

## Chapter Hy 15

## TRAFFIC CONTROL SIGNALS

Hy 15.01	General	Hy 15.03	Installation of traffic control signal equipment
Hy 15.02	Design of traffic control signal equipment	Hy 15.04	Operation of traffic control signals

*No. section 85*

Hy 15.01 General. (1) ~~AUTHORITY FOR THESE~~ REGULATIONS. Pursuant to authority contained in section 85.71(2), Wis. Stats., the commission prescribes the following regulations for the design, installation and operation of traffic control signals.

(2) APPLICATION. These regulations shall apply to all traffic control signals, including those presently installed.

(3) PREVIOUS REGULATIONS. These regulations supersede the regulations prescribed by the commission on October 11, 1945, and published on October 18, 1945, and revised on May 17, 1949, published on September 6, 1950, and appearing on pages 234-239, inclusive, of the 1950 edition of the Red Book.

Hy 15.02 Design of traffic control signal equipment. (1) DESIGN OF LENSES, REFLECTORS AND LAMP RECEPTACLES.

(a) *Shape*. Lens shall be circular.

(b) *Size*. Lens shall have not less than  $7\frac{3}{4}$ " visible diameter when assembled in housing.

(c) *Colors*.

1. Standard lenses for the control of vehicular traffic shall be red, yellow, and green. These colors shall conform to standard specification D 10.1-1951, UDC-656.054/.057 adopted on November 26, 1951, by the American Standards Association, 70 East 45th Street, New York 17, New York, as to spectral transmission. Copies of the said standard specifications are on file at the main office of the commission in Madison, and in the office of the secretary of state and revisor of statutes. *Subl 7/28/56*

2. Arrow lenses shall have a green illuminated arrow on a dark field.

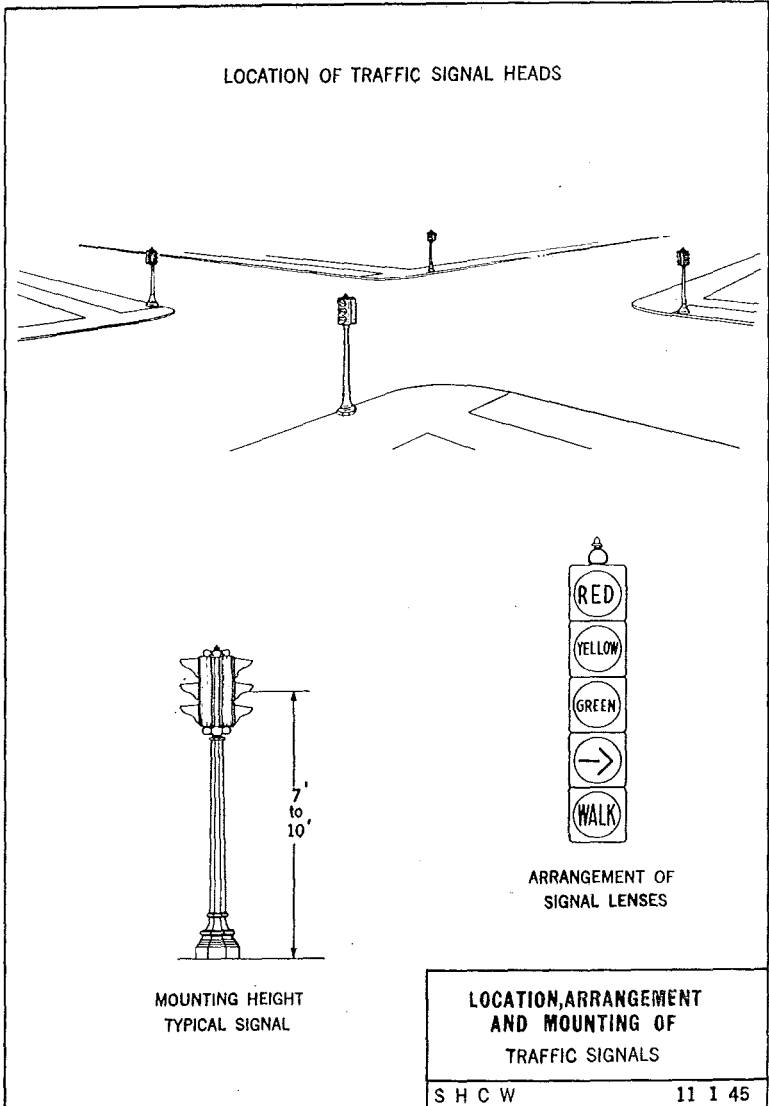
3. Walk lenses shall be white with either black letters on a white field or white frosted or lunar white letters on a black field.

