

## DESCRIPTION AND MINIMUM REQUIREMENTS FOR PREQUALIFICATION

August 18, 2017

The Illinois Department of Transportation prequalifies engineering/architectural consultants in multiple transportation categories of service. This is accomplished by interested firms submitting a Statement of Experience and Financial Condition (SEFC) to the department through the Engineering and Prequalification System (EPAS). <http://www.idot.illinois.gov/doing-business/procurements/engineering-architectural-professional-services/index>

These descriptions and minimum requirements for prequalification supplement the SEFC and are to be used as a guide in determining areas of specialization for which firms may wish to apply for prequalification. The categories are located in the EPAS application. All categories require a questionnaire to be completed and the questionnaires are required to be completed to be considered for prequalification in the categories. All consultants, prime and/or subconsultants, must be prequalified in the category of work the firm is performing.

Most categories require the firm to be registered through Illinois Department of Financial and Professional Regulation (IDFPR). Consultant firms are required to be registered as a Professional Design Firm in the following disciplines, Professional Engineering, Structural Engineering, Land Surveying, and/or Architecture.

Where the minimum requirements indicate Illinois licensing or registration, that individual must be a full-time employee who has acted in a leadership role on pertinent projects. A full-time employee is defined as one who works for a firm 35 or more hours/week, 52 weeks/year. Part-time staff members, special consultants, subconsultants, committed or pledging individuals, or persons on retainers cannot be used to meet the minimum requirements for prequalification, except as allowed for Environmental Reports prequalification. The experience of these licensed or registered individuals must be relevant to the category of transportation work and the work must have been performed within the **last ten years**.

Projects submitted for consideration must be complete. Ongoing projects and estimated completions dates for projects are not considered. Completion dates are for the specific category; for example, roads and streets projects are considered complete when the PS&E are done and the project is ready for bid. Location Design Report categories are complete when the Design Report has been prepared and the project is ready for the design phase.

Prequalification is based on firm experience and on individual experience. A firm can hire an individual with experience and if there is sufficient support staff, the firm can become prequalified in most categories. Each category is reviewed by IDOT experts in the specific categories and the firm's experience and the firm's staff experience is taken into consideration when prequalifying a firm. IDOT works with firms when prequalifying and may request additional information from the firm during the review process. The firm's support staff of engineers and/or technicians must have pertinent experience or training and be full-time. The lack of relevant experience or training of the support staff may result in denial of prequalification.

Firms must be specific in listing all experience, which qualifies them for prequalification in each category. At least one Principal Supervisory Personnel listed in the Statement of Experience and Financial Condition must have been in responsible charge of the firm's projects they are using for prequalification consideration. Details must be provided in the questionnaire for the specific categories in the Statement of Experience and Financial Condition.

Firms requesting prequalification in any area of specialization, at the department's discretion, will be required to send documentation of their past work and/or give a presentation to the department outlining the experience and capabilities of current staff and how the staff would

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accomplish a project if selected. The department at its discretion may make on-site visits to the consultant's office to verify the information set forth in the SEFC document submitted by a firm.

The description of the work involved in the areas of specialization and the minimum requirements are as follows:

**A. PREPARATION OF PLANS, SPECIAL PROVISIONS AND ESTIMATES**

1. Highways

a. Freeways

Freeways consist of engineering services necessary for and the preparation of plans, special provisions, and estimate of cost for controlled access highways. Previous experience in the design of controlled access highways or satisfactory work in the design of "Roads and Streets" including complex geometric design details is required for a prequalification rating in this category. Typical intersection improvement designs are not considered complex. Plan preparation of signage, Maintenance of Traffic Control, and Traffic Control Plans, are not considered PS&E for Freeways projects. Minimum personnel requirements are 2 full-time Illinois Licensed Professional Engineer with demonstrated experience and support staff.

b. Roads and Streets

Roads and Streets consists of engineering services necessary for and the preparation of plans, special provisions and estimate of cost for arterial and collector and local roads and streets. Previous experience in the design of "Roads and Streets" or related experiences such as the design of city streets or subdivision drives, etc., are a prerequisite for a rating in this category. Minimum personnel requirements are one full-time Illinois Licensed Professional Engineer with demonstrated experience and support staff. Bike paths, sidewalks, ADA ramps, street-landscaping, entrances, and parking lots are not considered PS&E for roadway projects.

2. Airports

Airports consist of engineering services and studies necessary for development of the air-side facilities of airports (runways, taxiways, aprons, lighting systems, etc.). Land-side facilities (roads, parking lots, terminal buildings, etc.) are not considered for prequalification in Airports. The year in which work was completed is required.

The following phases are considered for Airports prequalification:

a. Airport Planning and Special Services

- (1) Airport Layout Plan / Master Plan.
- (2) Environmental Assessment.
- (3) Noise Studies (FAR Part 150).
- (4) Wildlife Studies

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b. Airport Design

- (1) Airport Design (Plans and Specifications) - airfield pavements and simple electrical.
- (2) Airport Electrical Design (Plans and Specifications) - specialized NAVAIDs, vault work, complex electrical.
- (3) Previous work on Airports within the last ten years is required for a prequalification rating in this category.
- (4) Minimum personnel requirements are one Illinois Licensed Professional Engineer experienced in one or more phases of airport work.

c. Airport Construction Inspection

- (1) Airport Construction (Resident Engineering) - airfield pavements and simple electrical.
- (2) Airport Electrical (Resident Engineering) - specialized NAVAIDs, vault work, complex electrical.
- (3) Materials - Testing and Mix Designs.
- (4) Previous work on Airports within the last ten years is required for a prequalification rating in this category.
- (5) Minimum personnel requirements are one Illinois Licensed Professional Engineer experienced in one or more phases of airport work.
- (6) In addition to the above mentioned individuals, the consultant must also have one or more in-house full-time employees who have a working knowledge of IDOT documentation procedures for the inspection of work and a current certificate for the successful completion of the IDOT Construction Documentation of Contract Quantities. A current IDOT Construction Documentation of Contract Quantities certificate must be included.

Local airport sponsors (airport authorities, counties, municipalities, etc.), in cooperation with the Division of Aeronautics, perform selection and assignment of consultants for airport work.

3. Structures

Structures consist of engineering services required for the estimate of cost, planning, design, and preparation of plans and special provisions for bridges and structures. The firm must demonstrate staff experience in directly completing these functions for the requested category in order to become prequalified. Following are general descriptions of each structural category and the minimum requirements to prequalify in each.

a. Highway Bridges

(1) Simple

Description: Multiple cell box culverts, single span bridges, deck beam bridges, deck scarification with overlay and minor repairs on continuous span structures.

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The minimum requirements for prequalification in this category are:

- a) An Illinois Licensed Structural Engineer with experience at the simple level
- b) A support staff of one or more engineers with a degree in civil engineering and structural design experience

(2) Typical

Description: Basic single-unit continuous multiple span bridges classified as seismically “regular”\* regardless of seismic zone and basic retaining walls.

The minimum requirements for prequalification in this category are:

- a) An Illinois Licensed Structural Engineer with experience at the typical level.
- b) A support staff of engineers with degrees in civil engineering and bridge design experience.
- c) Adequate computer support equipment and software.
- d) Firms qualifying for this category will be required to have staff experience in successfully completing the planning, design and contract plan development for a minimum of three bridge structures listed in this category; new continuous multi-span structure designs of various types are preferred.

(3) Advanced Typical

Description: Basic curved or flared bridges regardless of seismic zone, tall retaining walls requiring advanced analysis and non-standard support requirements and seismically “irregular”\* structures which are otherwise structurally “typical”.

The minimum requirements for prequalification in this category are:

- a) Two (2) Illinois Licensed Structural Engineers; one SE with experience at the Advanced Typical level and the other SE with experience at the Typical level or higher.
- b) A support staff of engineers with degrees in civil engineering and design experience at the typical level.
- c) Adequate computer support equipment and software.
- d) Firms qualifying for this category will be required to have staff experience in successfully completing the planning, design and contract plan development for structures in at least three of the following categories: curved steel girder structures, flared girder bridges, “irregular” continuous multiple span bridges requiring multi-mode analysis, tall or unusual retaining walls requiring advanced analysis and non-standard support requirements, spandrel bridges, truss bridges with spans over 100 feet and other bridge types with spans over 200 feet. In addition, experience with repair projects of complex structures involving significant plan preparation and detailing, preparation of documents for non-standard structural temporary works or means and methods of

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construction, structural policy development, plan review oversight, and forensic engineering may be substituted for one of the three structure types listed above.

