

Crossing Signal Standards

THE Joint Committee on Grade Crossing Protection, Association of American Railroads, has issued Bulletin No. 3—Railroad Grade Crossing Protection, Recommended Standards. An objective of the work of this committee is to promote standardization of crossing protection, throughout North America. The Public Service Commission of Colorado, by formal action after hearing, has adopted these standards, and other States have previously or are expected to take such actions soon. In order to disseminate the information quickly, the text of the Bulletin No. 3 is published herewith. Several of the drawings are omitted here, but references are given so that readers can locate them in other literature such as the Signal Section Manual.

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FOREWORD

The Joint Committee on Grade Crossing Protection of the Association of American Railroads was organized in April 1930. Its two principal functions are—First, to investi-

gate various types of railroad-highway grade crossing protective devices, with reference to the application of the best methods to the different classes of crossings, and to recommend to the Association standards and practices for the purpose. Secondly, to maintain contact with Federal, State and other public authorities, and to keep them informed with respect to these recommended standards and practices, with a view to establishing uniformity in aspect and operation of grade crossing protective apparatus.

In November 1931, the Joint Committee issued its Bulletin No. 1—Railroad-Highway Grade Crossing Protection—Recommended Standards, and distributed it to Federal and State governmental bodies, and to other organizations interested, as well as to railroads. By this means all concerned became acquainted with the recommended standards. Bulletin No. 2, superseding Bulletin No. 1 was issued July 1935, in order to include the latest developments to that date.

Response to these publications has been gratifying. Many railroads that were using several types of protection

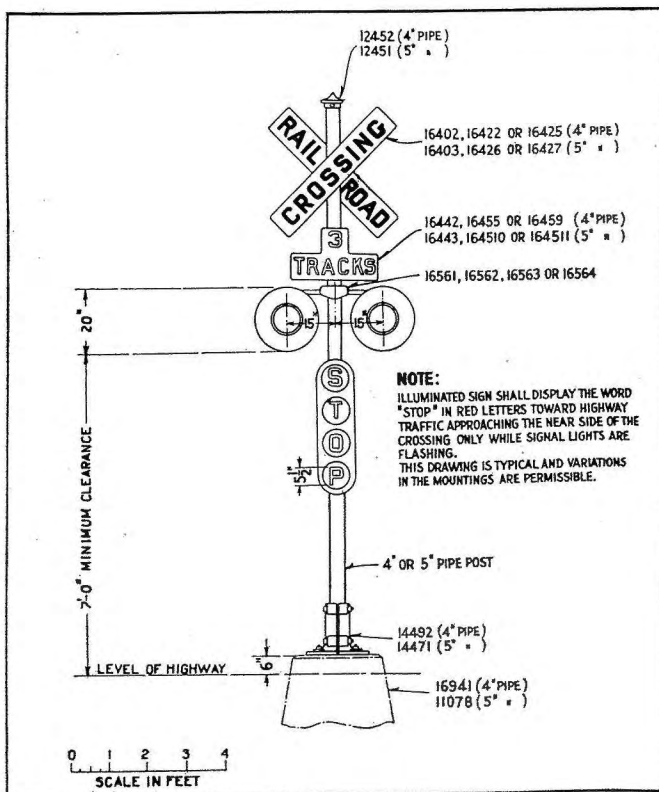


Fig. 11—Highway crossing signal flashing-light type
A.A.R. Signal Section Dwg. 1651C

