Preparation</u> – This category includes the preparation of</p>	<p>The firm must employ one person:</p>

	<p>environmental documents for transportation projects as identified in §2.43©, (d) and (e) of this title (relating to Highway Construction Projects – State Funds).</p>	<ul style="list-style-type: none"> • with a bachelor’s degree or equivalent experience in environmental studies, urban planning, civil or environmental engineering, or a related field, and with knowledge of pertinent federal, state, and local environmental regulations; • in responsible charge of the review and preparation of, and/or participation in any management that developed five or more moderate to large projects which were approved as environmental assessment-FONSI; or • in responsible charge of the review and preparation of, and/or participation in any management that developed 10 or more small to moderate projects which were approved as environmental assessment-FONSI; or • in responsible charge of the review and preparation of, and/or participation in any management that developed one project which was approved as an environmental impact statement.
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Group 3 - Schematic Development

Work Category	Category Description	Certification Requirements
	<p>The firm must employ sufficient production staff to perform the work described in the following categories.</p>	
3.1.1	<p><u>Route Studies and Schematic Design (Minor Roadways)</u> - This category includes the preliminary alignment and layout of minor roadways as described in Category 4.1.1.</p>	<p>The firm must employ one professional engineer with a minimum of three years experience in:</p> <ul style="list-style-type: none"> • design of minor roadways; and • capacity and level of service analysis.
3.2.1	<p><u>Route Studies and Schematic Design (Major Roadways)</u> - This category includes the preliminary alignment and layout of major roadways as described in Category 4.2.1.</p>	<p>The firm must employ a minimum of one professional engineer with three years experience in:</p> <ul style="list-style-type: none"> • design of major roadways; and • capacity and level of service analysis.
3.3.1	<p><u>Route Studies and Schematic Design (Complex Highways)</u> - This category includes the preliminary alignment and layout of complex highways as described in Category 4.3.1.</p>	<p>The firm must employ one professional engineer with a minimum of:</p> <ul style="list-style-type: none"> • five years experience in the area of complex highway design; and • one year of experience in capacity and level of service analysis.
3.4.1	<p><u>Minor Bridge Layouts</u> - This category includes the preliminary alignment and layout of minor bridges as described in Category</p>	<p>The firm must employ one professional engineer with a minimum of three years experience in:</p>

	5.1.1.	<ul style="list-style-type: none"> • design of minor roadways; and • capacity and level of service analysis.
3.5.1	<u>Major Bridge Layouts</u> - This category includes the preliminary alignment and layout of major bridges as described in Category 5.2.1.	<p>The firm must employ one professional engineer with a minimum of:</p> <ul style="list-style-type: none"> • three years experience in design of major roadways; and • one year of experience in capacity and level of service analysis.
3.6.1	<u>Multi-Level Interchange and Exotic Bridge Layout</u> - This category includes the preliminary alignment and layout of multi-level interchanges as described in Category 5.3.1 and 5.4.1.	<p>The firm must employ one professional engineer with a minimum of:</p> <ul style="list-style-type: none"> • five years experience in complex highway design; and • one year of experience in capacity and level of service analysis.

Group 4 - Roadway Design

Work Category	Category Description	Certification Requirements
	The firm must employ sufficient production staff to perform the work described in the following categories.	
4.1.1	<u>Minor Roadway Design</u> - This category includes the design of small urban and rural roadways involving repair, resurfacing, and rehabilitation that do not include major reconstruction, and urban and rural roadways that involve substantial capacity improvements. Associated activities include utility relocation and miscellaneous minor design services.	The firm must employ one professional engineer with a minimum of three years of roadway design experience on two projects.
4.2.1	<u>Major Roadway Design</u> - This category includes design of urban and rural roadways that involve major reconstruction or substantial capacity improvements through a developed area. Associated activities include utility relocation plans, stormwater permits, maintenance of traffic plans, and traffic engineering applications.	The firm must employ one professional engineer with a minimum of three years of roadway design experience on two separate projects.
4.3.1	<u>Complex Highway Design</u> - This category includes the design of	The firm must employ one professional engineer with a minimum of four years experience in complex highway

	expressways, limited access facilities, diamond interchanges, freeways, and new roadway and reconstruction work on complex projects including complex geometrics. Associated activities include substantial drainage evaluation and design features, traffic engineering applications, utility relocation plans, and maintenance of traffic plans.	design on two separate projects.
4.4.1	<u>Major Freeway Interchanges and Direct Connectors</u>	The firm must employ one professional engineer with a minimum of five years experience in design of a minimum of two separate projects involving major freeway interchanges and direct connectors.

