

6500000 VEHICULAR TRAFFIC SIGNAL ASSEMBLIES
COMMENTS FROM INTERNAL/INDUSTRY REVIEW

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Comments: (5-31-17, Internal)

These modifications affects the APL by modifying existing product requirements and creating new APL categories in 650-3.13. These issues will need to be resolved with Product Evaluation. I do not know the extent of the change at this time.

Response: These modules are already listed on the APL under “Light Rail Transit Signal” This product type should be modified to “Transit Signals”.
No change made.

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Comments: (6-8-17)

650-2.2.6.1 Seems to be a statement missing. Maybe it should read “...and visors may be used provided...”?

Response: Agree. Subarticle will be deleted.
Change made.

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Comments: (6-9-17)

1. 650-2.2, Strike the added phrase, "when used for alignment".

Response: Change will be made to revise requirement.
Change made.

2. 650-2.2 As written, the Spec still requires a 72-tooth connection for all signal head assemblies. Adding the words, "when utilized for alignment" does not remove that requirement. Need to re-word this section.

Response: Change will be made to revise requirement.
Change made.

3. Why not simply change this to “Plastic Signal Housings and Visors”?

oxidation must not occur within the normal life expectancy under typical installation conditions.¶
 → ~~650-2.2.6.Polycarbonate Signal Housings and Visors:~~ Construct signal housing assembly, door, and visors of UV-stabilized polycarbonate plastic with a minimum thickness of 0.1 inches, plus or minus, 0.01 inches, with the following physical properties:¶
 → → → → 1. Specific Gravity: 1.17 minimum, as per ASTM D792¶
 → → → → 2. Vicat Softening Temperature: 305-325 F (152-163 C), as per ASTM D1525¶

Response: Change will be made.
 Change made.

4. Why not just strike the word “polycarbonate”? This would eliminate the need for the addition of 650-2.2.6.1

oxidation must not occur within the normal life expectancy under typical installation conditions.¶
 → ~~650-2.2.6.Polycarbonate Signal Housings and Visors:~~ Construct signal housing assembly, door, and visors of UV-stabilized polycarbonate plastic with a minimum thickness of 0.1 inches, plus or minus, 0.01 inches, with the following physical properties:¶
 → → → → 1. Specific Gravity: 1.17 minimum, as per ASTM D792¶
 → → → → 2. Vicat Softening Temperature: 305-325 F (152-163 C), as per ASTM D1525¶

Response: 2.2.6.1 will be deleted. References to polycarbonate will be changed to plastic.
 Change made.

5. 650-2.2.6.1: The first sentence has no verb and the second sentence contradicts itself. Why not just make 650-2.2.6 apply to ALL plastic housings and strike the proposed addition if 650-2.2.6.1?

as per ASTM D671¶
 → → → ~~650-2.2.6.1: Alternative Plastics: Alternative plastics to construct traffic signal housings and visors provided the plastic meets or exceeds the requirements of 650-2.2.6.¶~~
 → → → → ~~Signals not meeting the structural requirements of 650-2.2.6 must have a requisite signal head design assembly meeting or exceeding the structural requirements of 650-2.2.6.¶~~

Response: 2.2.6.1 will be deleted. References to polycarbonate will be changed to plastic.
 Change made.

6. 650-2.2.7: Who makes the decision if louvers are required? We’re going from mandating them to making them an option. Will this be provided in the plans?

→ → → ~~Provide louvers for all backplates. If louvers are provided, Louver~~
 orientation must be vertical on sides and horizontal on top and bottom of the backplate and must be at least 1/2 inch from the inner and outer edge of the backplate panel. Universal backplates must fit all traffic signals listed on the APL.¶

Response: Since both louvered and non-louvered backplates will be allowed, this decision will be left up to the contractor unless a choice is specified in the Plans.
 No change made.

7. 650-2.2.7: Where is this defined? What other material requirements? Are they the same requirements as for the signal housing and visor?

marked in accordance with 650-2.1, on the long sides of the backplate.¶
→ → → Backplates with retroreflective borders must be constructed of aluminum or non-gassing plastics. Use only Type IV yellow retroreflective sheeting listed on the APL.

Response: Change will be made to remove non-gassing.
Change made.

5. 650-3.8: Why are we removing this requirement?

→ ~~650-3.8 Backplates:~~ Install ~~louvered~~ backplates on all signal head assemblies.¶
→ ~~650-3.9 Sealing Installed Signal Head Assembly:~~ Ensure that the installed signal head assembly is sealed to exclude dust and moisture. Drill two 1/4 inch drain holes in the bottom of

Response: Testing performed to-date could not confirm that louvers provided enough/any benefit to continue requiring louvers on all backplates.
No change made.

6. 650-3.13: Is this term define somewhere?

~~Diode (LED) Circular Signal Supplement.¶~~
→ ~~650-3.13 Transit Signal Heads:~~ For transit signal priority at signalized intersections with bus queue jumper lanes, install 12 inch two-lens signal head assembly per MUTCD, Figure 8C-3. The 12 inch LED optical unit indications must comply with MUTCD, Section 8C.11 and

Response: This term is defined in the Manual on Uniform Traffic Control Devices (MUTCD).
No change made.

5. 650-3.13: What is this?