- e) In addition to d), firms will be required to demonstrate through either experience, training or education, the ability to perform a multi-mode seismic analysis.

\* See the IDOT Bridge Manual section 3.15.3.2 "Seismic Design – Range of Applicability" for definitions of seismically "regular" and "irregular" bridges.

(4) Complex

Description: Regardless of seismic zone: complex curved girders, concrete and steel box girders, bridges or walls that require unique foundation treatment, expressway bridges with complex framing plans due to geometry requirements such as on/off ramps and the minor rehabilitation or repair of main structural components on major bridges. The minimum requirements for prequalification in this category are:

- a) Three (3) Illinois Licensed Structural Engineers with at least one SE at the complex level and the other two SE's at least at the Advanced Typical level.
- b) An adequate support staff of engineers with degrees in civil engineering and design experience at the typical level.
- c) Adequate computer support equipment and software.
- d) Firms qualifying for this category will be required to have broad staff experience in successfully completing the design and contract plan development for three of the bridge structure types listed in this category.

b. Railroad Bridges:

Description: Temporary or permanent railroad bridges.

The minimum requirements for prequalification in this category are:

- (1) An Illinois Licensed Structural Engineer with railroad bridge experience and a support staff of engineers with civil engineering degrees;
- (2) Or an Illinois Licensed Structural Engineer with highway bridge experience at the "typical" level and a support staff of licensed professional civil engineers with railroad bridge experience.
- (3) Firms qualifying for this category will be required to have staff experience in successfully completing the design and contract plan development for three bridges listed in this category

c. Movable Bridges:

Description: Bascule, swing and lift type bridges.

The minimum requirements for prequalification in this category are:

- (1) An Illinois Licensed Structural Engineer with movable bridge experience.
- (2) A support staff of engineers with movable bridge experience.

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- (3) Adequate computer support equipment and software.
- (4) Firms qualifying for this category will be required to have staff experience in successfully completing the design and contract plan development for three bridges listed in this category.

d. Major Bridges:

Description: The design, major rehabilitation, or forensic investigation of long span structures. Typically, these structures are founded in deep moving water, have spans greater than 350', which require sophisticated analysis and design and knowledge of specialized construction techniques. Superstructure types include steel plate girder, steel box girder and orthotropic, tied arch, concrete box girder, suspension, continuous/cantilever truss and cable stay girders.

The minimum requirements for prequalification in this category are:

- (1) Prequalification in the HIGHWAY BRIDGES –COMPLEX Category
- (2) An Illinois Licensed Structural Engineer with “major bridge” experience and an adequate support staff of engineers with civil engineering degrees and “major bridge” experience in the structure type specified;
- (3) Adequate computer support equipment and software.

4. Special Plans

a. Traffic Signals

This work consists of engineering services necessary for the design of traffic signal systems, including preparation of plans, special provisions and cost estimates. Previous experience in the design of traffic signals is required for a prequalification rating in this category. Minimum personnel required is one Illinois Licensed Professional Engineer who understands the state-of-the-art of modern traffic signal systems, including knowledge of traffic signal hardware, traffic control equipment, vehicle detectors, traffic signal control strategy, and communication equipment. Consultant statements should provide some indication as to the complexity of the firm's traffic signal or design experience.

b. Lighting

The minimum requirements for prequalification in this category are one individual and support staff with a minimum of five years of lighting design experience in those areas listed below. In addition to design experience in roadway lighting systems, the individual shall have a thorough knowledge of the department's lighting policies and procedures (see Bureau of Design and Environment Manual Chapter 56). This person must be under the direct supervision of or be an Illinois Licensed Professional Engineer qualified to do electrical and roadway lighting design.

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This individual must be knowledgeable in all aspects of lighting circuit design and the proper application of the National Electrical Code (NEC). In addition, it is recommended that this person be an electrical engineer, an active member of the Illuminating Engineering Society of North America (IESNA), and lighting certified by the National Council on Qualifications for the Lighting Professions (NCQLP).

This individual shall be personally involved and directly responsible for the lighting system design. This shall include the photometric analysis, design calculations, and final plan review. Computer capabilities shall include the necessary software and supporting equipment to design highway lighting to the department's standards.

(1) Typical Lighting:

This work consists of the design of roadway lighting systems. The ability to complete lighting design by the firm's in-house **staff** must be demonstrated in all 5 lighting design areas in the last 10 years. The **firm** experience must show significant project experience in at least 3 of the 5 lighting design areas in the last 10 years.

1. Urban Arterial,
2. Streetscape,
3. Roundabout,
4. Underpass, and
5. Partial Interchange.

(2) Complex Lighting:

This work consists of the design of all roadway lighting systems. The ability to complete lighting design by the firm's in-house **staff** must be demonstrated in all of the categories for Typical Lighting (shown above) and in the 5 areas below in the last 10 years. The **firm** experience must show significant project experience in at least 3 of the 5 lighting design areas in the last 10 years.

1. Continuous Freeway,
2. Complete Interchange,
3. Major Urban Arterial,
4. Tunnel, and
5. Major River Bridge.

c. Pumping Stations

This work consists of engineering services required for and the preparation of plans, special provisions, and estimate of cost of pumping stations including pumps, motors, controls, and buildings. Minimum personnel requirements are one or more Illinois Licensed Professional Engineers with training and experience in hydrology, hydraulics, electrical and mechanical engineering and an Illinois Licensed Structural Engineer. The Firm must also be prequalified in the Electrical and Mechanical prequalification categories. Firm must also be prequalified in the Electrical Engineering and Mechanical Engineering categories to obtain prequalification in this category.

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**B. SPECIAL STUDIES**

This work consists of comprehensive studies of all factors and an evaluation of alternatives for the following:

1. Location Drainage – The scope of work includes hydrologic/hydraulic analyses for highway (roadway) drainage facilities. This work consists of the design of roadside ditches, smaller culverts, storm drains, inlet spacing, and storage pipes with restrictors. The design of storm drains includes hydraulic grade line analysis and inlet spacing. Detention basin design and energy dissipation design can also be included in project scope. Drainage facility design experience within a highway improvement setting is preferred, as opposed to property or site development projects.

The minimum requirements for prequalification in this category are:

- a. One full-time Illinois Licensed Professional Engineer with a minimum of five years of hydrologic and hydraulic computer modeling experience including:
    - (1) Thorough knowledge of the department drainage policies and procedures;
    - (2) Familiarity with the applicable permit rules of IDNR- OWR (Office of Water Resources) and other regulatory agencies; and
    - (3) Knowledge of common Illinois drainage laws.
  - b. One full-time staff engineer with a minimum of three years of hydrologic and hydraulic computer modeling experience.
  - c. Drainage knowledge and/or experience which can be demonstrated by prior satisfactory work performance for IDOT or one or more engineering staff members who have completed training in NHI (National Highway Institute) or equivalent hydraulic courses in the following topics: highway hydrology, open channel flow, culvert hydraulics, storage routing/detention basin design, inlet spacing and storm drain design.
  - d. A minimum of two staff engineers, in addition to b. above, with experience in highway hydraulics and hydrology are needed to accomplish the scope of work.
  - e. Adequate computer support equipment and software to design and draft highway drainage facilities.
2. Traffic - Traffic Studies consist of engineering services required to monitor and analyze the characteristics of motor vehicle or pedestrian traffic on and near roadways. This includes a wide variety of studies including, but is not limited to, the following:



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- a. Traffic impact studies,
- b. On-site traffic circulation plans,
- c. Motor vehicle classification counts/studies,
- d. Speed studies,
- e. Traffic performance measures,
- f. MUTCD warrant studies,
- g. Signal timing plans,
- h. Signalization in conjunction with intersection design studies and accident studies,
- i. Human behavior/reaction studies,
- j. Vehicle emissions and fuel consumption studies, and
- k. Benefit-cost analyses of proposed signal improvements.

(Note: Vehicle and pedestrian counts are considered part of data collection and do not include analysis or computations. Simply having performed traffic counts WILL NOT qualify a firm in Traffic Studies.)

The minimum requirements for prequalification in this category are one full-time Illinois Licensed Professional Engineer with demonstrated traffic study work experience and a support staff.

3. Signal Coordination and Timing (SCAT) - These studies include traffic data analysis, and running and interpreting computer programs for determining optimum traffic signal timing to optimize traffic flow on arterial and street networks.