Group 5 – Bridge Design

Work Category	Category Description	Certification Requirements
	The firm must employ sufficient production staff to perform the work described in the following categories.	
5.1.1	<u>Minor Bridge Design</u> - This category includes the design of conventional, non-complex bridges, bridge replacements, simple bridge widening, railroad overpasses, non-standard retaining walls, and pedestrian bridges.	The firm must employ one professional engineer with a minimum of two years structural bridge design experience after licensure as a professional engineer.
5.2.1	<u>Major Bridge Design</u> - This category includes the design of bridges with complex geometry, complexity of design, spans less than 350 feet, non-conventional substructures, substructures requiring ship impact design, design of dolphins for bridge pier protection, railroad underpasses, complex bridge widening, steel truss spans, and concrete arch bridges.	The firm must employ one professional engineer with a minimum of five years of structural bridge design experience after licensure as a professional engineer.
5.3.1	<u>Multi-Level Interchange Design</u> - This category includes design of bridges with three levels or more.	The firm must employ one professional engineer with a minimum of seven years of structural bridge design experience in multi-level interchanges after licensure as a professional engineer.
5.4.1	<u>Exotic Bridge Design</u> - This category includes the design of bridges with spans greater than 350 feet, suspension bridges, cable-stayed bridges, precast, post-tensioned segmental bridges, bridges requiring unique analytical methods, and movable bridges.	The firm must employ one professional engineer with a minimum of seven years of structural bridge design experience in exotic bridge design after licensure as a professional engineer.

Group 6 - Bridge Inspection

Work Category	Category Description	Certification Requirements
	The firm must employ sufficient National Highway Institute (NHI) trained bridge inspectors and other technical personnel as required to perform inspection of bridges included in this category.	
6.1.1	<u>Routine Bridge Inspection</u> - This category includes the inspection of on-system and off-system bridges, inspection and load rating for culverts, pre-stressed beam bridges, cast-in-place concrete bridges, steel girder bridges, steel truss bridges, and timber bridges.	<p>The firm must employ:</p> <ul style="list-style-type: none"> • a project manager who is a registered professional engineer, is qualified for registration as a professional engineer under the laws of a state, or has a minimum of 10 years experience in bridge inspection assignments in a responsible capacity and has completed the comprehensive NHI training course "Safety Inspection of In-service Bridges;" and • a team leader who has the qualifications specified for the project manager in subdivision (i) of this subparagraph, or a minimum of five years of experience in bridge inspection assignments in a responsible capacity and has completed the comprehensive NIH training course "Safety Inspection of In-service Bridges," or is currently certified as a Level III or IV Bridge Safety Inspector under the National Institute for Certification in Engineering Technologies (NICET).
6.2.1	<u>Complex Bridge Inspection</u> - This category includes the inspection of on-system and off-system bridges, inspection and load rating for precast segmental structures, steel arch structures, cable stayed structures, fracture critical inspections, and movable bridges.	<p>The firm must employ:</p> <ul style="list-style-type: none"> • one professional engineer, to serve as project manager, with a minimum of seven years of bridge inspection or design experience, including one year of inspection or design of bridges included in this category, and who has completed the comprehensive NHI training course "Safety Inspection of In-service Bridges;" and • a person to serve as the inspection team leader who has a minimum of six years of experience in bridge inspection or design, including one year of inspection or design of bridges included in this category, and who has completed the comprehensive NHI training course "Safety Inspection of In-service Bridges" .

Group 7 - Traffic Engineering and Operations Studies

Work Category	Category Description	Certification Requirements
7.1.1	<u>Traffic Engineering Studies</u> - This category is defined as the study of the traffic operations of a roadway. Associated activities include preparation of or performance of traffic counts, signal warrants, collision diagrams, travel time and delay, capacity and level of service analysis, intersection analysis,	The firm must employ one professional engineer with demonstrated experience performing traffic engineering studies.

