SCOPE

1.0 General Requirements
This section outlines a general list of the responsibilities and requirements 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, education and licensing 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 shown below.

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 to be assigned to that project. The GEC must submit its request for approval to the 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 until the design-bid-build contract is complete, to resolve any final pay quantities disputes.

1.1.3 An individual, who is previously approved by MnDOT’s Project Manager, but whose performance is later determined by the State to be unsatisfactory, will not be allowed to continue on the project and must be replaced by the GEC by an acceptable alternate to MnDOT’s Project Manager.

1.1.4 MnDOT considers 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 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 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, experience, licensure, and registration requirements may vary from project to project, but will be specifically defined in each project work order. The personnel, experience, licensure, and registration requirements shown below are a representative sample of what MnDOT would require on specific project or program support activities.
Appendix A
Scope of Work
General Engineering Consultant for Preconstruction Services
Master Contract Program

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 Program and Project Manager(s)
1.2.1 Program Manager
Primary role is to act as MnDOT’s single point of contact for this Program
(Master Contract) and organize staff to meet deliverables and deadlines within
the work orders. Minimum qualifications include:
• B.S. in Civil Engineering.
• Registration as a professional engineer in the state of Minnesota by the time
the Master Contract is executed.
• Extensive knowledge of professional/technical contracting in the
transportation industry and in particular with MnDOT.
• Effective communicator.
• Able to plan and organize the work of subordinate staff members.

1.2.2 Project Managers for Work Order Contracts
• B.S. in Civil Engineering or equivalent in accordance with type of work
• Registration as a professional engineer in the state of Minnesota or
equivalent by the time the Master Contract is executed.
• Extensive knowledge and experience of managing pre-award activities
necessary to deliver transportation projects to letting.
• Able to plan and organize the work of subordinate staff members.
• Develop and review policies, methods, practices, and procedures and review
programs for conformity with MnDOT standards.
• Exercise initiative and independent judgment in the solution of work
problems.

1.3 Design Engineers
1.3.1 Roadway Design Engineer(s)
• B.S. in Civil Engineering.
• Registration as a professional engineer in the state of Minnesota by the time
the Master Contract is executed.
• Engineering experience in road design on state transportation projects.
• Direct a highly complex and specialized design review program.
• Able to plan and organize the work of subordinate staff members.
• Develop and review policies, methods, practices, and procedures and review
programs for conformity with MnDOT standards.
• Exercise initiative and independent judgment in the solution of work
problems.

1.3.2 Hydraulics Engineer(s)
• B.S. in Civil Engineering.
• Registration as a professional engineer in the state of Minnesota by the time
the Master Contract is executed.
Appendix A
Scope of Work
General Engineering Consultant for Preconstruction Services
Master Contract Program

- Experience with Geopak Drainage to configure inlets to meet MnDOT spread criteria and design storm sewers on MnDOT’s highway system.
- Experience using HydroCAD and XP-SWMM to design systems of wet storm water ponds and infiltration/filtration basins to meet rate control, water quality, and volume control requirements for highway drainage systems.
- Permitting experience related to hydraulic design and wetland impacts.
- Familiarity with MnDOT’s HydInfra rating system and database and rehabilitation techniques for drainage infrastructure.
- Experience developing erosion control plans, turf establishment plans, and Storm water Pollution Prevention Plans (SWPPP) for highway projects.

1.3.3 Traffic Engineer(s)
- B.S. in Civil Engineering.
- Registration as a professional engineer in the state of Minnesota by the time the Master Contract is executed.
- Traffic engineering experience on MnDOT’s highway system.
- Traffic modeling, forecasting, and Interstate Access Requests experience.
- Signal design, Intelligent Transportation Systems (ITS) design, and lighting experience.
- Able to receive general instructions regarding assignment to exercise initiative and independent judgment in the solution of work problems.

1.3.4 Geotechnical Engineer(s)
- B.S. in Civil Engineering.
- Registration as a professional engineer in the state of Minnesota by the time the Master Contract is executed.
- Foundation and material design recommendation experience on MnDOT’s highway system.
- Experience with multiple types of bridge foundation systems.
- Able to receive general instructions regarding assignment to exercise initiative and independent judgment in the solution of work problems.

1.4 Bridge/Structural Engineers
1.4.1 Senior Structures Design Engineer
- B.S. in Civil Engineering.
- Registration as a professional engineer in the state of Minnesota by the time the Master Contract is executed.
- Bridge and structures design experience on MnDOT’s highway system.
- Direct a highly complex and specialized design review program.
- Able to plan and organize the work of subordinate staff members.
- Able to receive general instructions regarding assignment to exercise initiative and independent judgment in the solution of work problems.

1.4.2 Structures Design Engineer(s)
- B.S. in Civil Engineering.
- Registration as a professional engineer in the state of Minnesota by the time the Master Contract is executed.
Appendix A
Scope of Work
General Engineering Consultant for Preconstruction Services
Master Contract Program

- Bridge and structures design experience on MnDOT’s highway system.
- Able to receive general instructions regarding assignment to exercise initiative and independent judgment in the solution of work problems.

1.5 Environmental Specialists
1.5.1 Environmental Manager
- Civil Engineering Technologies (or equivalent accredited program) degree.
- Experience with the preparation of environmental documents such as Environmental Assessments, Environmental Assessments Worksheets and Environmental Impact Statements.
- Experience with coordinating and obtaining permits from local, state and federal agencies.
- Experience with the development of Stormwater Pollution Prevention Plans (SWPPP).
- Experience with state environmental laws and federal National Environmental Policy Act (NEPA) requirements.

