GENERAL

All traffic signal systems shall be designed in accordance with the Texas Manual on Uniform Traffic Control Devices (TMUTCD) latest edition and acceptable engineering practices to ensure a safe and efficient operation.

All traffic signal systems shall be designed to meet the latest and/or state-of-the-art operational and functional features for traffic signal system required by Harris County.

All traffic signal systems shall be designed in accordance with Harris County’s latest specifications and standard drawings.

All traffic signal projects shall include a Topographic Surveys (Category 6 Condition 2) and Existing ROW Map (Category 1a Condition 2). All proposed ROW maps shall be Category 1b Condition 2; TCEs do not require proposed ROW maps.

The basic set of traffic signal system construction drawings shall include, but is not limited to the following categories:

1. Title Sheet
2. Express Review Sheet
3. General Notes Sheet
4. Basis of Estimate Sheet(s)
5. Existing Conditions Sheet(s)
6. Proposed Paving Plan Sheet(s) – if required
7. Proposed Traffic Signal Layout Sheet(s)
8. Proposed Traffic Signal Elevation Sheet(s)
9. Proposed Signing and Pavement Marking Sheet(s) – if required
10. Proposed Traffic Signal Interconnect Sheet(s) – if required
11. Proposed Traffic Control Sheet(s) – if required
12. Standard Drawing Detail Sheet(s)

Unless otherwise specified, all drawings are to be 11” x 17” in size at a 1” = 40’ scale.

Typical project milestones for traffic signal system design requirements are the following:

- Scoping Meeting(s)
- Field Meeting(s)
- First Submittal Design Drawings
- Second Submittal Design Drawings (Signed and Sealed)
- Final Submittal Drawings (Signed and Sealed)
SCOPING MEETING(S)

Scoping meeting(s) will be conducted with the Project Engineer(s) to discuss proposed traffic signal system design requirements. The Project Engineer(s) is required to perform the following tasks prior to scoping meeting.

- Review traffic signal study and recommendations.
- Verify type of intersection control equipment.
- Visit the project site and collect photographs.

FIELD MEETING

Project Engineer(s) is required to conduct a field meeting at the project location(s) with representatives from Harris County Engineering Department, CenterPoint Service Consultant and other required representatives. Project Engineer shall provide working drawings at the field meeting showing, as a minimum, the following:

2. Utilities.
3. Proposed wheelchair ramps, pads, and sidewalks - if required.
4. Proposed crosswalks - if required.
5. Proposed service outlet location.
6. Proposed controller cabinet location.
7. Proposed traffic signal pole locations.
8. Proposed pedestrian signal pole locations - if required.
10. Proposed pull box and ground box locations.
11. Proposed vehicular signal head locations.
12. All proposed overhead signing.
13. Proposed advance warning signs and flashers - if required.
14. Proposed conduit, including bore locations.
15. Proposed stop line and crosswalk locations.
16. For projects with road widening, construction phasing for traffic control should be included for a discussion in the field meeting.
17. Any construction easements or right-of-entry that may be needed.
18. Sight Triangles

NTP 1 SUBMITTAL

Project Engineer(s) shall provide a Cost Estimate of all long lead items (NTP 1) after the field walk (to be determined during scoping). Long lead items to include (but not limited to) the furnishing of: Strain Poles, Mast Arms, Luminaire Arms, Pedestrian Heads and Push Buttons, Signal Heads, Lighted Sign Assemblies, and all Controllers and Cabinets. Long lead items should also include the furnish and installation of a meter pole (if required). Based on project requirements, a second separate NTP 1 (NTP 1b) may be required for utilization of smart buy.
FIRST, SECOND, FINAL SUBMITTAL DESIGN DRAWINGS

All submittals shall be in PDF format and include the following items:

- Construction Plans
- Utility Conflict Table
- Cost Estimate (NTP’s), PDF and Excel Format

Traffic signal system construction drawings shall consist of, but are not limited to, the following:

1. Title Sheet (Harris County Standard Cover Sheet with Utility Signatures)
   - Project title including road names and road log numbers.
   - Funding (UPIN Number) for construction.
   - Names and titles for County Judge, each Commissioner, County Engineer, and County Auditor.
   - Site map with North arrow.
   - Index of drawings.
   - Harris County Permits Signature Block.
   - Utility Signatures.
   - Name and seal of Engineer.

