Chapter Hy 21

TRAFFIC CONTROL SIGNALS

Hy 21.01 General. (1) AUTHORITY FOR THESE RULES. Pursuant to section 349.08(1), Wis. Stats., the commission prescribes these rules for the design, installation and operation of traffic control signals.

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

History: Cr. Register, August, 1962, No. 80, eff. 9–1–62.

Hy 21.02 Effective date of regulations. Traffic control signals which comply with chapter Hy 21 as published in the Wisconsin Administrative Register for January, 1970, may be operated until January 1, 1977, but all new traffic control signal installations made after December 31, 1972 and all traffic control signal installations in place and operating after December 31, 1976 shall comply with these rules.

History: Cr. Register, August, 1962, No. 80, eff. 9–1–62; am. Register, April, 1967, No. 136, eff. 5–1–67; am. Register, September, 1970, No. 177, eff. 10–1–70; am. Register, June, 1972, No. 198, eff. 7–1–72.

Hy 21.03 Design of vehicular traffic control signal equipment. (1) DESIGN OF LENSES, REFLECTORS AND LAMP RECEPTACLES. *(a) Shape.* The aspect of all signal lenses used to control vehicles shall be circular in shape when illuminated except that lane use control signals shall present a square aspect.

(b) SIZE. 1. There are two approved nominal sizes of lenses—8 inches and 12 inches.

2. The 8-inch circular lens shall have a visible diameter of not less than 7¾ inches and an overall diameter of approximately 8⅝ inches.

3. The 12-inch circular lens shall have a visible diameter of not less than 11½ inches and an overall diameter of approximately 12 1/32 inches.

(c) *Signal light colors, intensity and distribution.* The color, intensity and distribution of light from red, yellow and green vehicular traffic signal lenses and also the design of arrow lenses shall meet the requirements of the revised standard of the Institute of Traffic Engineers, 2029 K Street, N.W., Washington, D.C. 20006, entitled "Adjustable Face Vehicle Traffic Control Signal Heads." A copy of the above standard and report is on file at the central office of the division of highways in Madison, and in the office of the secretary of state and revisor of statutes. When a vehicular signal lens is illuminated and the view of such indication is not physically ob-

structed, it shall be bright enough to be clearly visible (to drivers it controls) for a distance of at least ¼ mile under normal atmospheric conditions. Arrow lenses shall have an opaque background. The arrow shall be the illuminated part of the lens and shall be visible only when illuminated from within. Each arrow lens shall show only one arrow direction.

(d) *Lettering.* Lettering shall in no case be used on the visible part of vehicular signal lenses.

(e) *Illumination.* Each lens shall be illuminated independently. Especially designed traffic signal lamps shall be used with a minimum nominal wattage of 67 for 8-inch lenses and 108 watts for 12-inch yellow and green lenses and 150 watts for 12-inch red lenses. When 12-inch yellow lenses are used for nighttime flashing operation, the illumination shall be reduced so that the brilliance of the lighted lens will be equivalent to the brilliance of an 8-inch yellow lens with a nominal 67-watt lamp.

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

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

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

(2) DESIGN OF SIGNAL HEADS. (a) *Number of lenses.* 1. Each vehicular signal face, except in a freeway entrance ramp metering control signal, shall have at least 3 but not more than 5 lenses—red, yellow and green (circular or arrow)—except where a green arrow indication is used alone to indicate continuous movement or where because of special turning movements or other problems, flashing yellow or flashing and steady red signal indications are used to supplement an otherwise normal signal installation, or where one or more signal indications are repeated in the same signal face for reasons of safety or to improve the effectiveness of the signal. Freeway ramp metering control signals may have only 2 lenses—red and green.

2. Green arrow signal indications shall be used whenever a specific movement is allowed to proceed at a time when other vehicular movements on that approach have a different signal indication. Arrow indications include a straight through arrow, a left-turn arrow and a right-turn arrow, but arrows may be placed at angles other than 0 and 90 degrees with the vertical to indicate movements into streets which leave the intersection at different angles. The straight-through arrow shall point up.

(b) *Arragement of lenses.* 1. Lenses in a traffic signal face that is not mounted over the roadway (hereinafter referred to as post-mounted) shall be arranged in a vertical line. Lenses in a traffic signal face that is mounted over the roadway (hereinafter referred to as overhead-mounted) shall be arranged in either a vertical or horizontal line. In a vertical array, lenses of the same color may be