1.6 Quality Coordinator
1.6.1 Quality Coordinator
Primary role is to assist in the implementation of MnDOT’s quality management system on the project, including developing quality management processes and procedures for MnDOT staff, training oversight staff on design and construction quality management processes, reviewing quality manuals, overseeing the implementation of MnDOT’s quality processes.
- Two years experience with implementing quality management processes and procedures.
- Two years experience with training staff on quality management processes and procedures.
- Experience with materials control schedules and material testing management.

Note: Functional experts used as a resource or in an advisory role do not need to be registered/licensed in the State of Minnesota, but qualifications must be approved by MnDOT.

2.0 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 Bridge Plans
All tasks necessary to produce preliminary and/or certified final bridge plans. Work could include any of the following:
- Prepare type, size and location drawings. (TS&L)
Appendix A
Scope of Work
General Engineering Consultant for Preconstruction Services
Master Contract Program

- 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.
- Prepare special provisions.
- Conduct load rating analysis.

2.3 Bridge Visual Quality
Those tasks necessary to determine or make recommendations for the type and extent of bridge aesthetics treatments. Work could include participating and/or conducting meetings and developing a visual quality manual or guidelines.

2.4 Road Design
All the tasks necessary to prepare the desired level of road plans and roadway design criteria. This includes (but not limited to) elements such as estimated quantities, construction plan, profile, cross sections, signing, lighting, landscaping, ITS, and signal design criteria. The department may require the design to be completed using 3D design methods.

2.5 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 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.

2.6 Noise Analysis
All tasks associated with preparing preliminary noise analysis, including data collection, background measurements, modeling, noise barrier analysis and design, public involvement, and documents for inclusion in environmental documents.
Appendix A  
Scope of Work  
General Engineering Consultant for Preconstruction Services  
Master Contract Program

2.7 Air Quality Analysis  
All tasks associated with preparing the necessary air quality analysis, including data collection, background air quality sampling, modeling (both Mobile Source Air Toxics and Carbon Monoxide (CO)), public involvement, and documents for inclusion in environmental documents.

2.8 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, Environmental Assessments (EA’s), and Environmental Assessment Worksheets (EAW’s). Work also includes updating and amending Environmental Assessments (EA’s) and updating and amending Environmental Impact Statements (EIS). 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.

2.9 Soils Survey and Materials Design Recommendation 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. Work could include any of the following:

- Perform soils survey and sampling.
- Perform laboratory soils tests.
- Install and monitor piezometers.
- Prepare pavement and subgrade design.
- Perform life-cycle cost analysis.
- Prepare Materials Design Recommendations.

2.10 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.
- Install and monitor piezometers.
- Prepare documentation.
- Determine proposed surface type.
- Prepare pavement design and life-cycle cost analysis.
- Submit to CO Pavement Design Engineer.
Appendix A
Scope of Work
General Engineering Consultant for Preconstruction Services
Master Contract Program

- Obtain District concurrence.

2.11 Soils Review and Approval
The process of reviewing the District Soils Letter by both the Central Office Pavements and Geotechnical Sections which leads to the Soils Letter approval. Work could include any of the following:
- Perform pavement review.
- Perform Geotechnical review.
- Prepare draft Soils Letter.

2.12 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.

2.13 Public Involvement
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.

2.14 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.
- ESAL Calculations.
- Traffic Counts.
- Crash Studies.
- Traffic Signal warrant analysis.

2.15 Surveying
This task may include a variety of surveying activities to assist MnDOT. 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.
Appendix A
Scope of Work
General Engineering Consultant for Preconstruction Services
Master Contract Program

- 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.

2.16 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.

2.17 Preliminary/Final 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.

2.18 Right-of-Way (R/W)
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.

2.19 Scoping
All tasks necessary to properly identify the features of work that are both included and not included in a project. This may include work required by local agencies and outside parties like environmental permitting agencies.
Appendix A
Scope of Work
General Engineering Consultant for Preconstruction Services
Master Contract Program

2.20 MnDOT Project Management staff development
All tasks necessary to provide and implement training programs and tools to
develop MnDOT staff in the areas of Project Management to enhance MnDOT’s
ability to deliver projects. This could include, but is not limited to, conducting
workshops, conferences, giving presentations, writing papers and performing
research.

2.21 Special Project Documents
All tasks necessary to complete Special Project Documents, which are separate
documents (other than DEIS, FEIS, Environmental Assessment, Scoping
Document, SDD, 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) statements, noise
reports (preliminary & final), air quality reports, hydraulic reports, aesthetic
reports, wetlands findings, Interstate Access Reports, Environmental Assessment
Worksheets, etc.

2.22 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.

2.23 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.

2.24 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.

2.25 Visualization, 3D Design and 4D Scheduling
All tasks necessary to aid MnDOT in the selection and utilization of these tools
in the delivery of MnDOT projects. This could include, but is not limited to
providing recommendations and expertise for specific projects as well as actual implementation services.

2.26 P6 Scheduling  
All tasks necessary to aid MnDOT in the deployment of P6 on MnDOT projects. This could include, but is not limited to, providing scheduling expertise as needed.

2.27 Risk Analysis  
All tasks necessary to conduct a risk analysis for a project, including conducting Risk Assessment Workshops, identifying Risk Events, using qualitative and quantitative analysis and determining mitigation strategies.

2.28 Project Cost Estimating (including conceptual, risk based, and contractor style estimates)  
All tasks associated with the preparation of preliminary project costs, including items such as construction, quality management, design bid build design, design-builder design and construction contractor incentive mechanisms. 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.

2.29 Other projects development tasks.

3.0 Project Management  
3.1 All work during the course of the work order to maintain supervision and management of all activities. This includes processing any reporting requirements to MnDOT, quality management, invoicing, and general contract management of the Work Orders. No management or supervisor activities will be shown under other tasks.

The remainder of this page is intentionally left blank.