	signing, and pavement marking.	
7.2.1	<u>Highway-Rail Grade Crossing Studies</u> - This category includes the study of the operations of highway-rail grade crossings. Associated activities include preparation of or performance of corridor analysis, diagnostic inspections to determine appropriate type and location of active warning devices, advance warning signs and pavement markings, and other geometric or operational improvements.	The firm must employ one professional engineer with demonstrated experience performing highway-rail grade crossing studies.
7.3.1	<u>Traffic Signal Timing</u> - This category includes analysis, development, and implementation of timing for traffic signals. Associated activities include data collection, intersection analysis, computerized timing programs (development of phase intervals and sequence), and timing implementation.	A firm must employ: <ul style="list-style-type: none"> • one professional engineer with demonstrated experience in traffic signal timing and the application and interpretation of traffic flow and signal timing models; and • sufficient personnel with experience using traffic engineering software applications, loading timings into field equipment, and loading databases into central computers for retiming.
7.4.1	<u>Traffic Control Systems Analysis, Design and Implementation</u> - This category includes the use of electrical engineering, electronics engineering, computer science and traffic engineering to analyze, design, and implement real-time traffic control systems.	The firm must employ: <ul style="list-style-type: none"> • one professional engineer with experience in activities associated with traffic control systems; and • sufficient production staff to perform these activities.
7.5.1	<u>Intelligent Transportation System</u> - This category includes conducting ITS planning studies. Associated activities include the study of transportation systems, identification of ITS applications to mitigate transportation problems, development of short term and long term ITS implementation plans, and assessment of the impact of ITS projects on the transportation system.	The firm must employ: <ul style="list-style-type: none"> • one professional engineer with a background in transportation engineering and experience in activities associated with the development of ITS; and • sufficient production staff to perform these activities.

Group 8 - Traffic Operations Design

Work Category	Category Description	Certification Requirements
8.1.1	<u>Signing, Pavement Marking and Channelization</u> - This category includes the design and preparation of plans for signing, pavement marking, and channelization.	The firm must employ one professional engineer with a minimum of two years experience in this category.
8.2.1	<u>Illumination</u> - This category	The firm must employ one professional engineer:

	includes the design and preparation of plans for continuous roadway lighting, safety lighting, underpass lighting, tunnel lighting, and high mast lighting.	<ul style="list-style-type: none"> a minimum of two years experience in design and production of illumination plans meeting IESNA and AASHTO guidelines; and demonstrated experience in electrical engineering and the National Electric Code.
8.3.1	<u>Signalization</u> - This category includes the design and preparation of plans for traffic signalization.	The firm must employ one professional engineer with a minimum of two years experience in the design and production of traffic signalization.
8.4.1	<u>ITS Control Systems Analysis, Design and Implementation</u> - This category of work includes the use of transportation engineering, electronics engineering, and computer science to analyze, design and implement transportation control systems. Associated activities include system performance and cost analysis, system hardware and software design, communication system design, development of management plans, supervision of system installation and operation, system testing and debugging, preparation of system documentation, and the training of operations personnel.	The firm must employ: <ul style="list-style-type: none"> one professional engineer, with a background in electrical engineering, system engineering, or software engineering, with a minimum of two years experience in either the design and production of ITS plans or the operation of ITS; and sufficient personnel with experience in systems engineering, communications, system integration, or software development for ITS applications and ITS equipment.
8.5.1	<u>Highway-Rail Grade Crossings</u> - This category includes the design and preparation of plans for active warning devices, advance warning signs, pavement markings, and other geometric or operational improvements at highway-rail crossings.	The firm must employ one professional engineer with a minimum of two years experience in this category.

Group 9 – Bicycle and Pedestrian Facilities

Work Category	Category Description	Certification Requirements
9.1.1	<u>Bicycle and Pedestrian Facility Development</u> - This includes the design of bicycle and pedestrian facilities.	The firm must employ: <ul style="list-style-type: none"> one professional engineer with a minimum of one year of experience in the design of bicycle and pedestrian facilities, and with knowledge of drainage design; and sufficient production staff to perform these activities.