The minimum requirements for prequalification in this category are:

- a. One full-time Illinois Licensed Professional Engineer with demonstrated SCAT work experience,
- b. Electronic submittal of one SCAT report.
- b. Adequate support equipment and software, and
- c. Support staff.

[SCAT work experience must include an understanding of traffic signal systems - hardware, control strategies and communications, experience with capacity and signal optimization software programs, and experience in traffic signal controller operation (including the ability to implement timings into controllers).]

4. Safety - Safety Studies include a thorough analysis and evaluation of the cause(s) of accidents and a recommendation of appropriate/effective counter-measures to eliminate them or reduce their frequency and severity.

The minimum requirements for prequalification in this category are one full-time Illinois Licensed Professional Engineer with demonstrated experience in conducting Safety Studies, and support staff.

5. Feasibility - Feasibility Studies identify whether or not a proposal is worthy of additional detailed engineering studies. These studies include a general engineering study with an overview of potential environmental impacts. Projects must be transportation related. Value Engineering and estimates of cost for projects are not considered a feasibility study.

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The minimum requirements for prequalification in this category are one full-time Illinois Licensed Professional Engineer with demonstrated experience in conducting Feasibility Studies and support staff.

**C. LOCATION/DESIGN STUDIES**

Location/Design Studies involve the development, evaluation, and documentation of engineering alternatives, which when combined with the Environmental Report will result in the selection of the alignment and design features with the best combination of social, economic, environmental, and engineering effects. The Location/Design and Environmental Reports must be developed simultaneously to assure proper cross-coordination of findings and objectives. Each Location/Design Report must describe the alternates considered and the reasons for selecting the recommended alternate. The description should include essential elements such as appropriate design standards, traffic volumes, typical cross-section, access control features, vertical and horizontal alignment, right-of-way requirements, intersection designs, general structure requirements, and an estimate of cost. The report must include appropriate maps and drawings, a list of policy exceptions (and supporting reasons), a summary of views received from coordination and public involvement, and a description of the proposal's effects on adjacent roads and streets. The sub-categories listed below represent three different levels of complexity for Location/Design Reports.

1. Rehabilitation

This involves development and evaluation of alternatives appropriate for rehabilitation of existing highways. It will include more than minor work such as geometric changes, bridge improvements, pavement rehabilitation, safety investigations, drainage analysis, and establishment of safety clear zones. It may include minor right-of-way acquisition throughout the project length.

Minimum personnel requirements are one Illinois Licensed Professional Engineer and appropriate support staff. Geometric design, drainage, and public involvement expertise are required.

2. Reconstruction/Major Rehabilitation

This involves development and evaluation of alternatives appropriate for reconstruction or a major rehabilitation of an existing highway. A project will basically follow the existing alignment, but may replace more than 50% of the existing pavement due to adjustments in horizontal or vertical alignment. It may include significant geometric changes, additional through lanes, bridge improvements or replacement, major intersection/interchange design, drainage analysis, and safety investigation. Public involvement will also be an integral part of the project. Significant amounts of additional right-of-way may be required. Minimum personnel requirements are an Illinois Licensed Professional Engineer and staff with expertise in geometrics, hydraulics, public involvement, and report writing. The project manager must have an Illinois Professional Engineer's license and prior managerial experience with two or more rehabilitation projects or one Reconstruction/Major Rehabilitation project. Other appropriate support staff is also required.

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3. New Construction/Major Reconstruction

This involves development and evaluation of alternatives appropriate for a new highway on new location and/or major reconstruction of an existing highway for which one alternate may be a totally new location. The entire range of expertise necessary to totally develop and design a new highway will be required. This will include establishment of horizontal and vertical alignment, intersection/interchange design, and development of a drainage plan including sizing structures. Other related expertise will be required including field surveying, public relations, estimating, earthwork calculations, and traffic capacity analysis. All new or significant amounts of additional right-of-way will be required throughout the project. Minimum personnel requirements are one Illinois Licensed Professional Engineer, one Illinois Licensed Structural Engineer and additional staff with expertise in geometrics, hydraulics, estimating, traffic analysis, public involvement, and report writing. The project manager must be an Illinois Licensed Professional Engineer and have prior managerial experience with two or more Reconstruction/Major Rehabilitation projects or one New Construction/Major Reconstruction project. Other appropriate support staff is also required.

**D. HYDRAULIC REPORTS**

1. Waterway

a. Typical

The scope of work includes hydrologic and hydraulic analysis and modeling for culverts and bridges. Hydraulic modeling includes these flow conditions; multiple openings\ encroachments within a shared or adjacent floodplain, pressure flow and roadway overtopping. Design considerations include scour evaluations (bridges) and outlet protection (culverts). Sediment transport and stream stability design are also potential design elements.

The consultant must be able to implement hydrologic techniques including USGS regression equations and stream gage weighting analysis.

The minimum requirements for prequalification in this category are:

- (1) One full-time Illinois Licensed Professional Engineer with a minimum of five years of hydrologic and hydraulic computer modeling experience, including:
  - a) Thorough knowledge of IDOT drainage policies and procedures contained primarily within the IDOT Drainage Manual;
  - b) Familiarity with the applicable permit rules of IDNR- OWR (Office of Water Resources) and other involved regulatory agencies; and
  - c) Knowledge of common Illinois drainage laws.
- (2) At least one full-time staff engineer with a minimum of three years hydraulic computer modeling experience.

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- (3) Hydraulic knowledge and/or experience which can be demonstrated by prior satisfactory work performance for IDOT, or one or more engineering staff members who have completed training in NHI (National Highway Institute) or equivalent hydraulic courses in the following topics: highway hydrology, culvert design, stream stability and scour at highway bridges, and HEC-RAS.
- (4) A minimum of two staff engineers, in addition to (2), with experience in highway and structure hydraulics and hydrology are needed to accomplish the scope of work.
- (5) Adequate computer support equipment and software including, but not limited to, HEC-2, HEC RAS, and WSPRO.

b. Complex

Complex culverts and bridges include the items in the scope of work for 1.a. Typical, as well as the application of hydrologic modeling tools such as HEC-1, HEC-HMS, and TR-20. For those models, the consultant must also be able to utilize State Water Survey (SWS) Bulletin 70 rainfall data for the purposes of performing critical storm duration analysis and reservoir/storage routing analyses.

Hydraulic modeling experience that includes complex floodplain geometry, urbanized settings with sensitive flood receptors, and floodplain management studies such as FEMA revisions, flood optimization studies, or FEQ-based watershed studies is desirable. Experience with SMS utilizing the SRH-2D model is also desirable. The specialty questionnaire should clearly demonstrate a level of project complexity within the firm's experience.

In addition to the minimum requirements above in 1.a., the consultant must have the computer support equipment to implement the hydrologic techniques of HEC-1, HEC-HMS, and TR-20. There should be at least one staff member who has completed NHI training (or equivalent) in HEC-1, HEC-HMS, TR-20.

2. Pump Station

The scope of work includes hydrologic/hydraulic analysis for a highway storm water pump station as described in the IDOT Drainage Manual. The work includes developing an inflow hydrograph to the station in conjunction with stage\storage and stage outflow data to route the design event through the pump station for existing and proposed conditions. The project typically includes assessing the existing storm drain collection system, hydraulic gradeline and design\analysis needed to upgrade the system to acceptable IDOT policy standards. Head losses, reservoir\storage routing, inlet spacing, weir\orifice pipe flow and energy gradeline determinations are typically involved. The questionnaire should demonstrate some experience and familiarity with the hydraulic design of highway storm water pumping stations in an urban setting.

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The consultant must be able to utilize SWS Bulletin 70 rainfall data for the purposes of performing critical storm duration analysis and reservoir \ storage routing analyses. The consultant must implement hydrologic models such as HEC-1, HMS or TR-20 to develop inflow hydrographs. Experience with a version of SWMM modeling package is desirable.

The minimum requirements for prequalification in this category are:

- a. One full-time Illinois Licensed Professional Engineer with a minimum of five years hydrologic and hydraulic computer modeling experience, including:
  - (1) Thorough knowledge of IDOT drainage policies and procedures contained primarily within the IDOT Drainage Manual.
  - (2) Knowledge of common Illinois drainage laws.
- b. At least one full-time staff engineer with a minimum of three years of hydrologic computer modeling experience.
- c. Hydraulic knowledge and/or experience which can be demonstrated by prior satisfactory work performance for IDOT or one or more engineering staff members who have completed training in NHI (National Highway Institute) or equivalent hydrology\hydraulic courses in the following topics: urban hydrology (including HEC-1, HEC-HMS and TR-20), storage routing/detention basin design, inlet spacing and storm drain design, and pump station design.
- d. A minimum of two staff engineers, in addition to b. above, with experience in highway hydraulics and hydrology are needed to accomplish the scope of work.
- e. Adequate computer support equipment and software including, but not limited to, HEC-1, HEC HMS, TR-20.

