

Recognizing the limited surface area of the sides of a typical flat car, paragraph (a)(3) proposes to require a minimum of two 4x18 inch strips, one next to the other, be applied vertically as close to each end of the car as practicable, with the bottom edge of each strip no lower than 30 inches above the top of the rail, as practicable. Consistent with the application pattern

for other freight cars, paragraph (a)(3) requires that a minimum of one 4x18 inch strip be applied to the sides of flat cars vertically at intervals of no more than every ten feet (*i.e.*, at 10 feet, 20 feet, 30 feet, 40 feet, *etc.*), with the bottom edges of each strip no lower than 42 inches above the top of the rail, as practicable. See Figure 3. Because the surface area of a typical flat car is

between 4 and 18 inches in height, if vertical application of 4x18 inch strips is not feasible, paragraph (a)(3) allows retroreflective sheeting on flat cars to be applied vertically in three 4x6 inch strips placed directly next to each other, or placed horizontally along the side sills of the cars.

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Retroreflective Sheeting Pattern for Typical 60 Foot Flat Car

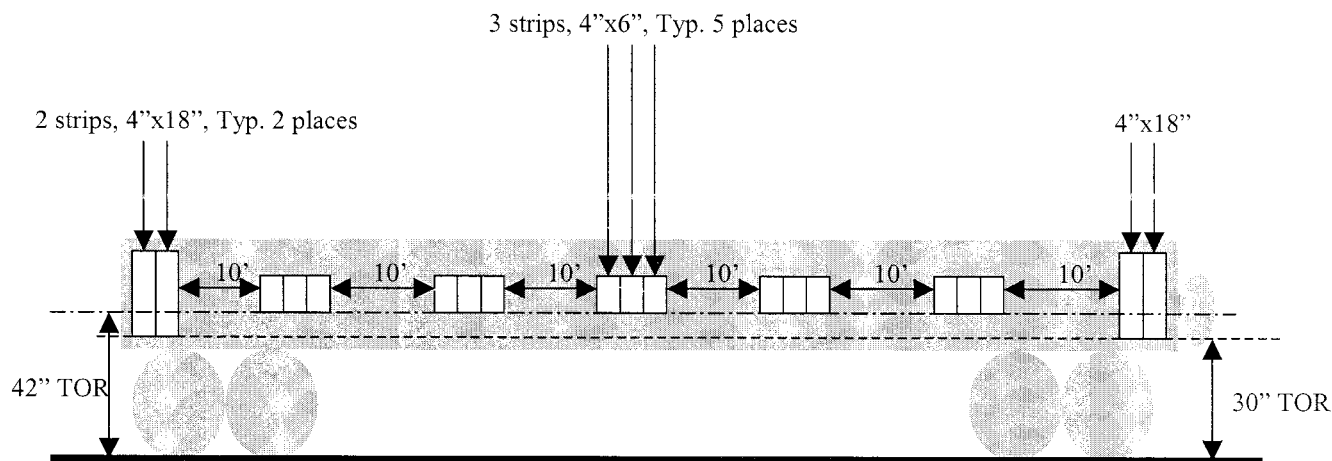


Figure 3

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Paragraph (a)(4) recognizes that not all freight cars will fit the standard configuration contemplated in paragraphs (a)(1) through (a)(3). FRA estimates that the patterns proposed for typical freight cars, tank cars, and flat cars would be impractical to apply to approximately 1% of the fleet (*e.g.*, schnabel cars, *etc.*) due to their unique physical configurations. Accordingly, this paragraph proposes a more flexible application pattern for these "cars of special construction." Specifically, based on the length of a "car of special construction," this paragraph specifies the required amount of retroreflective material and requires that the pattern of application for these cars conform as close as practicable to the standard patterns proposed in paragraphs (a)(1) through (a)(3).

Paragraph (b) contains the proposed requirements for the reflectorization of locomotives. The conspicuity issues surrounding locomotives differ from the issues surrounding freight cars in many respects. First, the physical configuration of locomotives is obviously quite different from the configuration of most freight cars. In

some cases, locomotives are painted brighter colors than freight cars; and locomotives owned by major railroads and used in road service are cleaned on a more frequent basis. Often, company logos are displayed on the sides of locomotives in fluorescent or reflective materials and locomotives have a light source attached at the front and sides. However, in other cases, locomotives are painted in dark colors or are not repainted for several years, resulting in a very dark appearance.

FRA believes that some pattern of retroreflective material recognizable to motorists is necessary to facilitate motorists' recognition of locomotives in grade crossings. Most major railroads have already instituted programs to accomplish this. Application of retroreflective material to locomotives will enhance conspicuity under the following scenarios:

- Several locomotives are coupled in a multiple-unit consist pulling a train and the motorists' first view of the crossing occurs when the first locomotive is already on the crossing.
- The train is stopped with one or more locomotives on the crossing.

- A locomotive is embedded in the consist providing "distributed power" or is in "helper service" pushing from the rear.

- During switching operations, the locomotive is pushing the train.

Inclusion of locomotives in this program is further warranted by their high utilization. While many freight cars sit idle for days or weeks at a time, locomotives are generally used on a daily basis. Investments in improved conspicuity of locomotives should be amortized through safety benefits even more quickly than would be the case with freight cars.

Although requiring the same amount of retroreflective material on locomotives as comparably sized freight cars, paragraph (b) does not propose to mandate a specific pattern. Instead, this paragraph proposes to allow any pattern that divides the amount of retroreflective sheeting equally between both sides of a locomotive and is applied in a "pattern recognizable to motorists," even a horizontal pattern along the sill or side walkway of a locomotive.

Although FRA believes that the patterns of application proposed in this