



MnDOT Accessible Pedestrian Signals (APS) Specification
For use in Traffic Control Signal Systems
07/22/2014

1. System Operational Requirements

- 1.1. Shall meet The United States Access Board's
"Revised Draft Guidelines for Accessible Public Rights-of-Way"
Chapter R3: Technical Provisions
Sub section: R306
Dated: November 23, 2005
<http://www.access-board.gov/prowac/draft.htm#Text>
<http://www.access-board.gov/prowac/index.htm>
- 1.2. Shall have a central master control unit located in the traffic signal cabinet.
- 1.3. Shall have confirmation of button activation (Push) via latching LED, sound, and vibrotactile bounce.
- 1.4. Shall verbalize direction of travel with an extended button push or shall play a voice message "wait to cross *street name* at *street name*".
- 1.5. Shall have a standard locating tone during pedestrian clearance phase.
- 1.6. Shall be able to program the device to broadcast a beaconing tone during the pedestrian clearance phase.
- 1.7. Shall broadcast a percussive tone which consists of multiple frequencies with dominant component at 880Hz or broadcast a standard voice message during the walk interval.
- 1.8. Shall have a Vibrating button during the walk interval.
- 1.9. Shall be capable of a standard locating tone, custom sound, or verbal count down during the pedestrian clearance phase.
- 1.10. Shall support custom voice messages, tones and sounds.
- 1.11. Shall support up to two (2) languages for speech messages.
- 1.12. Shall have all sounds adjust automatically to ambient noise levels over a 60dB range.
 - 1.12.1. Shall have a maximum volume of 100dBA.

- 1.13. Shall have minimum and maximum levels independently set for all audible features on each button.
- 1.14. Shall have all sounds emitted by the APS at an intersection synchronized.
 - 1.14.1. Push button locate tones are exempt from this requirement.
- 1.15. May provide the capability that an extended button push can turn on, boost and /or mute all sounds except those on activated crosswalk.
- 1.16. Shall provide for emergency messages.
- 1.17. Shall support programming of the individual push buttons from the central master control unit in the traffic signal cabinet.
- 1.18. May have a hand held programming unit for programming individual push buttons.

2. Mechanical Requirements Push Button Station

- 2.1. Shall meet The United States Access Board's
“Revised Draft Guidelines for Accessible Public Rights-of-Way”
Chapter R3: Technical Provisions
Sub section: R306
Dated: November 23, 2005
<http://www.access-board.gov/prowac/draft.htm#Text>
- 2.2. Shall have a housing constructed of aluminum.
- 2.3. Shall be black in color.
- 2.4. Shall have a raised tactile arrow on the push button.
- 2.5. Shall have a solid state switch rated at a minimum of 20 million actuations.

3. Environmental Requirements Push Button Station

- 3.1. Shall be fully operational between -30° F to +165°F (-34° C to +74° C).
- 3.2. Shall have a weatherproof speaker.
- 3.3. Shall be field tested in a traffic signal application for a period of at least one (1) year.

4. Electrical Requirements Push Button Station

- 4.1. Shall operate at (18 or 22 VDC) or (18 or 22 VAC rms)
- 4.2. Shall require only 2 wires to connect to the master control unit in traffic signal cabinet.
- 4.3. Shall operate when connected to the central master unit with 14 AWG International Municipal Signal Association (IMSA) 50-2 loop detector lead in cable.

5. Environmental Requirements Master Control Unit

- 5.1. Shall be fully operational between -30° F to +165°F (-22° C to +74° C).
- 5.2. Shall operate in a humidity range of 0 -100% Non – Condensing.