**E. GEOTECHNICAL SERVICES:**

1. Subsurface Explorations

Subsurface Explorations consists of engineering services necessary for obtaining subsurface geotechnical data to be utilized in geotechnical analyses and development of geotechnical reports. This typically includes coordination with the Geotechnical Engineer responsible for the geotechnical report or design, assisting in initial site/project reconnaissance, assisting in development of subsurface exploration plans, conducting subsurface explorations, laboratory testing of soil and rock, and reporting of the field explorations and laboratory test results.

Minimum personnel requirements are 1 Geotechnical Lead, 1 Field Drilling Supervisor, 1 Laboratory Supervisor, and support staff.

- The Geotechnical Lead shall be a full-time Illinois Licensed Professional Engineer with a minimum of five years of demonstrated experience in managing the efforts of staff and subcontractors, ensuring accuracy of geotechnical data, timely completion of services, performing the appropriate

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analysis, necessary interpretation and validation of soil and rock testing data, and determining the engineering properties of various subsurface materials using sound soil/rock mechanics. The firm's Geotechnical Lead shall also be familiar with IDOT's exploration and testing requirements, as set-forth in IDOT's Geotechnical Manual.

- The Field Drilling Supervisor must have a geology or geotechnical background and a minimum of three years of relevant experience in subsurface explorations/operations including split-spoon sampling, Standard Penetration and Rimac testing, Shelby tube soil sampling, rock coring, sample transportation, as well as soils and rock identification. The Field Drilling Supervisor is responsible for on-site drilling operations, describing/logging the soil/rock encountered, overseeing field testing and coordinating with the firm's Geotechnical Lead.

The Field Drilling Supervisor and the Laboratory Supervisor may be the Geotechnical Lead if that individual meets the background and experience requirements.

- The Laboratory Supervisor shall have a minimum of three years of experience in geotechnical laboratory testing procedures.

The firm is expected to employ sufficient geotechnical support staff, who may be engineers, geologists, or technicians, to assist the Geotechnical Lead on office and field work involved in developing and providing the project deliverables. It is expected that the firm will provide the project experience and specific geotechnical work completed by the individual Geotechnical Lead(s), Field Drilling Supervisor, Laboratory Supervisor, and geotechnical staff.

The firm shall demonstrate knowledge in subsurface investigations, drilling, sampling and testing conducted according to AASHTO/equivalent ASTM standard methods, or Illinois modified procedures as set-forth in IDOT's Geotechnical Manual and the Manual of Test Procedures for Materials.

The firm shall have sufficient facilities, equipment, and software to perform this work. If the firm is not also prequalified in at least one of the General Geotechnical Services, Structure Geotechnical Reports (SGR) or Complex Geotechnical/Major Foundations categories, then the firm shall own at least one of the following: 1) its own laboratory or 2) drilling equipment. Laboratory and drilling equipment shall meet the requirements in the following paragraphs.

The firm must own or subcontract the necessary soils and rock sampling equipment as well as sufficient support equipment to conduct subsurface drilling and obtain either split-spoon or Shelby tube samples. Drill rig(s) must be equipped with an automatic SPT hammer, which has been energy tested (ASTM D 4633) within the past five years, and the firm must provide documentation of the tested hammer energy and date for each drill rig. It is desirable for the firm to have additional geotechnical field testing capabilities beyond the routine exploration equipment, such as pressure meters, vane shear, cone penetrometer testing (CPT) rigs, geophysical, and others.

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The firm shall either own its own laboratory or subcontract with an independent testing facility with lab personnel proficient in the portions of the IDOT Geotechnical Manual dealing with laboratory testing. The firm's main/satellite or subcontractor's laboratory must have recent inspection results from AASHTO resource [formerly known as AASHTO Materials Reference Laboratory (AMRL)], for AASHTO test standards R 58, T 88, T 89, T 90, T 99, T 180, T 208, T 216, T 265, T 296, and T 297 (as a minimum) indicating compliance.

2. General Geotechnical Services

General Geotechnical Services consists of engineering services for geotechnical work typically pertaining to roadway widening or new alignments, pavements, earthwork, rock cuts, small culverts, small retaining walls, or other structures not requiring a Structure Geotechnical Report. This work generally includes coordination with the district and/or prime consultant, project/site reconnaissance, coordinating subsurface explorations and laboratory testing, geotechnical analyses, formulating recommendations, and preparing roadway or other geotechnical reports.

Minimum personnel requirements are 1 full-time Illinois Licensed Professional Engineer as the Geotechnical Lead and support staff. The Geotechnical Lead shall have demonstrated experience in projects dealing with geotechnical issues on roadway transportation projects described above. This individual must be familiar with IDOT's Geotechnical Manual, Subgrade Stability Manual, IDOT acceptable practices for subsurface treatments, and shall have prepared at least three geotechnical reports for federal, state or local transportation projects. These projects must demonstrate sound experience regarding evaluations and recommendations for geotechnical aspects of transportation such as subgrade treatments, embankments, slope stability, settlement, subsurface ground improvement, foundation design parameters, construction concerns, and feasibility of roadway alignment.

The firm is expected to employ sufficient geotechnical support staff, who may be engineers, geologists, or technicians, to assist the Geotechnical Lead on office and field work involved in developing and providing the project deliverables. It is expected that the firm will provide the project experience and specific geotechnical work completed by the individual Geotechnical Lead(s) and geotechnical staff. It is not required; however, it is desirable that the firm have geotechnical project experience beyond the projects listed under individual staff experience. Examples of such projects could include projects, which used staff no longer with the firm, or have moved into upper management or other positions. Including such projects in the firm experience demonstrates a history of providing similar geotechnical services to clients.

The firm shall also have sufficient facilities, equipment, and software to perform this work.

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3. Structure Geotechnical Reports (SGR)

This work consists of engineering services for developing geotechnical design parameters and recommendations for roadway transportation structures requiring a Structure Geotechnical Report. This generally includes coordination with the district and/or prime consultant, project/site reconnaissance, coordinating subsurface explorations and laboratory testing, performing analyses, formulating recommendations, and report preparation. Geotechnical recommendations for this work are typically developed for the design of structure foundations, bridge cone embankment, earth retention systems, noise abatement wall foundations, box culverts, and three-sided structures.

Minimum personnel requirements are 1 full-time Illinois Licensed Professional Engineer or Structural Engineer as the Geotechnical Lead and support staff. The Geotechnical Lead must have demonstrated experience in geotechnical/foundations engineering, be familiar with the most current IDOT Bridge Manual, Geotechnical Manual, IDOT's geotechnical policies, and shall have prepared at least three SGRs or similar foundation reports for federal, state or local transportation projects. These projects must demonstrate sound experience regarding evaluations and recommendations for geotechnical aspects of transportation structures such as foundation options, geotechnical and foundation design parameters, subsurface ground improvement, and construction issues.

The firm is expected to employ sufficient geotechnical support staff, who may be engineers, geologists or technicians, to assist the Geotechnical Lead on office and field work involved in developing and providing the project deliverables. It is expected that the firm will provide the project experience and specific geotechnical work completed by the individual Geotechnical Lead(s) and geotechnical staff. It is not required; however, it is desirable that the firm have geotechnical project experience beyond the projects listed under individual staff experience. Examples of such projects could include projects which used staff no longer with the firm, or have moved into upper management or other positions. Including such projects in the firm experience demonstrates a history of providing similar geotechnical services to clients.

The firm shall also have sufficient facilities, equipment, and software to perform this work.

4. Complex Geotechnical/Major Foundations

This work consists of engineering services utilizing advanced subsurface exploration and testing techniques, conducting complex subsurface/foundation modeling, performing advanced geotechnical/foundation analyses, evaluation, or design, preparing geotechnical reports for large transportation projects or major river bridges, and providing a sound and seasoned opinion and recommendations on unusual geotechnical or foundation issues. The ability to solve complex geotechnical/major foundation issues by the firm's in-house staff must be demonstrated in the following areas and require advanced analytical methods, studies, or innovative solutions:

- a. various difficult subsurface conditions;



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- b. failure analyses and repairs;
- c. forensic studies;
- d. state-of-the-art;
  - (1) exploration and testing methods,
  - (2) construction methods,
  - (3) soil and foundation modeling,
- e. tunnels in difficult subsurface soil and rock conditions; and
- f. specialized ground modification and improvement techniques.