Group 10 - Hydraulic Design and Analysis

Work Category	Category Description	Certification Requirements
10.1.1	<u>Hydrologic Studies</u> - This category includes rainfall, runoff determination, reservoir routing, and channel routing.	The firm must employ one professional engineer with: <ul style="list-style-type: none"> a minimum of two years experience in analysis of complex watersheds.
10.2.1	<u>Basic Hydraulic Design</u> - This category includes storm drain systems, culverts, sedimentation filtration systems, and detention/retention ponds.	The firm must employ one professional engineer with: <ul style="list-style-type: none"> a minimum of two years experience in hydrologic analysis, hydraulic design, and storm water quality evaluation.
10.3.1	<u>Complex Hydraulic Design</u> - This category includes hydraulic design of bridges over waterways, flood plain analysis, and channel modifications.	The firm must employ one professional engineer with: <ul style="list-style-type: none"> a minimum of two years experience in river geomorphology, sediment transport and scour analysis, flood plain analysis, river training techniques, and federal and state regulations and permit compliance.
10.4.1	<u>Pump Stations-Hydraulics</u> - This category includes the design of pump stations for conveyance of storm waters.	The firm must employ: <ul style="list-style-type: none"> one professional engineer with a minimum of two years experience in hydrologic analysis and storm drain and pump station design.
10.4.2	<u>Pump Stations-Electrical</u> – This category includes the design of pump motor control centers, controls, generators, and large distribution equipment stations for conveyance of storm water.	The firm must employ one professional engineer with: <ul style="list-style-type: none"> a minimum of five years experience in the design of large motor control centers and generating equipment, the National Electrical Code, and control systems.
10.4.3	<u>Pump Stations-Structures</u> – This category includes the structural design of walls, roofs, foundations, and wells of pump stations for conveyance of storm water.	The firm must employ one professional engineer with: <ul style="list-style-type: none"> a minimum of two years of structural pump stations design experience.
10.5.1	<u>Bridge Scour Evaluations and Analysis</u> - This category includes hydrologic analysis, channel and bridge hydraulic analysis and sediment transport modeling for evaluating the potential for scour of bridges.	The firm must employ one professional engineer with: <ul style="list-style-type: none"> a minimum of two years experience, after licensure as a professional engineer, in river geomorphology, sediment transport and scour analysis, and flood plain analysis.

Group 11 - Construction Management

Work Category	Category Description	Certification Requirements
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The firm must employ sufficient technical personnel with construction engineering inspection experience to staff projects under this category of work.		
11.1.1	<u>Roadway Construction Management and Inspection</u> - This category includes the performance of construction management duties for all categories of roadways and highways, and minor bridges as described in Category 5.1.1.	The firm must employ one professional engineer with a minimum of two years of responsible charge experience as a project engineer on roadway and bridge construction projects.
11.2.1	<u>Major Bridge Construction, Management and Inspection</u> - This category includes the performance of construction management duties for major bridges, multi-level interchanges, and exotic bridges as described in Category 5.2.1.	The firm must employ one professional engineer with a minimum of two years demonstrated major bridge construction experience after licensure as a professional engineer.

Group 12 - Materials Inspection and Testing

Work Category	Category Description	Certification Requirements
12.1	<u>Material Testing</u> - The firm must have available in-house equipment and employ qualified, certified staff necessary to perform the work specified in this category.	
12.1.1	<u>Asphaltic Concrete</u> - This category includes testing of asphaltic concrete material.	The firm must employ one professional engineer with a minimum of three years of experience in testing roadway construction materials and a minimum of one person with the proper Hot Mix Asphalt Specialist Certification (Level 1A minimum).
12.1.2	<u>Portland Cement Concrete</u> - This category includes testing of Portland cement concrete.	The firm must employ one professional engineer with a minimum of three years of experience in testing roadway and bridge construction materials, and one person with the proper concrete certification (ACI certification Grade 1).
12.2.1	<u>Plant Inspection and Testing</u> - This category includes inspection of the following types of facilities and inspection of materials and finished products within these facilities: fabrication plants, mines and quarries, mills, refineries, processors, and producers.	The firm must employ: <ul style="list-style-type: none"> one professional engineer with a minimum of three years of responsible experience in inspection and testing bridge and roadway construction materials; and sufficient technical personnel with construction engineering experience to properly staff this type of work.

Group 14 – Geotechnical Services

Work Category	Category Description	Certification Requirements
14.1.1	<u>Soil Exploration</u> - This category includes acquisition and reporting of subsurface material to be used	The firm must: <ul style="list-style-type: none"> employ one professional engineer with a minimum

	for the planning, design, construction, and performance of transportation facilities. The field classification of materials and acquisition of soil and rock samples is also included.	<p>of one year demonstrated experience in the activities normally associated with the category under consideration; and</p> <ul style="list-style-type: none"> • have available the equipment necessary to perform the work.
14.2.1	<u>Geotechnical Testing</u> – This category includes sampling and conducting tests on soil and rock according to the department's approved procedures for the purpose of classifying materials and/or identifying their physical properties.	<p>The firm must:</p> <ul style="list-style-type: none"> • employ one professional engineer with a minimum of one year demonstrated experience in the activities normally associated with the category under consideration; and • have available in-house equipment and employ qualified staff necessary to perform the work.
14.3.1	<u>Transportation Foundation Studies</u> - This category includes producing reports which contain selection of the type and depth of foundation for bridges, retaining walls, signs, and other types of transportation foundations. Working with bearing capacity, predicted settlement, stabilization, and construction on soft ground will be required.	The firm must employ one professional engineer with a minimum of three years demonstrated experience in the activities normally associated with this category.
14.4.1	<u>Building Foundation Studies</u> -This category includes producing reports which contain selection of the type and depth of foundation for buildings. Working with bearing capacity, predicted settlement, stabilization and construction on soft ground will be required.	The firm must employ one professional engineer with a minimum of three years demonstrated experience in the activities normally associated with this category.