~~as illustrated in Figure 8C-3. The 12 inch LED optical unit shall conform to the environmental, transient protection, operating voltage range and electronic noise requirements requirements of the ITE's Performance Specification, Vehicle Traffic Control Signal Heads-Light Emitting Diode (LED) Circular Signal Supplement regarding environmental requirements, transient protection, operating voltage range, and electronic noise. The indication may be pixilated in appearance. The indication (bar symbol) shall measure 1-1/2 inches wide by 9 inches long and shall be omnidirectional. It can be displayed in any angle of orientation from horizontal to vertical.¶~~

Response: These are national standards published by the Institute of Transportation Engineers (ITE) who sets standards for these types of devices. These specific standards give the minimum performance requirements for light emitting diode (LED) vehicle traffic signal modules while in service.
No change made.

6. 650-3.13: "Pixilated" is Strike this sentence.

~~as illustrated in Figure 8C-3. The 12¹/₂ inch LED optical unit shall conform to the environmental, transient protection, operating voltage range and electronic noise requirements requirements of the ITE's Performance Specification, Vehicle Traffic Control Signal Heads-Light Emitting Diode (LED) Circular Signal Supplement regarding environmental requirements, transient protection, operating voltage range, and electronic noise. The indication may be pixilated in appearance. The indication (bar symbol) shall measure 1-1/2 inches wide by 9 inches long and shall be omnidirectional. It can be displayed in any angle of orientation from horizontal to vertical.~~

Response: Change will be made to remove sentence.
Change made.

7. 650-3.13: ?? "It must be

~~as illustrated in Figure 8C-3. The 12¹/₂ inch LED optical unit shall conform to the environmental, transient protection, operating voltage range and electronic noise requirements requirements of the ITE's Performance Specification, Vehicle Traffic Control Signal Heads-Light Emitting Diode (LED) Circular Signal Supplement regarding environmental requirements, transient protection, operating voltage range, and electronic noise. The indication may be pixilated in appearance. The indication (bar symbol) shall measure 1-1/2 inches wide by 9 inches long and shall be omnidirectional. It can be displayed in any angle of orientation from horizontal to vertical.~~

Response: Sentence reworded. The signal has different meanings based on the orientation of the signal/bar. The signal "must" be capable of being orientated and "may" be displayed in any orientation.
Change made.

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Comments: (6-12-17)

1. 650-2.2.6.1 Alternative Plastics:

~~→ → → **650-2.2.6.1 Alternative Plastics:** Alternative plastics to construct traffic signal housings and visors provided the plastic meets or exceeds the requirements of 650-2.2.6.¶
→ → → → Signals not meeting the structural requirements of 650-2.2.6 must have a requisite signal head design assembly meeting or exceeding the structural requirements of 650-2.2.6.¶~~

This new subarticle allows other plastics to be used for signal housings and visors as long as it meets the requirements of 650-2.2.6, which requires that a UV stabilized polycarbonate plastic be used.

If you really want to allow "other plastics", the language should read:

→ → → → **650-2.2.6.1 Alternative Plastics:** Alternative plastics may be used to construct traffic signal housings and visors provided the plastic is UV stabilized and meets or exceeds the thickness and physical property requirements of 650-2.2.6.¶
→ → → → Signals not meeting the structural requirements of 650-2.2.6 must have a requisite signal head design assembly meeting or exceeding the structural requirements of 650-2.2.6.¶

Are there other plastics that can meet these requirements? If not, adding this subarticle to the language serves no purpose.

Response: Section will be deleted.
Change made.

2. 650-2.2.6.1: The second paragraph is confusing, please explain what it means?

Response: Section will be deleted.
Change made.

3. 650-2.2.7 Backplates (Standard and Retroreflective): The Design Manual (current and draft) requires that **louvered** backplates are to be installed on all signal heads for all approaches.

650-2.2.7 Backplates (Standard and Retroreflective): Backplates may be constructed of either aluminum or **polycarbonate plastic**. Minimum thickness for aluminum backplates is 0.060 inch and the minimum thickness for **polycarbonate plastic** backplates is 0.120 inch. The required width of the top, bottom, and sides of backplates must measure between five to six inches. Color of backplates must be black in accordance with 650-2.2.5. Backplate thickness measurement must not include the retroreflective sheeting thickness.
Provide For backplates **that are mechanically attached, provide with a** minimum of four corner mounting attachment points per signal section (for example, a three-section signal assembly would have 12 mounting points). Attachment points must not interfere with the operation of traffic signal section doors. Backplate outside corners must be rounded and all edges must be de-burred.
Provide louvers for all backplates if louvers are provided. Louwer orientation must be vertical on sides and horizontal on top and bottom of the backplate and must be at least 1/2 inch from the inner and outer edge of the backplate panel. Universal backplates must fit all traffic signals listed on the APL.

Current 2017 Design Manual: Chapter 7 Traffic and ITS Design.

7.4.15 Backplates
Install **louvered** backplates on all signal sections for all approaches. Retroreflective backplate borders are required for all backplates where the posted speed for the approach is 45 mph or greater. Retroreflective borders are recommended for all backplates where the posted speed for the approach is less than 45 mph.

Draft 2018 Design Manual: Chapter 232 Signalization.

232.1.5 Backplates
Install **louvered** backplates on signal sections for all approaches.
Install retroreflective backplate borders for approach posted speeds of 45 mph or greater. Retroreflective borders are recommended for approach posted speeds of less than 45 mph.

Response: The Design Manual will be updated to removing references to louvers.
No change made.

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Comments: (6-13-17)

650-2.2.6.1 Alternative Plastics: This sentence isn't clear to me - Alternative plastics to construct traffic signal housings and visors provided the plastic meets or exceeds the requirements of 650-2.2.6. Should it read "Alternative plastics may be used to construct traffic signal housings and visors provided the plastic meets or exceeds the requirements of 650-2.2.6."?

Response: Subarticle will be deleted.
Change made.