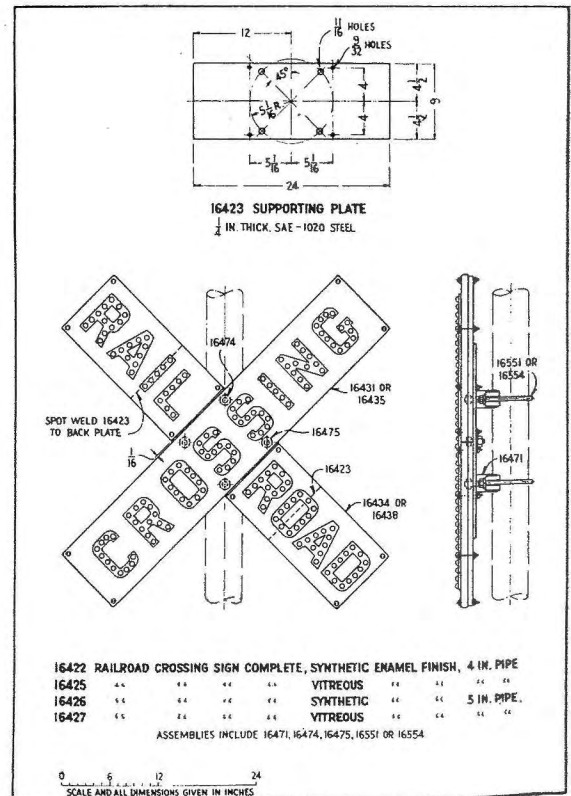


Fig. 17—Details of 90-deg. crossing sign
A.A.R. Signal Section Dwg. 1643C

immediately adopted as standard the recommendations as outlined therein. The Bureau of Public Roads, now the Public Roads Administration of the Federal Works Agency, and a number of State regulatory commissions also adopted these recommendations as standard.

Various organizations, national in character, such as the National Association of Railroad and Utilities Commissioners, the American Association of State Highway Officials, the National Conference on Street and Highway Safety and the American Automobile Association have endorsed the recommendations of the Committee. The American Standards Association has approved the standards and practices outlined in Bulletin No. 2.

Owing to the development of other types of apparatus for the protection of railroad highway grade crossings, and in order to present the recommended standards in their latest approved form, Bulletin No. 3 is now issued.

The Joint Committee on Grade Crossing Protection desires to express its appreciation to the many bodies, working toward the protection of railroad-highway grade crossings, for the favorable reception of its efforts, and for the wide and rapid extension of the use of the recommended standards. It also wishes to offer its continued cooperation and assistance to governmental and other public bodies interested in the prevention of acci-

dents at railroad-highway grade crossings.

The standards and practices contained in this bulletin are intended for new installations, or where general replacement of present apparatus is necessary.

Recommended Standards and Practices

Specifications and drawings referred to in this bulletin by number or figure, are those of the Signal Section or the Construction and Maintenance Section of the Association of American Railroads. Any reference thereto should mention the date and state or subsequent revision. Drawings of the Construction and Maintenance Section may be found in the American Railway Engineering Association Manual.

The location of signs, signals and automatic crossing gates for railroad-highway grade crossing protection shall be determined after inspection and study at the site. In addition to providing for adequate clearances, consideration shall be given to the type of pavement, angle of crossing and view when approaching the crossing.

Railroad-Highway Grade Crossing Signs

1. Railroad advance warning sign should be installed and maintained by the highway authorities in accordance

with Section 145 and 156 of the Manual on Uniform Traffic Control Devices for Streets and Highways—American Association of State Highway Officials, and National Conference on Street and Highway Safety, dated November 1935, reprinted September 1937, and revised February 1939.

2. Highway crossing signs shall be used as required.

3. Painted crossbuck sign, Figure 1, shall be used where it will provide adequate protection.

4. Reflector crossing sign, Figures 2, 3 and 4 may be used instead of the painted crossbuck sign, where adequate protection is not provided by the latter.

5. Suspended crossing sign, Figure 5, either painted type, Figures 6 and 7, or reflector type, Figures 8 and 9, may be used instead of the ground post sign, where local conditions prevent satisfactory location of the latter, or where the view is obstructed.

Crossing Signals

1. When visual warning signals are required, either flashing light type signals, Figure 10 or 11, or wig-wag type signals, Figure 12 or 13, shall be used, but both shall not be used at the same crossing. One signal shall be placed on each side of the track. (Note 1.)