The firm shall also demonstrate that they meet the requirements of Items E.2 and E.3 for General Geotechnical Services and Structure Geotechnical Reports above, as well as satisfy the following minimum requirements:

- a. The firm shall employ Geotechnical Leads with over 20 years of collective experience at the complex level. At least two of these employees shall be Geotechnical Leads who are full-time Illinois Licensed Professional Engineers with a minimum of ten years of experience at the complex level.
- b. The firm shall provide demonstrated experience with a minimum of three complex and premier projects that involved any of the complex issues described above and required innovative technologies/solutions.
- c. The firm shall have adequate support staff of engineers and other applicable professionals with experience in computer modeling, structure support, instrumentation equipment and software. The firm shall also have sufficient facilities, equipment, and software to perform this work.
- d. Firms are not specifically required to have experience outside the state of Illinois to become prequalified. However, firm experience outside the state is advantageous.

**F. ENVIRONMENTAL REPORTS**

Environmental Reports are prepared simultaneously with Location/Design Studies to assure that all environmental and engineering issues are considered in the decision-making process. Environmental Reports include all investigations and studies necessary to identify potential adverse impacts of proposed projects, evaluate their likely significance, and recommend mitigation actions to reduce their severity. Regulations require that an environmental assessment (EA) or environmental impact statement (EIS) be prepared for federally-assisted or regulated projects unless they are categorically excluded. Criteria for prequalification in **EA** and **EIS** are listed below.

1. Environmental Assessment (EA)

This category includes projects anticipated to include one or more of the following environmental issue areas: agricultural lands; wetlands; floodplains; sensitive biological resources (e.g., threatened or endangered species, nature preserves, or natural areas); cultural resources (archaeological and historical resources or structures); candidate Wild and Scenic Rivers; Section 4(f) lands; or other sensitive environmental resources of public concern. More than one technical

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environmental study will generally be necessary. The EA is expected to result in a Finding of No Significant Impact (FONSI).

To be prequalified for EA, firms must satisfy all requirements for **Environmental Leads** and **Qualified Environmental Staff**, which include:

- a. Employing a full-time **Environmental Lead** (subconsultants are not allowed) who meets the education, training, and experience for EA prequalification; and
- b. Designating **Qualified Environmental Staff** for Socio-economics/Community Impacts, Ecology, Noise, Water, Public Involvement, and Technical Writing.

**Environmental Lead**

Requirements to be pre-qualified as an Environmental Lead at the EA level are listed in the table below.

**Qualified Environmental Staff**

Staff or subconsultants who meet the requirements listed in the table below must be designated for each environmental discipline:

- Socio-economics/Community Impacts
- Ecology
- Noise
- Water

Qualified staff also must be assigned for:

- Public Involvement
- Technical Writing

No person may be assigned more than three disciplines. Resumes should reflect specific NEPA project experience and must include certificates of completion for all training classes. **Important Note:** All members of your firm's staff **AND all subconsultants** employed by other firms that you propose to assign for any environmental discipline must FIRST be entered as "**NEW STAFF**" on the **Corporate Profile/Staff screen in EPAS**. For each subconsultant, the following employment-related questions on the **Staff Information** screen must be completed EXACTLY AS FOLLOWS: **Is full time? NO. Is consultant? YES.** Next, the **CONSULTING FIRM NAME (the subconsultant's EMPLOYING FIRM)** must be listed as shown on page 68 of the EPAS Instruction Manual. Failure to follow these instructions and enter all subconsultant data correctly in EPAS will result in your submittal being denied.

2. Environmental Impact Statements (EIS)

This category includes major transportation-related developments that will involve a large number of displacements, or substantial disruption to local traffic patterns and result in potentially significant impacts to one or more of the following special environmental issue areas: agricultural lands; wetlands; floodplains; sensitive biological resources (e.g., threatened or endangered species, nature preserves, or natural areas); cultural resources (archaeological and historical resources and

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historic structures); candidate Wild and Scenic Rivers; Section 4(f) lands; and other sensitive environmental resources of public concern. Technical analyses of environmental studies are likely to be necessary, resulting in the identification of adverse impacts, suitable mitigation measures, and preparation of an EIS.

To be prequalified for EIS, firms must satisfy all requirements for **Environmental Leads** and **Qualified Environmental Staff**, which include:

- a. Employing a full-time **Environmental Lead** (subconsultants are not allowed) who meets the education, training, and experience for EIS prequalification; and
- b. Designating **Qualified Environmental Staff** qualified for (Socio-economics /Community Impacts), Ecology, Noise, Water, Public Involvement, and Technical Writing.

**Environmental Leads**

Requirements to be prequalified as an Environmental Lead at the EIS level are listed in the table below.

**Qualified Environmental Staff**

Staff who meet the requirements listed in the table below must be designated for each environmental discipline:

- Community Impacts/Socio-Economic
- Ecology
- Noise
- Water

Qualified staff also must be assigned for:

- Public Involvement
- Technical Writing

No person may be assigned more than three disciplines. For EIS, at least two disciplines must be assigned to qualified in-house staff other than the Environmental Lead. Qualified subconsultants are acceptable for the remaining two disciplines. Since extensive experience is required for EIS prequalification, resumes should reflect specific NEPA project experience and include certificates of completion for all training classes. **Important Note:** All members of your firm's staff **AND all subconsultants** employed by other firms that you propose to assign for any environmental discipline must FIRST be entered as "**NEW STAFF**" on the **Corporate Profile/Staff screen in EPAS**. For each subconsultant, the following employment-related questions on the **Staff Information** screen must be completed EXACTLY AS FOLLOWS: **Is full time? NO. Is consultant? YES.** Next, the **CONSULTING FIRM NAME (the subconsultant's EMPLOYING FIRM)** must be listed as shown on page 68 of the EPAS Instruction Manual. Failure to follow these instructions and enter all subconsultant data correctly in EPAS will result in your submittal being denied.

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<b>Environmental Lead Requirements</b>
<p><b>Education:</b> Minimum of B.S. in Urban Planning, Land Use Planning, Geography, Environmental Sciences/Studies or allied (natural/physical environmental resources) disciplines, or Engineering.</p> <p><b>Required Training Class:</b> NHI course #142005, "NEPA &amp; the Transportation Decision making Process" or comparable <math>\geq</math> 18-hour course (a syllabus of the comparable course may be required). Certificate of completion must be provided.</p> <p><b>Experience:</b> Must include serving as <u>Environmental Lead</u> for required number of completed NEPA documents:</p> <p>EA: One or more transportation-related EA; two or more transportation-related ECADs*; or one or more transportation-related EIS in the last 10 years.</p> <p>EIS: Two or more transportation-related EAs; or four or more transportation-related ECADs*; or one or more transportation-related EIS in the last 10 years.</p> <p>The <u>Environmental Lead</u> is the person that managed or oversaw the preparation of the NEPA environmental document (EA, EIS, or ECAD*). <b>Only one person may receive credit as the Environmental Lead of any NEPA document.</b> For EAs and ECADs, submit the signed cover page or signed FONSI. For EISs, submit the signed cover page and EIS List of Preparers. All signed cover pages, FONSI and EIS List of Preparers submitted as evidence must have been completed in the last 10 years.</p> <p>Notes:</p> <ul style="list-style-type: none"><li>• Subconsultants are not allowed as Environmental Leads.</li><li>• Highway experience is preferred, but airport, transit, and other transportation projects may be submitted for possible credit.</li></ul>
<b>Environmental Discipline Requirements</b>
<p>a) Socio-economics or Community Impacts:</p> <p>Education: Minimum of B.S. in Economics, Urban, or Land Use Planning, Geography or related degree.</p> <p>Experience shall include community studies (including demographics), regional economics or land use/urban planning. All NEPA experience should be detailed.</p>
<p>b) Ecology:</p> <p>Education: Minimum of B.S. in Biology, Botany, Plant Ecology, Soil Science, Zoology, Wildlife Biology, or allied discipline.</p> <p>Experience shall include knowledge of biological field surveys and wetland delineations. Provide certification of wetland delineation training.</p>
<p>c) Noise:</p> <p>Education: Minimum of B.S. in Acoustical or Civil Engineering, Environmental Sciences/Studies, or allied discipline.</p> <p>Required Training Classes: NHI course #142051, "Highway Traffic Noise" or comparable <math>\geq</math> 18-hour course (a syllabus of the comparable course may be required); and an FHWA Traffic Noise Model course. Certificates of completion <b>must</b> be provided.</p> <p>Experience shall include prediction and/or measurement of highway noise levels, analysis,</p>

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and/or design of abatement measures, and documentation of analysis results. Specific project experience should be provided.
d) Water: Education: Minimum of B.S. in Aquatic Biology, Biology, Limnology, or allied discipline. Experience shall include knowledge of at least two of the following: 1) fish, 2) mussels, 3) Stochastic Empirical Loading and Dilution Model (SELDM), or 4) aquatic macroinvertebrate populations.
e) Public Involvement and Technical Writing Requirements: Persons assigned for Public Involvement and Technical Writing must have knowledge and experience in these areas. (Refer to Chapter 19 of the Bureau Design and Environment (BDE) Manual for Public Involvement guidelines and duties.) Environmental Leads and/or other experienced staff may be designated to handle Public Involvement and/or Technical Writing.