2. Basis of Estimate Sheet(s)
   - Complete list of all construction items related project with associated quantities (including all NTP 1 and NTP 2 items).
   - All construction items shall reference a specification, construction contract and/or drawings.
   - Title block completely filled in, sheet is numbered.
   - Name and seal of Engineer.

3. Existing Condition Sheet(s)
   - Legend.
   - North arrow.
   - Utility notes
   - Pavement and Construction Joints
   - Existing right-of-way and easements.
   - Existing roadway geometrics (including sidewalks, ADA ramps, driveways, median openings, inlets, manholes, etc.).
   - Existing utility locations.
   - Existing signing and pavement markings.
   - Any existing signal equipment.
   - Use of match lines and not break lines – if applicable.
   - Existing speed limit on roadways.
4. Proposed Paving Plan Sheet(s) – if required

- Legend.
- North arrow.
- Utilities, utility notes, special notes.
- Right-of-way and easement(s).
- Show any easement(s) or right-of-entry(s) that may be needed.
- Centerline or baseline description.
- Location of proposed improvement areas.
- Typical roadway section(s).
- Median nose section
- Dimensions for any median or left turn lane improvements (including stations and offsets)
- ADA facilities.
- Block Sodding (placed around ADA ramps and adjacent to proposed roadway improvements as needed).

- Plan View
  - Single bank only.
  - Storm sewer size, alignment grade, including horizontal and vertical ties.
  - Utility lines indicating size, horizontal and vertical alignments and description. Any utility conflicts should be notified.
  - Plan view of proposed and existing roadside ditches, drainage improvements, and outfalls.
  - Proposed pavement alignment and profile.
  - Only if directed by HCED will a profile view will be required
  - Information regarding any clearing or grubbing required

- Title block completely filled in, sheet is numbered.
- Any reference to a different sheet should have sheet numbers filled in.
- Name and seal of Engineer.

5. Proposed Traffic Signal Layout Sheet(s)

- Legend.
- North arrow.
- Utilities, utility notes, special notes.
- Right-of-way and easements.
- Centerline or baseline description.
- Roadway geometrics (including sidewalks, ADA ramps, driveways, median openings, inlets, manholes, etc.).
- Pavement markings.
- Poles – including signal, pedestrian, electrical service, etc.
- Luminaires.
• Vehicular signal head locations.
• Vehicle detection placement (call out distance from stop bar).
• Pull boxes and ground boxes.
• Conduit runs.
• Leader call-outs for all conduit and wire runs.
• Phasing diagram.
• Poles and controller cabinet location table.
• Vehicle detector schedule.
• Signal head schedule.
• Electrical schedule.
• Sign details.
• Controller and controller cabinet description.
• Advance signal signing and/or flashers - if required.
• Title block completely filled in, sheet is numbered.
• Any reference to a different sheet should have sheet numbers filled in.
• Show any easements or right-of-entry that may be needed.
• Name and seal of Engineer.

6. Proposed Traffic Signal Elevation Sheet(s)

• Legend.
• Special Notes.
• Elevation views for all approaches including roadway section view.
• Show all conduits in foundations and call out what conduit runs to.
• Title block completely filled in, sheet is numbered.
• Any reference to a different sheet should have sheet numbers filled in.
• Name and seal of Engineer.

7. Permanent Signing and Pavement Marking Sheet(s)

• Legend.
• North arrow.
• All proposed pavement markings.
• All proposed signing.
• Annotation of proposed Lane widths
• Title block completely filled in, sheet is numbered.
• Any reference to a different sheet should have sheet numbers filled in.
• Name and seal of Engineer.