(d) *Lettering*. On urban streets only the word "GO" may be displayed on the green lens, the word "CAUTION" on the yellow lens and the word "STOP" on the red lens. The word "WALK" shall always be displayed on a pedestrian control lens.

(e) *Illumination*. Each lens shall be illuminated independently of any other lens by a clear lamp rated at not less than 40 watts but preferably 60 watts especially designed for traffic signals and operated at rated voltage.

(f) *Visibility*.

1. When illuminated, the green, yellow and red lenses shall be visible at any distance from 10 feet to 300 feet, under all light and atmospheric conditions except dense fog. When viewed from the usual angles the entire surface shall appear illuminated.



2. When illuminated, the indication of the green arrow lens shall be distinctly legible at a distance of 200 feet while the word "WALK" on a pedestrian control signal shall be legible for a distance of 100 feet.

(g) *Sun phantom.* The optical unit (lens, reflector, socket and visor) shall be so designed that sun phantom, or apparent illumination of the lens when the lamp is not burning will be at a minimum when the lens faces the sun.

(h) *Lamp receptacle.* The lamp receptacle shall be designed to hold an A-21 bulb of required wattage with the light center at the focal point of the reflector.

(i) *Visors.* Each optical unit shall be equipped with a suitable visor to aid in reducing sun phantom, and this visor shall be of such shape and size as is necessary to insure that the signal indication shall not be visible to cross traffic to such an extent as to be confusing.

(2) DESIGN OF SIGNAL HEADS. (a) *Number of lenses.* Each signal head shall have at least the three normal color lenses (red, yellow and green), and may have such additional lenses as are required for proper control of traffic.

(b) *Arrangement of lenses.* 1. All signal indications shall be in a straight line and shall be in the order shown on page 19. In vertical signals, which is the preferred arrangement, position No. 1 shall be at the top and position No. 5 at the bottom. In horizontal signals, position No. 1 shall be at the left (facing the signal) and position No. 5 shall be at the right.

*Note:* The full green indication will not always be required if arrow indications are used.

2. Since all of these indications are not usually needed in any one signal head the omission of one or more indications from the signal head will merely move each indication with a higher number further up or to the left.

(c) *Adjustment of signal heads.* Each signal head shall be so constructed that it may be rotated upon its vertical axis to allow each signal face to be directed at the traffic it is intended to control. It is desirable that the "WALK" lens be separately adjustable.

**Hy 15.03 Installation of traffic control signal equipment.** (1) INSTALLATION OF SIGNAL HEADS. (a) *Mounting.* The normal type of mounting of signal heads, which shall be used wherever possible, shall consist of two signal heads containing 3 or more lenses arranged in vertical sequence mounted back to back on a post located as detailed below. The mounting of signals on a pedestal at or near the center of the intersection is specifically prohibited, as is also the suspension of the signal head over the center of the intersection by means of a cable. This shall not, however, prohibit the use of suspended signals as auxiliary to the normally mounted signals, nor shall this prohibit the mounting of signal heads on posts which are placed on channelizing islands not at or near the center of the intersection.

(b) *Mounting height.* The height of the center of the yellow lens above the centerline grade of the pavement shall be as follows:

<i>Type of Mounting</i>	<i>Minimum Maximum</i>	
Post -----	7 ft.	10 ft.
Suspended over traffic -----	16 ft.	18 ft.

(c) *Location of signal heads.* 1. The post for traffic signals shall be located as near as possible to the point where traffic is expected to stop when presented with a red signal. In cities the post should usually be located immediately before the near crosswalk and approximately two feet inside the curb line.

