

# Appendix A

## **1.0 Requirements and Minimum Qualifications**

This section outlines requirements and minimum qualifications for the GEC. It is anticipated that the GEC will be used to support and supplement MnDOT staff in a variety of roles. The skill sets and number of GEC personnel will vary with each work order.

### **1.1 General Staffing Requirements**

- 1.1.1 The GEC may only use competent personnel who are qualified by experience and/or education as indicated. Minimum qualifications for some example positions are defined in this section. For any specific project work order, MnDOT may require that these minimum qualifications be altered in specific instances when the unique nature of the work requires specific or more specialized skills that are not identified in this section.
- 1.1.2 The GEC will adequately staff each work order sufficiently in advance of the beginning of work on that project to be properly prepared to satisfy its responsibilities; however, the GEC must not assign any personnel to any project until submitting, in writing for MnDOT's review and approval, the qualifications of each person proposed for that project. The GEC must submit its request for approval to the MnDOT Project Manager at least two weeks before the date an individual is to report to work. Responsible personnel, thoroughly familiar with all aspects of design and construction, may need to be available through the construction phase of the project, to resolve any final pay quantities disputes.
- 1.1.3 An individual, who is previously approved by the MnDOT Project Manager, but whose performance is later determined by the MnDOT Project Manager to be unsatisfactory, will not be allowed to continue on the project and may be replaced by the GEC if the alternate is acceptable to the MnDOT Project Manager.
- 1.1.4 MnDOT requires that any personnel identified in the GEC's proposal will be assigned to work orders and committed to performing program support services. Any changes in personnel from the people identified in the GEC's proposal will require written approval from the MnDOT Project Manager.
- 1.1.5 When operations on a work order diminish, the GEC will reduce the number of its personnel assigned to that Project as appropriate. Any adjustment of GEC forces as recommended by the MnDOT Project Manager will be accomplished within the agreed upon time period. MnDOT reserves the right to add or reduce staff on projects as it so desires during the course of the project.

- 1.1.6 Specific personnel needs may vary but will be specifically defined in each project work order.
- 1.1.7 All key personnel must be effective communicators in spoken and written English and must exercise initiative and independent judgement in the solution of the work problems.

1.2 Alternative Contracting Program Manager

Minimum qualifications include:

- B.S. in Civil Engineering.
- Registration as a professional engineer in the state of Minnesota by the time of work order approval.
- Demonstrated understanding of design-build and Construction Manager/ General Contractor (CMGC) contracting in the transportation industry.
- Demonstrated understanding of other alternative contracting methods such as P3, Indefinite Delivery/ Indefinite Quantity (IDIQ), etc.
- Demonstrated experience managing similar contracts. Demonstrated experience managing similar large and complicated contracts with multiple subordinate staff members and varied needs preferred. Demonstrated experience managing similar contracts for state DOTs preferred.

1.3 Alternative Contracting Technical Specialist

1.3.1 Design-Build Contracting Technical Specialist(s)

Minimum qualifications include:

- Extensive knowledge of design-build procurement and contracting in the highway and bridge transportation industry, including extensive knowledge of the practices of several other transportation agencies that have advanced design-build programs
- Extensive knowledge of risks and risk management associated with design-build procurements and contracts
- The demonstrated ability to exercise initiative and independent judgment and serve as a technical specialist.

1.3.2 CMGC Contracting Technical Specialist(s)

Minimum qualifications include:

- Extensive knowledge of the CMGC delivery method in the highway and bridge transportation industry
- Extensive knowledge of the CMGC practices of other state DOTs that have established CMGC programs, particularly related to CMGC procurement, risk management, and price negotiations for construction
- The technical writing skills necessary to develop procurement documents and programmatic or project-specific process documents.

1.4 Pre-Award Activity Staff

Minimum qualifications for each position are as listed below:

1.4.1 Design-Build Pre-Design Project Managers(s)

- B.S. in Civil Engineering
- Registration as a professional engineer in the state of Minnesota by the time of work order approval
- Demonstrated knowledge of Design-Build and CMGC procedures
- Demonstrated experience with MnDOT standards and procedures
- Demonstrated experience completing the National Environmental Policy Act (NEPA), permitting, layout review, and the other activities necessary to prepare transportation projects for procurement
- Demonstrated experience actively managing pre-design schedules and associated tasks
- The demonstrated ability to plan and organize the work of subordinate staff members

1.4.2 Design-Build Procurement Project Managers(s)

- B.S. in Civil Engineering
- Registration as a professional engineer in the state of Minnesota by the time of work order approval
- Demonstrated knowledge of Design-Build procedures
- Demonstrated experience leading the development of contract documents and all of their technical components in an efficient, timely, and independent manner
- The demonstrated ability to plan and organize the work of subordinate staff members