Group 15 - Surveying and Mapping

Work Category	Category Description	Certification Requirements
15.1	<u>Right of Way Surveys</u> - This category includes the performance of on the ground surveys and preparation of parcel maps, legal descriptions, and right of way maps.	The firm must employ one registered professional land surveyor and two technical personnel, all with demonstrated experience in the applicable category of work and the following subcategories:
15.1.1	<u>Survey</u>	
15.1.2	<u>Parcel Plats</u>	
15.1.3	<u>Legal Descriptions; and</u>	
15.1.4	<u>Right of Way Maps</u>	
15.2.1	<u>Design and Construction Survey</u> - This category includes performance of surveys associated with the gathering of survey data for topography, cross-sections, and other related work in order to design a project, or during layout	<p>The firm must:</p> <ul style="list-style-type: none"> • employ one registered professional land surveyor with a minimum of one year experience in roadway construction staking; • employ sufficient staff to undertake the

	and staking of projects for construction.	<p>requirements normally associated with this type of work; and</p> <ul style="list-style-type: none"> • employ sufficient technical production staff to perform this type of work. • have available the proper equipment to perform the work
15.3.1	<u>Aerial Mapping</u> - This category involves the collection and reduction of aerial survey data, and preparation of site maps and topographic maps. Associated activities include category 15.4.1.	<p>The firm must:</p> <ul style="list-style-type: none"> • employ sufficient lead technical personnel with a minimum of five years of experience each in aerial mapping; • have available the proper equipment meeting national mapping standards and other equipment required to perform the work; and • employ significant technical production staff to perform this type of work.
15.4.1	<u>Horizontal and Vertical Control for Aerial Mapping</u> - This category involves the establishment of the horizontal and vertical control for aerial mapping.	<p>The firm must:</p> <ul style="list-style-type: none"> • employ one registered professional land surveyor; • have available the proper equipment to perform the work; and • employ sufficient staff to undertake the requirements normally associated with this type of work.
15.5.1	<u>State Land Surveying</u> - This category includes the performance of land surveying associated with “the location or relocation of original land grant boundaries and corners; the calculation of area and the preparation of field note descriptions of both surveyed and unsurveyed land or any land in which the state or the public free school fund has an interest; the preparation of maps showing such survey results; and the field notes and/or maps of which are to be filed in the General Land Office,” as quoted in the Surveyors Act.	The firm must employ one licensed state land surveyor with demonstrated experience in state land surveying as defined in the category description.

Group 16 – Architecture

Work Category	Category Description	Certification Requirements
Buildings and other structures		
16.1.1	<u>Architecture</u> – This category includes architectural services for buildings and other related structures such as, but not limited to, radio towers, fuel island	The firm must employ sufficient project management and technical staff to provide services normally associated with this type of work. The firm must employ one registered architect with a minimum of two years experience in the areas identified.

	canopies equipment slabs, equipment and/or material storage structures.	
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Group 18 – Miscellaneous

Work Category	Category Description	Certification Requirements
18.1.1	<p><u>Value Engineering</u></p> <p>- This category includes the study of transportation related projects or selected processes by multi-disciplined teams to determine the most cost effective use of resources to accomplish the given functions.</p>	<p>The firm must employ:</p> <ul style="list-style-type: none"> • one professional engineer who: <ul style="list-style-type: none"> ○ is a certified value specialist with experience in the value engineering process and team leadership related to transportation projects as evidenced by having conducted a minimum of five transportation related value engineering studies, including one freeway project exceeding \$20 million initial estimated cost; ○ has taught a minimum of two transportation related value engineering classes in the last five years; and ○ has knowledge of and experience with federal, state, and local regulations, public involvement, professional engineering standards, project management, and cost estimating related to transportation projects; and • sufficient production staff to perform transportation related value engineering team leadership, produce final value engineering study reports, and teach classes on the principles and practices of value engineering.
18.2.1	<p><u>Subsurface Utility Engineering</u></p> <p>– This category involves the determination of vertical and horizontal locations of subsurface utilities by non-destructive methods</p>	<p>The firm must:</p> <ul style="list-style-type: none"> • employ one professional engineer with at least two years experience in subsurface utility engineering; • have available the proper equipment to accomplish non-destructive investigation methods to obtain horizontal and vertical locations of subsurface utilities and related subsurface utility engineering tasks.