Work Type Definition: Traffic Signal Design

I. Minimum requirements:

The work to be under the direct supervision of a Minnesota Professional Civil Engineer.

II. Description

Traffic Signal Design includes developing signal justification reports, project memoranda, appropriate forms and letters, supporting documentation, traffic signal plans, special provisions, engineer's cost estimate, and providing technical support and construction inspection for traffic signals construction projects. This includes all required data collection, field site investigation and surveys, coordination with power companies, traffic analysis and modeling, pole and footing structure analysis, civil and electrical engineering design, plan preparation, special provision preparation, cost estimation, any calculations and analysis required to produce the deliverables, and answering questions that arise during bidding and construction concerning the design. Traffic signals may be temporary systems used during construction projects or permanent installations.

II. Standards and specifications

Standards and specifications required for a project under this work type may include the following:

A. Plans will be delivered at 60 percent complete, 90 percent complete, and final stages, or as dictated by an associated road design project deliverables schedule.
B. The Plans, Special Provisions, and Engineer's Estimate will be in accordance with the standards listed above.
C. The deliverables will use the proper formats, symbols, abbreviations, etc.
D. The design will be adequate for the need while at the same time not over-designed.
E. Plan sheets must be provided in hard copy, PDF, and Microstation electronic files with proper level assignments.
F. Text documents must be provided in Microsoft Word format.
G. Spreadsheets must be provided in Microsoft Excel format.

III. Provided by Hennepin County

Information to be supplied by Hennepin County for a project may include the following:

A. Minnesota Statutes 169
B. MN Manual on Uniform Traffic Control Devices (MUTCD)

C. National Electrical Code
D. MnDOT Traffic Engineering Manual
E. MnDOT Standard Plates Manual
F. MnDOT Standard Specifications for Construction
G. American Association of State Highway & Transportation Officials (AASHTO) Green Book
H. AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and
Traffic Signals (2001)
I. MnDOT Traffic Signal Design Manual
J. MnDOT Signal Optimization and Timing Manual
K. MnDOT Computer Aided Design & Drafting (CADD) Traffic Signal Cell Library
L. Sample Signal Plans
M. Sample Signal Special Provisions
N. Project meetings and coordination
O. County furnished items, if available, including: base mapping, traffic counts, crash data, documentation of existing signal system, and house moving route information.
P. Design standards of City or State if not a Hennepin County-operated traffic signal.

IV. Provided by consultant

Deliverables to be supplied by the consultant for a project may include the following:

A. A Traffic Signal Design plan set may be for a stand-alone signal system project or for signals that are part of a larger grading/surfacing project, and includes the following:
   a. Title Sheet, Estimated Quantities Sheet, Detail Sheets, Intersection Layout Sheets, Field, Wiring Diagrams, Interconnect Layout Sheets, Mast Arm Signing and Pavement, Markings Sheets, “For Information Only” Sheets of Existing Signals, and Utilities Sheets, and — when construction is complete —”as-built” plans.
   The MnDOT Traffic Signal Design Manual provides a detailed description of the requirements for the plans.
B. Output includes Special Provisions defining special requirements for the construction or changes from the Standard Specifications for Construction.
C. Output also includes an Engineer’s Estimate, including “quantities tabulation” and an engineer’s estimate for construction cost.
D. Signal justification reports are described in the MnDOT Traffic Engineering Manual.
E. Forms and letters include Source of Power letter, Field Walk Checklist, Plan Review Checklist, etc.
F. Supporting documentation includes meeting minutes, correspondence, applicable calculations, etc.

Work Type Definition: Traffic Signal Operations

I. Description

Traffic Signal Operations includes developing traffic signal timing and coordination plans, and recommendations reports for signal timing, phasing and configuration. This includes all required data collection, field site investigation, software data entry and analysis, any calculations and analysis required to produce the deliverables, development of reports, installation of signal timing plans in the field, field adjustments to the timing plans, and analysis of measures of effectiveness.

II. Standards and Specifications

Standards and specifications required for a project under this work type may include the following:

A. The signal timing plans will be in accordance with the standards in the MN Manual on Uniform Traffic Control Devices (MUTCD), MnDOT Traffic Engineering Manual and MnDOT Signal optimization and Timing Manual.
B. The signal timing will be similar to comparable Hennepin County-timed traffic signals.
C. The signal timing will be effective for the traffic conditions while at the same time not overly complex.

III. Provided By Hennepin County

Information to be supplied by Hennepin County for a project may include the following:

A. MN Manual on Uniform Traffic Control Devices (MUTCD)
B. MnDOT Traffic Engineering Manual
C. MnDOT Signal Optimization and Timing Manual

IV. Provided by Consultant

Deliverables to be supplied by the consultant for a project may include the following:

A. Corridor signal operation analysis and recommendations reports.
B. Signal timing plans in hard copy and electronic format, including basic signal timings, coordination plans, time of day plans, and traffic responsive plans.
C. Electronic data, and hard copy outputs from Synchro software and other signal simulation and analysis software.
D. Field installation and adjustment of signal timing plans.