6. Electrical Requirements Master Control Unit

- 6.1. Shall operate at a nominal 115VAC (rms).
- 6.2. Shall have an Ethernet Port that supports network communications.
- 6.3. Shall be capable of operating over the input voltage range of 98 – 125VAC (rms).
- 6.4. Shall have optically isolated walk and Don't Walk inputs.
- 6.5. Shall operate Walk and Don't Walk inputs within a range of 80 – 150 VAC (rms) or DC at .005 Amps max.
- 6.6. Shall have optically isolated general purpose outputs rated at 36VAC (rms) or VDC in a range of (.2 to .3) Amps.
- 6.7. Shall have fault output relays for each pedestrian phase.
 - 6.7.1. Fault Relays place constant pedestrian calls if there is an APS system power failure.
 - 6.7.2. Shall have fault output relays rated for 125VAC or VDC at 1 amp.
- 6.8. Shall have an output power rating for driving the pushbutton station (18 or 22 VDC) or (18 or 22VAC rms).
 - 6.8.1. Outputs from the central control unit for driving the pedestrian pushbutton stations shall not source more than 100 VA. This requirement allows the circuits to be classified as power limited circuits as defined by the National Electrical Code (NEC).
- 6.9. Shall have short circuit protection for push button output ports and shall auto recover when the short circuit is removed.

6.10. Shall be capable of supporting a minimum of four (4) Push button Stations per NEMA Pedestrian Phase.

7. Pedestrian Information Sign

7.1. Shall meet The United States Access Board's
"Revised Draft Guidelines for Accessible Public Rights-of-Way"
Chapter R4: Technical Provisions
Sub section: R409
Dated: November 23, 2005
<http://www.access-board.gov/prowac/draft.htm#Text>

7.2. Shall have a pedestrian information sign that is integral to the Pedestrian Push Button Station.

7.3. Shall be R10-3e.

7.4. Shall be in accordance with the latest edition of the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) and the Standard Highway Signs and Markings publication.

http://mutcd.fhwa.dot.gov/ser-shs_millennium.htm

7.5. Shall be fabricated in accordance with applicable sections of MnDOT's Standard Specifications for Construction 3352.

<http://www.dot.state.mn.us/pre-letting/spec/index.html>

7.6. Shall use MnDOT approved sign sheeting for rigid permanent signs, delineators, and markers (type IX and XI).

7.6.1. Sheeting shall be installed according to the manufacturer's instructions.

7.6.2. Shall be installed on a flat panel.

7.6.3. Approved sign sheeting can be found on the MnDOT approved/qualified products list.

<http://www.dot.state.mn.us/products/signing/sheeting.html>

7.7. Shall use clear MnDOT approved translucent overlay film. The translucent overlay film provides additional environmental protection for the sign sheeting.

7.7.1. Overlay film shall be installed according to the manufacturer's instructions.

7.7.2. Approved clear translucent overlay film can be found on the MnDOT approved/qualified products list.

<http://www.dot.state.mn.us/products/signing/sheeting.html>

7.8. Shall have information written or printed in Braille that describes the street name being crossed.

7.8.1. Shall be a contracted (grade 2) braille message produced in accordance with The U.S. Department of Justice 2010 Standards for Accessible Design Section 703.3.

<http://www.ada.gov/>

7.8.2. Shall have each street name transcribed into contracted (grade 2) braille in accordance with Unified English Braille (UEB) and in accordance with the Braille Authority of North America (BANA) document:

Braille Formats
Principles of Print-to-Braille Transcription,
2011.

<http://www.brailleauthority.org/>

The Rules of Unified English Braille,
International Council on English Braille
June 2010.