2. Circuits for automatic operation of flashing light or wig-wag signals shall be so arranged that signals will

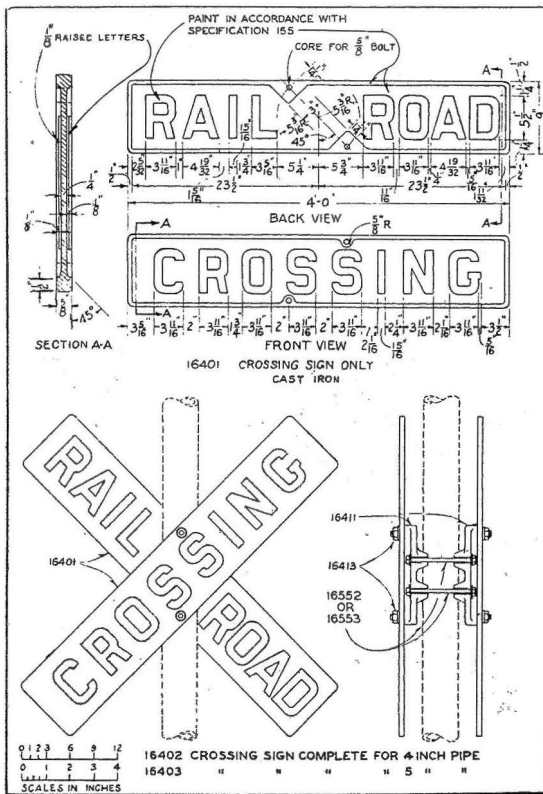


Fig. 15—90-deg. cast-iron crossing sign
A.A.R. Signal Section Dwg. 1640B

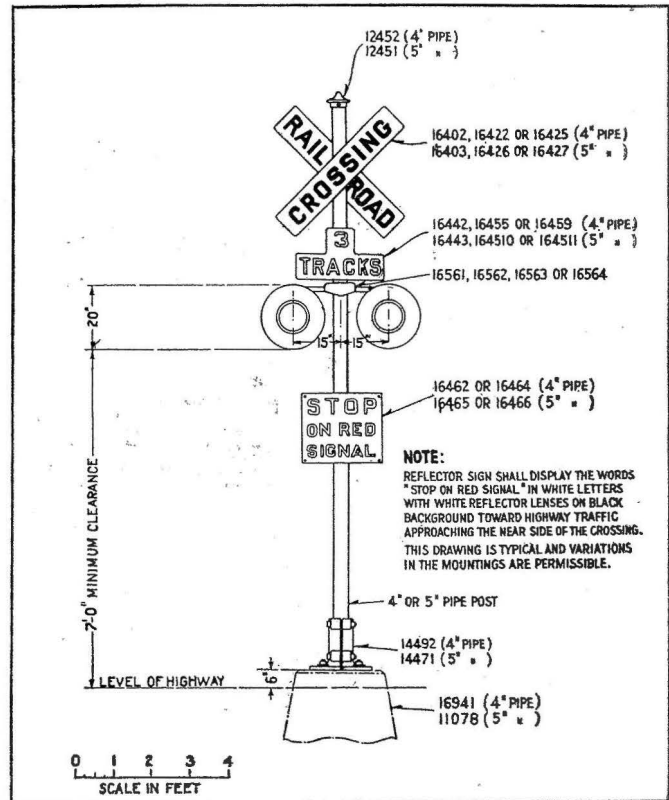


Fig. 10—Highway crossing-flashing-light type
A.A.R. Signal Section Dwg. 1653C

operate until rear of train reaches or clears the crossing.

3. Bell shall be used on crossing signals where required, and shall be in accordance with Association of American Railroads Signal Section Specification 44.

4. An electrically or mechanically operated signal used for the protection of highway traffic at railroad-highway grade crossings, shall present toward the highway, when indicating the approach of a train, the appearance of a horizontally swinging red light or swinging disc. (See Note 2.)

5. The railroad crossing sign and the signal shall be mounted on the same post.

6. Sign indicating the number of tracks, Figure 18 or 19, shall be used where there are two or more tracks. The number displayed on the sign shall be total number of tracks crossed, including sidings.

