

ORIGINATION FORM

Date: November 9, 2012

Originator: Jeff Morgan

Contact Information:

Traffic Engineering and Operations, Traffic Systems Section
850-410-5600

Specification Title:

IN-ROADWAY LIGHTS

Specification Section, Article, or Subarticle Number: 654

Why does the existing language need to be changed? This is a new specification to establish FDOT minimum requirements for In-Roadway Lights used to warn users that they are approaching a condition on or adjacent to the roadway that might require them to slow down and/or stop. The principle use of In-Roadway Lights is to provide additional warning to road users at certain marked crosswalks.

Summary of the changes: The changes create a new section to define minimum requirements for In-Roadway Lights.

Are these changes applicable to all Department jobs? If not, what are the restrictions?

This requirement is applicable to all jobs that include In-Roadway Lights.

Will these changes result in an increase or decrease in project costs? If yes, what is the estimated change in costs? Inclusion of In-Roadway Lights in crosswalks will increase the cost of the crosswalk. Typical system cost is estimated to range from \$20-50K

With who have you discussed these changes? In-house stakeholders (Traffic Engineering and Operations Office staff, Specifications Office staff, C-team).

What other offices will be impacted by these changes? Specifications and Estimates, Construction, Maintenance, and Roadway Design.

Are changes needed to the PPM, Design Standards, SDG, CPAM or other manual? Yes. Coordination of changes is an ongoing effort of the Consolidation of Products and Specifications (COPS) working group in conjunction with the C-team.

Is a Design Bulletin, Construction Memo, or Estimates Bulletin needed? Yes.

Contact the State Specifications Office for assistance in completing this form.

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ANANTH PRASAD, P.E.
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MEMORANDUM

DATE: May 15, 2013

TO: Specification Review Distribution List

FROM: Trey Tillander, Manager State Specifications and Estimates Office

SUBJECT: Proposed Specification: **6540000 Midblock Crosswalk Enhancement Assemblies.**

In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change.

This change was proposed by Jeff Morgan, of the State Traffic Engineering and Operations Office, to establish FDOT minimum requirements for In-Roadway Lights, Rectangular Rapid Flashing Beacon, and Pedestrian Hybrid Beacon used to warn users that they are approaching a condition on or adjacent to the roadway that might require them to slow down and/or stop. The principle use of In-Roadway Lights is to provide additional warning to road users at certain marked crosswalks.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or to my attention via e-mail at SP965TT or trey.tillander@dot.state.fl.us. Comments received after **June 12, 2013**, may not be considered. Your input is encouraged.

TT/cah
Attachment

**MIDBLOCK CROSSWALK ENHANCEMENT ASSEMBLIES.
(REV 5-15-13)**

PAGE 808. The following new Section is added after Section 653:

**SECTION 654
MIDBLOCK CROSSWALK ENHANCEMENT ASSEMBLIES**

654-1 Description.

Furnish and install midblock crosswalk enhancement assemblies.

654-2 Materials.

Use midblock crosswalk enhancement assemblies listed on the Department's Approved Product List (APL).

654-2.1 Classification of types: *Midblock crosswalk enhancement assemblies are classified as the following types: In-roadway Light Assemblies, Rectangular Rapid Flashing Beacon Assemblies, (RRFB), and Pedestrian Hybrid Beacon Assemblies.*

654-2.2 In-roadway Light Assemblies: *In-roadway light assemblies must meet the physical and operational requirements of the latest edition of the MUTCD, Chapter 4N.*

In-roadway light assemblies shall be normally dark, initiate operation only upon pedestrian actuation via a pedestrian pushbutton, and cease operation at a predetermined time after the pedestrian actuation or, with passive detection, after the pedestrian clears the crosswalk. The duration of the predetermined period shall be programmable and capable of matching the pedestrian clearance time for pedestrian signals as determined by MUTCD procedures. The timer that controls flashing must automatically reset each time a pedestrian call is received.

654-2.3 Rectangular Rapid Flashing Beacon Assemblies: *RRFB assemblies must include two rapidly and alternately flashed rectangular yellow indications having LED-array based pulsing light sources. Each rectangular yellow indication must be a minimum of five inches wide by two inches high.*

654-2.3.1 RRFB Sign Assemblies: *RRFB assemblies must be attached to a W11-2 (Pedestrian) or S1-1 (School) crossing warning sign with a diagonal downward arrow (W16-7p) plaque, a single column ground sign post, and attachment hardware in accordance with Design Standards, Index No. 11860. The two RRFB indications shall be aligned horizontally, with the longer dimension horizontal and with a minimum space between the two indications of approximately 7 inches measured from inside edge of one indication to inside edge of the other indication. The outside edges of the RRFB indications, including any housings, shall not project beyond the outside edges of the W11-2 or S1-1 sign.*

654-2.3.2 Beacon Flashing Requirements: *When activated, the two yellow indications in each RRFB shall flash in a rapidly alternating "wig-wag" flashing sequence (left light on, then right light on).*

The RRFB flash rate shall be 70 to 80 periods of flashing per minute. Each beacon shall have alternating flash rates, but approximately equal periods of rapid pulsing light emissions and dark operation. During each of its 70 to 80 flashing periods per minute, the yellow indications on the left side of the RRFB shall emit two slow pulses of light after which the yellow indications on the right side of the RRFB shall emit four rapid pulses of light followed by

a long pulse. The flash rate of each individual yellow indication, as applied over the full on-off sequence of a flashing period of the indication, shall not be between 5 and 30 flashes per second, to avoid frequencies that might cause seizures.