*\*IDOT previously used the Environmental Class of Action Document (ECAD) as documentation of environmental impacts to aid in NEPA classification. While the ECAD report is no longer in use, ECADs may be submitted for consideration as Firm or Environmental Lead experience (2 ECADs = 1 EA).*

**G. SPECIAL TRANSPORTATION STUDIES**

1. Mass Transit

Mass Transit work consists of the planning and design of operating systems for the effective movement of people. This includes sociological studies, corridor and terminal design and vehicle selection. Experience in the design of rail or mass transportation is required for prequalification. Minimum personnel requirements are one experienced Illinois Licensed Professional Engineer and support staff.

2. Railway Engineering

This consists of the inspection, evaluation, design, and cost/quantity estimation of existing or potential railway track and structures. The firm is required to have experience in the design, construction, and rehabilitation of track for prequalification. Minimum personnel requirements are; one Illinois Licensed Professional Engineer with Class I Railroad carrier engineering experience in design, construction and rehabilitation of mainline railroad track and all necessary support staff.

**H. SPECIAL SERVICES**

1. Surveying

This consists of measurements, calculations, and field work necessary to establish line and grade for a specific transportation improvement. Surveys also include topographic surveys, determining boundaries, writing descriptions of specific parcels of land and the installation and restoration of monuments. Minimum personnel requirements are one Illinois Licensed Professional Land Surveyor and support staff.

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2. Aerial Mapping and LiDAR

Aerial Mapping consists of acquiring and developing aerial photographs suitable for mapping, planning studies, and the development of precise topographic maps and related photogrammetric products based upon information obtained from the aerial photography. Minimum requirements are one Illinois Licensed Professional Engineer or Professional Land Surveyor or a Certified Photogrammetrist and support staff.

LiDAR consists of obtaining and processing aerial and/or terrestrial LiDAR data to provide digital elevation data. Minimum requirements are one Illinois Licensed Professional Engineer or one Professional Land Surveyor or a Certified Photogrammetrist and support staff with training and experience in LiDAR data collection and processing.

3. Electrical Engineering

This consists of the design of electrical components of transportation facilities. Minimum personnel requirements are one Illinois Licensed Professional Engineer with training and experience in electrical engineering.

4. Mechanical Engineering

This consists of the design of mechanical components of transportation facilities. Minimum requirements are one Illinois Licensed Professional Engineer with training and experience in mechanical engineering.

5. Sanitary Engineering

This may consist of the analysis of various waste material and the design and application of storm water and waste disposal facilities to handle and dispose of such. Experience in moving, relocating, and/or establishing sanitary sewers through and/or in roadway systems is required. Minimum requirements are one Illinois Licensed Professional Engineer with training and experience in sanitary engineering.

6. Architecture

This consists of the design and preparation of plans, special provisions, and estimate of cost for the construction of transportation related buildings, such as bus /train stations, airport terminal, Tollway plaza, etc. Minimum personnel requirements are one Illinois Licensed Architect and support staff.

7. Landscape Architecture

This consists of the preparation of plans, special provisions, and estimate of cost for aesthetically pleasing landscape features. Experience in landscaping along roadways, freeways and other transportation facilities is required. Minimum personnel requirements for prequalification are one Illinois Licensed Landscape

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Architect, Illinois Licensed Architect, and/or an Illinois Licensed Professional Engineer with training and experience in landscape architecture and support staff.

8. **Hazardous Waste**

**Hazardous Waste: Simple**

A variety of sites may be assessed (e.g., residential, commercial/industrial sites, chemical manufacturing sites, vehicle service stations, storage sites and buildings, structures containing potential contamination, and spills in IDOT yards). Additional work may include conducting surveys and testing of stored materials, tank contents, and containers to determine whether hazardous waste, special waste, or hazardous materials are present.

Provisions for laboratory and field testing including geophysical methods will be required for a variety of hazardous and non-hazardous wastes including, but not limited to water quality parameters.

Evaluation, summarizations, and reporting on preliminary site investigations, petroleum-related leaking underground storage tanks (LUSTs), laboratory analysis, and remedial designs, as well as construction oversight activities may be included as an important part of this work.

For a firm to be prequalified in this area of specialization, the following must be fully met: (a) office location and organization, (b) minimum firm experience, (c) minimum staff experience, and (d) equipment/support services, as described below.

a. **Office location and organization**

1. List the office(s) from which the majority of IDOT work will be accomplished. That is, key management and technical staff proposed to work on any part of the contract must be stationed at this office location. Specialized expertise from outside offices utilized intermittently during the study, design or implementation of projects is allowed and should be included.
2. Provide an organizational chart showing the administrative/management of the office and a flow chart of key personnel, professional and technical, and offices that would most likely be involved in the project(s). The organizational chart shall specifically identify the Illinois Licensed Professional Engineer(s) and/or Illinois Licensed Professional Geologist(s). Similarly, subconsultant(s) location and organization shall be detailed in this section. The staff should match those listed in Section c, Minimum Staff Experience. Also, two additional documents shall be added as supplemental pages to the organizational chart; see Sections b (Minimum firm experience) and c (Minimum staff experience) for details on the cross-referenced table/matrix.

- b. **Minimum firm experience** requires the successful completion as the prime consultant of the following:

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1. Seven or more of the following types of projects completed within the past 10 years:
  - a. One (1) RCA
  - b. One (1) LUST (using 35 Illinois Administrative Code [IAC] 742 Tier 2 or Tier 3 analysis)
  - c. One (1) SRP (under 35 IAC 740 using 35 IAC 742 Tier 2 or Tier 3 analysis)
  - d. One (1) RD
  - e. One (1) RCO
  - f. Two (2) other types of environmental-related projects.

To facilitate IDOT review of minimum firm experience, the firm shall present each project description with a numerical identification. The firm shall provide a cross-referenced table / matrix listing the project type (i.e., RCA, LUST, SRP, RD, RCO, other), project name (name, brief description, location, and regulatory reference ID #), year project was completed, and the staff names. The table/matrix shall be titled "Table 1 - Firm Experience" and can be added as a supplemental page to the organization chart.

- c. Minimum staff experience includes the following technical groups of which at least one individual must be an Illinois Licensed Professional Engineer or an Illinois Licensed Professional Geologist.
  1. Administrative/Managerial Staff – (Responsible for the day-to-day supervision of work assignments, efficient utilization of resources, client satisfaction, and project budgets).

Two or more individuals with five or more years of direct experience in the following skill sets:

- a. RCA – Resource Conservation and Recovery Act (RCRA) Corrective Action
- b. LUST – Petroleum-related Leaking Underground Storage Tank cleanup in Illinois
- c. SRP – Site Remediation Program cleanup in Illinois
- d. RD – Remedial Design
- e. RCO – Remedial Construction Oversight

2. Technical/Professional Staff – (Responsible for performing technical tasks for the projects).

Two or more individuals with three or more years of direct experience in the following skill sets: LUST, SRP, RD, and RCO.

3. Investigation Field Staff

Two or more individuals, each with two or more years of experience in environmental sampling/measurement activities.

