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of bridge navigation lights..",
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RECOMMENDATIONS FOR TEMPORARY AND PERMANENT INSTALLATIONS
OF
BRIDGE NAVIGATION LIGHTS
AND
REFLECTIVE MATERIAL

When needed for the safety of navigation, the Coast Guard (District Commander) will require bridge lighting in accordance with Title 33, Section 118, Code of Federal Regulations. The required bridge lighting must be installed at the locations and in the manner prescribed by the District Commander on Coast Guard approved bridge plans.

The following guidelines will assist in the selection and installation of the proper equipment needed to maintain marine navigation lights and reflective material on bridges:

I. Bascule Bridges.

1. The lift span of a bascule bridge must be lighted so that the free ends of a fully open span will be marked on each side by green lights during the passage of vessels and by red lights for all other positions of the lift span. Each red or green light shall show through a horizontal arc of 180 degrees. Further, the lights shall be securely mounted on the side of the span so as to show 90 degrees on either side of a line parallel to the channel axis in order to be visible from an approaching vessel.
2. The upstream and downstream sides of the main channel piers must be marked with red lights. Each red light shall show through a horizontal arc of 180 degrees and must be securely mounted on the pier as low as practicable but not lower than two feet above navigable high water to show 90 degrees on either side of a line parallel to the axis of the channel so as to be visible from an approaching vessel.
3. The channelward side of the pier protection cell must be marked with a red light. The red light must show through a horizontal arc of 180 degrees and must be securely mounted on top of the cell in the upstream channelward quadrant in order to show 90 degrees on either side of a line parallel to the channel axis so as to be visible from an approaching vessel.

4. In addition to the navigation lights prescribed, a red reflector should be installed in the channelward upstream quadrant of the cell and the upstream and downstream sides of each channel pier. The reflector must have a reflective area of not less than 36 square inches and not more than 144 square inches.

II. Fixed Bridges.

Upstream and downstream sides of channel piers and protection cells (if any) may be marked with red reflectors or red retroreflective material in addition to the lights prescribed. The material is normally affixed to the upstream channelward quadrant of each upstream channel pier and cell and to the downstream channelward quadrant of the downstream channel pier and cell in order to effectively reflect the light from an approaching vessel. The reflectors or retroreflective materials should cover about 0.5 square foot in each location and located at or above the high water line.

III. Swing Bridges.

1. Swing spans shall be marked with three lights so that when viewed from an approaching vessel, the closed swing span will display three red lights on top of the span structure (one at each end of the span on the same level and one at the center of the span, not less than 10 feet above the other two lights). The swing span, when open, will display three green lights on top of the span structure in a line parallel to and directly above the long axis of the span (one at each end of the span on the same level and one at the center of the span, no less than 10 feet above the other two lights). Each light shall show through alternate red and green horizontal area of 60 degrees each with the axis of adjacent arcs being 90 degrees from each other. Further, each light shall be securely mounted with the axis of the green arcs parallel to the long axis of the bridge.

2. Protection cells and light platforms located upstream from the right descending rest piers, the upstream and downstream pivot pier protection cells, and the downstream side of the right and both sides of left rest piers, must be marked with red lights. Each light must show through a horizontal arc of 180 degrees and must be mounted on top of the structures in order to show 90 degrees on either side of a line parallel to the axis of the channel so as to be visible from an approaching vessel.

IV. Vertical Lift Bridges.

1. Vertical lift spans which are open for navigation shall be lighted so that the center of the navigable channel under the span will be marked by a range of two green lights. For all other positions of the lift span, each side must be marked by one red light. Each green light must show through a horizontal arc of 360 degrees and must be securely mounted just below the outermost edge of the bridge span structure so as to be visible from an approaching vessel. Each red light must show through a horizontal arc of 180 degrees and must be securely mounted just below the outermost edge of the lift span in order to show 90 degrees on either side of a line parallel to the channel axis so that only one such light will be visible from an approaching vessel.