The light intensity of the yellow indications shall meet the minimum specifications of Society of Automotive Engineers (SAE) standard J595 for Class 1 (Directional Flashing Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles).

654-2.3.3 RRFB Operation: *RRFB assemblies shall be normally dark, initiate operation only upon pedestrian actuation via a pedestrian pushbutton, and cease operation at a predetermined time after the pedestrian actuation or, with passive detection, after the pedestrian clears the crosswalk. The duration of the predetermined period shall be programmable and capable of matching the pedestrian clearance time for pedestrian signals as determined by MUTCD procedures. The timer that controls flashing must automatically reset each time a pedestrian call is received.*

All RRFBs associated with a single crosswalk (including those with an advance crossing sign, if used) shall simultaneously commence operation of their alternating rapid flashing indications and shall cease operation simultaneously.

RRFBs must include an instruction sign with the legend PUSH BUTTON TO TURN ON WARNING LIGHTS mounted adjacent to or integral with each pedestrian pushbutton.

A small light directed at and visible to pedestrians in the crosswalk must be installed integral to the RRFB or push button to give confirmation that the RRFB is in operation.

654-2.4 Pedestrian Hybrid Beacon Assemblies: *Pedestrian hybrid beacon assemblies must meet the physical and operational requirements of the latest edition of the MUTCD, Chapter 4F. The cabinet, signals, controller, pedestrian detectors, and other traffic control devices used to create a pedestrian hybrid beacon assembly must be listed on the APL.*

654-2.5 Cabinets, Housings, and Hardware: *Cabinets used as part of the midblock crosswalk enhancement assembly must meet the applicable criteria of Section A676 of the MSTCSD.*

All housings other than approved cabinets must be powder coat painted dull black (Federal Standard 595A-37038) with a reflectance value not exceeding 25 percent as measured by American Society for Testing and Material E1347. Cabinets and housings must prevent unauthorized access.

Pole-mount assemblies shall allow installation on 4-1/2 inch outer diameter posts.

Ensure all assembly hardware, including nuts, bolts, external screws and locking washers less than 5/8 inch in diameter, are Type 304 or 316 passivated stainless steel. Stainless steel bolts, screws, and studs must meet ASTM F593. Stainless steel nuts must meet ASTM F594. All assembly hardware greater than or equal to 5/8 inch in diameter must be galvanized. Carbon steel bolts, studs, and threaded rod must meet ASTM A307. Structural bolts must meet ASTM A325.

654-2.6 Electrical Specifications: *Equipment must operate on solar power or a nominal voltage of 120 volts alternating current (VAC). If the device requires operating voltages of less than 120 VAC, supply the appropriate voltage converter. Solar powered systems must be designed to provide 10 days of continuous operation without sunlight. Solar powered systems*

must automatically charge batteries and prevent overcharging and over-discharging. Solar powered systems must include a charge indicator and AC/DC battery charger.

654-2.7 Environmental Specifications: *All electronic assemblies shall operate as specified during and after being subjected to the transients, temperature, voltage, humidity, vibration, and shock tests described in National Electrical Manufacturers Association (NEMA) TS2, 2.2.7, 2.2.8, and 2.2.9. Electronics must meet Federal Communications Commission (FCC) Title 47, Subpart B, Section 15.*

654-3 Installation Requirements.

Restore any areas impacted by the installation of the crosswalk enhancement assembly to original condition unless otherwise shown in the Plans.

654-4 Warranty.

Ensure the midblock crosswalk enhancement assembly has a manufacturer's warranty covering defects for two years from the date of final acceptance in accordance with 5-11 and Section 608. Ensure the warranty includes providing replacements within 10 calendar days of notification for defective parts and equipment during the warranty period at no cost to the Department or the maintaining agency.

654-5 Method of Measurement.

654-5.1 General: *All midblock crosswalk assemblies shall include all materials, equipment, and labor necessary for a complete and accepted installation.*

654-5.2 In-Roadway Light Assembly: *The in-roadway light assembly includes in-roadway lights, signs, sign support structures, cabinet, electronics, wiring, and pedestrian detectors for a complete crossing. Solar panels are included in the cost of the assembly, when shown in the plans.*

654-5.3 Rectangular Rapid Flashing Beacon Assembly: *The RRFB assembly includes a pair of lights for each approach, signs, sign support structure, cabinet, electronics, wiring, and pedestrian detector. Solar panels are included in the cost of the assembly, when shown in the plans.*

654-5.4 Pedestrian Hybrid Beacon Assembly: *A single pedestrian hybrid beacon face consists of 3 signal sections, with a circular yellow signal indication centered below 2 horizontally aligned circular red signal indications. The assembly includes the 3-sections, signal, hardware, and backplate. Pedestrian signals, cabinet, signs, mast arms, strain poles or other support structures, and signal cable will be paid under the applicable sections for each item.*

654-6 Basis of Payment.

Price and Payment will be full compensation for all work specified in this Section.

Payment will be made under:

<i>Item No. 654-1</i>	<i>In-Roadway Light Assembly</i>
<i>Item No. 654-2</i>	<i>Rectangular Rapid Flashing Beacon Assembly</i>
<i>Item No. 654-3</i>	<i>Pedestrian Hybrid Beacon Assembly</i>