To facilitate IDOT review of minimum staff requirements, the firm shall provide a cross-referenced table / matrix listing the staff names in each of the three staffing



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groups, their respective project type experience, professional license(s), if any, and years of experience. The document shall be titled "Table 2 - Staff Experience" and can be added as a supplemental page to the organizational chart.

d. Minimum equipment/support services:

1. PPE: List five important pieces of personal protection equipment (levels D, C and B) the firm should have readily available to conduct investigations, remediation, and oversight.
2. Measuring & Sampling: List ten critical pieces of physical/chemical/geophysical measurement and sampling equipment the firm should have readily available to conduct investigations, remediation, and oversight.
3. Chemical Testing: In-house capability or established working and/or contractual relationships with an environmental testing laboratory. The environmental laboratory (ies) must be accredited by IEPA under 35 Illinois Administrative Code 186.
4. Physical Testing & Drilling: In-house capability or established working and/or contractual relationship with physical, geophysical, and drilling companies to conduct investigations, remediation, and oversight.

Additional information for SEFC preparation

- Each project description should clearly indicate, at a minimum:
  - One IDOT project category, i.e., RCA, LUST, SRP, RD, RCO, Other.
  - The year project began and was completed.
  - Client contact person and phone #. It is acceptable to mark as confidential but still must provide contact name and phone. IDOT must have a way to check references.
  - IEPA program reference number for LUST and SRP projects.
- For minimum firm experience, identify only one category per project description. Thus, there must be at least seven (7) unique project descriptions.
- Ensure the project description and scope of work are germane and specific to the chosen category.
- Project Description: Provide a concise description of the overall project. It is unnecessary to repeat the same information in the Scope of Work section.
- Scope of Work: Describe the specific services the firm provided that are applicable and responsive to the particular category. Do not repeat the same information in the Project Description section.

**Hazardous Waste: Advance**

A variety of sites may be assessed (e.g., old, abandoned, or improperly closed dumps, chemical manufacturing sites, metal plating/fabricating sites, dry cleaning/service stations, storage sites and buildings, structures containing potential contamination, spills in IDOT yards, and screening for the presence of

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radionuclides). Additional work may include conducting surveys and testing of stored materials, tank contents, and containers to determine whether hazardous waste, special waste, or hazardous materials are present, conducting environment compliance audits and developing or maintaining environmental management systems.

Provisions for laboratory and field testing including geophysical methods will be required for a wide variety of hazardous and non-hazardous wastes including, but not limited to water quality parameters, poly-chlorinated biphenyls (PCBs), pesticides, heavy metals, organics, and radioactive wastes.

Evaluation, summarizations, and reporting on preliminary site investigations, petroleum-related leaking underground storage tanks (LUSTs), asbestos assessments, laboratory analysis, and remedial designs, as well as construction oversight activities may be included as an important part of this work.

For a firm to be prequalified in this area of specialization, the following must be fully met: (a) office location and organization, (b) minimum firm experience, (c) minimum staffing experience, and (d) equipment/support services, as described below.

a. Office location & organization:

1. List the main office from which the majority of IDOT work will be accomplished. That is, key management and technical staff proposed to work on any part of the contract must be stationed at this office location. Specialized expertise from outside offices utilized intermittently during the study, design or implementation of projects is allowed and should be included.
2. Provide an organizational chart showing the administrative/management of the office and a flow chart of key personnel, professional and technical, and offices that would most likely be involved in the project(s). The organizational chart shall specifically identify the Illinois Licensed Professional Engineer(s) and Illinois Licensed Professional Geologist(s). Similarly, subconsultant(s) location and organization shall be detailed in this section. The staff should match those listed in Section C, Minimum Staff Experience. Also, two additional documents shall be added as supplemental pages to the organizational chart; see Sections b (Minimum firm experience) and c (Minimum staff experience) for details on the cross-referenced table/matrix.

b. Minimum firm experience requires the successful completion as the prime consultant of the following:

1. Ten or more of the following types of projects completed within the past 10 years:
  - a. one (1) Remedial Investigation/Feasibility Study (RI/FS) (using CERCLA/SARA procedures),
  - b. one (1) RCRA Corrective Action (RCA),

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- c. one (1) Remedial Design (RD),
  - d. one (1) Remedial Construction Oversight (RCO),
  - e. two (2) Site Remediation Programs (SRPs) (under 35 Illinois Administrative Code (IAC) 740, and at least one (1) using 35 IAC 742 Tier 2 or Tier 3 analysis), and
  - f. two (2) Leaking Underground Storage Tanks (LUSTs) (both using 35 IAC 742 Tier 2 or Tier 3 analysis).
  - g. two other types of projects (RI/FS, RCA, RD, RCO, SRP or LUST using Tier 2 or Tier 3, ECA, EMS, Risk Assessment [RA], or Construction Oversight [CO]).
2. In addition to the above projects, five of the following types of projects completed within the past **10 years**:
- a. four (4) Environmental multi-media Compliance Audits (ECA) on industrial or governmental facilities, and
  - b. development of an (1) Environmental Management System (EMS).

To facilitate IDOT review of minimum firm experience, the firm shall present each project description with a numerical identification. The firm shall provide a cross-referenced table/matrix showing the project identification and name (and brief description location, and regulatory ID number, year project was completed, and the staff names) versus the project type (e.g., RI/FS, RCA, RD, LUST, etc.). Include the client name and telephone number for every project description. For LUST and SRP project descriptions, include the IEPA program tracking reference numbers. The cross-reference table/matrix shall be titled "Table 1 - Firm Experience" and can be added as a supplemental page to the organizational chart.

- c. Minimum staff experience includes the following technical groups of which one individual must be an Illinois Licensed Professional Engineer and one individual must be an Illinois Licensed Professional Geologist:

1. Administrative/Managerial Staff - (Responsible for the day-to-day supervision of work assignments, efficient utilization of resources, client satisfaction, and project budgets).

Three or more individuals, each with five or more years of direct experience in the following skill sets:

- Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended by the Superfund Amendments and Reauthorization Act of 1986 (CERCLA/SARA),
- Remedial Investigation/Feasibility Studies (RI/FS's),
- Resource Conservation and Recovery Act (RCRA),
- Facility Inspections (RFI's),
- RCRA Corrective Action (RCA),
- Remedial Designs (RD's),
- Remedial Construction Oversight (RCO),

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- Site Remediation Program (SRP) cleanups in Illinois,
  - Petroleum-related Leaking Underground Storage Tank (LUST) cleanups in Illinois,
  - Environmental multi-media Compliance Audits (ECA's), and
  - Environmental Management Systems (EMS).
2. Technical/Professional Staff - (Responsible for providing technical direction for the project(s), and effective management of technical support staff, project schedule(s), and budget(s)).
- a. Four or more individuals, each with five or more years of direct experience in CERCLA/SARA, RI/FS's, RFI's, RCA, RD's, RCO, SRP, and petroleum-related LUST cleanups in Illinois, ECA's, and EMS.
  - b. Three or more individuals, each with four or more years of direct experience in CERCLA/SARA, RCA, RDs and RCO.
3. Investigation Field Staff - Four or more individuals, each with three or more years of experience in environmental sampling/measurement activities.

To facilitate IDOT review of minimum staff requirements, the firm shall provide a cross-referenced table/matrix listing the staff names in each of the three staffing groups, their respective project type experience, professional license(s), if any, and years of experience. The document shall be titled "Table 2 - Staff Experience" and can be added as a supplemental page to the organizational chart.

- d. Minimum equipment/support services:
- 1. PPE: Personal protection equipment (levels D, C and B) to conduct investigations and remediations.
  - 2. Measuring & Sampling: Physical/chemical/geophysical measurement and sampling equipment to conduct investigations and remediations.
  - 3. Chemical Testing: In-house capability or established working and/or contractual relationships with an environmental testing laboratory. The environmental laboratory (ies) must be accredited by IEPA under 35 Illinois Administrative Code 186.
  - 4. Physical Testing & Drilling: In-house capability or established working and/or contractual relationship with physical, geophysical, and drilling companies to conduct investigations, remediation, and oversight.

Additional information for SEFC preparation

- Each project description should clearly indicate, at a minimum:
  - One IDOT project category, i.e., ECA, RI/FS, LUST, SRP, Other, etc.
  - The year project began and was completed.

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- Client contact person and phone #. It is acceptable to mark as confidential but still must provide contact name and phone. IDOT must have a way to check references.
- IEPA program reference number for LUST and SRP projects.
- Identify only one category per project description. Thus, there must be at least fifteen (15) unique projects.
- Ensure the project description and scope of work are germane and specific to the chosen category.
- Project Description: Provide a concise description of the overall project. It is unnecessary to repeat the same information in the Scope of Work section.
- Scope of Work: Describe the specific services the firm provided that are applicable and responsive to the particular category. Do not repeat the same information in the Project Description section.