2. The upstream and downstream sides of the channel piers shall be marked with red lights. Each red light shall be visible through a horizontal arc of 180 degrees and shall be securely mounted on the pier as low as practicable but not lower than two feet above navigable high water to be visible from an approaching vessel for 90 degrees on either side of a line parallel to the channel axis.

3. The upstream and downstream sides of the channel piers should be marked with red retroreflective material. This material should be affixed near the top of the pier column and on the extreme channelward quadrant of the pier column so as to effectively reflect the searchlight from a vessel approaching from the usual direction. Such material should be affixed in one piece, when practicable, and should have a reflective area of not less than 16 square inches and not more than 144 square inches.

V. Other Guidelines:

1. Equipment used for general illumination of a bridge shall be so designed that the light distribution pattern will not permit high intensity light to spill over and blind or interfere with marine navigation. There are a number of street light luminaries manufactured to control the light distribution by lense, ray collectors, hoods or shields. Proper consideration of this matter while the bridge design is in progress will avoid difficulties in the future.

2. Fresnel lens lanterns should be used and installed, i.e., a service lamp with at least one standby lamp. Both lamps should be controlled by a lightout relay or lampchanger mechanism so as to exhibit the standby lamp upon burnout of the service lamp.

3. Lamps for fresnel equipment should be properly secured and properly focused in the lenses.

4. Prescribed bridge lights must be displayed from sunset to sunrise each night of the year and at other times when the visibility is less than one mile. The lights should be of sufficient candlepower so as to be visible against the background lighting at a distance of at least 2,000 yards for 90 percent of the nights of the year.

It is the responsibility of the bridge owner to maintain proper temporary navigational lighting and such other marking as may be prescribed on bridges during construction and permanent lighting on the bridge when it spans the river and falsework has been removed. Temporary lights and reflectors must be of the same color and characteristic and have a range of visibility equal to that prescribed for permanent lights.

Responsibility of the owner does not cease upon installation of the prescribed lights. Provisions for maintaining all prescribed lights should be included in the planning for initial installation. A continuing program of inspection and maintenance is necessary to insure that the lights are properly displayed.

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PROCESS FOR KEEPING MARINE TRAFFIC
MOVING DURING BRIDGE CONSTRUCTION OR
RECONSTRUCTION

- A. The main objective of the Coast Guard during construction or reconstruction of bridges in the navigable waters of the United States is to provide for the reasonable needs of navigation. This means that we must assure as much as possible the safe passage of navigation while at the same time minimize traffic delays and delays to bridge construction. To assure this, the Coast Guard usually takes the following precautions:
1. Impose limitations on the bridge builder as to the amount of obstructions to be placed in the waterway, i.e., falsework, etc.
 2. Prescribe minimum navigational clearances according to the type of vessels and cargo transiting the waterway.
 3. Assure that both sides of the channel are not blocked at the same time.
 4. Assure prompt removal of falsework from the waterway following completion of work for permanent bridge.
 5. Require protection dolphins to deflect vessels from falsework or caissons.
 6. Assure that adequate navigational lighting and reflectors are placed on the construction site.
 7. Advise the mariner by public notice, radio or newspaper announcements of conditions on the waterway.
 8. In case of bridge replacement, require removal of the old bridge usually within 90 days subsequent to the opening to vehicular traffic of the new bridge.
 9. Set-up safety zone at the bridge site if navigational channel is severely restricted. Such restriction, should be for only a short period of time, - hours. The Captain of the Port or the Marine Safety Officer must approve such channel restriction.
 10. If necessary, the Coast Guard may require a radio-equipped tug at the construction site to assist tows through the construction site. The name of the tug and its call sign is published by the Coast Guard so that the mariners can contact it.

B. To accommodate vehicular traffic the Coast Guard usually:

1. Allows the old bridge to remain in place while the new bridge is being constructed.
2. Allows the construction of temporary bridges which remain in place until the new bridge is completed