2. For each street or highway entering an intersection there shall be two signal heads, one to be located on the near right hand corner and the other on the far left hand corner of the intersection for the traffic which these signal heads control. In some cases it may be desirable to provide additional signal heads for the control of traffic on one or more approaches.

(2) ELECTRICAL INSTALLATION. The equipment and manner of its installation shall conform to the Wisconsin Electrical Code.

**Hy 15.04 Operation of traffic control signals.** (1) SEQUENCE OF INTERVALS. (a) *Standard minimum sequence.* The standard sequence of signal indications as presented to traffic approaching the intersection on any one street or highway shall be as follows: red, followed by green, followed by yellow, followed by red, which is again followed by green, etc.

<i>Interval No.</i>	<i>Main Street</i>	<i>Cross Street</i>
1 -----	Red	Yellow
2 -----	Green	Red
3 -----	Yellow	Red
4 -----	Red	Green
etc. -----	Repeat	Repeat

(b) *Prohibition of red-yellow overlap.* The yellow signal shall not be shown with or after a red signal and before a green signal appears.

(c) *Additional approved intervals.* Such additional intervals as are necessary for the proper control of traffic may be added to or substituted for intervals of the standard minimum sequence. Additional approved intervals are listed below. Other additions to the standard minimum sequence will be considered if presented to the commission.

(d) *Additional intervals.* 1. Green and yellow shown together following green alone, either as a substitute for or in addition to the yellow as a clearance interval for both pedestrians and vehicles.

2. All-red interval following each clearance interval in which a red indication is presented for a very short time to all traffic entering the intersection as a safety clearance interval.

3. "WALK" interval, either with the green as a pedestrian indication or with an all-red indication to provide for pedestrian movement while stopping all vehicular traffic. In either use of this interval a pedestrian clearance interval must be provided by terminating the "WALK" interval sufficiently in advance of a change in vehicular traffic movement to permit pedestrians to reach a place of safety.

(2) LENGTH OF CYCLE AND INTERVALS. (a) *Total time cycle.* The length of the total time cycle shall be the least that will promote the orderly movement of traffic. It is generally felt that a good cycle length under ordinary conditions is 30 to 50 seconds or 60 seconds in exceptional cases. Where three streets intersect it may be necessary to increase this by a small amount.

(b) *Vehicular intervals.* The proportion of each total time cycle allotted for movement on each street shall be proportioned as nearly as possible to the needs of traffic. The length of the yellow interval shall not be greater than is necessary to carry out its function as a clearance and warning interval.

(c) *Pedestrian intervals.* The duration of the "WALK" indication in an exclusive pedestrian interval shall be proportioned to the amount of pedestrian and vehicular traffic. The length of the pedestrian clearance interval following the "WALK" interval shall be the minimum sufficient to permit the pedestrian to reach a place of safety. Where the pedestrian indication is used with the green vehicular indication and not as a separate interval, the yellow interval shall be counted as a part of the pedestrian clearance interval.

(3) **ABNORMAL OPERATING CONDITIONS—OFF-PEAK OPERATION.** Whenever a traffic control signal is not operating on a regular cycle with the normal intervals it may be set to give a flashing indication on one or both streets. Standard methods of flashing operation are as follows:

(a) Flashing yellow on the major street, and flashing red on the minor street.

(b) Flashing yellow on both streets.

(c) Flashing red on minor street.

*Note:* Under the statutes, flashing red means "Stop" and flashing yellow "Caution."

(4) **COORDINATION OF ADJACENT SIGNALS.** Wherever possible adjacent traffic control signals shall be coordinated in their operation in such a way as to facilitate the flow of traffic. Possible coordination of adjacent signals should be taken into consideration in purchasing equipment as some types are more readily coordinated than others.

(5) **MAINTENANCE.** (a) *Painting.* Signal heads (except the underside of visors), their supporting hardware and the standard if used solely to support signal, shall be painted Federal yellow. Said paint shall be renewed frequently enough to keep it in good condition.

(b) *General.* Maintenance of the equipment including servicing of the controller and associated equipment, replacement of bulbs, cleaning of lenses and reflectors, etc., shall be carried out in such a manner that the signal will be working in a satisfactory manner at all times.