7. Automatic signal devices used to indicate the approach of trains shall so indicate for not less than 20 seconds before the arrival of the fastest train operated over the crossing. Local conditions may require a longer operating time; however, too long an operation by slow trains is undesirable.

8. Signal lights on flashing light or wig-wag crossing signals shall shine in both directions along the highway.

9. Post and assemblies shall be painted white or aluminum except parts which function as background

for light signal indications, which shall be black.

10. Material for flashing light or wig-wag signals shall be in accordance with Association of American Railroads Signal Section Specification 176.

11. Cantilever type signal support, Figure 23, may be used instead of the standard type where the latter cannot be located in its proper place, or where the view is obstructed.

FLASHING LIGHT TYPE

12. Signal lights shall be mounted horizontally 2 feet 6 inches centers. Lamps shall preferably be not less than 7 feet nor more than 9 feet above the surface of the highway.

13. Lamp cases shall open at the front, and be so designed that the door will open to the side or downward. Peep holes may be used.

14. Lamp unit shall be in accordance with Association of American Railroads Signal Section Specification 190.

15. Lights shall flash alternately. The number of flashes of each light per minute shall be 30 minimum, 45 maximum. Lights shall each burn the same length of time. Total burning time of both lamps shall be practically the entire operating time.

16. Lamp units shall be hooded to shade them from the sun, but not shielded at sides to impair close indication.

17. Range shall be the distance at which the indications will be clear and distinct to a person with normal vision.

18. Each flashing light unit shall provide an indication having a beam candle-power of uniform intensity at any angle up to 10 degrees on either side of the axis, and the range at any point in the 20 degree angle under bright sunlight conditions with the sun at or near the zenith, shall be not less than 1500 feet when a 10 watt lamp rated at 1000 hours is burned at rated voltage.

19. Lenses or roundels shall be 8 3/8 inches diameter minimum, and shall be in accordance with Association of American Railroads Signal Section Specification 69.

20. Signal shall display a satisfactory close indication.

21. When desired, or when required by governmental authorities, a rotating disc bearing the word "Stop" in reflector lenses may be used instead of the "Stop on Red Signal" or the illuminated "Stop" sign.

WIG-WAG TYPE

22. Lenses or roundels shall be 5 inches in diameter minimum, and shall be in accordance with Association of American Railroads Signal Section

NOTE 1—Bracket type mounting for wig-wag signal fulfills the requirements of type of support illustrated.

NOTE 2—This requirement is fulfilled when the light in the swinging disc is illuminated only in the extreme positions of the disc.