9. Asbestos Abatement Surveys

Services are required to perform asbestos surveys of buildings requiring demolition. This work will include review of existing data, a building survey, asbestos sampling and analysis and preparation of a report summarizing the location and description of the identified asbestos, quantities, and a preliminary estimate of abatement costs.

For a firm to be prequalified in this area of specialization, the following minimum firm experience, staffing requirements, and equipment/support services must be fully met:

- a. Minimum firm experience requires the successful completion as the prime consultant of ten or more asbestos abatement surveys in the last ten years.
- b. Minimum staff requirements include the following of which one individual must be an Illinois Licensed Professional Engineer and/or Architect:
  - (1) Administrative/Managerial Staff - (Responsible for the day-to-day supervision of work assignments, efficient utilization of resources, and client satisfaction).

One or more individuals, each with five or more years of direct experience in conducting Asbestos Abatement Surveys.

- (2) Technical/Professional Staff - (Responsible for providing technical direction for the project(s), and effective management of technical support staff, project schedule(s), and budget(s)).

Two or more individuals, each with five or more years of direct experience in Asbestos Abatement Surveys. These individuals must also be licensed by the Illinois Department of Public Health (IDPH).

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- c. Minimum equipment/support services include in-house capability or established working relationship with a laboratory accredited by the American Industrial Hygiene Association (AIHA) to conduct asbestos analyses.

10. Construction Inspection

Construction Inspection work consists of staking, material testing and inspection, documentation of materials and quantities, record keeping and enforcement of specifications applicable to a contractor's work on construction projects. As a prerequisite for a Construction Inspection prequalification rating, a consultant must have:

- a) An in-house full-time employee who has experience in the position of Resident Engineer, or equivalent experience, in construction work under IDOT specifications and has a working knowledge of IDOT specifications and procedures.
- b) One or more in-house full-time employees who have a working knowledge of IDOT specifications and documentation procedures for the inspection of work and a current certificate for the successful completion of the IDOT Construction Documentation of Contract Quantities class. A current IDOT Construction Documentation of Contract Quantities certification number must be included. It is desired the current IDOT Construction Documentation of Contract Quantities certificate also be attached.
- c) Trained technicians who have experience and a working knowledge in the area of Hot Mixed Asphalt (HMA), Portland Cement Concrete (PCC), and Soils testing are highly desirable. All personnel performing materials field testing for PCC (air, slump, making strength specimens, sampling, and temperature) and HMA (density and temperature) should have successfully completed the appropriate QC/QA trained technician classes. Personnel performing field testing for Soils (density) shall have completed IDOT Class STTP S-33 for Soils Field Testing and Inspection, formerly known as "Standard Earth Density."
- d) Access to IDOT approved testing equipment for PCC, HMA, Aggregates, and Soils according to the "Manual of Test Procedures for Materials."
- e) Either a full time employee with experience as a survey party chief and adequate survey equipment or a subconsultant prequalified in surveying.

11. Quality Assurance Testing

a. Services

A quality assurance plan following the BDE Manual Chapter 8-6 "Quality Assurance/Quality Control Guidelines for Work by Consulting Engineers" is required. Services include managing the Quality Assurance (QA) requirements for Hot Mix Asphalt (HMA) and Portland Cement Concrete (PCC) Quality Control/Quality Assurance (QC/QA) projects according to the

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Standard Specifications for Road and Bridge Construction and any applicable contract special provisions.

Services also include coordination of QA activities with the contractor and the Engineer, QA field and lab tests, inspection of the contractor's QC activities, reporting of results and investigations of tests when required by the contract.

b. Personnel Requirements

Project Manager - Minimum personnel requirements include a qualified project manager who shall be an Illinois Licensed Professional Engineer and who shall manage the required QA activities and tests at the specified Quality Assurance laboratory listed in the SEFC application. The Project Manager shall be a full time employee at the QA laboratory. The project manager must have successfully completed the following classes:

(1) QC/QA Training Classes

- a) HMA Level I, II, and III Mix Design classes and the Superpave upgrade class (if the original class preceded the inclusion of Superpave),
- b) PCC Level I, II, and III Mix design Classes,
- c) Aggregates – Aggregate classes are in addition to the HMA and/or PCC QC/QA Training classes. They include the three-day Mixture Aggregate Technician Course or the 5-day Aggregate Technician Course.

(2) Specific Task Training Program Classes

- a) S-14 Construction Documentation
- b) S-33 Soils Field Testing and Inspection

(3) Field Supervisor/Lab Manager – The project manager shall indicate on the SEFC who, if other than the project manager, oversees operation of field technicians, or laboratory activities. The project manager shall document the person's time in their position, as well as their experience and education.

(4) Field/Lab Technicians

Personnel directly in charge of sampling and testing should have a minimum of 3 years (field) and/or 5 years (lab) of relevant experience in HMA designs. Personnel coordinating QA activities for PCC projects should have at least two years of experience in field tests and observations. The consultant shall provide a list of all current technical employees who have received training through the QC/QA program and/or the Specific Task Training program offered by IDOT. The list shall include all attendance dates as well as a Pass (P) or Fail (F) notification document.

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c. Laboratory and Equipment

The consultant shall have an IDOT approved PCC/Aggregate, or HMA/Aggregate laboratory as indicated in the advertisements for offers of interest for professional services. The laboratory and equipment shall be approved according to the current Bureau of Materials and Physical Research (BMPR) Policy Memorandum, "Minimum Private Laboratory Requirements for Construction Materials Testing or Mix Design."

The laboratory indicated in the advertisement for offers of interest for professional services shall be accredited according to the AASHTO Accreditation Program (AAP) for those procedures specified for the type(s) of laboratory in the BMPR Policy Memorandum, "Minimum Private Laboratory Requirements for Construction Materials Testing or Mix Design." They shall also participate in **ALL** proficiency testing specified for the type(s) of laboratory in the policy memorandum as well. The project manager (or designee) shall add IDOT as a specified on the AASHTO website, allowing IDOT access to the laboratory's proficiency test results. The effected date for IDOT to have access to proficiency test results shall be rolled back as far as possible for each test procedure on the AASHTO website.

The Consultant shall also have IDOT-approved testing equipment for PCC and HMA field tests according to the "Manual of Test Procedures for Materials." PCC field testing includes air, slump, making strength specimens, sampling, temperature, and self-consolidating concrete tests. HMA field testing includes density and temperature. The Manual of Test Procedures for Materials may be downloaded from the website under the Bureau of Materials Section.

12. Subsurface Utility Engineering

Services include the utilization of ASCE 38 "Standard Guideline for Collection and Depiction of Existing Subsurface Utility Data." Responsibilities include highly efficient, nondestructive engineering incorporating civil engineering, surface geophysics, surveying and mapping, nondestructive vacuum excavation, and asset management technologies to identify and classify quality levels of existing subsurface utility data as well as map the locations of the underground utilities. The projects will involve research, field investigations, test holes, plotting design, engineering analysis and recommendations relative to impacts on existing or proposed utilities. The consultant must be able to complete the following four levels of subsurface utility engineering:

**Level A:**

Precise horizontal and vertical location of utilities obtained by the actual exposure and subsequent measurement of surface utilities, usually at a specific point. Minimally intrusive excavation equipment is typically used to minimize the potential for utility damage. A precise horizontal and vertical location, as well as other utility attributes, is shown on plan documents. Accuracy is typically set to 15-mm vertical and to applicable horizontal survey and mapping accuracy as defined or expected by the project owner.



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**Level B:**

Information obtained through the application of appropriate surface geophysical methods to determine the existence and approximate horizontal position of subsurface utilities. Quality level B data should be reproducible by surface geophysics at any point of their depiction. This information is surveyed to applicable tolerances defined by the project and reduced onto plan documents.

**Level C:**

Information obtained by surveying and plotting visible above-ground utility features and by using professional judgment in correlating this information to quality Level D information.

**Level D:**

Information derived from existing records or oral recollections.

The consultant is also required to have the following:

- a. Experience in researching the location of utilities, above and underground.
- b. Knowledge of the equipment/techniques necessary to locate the utilities.
  - (1) Surface geophysical techniques, such as, electromagnetic, magnetic, sonic, etc.
  - (2) Excavation by use of test holes using vacuum excavation or comparable non-destructive equipment.
- c. The ability to determine the extent the proposed roadway improvement impacts the existing utilities.
- d. The ability to provide staff and equipment for simultaneous projects at multiple locations.
- e. A project manager and project engineer who have adequate experience in managing subsurface underground engineering projects.
- f. One Illinois Licensed Professional Engineer and support staff.