1.4.3 Roadway Design Engineer(s)

- B.S. in Civil Engineering
- Registration as a professional engineer in the state of Minnesota by the time of work order approval
- Demonstrated engineering experience with road design on Minnesota transportation projects
- Demonstrated experience with utility coordination and management practices and policies
- Demonstrated experience with Americans with Disabilities Act (ADA) designs and policies
- Demonstrated experience with MnDOT standards and the pre-award activities necessary to prepare transportation projects for letting
- Demonstrated experience directing a highly complex and specialized design review program

- The demonstrated ability to plan and organize the work of subordinate staff members
- 1.4.4 Hydraulics Engineer (s)
- B.S. in Civil Engineering
  - Registration as a professional engineer in the state of Minnesota by the time of work order approval
  - Demonstrated hydraulic design experience on MnDOT's highway system
  - Demonstrated permitting experience related to hydraulic design
  - Demonstrated knowledge of MnDOT standards
- 1.4.5 Traffic Engineer(s)
- B.S. in Civil Engineering
  - Registration as a professional engineer in the state of Minnesota by the time of work order approval
  - Demonstrated traffic engineering experience on MnDOT's highway system
  - Demonstrated experience with traffic modeling, forecasting, and Interstate Access Requests
  - Demonstrated experience with signal, Intelligent Transportation Systems (ITS), signing, and lighting design
  - Demonstrated knowledge of MnDOT standards
- 1.4.6 Geotechnical Engineer(s)
- B.S. in Civil Engineering
  - Registration as a professional engineer in the state of Minnesota by the time of work order approval
  - Demonstrated foundation and soil design experience on MnDOT's highway system
  - Demonstrated experience with multiple types of bridge foundation systems. Demonstrated experience implementing new geotechnical solutions for an owner
  - Demonstrated experience working with monitoring instrumentation.
  - Demonstrated knowledge of MnDOT standards
- 1.4.7 Structures Design Engineer(s)
- B.S. in Civil Engineering
  - Registration as a professional engineer in the state of Minnesota by the time of work order approval
  - Demonstrated bridge and structures design experience on MnDOT's highway system
  - Demonstrated experience directing a highly complex and specialized design review program

- Demonstrated experience with Accelerated Bridge Construction (ABC)
- The demonstrated ability to plan and organize the work of subordinate staff members
- Demonstrated knowledge of MnDOT standards

1.4.8 Environmental Manager(s)

- Civil Engineering Technologies (or equivalent accredited program) degree
- Experience with the preparation of environmental documents and Stormwater Pollution Prevention Plan (SWPPP)s
- Demonstrated experience coordinating and obtaining permits from local, state and federal agencies
- Demonstrated knowledge of state environmental laws and federal NEPA requirements
- Demonstrated knowledge of state and federal guidelines regarding cleanup of contaminated sites and the handling of regulated materials.

1.4.9 Estimator(s)

- Ten or more years of experience working with all trades within the heavy civil and transportation industry and knowledge of construction means, methods, and equipment in these areas.
- Ten or more years of experience preparing preliminary and final cost estimates for all trades within the heavy civil and transportation industry
- Ten or more years of experience using all major heavy civil and transportation estimating methods/techniques such as production-based, average unit bid prices, and parametric.
- An understanding of Design-Build (DB) and CMGC contracting with DB and CMGC cost estimating experience preferred
- Experience with identifying, assessing, and pricing risk.
- Experience with schedule development and analysis in all trades of heavy civil and transportation.

1.4.10 Contract Editor(s)

- Demonstrated experience with technical writing and editing
- Demonstrated experience with the preparation of complicated highway and bridge construction documents. Experience preparing Design-Build and CMGC documentation preferred.
- Demonstrated experience with risk management on highway and bridge construction projects
- Demonstrated experience with design-build contracting working with either an owner or a proposer

1.4.11 CM/GC Project Management Support

- B.S. in Civil Engineering
- Registration as a professional engineer in the state of Minnesota by the time of work order approval
- Demonstrated knowledge of CMGC
- Demonstrated experience with MnDOT standards and managing the pre-construction phase activities necessary to prepare transportation projects for letting
- The demonstrated ability to plan and coordinate the work of subordinate staff members

1.5 Design-build Contract Administration Technical Specialists

Minimum qualifications for each position are as listed below:

1.5.1 Quality Coordinator(s)

- Demonstrated experience with Design-Build contracting. CMGC experience preferred
- Demonstrated experience with implementing quality management processes and procedures on transportation projects
- Demonstrated experience with training staff on quality management processes and procedures
- Demonstrated experience with materials control schedules and material testing management

1.5.2 Contract Administrator(s)

- B.S. in Civil Engineering
- Registration as a professional engineer in the state of Minnesota by the time of work order approval
- Demonstrated experience with Design-Build contracting. CMGC experience preferred
- Demonstrated project management experience on transportation projects during their construction phase
- Demonstrated experience with drafting contract change documents such as Change Orders, Work Orders and/or Supplemental Agreements for owners on transportation projects

**2.0 Pre-Award Project Development**

All personnel performing these tasks are required to meet the minimum qualification requirements listed in Section 1.0.

- 2.1 Bridge Specifications and Design Criteria - Those tasks required to prepare the written special provisions and design criteria required for the bridge construction that supersede or supplement MnDOT standard specifications and the information shown on the plan.

- 2.2 Design-Build Bridge Concepts - Those activities required to develop and/or verify bridge concepts that will be included in the design-build Request for Proposal (RFP). Work could include any of the following:
- Verify bridge locations, widths and span lengths
  - Determine preliminary beam type and superstructure depth
  - Verify lateral and vertical clearances
  - Verify retaining wall locations
  - Determine retaining wall types (cut or fill) and approximate heights
  - Verify noise wall locations and heights
  - Estimate bridge, retaining wall, and noise wall costs
  - Determine repair recommendations

Deliverables could include documentation showing the following items:

- Bridge locations
  - Lane, shoulder, and sidewalk widths
  - Span lengths
  - Preliminary beam type
  - Beam and superstructure depth
  - Minimum lateral and vertical clearances
  - Retaining wall locations shown on preliminary geometric layout
  - Wall types (cut or fill) and approximate heights
  - Noise wall locations shown on preliminary geometric layout
  - Noise wall heights
  - Bridge, retaining wall, and noise wall costs
  - Repair recommendation documents
- 2.3 Preliminary Bridge Plan - All tasks necessary to prepare a type, size, and location drawing for a bridge project. The drawing shows span arrangement, roadway cross section, and any other information necessary for guiding the detail design of the bridge. Work could include any of the following:
- Bridge hydraulics
  - Bridge foundation review
  - Receive bridge survey
  - Submit depth of structure
  - Receive grades
  - Begin drawing
  - Complete drawing
  - Check drawing
  - Conduct construction review
  - Prepare for plan signing
- 2.4 Visual Quality - Those tasks necessary to determine or make recommendations for the type and extent of project aesthetic treatments. Work could include participating and/or conducting meetings, working



with a separate visual quality consultant to format the visual quality manual to meet the design-build RFP format, and/or developing a visual quality manual or guidelines.

- 2.5 Noise Analysis- All tasks associated with preparing preliminary noise analysis, including data collection, modeling, and documents for inclusion in environmental documents and the design-build RFP.
- 2.6 Environmental Documentation - Those tasks necessary to produce or assist MnDOT or its consultant hired under a separate contract, in the preparation of documents and items related to Class II – Categorical Exclusions. Work also includes updating and amending Class III Environmental Assessments (EA's) and updating and amending Class I Draft (DEIS) and Final Environmental Impact Statements (FEIS). It may also be used as a vehicle for coordination with outside agencies (and the public) that may have an interest in the project. Work could include any of the following:
- Prepare document
  - Conduct review process
  - Incorporate comments
  - Assist with obtaining approvals
  - Produce and distribute documents
  - Prepare and/or conduct public hearings or public meetings
- 2.7 Geometric Layout - All tasks necessary to prepare the Geometric Layout on federal environmental Class II projects. All tasks necessary to update Geometric Layouts on federal environmental Class I and Class III projects. Work could include any of the following:
- Alignment and profile
  - Construction limits suitable for purchase of any additional Right of Way (R/W), if necessary, to construct the project. Such R/W may include, but is not limited to, drainage; NPDES permit requirements, and wetland mitigation.
  - Cross-sections
  - Road approach profiles and touchdown points
  - Preparing the geometric layout and design criteria to be incorporated into the RFP
- 2.8 Traffic Engineering and Forecasting - This task may include a variety of traffic engineering used to develop preliminary design concepts and pavement design criteria. Work could include, but is not limited to, any of the following:
- Traffic Forecasting
  - Equivalent Single-Axle Load (ESAL) Calculations
  - Traffic Counts
  - Crash Studies

