

# **Suggested Traffic Signal Design Procedures Indefinite Delivery (ID) Contract Locations and Conventional Signal Contract Locations**

## **MDOT SUGGESTED TRAFFIC SIGNAL DESIGN PROCEDURE INDEFINITE DELIVERY INSTALLATION**

1. Designer is supplied with existing drawings (if available) and scope of services for design. Designer establishes a date for an on site meeting with personnel from Traffic Signals Unit, Regional T&S engineer, Regional electrician, the maintaining agency, others designated by the MDOT representative and the electrical contractor who is working on the Indefinite Delivery contract. MDOT will notify all utility companies of the pending work and will request their participation in this meeting to discuss any potential impacts to their facilities. All signal designs are to be box spans designs. At locations where available right of way, utility conflicts or cone of vision requirements could make a box span design difficult, contact the Traffic Signals Unit.
  
2. During the on site meeting, using the knowledge of attending representatives and/or the designers own investigations, the designer will obtain all necessary information to produce a traffic signal design Preliminary Plan. The preliminary plan should include the following:
  - a. Centerlines of all intersecting streets with offsets, and angles, if applicable.
  - b. Width of streets, lineage, lane use, parking, stop bars and crosswalks on each leg.
  - c. Curb radius, sidewalks, poles, pedestals, fire hydrant, right-of-way, buildings and any other existing above-ground facilities.
  - d. All existing traffic signal equipment such as controller, traffic signal heads, pedestrian signals, and all pole/pedestal supports.
  - e. Location of utilities as supplied by industry representatives.
  - f. Posted speeds for all approaches.
  - g. Location of supporting structures, both poles and pedestals.
  - h. Location of final traffic and pedestrian head displays.
  - i. Material list showing all appropriate pay items and quantities.
  - j. Span calculation POCH diagrams.
  - k. Location, size and number of detection loops, if any.
  - l. All appropriate notes for the utility company, railroad and Department of Consumer and Industry Services.

- m. Follow basic drafting principles for orientation of plan (north is up or to the right). For designs to be included with road projects, follow north orientation as designated by the road plans.
3. Obtain soil boring information at steel pole or mast arm standard foundations. In some cases MDOT is able to provide soil boring information and the designer will be notified of MDOT's availability to provide that information. If special foundations are necessary, designer will work with MDOT's Geo-Technical Unit
4. Designer submits electronic and paper copies of preliminary plans for review by MDOT personnel.
5. Designer revises preliminary plans based on MDOT's review.
6. Provide paper copies and email electronic files to MDOT's Traffic Signals Unit of the final plans and engineer's estimate based on bid prices of the ID contract.
7. MDOT's final review of the plans and engineer's estimate.
8. Make final corrections and email electronic file of design to the Traffic Signals Unit. Include all supporting documentation (engineer's estimate, radio survey information, etc) with the submittal.

**MDOT**  
**SUGGESTED TRAFFIC SIGNAL DESIGN PROCEDURE**  
**LARGE MULTI-LOCATION PROJECT**

1. Initial site visit by designer using drawings which have been supplied, if available. Information to be gathered to produce a useable drawing for the first field meeting. This drawing should contain the following:
  - a. Centerlines of all intersecting streets with offsets, and angles, if applicable.
  - b. Width of streets, lineage, lane use, parking, stop bars and crosswalks on each leg.
  - c. Curb radius, sidewalks, poles, pedestals, fire hydrant, right-of-way, buildings and any other existing above-ground facilities.
  - d. All existing traffic signal equipment such as controller, traffic signal heads, pedestrian signals, and all pole/pedestal supports.
2. Prepare a drawing (1"=30') with all the above features shown. This drawing is to be used at the first on-site meeting with copies available to all attending representatives.
3. MDOT sends existing designs of each location and requests information from any utility company that may be located in the design area. This information will be forwarded to the designer to be used in the design to avoid conflicts, aerial and underground, with proposed signal structures. If the design cannot be adjusted to avoid utility conflicts, the designer will attend a utility coordination meeting to resolve any conflicts. This may require any or all of the following: exposure of underground utilities, special foundation design, and visit to the site to determine new support placement or having a utility move their facilities. All this work must be completed under the direction of the MDOT's Traffic Signals Unit representative and Region Utility Engineer (if necessary).
4. Arrange an on-site meeting with representatives from MDOT's Traffic Signals Unit, the maintaining agency, local utility company, and possibly others designated by the MDOT representative.
5. At the on-site meeting, using the knowledge of attending representatives and/or the designers own investigations, the designer will obtain all necessary information to produce a traffic signal design Preliminary Plan which shows the following:
  - a. Removal plan with appropriate bid items
  - b. Removal wiring diagram showing the routing of all traffic signal wiring through conduit, manholes, handhold and each traffic/pedestrian signal head numbered.

- c. Installation plan drawing to 1"=30' showing signal head placement, supporting structure, useable existing conduit, new conduit, handholes, pedestrians signal heads, controllers, mounting details and any necessary phasing diagrams or span calculation diagrams and reinstallation of any other items disturbed by this design such as street lights, etc.
  - d. All signal designs must be box span configuration. At locations where available right of way, utility conflicts and/or cone of vision requirements could make a box span design difficult, contact the Traffic Signals Unit for direction.
  - e. Posted speeds for all approaches.
6. Review Preliminary plans by MDOT personnel.
7. Designer modifies preliminary plans based on recommendations.
8. Provide paper copies for Traffic Signals Unit, two sets to the maintaining agency for review.
9. Schedule necessary on-site visits to resolve any conflicts with all parties involved.
10. Prepare preliminary final plans with any changes which occurred due to utility conflicts to show the following:
  - a. Location of supporting structures, both poles and pedestals.
  - b. Location of final traffic and pedestrian head displays.
  - c. Material list showing all appropriate pay items and quantities.
  - d. Span calculation POCH diagrams.
  - e. All appropriate notes for the utility company, railroad and Department of Consumer and Industry Services.
  - f. Follow basic drafting principles for orientation of design plan (north is up or to the right within reason). For designs to be included with road projects, follow north orientation as designated by the road plans.
11. Obtain soil boring information at steel pole or mast arm standard foundations.
12. Provide MDOT with set of preliminary final plans and subsurface information for review by MDOT's Traffic Signals Unit and Geo-Technical Unit to determine the need for special foundations if appropriate.
13. Revise plans based on MDOT's review. Prepare final special provisions, specifications, measurement and payment items and engineer's estimate.
14. Provide paper copies and email electronic files of the final plans, proposal and engineer's estimate to MDOT's Traffic Signals Unit. Remove item code number from final plan submittal.

15. MDOT's final review of the plans, proposal and engineer's estimate.
16. Make final corrections and submit mylar plans, proposal and engineer's estimate. Provide CD of electronic files of designs to Traffic Signals Unit. As of September 2006 all designs will be done via E proposals, so designs must be submitted electronically in PDF format.