8. Signal Interconnect Sheet(s) – if required

• Legend.
• North arrow.
• 1" = 100’ scale on half size (11” x 17”) layout - unless otherwise specified.
• Utilities, utility notes, special notes.
• Right-of-way and easements.
• Centerline or baseline description.
• Show all poles, to be attached, conduits, communication ground boxes, utilities, roadway features, driveways, cross streets and etc.
• All required details and elevation details.
• Title block completely filled in, sheet is numbered.
• Any reference to a different sheet should have sheet numbers filled in.
• Show any easements or right-of-entry that may be needed.
• Name and seal of Engineer.

9. Traffic Control Plan Sheet(s)

• Phasing Overview Sheet(s) – if required
  o Legend.
  o North arrow.
  o Should show each phase of construction for project limits.
  o Step description for each step in each phase.
  o A typical cross section for each phase.
  o Detour or temporary pavement should be shown constructed as a phase.
  o See Harris County Traffic Control Guidelines for specific details required for traffic control drawings.
  o Title block completely filled in, sheet is numbered.
  o Any reference to a different sheet should have sheet numbers filled in.
  o Name and seal of Engineer.

• Advance Signing Sheet(s) – if required
  o Legend.
  o North arrow.
  o Should show each phase of construction for project limits.
  o This is an optional sheet used to show all advance construction signing for the project. This includes all side street signing and supersedes the need for showing advance signing on each individual traffic control sheet.
  o Show Advance signing for major street and side streets.
  o Call out distance for placement of signs (as per TMUTCD).
  o Show sign legend (all sign numbers must be called out).
  o Show all necessary construction notes.
  o Show existing posted speed.
  o See Harris County Traffic Control Guidelines for specific details required for traffic control drawings.
  o Title block completely filled in, sheet is numbered.
  o Any reference to a different sheet should have sheet numbers filled in.
  o Name and seal of Engineer.
• Individual Traffic Control Sheet(s) – if required
  o Legend.
  o North arrow.
  o One construction phase per sheet.
    o 1" = 100' scale on half size (11" x 17") layout - unless otherwise specified.
  o Steps to be done in individual phase should be shown on a separate sheet if room is not available on that individual phase sheet.
  o Centerline or baseline description.
  o Show storm sewers to be constructed.
  o Typical roadway section(s).
  o Show all striping (in cross section as well).
  o Ten foot minimum travel lanes to be maintained at all times when possible.
  o Maximum of two foot shift through an intersection.
  o Proposed and existing roadway should be distinguishable.
  o Show detour pavement (distinguishable from proposed and existing pavement).
  o All construction signing and channeling devices.
  o Maintain left-turn lanes at signalized intersections.
  o See Harris County Traffic Control Guidelines for specific details required for traffic control drawings.
  o Title block completely filled in, sheet is numbered.
  o Any reference to a different sheet should have sheet numbers filled in.
  o Name and seal of Engineer.

• Temporary Traffic Signal Sheet(s) – if required
  o Legend.
  o North arrow.
  o 1" = 100' scale on half size (11" x 17") layout - unless otherwise specified.
  o Applicable traffic control phase and/or step in background.
  o Right-of-way and easements.
  o Centerline or baseline description.
  o Pavement markings.
  o Poles – including signal, pedestrian, electrical service, etc.
  o Luminaires.
  o Vehicular signal head locations.
  o Vehicle detection placement.
  o Pull boxes and ground boxes.
  o Conduit runs.
  o Leader call-outs for all conduit and wire runs.
  o Phasing diagram.
  o Signal head schedule.
  o Electrical schedule.
  o Sign details.
o See Harris County Traffic Control Guidelines for specific details required for traffic control drawings.
o Title block completely filled in, sheet is numbered.
o Any reference to a different sheet should have sheet numbers filled in.
o Name and seal of Engineer.

- Detour Sheet(s) – if required
  o Legend.
o North arrow.
o Should show a map of area.
o Detour signing.
o Does not have to be to scale.
  o See Harris County Traffic Control Guidelines for specific details required for traffic control drawings.
  o Title block completely filled in, sheet is numbered.
  o Any reference to a different sheet should have sheet numbers filled in.
o Name and seal of Engineer.

10. Standard Drawing Detail Sheet(s)

- Include all applicable standard drawings
- Add revisions as necessary with name and seal of Engineer
- Title block completely filled in, sheet is numbered