- Traffic Signal warrant analysis
- 2.9 Surveying - This task may include a variety of surveying activities to assist the district. Work could include, but is not limited to, any of the following:
- Preliminary Design Mapping – obtain survey information necessary to prepare the geometric layout, including land surveying, photogrammetric cross sections, exhibits and map annotation.
  - Control Surveys – furnish horizontal and vertical control for the project such as traverse/GPS control, tie sheets, photo control.
  - Land Surveys - (e.g. sections corners, research information, update survey base map)
  - Design Survey – survey tasks necessary to complete design activities. (e.g. topography, cross sections, utilities, drainage)
  - Bridge Survey – all tasks necessary to document bridge geometrics.
  - R/W boundary and monumentation
- 2.10 Public Information Meeting - All tasks necessary to prepare for, conduct, and document public information meetings. Work could include any of the following:
- Arrange for meeting location
  - Announce meeting
  - Prepare for meeting
  - Conduct meeting
  - Incorporate comments into Public Meeting Document
- 2.11 Economic Analysis - All tasks needed to identify the positive economic gains from a project and compare them to the investment made in order to ensure that infrastructure investments strengthen the economy. Work could include any of the following:
- Define alternatives, including base case
  - Perform traffic modeling
  - Estimate total costs
  - Monetize travel time, vehicle operating costs, traffic crashes
- 2.12 Risk Analysis - All tasks needed to assist MnDOT and stakeholders with risk identification, analysis, management, preliminary cost estimating, and final cost estimating. This includes the initiation and facilitation of formal risk workshops.
- 2.13 Special Project Documents - All tasks necessary to complete Special Project Documents, which are separate documents (other than DEIS, FEIS, Environmental Assessment, Project Path Report, Scoping Document, Scoping Decision Document (SDD), Findings of Fact and Conclusions (FOFC), FONSI, Project Memorandum, or Study Report),

which are prepared based on the specific needs of an individual project. Examples of types of special documents necessary would include Section 4(f) evaluations, noise reports (preliminary & final), air quality reports, hydraulic reports, aesthetic reports, wetlands findings, Interstate Access Reports, Environmental Assessment Worksheets, Value Engineering Reports, etc.

- 2.14 Preliminary Hydraulics Design - The tasks needed to develop preliminary hydraulic recommendations from the District Hydraulics/Metro Water Resources Engineer. In place field data collection (surveys, inspection, etc.) cannot be accurately gathered during the winter season (December through April). Work could include any of the following:
- Research files
  - Identify permits
  - Identify and review in place drainage patterns and structures
  - Identify new drainage patterns and design criteria
  - Recommend preliminary construction limits
  - Prepare cost estimates, cost splits (by agency if applicable), and recommendations
  - Performing bridge or culvert hydraulic design
- 2.15 Pavement Type Selection - All tasks associated with the preparation of the pavement type selection documentation. Work could include any of the following:
- Perform preliminary soils survey and sampling
  - Perform laboratory soils tests
  - Prepare documentation
  - Determine proposed surface type
  - Submit to Central Office (CO) Pavement Design Engineer
  - Prepare pavement design and life-cycle cost analysis
  - Obtain District concurrence
- 2.16 Soils Survey and Letter - All field, lab, and office tasks necessary to provide roadway soils recommendations (including soils profile and cross-sections when appropriate) for use in developing final design plans and special provisions. Recommendations for resurfacing projects will require a shorter duration than reconstruction or new construction projects.
- 2.17 Soils Review and Approval - The process of reviewing the Materials Design Recommendations by both the Central Office Pavements and Geotechnical Sections which leads to their approval. Work could include any of the following:
- Perform pavement review
  - Perform Geotechnical review
  - Prepare draft Soils Letter

- 2.18 Foundation Recommendations - All field, lab, and office tasks necessary to provide foundations recommendations for the structural elements of a project (i.e., bridges, retaining walls etc). Work could include any of the following:
- Review preliminary design data
  - Schedule field borings
  - Bore holes
  - Perform laboratory tests and analysis
  - Prepare foundations recommendation
- 2.19 Utility Coordination - All tasks associated with utility identification and coordination. Work could include any of the following:
- Identify utilities and assess project impacts on utilities
  - Provide sub-surface utility exploration
  - Coordinate with affected utility(ies)
  - Verify utility
  - Develop utility plan information
  - Coordinate with Central Office Utilities
- 2.20 Project Cost Estimate - All tasks associated with the preparation of project costs, including items such as design-builder design, construction, quality management, warranties. Assist with developing municipal, utility, and all other cost sharing agreement(s) associated with this project. As part of this task, develop a detailed opinion of probable construction costs for all work associated with this project and other agency cost participation. Cost sharing agreements could require a breakdown of costs; i.e., cost apportioned to affected city(ies), county(ies), utility(ies), or other party(ies), and MnDOT. Work could include the preparation of the following:
- Parametric estimates
  - Quantity-based estimates
  - Risk estimates
  - Production-Based estimates
- 2.21 Road Design - All the tasks necessary to prepare the desired level of road plans and roadway design criteria. This includes elements such as signing, lighting, landscaping, ITS, and signal design criteria.
- 2.22 Permits - All tasks associated with preparing, processing, and securing permits on a project. Work could include any of the following:
- Prepare permit documentation
  - Submit documentation to permitting agency and obtain permits