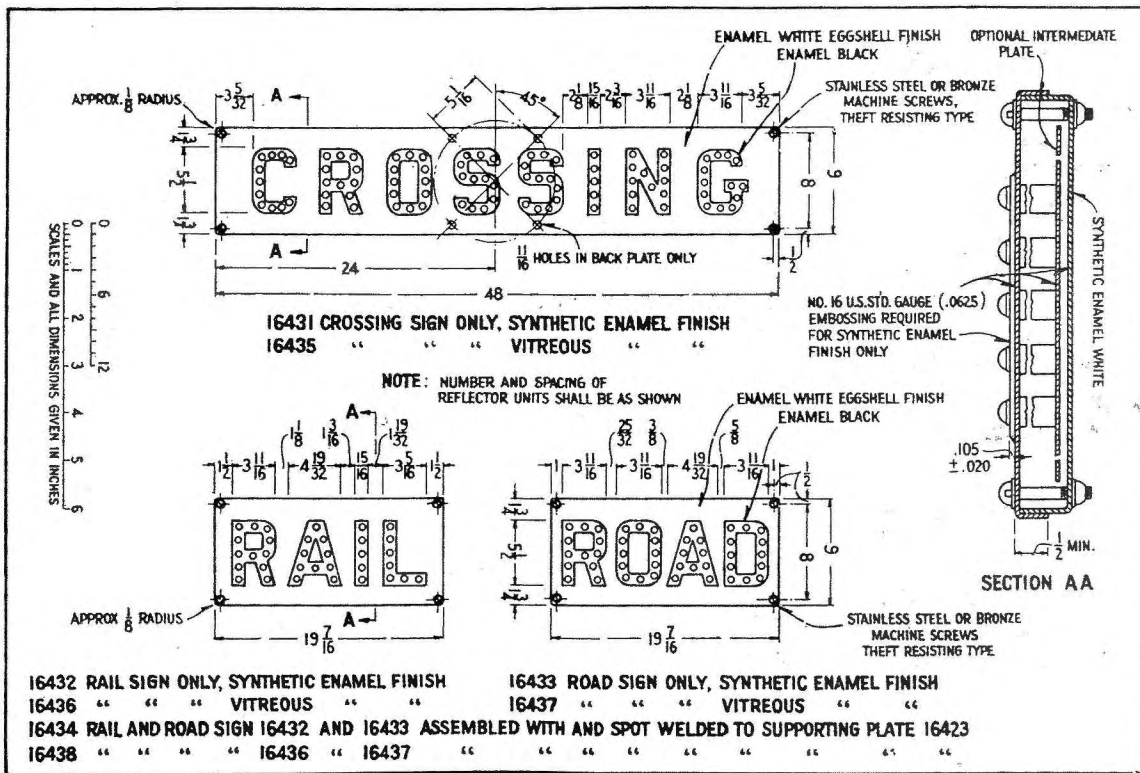


Fig. 17—90-deg. reflector crossing sign A.A.R. Signal Section Dwg. 1643C

Specification 69 in the Manual.
 23. The signal light, when the disc is suspended vertically, shall have a range, at night, of 1500 feet through a total angle of not less than 30 degrees when a 10 watt lamp, rated at 1000 hours, is burned at rated voltage.

24. Movement from one extreme to the other and back constitutes a cycle. The number of cycles per minute shall be 30 minimum, 45 maximum.

Automatic Gates

1. Automatic gates where installed shall be provided as an adjunct to Association of American Railroads recommended automatic crossing signals of the flashing light or wig-wag type.

2. Automatic gates for the protection of highway traffic at a railroad grade crossing shall, when indicating the approach of a train, present toward the highway the appearance of a horizontal arm, extending over the traveled roadway a sufficient distance to cover the lane or lanes used by traffic approaching the crossing.

3. The automatic gate arms when not indicating the approach of a train shall neither obstruct nor interfere with highway traffic.

4. A highway crossing bell, if used, shall sound a warning while the gate is being lowered.

5. The automatic gate arms shall be mounted on posts or housings containing the arm operating mechanisms.

6. The design of the gate operating mechanism shall, so far as practicable, be such as to insure proper operation during unfavorable weather conditions, and if out of order, the gate arms shall assume the horizontal position across the roadway.

7. The mechanisms shall be so designed that if the arms, while being raised or lowered, strike or foul an object, they will readily stop and, on removal of the obstruction, shall assume the position corresponding with the control apparatus.

8. Circuits for operation of the automatic gates shall be so arranged that gates will start to assume the horizontal position between 3 and 5 seconds after the warning signals start to operate. Gates shall reach full horizontal position before the arrival of the fastest train operated over the crossing, and shall remain down until the rear of the train has cleared the crossing.

9. Each gate arm, extending over the roadway, shall have three red lights shining in both directions along the highway. The light nearest the tip of each arm shall burn steadily, and the other two lights on each arm shall flash alternately.

10. The bottom of the gate arms, when in the horizontal position, shall be not less than 3 feet, nor more than 4 feet above the crown of the roadway.

11. The gate arms shall be painted on both sides with alternate diagonal

stripes of white and black, in accordance with Figure 24.

12. The automatic highway crossing signals shall operate in accordance with Association of American Railroads recommended practice, and independently of the gates.

