

Traffic signal design

Minimum requirements

Work must be completed under the direct supervision of a Minnesota licensed professional civil engineer.

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.

Standards and specifications

May include the following:

- Minnesota Statute 169
- MN Manual on Uniform Traffic Control Devices (MUTCD)
- National Electrical Code
- MnDOT Traffic Engineering Manual
- MnDOT Standard Plates Manual
- MnDOT Standard Specifications for Construction
- American Association of State Highway & Transportation Officials (AASHTO) Green Book
- American Association of State Highway & Transportation Officials (AASHTO) Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals (2001)
- MnDOT Traffic Signal Design Manual
- MnDOT Signal Optimization and Timing Manual

- All work completed must meet Hennepin County's CADD Standards, including the use of Bentley OpenRoads Designer Connect Edition.
- Plans will be delivered at 30 percent complete, 60 percent complete, 90 percent complete, and final stages, or as dictated by an associated road design project deliverables schedule.
- The plans, special provisions, and engineer's estimate will be in accordance with the standards listed above.
- The deliverables will use the proper formats, symbols, abbreviations, etc.
- The design will be adequate for the need while at the same time not over-designed.
- Plan sheets must be provided in PDF and Bentley OpenRoads Designer Connect Edition electronic files with proper level assignments.
- Text documents must be provided in Microsoft Word format.
- Spreadsheets must be provided in Microsoft Excel format.

Typical services

Project deliverables may include the following:

- 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:
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.
- Output includes special provisions defining special requirements for the construction or changes from the Standard Specifications for Construction.
- Output also includes an engineer's estimate, including "quantities tabulation" and an engineer's estimate for construction cost.
- Signal justification reports.
- Warrant analysis.
- Forms and letters include Source of Power letter, Field Walk Checklist, Plan Review Checklist, etc.
- Supporting documentation includes meeting minutes, correspondence, applicable calculations, etc.