- 2.23 Agreements - All tasks associated with assisting MnDOT with the preparation and processing of various types of agreements such as:
- Municipal Agreements
  - Railroad Agreements
  - Utility Agreements (including Master Utility Agreements)
  - Signal and Lighting Agreements
  - Lighting Agreements
  - Maintenance Agreements
- 2.24 Right-of-Way - All tasks associated with assisting MnDOT with the preparation of right-of-way documents and deliverables for the project. Specific tasks could include:
- Title Order
  - Right-of-Way Acquisition Package (authorization map, R/W work map, building books)
  - Plats (plat preparation, stake boundary monumentation).
  - Pre-acquisition activities (legal descriptions, office abstracts, relocation plans, identify replacement housing, preparation of purchase instruments).
  - Valuation and Purchase Offers

### **3.0 Procurement Development**

- 3.1 Contract Preparation - All tasks required to assist MnDOT with the preparation of Request for Qualification (RFQ) and Request for Proposal Documents (RFP) for both design-build and design-bid-build best-value projects. This includes technical writing, formatting and preparation of all elements of these documents. Deliverables will be in the format of both hard copies and electronic copies.
- 3.2 Evaluation Process - All tasks required to assist MnDOT with the preparation of RFQ and RFP evaluation criteria, developing evaluation manuals, assisting MnDOT with the review and evaluation of proposals, conducting debriefing with unsuccessful teams, and preparing documents describing the selection process.
- 3.3 Procurement Development - All tasks required to assist MnDOT with the development of procurement procedures for best-value contracting on design-bid-build contracts, Alternative Technical Concepts on design-bid-build contracts, and other techniques. This also includes assisting MnDOT with the evaluation of other alternative contracting methods.

### **4.0 Alternative Contracting Contract Administration**

- 4.1 Quality Management

- Train MnDOT oversight staff with design, construction, contract administration, and document management services.
- Manage MnDOT quality management processes such as design reviews, documents management, and materials management, training, implementation, and auditing.
- Audit design-build Contractor quality management systems.
- Develop quality management lessons learned.

4.2 Contract Management

- Develop and implement design oversight, construction oversight, and document management procedures.
- Train MnDOT oversight staff on design oversight, construction oversight, and document management procedures.
- Document and report changes to contract documents, Released for Construction (RFC) drawings, procedures or policies.
- Assist with change management (change orders)

**5.0 Alternative Contracting Program Support Activities**

- 5.1 Training - All tasks necessary to assist MnDOT with training MnDOT staff and other key stakeholders about the alternative contracting process. This task includes developing curriculum and other training materials.
- 5.2 Alternative Contracting Research - All tasks and work necessary to research options and methods of delivering projects using alternative contracting techniques as specified by MnDOT. This includes, but is not limited to, attending training and seminars, providing MnDOT with reports or draft guides discovered during research activities.
- 5.3 Contract Document Management - All tasks necessary to assist MnDOT with the development and maintenance of the RFQ, RFP and other contract document templates. This would include periodic updates to the MnDOT manuals, implementing improvements to the contract documents, and assisting MnDOT with researching improvements to the documents.
- 5.4 Program Management - All tasks necessary to assist MnDOT's Design-Build Program Manager and Innovative Contracting Director with identifying and acting on program-related research, coordination, and policy. This could with the development of program for various alternative contracting initiatives such as CMGC, ID/IQ, best value, lump sum contracting, developing white papers, developing processes/procedures, drafting manual, drafting procurement and contract documents, and improving areas of the program such as quality management, utility coordination, Disadvantage Business Enterprise (DBE) /Equal Employment Opportunity (EEO) compliance, and insurance requirements.

- 5.5 Bid Challenge and Legislation Assistance - All tasks necessary to assist MnDOT with bid protests and legislative issues associated with alternative contracting projects. This could include providing support to analyze and recommend actions associated with bid protests, assisting MnDOT with legislative initiatives and providing guidance on the development of legislation language.

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