13. Details of the signals, gates, operating mechanisms, and control circuits shall be in accordance with Association of American Railroads recommended practice.

14. The gate arms shall operate uniformly, smoothly, and complete all movements without rebound or slap, and be securely held when in the raised position.

15. Each individual gate post shall be provided with independent operating mechanism, and housing shall be of sufficient size to allow ready inspection, adjustment and repairs.

16. The highway traffic lanes in the vicinity of the crossing shall be distinctly marked.

Advance Warning Sign

A railroad advance warning sign should be installed and maintained in accordance with the recommendation of the Manual on Uniform Traffic Control Devices for Streets and Highways, which reads as follows:

“Railroad advance warning signs are usually off the railroad right of way and should be the responsibility of the highway authorities.”

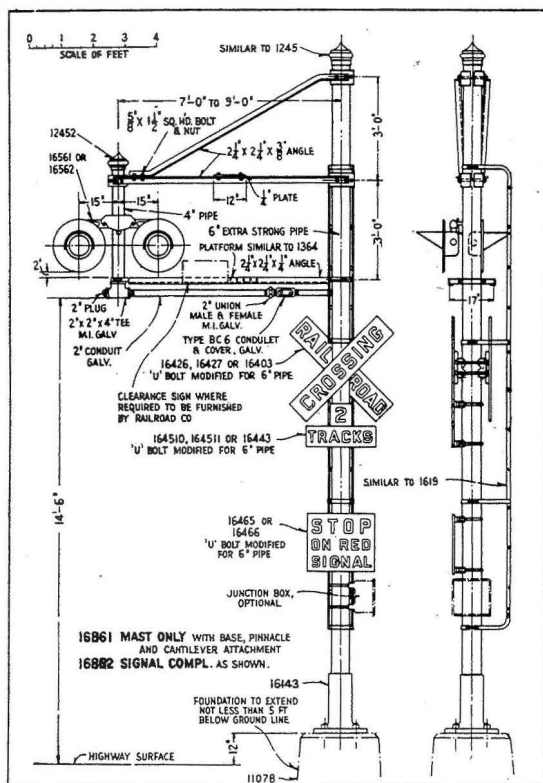


Fig. 23—Cantilever mounting for flashing-light
 A.A.R. Signal Section Dwg. 1686C

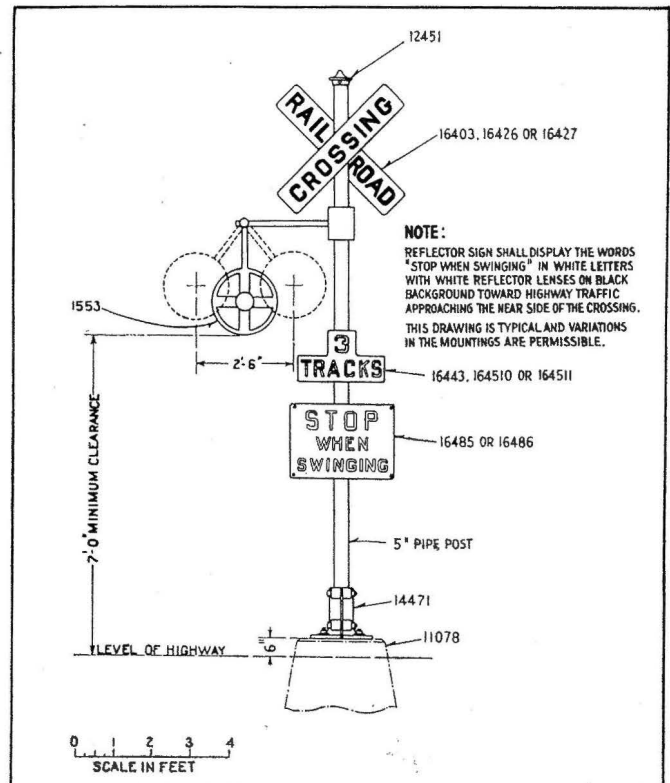


Fig. 12—Wig-wag crossing signal assembly
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