<http://www.iceb.org/>

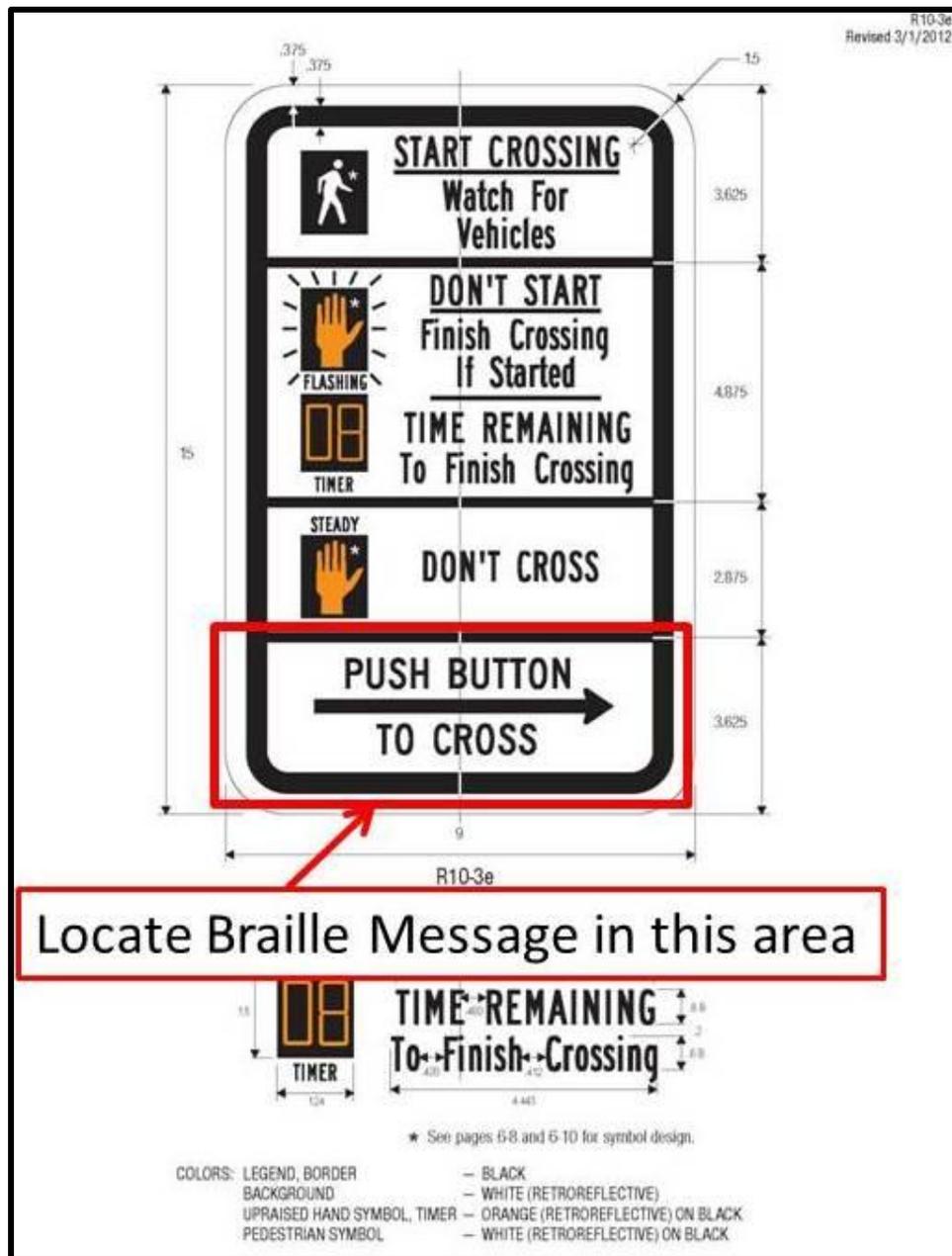
7.8.3. Shall use a manufacturer approved adhesive to attach the braille message to the overlay film.

7.8.4. Braille message shall be located on the bottom 3.625 inches of the sign.

7.8.5. Shall be placed over the area of the sign as shown below in Figure 1.

7.8.5.1. Shall be centered both vertically and horizontally in the designated area.

Figure 1



7.9. Shall provide a written English translation of the Braille message on the back side of the sign panel.

7.9.1. This aids in maintenance and repair of the sign.

7.9.2. Shall be a self-adhering machine printed label suitable for use in damp locations.

8. Hand Held Programmer

- 8.1. Is required when the buttons can be programmed from a manufacturer specific programmer. The ability of a button to be programmed from a laptop computer does not meet this requirement.
- 8.2. Shall be a hand held device for programming the individual Pedestrian Push Button Stations.
- 8.3. Shall have a remote infrared programming module that allows programming of the pedestrian push buttons without direct connection to the station.
- 8.4. Shall operate over the temperature range of 32° F to 122° F (0° C to +50° C).

9. Interface Connection Panel

- 9.1. Shall have an interface panel located in the traffic signal cabinet for connecting external APS button connecting wires to the central control unit in the traffic signal cabinet.
- 9.2. Shall have fail safe circuitry such that if the central control unit loses power constant pedestrian calls are placed on all active pedestrian controller inputs.